with most of the increase occurring among people over 60 years of age [5]. A similar increase in listeriosis among people over 60 years of age occurred in England and Wales from 2001-2004 [6].

In France and Finland, routine serotyping and molecular subtyping by pulsed-field gel electrophoresis (PFGE) resulted in the detection of several case clusters and common-source foodborne outbreaks. However, few isolates in Germany were serotyped or subtyped by PFGE, and no foodborne outbreaks were identified. The importance of routine molecular typing of Listeria isolates for outbreak detection and investigation was further highlighted by the two outbreaks reported in this issue from Switzerland, where the incidence of listeriosis has been stable but relatively high, and the United Kingdom, where incidence has been increasing [7,8]. Although both were identified because of a regional clustering of cases, rapid characterisation of an outbreak strain facilitated both investigations. Ultimately, isolation of the outbreak strains from implicated food items confirmed the source of the contamination [8].

The national experiences with listeriosis surveillance summarised in this issue suggest that across much of Europe, rates of listeriosis may be increasing or remaining stable at relatively high levels. In Germany, the increasing proportion of highly susceptible persons in the population was cited as a contributing factor to the increased incidence of listeriosis [5]. Indeed, across Europe the population is ageing and the prevalence of cancer increased by 40% between 1990 to 2000 [10]. However, a growing-at-risk population should not inevitably increase the public health burden of listeriosis. Where rates of listeriosis are declining, such as in France, this appears to be the result of extensive surveillance efforts to define the scope of the problem, followed by active collaboration between public health officials, food regulatory officials and food producers to reduce the levels of contamination in the food supply [3].

European food safety standards will help establish consistent approaches to the control of Listeria in ready-to-eat foods. However, implementation of these standards will still require extensive collaborations at the national level. Reliable surveillance data on listeriosis are a foundation upon which effective collaborations are built. Strengthening surveillance in individual countries by harmonising microbiological methods and providing epidemiologic tools for investigations will be a key step in reducing the public health burden of listeriosis, even as the population at risk grows. Thus, the need for a European surveillance network for Listeria has never been greater.

References
human and animal faecal inputs are likely to exhibit a different distribution. Because of this the relationships between pathogen and indicator when measured throughout the year are likely to vary by orders of magnitude. As an example Norovirus is the commonest cause of human gastrointestinal disease but is not thought to derive from animals. There will therefore be some relationship between human faecal contamination and norovirus infection whereas there will not be with animal contamination. As with disease burden studies related to drinking water [13] this approach has to generalise from the conditions within the local environment of the study to a general assessment. Despite this, there is a need to set new standards and the levels established from bathing studies have been revised for this purpose. A new EU Directive [14], was published by the European Union on 4 March 2006 and entered into force 20 days later on 24 March. Under the Directive the tests for bathing waters are simplified to E. coli and intestinal enterococci, instead of 19 different tests used previously. It will classify beaches as either ‘excellent’, ‘good’, ‘sufficient’ or ‘poor’. The extra classification of ‘sufficient’ quality comes below ‘excellent’ and ‘good’ but still allows a beach to qualify as a bathing water and the standards have been raised so that the estimated health risk to bathers is reduced. There will be more tests carried out more frequently when a beach is classified as ‘poor’ or only ‘sufficient’. Information on water quality will be provided on the internet in a timely fashion. New standard signs will be used on all bathing beaches to show the quality of recent tests. Under this new regime it is hoped that infections linked to recreational activity will be reduced. MEPs voted on 18 January 2006 to allow the new standards to replace the existing 1976 Directive. This bathing water management programme was introduced over a 13 year period, starting in 2008. There is a difference between recreational water activity in natural and man-made environments. In recent years there has been an increase in outbreaks of infectious diseases associated with public water features of various types [15-21]. It seems that there are factors in the design of many of these features that increase the risks of people, particularly children, being infected. Outbreaks in other countries have involved Shigella sonnei [20], norovirus [19], legionnaires disease [17] and Pontiac fever [18]. The microbiology of such water features and the treatment of the water within them have received little attention. There have been a number of recent outbreaks linked to recreational water features in England and Wales caused by cryptosporidium. There was also a large outbreak of cryptosporidiosis at the Seneca State Park sprayground (an interactive water feature) in New York State, USA, in August 2005 which affected an estimated 3000 people. Cryptosporidium was found in two water storage tanks that supplied water to a water spray attraction. A variety of private and municipal water features are being developed that allow people, particularly young children, to play in them. These may present risks to the populations using them if they are not designed and operated correctly. These features differ from swimming pools in potentially having a greater burden and variety of environmental contamination and requiring a high water turnover that puts a burden on any treatment processes. Interactive water features are usually located outdoors and include fountains, shallow pools, vertical pressure jets, overhead sprays and showers. Children can run around in and easily drink the water. The area is usually designed to collect the water from the feature and return it to an underground holding tank. The water jets are operated by pumps that use their water from a holding tank. The features are often fitted with control valves that enable operation to be varied either manually or via an automatic programme. The holding tank should be sized to ensure that there is adequate water available to operate the feature and there should be a separate system for water treatment. These features pose a high risk of microbiological contamination and transmission of infection to children. The filtration systems need to be well designed and managed to remove cryptosporidium oocysts that can escape from the environment and from shoes and bodies. Additionally, the disinfection should be sufficient to inactive bacterial and viral pathogens. The microbiological quality of water at the feature’s spouts of the feature should be to the same standard as swimming pool water and should be checked at least monthly (BS PAS 39:2003). Water should ideally be mains water that is not re-circulated. In all cases the UK Water Supply (Water Fittings) Regulations 1999 apply. Where re-circulation is required treatment should involve filtration and disinfection as occurs with swimming pools. With interactive water features the risk of cryptosporidium infection may be the same as, or greater than that from swimming pools. The use of UV treatment to reduce the risk of cryptosporidiosis is recommended. There should be clear signs indicating that the water is not fit for drinking, and alternative sources of safe drinking water should be readily available. Interactive water features may suffer from environmental contamination, including domestic and wild animals and birds, and people can occasional cause accidental fouling with vomit or faeces. In these instances the contaminated water should be diverted to drain and the pool cleaned. These features need to automatically make-up water lost by evaporation and filter backwashing. Some plant rooms may be located underground and these should be well designed for housing all equipment and ensuring the safe delivery and storage of chemicals. Water from these features should not be used to top up other pools as this could lead to contamination and an outbreak [22]. There are a variety of municipal water features including decorative pools and fountains, that have not been designed for bathing but which are used for this purpose in hot weather, often by children. These pools can involve the same problems as interactive water features and may also have inadequate filtration and disinfection. Such pools should be designed to make it difficult for children to use them as recreational play areas. Indoor features such as fountains have also been responsible for outbreaks of legionellosis, which probably reflects higher water temperatures. Increasing evidence of outbreaks linked to both recreational waters and decorative water features

**Increasing evidence of outbreaks linked to both recreational waters and decorative water features**
and management. All such features should be formally assessed for microbiological risks, including legionella, during the design stage and ensure that treatment is adequate for minimising the risks to the public. Risk assessment should involve a public health microbiologist. The risk assessments should be reviewed at regular intervals and at least every two years. The principal microbiological risks are cryptosporidiosis resulting from inadequate filtration, legionellosis resulting from inadequate disinfection, and bacterial and viral infections also resulting from inadequate disinfection. In addition to infection risks there needs to be assessments of other risks such as slipping, drowning (36) and disembowelment (37, 38). Disinfection and filtration systems must be well maintained and monitored. Measures should be in place to minimise faecal contamination, especially from footware, and to minimise potential risks for children to drink of the water. Recent outbreaks indicate that there is a risk of litigation if water features are found to be the cause of an outbreak. If an outbreak is associated with such a feature, consideration should be given to pool closure and drainage until the pool can be shown to be safe.

What should we conclude from these two papers about the risks of infection? There is increasing evidence of outbreaks linked to both recreational waters and decorative water features. While the source of contamination on bathing beaches may be contamination of the sea from rivers, the diffuse sources from small streams can be important in contamination on bathing beaches may be contamination of the sea of infection? There is increasing evidence of outbreaks linked to both

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