Scientific Interpretive Summary:

Diagnostic and public health management practices of foodborne bacterial diseases

Evidence from disease notifications, case investigations, outbreak investigations and epidemiological studies of human enteric diseases is increasingly used as a source of data for risk assessments and source attribution. However, its application is often restricted by the strength of the evidence presented and its interpretation. Geographical variations in disease incidence have long been described in New Zealand but their aetiologies have not been identified. A range of reports have described variation in the present system of public health investigation and the management of identified cases of human enteric diseases.

It is possible that the above variations and other contributory factors are a result of laboratories using different diagnostic protocols for analysing clinical samples (e.g. faecal samples) from human cases, or from Public Health Units (PHUs) taking different approaches to investigating notifiable diseases and responding to information they receive from laboratories and the national Enteric Reference Laboratory (ERL) at ESR.

The objectives of this study were:

• To determine individual laboratory practices in diagnosing human campylobacteriosis, listeriosis, salmonellosis, yersiniosis, and infection by verocytotoxigenic *E. coli* (VTEC)/shigatoxin-producing *E. coli* (STEC);
• To determine individual PHU practices in response to laboratory notifications/ERL reporting of these diseases;
• Using VTEC/STEC infection as an example, evaluate the influences of laboratory and PHU practices on District Health Board (DHB) notification data.
The report identifies variability in the methods used by clinical laboratories in New Zealand to isolate and identify the pathogens investigated in this study, but the methods do not appear to have changed significantly over the last five years. Evaluation of the laboratory data has also identified some areas where testing might be improved or standardised..

The investigation practices reported by PHU staff were also shown to vary. The different systems around de-notifying cases and investigating non-O157 VTEC/STEC cases are likely to have some influence over regional notification rates. There is no standard approach for investigating non-O157 VTEC/STEC cases at the PHU or laboratory levels. The PHU survey data also revealed that salmonellosis and campylobacteriosis cases are less likely to be investigated than other diseases. This may reduce the amount of information that is available for attribution and intervention studies.

The evaluation of laboratory methods and PHU practices in DHBs with high VTEC/STEC notification rates and DHBs with low VTEC/STEC notification rates did not reveal any differences between the activities in these DHBs that could account for the disparate notification rates. However differences in the criteria used by laboratories to determine if samples are tested for VTEC/STEC could account for low incidence rates in some DHBs.

Overall the main influence on geographical variations in enteric disease notifications and their various exposures is PHU investigation practices. Risk assessors and researchers need to be aware of these underlying issues when using these data.

Updated 1 September 2010