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UPDATE

EMERGING THREATS: FIVE DISEASES NURSES NEED TO KNOW ABOUT

What are the likely contenders for emerging diseases over the next five years in the UK? Nerys Hairon investigates the conditions that could make an impact on nurses' work

INTRODUCTION

Nursing Times has asked leading epidemiologists and public health experts to predict which diseases could produce an impact over the next few years. Different factors can influence disease incidence – ranging from global issues, such as climate change and increasing air travel and travel abroad, to sociological trends such as an ageing population. And even positive factors, such as improvements in the national diet, can exert a negative influence on public health. For example, improved nutrition before puberty is producing an increase in the incidence of breast cancer.

Here *NT* outlines some of the conditions which could either increase in incidence or come to the UK, affecting the work nurses do.

LEGIONNAIRES' DISEASE

Climate change and increasing travel abroad could unite to produce a rise in cases of legionnaires' disease.

The last 10 years have seen a steady increase in the number of confirmed cases in England. Some of these are associated with overseas travel, and the upward trend mirrors the increase in holidays abroad (see

Fig 1, p56 which shows cases in residents of England and Wales who travelled abroad in the 2–10 day incubation period).

Professor Nick Phin, consultant epidemiologist in acute respiratory infection at the Health Protection Agency's Centre for Infections, said the published figures can be seen only as 'the tip of the iceberg'.

This is partly because, in many instances where people present with lower respiratory tract infections, legionella is not considered in the differential diagnosis, and partly due to under-recognition of legionella species other than *Legionella pneumophila* (the species detected with the current urine antigen test).

Professor Phin explained that there is growing evidence to support a link between climate patterns and the incidence of legionnaires' disease. He said: 'Preliminary work at the HPA Centre for Infections suggests that a rise in the number of cases of legionnaires' disease seems to be associated with warm weather in the preceding 2–3 months and a period of increased humidity.'

He added that work is ongoing to establish if it is possible to predict likely increases in

this disease based on weather conditions, so that warnings can be issued.

Professor Phin also warned that climate change might affect the incidence of legionnaires' disease: 'Should global warming become a recognised phenomenon this may also result in more cases of this disease,' he said.

Legionnaires' disease is an uncommon form of pneumonia caused by the legionella bacterium. It is usually reported as isolated cases but outbreaks can occur. Infection occurs when people inhale legionella bacteria that have been released into the air in aerosolised form from a contaminated source (HPA, 2008a). Once in the lungs the bacteria multiply and cause either pneumonia or a less serious flu-like illness.

The bacteria are widely distributed in the environment and can live in all types of water including both natural and artificial sources. They only become a risk to health when the temperature allows them to grow rapidly, such as in water systems that are not properly designed, installed or maintained. Legionella is a leading cause of community-acquired pneumonia and still associated with significant mortality of around 10%, even with treatment.

RENAL DISEASE

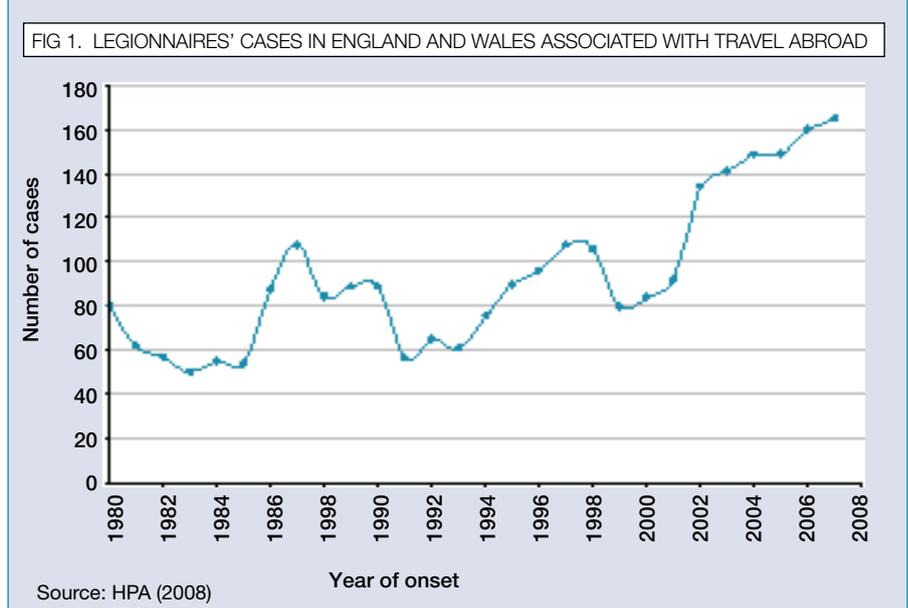
Over the next five years pressure on renal services is set to rise. Public health experts predict an increase in renal disease due to rising levels of obesity, diabetes and hypertension. Professor Alan Maryon-Davis, honorary professor of public health at King's College London, said: 'Chronic kidney disease is an issue because of the increase in diabetes and [high] blood pressure, so that will mean more people will be needing dialysis.'

The government's futures think tank, Foresight, has predicted soaring levels of obesity if current trends continue (Foresight, 2007; Hairon, 2007). The prevalence of obesity has more than doubled in the last 25 years in the UK; in England nearly a quarter of adults and around 10% of children are obese.

The link between obesity and diabetes is well established, and Diabetes UK (2008) has reported that the growth in diagnosed cases has doubled in just a year. The number of people diagnosed with diabetes in the UK has risen by more than 167,000 since last year, bringing the total to almost 2.5 million (Diabetes UK, 2008). This rise is more than double the 2006–2007 increase of 83,000. While it is partly due to improved screening, the rise is mainly due to an alarming increase in obesity. Five million people are now registered obese in the UK, compared with just under 4.8 million last year.

Helen Noble, senior clinical nurse specialist in renal and supportive care at Barts and The London NHS Trust, highlighted the ageing population as a major contributing factor: 'People will live longer with diabetes and living longer predisposes them to eventually ending up with CKD.'

While Ms Noble said there is increasing emphasis on early identification of CKD, there may also be an issue in terms of managing end-stage renal disease in an ageing population with increasing comorbidities. 'People are living for longer with these chronic diseases, it may not be that dialysis is appropriate for them. If you are talking about



people with diabetes living for longer, by the time they develop CKD stage 5 they may be frailer, older and sicker. They may have other comorbidities and may not be suitable candidates for a treatment such as dialysis. There may be a need for more provision of supportive and palliative care services.'

PVL-ASSOCIATED *S. AUREUS*

Panton-Valentine Leukocidin (PVL) is a toxic substance produced by some strains of *Staphylococcus aureus*. Other countries have encountered widespread problems with PVL-related disease, and while it is as yet uncommon in the UK, we have recently seen an increase in cases of PVL-SA. This has prompted increasing vigilance.

PVL destroys white blood cells and is carried by less than 2% of *S. aureus*, including those that are sensitive to the antibiotic methicillin (MSSA) and methicillin resistant (MRSA). PVL-positive strains of *S. aureus* are more commonly contracted in the community and generally affect previously healthy children and young adults.

PVL has been seen in the UK since the

1950s and 1960s. At this time, one PVL-MSSA strain caused widespread disease (most commonly boils and abscesses) in previously healthy people in the community, as well as hospitalised patients and healthcare workers. PVL-positive MSSA strains were common worldwide in the 1950s, but became rare in later decades (Association of Medical Microbiologists, 2007).

Dr Angela Kearns, head of the staphylococcus reference laboratory at the HPA, explained that the late 1990s saw reports of PVL strains that were resistant to methicillin (PVL-MRSA). 'These reports started in the late 1990s and early 2000s, coming from North America and Australia,' she said. 'From first being documented round about in 2000, within a period of five years we then see an epidemic of PVL-MRSA in America. If you contrast that with the rest of the world, they are seeing PVL-MRSA but in much more modest numbers – nobody understands why this is.'

Guidance by the HPA on diagnosing and managing PVL-SA in England (HPA, 2008b) said that the escalation in morbidity and mortality associated with PVL-MRSA has caused public health concern worldwide. So far most PVL-SA strains in the UK have been MSSA but it pointed out that a major problem has emerged with CA-MRSA in the US, most of which produce PVL.

The Department of Health is funding some systematic research in the UK into PVL-MRSA, as there is no mandatory system for reporting. The HPA's study has two arms –

OTHER CONTENDERS AS EMERGING DISEASES

- Increasing comorbidity – from ageing population
- Multi-drug-resistant tuberculosis
- Liver disease in the young – due to heavy alcohol consumption
- Drug-resistant malaria
- Sub-fertility – as a result of rising incidence of chlamydia
- Dementia
- Depression – as a result of breakdown of the nuclear family
- Mesothelioma
- Pandemic influenza

one will look at patients presenting to A&E with boils and abscesses to see how many are due to PVL-SA, and the other will examine asymptomatic carriage.

Dr Kearns added: 'We know that the number of cases of these bugs [PVL-MRSA] are increasing worldwide. Some of the cases are imported. I think it's very much here to stay for a period of time and is likely to increase but I would not like to say to what extent it's likely to increase. It's inevitable that we will see it occurring in the UK and probably increasing to some extent but whether we are going to see a modest increase that we have seen recently or a large increase I cannot say.'

WEST NILE VIRUS

West Nile virus (WNV) is an emerging mosquito-borne disease that could appear in the UK. Since 2001 the HPA and DH have been raising healthcare professionals' awareness. The DH (2004) published a contingency plan for the virus, following its rapid spread across the US and the death of 284 people in 2002.

WNV belongs to the group of viruses known as 'arboviruses'. These are largely transmitted by arthropods (insects such as mosquitoes and ticks). The mosquitoes involved in transmission of WNV usually feed on birds but will sometimes bite horses or humans (HPA, 2008c; Defra, 2008).

West Nile virus was found in the US for the first time in 1999 with 62 human cases (including seven deaths) confirmed in the New York area (HPA, 2008d). It is now considered endemic in the US and Canada.

To date, there have been no reported human cases of UK-acquired infection. The first case of WNV infection in a UK resident, acquired in Canada, was identified in 2006. No active disease in birds has been detected in the UK, although some research indicates that certain species of UK birds may have been exposed to the virus. Further study in UK birds, mosquitoes and horses has failed to find any evidence of infection.

However, experts have speculated that WNV could move to the UK. Professor Maryon-Davis said: 'In general you could argue that with global warming you will get an extension where mosquitoes are prevalent – we might see extensions of the areas where you can get malaria, yellow fever and West Nile virus. That's a possibility.'

'One of the key factors in all of this is air travel. On the one hand air travel could increase but on the other hand because we

are all trying to save the planet we might do far less air travel, which might contain these diseases in their natural countries,' he said.

According to the HPA (2008d), while the risk of transmission to humans in the UK is low it cannot be ruled out, and it would be 'incautious' to do so.

The majority infected have no symptoms, while 20% have a mild influenza-like illness. Less than 1% develop more serious disease, such as encephalitis, meningitis or meningo-encephalitis, and, occasionally, infected people may die (HPA, 2008d).

BREAST CANCER

Public health experts predict that the incidence of breast cancer is to rise over the next five years. One reason is the increase in good nutrition before puberty, which is linked to earlier onset of puberty in girls.

Breast cancer is the most common cancer in the UK (Cancer Research UK, 2008a). Its incidence has been increasing for many years in economically developed countries – between 1981 and 2005 the incidence rate increased in Britain among women by a massive 57%. The age-standardised incidence per 100,000 women increased from 74 in 1975 to 123 in 2005.

Professor Martin McKee, professor of European public health at the London School of Hygiene and Tropical Medicine, told *NT*: 'We can expect that breast cancer rates will continue to rise for some time.' Professor Maryon-Davis explained the trend: 'The main risk factors for breast cancer are early puberty, linked to good nutrition, and puberty seems to be getting earlier and earlier.' He added that trends such as starting a family late and having fewer children are also risk factors, as breast cancer is linked to the number of menstrual cycles a woman has.

Other risk factors, such as obesity and alcohol consumption, also show no signs of diminishing in the UK. Obesity increases risk of postmenopausal breast cancer by up to 30%, while drinking as little as one pint of beer or one large glass of wine a day increases risk by over 7% (CRUK, 2008b).

On a positive note, more women are surviving breast cancer than ever before. In the 1970s around five out of ten patients with breast cancer survived beyond five years, now eight out of ten do. Since peaking in the late 1980s, breast cancer death rates have fallen by a third (CRUK, 2008b). ■

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