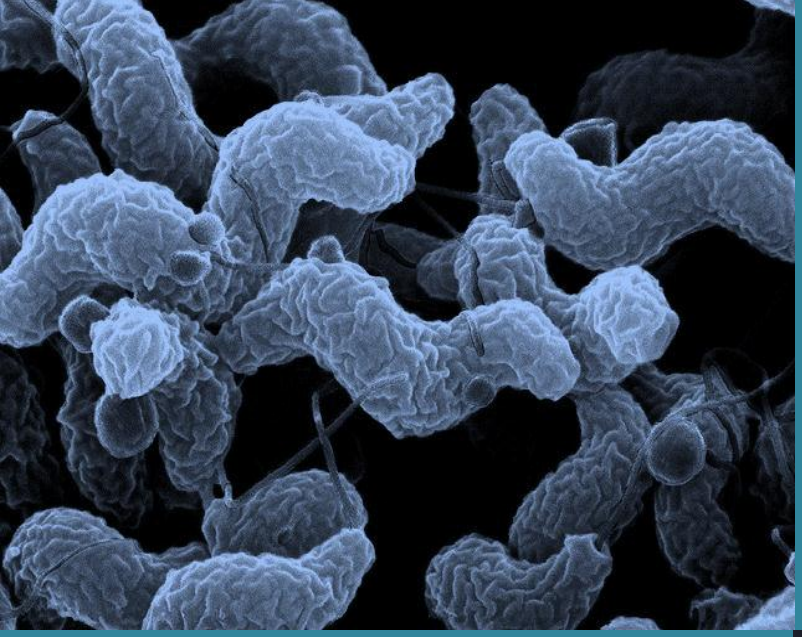
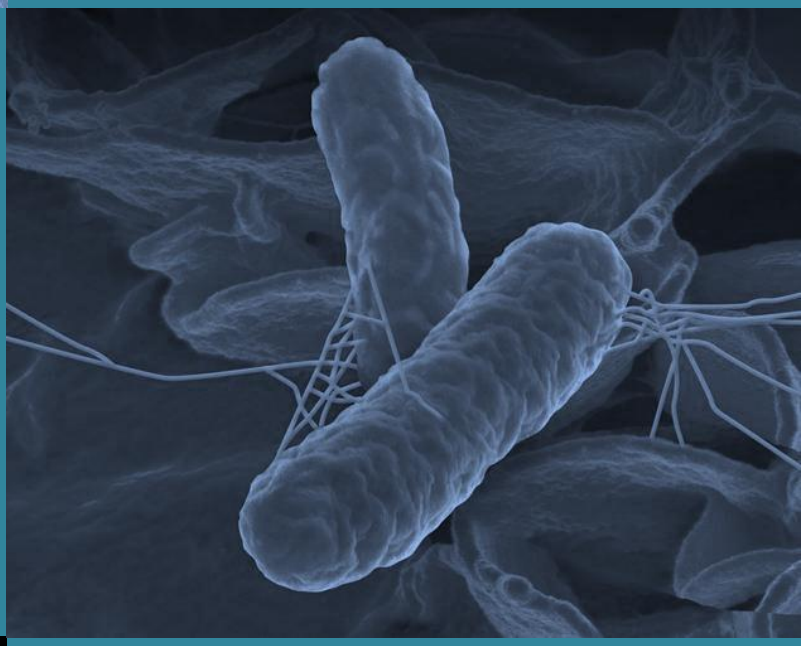
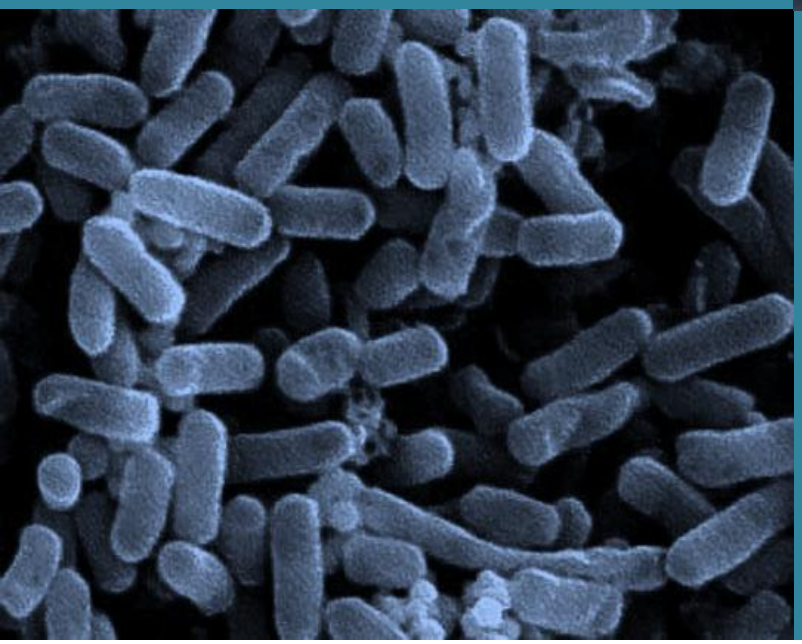


Gastrointestinal Infections in Northern Ireland





Annual Surveillance Report 2013

HSC Public Health Agency

Gastrointestinal Infections in Northern Ireland Annual Surveillance Report 2013

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Key Points

- There were increases in both *Campylobacter* and *Salmonella* in 2013; however, reductions were seen in most other viral and bacterial causes of gastrointestinal illness as well as a substantial reduction in the number of outbreaks reported compared to 2012.
- Notifications of food poisoning decreased slightly in 2013; however in general numbers of notifications have been increasing since 2008. The total number of notifications has increased by 35% since 2008.
- *Campylobacter* infections continue to rise with 1,355 detections in 2013, compared to 1,211 in 2012 (12% increase), and overall laboratory reports increasing by 60% since 2008.
- *Cryptosporidium* infections decreased from 177 laboratory reports in 2012 to 161 in 2013 (10% decrease) but remain relatively high compared to previous years.
- There were 72 laboratory confirmed cases of *E. coli* O157 reported in 2013. Phage type 32 was the most commonly reported phage type (n=42). 42% of the cases reported in 2013 were admitted to hospital.
- Only 6% of confirmed cases of *E. coli* O157 (n=4) were linked to outbreaks in 2013.
- The number of laboratory confirmed cases of giardiasis remains relatively high with 47 cases in 2013. This represents a slight decrease compared to the 50 cases reported in 2012 (6% decrease).
- The number of *Salmonella* infections reported increased in 2013 with 157 laboratory reported cases compared to 146 in 2012, representing an 8% increase. *Salmonella* definitive phage type (DT) 193 remains the most frequently reported phage type in 2013 with 20 cases due to this phage type.
- Travel remains a significant risk factor for some gastrointestinal infections, with 49% of *Salmonella* infections being related to travel outside the UK in 2013.
- During 2013 the number of outbreaks of gastrointestinal infection decreased. Similar to previous years the majority were spread through person-to-person transmission.
- No confirmed foodborne outbreaks were reported in 2013.
- A number of laboratories within Northern Ireland have indicated that their testing procedures will be changing in 2014. This is likely to have an impact on future surveillance and may lead to increased ascertainment.

Introduction

The Public Health Agency (PHA) has a lead role in protecting the population from infection and environmental hazards through a range of core functions including communicable disease surveillance and monitoring, operational support & advice, and education, training and research.

The effective management of infectious disease depends on high quality surveillance. Surveillance of communicable gastrointestinal infectious disease provides timely information so that public health action can result. The range of surveillance outputs is broad and includes:

- Weekly surveillance – weekly internal report to the Health Protection team.
- Monthly/quarterly and annual returns – to various external bodies including the Food Standards Agency, European Centre and Disease Control, Epidemiology of Foodborne Infections Group and Department of Health, Social Services & Public Safety.
- Annual reports and data – published yearly on the PHA website.
- Analysis of outbreaks – descriptive and/or analytical epidemiological analysis.

Epidemiological data is collated from a number of surveillance systems:

- Regional CoSurv for NI laboratories – all confirmed organisms/infections are reported electronically from seven laboratories to PHA.
- Reference laboratory reporting – selected organisms are sent by the local laboratories to reference laboratories in England for typing and the results are reported to PHA.
- Notifications of Infectious Diseases (NOIDS) – General Practitioners and Hospital Physicians have a statutory duty to report notifiable infectious diseases (e.g. food poisoning) to the PHA under the Public Health Act (NI) 1967.
- HP Zone – software package used in case management, contact tracing, and outbreak investigation & control. HP Zone facilitates the capture of data and collection of timely local and regional infectious disease intelligence.
- Enhanced surveillance systems for *E. coli* O157 - an active surveillance system is in place to assemble a comprehensive clinical, epidemiological and microbiological dataset on all primary indigenous *E. coli* O157 cases.

This report presents the epidemiological data for selected gastrointestinal infections reported in Northern Ireland in the calendar year 2013.

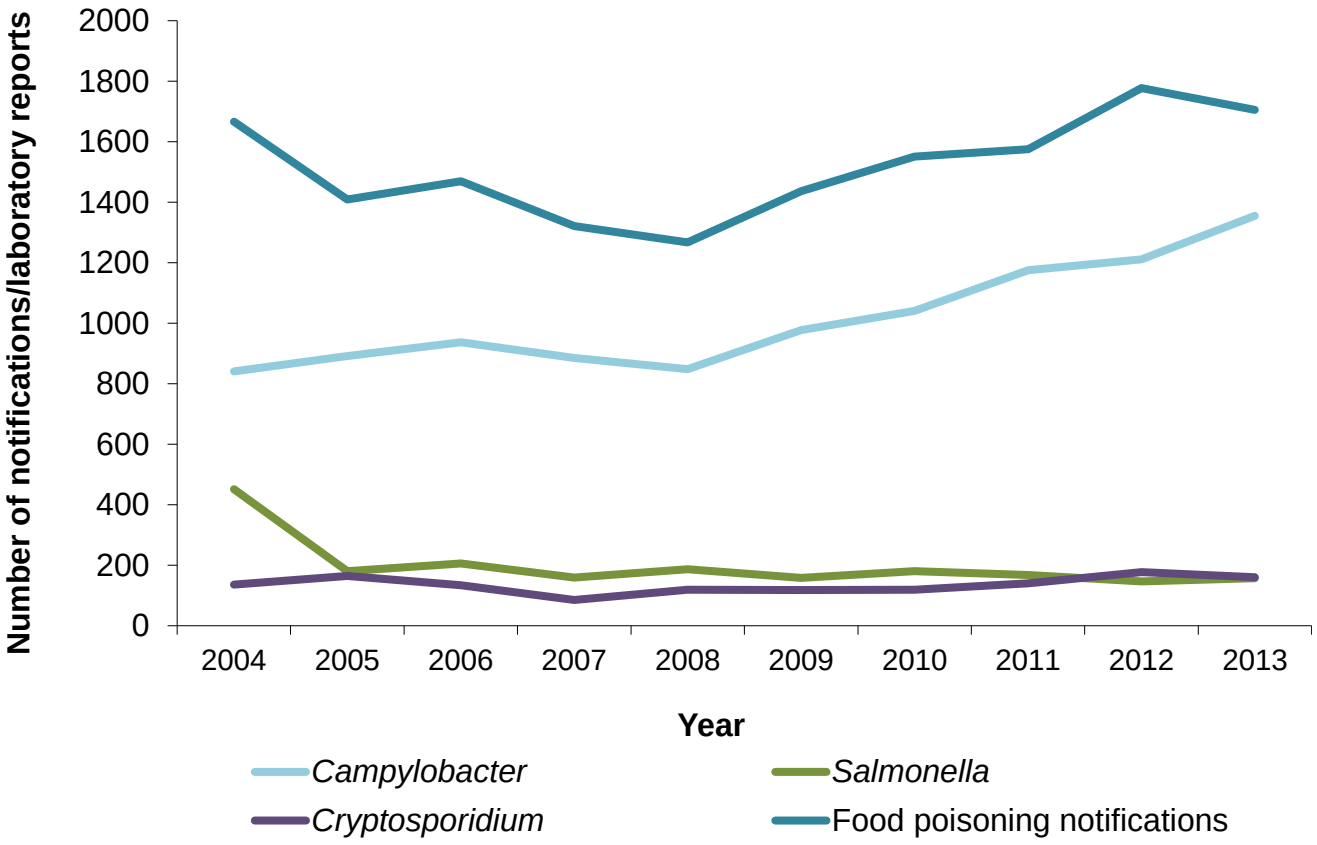
Food Poisoning

Food poisoning notifications fell from 2004 to 2008; however, since then they have been rising steadily (Figure 1) increasing by 35% since 2008. Despite this general increase, the number of notifications dropped slightly in 2013 compared to 2012.

Salmonella and C*ampylobacter* commonly cause food poisoning. *Salmonella* cases increased sharply in 2004 due to three outbreaks but have remained relatively stable since. In contrast, C*ampylobacter* infections have been increasing since 2008, in line with increasing food poisoning notifications.

Cryptosporidium is a protozoa that is commonly acquired through the consumption of contaminated water. Following decreases in 2006/07 cases of C*ryptosporidium* have been increasing since 2007 with numbers in 2012/13 exceeding those at the start of the ten year period.

Fig 1: Food Poisoning: Notifications and Laboratory Reports 2004 – 2013



Campylobacter

Number of cases	**1,355**
Incidence rate	**74.1 per 100,000 population**

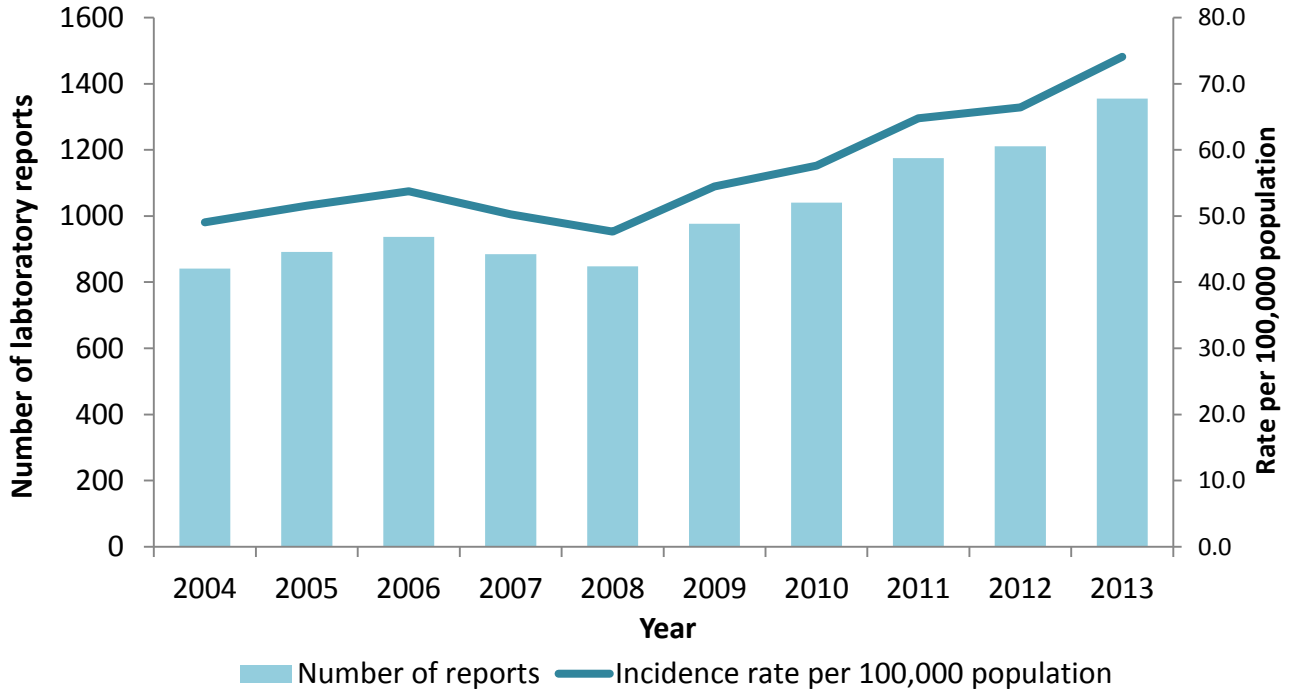
Campylobacter is the most common bacterial cause of gastrointestinal infection in the UK and Europe. Campylobacteriosis is characterised by diarrhoea, abdominal pain, malaise, fever, nausea and vomiting. Symptoms generally last for only a few days.

In 2013, C*ampylobacter* remained the most common bacterial gastrointestinal infection in Northern Ireland with 1,355 laboratory reported cases, an increase of 144 cases compared to 2012 (n=1,211 cases). The incidence of C*ampylobacter* infections was 74.1 per 100,000 population. Cases of C*ampylobacter* have been increasing since 2008 with an overall increase of 60% over this period (Table 1, Figure 2). Only 31 (2%) cases were reported as being associated with foreign travel; however, as reporting forms are completed on only a fraction of cases this figure is likely to be an underestimate.

Table 1. No of laboratory reports of *Campylobacter*, 2004 - 2013

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
841	891	937	885	848	977	1040	1175	1211	1355

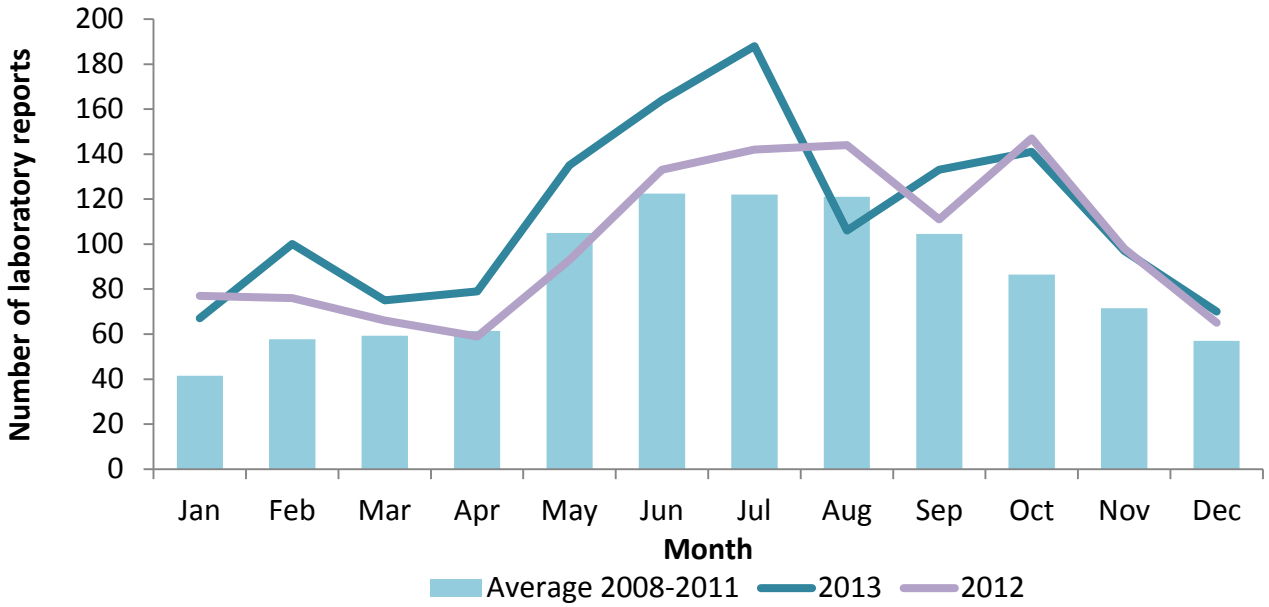
Fig 2: Laboratory reports and incidence rate of *Campylobacter*, 2004 - 2013



Cases of C*ampylobacter* follow a seasonal pattern with the number of cases generally increasing in May with a peak in June and declining from September onwards.

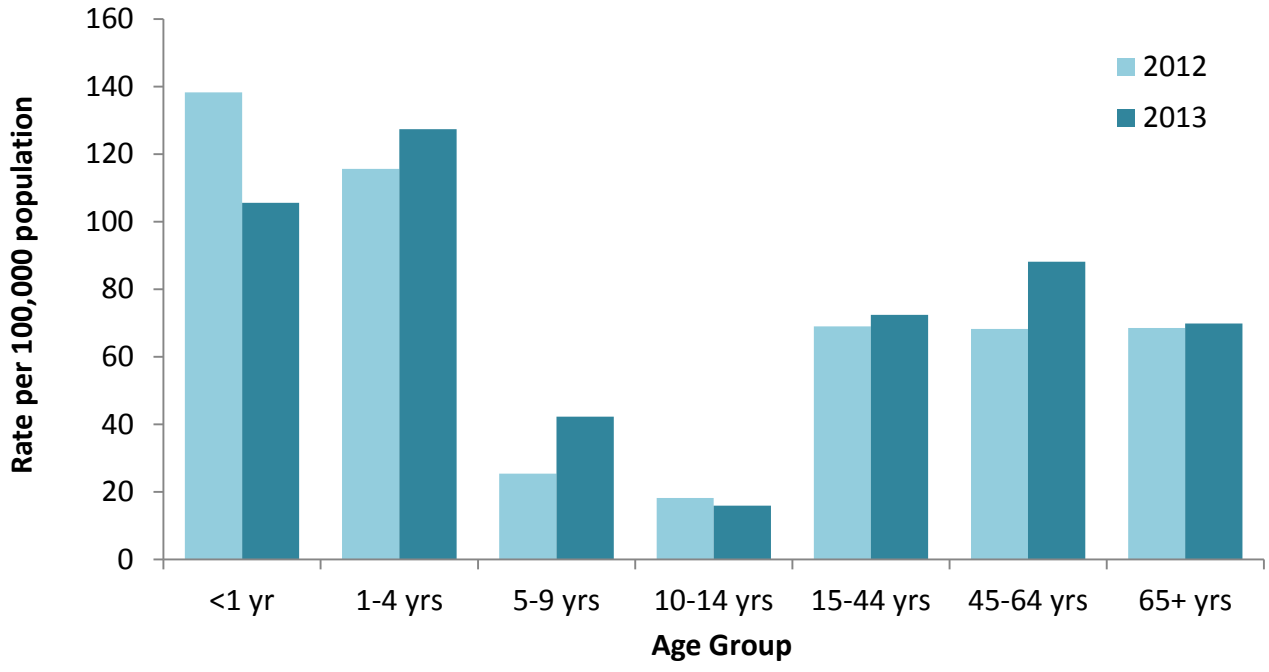
In 2013, the peak was slightly later than usual in July but earlier than in the previous season with the peak number of cases (n=188) being substantially higher than that of 2012 (n=144). Cases fell sharply in August but increased again in September with a secondary peak in October, similar to 2012 (Figure 3).

Fig 3: Monthly laboratory reports of *Campylobacter*, 2008 - 2013



The highest incidence rate of laboratory reported C*ampylobacter* infections in 2013 was in the 1-4 year old age group (127.47 per 100,000 population) (Figure 4). The proportion of reported cases in males was 56% (n=753), similar to that in 2012.

Fig 4: Laboratory reports of *Campylobacter*, age-specific incidence rate, 2012 - 2013



Cryptosporidium

Number of cases	**160**
Incidence rate	**8.7 per 100,000 population**

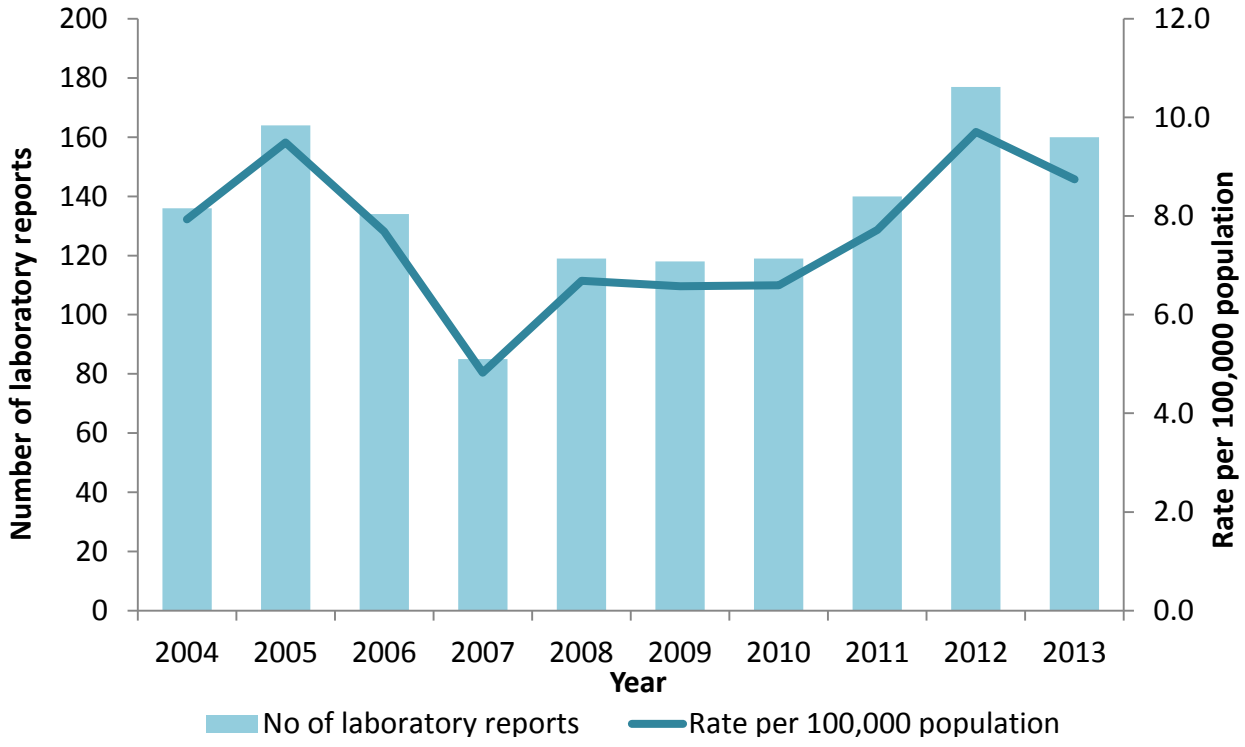
Cryptosporidium is a protozoal parasite that causes a diarrhoeal illness that can last between 2 days and 4 weeks. The infection can be a more serious illness in people who are immunosuppressed. *Cryptosporidium* is found in lakes, streams, rivers, untreated water and occasionally in swimming pools.

In 2013, there were 160 laboratory reported cases of *cryptosporidium* infection. This was a 10% decrease compared to 2012 (n=177) (Table 2, Figure 5). The incidence rate of *Cryptosporidium* infection was 8.7 per 100,000 population. No outbreaks of *Cryptosporidium* were identified in 2013 and only 12 cases (7%) were thought to be associated with travel outside the United Kingdom.

Table 2. No of laboratory reports of *Cryptosporidium*, 2004 - 2013

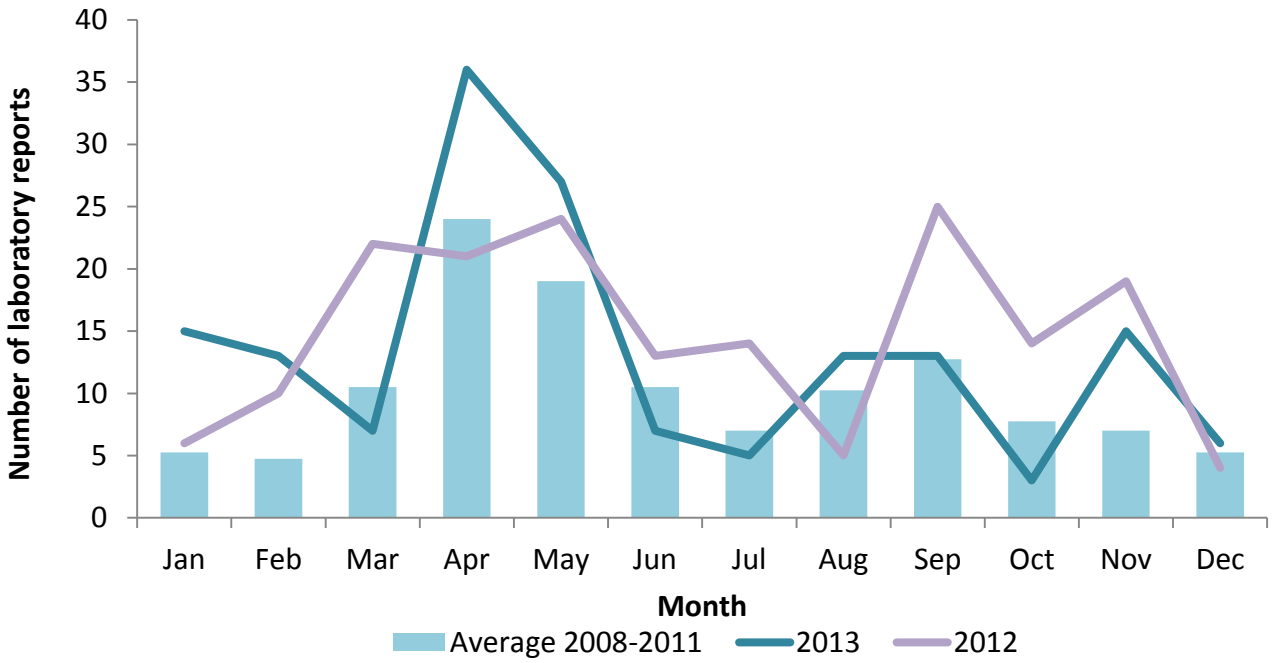
2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
136	164	134	85	119	118	119	140	177	161

Fig 5: Laboratory reports of *Cryptosporidium*, 2004 - 2013



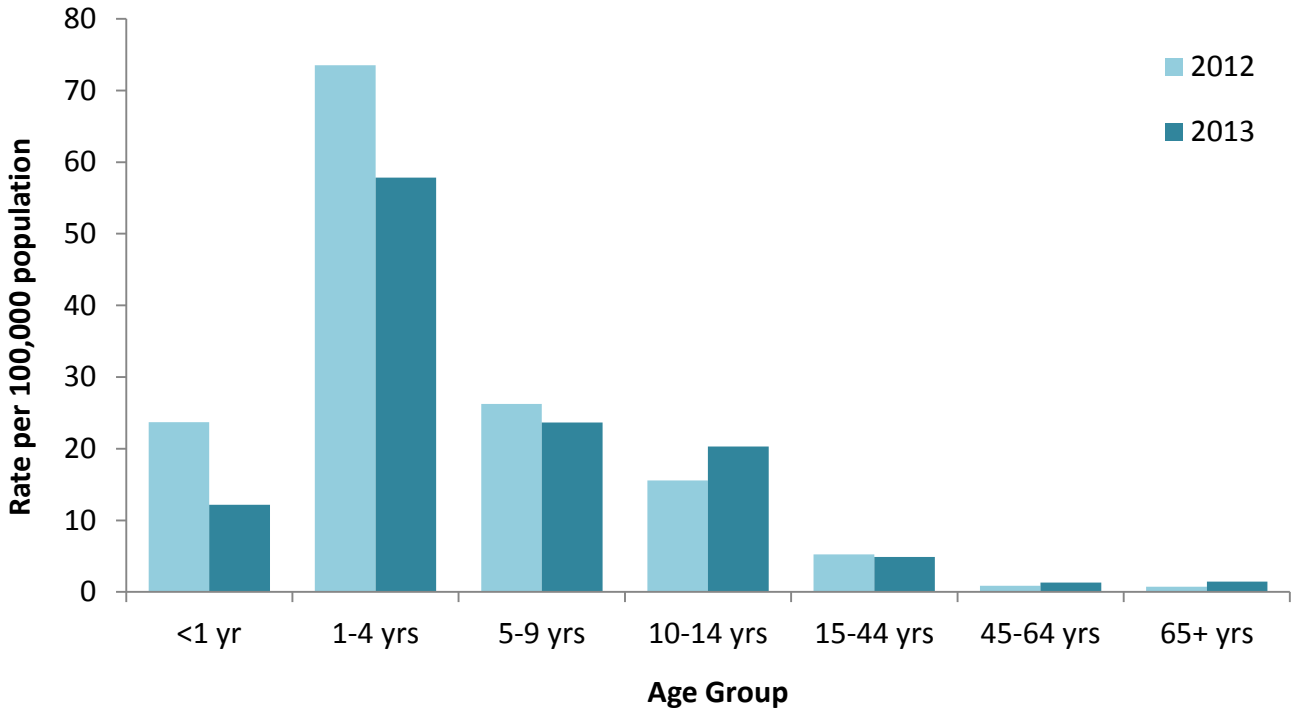
Whilst numbers overall were down in 2013 the spring peak was significantly higher than in 2012, with a much less pronounced peak in the autumn compared to the previous year. (Figure 6).

Fig 6: Monthly laboratory reports of *Cryptosporidium*, 2008 - 2013



Similar to 2012 the highest incidence rate in 2013 was in the 1-4 years old age group (57.8 per 100,000 population) with 37% of cases in this age group (Figure 7). Rates in younger children have decreased in comparison to 2012. Overall 49% of cases were males in 2013, however in the 1-4 year age group this proportion increased to 64%.

Fig 7: Laboratory reports of *Cryptosporidium*, Age-Specific Rate (per 100,000 population), 2012 - 2013



E. coli O157

Number of cases	**72**
Incidence rate	**3.9 per 100,000 population**

Escherichia coli O157 is a bacterial cause of gastroenteritis. Symptoms can range from mild gastroenteritis to severe bloody diarrhoea. A small proportion of patients can develop haemolytic uraemic syndrome (HUS) which is a serious life-threatening condition resulting in kidney failure.

There were 72 laboratory confirmed cases of *E. coli* O157 reported in 2013, of which 57 (79%) were positive for verocytotoxigenic (VTEC) genes. Four cases were associated with a single outbreak that could not be confirmed as foodborne, and 11 cases (15%) were associated with travel outside the United Kingdom.

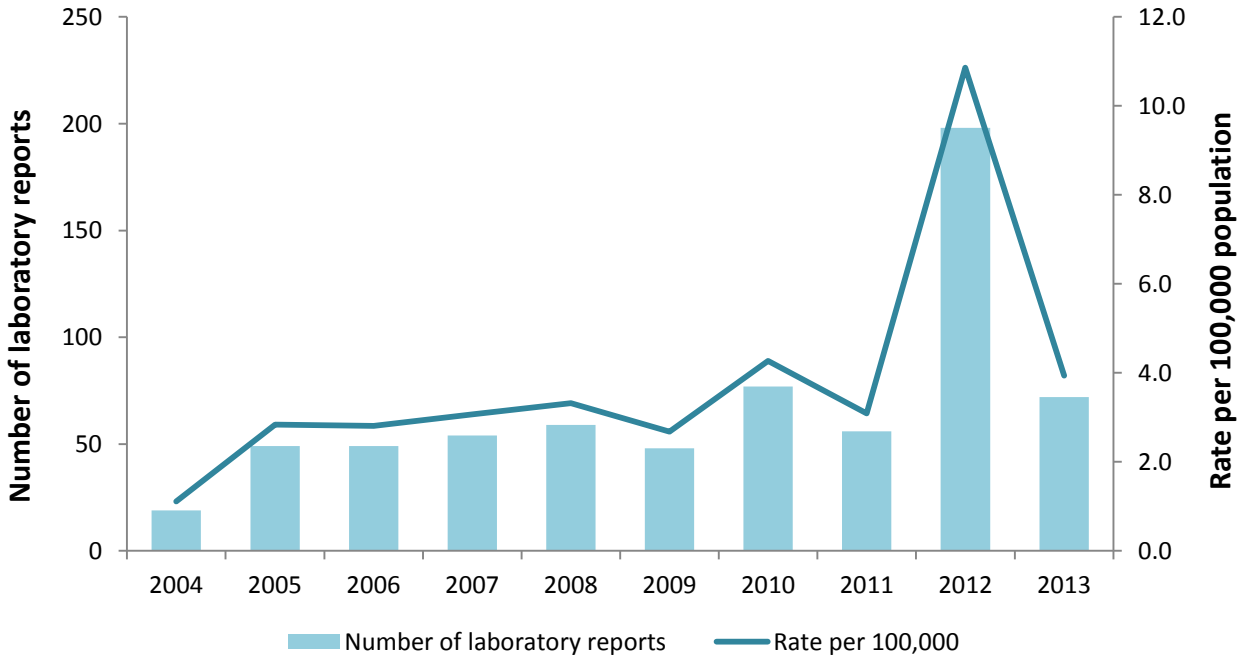
The number of *E. coli* O157 reports decreased substantially compared to 2012, however the high peak in 2012 was mainly due to a single large outbreak with 141 laboratory confirmed cases. Excluding the 2012 data the number of cases seen in 2013 is higher than the average over the preceding 10 years (n=45) (Figure 8, Table 3).

Table 3. No of laboratory reports of *E. coli* O157, 2004 - 2013

2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013
19	49	54	53	59	48	77	56	198	72

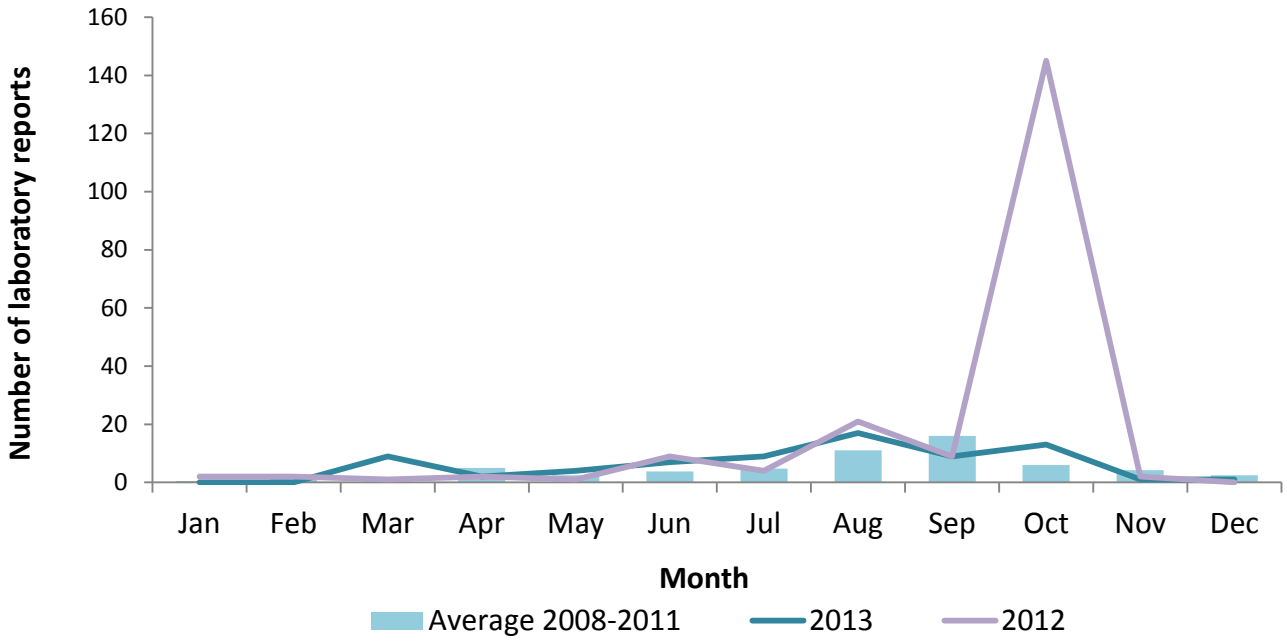
** increase due to largest recorded outbreak of E coli in N. Ireland with 141 confirmed cases*

Fig 8: Laboratory reports of *E. coli* O157, 2004 - 2013



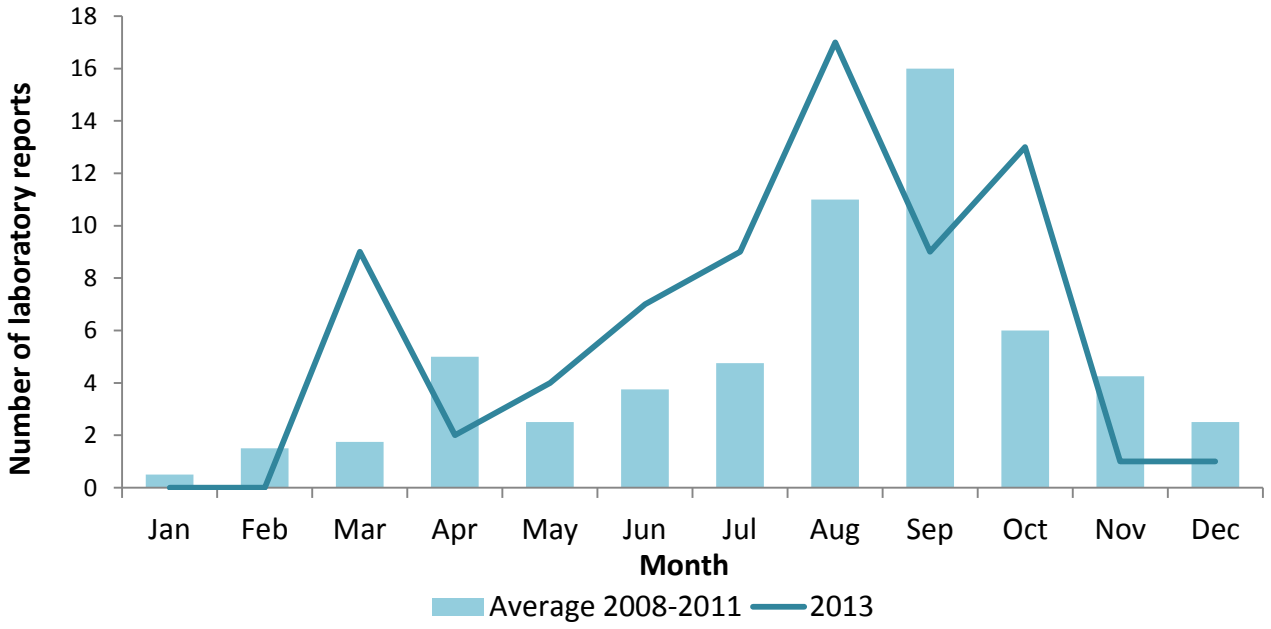
Similar to previous years *E. coli* O157 displayed a strong seasonality with a peak in August, slightly earlier than usual compared to the previous 5 years, a smaller spring peak was also observed which was again earlier than recent years. Due to the large outbreak that occurred in October 2012 the seasonality is somewhat obscured in Figure 9.

Fig 9: Monthly laboratory reports of *E. coli* O157, 2008 - 2013



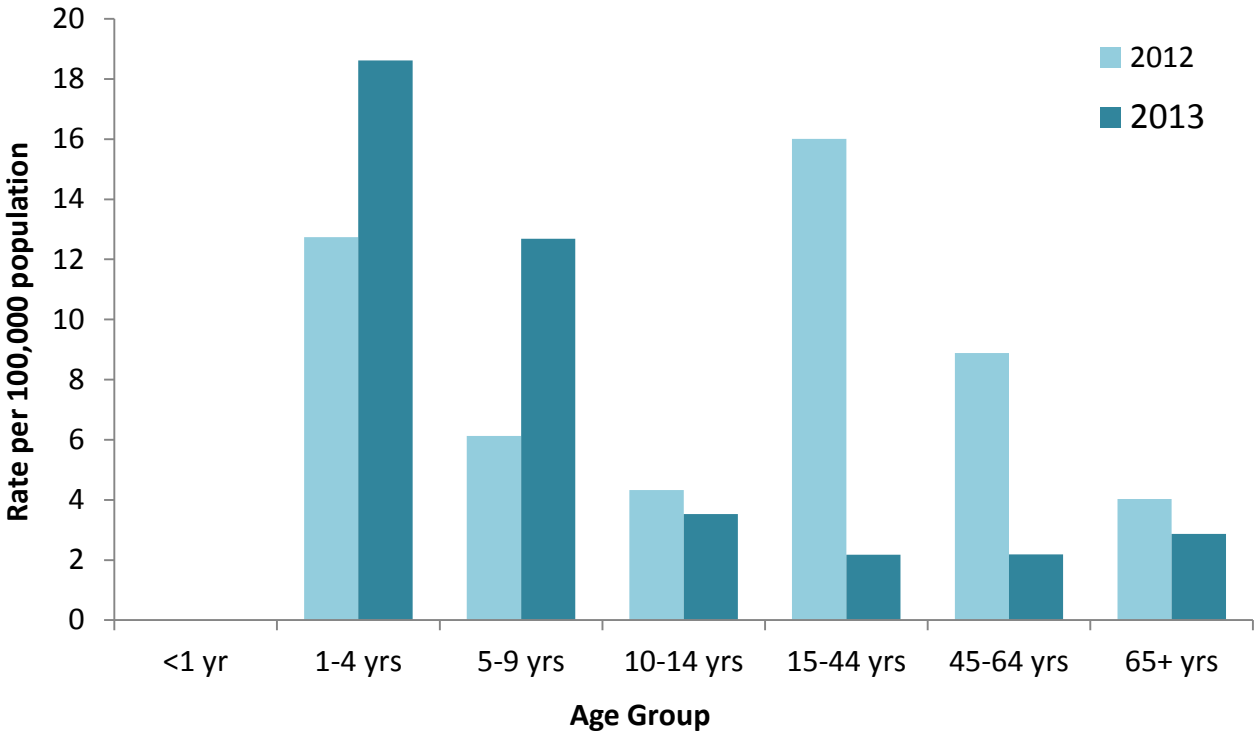
Removing the data for 2012 we see a clearer picture of the seasonality for *E. coli* O157 in 2013 and earlier years (Figure 10).

Fig 10: Monthly laboratory reports of *E. coli* O157, 2008 – 2013 (excluding 2012)



Age-specific rates were highest in the 1-4 year age category (18.6 per 100,000 population) with rates generally declining with age until the over 65 year age group. Comparisons to the previous year are difficult due to the large outbreak that occurred in 2012; however, rates for the 1-4 and 5-9 year age group were still significantly higher in 2013 despite the higher overall numbers in 2012 (Figure 11). Discounting the cases related to the outbreak in 2012 the rates in the 10-14, 15-44, 45-64 and over 65 year age groups were similar across the two years.

Fig 11: Distribution of *E. coli* O157 cases by age group, 2012-13



Phage type data were available for 59 of the 72 laboratory confirmed cases in 2013 (Table 4). The most commonly reported phage type in 2013 was PT32, making up 69% of the typed E coli O157 cases. The proportion of cases with this phage type has increased by 45% compared to 2010 (24%). PT8 was the only other phage type contributing substantial numbers with 10 cases (17%) being reported. The large increase in PT54 displayed in 2012 was due to a single outbreak, excluding these outbreak related cases the most common phage type in 2012 was also PT32.

Verocytotoxigenic gene type was available for 61 of the 72 laboratory confirmed cases in 2013. No samples of E Coli O157 were positive for VT1 only genes. With the exception of 2012 VT2 only has been the dominant verotoxin pattern reported in the past ten years (Table 5).

Table 4: Distribution of phage types of laboratory confirmed cases of *E. coli* O157 by year, 2009-2013

Phage type	2009	2010	2011	2012	2013
1	0	1	0	1	0
2	0	0	0	1	1
4	0	0	1	0	0
8	8	34	19	14	10
14	0	0	0	1	2
21/28	1	2	6	3	2
31	9	2	3	14	2
32	11	14	11	20	42
33	0	0	0	1	0
34	0	6	0	0	1
51	1	0	4	0	0
54	0	0	1	135	1
89	0	0	0	1	0
Unknown	18	18	11	7	11
Total	**48**	**77**	**56**	**198**	**72**

Table 5: Verotoxin (VT) genes of laboratory confirmed cases of *E. coli* O157, 2004-2013

VT	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
VT1	0	0	0	0	0	0	2	0	0	0
VT2	16	31	33	45	39	25	42	24	34	50
VT1+2	2	10	8	4	11	11	22	20	153	9
VT+	0	6	1	0	6	8	1	5	2	2
Total	**18**	**47**	**42**	**49**	**56**	**44**	**67**	**49**	**189**	**61**

The distribution of symptoms experienced by cases in 2013 is similar to that in 2012 with the most common symptoms reported being diarrhoea (95%) and abdominal pain (83%) (Table 6). Overall 65% of cases experienced bloody diarrhoea. Cases in the over 65 year age group were the most likely to report bloody diarrhoea with 88% of cases reporting

these symptoms, with those in the 15-44 year age group displaying similar levels (86%). Only eight cases reported having all six symptoms listed.

Table 6: Symptoms experienced by *E. coli* O157 cases, 2013

Symptom	Number	Percentage*
Abdominal pain	54	83%
Blood in stools	42	65%
Diarrhoea	62	95%
Fever	21	32%
Nausea	34	52%
Vomiting	27	41%

** percentage of cases where a questionnaire has been received*

Hospital admissions occurred in all age groups in 2013, with the exception of infants under 1 year old. In total 42% of cases were admitted to hospital in 2013. Cases in the over 65 year old age group were most likely to be hospitalised (88% of age group hospitalised) although the 45-64 year old age group also displayed a high level of hospitalisation (50%) (Table 7).

Table 7: Hospitalisation of *E. coli* O157 cases by age group, 2013

Age group	Number of cases for whom questionnaire was received	Number of cases who visited GP	Number of cases who attended hospital	Number of cases hospitalised	% of age group hospitalised
<1	0	0	0	0	n/a
1-4	16	11	6	5	31%
5-9	14	12	5	4	29%
10-14	3	2	2	1	33%
15-44	14	11	8	5	36%
45-64	10	9	8	5	50%
65+	8	6	7	7	88%
Total	**65**	**51**	**36**	**27**	**42%**

Giardiasis

Number of cases	**47**
Incidence rate	**2.6 per 100,000 population**

Giardia lamblia is a protozoan parasite that causes giardiasis. The parasites are found in the gut of both humans and animals. Giardiasis can cause diarrhoea, abdominal cramps and flatulence. Up to a quarter of cases can be asymptomatic.

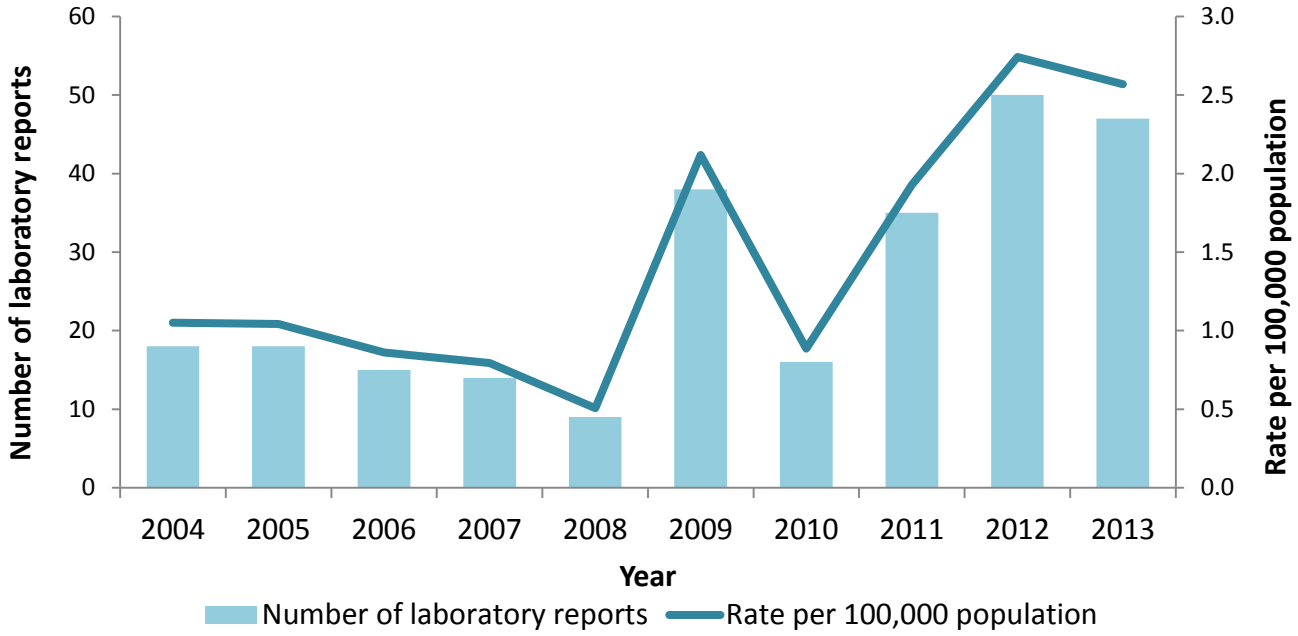
In 2013, there were 47 laboratory confirmed cases of giardiasis, a slight decrease on 2012 but a higher number than in previous years. The incidence rate was 2.67 per 100,000 population. There were 10 (21%) cases that were reported as being likely to be associated with foreign travel.

Prior to 2009 there was a long-term decline in *Giardia* infections. This has changed in recent years with relatively high numbers reported in four out of the past five years (Table 8, Figure 12). Similar patterns have been described in England and Wales. There were no outbreaks of giardiasis reported in 2013.

Table 8. No of laboratory reports of *Giardia lamblia*, 2004 - 2013

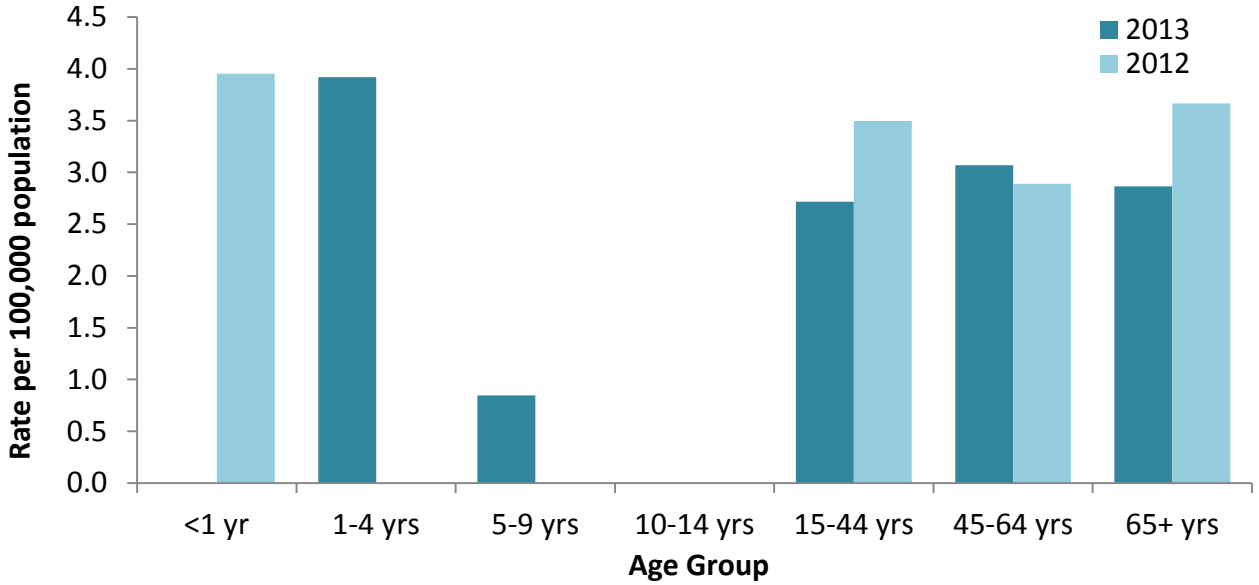
2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
18	18	15	14	9	38	16	35	50	47

Fig 12: Laboratory reports of *Giardia lamblia* (all specimen types), 2004 - 2013



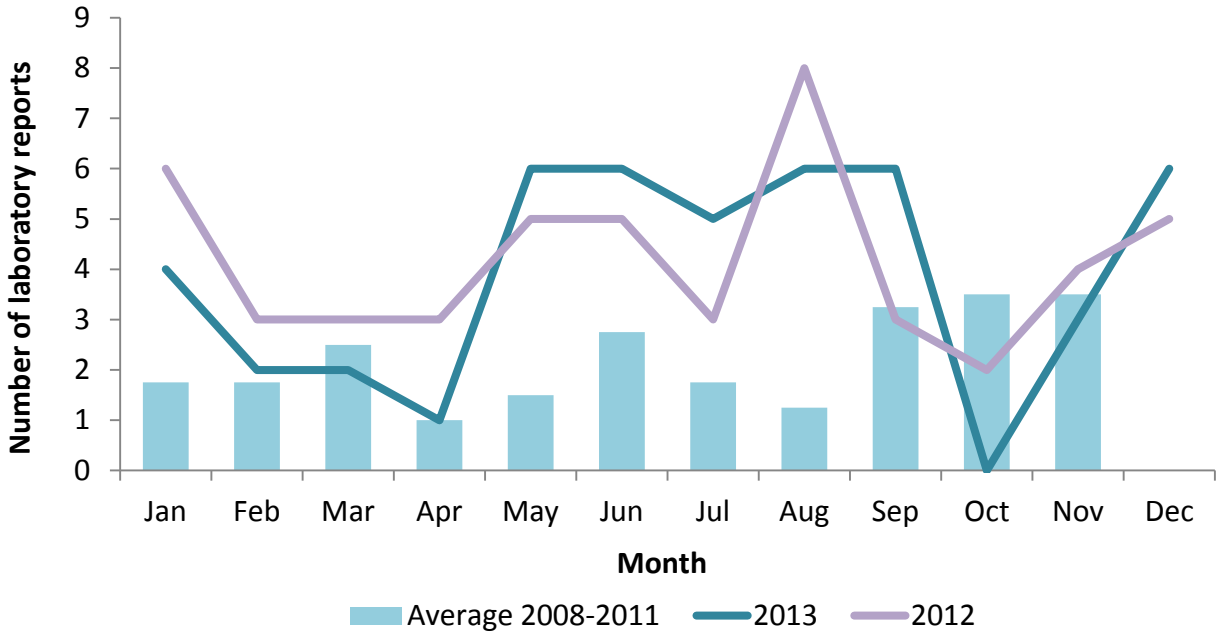
The highest incidence rate in 2013 was in the 1 – 4 year old age group (3.9 per 100,000 population) however this represents only four cases. The next highest age specific incidence rate is in the 45 - 64 year old group (n=14) with a rate of 3.1 per 100,000 population; however the rates for both the 15-44 and over 65 year age groups are similar. There have been no cases in the 10-14 year age group in either 2013 or 2012. Due to small numbers the age-specific rates can vary substantially over time (Figure 13).

Fig 13: Laboratory reports of *Giardia lamblia* (all age groups), 2012 - 2013



There is little evidence to suggest seasonality for G*iardia* in Northern Ireland (Fig 14); however, this may be due, in part, to the relatively small numbers reported in Northern Ireland as other countries in Europe have reported seasonality with increased numbers during summer/autumn.

Fig 14: Monthly laboratory reports of *Giardia lamblia*, 2008 – 2013



Salmonella

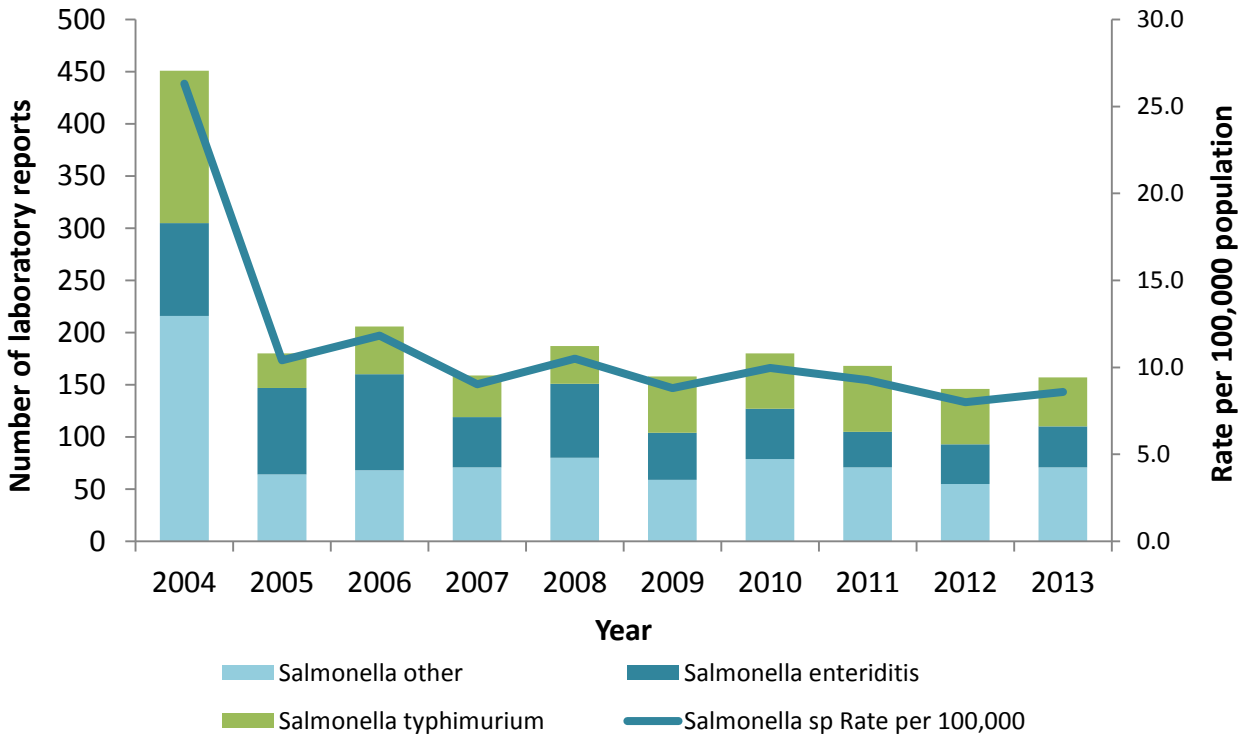
Number of cases	**157**
Incidence rate	**8.6 per 100,000 population**

Salmonella infections are one of the most commonly reported causes of bacterial gastrointestinal infections across Europe. *Salmonella* infection is characterised by abdominal pain, diarrhoea, fever, nausea, headache and occasionally vomiting. Dehydration amongst vulnerable populations such as infants, the immunocompromised and the elderly can be severe.

In 2013, there were 157 laboratory reported cases of *Salmonella* representing an 8% increase compared to 2012 (n=146). The incidence of *salmonella* infections was 8.6 per 100,000 population. Almost half of the reported cases (n=77, 49%) were likely to be associated with foreign travel. There were significant differences in association with foreign travel between the two most common serovars, with 67% of *S.* Enteriditis cases associated with travel, but only 25% of *S*. Typhimurium associated with travel. All cases of *S.* Typhi and *S*. Paratyphi were associated with travel.

With the exception of 2004 the number of cases reported has been relatively stable over the past ten years. The large number of cases in 2004 is accounted for by several outbreaks: DT 104, *Salmonella* Virchow and *Salmonella* Newport outbreaks occurred in 2004 and together accounted for more than half of the 451 cases reported that year (Figure 15).

Fig 15: Laboratory Reports of *Salmonella*, 2004- 2013



Over the ten year period there has been a general trend of decreasing *S*. Enteriditis and increasing *S*. Typhimurium whilst other serovars have remained relatively steady (Table 9).

Table 9. No of laboratory reports of *Salmonella*, 2004 - 2013

Serovar	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Enteriditis	89	83	92	48	71	45	48	34	38	39
Typhimurium	146	33	46	40	36	54	53	63	53	47
Paratyphi	0	2	0	2	1	0	2	1	1	1
Typhi	0	1	0	2	1	0	0	1	0	1
Other	216	64	68	71	80	59	79	71	55	71
Total	**451**	**180**	**206**	**159**	**187**	**158**	**180**	**168**	**146**	**157**

Cases of *Salmonella* also follow a seasonal pattern. In 2013 cases peaked in September with 27 cases reported (Figure 16). This increase is in line with previous years; however, cases of the most common serotypes *S.* Enteriditis and *S.* Typhimurium peaked in different months, with *S.* Enteriditis peaking in September and *S.* Typhimurium peaking in April (Figure 17).

Fig 16: Monthly laboratory reports of *Salmonella*, 2012 & 2013

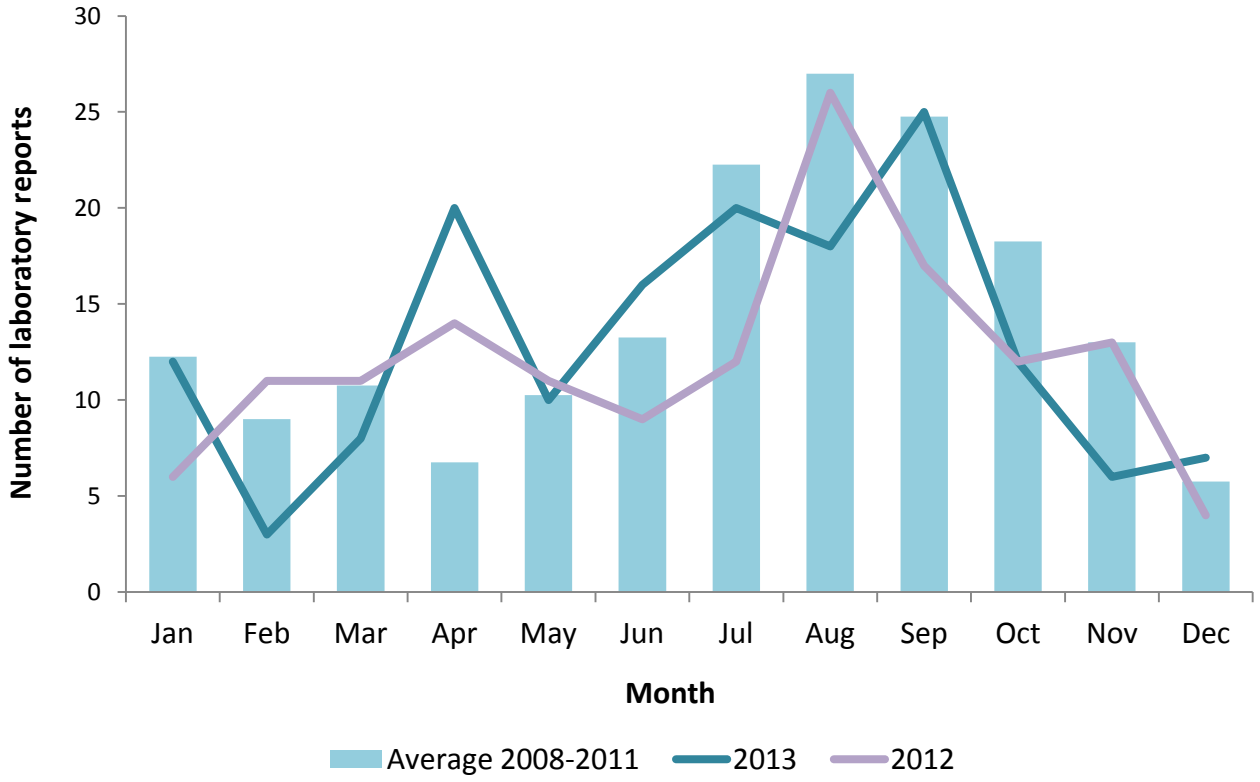
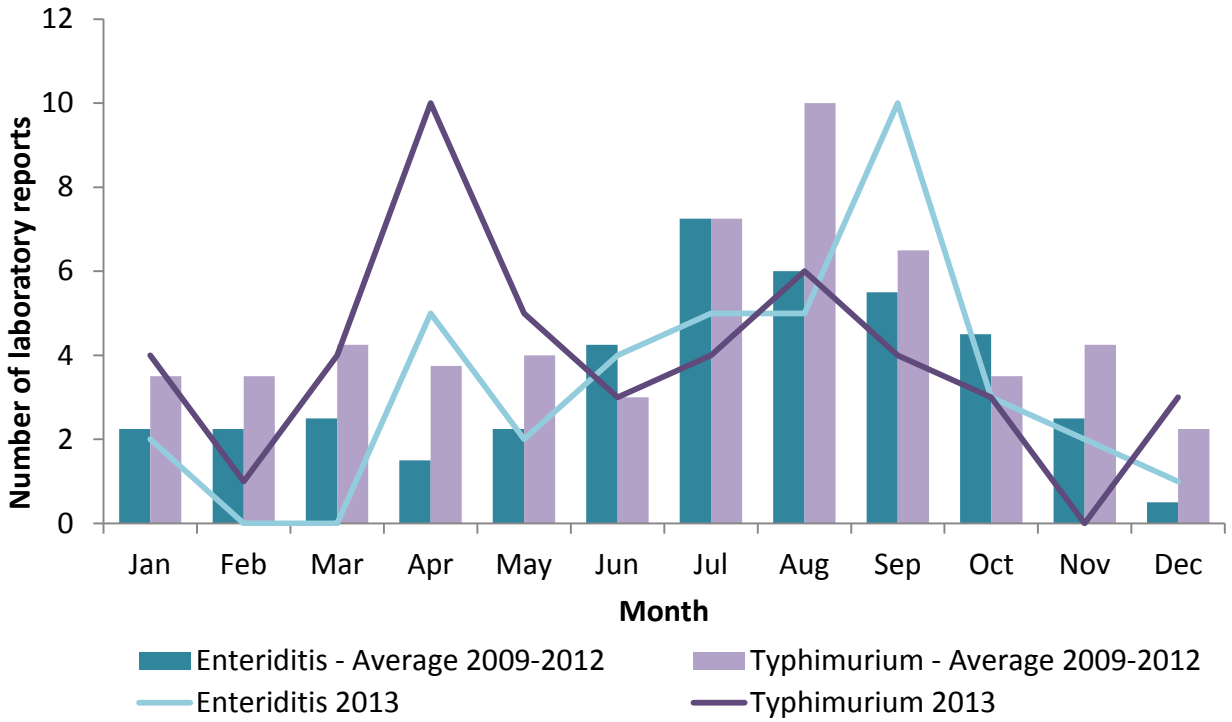
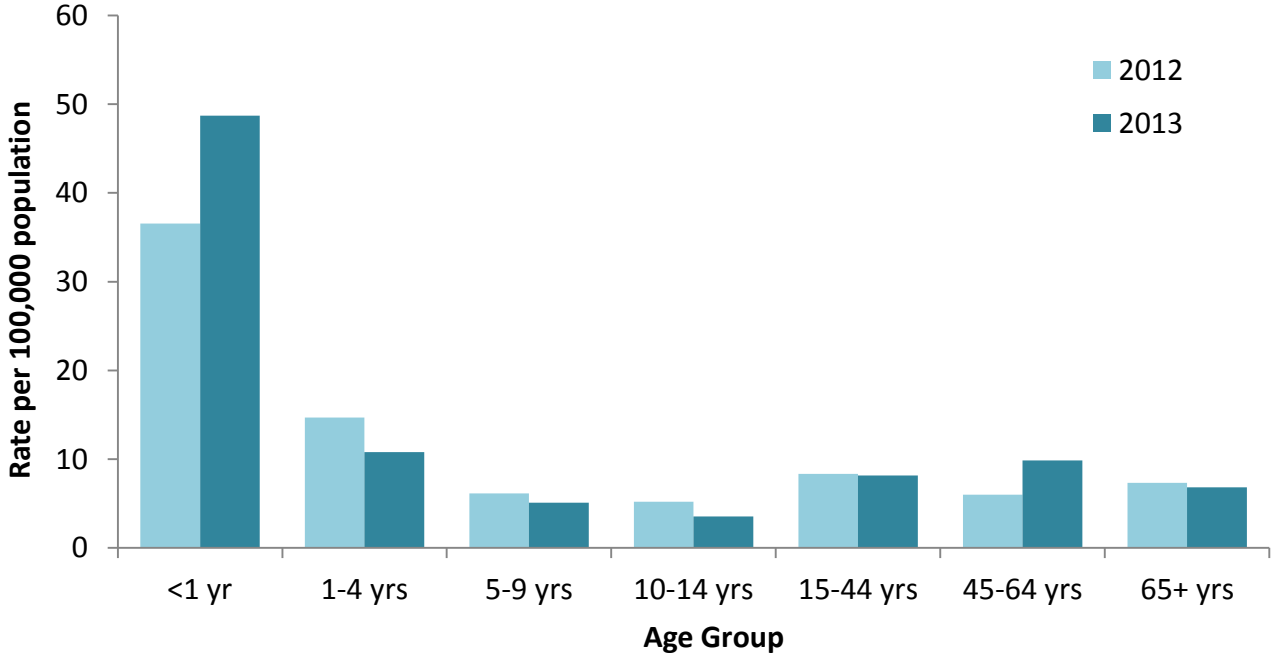


Fig 17: Monthly laboratory reports of *S.* Enteriditis and *S.* Typhimurium, 2013



In 2013 52% of the cases were female. Similar to 2012 the highest incidence rate in 2013 was in the under 1 year old age group (48.7 per 100,000 population); however, this represented only 8% of all cases (Figure 18). *S.* Enteritidis also peaked in the under 1 year age group with *S.* Typhimurium peaking in the 1-4 year old age group; though it should be noted that there are very small numbers in both these age groups when examining these serovars in isolation.

Fig 18: Laboratory reports of *Salmonella*, age specific rates (per 100,000 population), 2012 - 2013



In 2013 *S.* Enteritidis and *S*. Typhimurium remained the two most frequently reported serotypes in Northern Ireland, accounting for 25% and 30% of cases respectively, although the overall proportion due to these two serotypes has decreased compared to 2012. S. Enteriditis cases have been comparatively low over the past 3 years with cases of *S*. Typhimurium exceeding those of *S.* Enteritidis since 2009.

Other serotypes for which more than one report was received in 2013 are presented in Table 10 along with data from the previous 3 years; however, other than S. Enteriditis and S. Typhimurium numbers of individual serovars remain very low. There were an additional 22 serovars reported in 2013 where only one case was reported, including one *Salmonella* Paratyphi A and one *Salmonella* Typhi.

Table 10. *Salmonella* serovars 2010 -2013

2010		2011		2012		2013	
Serovar	**No**	**Serovar**	**No**	**Serovar**	**No**	**Serovar**	**No**
Bareilly	5	Dublin	4	Mikawasima	5	Infantis	7
Infantis	5	Infantis	4	Newport	5	Senftenberg	4
Java	5	Tokoin	4	Infantis	4	Bareilly	3
Haifa	4	Montevideo	3	Stanley	4	Java	3
Saint-Paul	4	Newport	3	Bredeney	3	Kentucky	3
Arizonae	3	Stanley	3	Agona	2	Stanley	3
Kottbus	3	Braenderup	2	Bareilly	2	Abony	2
Mbandaka	3	Glostrup	2	Dublin	2	Agama	2
Montevideo	3	Lagos	2	Kentucky	2	Agona	2
Newport	3	Oranienburg	2	Montevideo	2	Dublin	2
Agona	2	Saint-Paul	2	Oranienburg	2	Hadar	2
Brandenburg	2	Virchow	2			Haifa	2
Hvittingfoss	2					Kottbus	2
Kentucky	2					Mikawasima	2
Mikawasima	2					Panama	2
Paratyphi A	2					Saint-Paul	2
Rissen	2						
Stanley	2						

In 2013, *S.* Enteritidis PT 14B was the predominant phage type reported accounting for 18% of *S.* Enteritidis cases. PT 8 has been the predominant phage type of *S.* Enteritidis since 2010; however, the number of cases due to this phage type fell from 16 in 2012 to 6 in 2013. Other phage types such as PT1, PT4 and PT2 which predominated in earlier years have also decreased (Table 11).

Table 11. Common phage types of *S.* Enteriditis										
Phage type	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
PT 1	26	24	34	2	7	5	10	6	3	3
PT 4	15	13	13	3	10	4	5	2	2	2
PT 6	2	0	6	4	5	2	3	0	0	1
PT 6A	1	2	3	2	2	3	0	0	3	0
PT 8	7	3	2	5	10	3	12	10	16	6
PT 14B	4	6	13	8	9	5	0	4	3	7
PT 21	12	9	8	4	11	3	3	3	4	3
Other	6	6	10	5	12	15	12	7	6	14
Untyped	16	20	3	15	5	5	3	2	1	3
Total	**89**	**83**	**92**	**48**	**71**	**45**	**48**	**34**	**38**	**39**

Whilst *S.* Typhimurium definitive phage type (DT) 193 has decreased compared to 2012 it remains the largest single phage type of *S.* Typhimurium. *S.* Typhimurium DT 120 and DT 104 have also decreased in comparison to 2012 (Table 12).

Table 12. Common phage types of *S.* Typhimurium										
Phage type	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
DT 1	1	1	0	2	1	0	0	1	1	4
DT 8	0	2	1	0	1	13	10	5	2	5
DT 104	95	4	11	0	5	5	5	14	10	4
DT 104B	2	2	12	5	11	0	2	7	1	0
DT 193	1	3	6	6	5	6	10	13	20	11
DT 120	0	1	0	1	0	2	6	5	11	7
Other	5	6	13	12	9	20	13	17	7	13
Untyped	42	14	3	14	4	8	7	1	1	3
Total	**146**	**33**	**46**	**40**	**36**	**54**	**53**	**63**	**53**	**47**

Other Gastrointestinal Infections

Clostridium perfringens

Clostridium perfringens is widely distributed in the environment and foods, and forms part of the normal gut flora in humans and animals. Food poisoning most often occurs when food (usually meat) is prepared in advance and kept warm for several hours before serving. Illness generally lasts no more than 24 hours although elderly people may be more seriously affected (Table 13).

Table 13. No of laboratory reports of Clostridium perfringens

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
11	22	29	20	36	18	36	16	28	24

Listeria

Listeria is a rare but potentially life-threatening disease. Healthy adults are likely to experience only mild infection, causing flu-like symptoms or gastroenteritis. However, listeria infection can occasionally lead to severe blood poisoning or meningitis. Pregnant women, the elderly and people with weakened immune systems are more susceptible to listeria. It is particularly dangerous in pregnancy as although the illness is unlikely to be serious for the mother, it can cause miscarriage, premature delivery or severe illness in a newborn child (Table 14).

Table 14. No of laboratory reports of *Listeria*

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
4	3	6	5	11	4	2	3	7	2

Norovirus

Norovirus is the most common known cause of gastrointestinal infections in the UK. Within closed settings such as hospitals, the virus can cause widespread disruption because it is able to survive for long periods in the environment, it has a low infectious dose and any immunity to infection is short-lived. Norovirus infection rates peak in winter months; however, it is present in the community all year round (Table 15).

Table 15. No of laboratory reports of norovirus

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
276	209	385	439	439	424	643	445	592	386

Rotavirus

Rotavirus is the most common cause of gastroenteritis in infants and very young children with almost every child suffering an infection by the age of five. Rotavirus can cause severe vomiting, severe diarrhoea, and stomach cramps. These symptoms usually last from 3-8 days. Adults may become infected; however, repeat infections are generally less severe than infections during childhood. The majority of infections tend to occur during the spring (Table 16).

A vaccine for rotavirus for children was introduced in Northern Ireland in July 2013 which will likely lead to a reduction in case numbers in future years. For further information on the rotavirus immunisation programme please see http://www.publichealth.hscni.net/news/pha-launches-rotavirus-vaccine-protect-babies-under-4-months.

Table 16. No of laboratory reports of rotavirus, 2004 - 2013

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
465	438	432	363	724	594	599	630	543	599

Shigellosis

Shigellosis, also called bacillary dysentery, is caused by four species; *Shigella dysenteriae*, *Shigella flexneri*, *Shigella boydii* and *Shigella sonnei*. The two most commonly seen in Northern Ireland are *Shigella sonnei* and *Shigella flexneri* with the latter generally being more severe. The illness is characterised by diarrhoea, sometimes with blood and mucus and is common amongst young children although infection can occur in all ages after travel to areas where hygiene is poor. Invasive disease is rare but extra intestinal complications such as Haemolytic Uraemic Syndrome can occur (Tables 17 & 18).

Table 17. No of laboratory reports of Shigellosis, 2004 - 2013

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
8	7	9	16	16	13	5	8	9	4

Table 18. No of laboratory reports of Shigellosis by serogroup, 2009 - 2013

Serogroup	2009	2010	2011	2012	2013
S. boydii	2	0	0	0	0
S. dysenteriae	0	0	0	1	0
S. flexneri	3	3	1	5	1
S. sonnei	6	2	7	3	2
Untyped	2	0	0	0	1

Gastrointestinal Outbreaks

A total of 172 gastrointestinal outbreaks were reported in 2013, none of which were confirmed as foodborne. The suspected mode of transmission for these outbreaks was person-to-person spread or unknown.

The number of gastrointestinal outbreaks reported decreased substantially compared to 2012 when 248 gastrointestinal outbreaks were reported, one of which was confirmed as foodborne.

The most common causative agent of the gastrointestinal outbreaks was norovirus, which accounted for 71 (43%) outbreaks. A further two outbreaks were caused by norovirus plus another organism (rotavirus). Three outbreaks in residential institutions had rotavirus alone implicated as a causative agent. There was also one *E coli* outbreak in a nursery school setting and two *campylobacter* related outbreaks.

The causative organism was not determined in 93 of the gastrointestinal outbreaks.

During 2013 there were a total of 23 hospital outbreaks affecting at least 234 people; 133 residential institution outbreaks affecting at least 2,416 people; and a further 10 outbreaks linked to other sites (e.g. nursery, school/university) affecting at least 251 people (Table 19).

Table 19: Total distribution and location of gastrointestinal outbreaks 2013

Location	Identified Organism(s)*	No of outbreaks	Number ill**
Hospital	Norovirus	11	134
	Norovirus & rotavirus	2	7
	Not identified	13	93
Residential institution	Norovirus	58	1541
	Rotavirus	3	53
	Not identified	75	822
Other	*Campylobacter*	2	9
	E coli	1	12
	Norovirus	2	68
	Not identified	5	162

* Note that Clostridium difficile is no longer included in the gastrointestinal outbreak report and is reported on separately as part of the Healthcare Associated Infections reporting.

** In gastrointestinal outbreaks once the causative organism is identified it is not normal practice for all other symptomatic individuals to be tested. Therefore the number of symptomatic individuals is often in excess of the number of laboratory confirmed cases.

Summary

Overall laboratory reports and notifications of gastrointestinal disease decreased in 2013 compared to 2012, with the exception of *Campylobacter* (12% increase) and *Salmonella* (8% increase). *Campylobacter* has been steadily increasing since 2008 in line with other areas within the United Kingdom and at present the reason for this continuing increase has not been determined. *Salmonella*, however, whilst showing an increase compared to 2012 has, in general, been decreasing over the past 10 years and the number of reports in 2013 are the second lowest over that period.

Cryptosporidium reports decreased slightly in 2013, but remain elevated compared to the average over the past ten years. Although overall numbers were down, the spring peak normally associated with this disease was substantially higher in 2013 than in 2012. A reduction was also seen in *E. coli O157* cases during 2013; however given the large outbreak experienced in 2012 this would be expected. Excluding 2012 data the number of reports of *E. coli* O157 seen in 2013 is also elevated compared to reports in the previous ten years. Reports of giardiasis displayed a similar pattern with a small reduction compared to 2012 but remaining elevated when compared to earlier years.

Whilst travel remains important for some of the gastrointestinal diseases it is of particular importance for *Salmonella* with a large proportion (49%) of reported case thought to be travel related. However, there are significant variations between different serotypes in terms of the proportion due to travel.

Outbreak activity was reduced compared to 2012 with a drop of over 30% in the number of outbreaks reported to the PHA. Similar to previous years the majority of outbreaks are related to either Norovirus or suspected viral gastroenteritis with only 3 outbreaks related to bacterial causes in 2013 none of which could be confirmed as foodborne. The majority of the viral outbreaks took place in residential facilities, particularly those for the elderly population.

A new vaccine was introduced in August of 2013 for rotavirus, and whilst the overall figures for 2013 do not show any reduction, the indications so far in 2014 are that a substantial reduction has been achieved.

Significant changes in some laboratory reporting procedures are taking place in 2014 with the introduction of new testing methods which may lead to increased ascertainment. This may present challenges in future surveillance when determining whether increases are real or simply due to the new testing arrangements.

Acknowledgements

Public Health Agency would wish to acknowledge the following organisations in providing data for inclusion in this report:

- NI Regional Laboratories
- Public Health England

Compiled by the Gastrointestinal Infection surveillance team

Contributions from

- NI Regional Laboratories
- Public Health England

The authors would like to thank all who have contributed to the surveillance system and to this report.

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