

# NSW PUBLIC HEALTH BULLETIN

## Special Issue – Enteric diseases

### Improving foodborne disease surveillance in NSW

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The term ‘enteric diseases’ includes a multitude of conditions. In the public health context, it usually refers to infections (or intoxications) that are food- or waterborne, or otherwise transmitted by the faecal-oral route. Symptoms are usually non-specific – nausea, vomiting, diarrhoea, abdominal pain and fever in varying combinations – and unpleasant, rather than serious or life threatening. The importance of enteric infections lies mainly in their numbers. The results from *The National Gastroenteritis Survey 2001–2002* estimated that 17.2 million cases of gastroenteritis occur annually in Australia, leading to 7 million courses of medication (including antibiotics), 6 million days of paid work lost, 3.7 million doctor visits and 0.5 million stool tests.<sup>1</sup> A third of gastroenteritis cases (5.4 million each year) are due to foodborne infection. There are also approximately 6000 cases annually of other foodborne diseases in which gastrointestinal symptoms are not prominent, such as invasive listeriosis.<sup>2</sup> Overall, foodborne diseases are responsible for approximately 18 000 hospital admissions and 120 deaths, and cost \$1249 million, annually in Australia.<sup>3</sup>

The perception within the community that foodborne and institutional outbreaks of enteric disease may represent negligence or system failure can often provoke substantial and disproportionate attention and, occasionally, litigation.<sup>4</sup> Combined with the high disease burden, this provides a strong incentive for active surveillance to identify outbreaks. Periodic reviews of the value and effectiveness of disease prevention programs are important and this special issue of the *NSW Public Health Bulletin* contributes to this field.

Routine notifiable disease data capture only a tiny fraction of enteric disease burden, namely from laboratory-confirmed cases due to some specific pathogens and easily recognised disease outbreaks. The number of notifications

depends on variables other than actual disease rates, including: whether a general practitioner orders a stool examination; laboratory diagnostic and strain typing methods; and the local capacity for outbreak recognition and investigation. For example, the article by Cretikos, Telfer and McAnulty on enteric disease outbreak reporting in New South Wales notes that the highest rate of outbreaks was reported by the only Public Health Unit with resources dedicated to enteric disease surveillance and control. Presumably this reflects better ascertainment of cases rather than higher disease rates. An evaluation of the enteric disease outbreak surveillance system by the same authors showed that many users found it cumbersome and labour intensive. The proposed changes should improve the system’s efficiency and reduce inconsistencies of rates and delays in outbreak reporting.

The consistency and timeliness of disease notification depend on resources and competing priorities; and the value of the data obtained depends on data quality and how rapidly it is analysed and acted on. Increasingly, the time-consuming form filling and duplication of paper-based notification is being replaced by electronic systems. These have the potential for simultaneous, immediate data transfer from multiple sources to a central database where information can be combined and analysed rapidly. Although electronic systems, such as the *NetEpi Collection* discussed by Viney and McAnulty, have significant advantages, they may not be immediately acceptable to users without access to appropriate facilities, training and support.<sup>5</sup> The Public Health Real-time Emergency Department Surveillance System (PHREDSS) is an electronic syndromic surveillance system, recently introduced in NSW.<sup>6</sup> It automatically receives and analyses data from existing emergency department clinical information systems, in near real-time. The PHREDSS is designed to identify outbreaks rapidly that

may not be easily recognised by individual public health units. As illustrated by the report of a gastroenteritis outbreak at a school music camp, Mannes et al. show that PHREDSS can also provide individual patient information and identify additional cases in recognised outbreaks.

When based on spatiotemporal clustering of specific pathogens, laboratory notification can also identify outbreaks that are not otherwise recognisable, as described in two following papers by Viney et al. and Wang et al. Although insensitive, this method is generally consistent, objective and specific and, in conjunction with epidemiological investigations, can identify risk factors and potential sources. However, diagnostic laboratories identify common enteric pathogens, like *Salmonella enterica* and *Campylobacter jejuni*, only to the level of species, and additional typing is needed to identify outbreaks against high background rates. None of the many possible *Campylobacter* strain-typing methods are generally accepted or used routinely.<sup>7</sup> Therefore outbreaks are rarely recognised and campylobacteriosis is not notifiable in NSW, although data from elsewhere in Australia indicate that it is significantly more common than salmonellosis. State reference laboratories throughout Australia perform *Salmonella* serotyping (see Wang et al. in this issue). Reference laboratories can identify suspected outbreaks due to uncommon serotypes, but further subtyping of the most common serotype, *S. Typhimurium*, is needed. Faster, more discriminatory methods for *S. Typhimurium* typing, as described by Gilbert, have the potential to identify more outbreaks more rapidly. While such methods may stretch public health resources, they should increase the success rate of investigations.

The mainstays of prevention for most enteric diseases are safe food production and handling, and good infection control practice, especially to prevent outbreaks of norovirus in institutions. A few enteric diseases are preventable by vaccines, including polio, which is close to being eradicated worldwide, and hepatitis A, which occurs at low rates in Australia (see Ward and McAnulty in this issue). Continued surveillance of these viral diseases is

needed to monitor, control and identify appropriate target populations for immunisation. More generally, the consistent surveillance and investigation of foodborne disease and institutional outbreaks of enteric infections, are essential for understanding the changing epidemiology of these diseases and for evaluating the effectiveness of interventions, on which control and prevention depend.

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