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Methods for assessing the disease burden from swimming

Gordon Nichols, Health Protection Agency Centre for Infections, London, UK
Gordon.nichols@hpa.org.uk

Swimming is a healthy form of exercise that carries with it some risks to health associated with drowning, neck injury and infection. To determine the burden of disease within the population that is associated with swimming is not straightforward and a variety of methods have been used. These include outbreak surveillance, controlled bathing beach studies, case-control and case-case studies as well as routine death notification data. Infections can be monitored through laboratory surveillance and outbreaks detected by the demonstrations of local clusters of cases, particularly of cryptosporidiosis. This presentation will examine some of the ways that have been used to examine the risks from swimming and whether these are useful in determining disease burden.

The health risks from swimming range from uncommon but serious conditions such as drowning and neck injury through outbreaks of infectious disease to more difficult to prove links between chlorine breakdown products and asthma.

Routine surveillance has been particularly useful in detecting local outbreaks of cryptosporidiosis linked to swimming pools. However, the burden of cryptosporidiosis related to pools is not clear from routine surveillance data. Enhanced surveillance and case-control studies can also contribute to a better understanding of the risk factors associated with sporadic infectious diseases through estimating the attributable fraction. They can also be used to examine seasonal effects of the risks. An alternative approach that has been used for lake and sea water bathing is experimental studies where people volunteer to bathe or not bathe in a location that is a designated bathing beach and are then followed up for subsequent ill health. The recent EU funded EPIBATHE studies are an example of these. These studies are a useful way of relating health to microbiological counts of indicator organisms in the water. However, they assume that disease will be common and affected by comparatively small changes in contamination. For example they would be unlikely to be capable of demonstrating an association between bathing and VTEC infection because this infection is relatively uncommon.

The Food Standards Agency's first study on Infectious Intestinal Diseases provided an important means of relating infectious diseases diagnosed in the laboratory to what is happening within the community and formed the basis of work on the burden of food-borne disease. However, this approach did not provide an insight into the likely disease burden attributable to swimming. A form of enhanced surveillance involving case-case studies has the potential for providing much stronger information about risks. A Coordinated Local Authority / HPA Sentinel Surveillance of Pathogens (CLASSP) study conducted over three years on sporadic *Campylobacter* and *Salmonella* cases has been used to look at the risks associated with travel related infections where swimming in the sea and swimming pools may

be important risks. The study does not relate the disease burden to the whole population but does provide a means for comparing the relative risks for different pathogens.

Further work needs to be done to assess the burden of disease related to swimming so that sensible interventions strategies can be adopted.