Epidemiology of gastrointestinal infections in Grampian and the actions taken to minimise risk to the public health

2007-2011

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1. **Purpose of this report**

The aim of this report is to describe the impact of gastrointestinal infections in Grampian and the actions taken to investigate and minimise the risk to public health. The report begins with background information about Health Protection, the legislation requirements governing Health Protection work and the risk factors for gastrointestinal illness. It then goes into detail about selected infections and the number of cases and outbreaks per year in Grampian. The report finishes with advice for the general public as to how they can prevent and manage gastrointestinal illness.

2. **Frequency of report**

This first report covers the time period from 2007 to 2011. A comprehensive report will be provided every 3 years with updated surveillance data provided on an annual basis.

3. **Introduction**

3.1 **Background**

Health Protection is now the accepted term to describe the work that encompasses the surveillance, investigation, control and prevention of communicable disease and environmental hazards to human health. Surveillance is the process of collecting and analysing data regarding infectious disease in order to provide information and allow action to be taken about cases or the identification of outbreaks. It is a key aspect of the good management of infectious disease.¹

NHS Grampian works closely with the three Local Authorities (Aberdeen City, Aberdeenshire and Moray) and other partner agencies such as Health Protection Scotland to deliver services to protect the health of the Grampian population. Health Protection Scotland (HPS) is the national Health Protection body in Scotland. Among its functions it coordinates national Health Protection activity, provides expert advice and collates national surveillance data.²

One major aspect of Health Protection work is the public health management of gastrointestinal infections. These are infections involving the digestive tract and lead to symptoms such as diarrhoea and vomiting. They can be caused by a variety of organisms including bacteria such as *Escherichia coli* (*E. coli*) O157 and viruses like Norovirus.

The Health Protection Team (HPT) in partnership with Environmental Health colleagues also manage outbreaks of gastrointestinal illness. An outbreak is as an event in which two or more linked cases experience the same illness, or
when the observed number of cases unaccountably exceeds the expected number.³

HPS collects information on general outbreaks using the ObsSurv system. ObsSurv is a voluntary surveillance system for “all general outbreaks of infectious intestinal disease (IID) in Scotland”.³ The definition of outbreaks used by NHS Grampian is slightly different from that used by HPS. HPS defines general outbreaks as “outbreaks affecting members of more than one household or residents of an institution”.³ In NHS Grampian, a family member living in a separate household may be considered to be part of an extended family and illness affecting both these households is not necessarily considered to be an outbreak.

### 3.2 Public Health etc (Scotland) Act 2008 - Notifiable diseases/organisms

Some gastrointestinal infections are notifiable under the Public Health etc (Scotland) Act 2008. Notifiable diseases are those which require to be notified to a Health Board by a medical practitioner if they have a reasonable suspicion that a patient whom they are seeing has the disease. Directors of Diagnostic Laboratories are required to notify specified organisms. These notifiable diseases and organisms are set out in Schedule 1 of the Act. The purpose of this is to give an early indication of potential threats to human health in order to assess whether any public health action may be required to minimise the risk.⁴

All notifications were supplied by either the diagnostic laboratories at Aberdeen Royal Infirmary or the private Albyn Hospital.

The list of notifiable diseases and organisms changed in January 2010 with the new Public Health etc (Scotland) Act 2008. As a result a number of diseases and conditions ceased being notifiable (e.g. “food poisoning”) and a number became notifiable (e.g. “clinical syndrome due to *E. coli* O157”). This must be taken into account when comparing disease trends over time.⁴⁵

### 3.3 Public Health etc (Scotland) Act 2008 – Exclusion and Restriction Orders

The Public Health Act also allows for a Health Board Competent Person to make an “exclusion” or “restriction” order. This excludes an individual from a specified place (usually a workplace, school or nursery) or restricts their activities when it is considered they pose a significant risk to public health. As the consequences of infections such as *E. coli* O157 can be severe it is important to minimise spread.⁶ There are certain high-risk groups (such as health-care workers, food handlers and young children) who may be considered for exclusion until there is evidence that they are free of infection.
### 3.4 Risk factors for gastrointestinal infections

There are a number of risk factors for developing gastrointestinal illness. Awareness of these risk factors can explain differences in rates of infection between different areas. Grampian continues to have one of the highest rates of gastrointestinal infection in Scotland. See Appendix for the rates of gastrointestinal illness in the 14 Health Boards in Scotland for 2010 and 2011.

Some of these infections are the result of our lifestyles and behaviours. For example, the risk of infection from organisms such as *Campylobacter*, *Cryptosporidium*, *E. coli* O157 and *Salmonella* is increased by contact with animals, the use of untreated or poorly maintained private water supplies, poor hand washing after handling raw food and travel abroad. In Aberdeenshire especially, there are a significant number of households on poorly treated and maintained private water supplies in combination with a large number of cattle and sheep in the surrounding environment.

A private water supply (PWS) is one which is not provided by Scottish Water. A PWS can be classified as Type A or Type B. A Type A supply provides more than 10 cubic metres of water per day, supplies more than 50 people or is used as part of a commercial or public activity. Type B supplies are all other PWS.

PWS tend to be concentrated in rural areas. This can be seen in the fact the number of PWS in Aberdeenshire far outweighs the number in Aberdeen City (despite there not being a large difference in population size). Additionally, the population of Moray is smaller than Aberdeen City but it also has more PWS, reflecting its more rural nature (Table 1).

#### Table 1: Number PWS in each Local Authority (LA) area

<table>
<thead>
<tr>
<th>Local Authority</th>
<th>Number Type A PWS</th>
<th>Number Type B PWS</th>
<th>Total number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aberdeen City</td>
<td>12</td>
<td>98</td>
<td>110</td>
</tr>
<tr>
<td>Aberdeenshire</td>
<td>237</td>
<td>7,342</td>
<td>7579</td>
</tr>
<tr>
<td>Moray</td>
<td>95</td>
<td>669</td>
<td>764</td>
</tr>
</tbody>
</table>

Source: 2010 DWQR report

The Private Water Supplies (Scotland) Regulations 2006 sets out legislative requirements for monitoring PWS. These are enforced by Local Authority Environmental Health teams and supervised by the Drinking Water Quality Regulator (DWQR). The quality of Type A supplies must be assessed by Local Authorities at least once a year. Type B supplies must be assessed by Local Authorities at the owners or users request.

The microbiological quality of PWS is one aspect of assessment. The presence of coliforms may indicate faecal contamination of the water whilst the presence of *E. coli* confirms this.
The Health Protection Team in collaboration with Environmental Health Officers (EHOs) in the Local Authority or Scottish Water may decide to recommend a boil notice if there are concerns that a water supply (private or public) is a potential source of a gastrointestinal illness. The responsibility of implementing the boil notice lies with the Local Authority or Scottish Water.

Another risk factor for gastrointestinal illness is foreign travel. Some infections such as dysentery, *Hepatitis A* and *Typhoid* are predominantly imported following travel abroad.

Many of these infections show a seasonal pattern. For example we see an increase in reports of *Salmonella* and *Campylobacter* infections in the summer months possibly associated with travel abroad and outdoor living. The numbers of *E. coli* O157 infections tend to increase in August and September, especially after heavy rain. See later for more detail.

### 4. Surveillance of gastrointestinal infections

In the NHS Grampian Board area some infections are seen regularly, although the numbers do vary from year to year (Table 2). A selection of those organisms we see most commonly and/or have the greatest impact upon the public’s health and the Health Protection workload are presented here. Data from 2007-2011 are presented.
Table 2: Number of cases of reported and notified communicable disease in Grampian in 2007 – 2011*

<table>
<thead>
<tr>
<th>Organism/ Illness</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campylobacter</td>
<td>664</td>
<td>665</td>
<td>801</td>
<td>808</td>
<td>763</td>
</tr>
<tr>
<td>Cryptosporidium</td>
<td>67</td>
<td>79</td>
<td>107</td>
<td>70</td>
<td>44</td>
</tr>
<tr>
<td>E. coli O157</td>
<td>55</td>
<td>56</td>
<td>57</td>
<td>51</td>
<td>41</td>
</tr>
<tr>
<td>Entamoeba histolytica</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Giardia</td>
<td>12</td>
<td>17</td>
<td>17</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Paratyphoid</td>
<td></td>
<td></td>
<td></td>
<td>3**</td>
<td>1</td>
</tr>
<tr>
<td>Salmonella</td>
<td>135</td>
<td>127</td>
<td>105</td>
<td>103</td>
<td>102</td>
</tr>
<tr>
<td>Shigella species (Dysentery)</td>
<td>13</td>
<td>12</td>
<td>6</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Typhoid</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Yersinia</td>
<td>25</td>
<td>21</td>
<td>26</td>
<td>5***</td>
<td>2</td>
</tr>
</tbody>
</table>

** Prior to 2010 any Paratyphoid notifications were likely included in the Typhoid or Salmonella figures.
*** The number of Yersinia notifications has likely dropped due to a change in laboratory practices. The laboratory no longer carry out routine culture for Yersinia and now only do so when the clinical features indicate it, for example a child with fever and pain in the right side of their abdomen.

4.1 E. coli O157

There are many strains of E. coli which can lead to gastrointestinal illness. Verotoxigenic E. coli (VTEC) is the cause of the most serious illness. E. coli O157 is the most common serogroup of VTEC in the UK. It is also the most likely to cause bloody diarrhoea. Infection can be asymptomatic or range from mild diarrhoea to bloody diarrhoea, haemolytic uraemic syndrome (HUS) and death. Children, the elderly and other vulnerable groups such as those with an underlying illness have increased risk of developing complications.¹

VTEC colonises the gastrointestinal tract of animals such as cattle and sheep, and does not usually cause illness in these animals. Transmission to humans is via the faecal-oral route. This means an individual must swallow the bacteria in some way. Only small amounts of the bacteria need to be eaten to cause illness and this is not visible to the human eye.

VTEC is passed to humans through the contamination of food, water or surfaces by excreta of a case (human or animal). Foodborne infection is usually due to the consumption of inadequately cooked contaminated meat, unpasteurised milk and raw vegetables. As described previously, private water supplies are at risk of contamination and those visiting a rural area may be more susceptible to infection than those living there.¹,²
The Health Protection Team, in collaboration with EHO colleagues, take immediate action when notified of a case, in order to prevent onward transmission. This includes ascertaining the case’s occupation (or school or nursery attendance), identifying possible sources of infection, identifying contacts and promoting infection control measures (such as hand hygiene advice). The number of *E. coli* O157 cases remained broadly constant between 2007 and 2010 but is lower in 2011 (Table 1). This was the lowest number since 2003. The rate of *E. coli* O157 infection in Grampian in 2011 was the second highest in Scotland (see Figure 5 in Appendix).

Eight cases in 2011 were travel related and the remaining 33 were likely to have been acquired in Grampian. Seven of these cases were part of a nationwide outbreak of *E coli* O157 Phage type 8 (see “outbreaks of gastrointestinal infections” below). Three cases had consumed water from a PWS but *E. coli* O157 was not isolated on sampling. Eleven cases had been in a rural environment and/or visited farms. Two cases appear to have occurred after transmission from another infected person. This occurred prior to receiving infection control advice from the Health Protection Team.

*E. coli* O157 reports tend to peak in the 3rd quarter of the year (Figure 1). This may relate to a combination of heavier rain fall (which may contaminate private water supplies), foreign travel and outdoor activities in the summer months.

![Figure 1: Number of *E. coli* O157 notifications by month, 2007-2011](image-url)
4.2 Campylobacter

*Campylobacter* usually causes an acute diarrhoeal illness with abdominal pain, nausea and fever. There may also be blood in the stool. The illness usually settles after a few days, however there may be complications in a small number of cases such as reactive arthritis, HUS and Guillain-Barré syndrome.¹

*Campylobacter* is carried in the gastrointestinal tract of birds and mammals and can be transmitted to humans when they consume faecally contaminated food or water. Unpasteurised milk, poorly treated water supplies and improperly cooked meat such as chicken are potential sources. The risk of illness from *Campylobacter* can be reduced by thorough hand washing, careful handling and adequate cooking of meat, pasteurising milk and fitting and maintaining systems to treat PWS.¹

The Health Protection Team and EHOs from Local Authorities no longer routinely interview cases of *Campylobacter*. However, an information leaflet is sent to individuals affected. This approach is consistent with a recently agreed consensus statement of the public health management of *Campylobacter* in Scotland.

The rate of *Campylobacter* notifications by NHS Grampian to HPS in 2011 was 138.8 per 100,000 population, this was the sixth highest rate in Scotland (see Figure 6 in Appendix).

In 2009 and 2010 there were higher numbers of *Campylobacter* notifications than in previous years across Scotland. This increase was also observed in England and Wales. This could be due to improved surveillance or increased exposure to the bacteria in food or other sources.⁹ There was however a slight drop in 2011.

In 2011, the Health Protection Agency in England found that over 90% of outbreaks of *Campylobacter* infection in catering venues during that year were linked to consumption of chicken liver pate. As a result, advice has been issued to cook poultry livers thoroughly.¹⁰

The seasonality of *Campylobacter* is demonstrated below (Figure 2). As can be seen there tends to be a peak in cases in early summer with one smaller peak towards the end of the year. The reason for this seasonality is not fully understood.¹¹ The summer peak may reflect higher risk activities such as barbeques in which raw meat may be handled without proper hand washing and meat may not cooked adequately.
4.3 Cryptosporidiosis

Cryptosporidiosis is caused by a parasite (*Cryptosporidium*) often found in the gastrointestinal tract of animals. It normally causes a short-lived diarrhoeal illness in humans. However, it can cause severe illness in immunocompromised people (for example those with underlying cancer or infections such as HIV).\(^1\)

Infections can occur if individuals swallow the parasite. This may be due to drinking contaminated drinking water, swimming pool water and other water bodies. It can also occur through contact with infected humans and animals.\(^2\)

There is a slight variation in how cases of Cryptosporidiosis are investigated by the three Local Authorities. Cases resident in Moray are interviewed by EHOs in order to collect surveillance data. Cases resident in Aberdeen City and Aberdeenshire are sent a letter of information, a self complete surveillance questionnaire and a stamped addressed envelope to return the questionnaire to the Health Protection Team. Information was gathered from 22 out of 44 cases in 2011. Nine of these cases were travel related and 5 reported being on farms.

The two commonest sub-types (“serotypes”) of *Cryptosporidium* identified are *C. parvum* and *C. hominis*. It appears that *C. parvum* is most common between April to July (with animal transmission) and *C. hominis* is more common between August and December (associated with foreign travel and swimming pools).\(^12,13\)
These two peaks can be observed in NHS Grampian’s data (Figure 3). Note that the notifications in the Figure do not differentiate between species. In 2011, 28 cases were identified as *C. parvum*, 12 were *C. hominis* and 4 were unknown.

![Cryptosporidium notifications 2007-2011](image)

**Figure 3: Number of cryptosporidium notifications by month, 2007- 2011**

The rate of Cryptosporidium infection in 2011 in Grampian was 9.8 per 100,000 population. This was slightly higher than the Scottish average (see Figure 7 in Appendix).

As with all gastrointestinal infections, the risk of Cryptosporidium infection can be reduced by effective hand washing. Risk assessment and good management of water supplies can also reduce the risk. The number of *C. parvum* cases has decreased over the years which is believed to be due to improvements in drinking water quality. This is not shown in Figure 3 as data from a longer time period would be required. Severely immunocompromised patients may be advised to boil water before consumption and avoid contact with farm animals and people infected with *Cryptosporidium*.

### 4.4 Salmonellosis

Infection by *Salmonella* bacteria can cause symptoms such as diarrhoea, stomach cramps and occasionally vomiting and fever. The illness is usually not severe but may cause complications in some people, especially those who have other illnesses.
Salmonella is often carried in the gastrointestinal tract of animals, for example chicken, cattle and pigs. Raw or undercooked meat or eggs and unpasteurised milk are potential sources of infection. Salmonellosis is also a risk to travellers abroad and can spread from person to person, especially if people are not observing adequate hand and environmental hygiene practices. The risk can therefore be reduced by vaccination of poultry, pasteurisation of milk, and routine food and personal hygiene measures (including care with raw poultry and eggs).\(^1\)

People with confirmed Salmonella are usually interviewed by EHOs in order to assess potential sources, the risk to others and to give hand and environmental hygiene advice.

Although Salmonella notifications have been decreasing in Grampian (Table 1), they have increased between 2009 and 2010 in Scotland.\(^{14}\) However, the rate of Salmonella infection in Grampian is the highest in Scotland in 2011, despite the decrease in notifications (see Figure 8 in Appendix).

The number of Salmonellosis cases relates to the serotype which is causing the infection. There are many serotypes of Salmonella. Salmonella enteritidis is the most common; however cases have decreased since the introduction of vaccination of poultry flocks.\(^{1,14}\) The second most common serotype observed is S. typhimurium and reports of these are increasing at a national level.\(^{14}\) It is not clear why this is.

Salmonella infections peak in late summer. This is thought to be due to more rapid multiplication of bacteria at higher temperatures and perhaps an increase in undercooked food consumption due to activities such as barbeques and picnics (Figure 4).\(^1\)
Thirty one of the 102 cases in 2011 were *S. enteritidis* and 26 were *S. typhimurium*. There were a wide variety of other species reported including *S. monophasic*, *S. napoli* and *S. derby*.

Thirty seven cases were associated with travel, the majority of which was outside the United Kingdom. Two sporadic cases of *S. napoli* may have been linked to a food establishment and this was investigated by the EHOs in the Local Authority.

5. **Outbreaks of gastrointestinal infections**

The number of outbreaks of gastrointestinal infection in Grampian is shown below (Table 3). These figures are derived from the HPS ObSurv surveillance system and are by date of report to HPS. It is clear that the most common cause of outbreaks of gastrointestinal infection is Norovirus (NV).
Table 3: Number of outbreaks of gastrointestinal infection in Grampian by date reported to Health Protection Scotland, 2007-2010

<table>
<thead>
<tr>
<th>Organism</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campylobacter</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>C. difficile</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>C. perfringens</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>E. coli O157</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Norovirus</td>
<td>38</td>
<td>41</td>
<td>47</td>
<td>54</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Salmonella</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Scombrotxin</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Shigella sonnei</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Staph aureus</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Viral</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46</strong></td>
<td><strong>46</strong></td>
<td><strong>53</strong></td>
<td><strong>58</strong></td>
</tr>
</tbody>
</table>

At a Scottish level, 371 general outbreaks of gastrointestinal illness were reported to ObSurv in 2010. This was an increase of 31% compared to 2009 and the highest since the ObSurv system was established. The increase in the overall number of outbreaks appears to be due to an increase in NV outbreaks. 93% of outbreaks in 2010 were caused by NV; this was an increase of 41% on 2009.  

### 5.1 Norovirus

In Grampian, 2010 also saw a higher number of NV cases and outbreaks compared to previous years. There also appears to be an upwards trend in the number of cases and outbreaks. It is not clear why this increase has occurred. NV outbreaks affected an estimated 4312 individuals between 2007 - 2010 (Table 4).

Table 4: Total number of reported cases and outbreaks and total number of microbiologically confirmed cases in NV outbreaks in NHS Grampian (all locations) 2007-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of outbreaks</th>
<th>Total number of cases</th>
<th>Total number positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>38</td>
<td>1122</td>
<td>164</td>
</tr>
<tr>
<td>2008</td>
<td>41</td>
<td>908</td>
<td>100</td>
</tr>
<tr>
<td>2009</td>
<td>47</td>
<td>1034</td>
<td>107</td>
</tr>
<tr>
<td>2010</td>
<td>54</td>
<td>1248</td>
<td>145</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>180</strong></td>
<td><strong>4312</strong></td>
<td><strong>516</strong></td>
</tr>
</tbody>
</table>

*2 NV outbreaks in 2007 also involved *C. difficile*

The rate of NV reports in 2011 in Grampian was the second highest in Scotland (see Figure 9 in Appendix).
NV was previously called Norwalk-like virus (NLV) or Small Round Structured Virus (SRSV) and causes what is sometimes called ‘Winter Vomiting Disease’ although it can occur at any time of year. NV is highly infectious. The most prominent symptom is vomiting, which is often projectile. Diarrhoea is usually mild and watery. Nausea, headache, fever and muscle aches also occur. The illness is generally mild and short-lived (12-72 hours) although people with pre-existing chronic medical conditions may be more seriously affected. The most prominent symptom is vomiting, which is often projectile. Diarrhoea is usually mild and watery. Nausea, headache, fever and muscle aches also occur. The illness is generally mild and short-lived (12-72 hours) although people with pre-existing chronic medical conditions may be more seriously affected.1

There are a number of ways in which NV can be spread. In order to contract NV, it must be ingested in some way. Transmission from person to person occurs when one person has direct contact with the faeces of an infected person or contaminated surface (e.g. toilet flush handle) and then transmits the virus to their mouth. The virus is not visible to the human eye. This risk can be reduced through effective hand washing and environmental hygiene. Some foods, especially shellfish, and water may be contaminated before entering the kitchen. Infectivity in humans lasts for at least 48 hours after resolution of symptoms. Infected food handlers may contaminate food, which is especially high risk if it is then eaten raw. Additionally, projectile vomiting can spread the virus in the air in droplets. These can land on surfaces or be inhaled and swallowed by individuals.1,15

In order to prevent or reduce the spread of NV, it is essential to observe good standards of personal hygiene (such as hand washing), along with effective infection control in hospitals and institutions. Reports of outbreaks of NV infection have increased substantially in recent years. Most occur in closed or semi-closed communities, especially hospitals, care homes and leisure industry settings such as hotels, holiday and caravan camps, cruise ships and coaches.1

The most common location for outbreaks to be reported is Residential Institutions (Table 5). These make up 76% of outbreaks.

Table 5: Location of outbreaks of Norovirus infection reported by NHS Grampian

<table>
<thead>
<tr>
<th>Location</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td>20</td>
<td>20</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Residential Institution</td>
<td>17</td>
<td>11</td>
<td>30</td>
<td>41</td>
</tr>
<tr>
<td>Hotel</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Restaurant</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>School</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Armed services</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>38</strong></td>
<td><strong>41</strong></td>
<td><strong>47</strong></td>
<td><strong>54</strong></td>
</tr>
</tbody>
</table>

An increased number of reports does not necessarily reflect an increased volume of illness in Residential Institutions. There are a number of reasons for higher reports. HPS have produced advice for care homes which states that care homes...
should report any suspected outbreak of Norovirus to the Care Inspectorate and local HPT. Additionally, the good working relationships between the HPT, Environmental Health and the Care Inspectorate, mean reports to any one partner are shared with the others. Furthermore, the HPT provide free teaching regarding Infection Control principles to care homes and other institutions. This fosters good relationships and increases awareness amongst staff.

5.2  **E. coli O157**

There are a small number of outbreaks of *E. coli* O157 in Grampian each year, with one outbreak in 2010. This compared to 8 outbreaks nationally (Table 6).

Table 6: Outbreaks of *E. coli* O157 in Grampian and Scotland 2007-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Number outbreaks in Grampian</th>
<th>Total number outbreak cases in Grampian</th>
<th>Number outbreaks in Scotland</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>2</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>2008</td>
<td>1</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>2009</td>
<td>1</td>
<td>2</td>
<td>9</td>
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**E. coli O157 Phage Type 8 Outbreak 2010/2011**

This was a national outbreak and so is not included in Table 6 above. Between December 2010 and July 2011, there were 250 reports of cases of infection of *E. coli* O157 Phage Type 8 (PT8) in England, Scotland and Wales. Most of these cases were mild to moderate in severity but four developed HUS and one patient (who had underlying health problems) died. There were 7 cases in Grampian. The outbreak is now over.  

There appeared to be an association between handling loose raw vegetables (especially leeks and potatoes) in the home and developing the illness. This could be due to the vegetables having soil on them which contained the bacteria. However, this did not explain all cases. Additionally, it is important to be aware that it is not solely *E coli* which can contaminate soil and thus make handling raw vegetables a risk. Inadequate washing of loose vegetables, insufficient hand washing after handling the vegetables or not thoroughly cleaning kitchen equipment, or surfaces after preparing the vegetables can increase the risk of infection. It is not unsafe to eat vegetables, as long as they have been thoroughly washed before cooking and good kitchen hygiene practices are followed. It is also important to prevent loose vegetables contaminating other foodstuffs, especially those which will not be washed prior to eating.
5.3 *Salmonella Bareilly* Outbreak 2010

There was an outbreak of foodborne *Salmonella Bareilly* infection in the UK between August and mid-December 2010. Of 241 cases, 21 cases were in Scotland, and Grampian had one case. Following investigation, bean sprouts were implicated as the likely vehicle of *S. Bareilly* transmission. This investigation also concluded that the main way to decrease further risk was by increasing public knowledge regarding the preparation of raw bean sprouts.\(^\text{18}\)

6. Action taken to minimise Gastrointestinal infections in Grampian

- There are robust systems in place to undertake the ongoing surveillance of gastrointestinal infections.
- Colleagues work together on campaigns which promote good practice in the area of Health Protection
- The HPT work closely with Environmental Health colleagues and other agencies to investigate cases and/or outbreaks of gastrointestinal infections.
- All cases of *E. coli* O157 infections and other serious gastrointestinal infections are promptly investigated and followed up, families supported and public health advice provided.
- The HPT and Environmental Health colleagues use every opportunity to promote the importance of hand washing. For example, advice on hand washing is included in letters to patients and contacts, letters to parents, information leaflets and press statements.
- The HPT and Environmental Health work closely with Care Homes and Schools to manage any outbreak and encourage them to report these as soon possible
- Infection control training is provided by the HPT to a large number of Care Home and Social Care staff on a regular basis to minimise the risk of outbreaks.
- The advice available to public and healthcare professionals about the risks of gastrointestinal infections has been reviewed and information has been provided via the media.
- The HPT and Environmental Health will continue to highlight the risk associated with private water supplies throughout the year.
• In 2012 the HPT will work with primary care staff to ensure they can provide the appropriate information to families to minimise their risk of gastrointestinal infections.

• A range of local Infection Prevention and Control Policies are in place. For example the NHS Grampian “Safe Working Practice” document provides infection control advice for non-NHS settings such as care homes. ¹⁹

• Health Protection Network (HPN) Guidance is implemented and followed. The HPN draws together professionals working in Health Protection across Scotland in order to promote good practice and guidance in areas such as VTEC and Clostridium difficile. ²⁰

• The HPT review guidance developed by the HPA and in discussion with HPS and the Health Protection Network consider it’s suitability for use in Scotland e.g. the HPA Hepatitis A guidance and the more recent HPA Typhoid and Paratyphoid guidance.

• The HPT and Environmental Health participate in a range of research studies examining risk factors and management of infection.

7. Advice to the general public

The public can also take actions to protect their own health through the following straightforward measures.

7.1 Hand washing

This is the single most important thing which can be done to reduce the spread of infections. It takes at least 15 seconds to wash hands properly. For a helpful demonstration of hand washing, see the NHS Scotland website at:

www.washyourhandsofthem.com/hand-hygiene--you/how-to-wash-your-hands.aspx

Hands should be washed and dried thoroughly especially:

• When hands are visibly soiled
• Before handling food, eating or feeding others
• After using or cleaning the toilet, changing a nappy or handling human waste
• After touching animals or animal waste or visits to farms and petting zoos

If there are no handwashing facilities are available (for example when hiking or picnicking in the countryside) large moist handwipes may be used as a temporary measure in order to physically remove dirt. Continue to use new
wipes until all parts of the hands are clean. Alcohol-based hand rubs are only effective on visibly clean hands as they are unlikely to penetrate through any dirt or grime. These rubs are also not effective against some organisms such as Cryptosporidium. Handwashing with liquid soap and running water should be completed as soon as possible.

7.2 Prepare and cook food safely

It is important to prepare and cook food safely at home as harmful organisms in certain foods can lead to illness. Raw meat should be cooked thoroughly (especially chicken, pork, burgers, sausages and kebabs) so that there is no pink meat inside. Vegetables should be washed prior to eating as any soil or dirt remaining could be a source of bacteria such as E. coli O157.

Cross-contamination between foodstuffs such as raw meat and food which will not be cooked before eating should be prevented, for example by keeping raw and cooked food separate in the fridge.

For more information and tips on food safety please see the NHS Choices website at:

www.nhs.uk/Livewell/homehygiene/Pages/Homehygienehub.aspx

and the Food Standards Agency website at: http://www.food.gov.uk/

7.3 Private Water Supplies

Individuals can reduce their risk of illness resulting from a PWS by ensuring their supply is regularly maintained. If they do not own their supply, they can ask the owner to do this.

Grant assistance may be available. For further advice and information as to what grants are available and how to maintain a PWS, individuals should contact their local Environmental Health department which will be based in their Local Authority.

7.4 Actions for individuals with symptoms of gastrointestinal illness

If you or a household member have symptoms of gastrointestinal illness (for example diarrhoea and/or vomiting), it is advisable to seek medical attention if you are concerned in any way.

There are simple steps which can be taken to prevent spread to others in your household, at work or at school or nursery. Firstly, promote regular thorough handwashing using running water and liquid soap. Bars of soap can trap
bacteria. Everyone in the household should have an individual towel as towels can become contaminated. Young children should be taught how to wash their hands correctly or have their practice observed.

Within the household there are a number of environmental cleaning practices which can aid in reducing the risk of the infection being picked up by someone else. For some infections like *E. coli* O157, only a very small amount of the bacteria needs to be ingested to cause illness. Therefore it is very important to thoroughly clean all surfaces which may have become contaminated (the presence of contamination is likely not to be visible to the human eye).

After the affected individual has been to the toilet it is advisable to clean hard surfaces including flush handles, taps, and toilet seats, with a multi-purpose detergent followed by a diluted bleach solution (follow the manufacturer’s instructions regarding dilution for environmental cleaning and health and safety). Rinse and allow to dry.

You should not attend work, school or nursery until **48 hours after** the last episode of diarrhoea and/or vomiting. This is vitally important to prevent spread to others. If you submit a stool sample which demonstrates you have an infection caused by an organism such as *E. coli* O157, you may be excluded from work, school or nursery as was described previously. The HPT will arrange this if this is required and keep you informed.

For further information about the NHS Grampian Health Protection Team, please visit the website at:  [www.nhsgrampian.org](http://www.nhsgrampian.org)
References


(15) Health Protection Scotland. General information and infection prevention and control precautions to prepare for and manage norovirus in care homes. Health Protection Scotland, 2011.

(16) Health Protection Scotland. General information and infection prevention and control precautions to prepare for and manage norovirus in care homes. Health Protection Scotland, 2011.


Figure 5: Rates per 100,000 population of reports of *E. coli* O157 to HPS, 2011 (2010)

Figure 6: Rates per 100,000 population of reports of *Campylobacter* to HPS, 2011 (2010)
Figure 7: Rates per 100,000 population of reports of Cryptosporidium to HPS, 2011 (2010)

Figure 8: Rates per 100,000 population of reports of Salmonella to HPS, 2011 (2010)
Figure 9: Rates per 100,000 population of reports of Norovirus to HPS, 2011 (2010)

NHS Board Abbreviations

AA Ayrshire & Arran  BR Borders          DG Dumfries &
GG Greater Glasgow & FF Fife            Galloway
Clyde              GR Grampian           FV Forth Valley
LN Lanarkshire    LO Lothian           HG Highland
SH Shetland       WI Western Isles     OR Orkney
Y Tayside

Source
Health Protection Scotland