Havelock North Waterborne Outbreak August 2016

The Worlds Largest Campylobacteriosis Outbreak

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Health Related Water Microbiology Conference
Chapel Hill
Thursday 18th August 2016
Campylobacteriosis

Campylobacter jejuni

- Nausea
- Abdominal pain and cramps
- Diarrhoea
- Fever
- Headache and overall weakness (in rare cases, the weakness can cause trouble breathing)
Figure 1. Cases linked to the Havelock North waterborne campylobacteriosis outbreak reported to EpiSurv by known onset date (n=886)

Health Intelligence Team, ESR
This figure has been revised - December 2016
Water
Water samples (sampled 12 Aug)

<table>
<thead>
<tr>
<th>Description</th>
<th>Total coliforms</th>
<th>E. coli</th>
<th>Campylobacter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bore 1</td>
<td>37</td>
<td>10</td>
<td>Not detected</td>
</tr>
<tr>
<td>Bore 2</td>
<td>30</td>
<td>13</td>
<td>C. jejuni</td>
</tr>
<tr>
<td>41 Hikanui Dr</td>
<td>110</td>
<td>23</td>
<td>C. jejuni</td>
</tr>
<tr>
<td>31 Endsleigh Rd</td>
<td>48</td>
<td>12</td>
<td>C. jejuni</td>
</tr>
<tr>
<td>92 Endsleigh Rd</td>
<td>51</td>
<td>23</td>
<td>C. jejuni</td>
</tr>
<tr>
<td>Library</td>
<td>46</td>
<td>14</td>
<td>C. jejuni</td>
</tr>
</tbody>
</table>
MBiT – 18 genes

Same-Day Subtyping of *Campylobacter jejuni* and *C. coli* Isolates by Use of Multiplex Ligation-Dependent Probe Amplification–Binary Typing

Angela J. Cornelius, Olivier Vandenberg, Beth Robson, Brent J. Gilpin, Stephanie M. Brandt, Paula Scholes, Delphine Martiny, Philip E. Carter, Paul van Vught, Jan Schouten, Stephen L. W. On

Institute of Environmental Science and Research (ESR), Christchurch, New Zealand; National Reference Center for Campylobacter, Saint Pierre University Hospital, Brussels, Belgium; Ecole de Santé Publique, Université de Montréal, Montréal, Canada

Campylobacteriosis is the most common of infectious sources requires subtyping sources to differentiate the predominant genotype and possi- available. MBiT was more discriminatory and cost-effective than both MLST and...
MBiT results (Friday 19 Aug)

Faecal source tracking

Molecular markers

Indicative: human, ruminants, pigs, dog, horses, possum, ducks,
Human, Surface water, Human, Ovine, Pit, Bore water, Ovine, Reticulated Water, Reticulated Water, Bovine, Surface water, Bore water, Animal

Whole Genome Sequencing

MBiT Analysis
Whole Genome Sequencing
coreMLST (>1200 genes)

(SNP Analysis)
THE PERFECT STORM
Runoff volume from 5-8 August 2016 for a scenario with 125mm of rainfall.
This figure has been revised - December 2016
Mangateretere Stream Pond 6th Sep 2016
Photo 1: Tree stumps in the dry channel of the Mangateretere Stream, 19 October 2016.
Acknowledgements

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Massey University Jonathan Marshall, Patrick Biggs, David Hayman, Nigel French, David Wilkinson, Ji Zhang
Government Inquiry into Havelock North Drinking Water

Overview

On 12 September 2016, the Government announced that an Inquiry into the Havelock North water supply contamination Incident would be held.

The Inquiry members appointed are Hon Lyn Stevens QC (chair), Dr Karen Poutasi CNZM and Anthony Wilson ED*.

The Inquiry follows the widespread outbreak of gastroenteritis in Havelock North in August 2016, with more than 5000 people falling ill, following the confirmation of the presence of E. coli in the water supply. Testing through the health system led the Hastings District Council and the Hawke’s Bay District Health Board staff to suspect that Campylobacter was the primary infectious agent.

Drinking water supplies across New Zealand rely on different methods of take and treatment, depending on the nature and security of the water source. Drinking water supplies are regulated under the Health Act 1956 and the source of drinking water is regulated under the Resource Management Act and National Environmental Standards for sources of drinking water. The National Environmental Standards are given effect to by the Hawke’s Bay Regional Council.

New Zealanders expect that water supplied to their homes and businesses for drinking purposes will be safe to
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