Enteric Disease Outbreaks in BC

In 2017, 33 enteric disease outbreaks were investigated in BC (Table 5.1). The number of outbreaks was higher than all previous years to date due to the implementation of whole genome sequencing in May 2017 (Figure 5.2). Five health authorities reported outbreaks in 2017.

Bacteria and viruses caused a similar proportion of outbreaks (45.4% and 51.5%) (Table 5.3). The pathogen was laboratory-confirmed in 27 (81.8%) outbreaks; this is similar to previous years. Norovirus and *Salmonella* remained the two most frequently identified pathogens as in previous years. Four outbreaks of *E. coli* were reported in 2017, three of them were caused by non-O157 strains. This is the largest number of *E. coli* outbreaks reported in a single year and the most caused by non-O157 strains.

Outbreaks occurred in a variety of settings, most commonly the community and food service establishments (Table 5.4).

Similar to previous years, the most common mode of transmission was foodborne (Table 5.5). Among the 19 foodborne outbreak investigations, 16 (84.2%) identified a food source, which is higher than previous years. Meat was the most commonly reported food source (Table 5.6) and all meat outbreaks were caused by chicken. Three of these were caused by frozen breaded chicken products and led to recalls of products. This year also saw unique pathogen-source combinations such as *E. coli* O121 associated with flour and *Salmonella* associated with nut cheese (*S. Weltervreden*) and coconut (*S. Chailey*).  

5.1 Enteric disease outbreaks by reporting organization, BC, 2017

<table>
<thead>
<tr>
<th>Reporting Organization</th>
<th>Number of outbreaks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraser Health</td>
<td>0</td>
</tr>
<tr>
<td>Interior Health</td>
<td>5</td>
</tr>
<tr>
<td>Northern Health</td>
<td>2</td>
</tr>
<tr>
<td>Vancouver Coastal Health</td>
<td>10</td>
</tr>
<tr>
<td>Island Health</td>
<td>4</td>
</tr>
<tr>
<td>British Columbia Centre for Disease Control</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
</tr>
</tbody>
</table>

5.2 Number of Outbreaks By Year Investigation Started, BC, 2009-2017 (N=201)

![Graph showing the number of outbreaks by year from 2009 to 2017.]

- **Bacterial (N=12)**: 15 outbreaks
- **Viral (N=10)**: 11 outbreaks
- **Parasite (N=1)**: 1 outbreak
- **Total (N=33)**: 27 outbreaks

### Characteristics of Enteric Outbreaks by Pathogen Type, BC, 2017

<table>
<thead>
<tr>
<th></th>
<th>Bacterial (N=12)</th>
<th>Viral (N=10)</th>
<th>Parasite (N=1)</th>
<th>Total (N=33)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of lab confirmed outbreaks</td>
<td>15</td>
<td>11</td>
<td>1</td>
<td>27</td>
</tr>
<tr>
<td>Number of lab confirmed cases</td>
<td>62</td>
<td>47</td>
<td>19</td>
<td>128</td>
</tr>
<tr>
<td>Number of clinical cases</td>
<td>59</td>
<td>672</td>
<td>0</td>
<td>731</td>
</tr>
<tr>
<td>Number of hospitalizations</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Number of deaths</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Median duration of outbreak* (days)</td>
<td>11 (Range 1-87)</td>
<td>7 (Range 2-104 days)</td>
<td>NA**</td>
<td>7</td>
</tr>
<tr>
<td>Causative agent</td>
<td><em>Salmonella</em> (10)</td>
<td><em>Norovirus</em> (11)</td>
<td><em>Astrovirus</em> (1)</td>
<td><em>Cyclospora</em></td>
</tr>
<tr>
<td></td>
<td><em>Clostridium</em> (1)</td>
<td><em>Unknown</em> (1)</td>
<td><em>Unknown</em> (5)</td>
<td></td>
</tr>
</tbody>
</table>

*calculated for outbreaks with more than one case and for columns with more than one outbreak
**Not applicable
### 5.4 Outbreak by Setting Type, BC, 2017

<table>
<thead>
<tr>
<th>Outbreak setting</th>
<th>Outbreak Investigated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>11 (33.3%)</td>
</tr>
<tr>
<td>Food service establishment</td>
<td>10 (30.3%)</td>
</tr>
<tr>
<td>Private Function</td>
<td>3 (9.1%)</td>
</tr>
<tr>
<td>Recreational facility</td>
<td>2 (6.1%)</td>
</tr>
<tr>
<td>Other</td>
<td>7 (21.2%)</td>
</tr>
<tr>
<td>Total</td>
<td>33 (100%)</td>
</tr>
</tbody>
</table>

### 5.5 Outbreaks by Mode of Transmission, BC, 2017

<table>
<thead>
<tr>
<th>Outbreak mode of transmission</th>
<th>Outbreak Investigated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foodborne</td>
<td>19 (57.6%)</td>
</tr>
<tr>
<td>Person-to-person</td>
<td>8 (24.2%)</td>
</tr>
<tr>
<td>Environment-to-person</td>
<td>1 (3.0%)</td>
</tr>
<tr>
<td>Multiple</td>
<td>1 (3.0%)</td>
</tr>
<tr>
<td>Waterborne</td>
<td>1 (3.0%)</td>
</tr>
<tr>
<td>Unknown</td>
<td>3 (9.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>33 (100%)</td>
</tr>
</tbody>
</table>
5.6 Source of Foodborne Outbreaks by Pathogen, BC, 2017

<table>
<thead>
<tr>
<th>Source of Food</th>
<th>Campylobacter</th>
<th>Cyclospora</th>
<th>E. coli</th>
<th>Norovirus</th>
<th>Salmonella</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eggs</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Meat</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Mixed Foods</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Produce</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>2 (flour)</td>
<td>0</td>
<td>1 (nut cheese)</td>
<td>3</td>
</tr>
<tr>
<td>Seafood</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Unknown</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>10</td>
<td>19</td>
</tr>
</tbody>
</table>