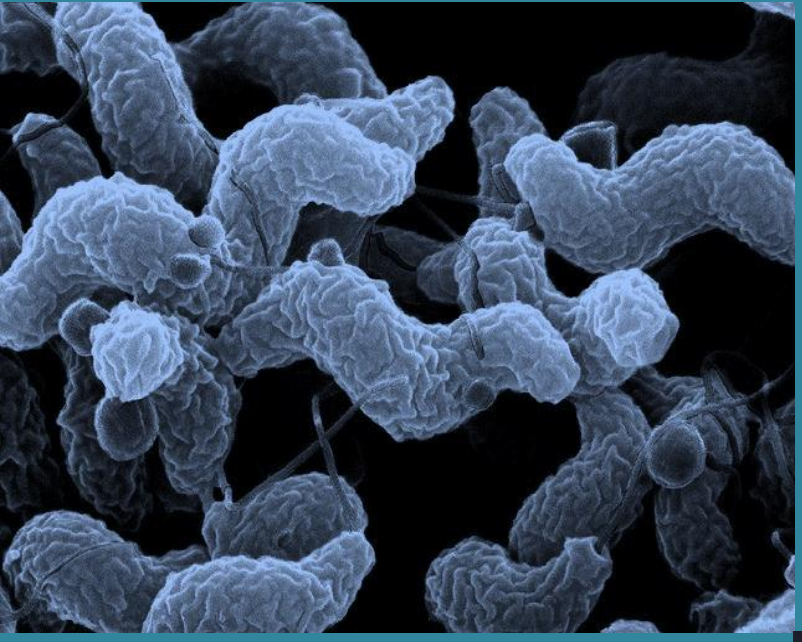
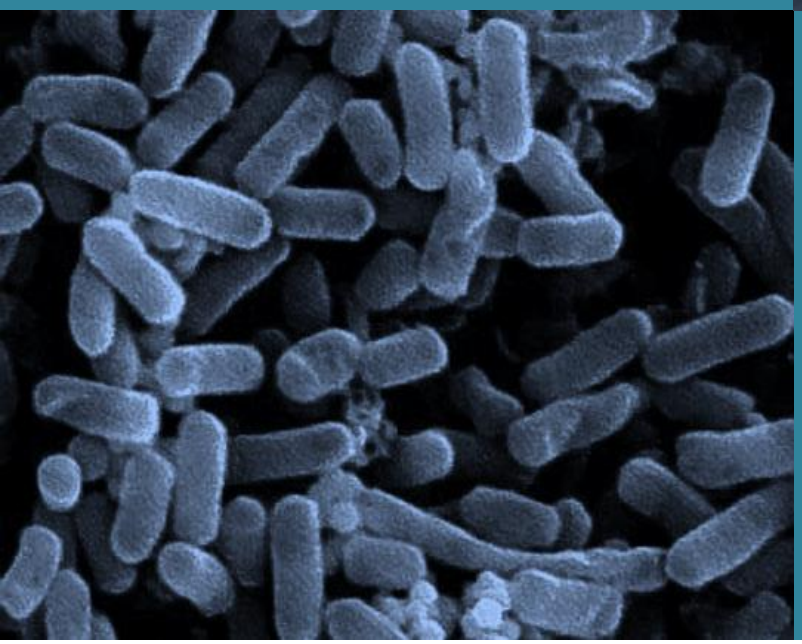


Gastrointestinal Infections in Northern Ireland



Annual Surveillance Report 2018

HSC Public Health Agency

Gastrointestinal Infections in Northern Ireland Annual Surveillance Report 2018

Contents

Key Points

- Most reports of bacterial and parasitic gastrointestinal illness increased compared to 2017 although both *Giardia* and *Shigella* decreased slightly.
- *Campylobacter* infections increased again in 2018 (4%) although the increase was not as substantial as the previous year.
- *Cryptosporidium* infections increased by 17% compared to 2017, with the highest number of reports since changes to testing were introduced in 2015.
- There were 85 laboratory confirmed cases of *E. coli* O157 reported in 2018, a substantial increase compared to 2017.
- For the first time since the introduction of PCR testing in 2015 the number of laboratory reports of Giardia has decreased (7%), although it remains much higher than in years prior to the testing changes.
- The number of *Salmonella* infections reported decreased by 9% with almost all of this decrease due to a large drop in reports of S. typhimurium.
- The number of *Shigella* reports decreased compared to the previous year with a total of 21 culture confirmed cases compared to 24 in 2017.
- Travel remains a significant risk factor for some gastrointestinal infections, with 41% of *Salmonella* infections being related to travel outside the UK in 2018.
- There was a decrease in the number of gastrointestinal related outbreaks with viral illness being the most common type.
- Differences in testing policy and procedures between laboratories and their relatively recent introduction continue to make interpretation of surveillance data challenging.

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.

Epidemiological data is collated from a number of surveillance systems:

- N. Laboratory Information System – 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.

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.

This report presents the epidemiological data for selected gastrointestinal infections reported in Northern Ireland in the calendar year 2018.

It should be noted that most gastrointestinal illness samples which are sent for testing are not tested for every organism listed. What testing occurs may vary between laboratories and based on clinical criteria or age.

Campylobacter

Number of cases	**1,475**
Incidence rate	**78.4 per 100,000 population**

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

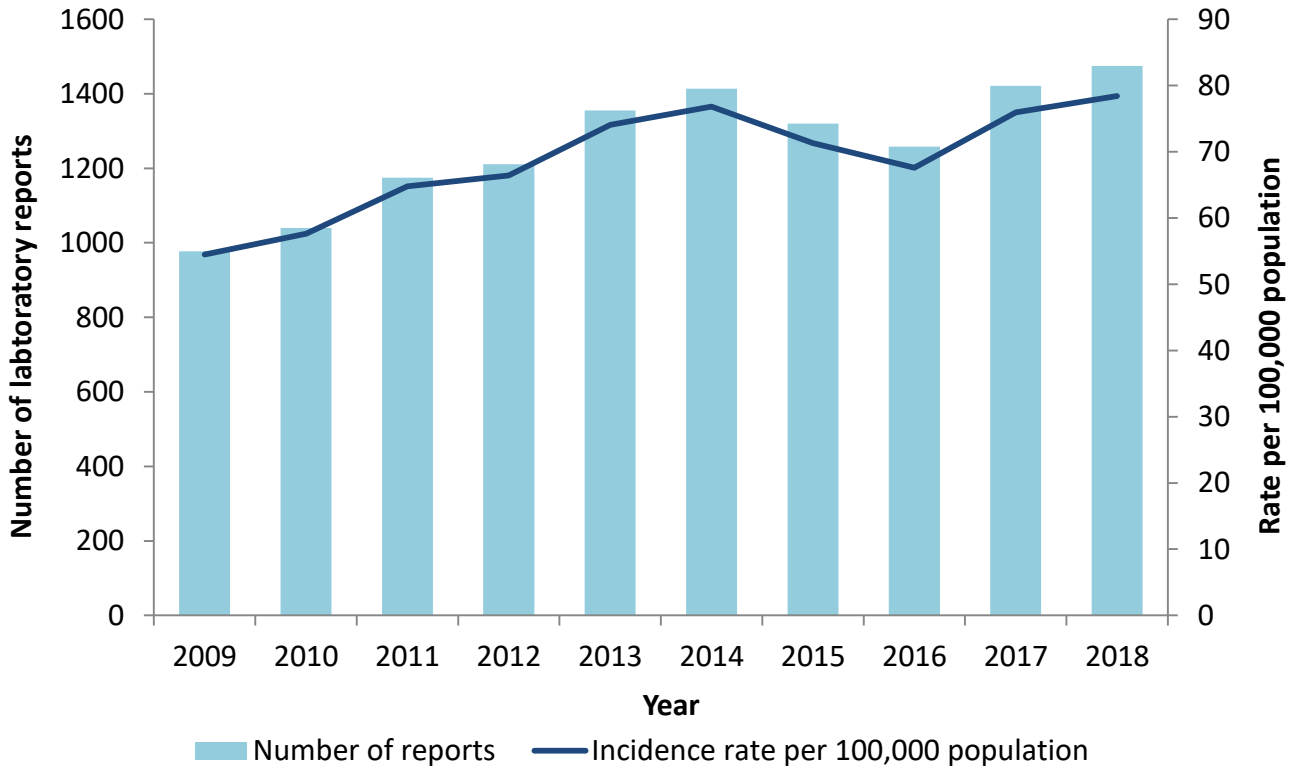
The number of cases of *Campylobacter* increased again in 2018 continuing a general trend upwards since 2008. C*ampylobacter* remains the most commonly reported bacterial gastrointestinal infection in Northern Ireland with 1,475 laboratory reported cases in 2018, an increase of 54 cases (4%) compared to 2017 (n=1,421 cases) (Table 1, Figure 1).

The incidence of C*ampylobacter* infections in 2018 was 78.4 per 100,000 population.

Table 1. No of laboratory reports of *Campylobacter*, 2008 - 2017

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
977	1040	1175	1211	1355	1414	1320	1258	1421	1475

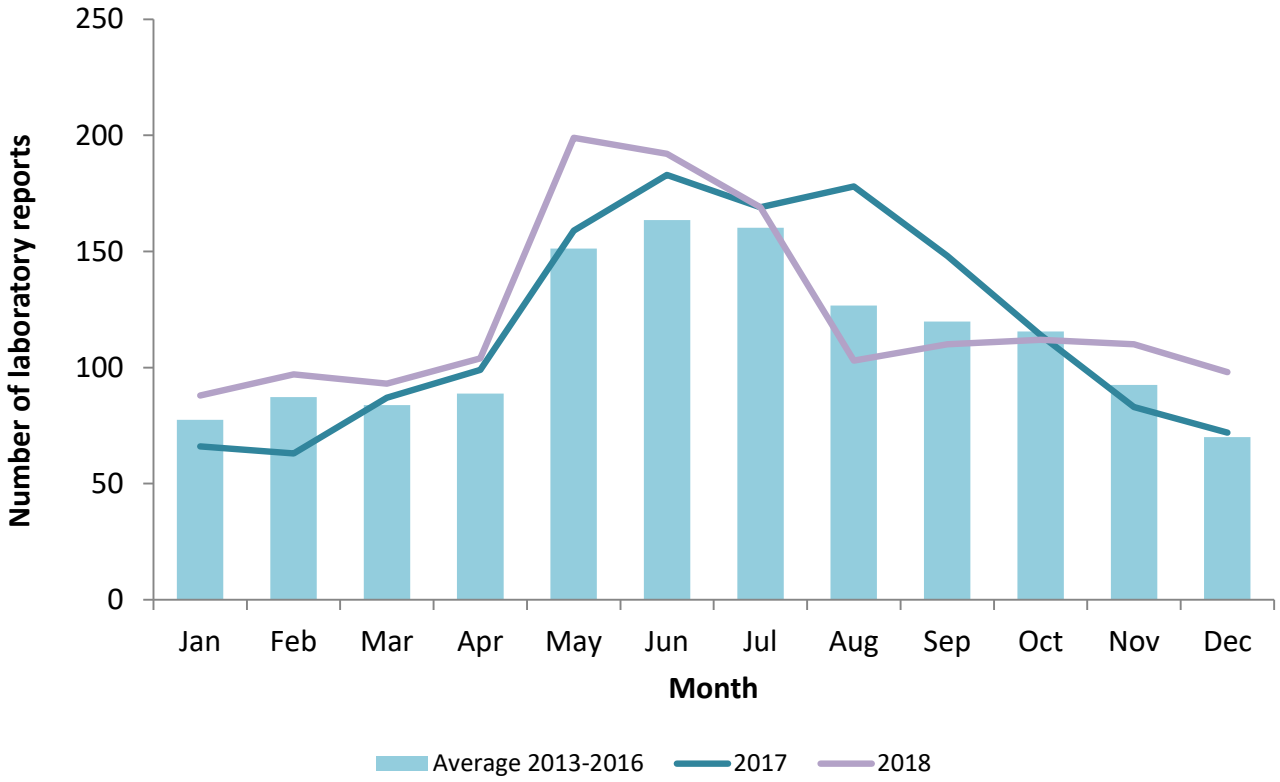
Fig 1: Laboratory reports and incidence rate of *Campylobacter*, 2008 - 2017



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

Monthly reports in 2018 generally followed this pattern remaining elevated between May and July before reducing in August although, somewhat unusually, the number of cases did not decrease after August in contrast with previous years (Figure 2).

Fig 2: Monthly laboratory reports of *Campylobacter*, 2017 - 2018

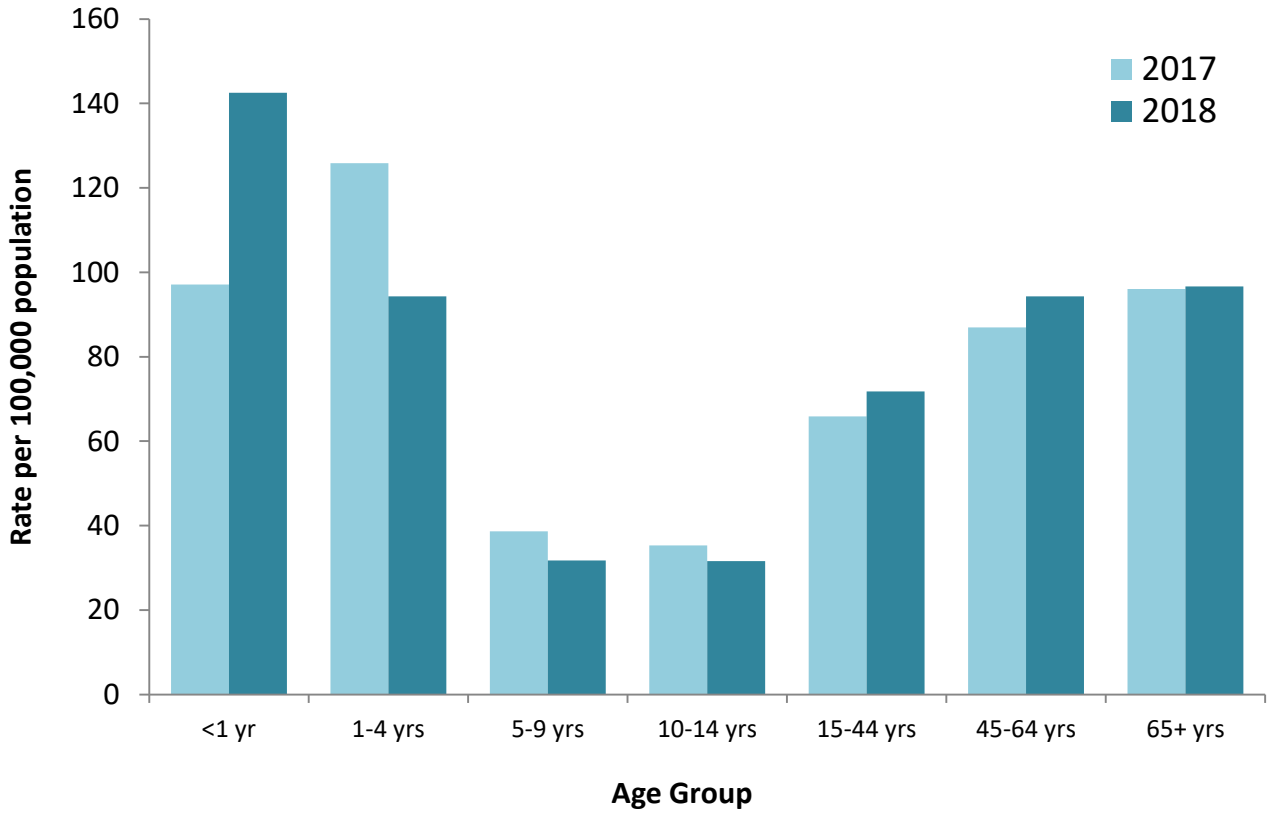


Most age groups displayed only small changes compared to the previous year with the exception of the two youngest age groups. In the under one age group there was a large increase in rates (from 97.1 to 142.5 per 100,000 population) but in the 1-4 year age group a substantial reduction (125.9 to 94.3 per 100,000 population). (Figure 3). The older age groups (15 and over) increased only slightly compared to the previous year. The highest age specific rate was in the under 1 year old age group (142.4 per 100,00).

In 2018 the proportion of reported cases that were male was 57% (n=835) unchanged from 2017.

Travel related data is not available for campylobacter. There were no outbreaks reported that were linked to *Campylobacter sp*.

Fig 3: Laboratory reports of *Campylobacter*, age-specific incidence rate, 2017 - 2018



Cryptosporidium

Number of cases	**297**
Incidence rate	**15.8 per 100,000 population**

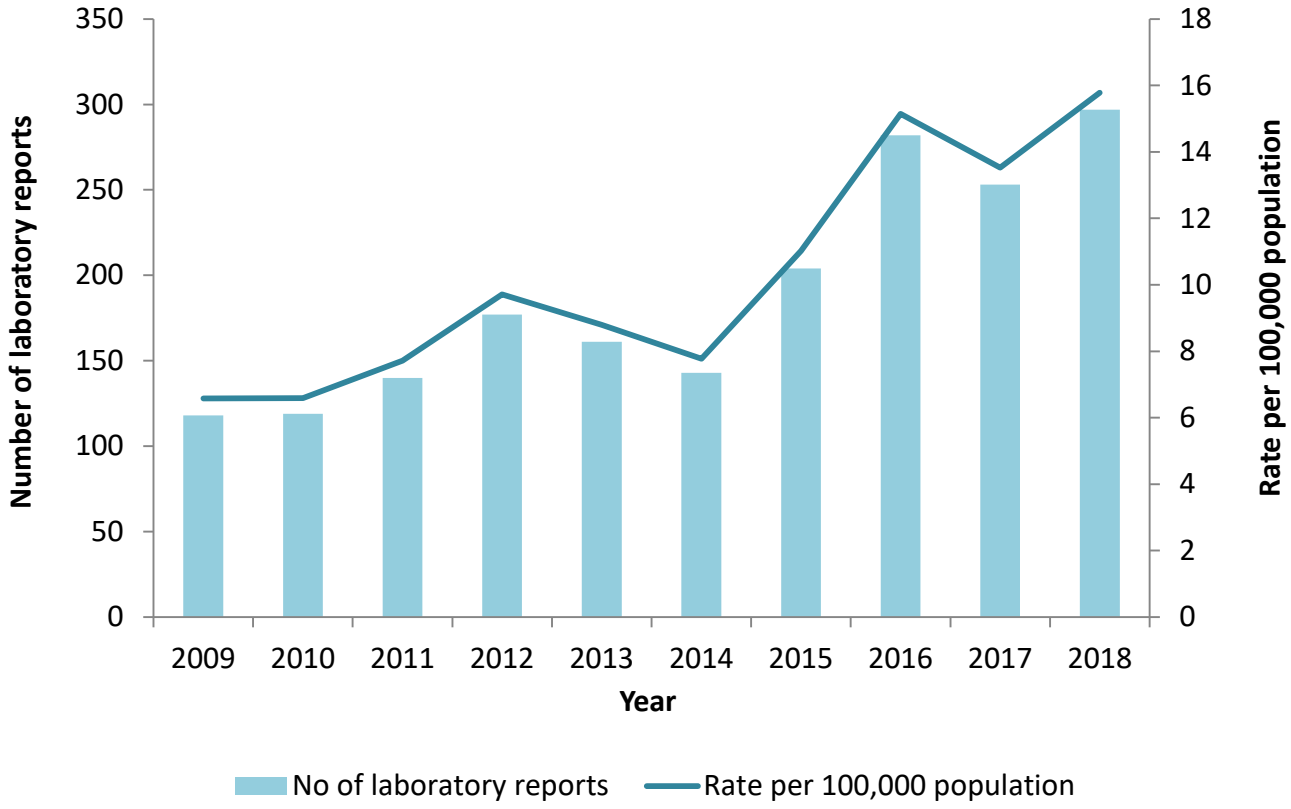
Cryptosporidium is a protozoal parasite that causes a diarrhoeal illness that can last between two days and four weeks. The infection can be more serious in people who are immunosuppressed. *Cryptosporidium* is found in lakes, streams, rivers, untreated water and occasionally in swimming pools.

Reports of Cryptosporidium increased from 253 in 2017 to 297 in 2018. The number of reported cases of Cryptosporidium has increased substantially since 2015 when changes to testing were introduced. (Table 2, Figure 4). The incidence rate of C*ryptosporidium* infection in 2018 was 15.8 per 100,000 population. There was one outbreak associated with a school and one small family cluster. There were 20 cases (7%) that were thought to be associated with travel outside the United Kingdom.

Table 2. No of laboratory reports of *Cryptosporidium*, 2009 - 2018

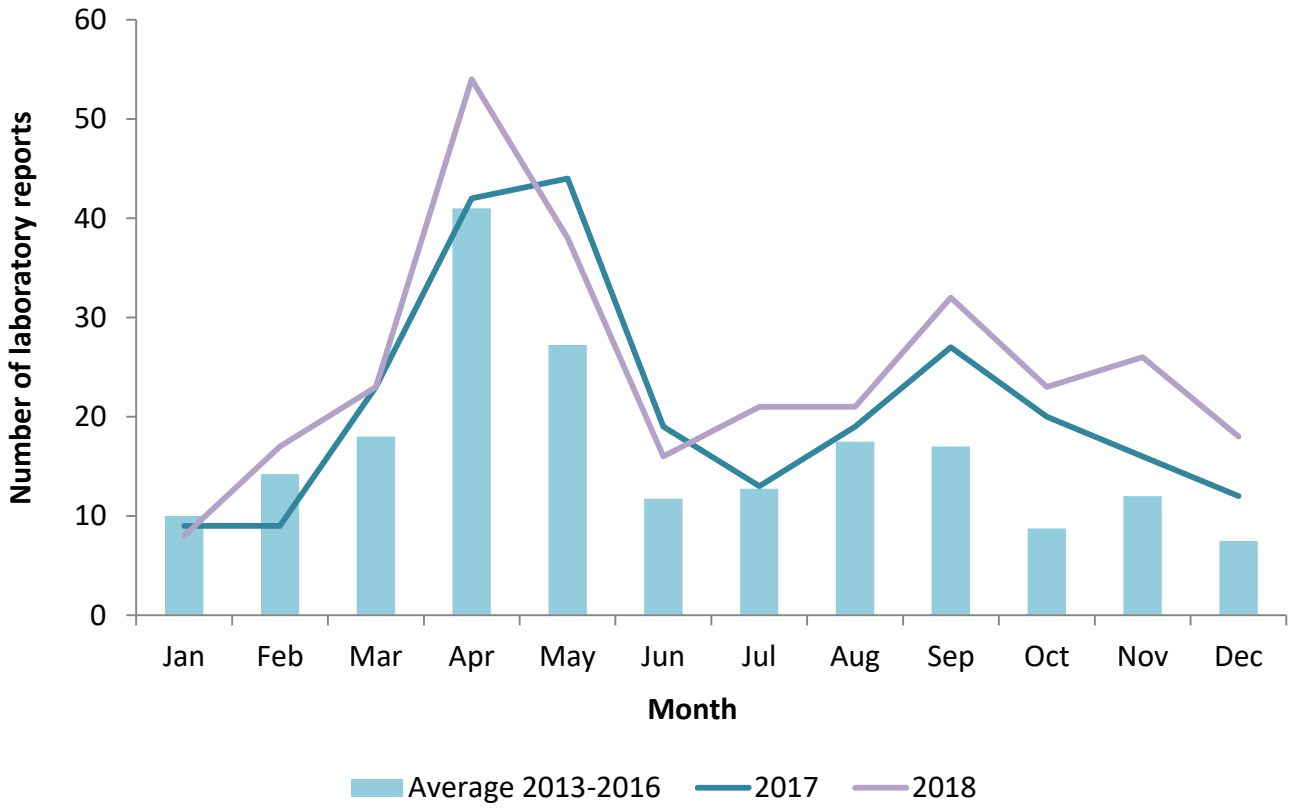
2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
118	119	140	177	161	143	204	282	253	297

Fig 4: Laboratory reports of *Cryptosporidium*, 2009 - 2018



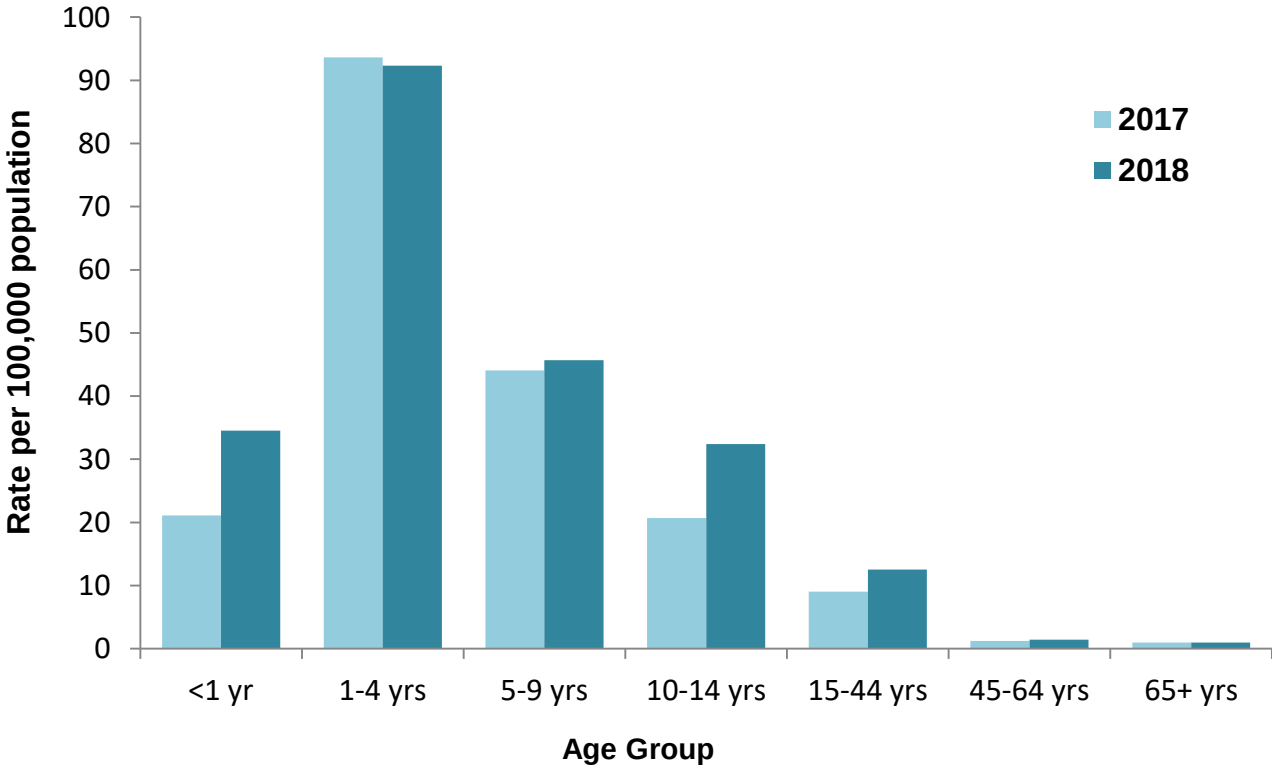
The seasonal distribution of cases in 2018 was very similar to previous years (Figure 5).

Fig 5: Monthly laboratory reports of *Cryptosporidium*, 2017-2018



Similar to previous years the highest age specific rate was in the 1-4 year age group (92.3 per 100,000 population) (Figure 6) despite this being the only age group that displayed a decrease in 2018. The highest increase were in the under 1 and 10-14 year age groups, although the number of cases in the under 1 group remain very small in comparison to other age groups.

Fig 6: Laboratory reports of *Cryptosporidium*, Age-Specific Rate (per 100,000 population), 2017 - 2018



E. coli O157

Number of cases	**85**
Incidence rate	**3.0 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.

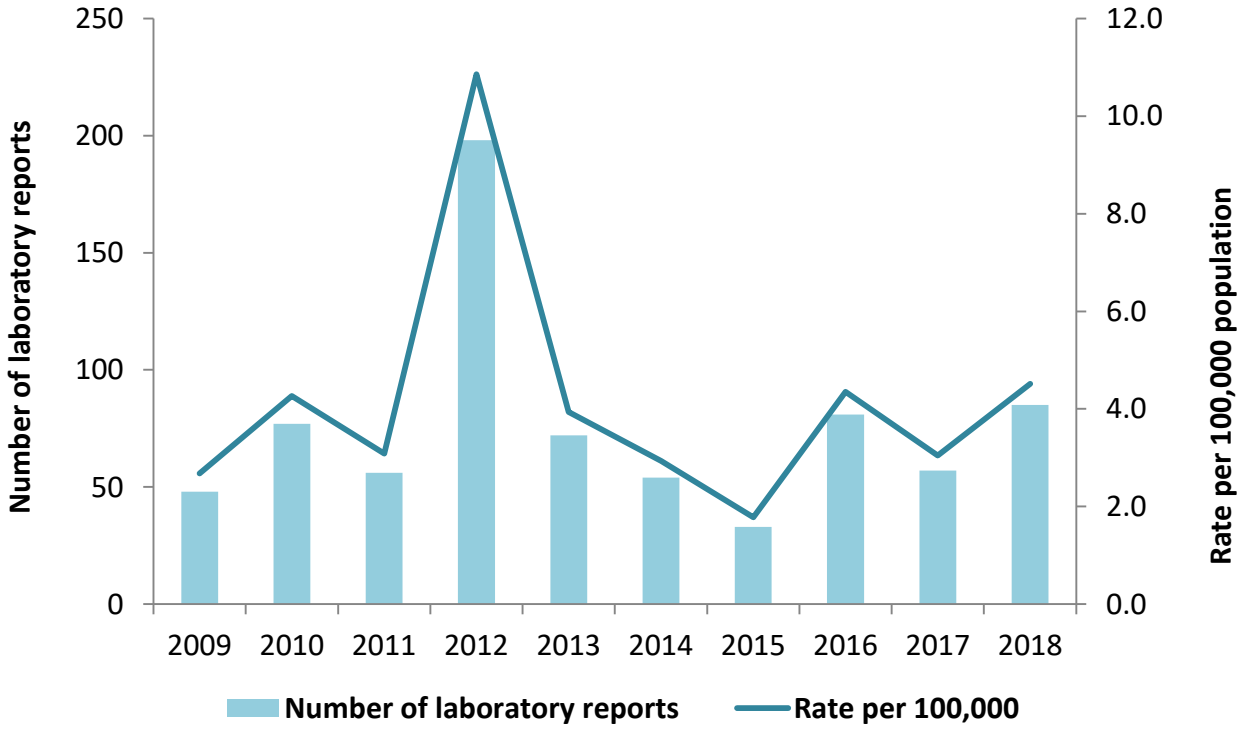
There were 85 laboratory culture confirmed cases of *E. coli* O157 reported in 2018, of which 68 (80%) tested positive as Shiga toxin-producing *Escherichia coli* (STEC). STEC strains produce a toxin which can cause severe illness. Note that due to variations in testing across local laboratories not all O157 cultures have been tested for the existence of this toxin. There were no cases associated with outbreaks, and 22 cases (26%) were associated with travel outside the United Kingdom (Figure 7, Table 3).

Table 3. No of laboratory reports of *E. coli* O157, 2009 - 2018

2009	2010	2011	2012*	2013	2014	2015	2016	2017	2018
48	77	56	198	72	54	33	81	57	85

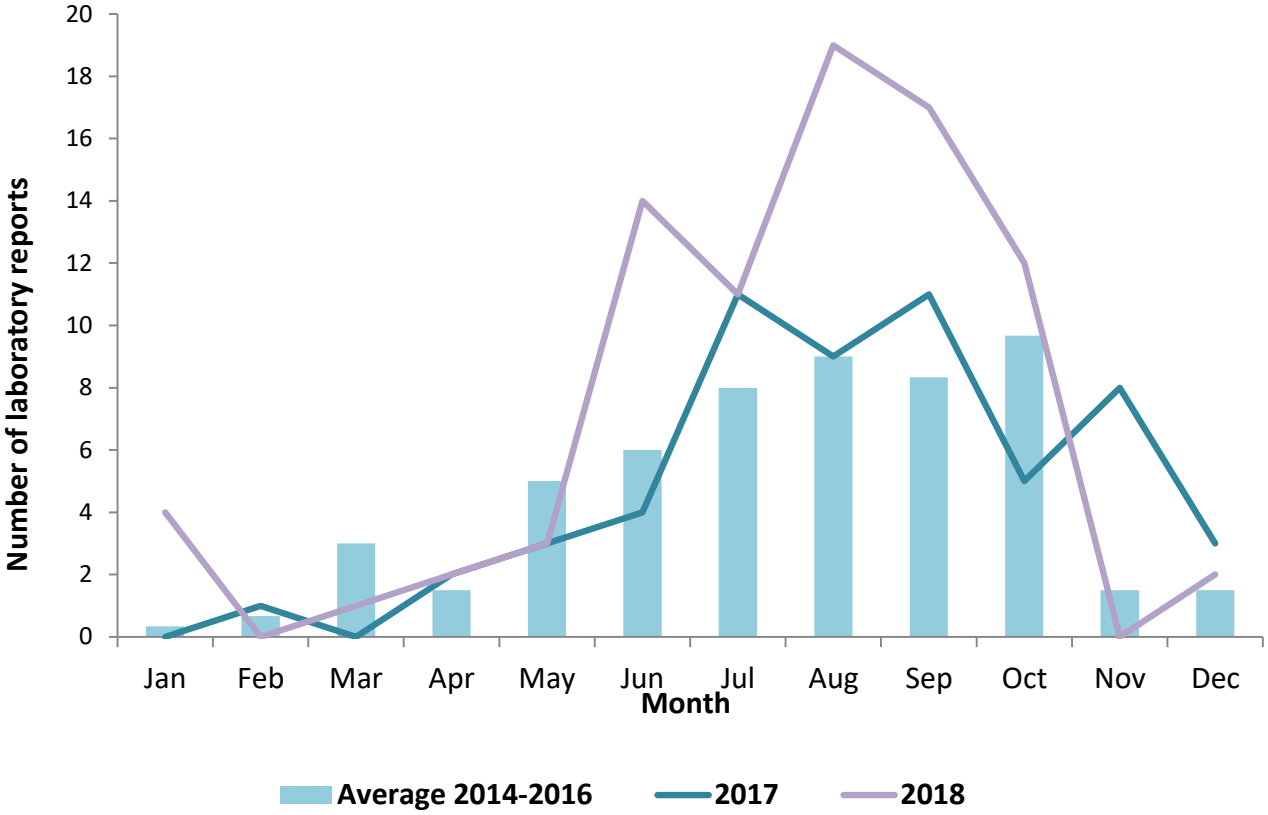
** increase due to largest recorded outbreak of E. coli in N. Ireland with 141 confirmed cases*

Fig 7: Laboratory reports of *E. coli* O157, 2009 - 2018



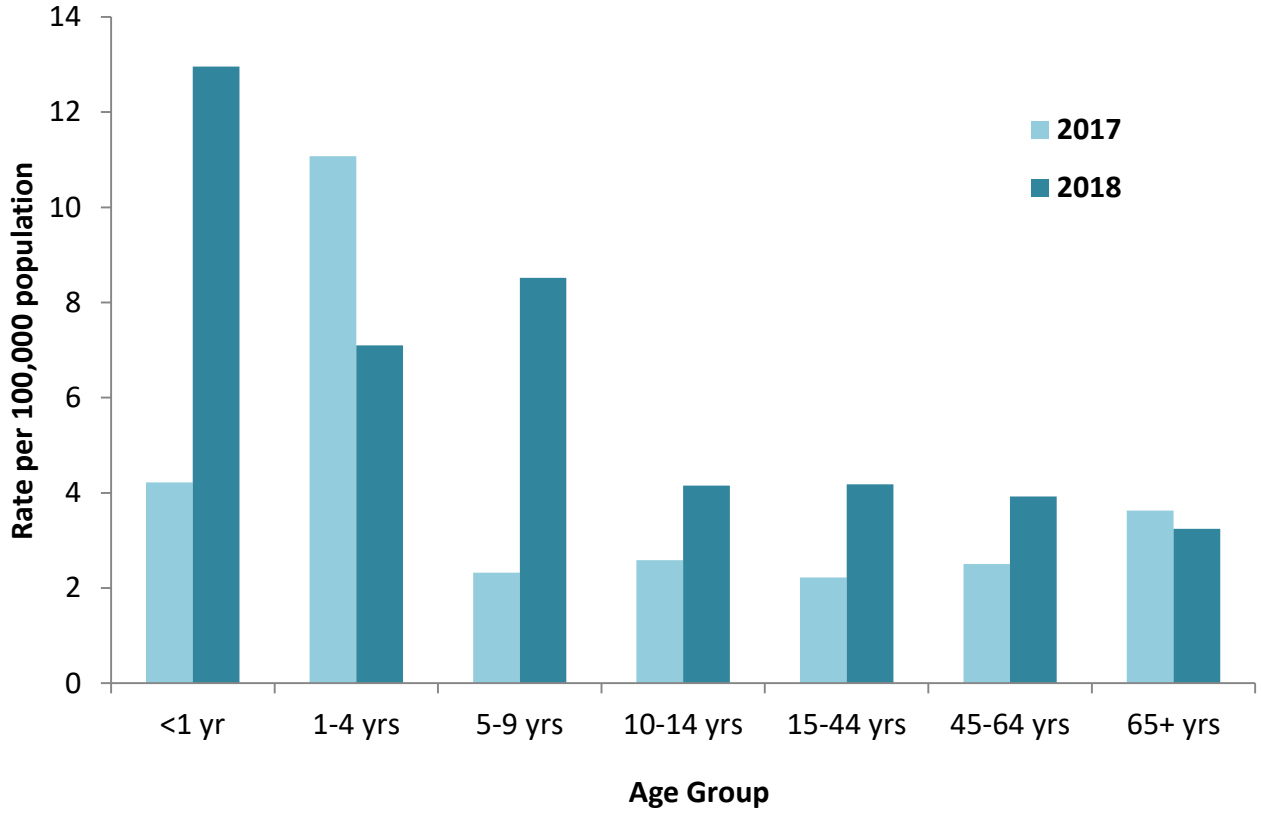
The peak in 2018 was much higher and more pronounced than in 2017 and slightly earlier than in previous years.

Fig 8: Monthly laboratory reports of *E. coli* O157, 2014 - 2018



Age specific rates increased in all but two age groups – those in the 1-4 and over 65 age groups. (Figure 9). The large increase in rates shown in the under 1 age group is due to the very small numbers in this age group as the increase only represents two cases. The same is true, to a lesser extent, in the other age groups under 15 year of age.

Fig 9: Distribution of *E. coli* O157 cases by age group, 2016 - 2017



Shiga-toxin gene type was available for 68 of the 85 laboratory culture confirmed cases in 2018. Toxin type ST2 and ST1&2 were the most common toxin profile with 45% and 44% respectively of cases (where toxin typing took place) displaying this toxin type. There were only very small numbers of VT1 only toxin type (n=3), with 4 cases where the toxin type was not identified (Table 4).

Table 4: Verotoxin (VT) genes of laboratory confirmed cases of *E. coli* O157, 2009 - 2018

VT	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
VT1	0	2	0	0	0	0	0	0	0	3
VT2	25	42	24	34	50	18	16	32	17	31
VT1+2	11	22	20	153	9	13	10	17	14	30
VT+	8	1	5	2	2	12	6	15	14	4
Total	**44**	**67**	**49**	**189**	**61**	**43**	**32**	**63**	**45**	**68**

Questionnaires were received for 80 of the 85 O157 cases (94%) with 75 reporting symptoms. Those not reporting symptoms are contacts of symptomatic cases who have tested positive for *E. coli* O157. Similar to 2017 the most common symptoms reported were diarrhoea (90%) and abdominal pain (84%) similar to previous years (Table 5). Overall 68%

of cases experienced bloody diarrhoea with substantial variation in the age specific proportion although some of this variation is likely to be due to small numbers in some age groups.

Table 5: Symptoms experienced by *E. coli* O157 cases, 2018

Symptom	Number	Percentage*
Abdominal pain	67	84%
Blood in stools	54	68%
Diarrhoea	72	90%
Fever	37	46%
Nausea	43	54%
Vomiting	27	34%

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

Hospital admissions occurred in all age groups with 35% of cases admitted to hospital in 2018, a substantial reduction compared to 2017 (46% hospitalised). There were substantial variations in the percentage hospitalised by age group but this may be due to the small numbers involved (Table 6).

Table 6: Hospitalisation of *E. coli* O157 cases by age group, 2018

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	2	2	1	1	50%
1-4	7	6	2	1	14%
5-9	11	8	6	4	36%
10-14	5	4	3	2	40%
15-44	29	22	20	12	41%
45-64	17	12	9	6	35%
65+	9	8	5	2	22%
Total	**80**	**62**	**46**	**28**	**35%**

E. coli – serotypes other than O157

The introduction of PCR testing in several of the Northern Ireland health service laboratories has allowed for the detection of non-O157 serotypes of verotoxin positive *E. coli* where previously only *E. coli* O157 could be identified. However, only one laboratory in Northern Ireland is currently able to identify the particular serotype involved and this is limited to the eight most commonly found serotypes. The other laboratories do not routinely send non-O157 serotypes for further identification, resulting in an underestimate of the incidence of non-O157 serotypes and variation due to geographical differences.

In addition some specimens that test positive using PCR techniques cannot be subsequently cultured or identified. In some cases this would likely be due to the serotype being one the laboratory cannot identify but it can also include cases of O157 where it simply has not been possible to culture the organism. Depending on the severity of the symptoms or links to existing cases, a questionnaire may not be obtained for cases only identified through PCR testing. These changes mean that data prior to 2015 is not directly comparable to current data, as well as making interpretation of more recent data difficult.

There was a reduction in the number of O026 serotypes reported in 2018 but it remains the second most common serotype after O157 (Table 7). There was also a smaller decrease in PCR only reports of toxin positive *E. coli* where serotype cannot be identified (Table 8).

Table 7: Culture positive VTEC samples where a serotype was established

Serotype	2014	2015	2016	2017	2018
O026	18	17	33	19	14
O145	1	4	3	1	6
O103	0	0	0	0	2
O091	1	2	0	0	0
O110	1	1	0	0	0
O111	0	0	0	0	2
O126	0	0	0	0	2
O5	0	0	1	1	0
Others*	4	1	1	0	0

* Others includes serotypes where only one positive has been identified in the past 5 years

There were also three cases where *E. coli* was cultured but it was not possible to identify the serotype. Samples positive for non-O157 are not routinely sent for toxin typing so this information is not available for the majority of non-O157 cases.

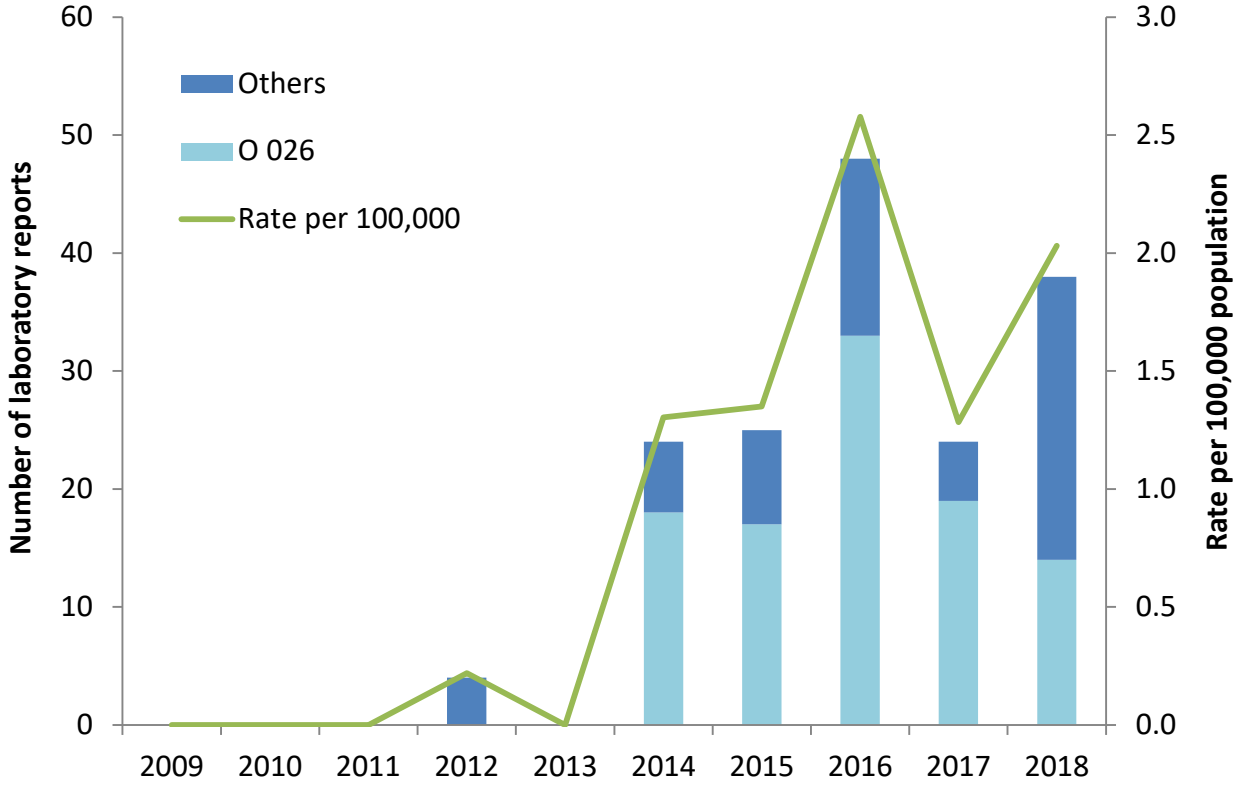


Table 8: PCR positive only VTEC samples				
2014	**2015**	**2016**	**2017**	**2018**
0	93	129	120	152

There were a total of 190 cases where *E. coli* was detected but the serotype was either not O157 or not typed, this includes both culture and PCR only samples. Of the 152 PCR only cases questionnaires were obtained for 45 (30%) with 39 being symptomatic (87% of questionnaires).

Giardiasis

Number of cases	**151**
Incidence rate	**8.0 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; however up to a quarter of cases can be asymptomatic.

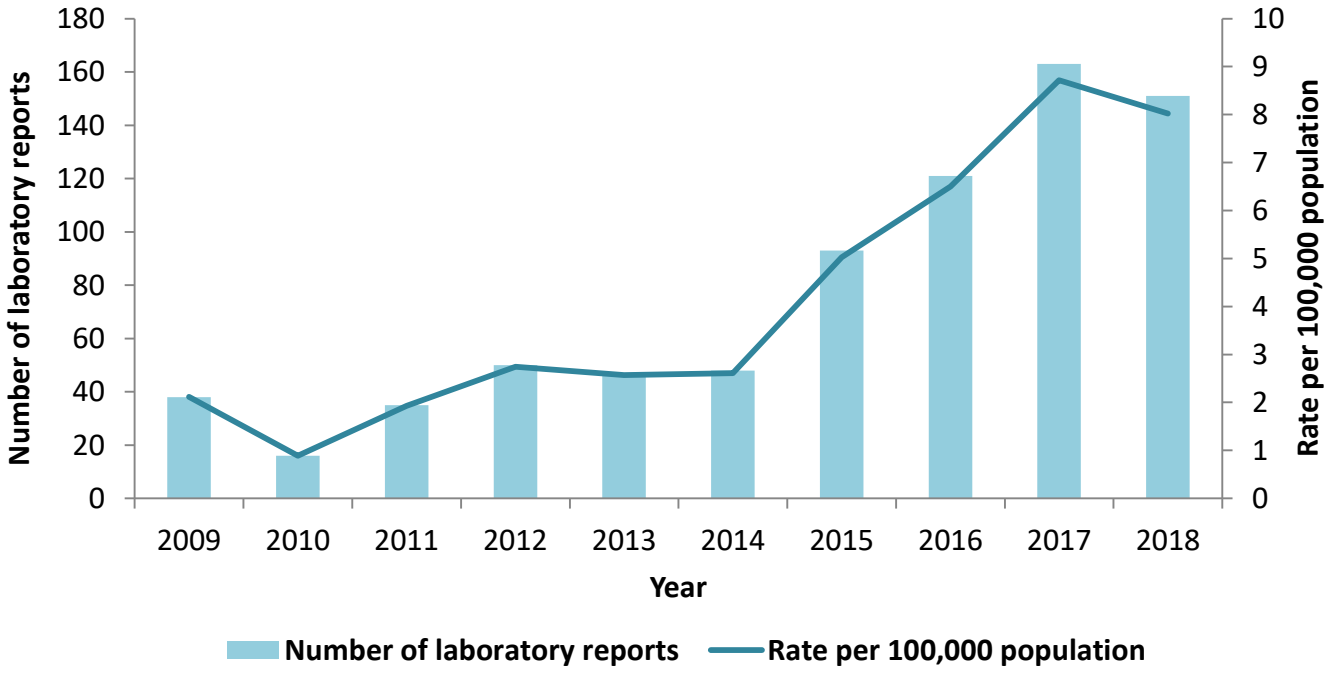
The number of reported cases fell in 2018 after a period of steady and substantial increases from 2015 onwards. At least some of the increases in recent years are due to changes in testing.

Laboratory confirmed cases of giardiasis decreased from 163 in 2017 to 151 in 2018 (8% decrease). The incidence rate in 2017 was 8.0 per 100,000 population. There were 44 (29%) cases that were reported as being likely to be associated with foreign travel (Table 11, Figure 10). The proportion of male cases was 67% which is higher than for most gastrointestinal infectious diseases and slightly higher than 2017. Other than one family cluster there were no outbreaks of giardiasis reported in 2018.

Table 11. No of laboratory reports of *Giardia lamblia*, 2008 - 2017

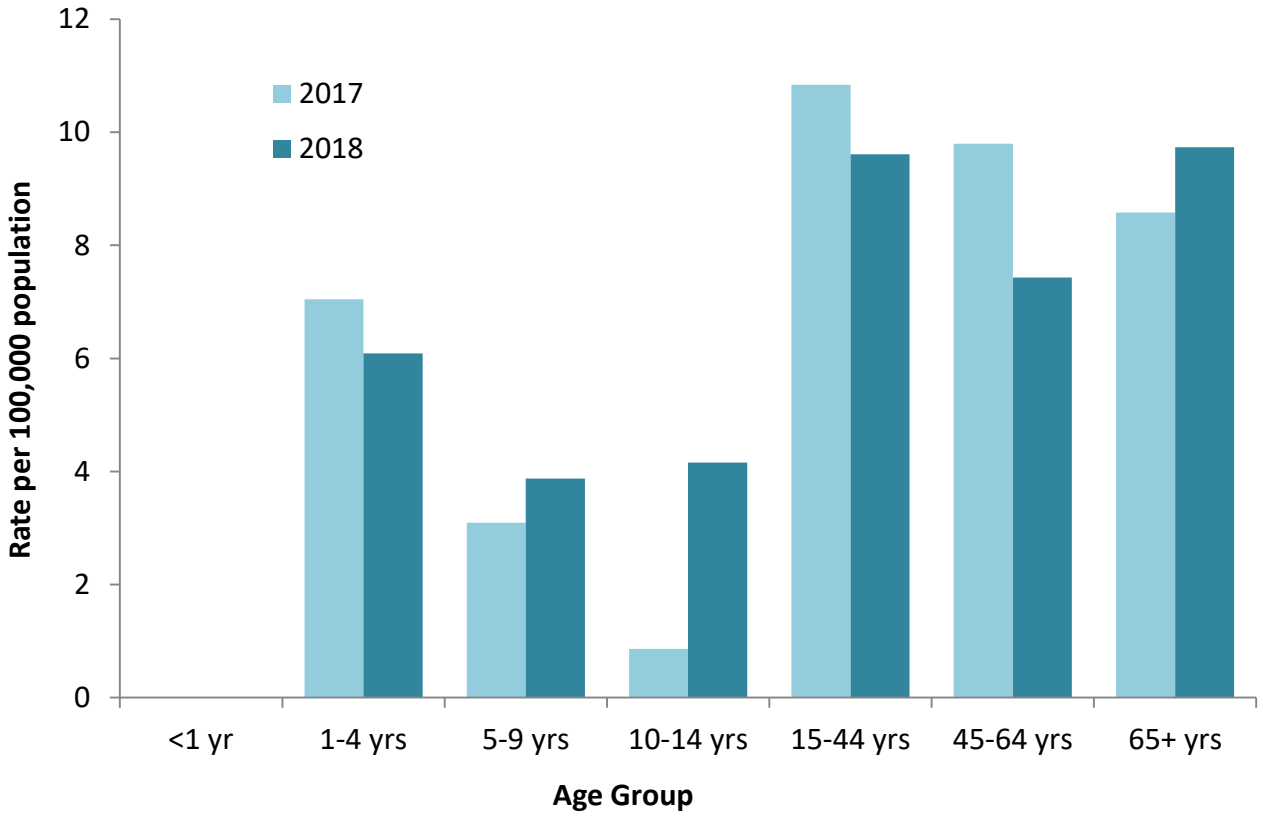
2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
38	16	35	50	47	48	93	121	163	151

Fig 10: Laboratory reports of *Giardia lamblia* (all specimen types), 2009 - 2018



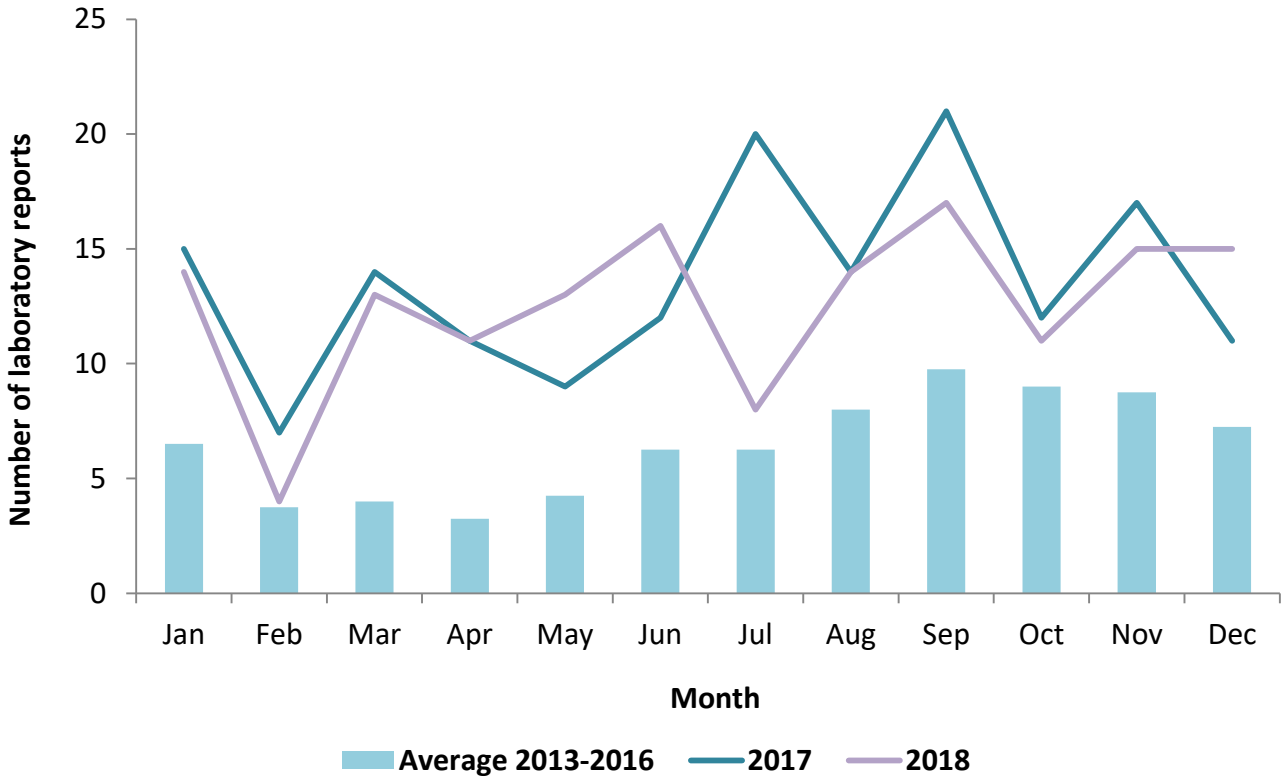
The highest incidence rate in 2018 was in the over 65 age group (9.7 per 100,000 population). Unlike most other common gastrointestinal disease the highest incidence rates of Giardiasis are in adults, with 89% of cases aged 18 or over. (Figure 11).

Fig 11: Laboratory reports of *Giardia lamblia* (all age groups), 2017 – 2018



While the number of cases in 2018 increased in the autumn period there were several peaks from July to November. Prior to 2015 the low numbers for this organism meant that seasonality was unclear but recent data would indicate that Giardia tends to peak in the autumn which corresponds with data from England and Wales (Figure 12).

Fig 12: Monthly laboratory reports of *Giardia lamblia*, 2013 - 2018



Salmonella

Number of cases	**155 (non-typhoidal)**
Incidence rate	**8.2 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.

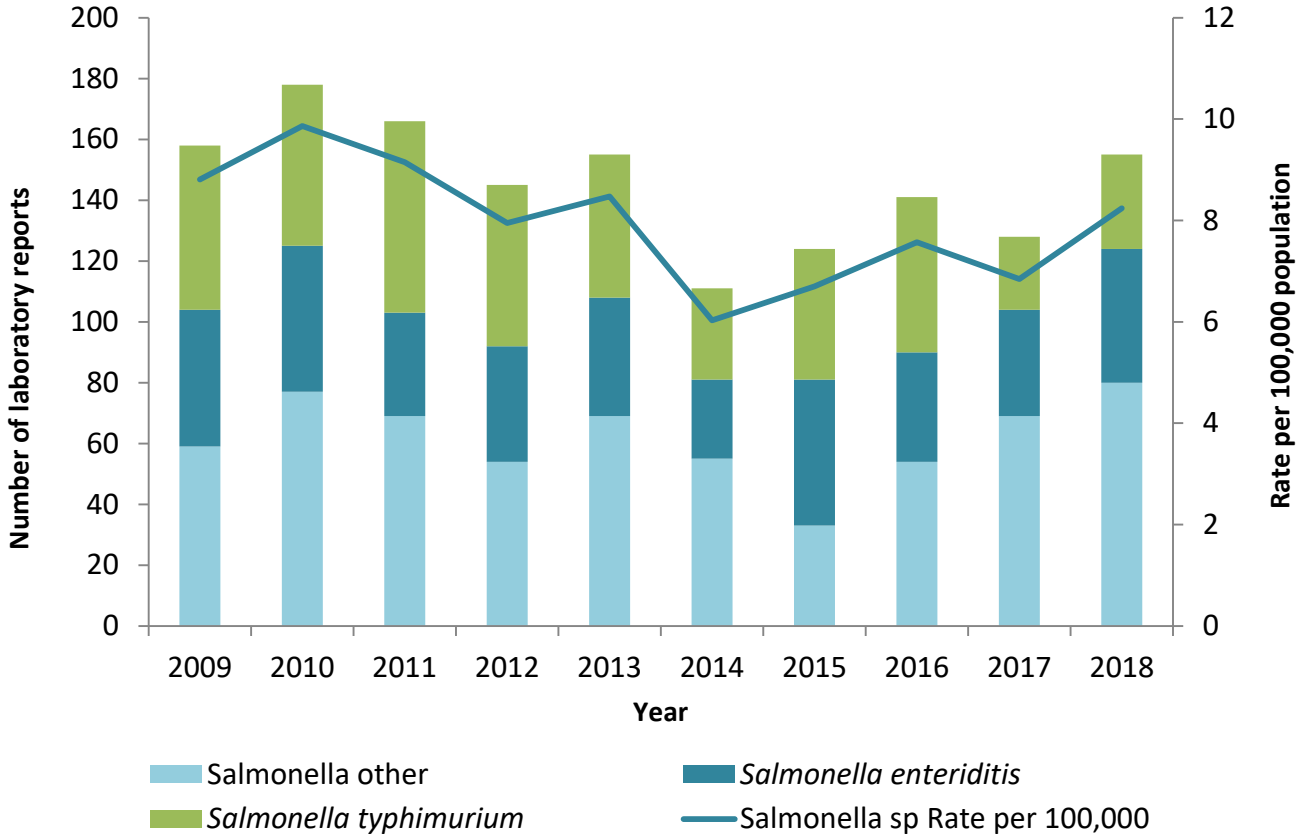
Laboratory reports of *Salmonella* increased from 128 in 2017 to 155 in 2018. Increases were seen in both the main serotypes (*S*. Typhimurium and *S.* Enteriditis). The incidence of *salmonella* infections in 2018 was 8.2 per 100,000 population.

The number of reported cases that were associated with foreign travel made up a substantial proportion of the reports at 41% (n=63). Consistent with previous years there were differences in the proportion due to travel between serotypes, with 48% of *S.* enteriditis due to travel but only 35% in the case of *S*. typhimurium.

There was one case each of *S.* typhi and S. paratyphi A and both were associated with travel.

In 2018 the proportion of cases in males was 50%, a small increase compared to the previous year but within the normal range for *Salmonella*.

Fig 13: Laboratory Reports of *Salmonella*, 2009 - 2018



In 2018 *S.* enteritidis and *S.* typhimurium remain the two most frequently reported serotypes in Northern Ireland, accounting for 28% and 20% of cases respectively (Table 12).

Table 12. No of laboratory reports of *Salmonella*, 2009 - 2018

Serovar	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Enteriditis	45	48	34	38	39	26	48	36	35	44
Typhimurium	54	53	63	53	47	30	43	51	24	31
Paratyphi	0	2	1	1	1	1	0	2	1	1
Typhi	0	0	1	0	1	1	1	2	1	1
Other	59	77	69	54	69	55	33	54	69	80
Total	**158**	**180**	**168**	**146**	**157**	**113**	**125**	**145**	**130**	**157**

Similar to many gastrointestinal illnesses, S*almonella* cases follow a seasonal pattern. Reports of salmonella peaked slightly earlier in 2018 than would normally be expected. (Figure 14). *S.* enteriditis peaked in August; however, *S.* typhimurium did not display a pronounced peak this year (Figure 15). The difference in peak months may be partially due to the differing proportions due to travel for each of these serovars.

Fig 14: Monthly laboratory reports of *Salmonella*, 2017 – 2018

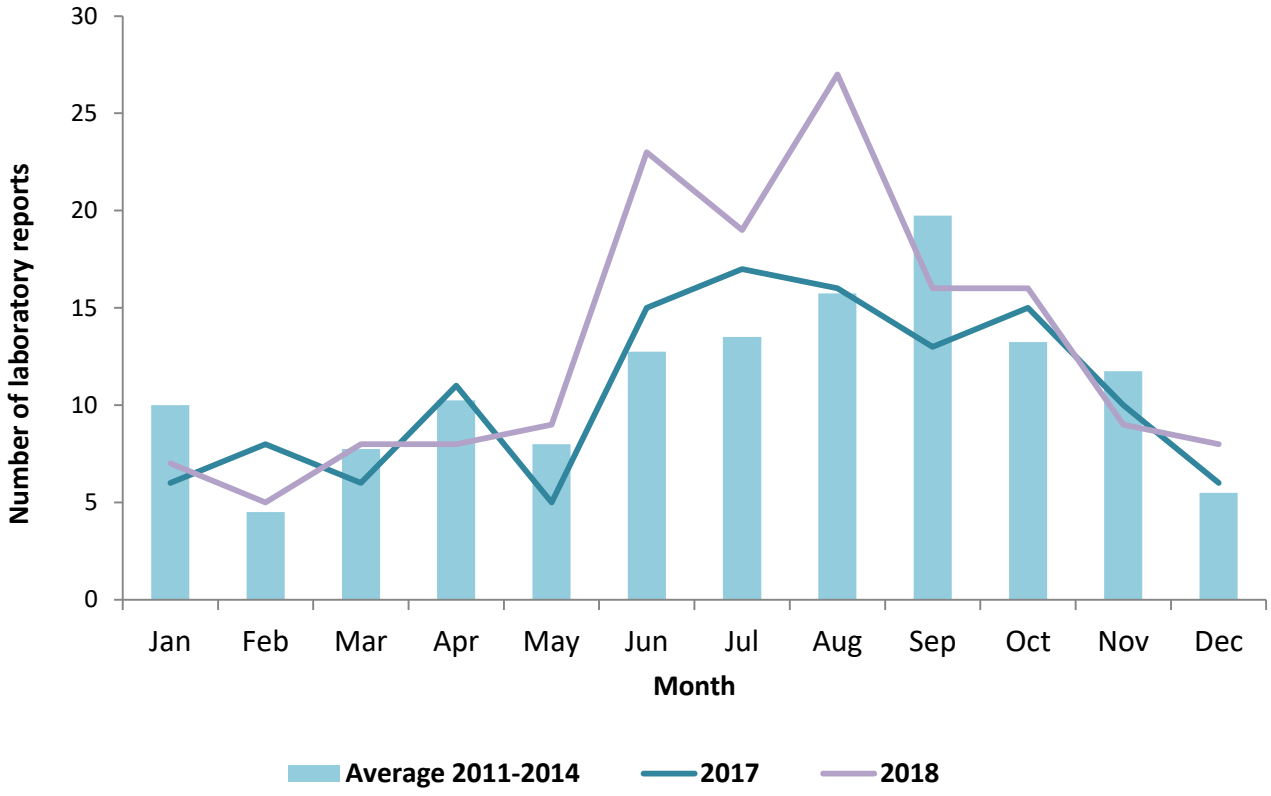
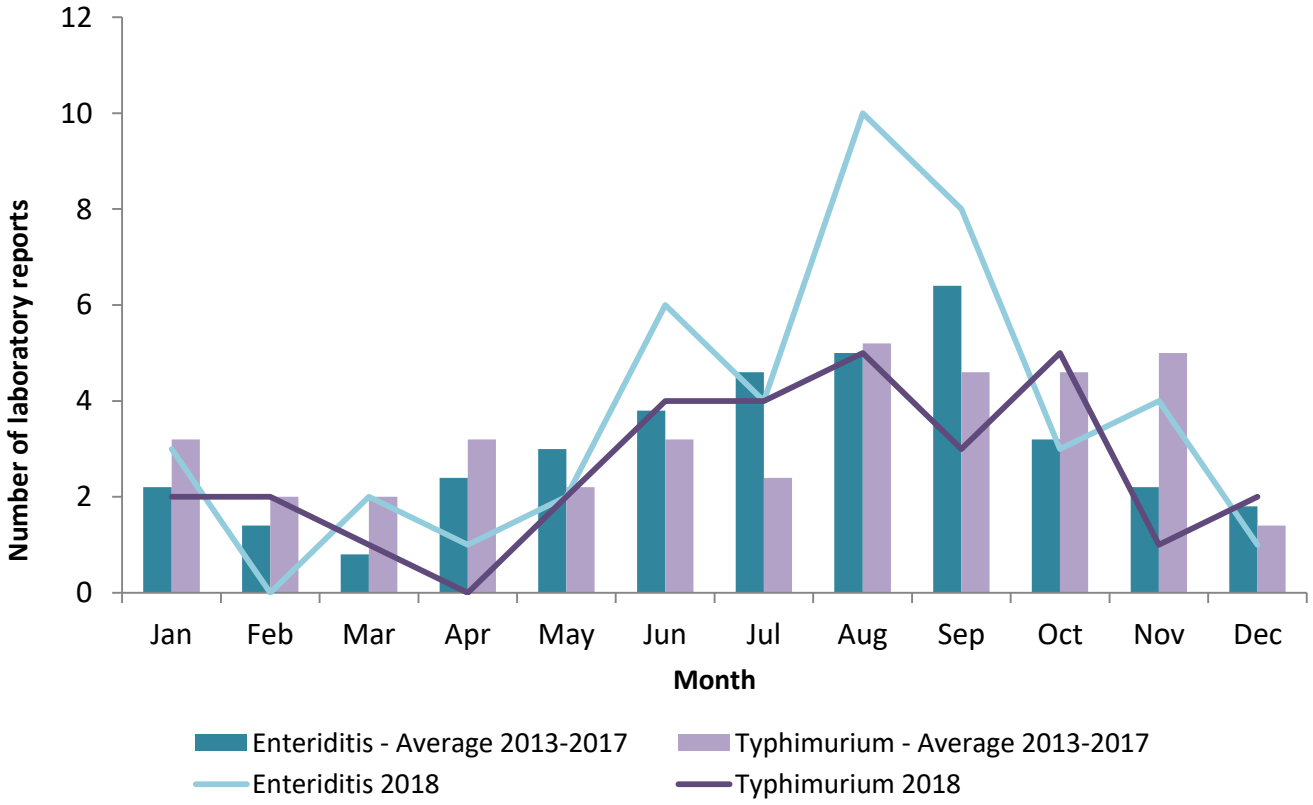
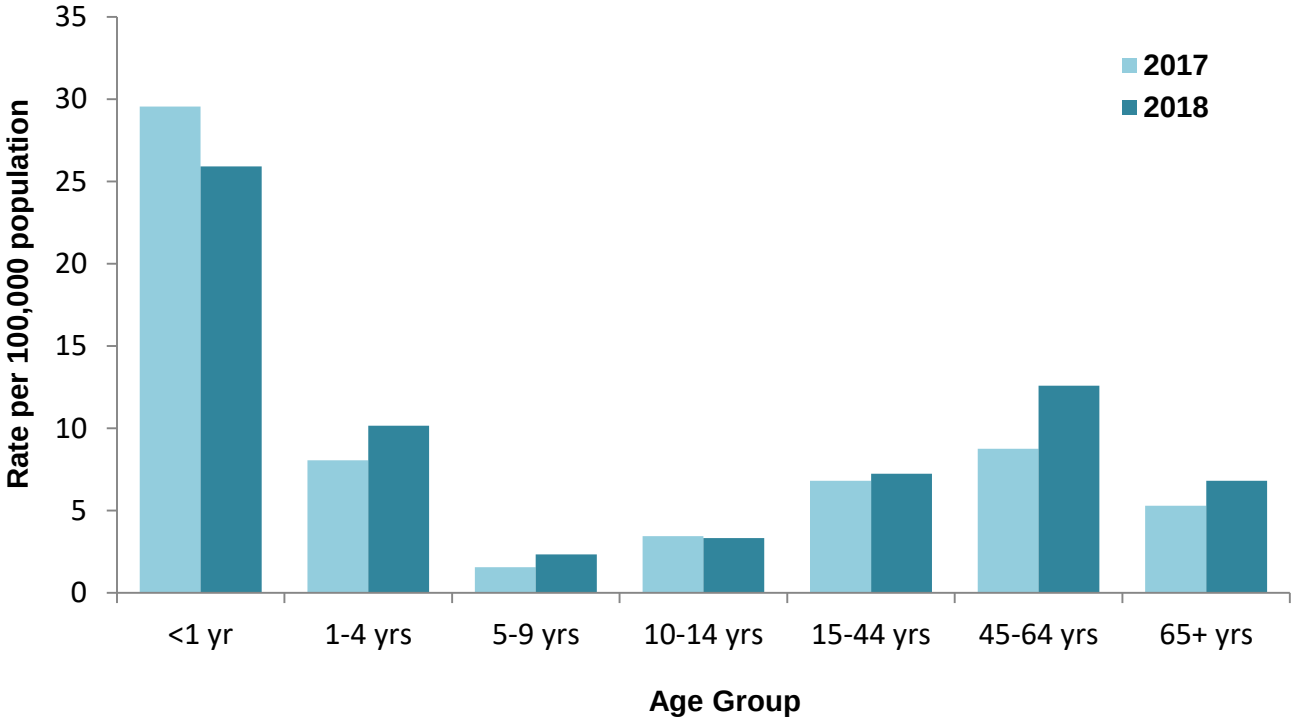


Fig 15: Monthly laboratory reports of *S*. Enteriditis and *S*. Typhimurium, 2017



Similar to 2017, the highest incidence rate in 2018 was in the under 1 year old age group (29.6) per 100,000 population although this represents only seven cases (Figure 16). Most age groups displayed an increase in 2018 with only the under one year old age group displaying a decrease.

Fig 16: Laboratory reports of *Salmonella*, age specific rates (per 100,000 population), 2017 – 2018



Other serotypes for which more than one report was received in 2018 are presented in Table 13 along with data from the previous 3 years. However, other than S. enteriditis and S. typhimurium the numbers of individual serovars remain very low. There were an additional 20 serovars reported in 2018 where only one case was reported, four of which were seen for the first time in Northern Ireland.

Table 13. *Salmonella* serovars 2015 – 2018

2015		2016		2017		2018	
Serovar	No	Serovar	No	Serovar	No	Serovar	No
Infantis	3	Infantis	7	Infantis	8	Newport	7
Stanley	3	Oranienburg	3	Mikawasima	7	Agona	5
Agona	2	Agona	3	Stanley	4	Java	5
Heidelberg	2	Bredeney	2	Newport	4	Saint-Paul	4
Saint-Paul	2	Stanley	2	Agona	3	Virchow	4
Nachshonim	2	Newport	2	Saint-Paul	3	Braenderup	3
Muenchen	2	Hadar	2	Java	3	Infantis	3
		Typhi	2	Montevideo	2	Mbandaka	2
		Paratyphi	2	Agama	2	Rissen	2
				Indiana	2	Senftenberg	2
						Stanley	2

Shigella

Number of cases	**21**
Incidence rate	**1.1 per 100,000 population**

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 (HUS) can occur.

Whilst the total number of culture confirmed laboratory reports of Shigella species decreased slightly in 2018 there was an increase in the number of *S. sonnei* cases from 10 in 2017 to 14 in 2018 (Tables 14 & 15). The number of cases that were identified solely by PCR testing methods decreased substantially compared to 2017 from 25 to 13 in 2018.

Table 14. No of culture confirmed laboratory reports of Shigellosis, 2009 - 2018

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
13	5	8	9	4	21	31	21	24	21

Table 15. No of culture confirmed reports of Shigellosis by serogroup, 2014 - 2018

Serogroup	2014	2015	2016	2017	2018
S. boydii	1	1	0	2	0
S. dysenteriae	0	0	0	2	0
S. flexneri	13	14	8	9	6
S. sonnei	7	16	12	10	14
Untyped	0	0	1	1	1
Total	**21**	**31**	**21**	**24**	**21**

Table 16. No of PCR only reports of Shigellosis, 2015 - 2018

	2015	2016	2017	2018
Number of reports	16	5	25	13

Fig 17: Culture confirmed laboratory reports of *Shigella*, 2009 - 2018

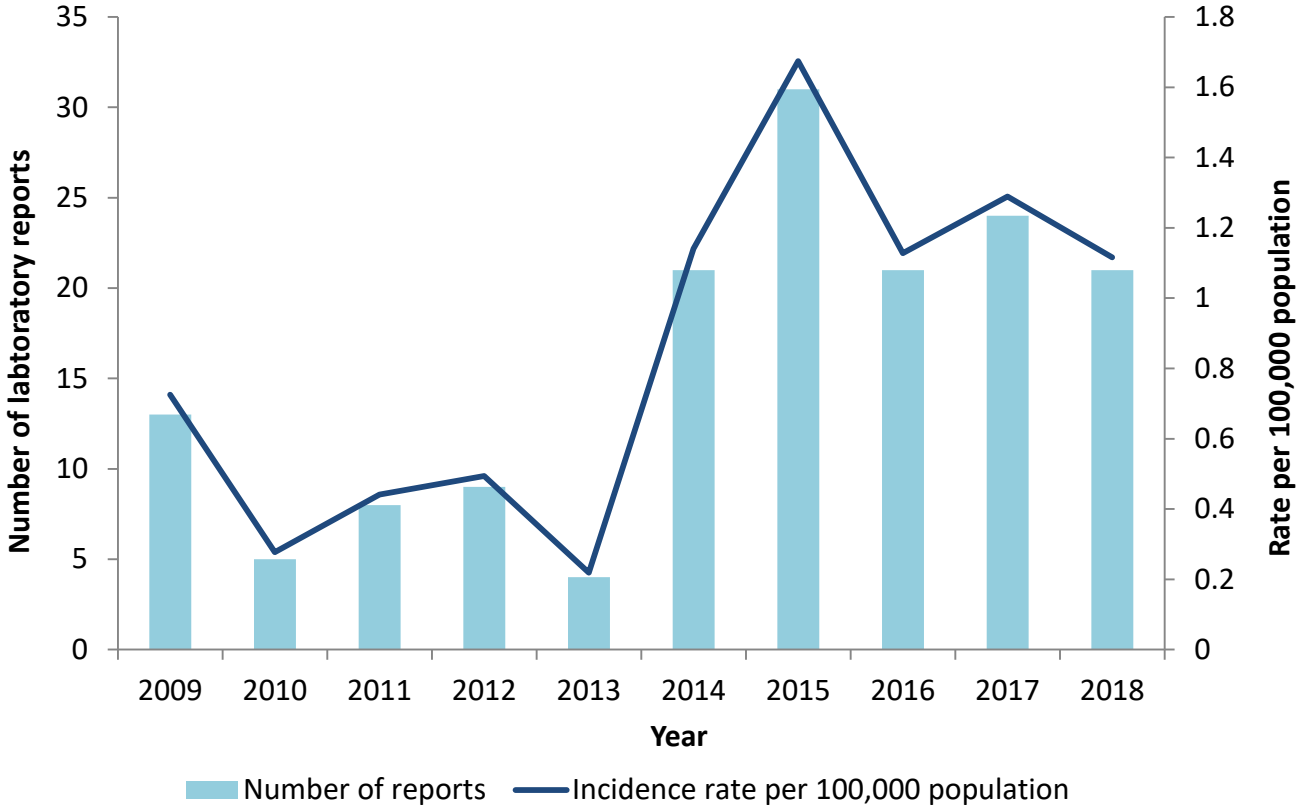
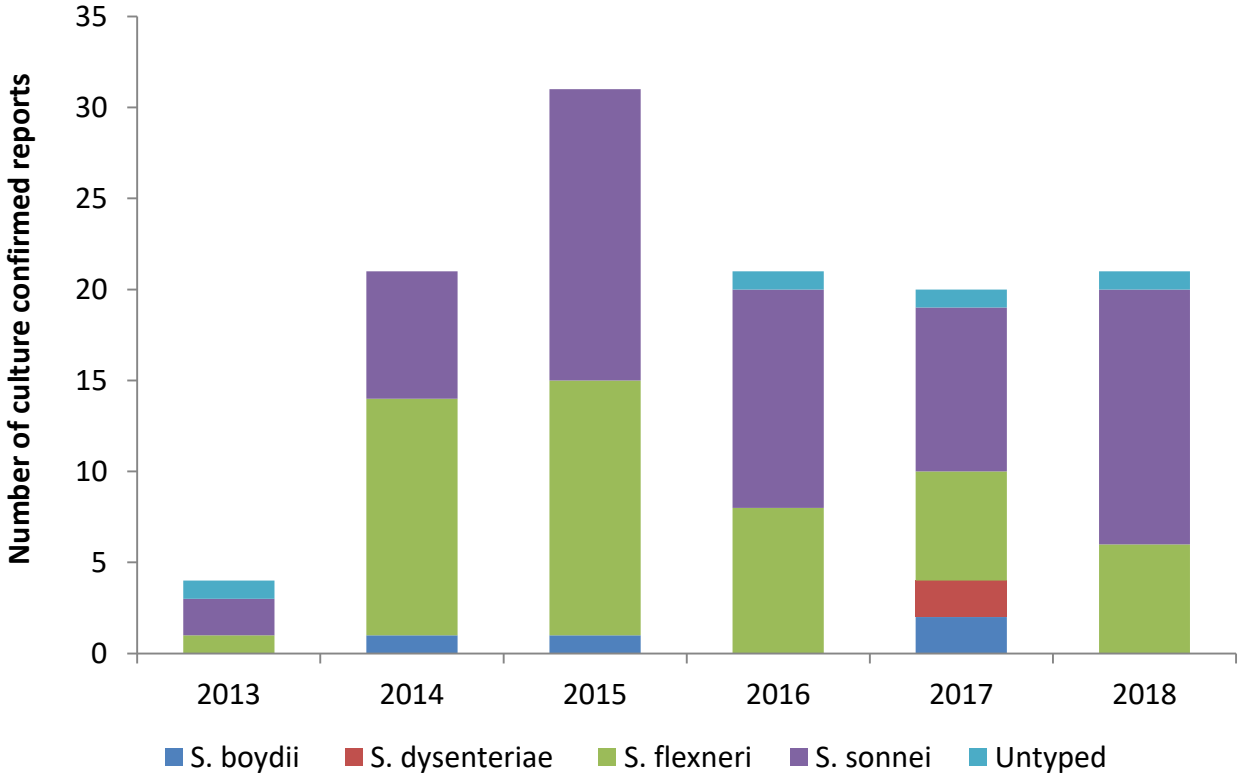


Fig 18: Culture confirmed laboratory reports of *Shigella sp*, 2013 - 2018



Whilst a number of gastrointestinal infections show a slightly larger proportion of male cases *Shigella sp* displays a higher proportion of males than any other, particularly in those infections considered to be community acquired (i.e. not travel related). Overall 71% of culture confirmed cases are male in 2018.

Shigella sp has been involved in a number of ongoing outbreaks within the MSM (males who have sex with males) community in England. Enhanced surveillance of cases in Northern Ireland have also indicated that at least some are likely related to sexual transmission within the MSM community. This may also partially explain the high proportion of males with the infection.

Other Gastrointestinal Infections

Adenovirus (gastroenteritis)

Adenovirus causes a variety of diseases but certain serotypes can cause gastroenteritis, particularly in young children. It is estimated that it is the second most common virus causing gastroenteritis in young children. Symptoms generally include diarrhoea and vomiting but tend to be relatively mild and short-lived although dehydration can sometimes be an issue.

Table 17. No of laboratory reports of Adenovirus (faecal), 2009 - 2018

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
222	127	209	207	102	125	115	104	85	115

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. This organism is not routinely tested for in cases of gastroenteritis. In 2018 there were 20 cases of clostridium perfringens reported in Northern Ireland (Table 18).

Table 18. No of laboratory reports of Clostridium perfringens, 2009 - 2018

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
18	36	16	28	24	23	34	24	25	20

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 new-born child. This organism is not routinely tested for in cases of gastroenteritis. In 2018 there were three cases of listeria reported in Northern Ireland (Table 19).

Table 19. No of laboratory reports of *Listeria*, 2009 - 2018

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
4	2	3	7	2	4	6	4	1	3

Norovirus

Norovirus is the most common known cause of gastrointestinal infections in the United Kingdom. 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.

The number of laboratory reports of norovirus does not necessarily reflect the level of norovirus present in the community as many reports are associated with outbreaks. However, in outbreak situations only a small number of patients are usually tested and once norovirus is identified there is usually no further testing done for patients associated with that outbreak; this means that relatively few cases are identified for testing.

In 2018 there were 250 laboratory reports of Norovirus reported in Northern Ireland (Table 20).

Table 20. No of laboratory reports of norovirus, 2009 - 2018

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
424	643	445	592	386	272	335	618	299	250

Rotavirus

Rotavirus is a common cause of gastroenteritis in infants and very young children, with many children suffering an infection by the age of five. Rotavirus can cause severe vomiting, severe diarrhoea, and stomach cramps. Symptoms usually last from three to eight days. Adults may become infected; however, repeat infections are generally less severe than infections during childhood. The majority of infections tend to occur in the spring (Table 21).

A rotavirus vaccine for children was introduced in Northern Ireland in July 2013, and a high uptake rate has been reported so far (estimated at 94% of eligible children receiving two doses of the vaccine in the first year of the programme). 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.

Rotavirus reports in 2018 reduced to the lowest levels in the past ten years.

Table 21. No of laboratory reports of rotavirus, 2009 - 2018

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
594	599	630	543	599	210	404	101	234	97

Gastrointestinal Outbreaks

A total of 131 gastrointestinal outbreaks were reported in 2018 with the suspected mode of transmission for these outbreaks being either person-to-person spread or unknown in all cases.

Similar to previous years the most commonly identified causative agent of the gastrointestinal outbreaks was norovirus, which accounted for 31 (24%) of outbreaks. Five other outbreaks had an organism identified, two as *Cryptosporidium*, and one each as Giardia, Hepatitis A and E. coli O157.

The causative organism was not determined in 89 of the gastrointestinal outbreaks, although it is likely these were viral in origin.

During 2018 there were a total of 29 hospital outbreaks, 101 residential institution outbreaks and a further 7 outbreaks linked to other sites (e.g. nursery, conference facilities) reported (Table 22).

Table 22: Total distribution and location of gastrointestinal outbreaks 2018 (based on date of report to PHA)

Location	Identified Organism(s)	No of clusters/outbreaks
Hospital	Norovirus	13
	Not identified	10
Residential institution	Norovirus	24
	Not identified	77
Other	*Cryptosporidium*	2
	Giardia lamblia	1
	Hepatitis A	1
	E coli O157	1
	Not identified	2

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

Summary

Campylobacter continued to increase in line with a general trend upwards from 2008 (4%). Some of this increase in the past few years may be due to higher ascertainment rather than a true increase.

Reports of *Cryptosporidium* reports increased (17% increase) with the highest figure seen in the past ten years. However, reports of giardiasis decreased but remain much higher than in years prior to the introduction of testing changes. Some of the increase seen in recent years is likely due to increased ascertainment due to the same testing changes seen in other organisms but the year on year rise would suggest that there has also been an increase in the underlying incidence of giardiasis.

E. coli O157 cases displayed a large increase (54% increase) in 2018 but is still in line with earlier years. We are continuing to see relatively large numbers of other serotypes and PCR positive only specimens, although these data are difficult to interpret due to the lack of comparable data.

Reports of *Salmonella* rose in 2018 (21% increase) with the increase seen in both the main serovars (S. typhimurium and S. enteriditis) as well as in the unusual salmonellas. Similar to previous years a large proportion (41%) of reported cases were thought to be travel related and similar variations were found between different serotypes in terms of the proportion due to travel.

Shigella reports decreased slightly from 24 culture confirmed cases in 2017 to 21 in 2018 although *S. sonnei increased this year*. Reports remain relatively high compared to the years prior to 2014. PCR only results decreased substantially compared to 2017, and seem to display fairly large variations in the four years since PCR testing was introduced.

Reported outbreak activity fell again slightly in 2018. As usual the majority of outbreaks were related to either Norovirus or suspected viral gastroenteritis. Four outbreaks were reported as being from a non-viral source (*Cryptosporidium, Giardia, E Coli O157*).

The number of reports of rotavirus data decreased by 59% compared to 2017 and represents the lowest number of reports in the past 10 years by far. This is likely due to the effect of the ongoing vaccination programme.

Summary table of laboratory reports

Table 23. No of laboratory reports of selected gastrointestinal infections, 2009 - 2018

Organism	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Adenovirus (faecal)	222	127	209	207	102	125	115	104	85	115
Campylobacter sp	977	1040	1175	1211	1355	1414	1320	1258	1421	1475
Clostridium perfringens	18	36	16	28	24	23	34	24	25	20
Cryptosporidium sp	118	119	140	177	161	143	204	282	253	297
E coli O157	48	77	56	198	72	54	33	81	57	85
Giardia sp	38	16	35	50	47	48	93	120	163	151
Listeria sp	4	2	3	7	2	4	6	4	1	3
Norovirus	424	643	445	592	386	272	335	618	299	250
Rotavirus	594	599	630	543	599	210	404	101	234	97
Salmonella sp*	158	178	166	145	155	111	124	141	128	155
Shigella sp**	13	5	8	9	4	21	31	21	24	21

* non-typhoidal
** culture confirmed

See individual sections for more information.

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Public Health Agency
12-22 Linenhall Street
Belfast
BT2 8BS
Tel: 0300 555 0114

www.publichealth.hscni.net