Gastroenteric, Zoonotic and Vectorborne Diseases in Ireland: Quarterly report

Quarter 3, 2024

November 2024

Acknowledgements

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Preventing Gastroenteritis and other Zoonotic diseases

See HPSC website for information on prevention of gastroenteritis: Gastroenteritis Fact Sheet

- Ensure that you regularly wash your hands with soap under warm running water and especially:
  - After using or cleaning the toilet
  - After attending to anyone with diarrhoea or vomiting or touching anything contaminated by diarrhoea or vomiting
  - After handling household and garden waste or rubbish (including nappies)
  - After touching or handling pets or other animals
  - On returning to the house having been working in the garden or on the farm
  - Before handling, preparing, serving, or consuming food or drink
- Cook meats and eggs thoroughly before consumption.
- Clean kitchen work surfaces and utensils with soap and water immediately after they have been in contact with raw meat.
- Wash fruit and vegetables thoroughly in clean water, especially those that will not be cooked further.

See HPSC website for travel advice for international travellers: Travel Health Fact Sheet

- When on holiday, you should take extra travel precautions with your and your family's health and ensure your travel vaccinations are up to date.

If anyone in your home is suffering from vomiting or diarrhoea, the toilet and other areas should be cleaned and disinfected after use. Anyone who is ill with diarrhoea or vomiting should stay off work/school until they have been symptom free for 48 hours.

Preventing Vectorborne diseases

See HPSC website for information on prevention of mosquito-borne diseases: Protect yourself against mosquitoes

- The best protection against mosquito-borne diseases is to protect yourself against their bites
- Avoid areas where mosquitoes live and breed, such as near standing or slow-moving water including rainwater collections, ponds, lakes and marshes
- Protect your skin from mosquito bites by wearing long sleeves, long trousers, closed shoes and hats
- Use bug spray/insect repellent and read the instructions on the label carefully before use. Your local pharmacist can advise you on the best product for your trip.
- To prevent malaria there are effective prophylactic medications that should be taken as prescribed

See HPSC website for information on prevention of tick-borne diseases: Prevent tick bites

- Protect yourself against bites as above
- Check skin, hair and warm skin folds (especially the neck and scalp of children) for ticks, after a day out
- Check for ticks and remove any from your pets/clothing/outdoor gear
- Remove any ticks and consult with a GP if symptoms develop

Additional Resources

Additional information on minimising the risk of foodborne illness:

- www.safefood.net/food-safety
- www.fsai.ie/consumer-advice/food-safety-and-hygiene

Additional information on minimising the risk of zoonotic infection:

- www.hpsc.ie/a-z/zoonotic/petsandotheranimals/

Additional information on minimising the risk of travel-associated infection:

- www.ireland.ie/en/dfa/overseas-travel/advice/
- www.who.int/travel-advice
- www.hse.ie/eng/health/immunisation/pubinfo/travelvacc/

Additional information on minimising the risk associated with sexual transmission of shigellosis:

- www.sexualwellbeing.ie/sexual-health/sexually-transmitted-infections/types-of-stis/shigella-in-gbmsm.html
- man2man.ie/shigella/

See Department of Foreign Affairs website for information on Zika virus in Thailand:

Since 2023, Thai authorities have reported a 300% increase in cases of Zika virus disease, with more than 800 cases identified last year. Zika virus is a mosquito-borne disease and can have serious health impacts on babies if contracted during pregnancy.

Gastroenteric, Zoonotic and Vectorborne Diseases: Key Points Q3 2024

- Notifications of **Norovirus infection**, **Rotavirus infection, Typhoid**, **Dengue Fever** and **Malaria** were higher in Q3 2024 than Q3 2023

- **Norovirus Infection:**
  - Notifications of Norovirus infection, which had remained unseasonably high during Q2 and at the beginning of Q3 2024, began to decrease during Q3 2024 and had returned to the expected level by the latter half of Q3
  - Irish data were included in a Eurosurveillance paper detailing a shift in the predominant norovirus genotype from GII.4 to GII.17 or a general increase in genotype GII.17 in many European countries and the US: https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2024.29.39.2400625
- **Rotavirus:**
  - Rotavirus notifications were 58% higher in Q3 2024 than Q3 2023 and the total number of notifications Q1-3 2024 was 44% and 32% higher than the same time period in 2022 and 2023, respectively
  - Children aged <5 years remain the group most affected by Rotavirus despite children in this age cohort being eligible for vaccination as part of the primary vaccination schedule (at 2 and 4 months)
  - Nationally, the uptake rate for the Rotavirus vaccine has been greater than 89% when reported at 24 months but the rate has remained below the WHO target of ≥95% since its introduction in 2016

- **Botulism:**
  - One case of botulism was notified during Q3 2024; this was a case of infant botulism
  - This was the first case of infant botulism notified since 2014

- **Typhoid Fever:**
  - The number of typhoid notifications in Q3 2024 was the highest quarterly number notified on CIDR since records began in 1988
  - Where travel history was known, the most frequently reported countries of infection were those in Asia that have been experiencing a continuous surge of antimicrobial resistant *S*. Typhi for a number of years
  - An effective vaccine against typhoid is available; families living in Ireland and planning a holiday to visit family and friends in countries with endemic typhoid should seek advice on typhoid vaccination prior to travelling
  - Further information is available here: Antimicrobial resistant typhoid fever in Ireland. Epi Insight Vol 24 Issue 6 June 2023.

Gastroenteric, Zoonotic and Vectorborne Diseases: Key Points Q3 2024 continued

- **Dengue Fever:**
  - Notifications of Dengue Fever in Ireland continued to increase during Q3 2024, with the majority of cases, where travel was known, reporting travel to Asia. This is a change from Q1 and Q2 2024 where the Americas were the most commonly reported region of travel
  - This mirrors historic Dengue data where most cases with travel to Asia were notified in Q3 and is to be expected based on the seasonal pattern for dengue in Asia and the Americas

- **Malaria:**
  - Notifications of malaria were 32% higher in Q3 2024, compared with Q3 2023
  - However, there was a lower number of malaria cases notified in Q2 2024 (56% lower than Q2 2023)
  - As such, there are still fewer notifications of malaria Q1-Q3 2024 as there were for the same time period in 2023

- Notifications of **Cryptosporidiosis**, **Giardiasis**, **Leptospirosis** and **VTEC** were lower in Q3 2024 compared to Q3 2023

- **Cryptosporidiosis:**
  - Notifications of cryptosporidiosis were 63% lower in Q3 2024, compared with Q3 2023
  - A travel related outbreak with 54 confirmed cases associated with travel to Salou in Spain and high domestic transmission contributed to the high number of notifications in Q3 2023
  - Further information is available here: Cryptosporidiosis reported in returning travellers. Epi Insight Vol 24 Issue 8 November 2023.

- **Leptospirosis:**
  - Notifications of leptospirosis were 80% lower in Q3 2024, compared with Q3 2023
  - There were a record number of leptospirosis notifications in 2023, but this has decreased back to previous levels in 2024
  - The increase in 2023 was investigated and no definite cause was identified; surveillance developments are in progress to enhance our understanding

- Notifications of other GZV diseases remained largely unchanged
- Notifications of **Campylobacteriosis**, **Salmonellosis** and **VTEC** remained at high levels in Q3 2024

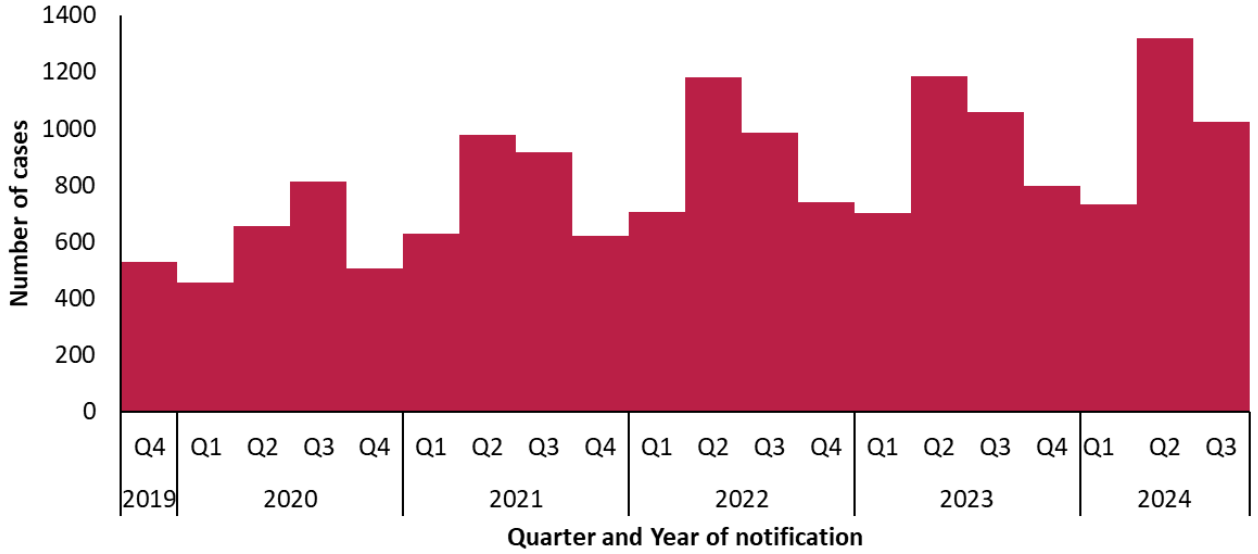
GZV diseases in Ireland summary, Q3 2024

Disease category	Disease	Q3 2023	Q3 2024	Increase/ Decrease	% Change
Bacterial IID infections	Campylobacter infection	1057	1024	-33	-3%
	Cholera	0	0	0	0%
	Listeriosis	6	6	0	0%
	Paratyphoid	4	1	-3	-75%
	Salmonellosis	150	133	-17	-11%
	Shigellosis	75	63	-12	-16%
	Typhoid	3	11	8	267%
	Verotoxigenic Escherichia coli infection	343	247	-96	-28%
	Yersiniosis	7	11	4	57%
Viral IID infections	Noroviral infection	157	276	119	76%
	Rotavirus infection	163	258	95	58%
Foodborne Hepatitis	Hepatitis A	19	15	-4	-21%
	Hepatitis E	13	14	1	-8%
Parasitic IID infections	Cryptosporidiosis	239	76	-163	-68%
	Giardiasis	117	87	-30	-26%
IID toxins	Clostridium perfringens (type A) food-borne disease	1	0	-1	-100%
	Bacillus cereus food-borne infection/intoxication	0	0	0	0%
	Botulism	0	1	1	N/A
	Staphylococcal food poisoning	0	0	0	0%

GZV diseases in Ireland summary, Q3 2024 continued

Disease category	Disease	Q3 2023	Q3 2024	Increase/ Decrease	% Change
Non-IID Zoonotic infections	Anthrax	0	0	0	0%
	Brucellosis	1	0	-1	-100%
	Echinococcosis	0	1	1	N/A
	Leptospirosis	10	2	-8	-80%
	Plague	0	0	0	0%
	Q fever	2	1	-1	-50%
	Rabies	0	0	0	0%
	Toxoplasmosis	5	0	-5	-100%
	Trichinosis	0	0	0	0%
Vectorborne Diseases	Chikungunya disease	0	0	0	0%
	Dengue fever	12	18	6	50%
	Lyme disease	3	5	2	67%
	Malaria	28	37	9	32%
	Tularemia	1	0	-1	-100%
	Typhus	0	0	0	0%
	Viral encephalitis (TBE only)	0	0	0	0%
	West Nile fever	1	1	0	0%
	Yellow fever	0	0	0	0%
	Zika virus infection	1	0	-1	-100%
	Viral haemorrhagic fevers	0	0	0	0%

Campylobacter in Ireland, Q3 2024



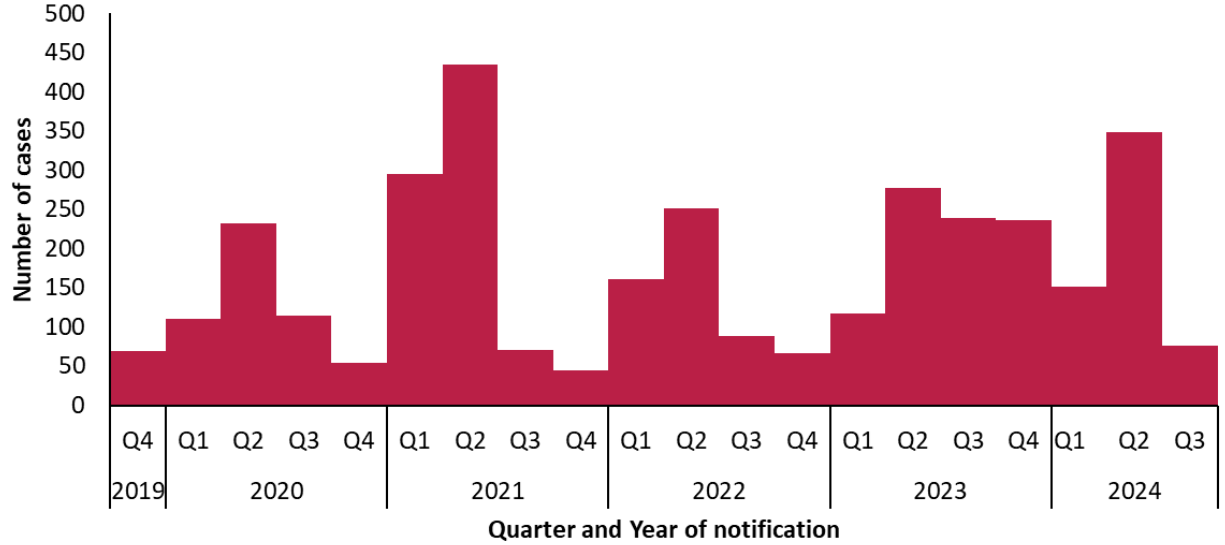
Type	Outbreaks (N)	Number ill	Range ill
Family	2	5	2-3

Species	Number of isolates	Proportion of sequenced isolates
Campylobacter jejuni	58	84%
Campylobacter coli	10	15%
Campylobacter lari	1	1%
Total	**69**	**100%**

- 1,024 cases of Campylobacteriosis notified in Q3 2024, comparable with the number notified in Q3 2023 (n=1,057)
- Two Campylobacter outbreaks notified in Q3 2024; both outbreaks were family outbreaks in private households
- 69 Campylobacter isolates were sequenced in the sentinel Campylobacter Reference Laboratory, representing approximately 7% of campylobacteriosis cases notified
- As usual, *C. jejuni* was most common with 84% of isolates sequenced being *C. jejuni*

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024 and Public Health Laboratory, Cherry Orchard 08/10/2024

Cryptosporidiosis in Ireland, Q3 2024



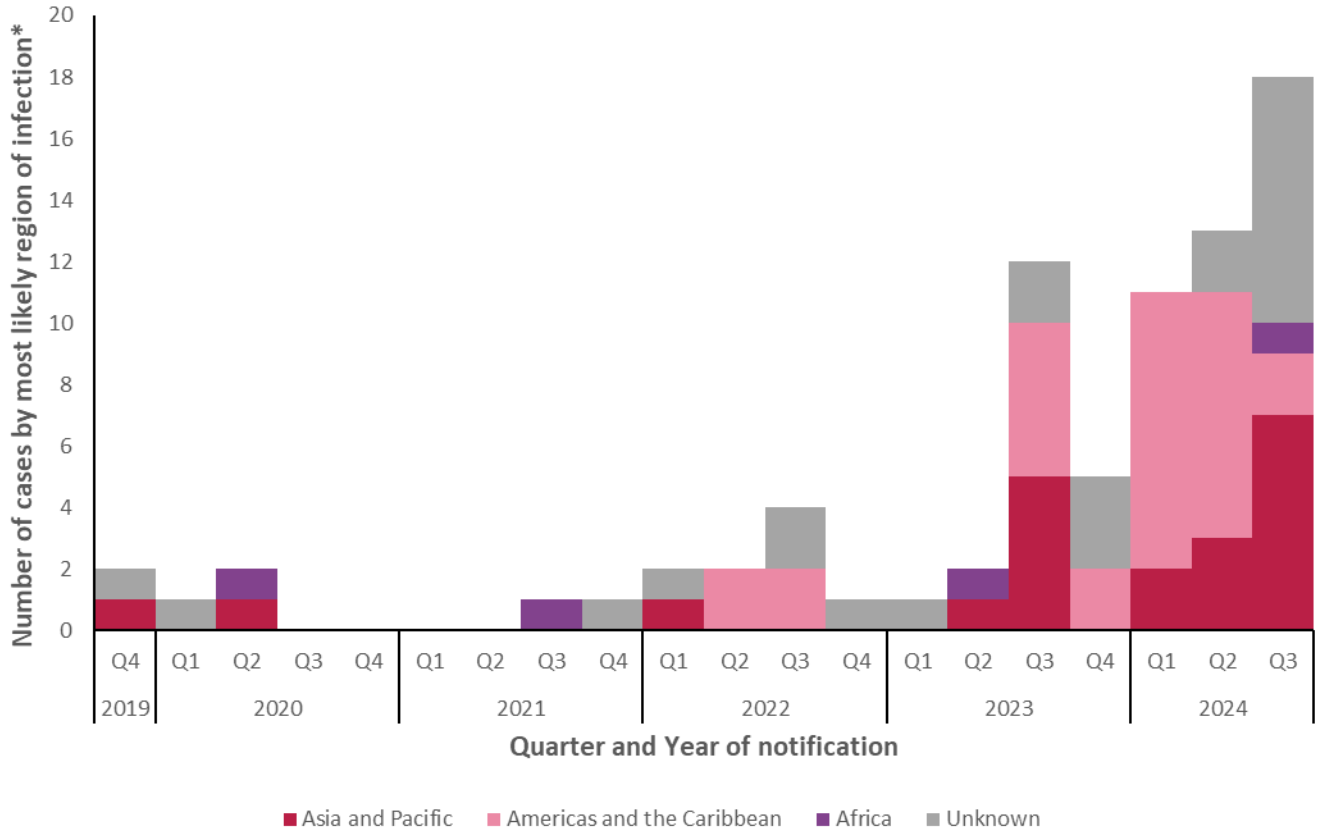
	N	% where known
Indigenous	53	71%
Travel-related	22	29%
Travel status not known	1	n/a
Total	**349**	

Type	Outbreaks (N)	Number ill	Median ill	Range ill
Family	4	9	2	2-3
General	0	n/a	n/a	n/a

- 76 cases of cryptosporidiosis notified in Q3 2024, much lower than in Q3 2023 (n=239), and more similar to Q3 in previous years
- 4 Cryptosporidiosis outbreaks notified in Q3 2024, lower than the number of outbreaks reported for the same time period in 2023 (n=13)
- 71% of cases in Q3 2024 were reported as indigenous (where travel status was known)

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024

Dengue Fever in Ireland, Q3 2024



*Likely region of infection is a composite variable using country of infection data as well as free text comments indicating travel to one or more countries where definitive country of infection could not be determined.

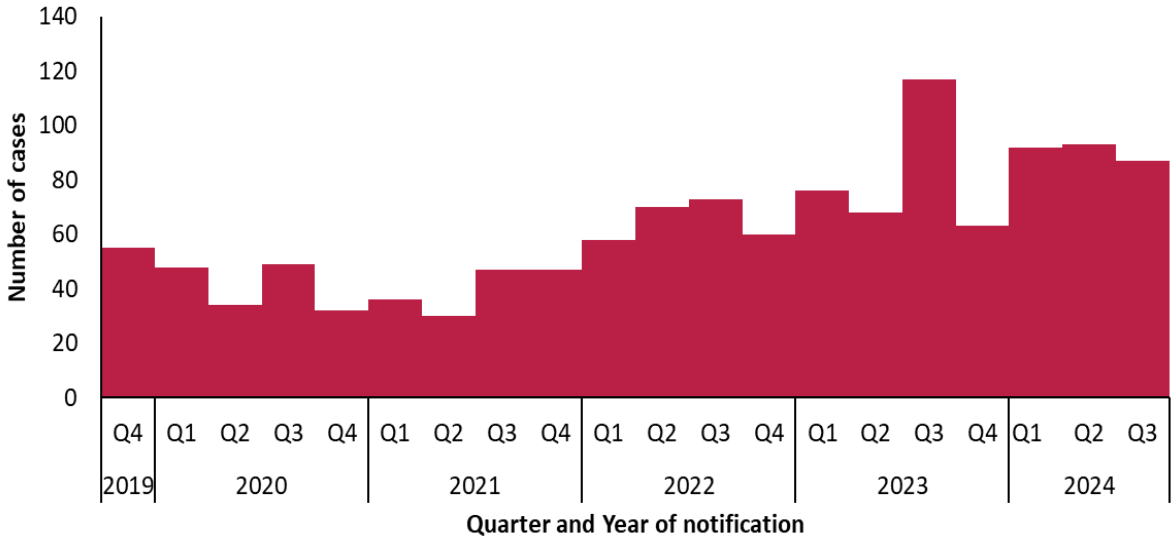
	Q3 2023	Q3 2024	% Change
Number of cases	12	18	+50%
No. hospitalised	4	4	+0%

- There was an increase in Dengue Fever notifications in Q3 2024 with 18 cases compared to 12 in Q3 2023
- 70% of cases in Q3 2024, where travel history was known (7/10), had travelled to Asia. This is an increase of 27% compared to Q2 2024 and 50% compared to Q3 2023

Data completeness related to countries of travel is low. Therefore, caution is advised when interpreting these data.

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024

Giardiasis in Ireland, Q3 2024



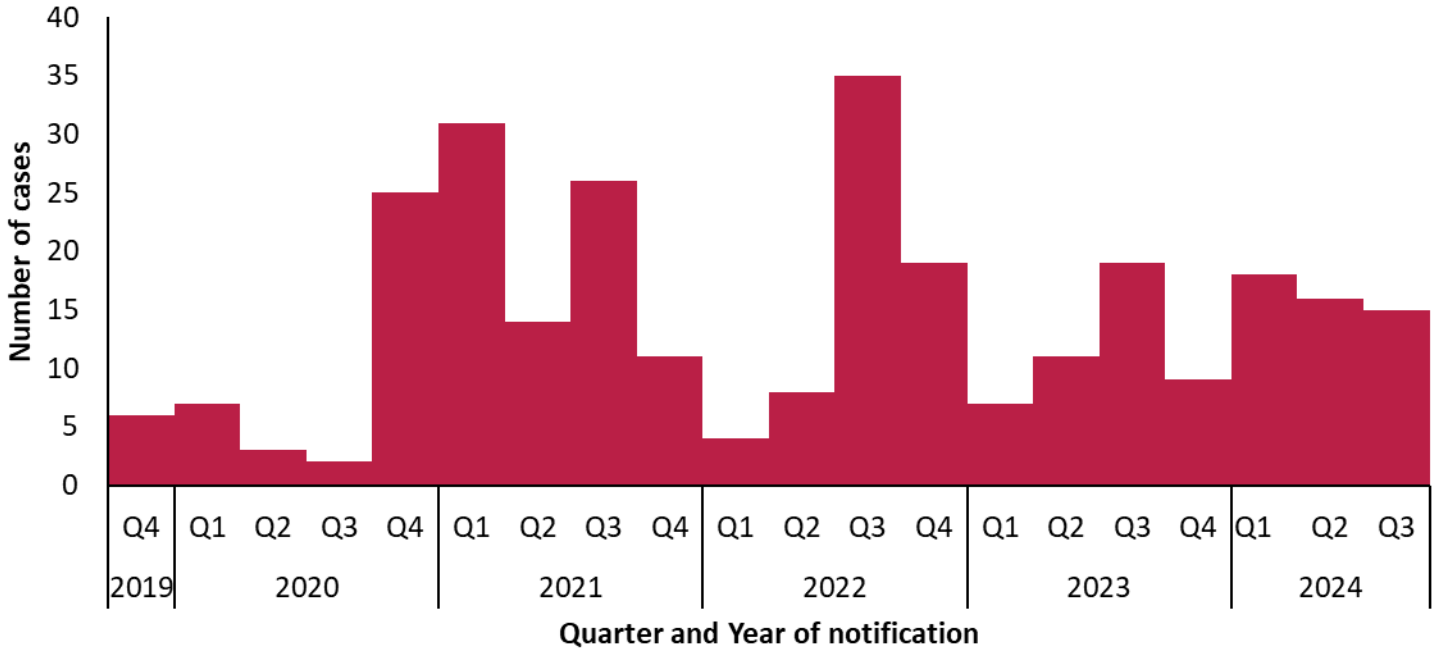
Travel status	Number of cases	% where known
Domestic	39	65%
Travel-related	21	35%
Travel status not known	27	n/a
Total	**87**	**100%**

Outbreak Type	Number of outbreaks	Total number ill	Range number ill
Family	1	2	N/A
General	0	N/A	N/A
Total	**1**	**2**	**N/A**

- 87 cases of giardiasis notified in Q3 2024, lower than 117 notified in Q3 2023 but comparable to Q1 and 2 2024
- The male to female ratio of cases reported in Q3 2024 was 2.8
- Where travel status was known (for 69% of cases), 65% were reported as domestically-acquired and 35% were associated with international travel; travel status was not available for 31% of cases so caution is advised when interpreting these data
- One family outbreak of giardiasis was notified in Q3 2024; this outbreak was travel-related and transmission route was reported as person-to-person and animal contact

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024

Hepatitis A in Ireland, Q3 2024

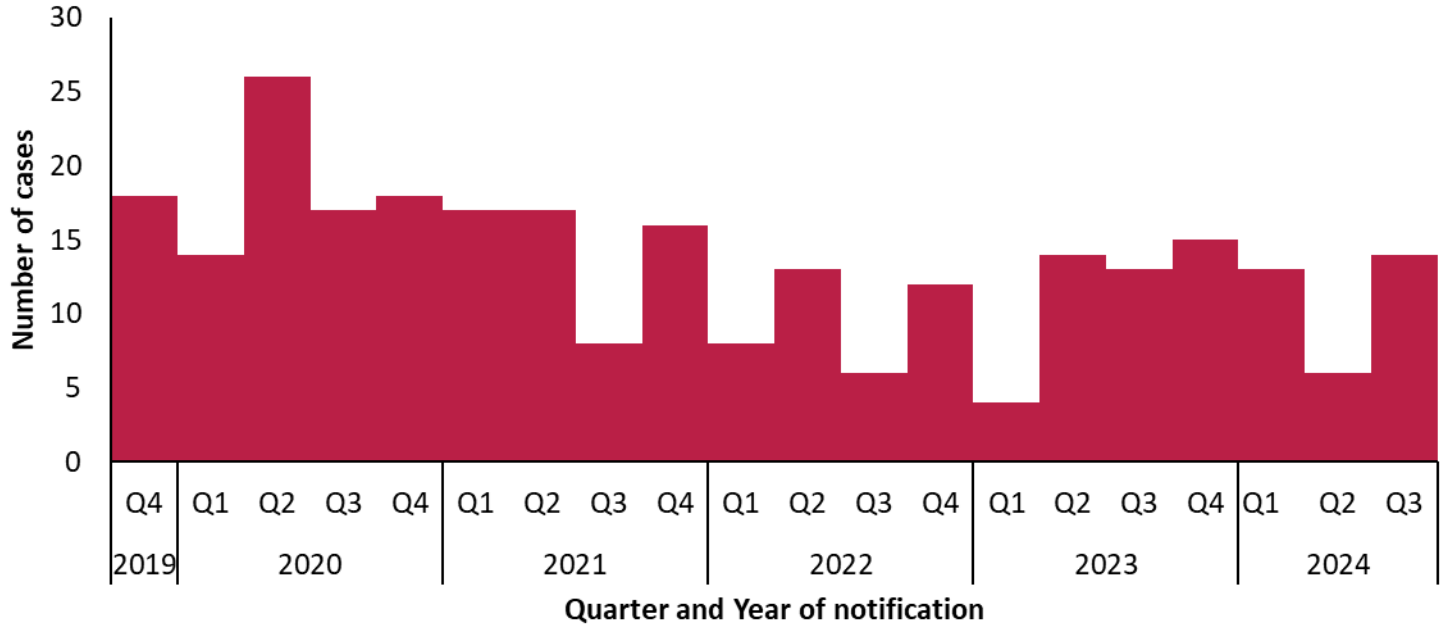


	N	% where known
Indigenous	6	50%
Travel-related	6	50%
Travel status not known	3	n/a
Total	**15**	

- 15 cases of Hepatitis A notified in Q3 2024, lower than in Q3 2023 (n=19) but comparable to the quarterly numbers reported for the rest of 2024
- 3 family Hepatitis A outbreaks notified in Q3 2024; one of these outbreaks was associated with international travel
- 50% of cases in Q3 2024 were reported as indigenous (where travel status was known; travel status was known for 80% of cases)

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024

Hepatitis E in Ireland, Q3 2024

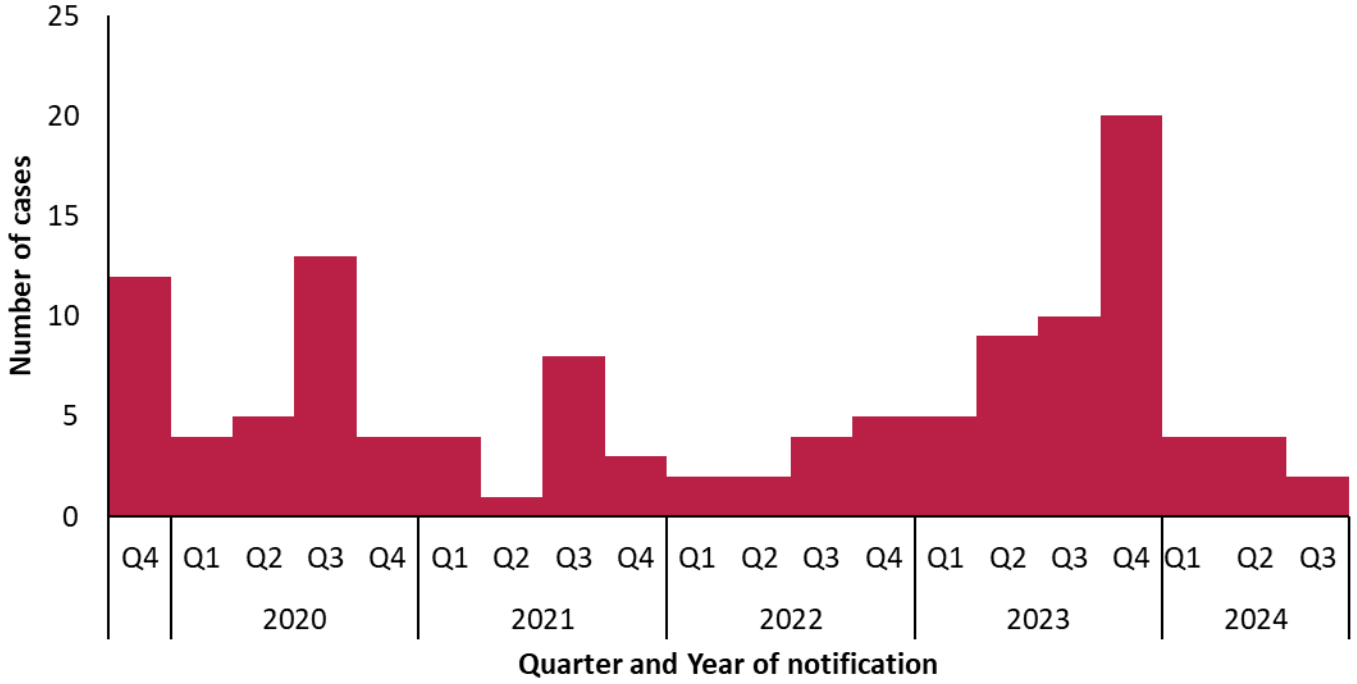


Country of infection	N	% where known
Africa	1	7
Not specified	13	n/a
Total	14	n/a

- 14 cases of Hepatitis E were notified in Q3 2024, compared to 13 in Q3 2023, 71% of cases were female and 29% were male
- 72% of cases were aged between 25 and 64 years and one case was aged <10 years
- Case numbers were 133% higher in Q3 (n=14) than Q2 (n=6,) however, cases numbers for Q1-3 in 2024 (n=33) were comparable to the same time period in 2023 (n=31)
- No Hepatitis E outbreaks were reported in Q3 2024
- Country of Infection (COI) was specified for only 1 of the 14 cases in Q3 2024

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024

Leptospirosis in Ireland, Q3 2024

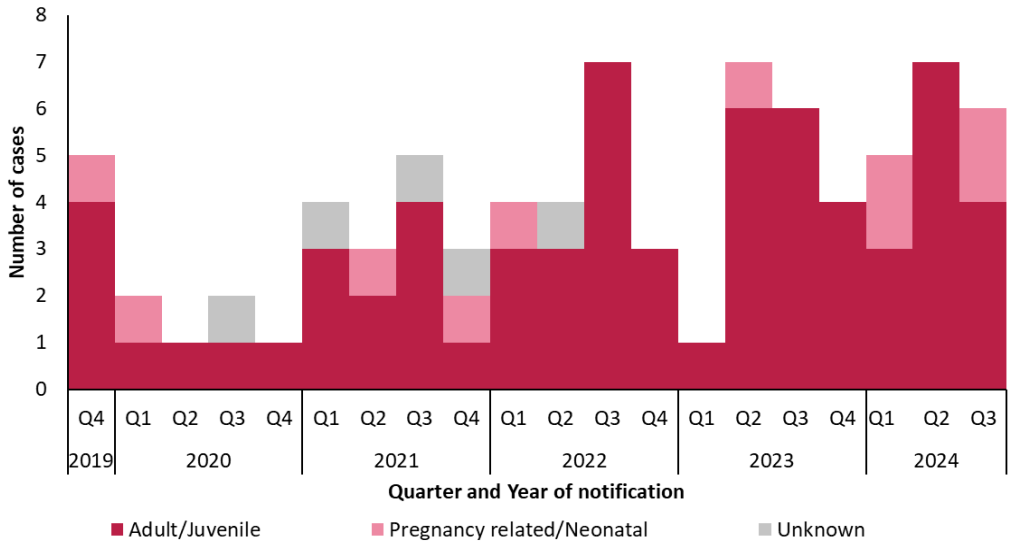


	Q3 2023	Q3 2024	% Change
Number of cases	10	2	-80%
No. hospitalised	9	1	-89%

- There were 2 notified cases of leptospirosis in Q3 2024, 80% lower than Q3 2023 (n=10) and 50% lower than Q2 2024 (n=4)
- Most cases in 2024 were reported to have been acquired occupationally including 4 farmers

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024

Listeriosis in Ireland, Q3 2024



Adult/Juvenile case Principal Diagnosis	Number of cases
Septicaemia	2
Not specified	2
Total	**4**

Pregnancy related case outcome	Number of cases
Still pregnant	1
Live birth	1
Total	**2**

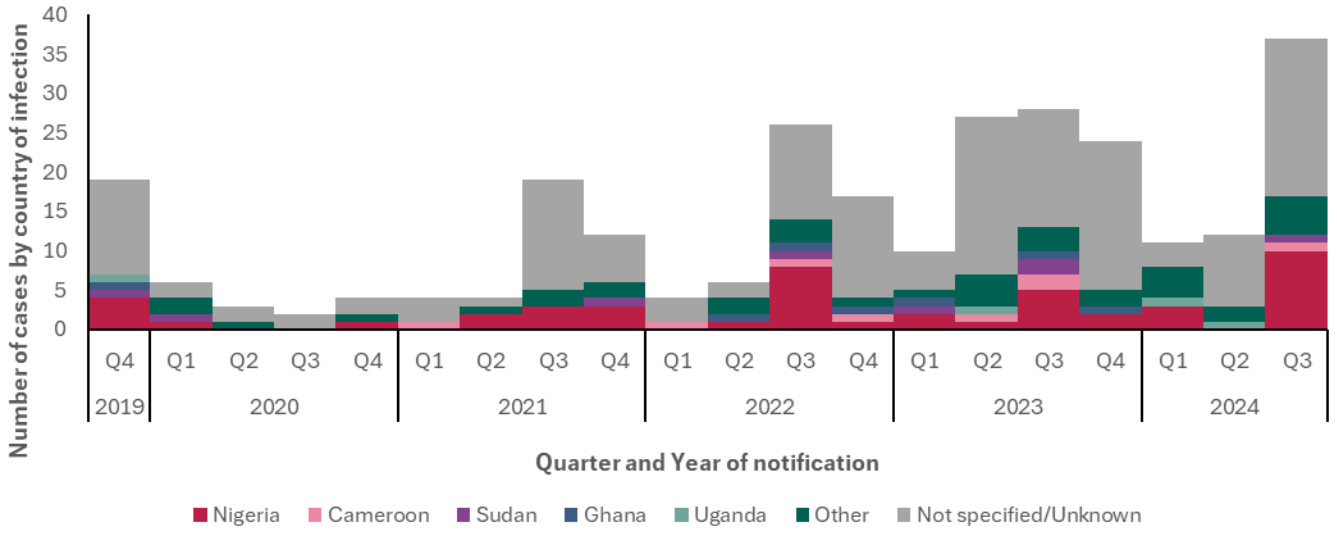
Serotype	Number of isolates
Listeria monocytogenes 1/2a	2
Listeria monocytogenes 1/2c	2
Listeria monocytogenes 4b	1
Total	**5**

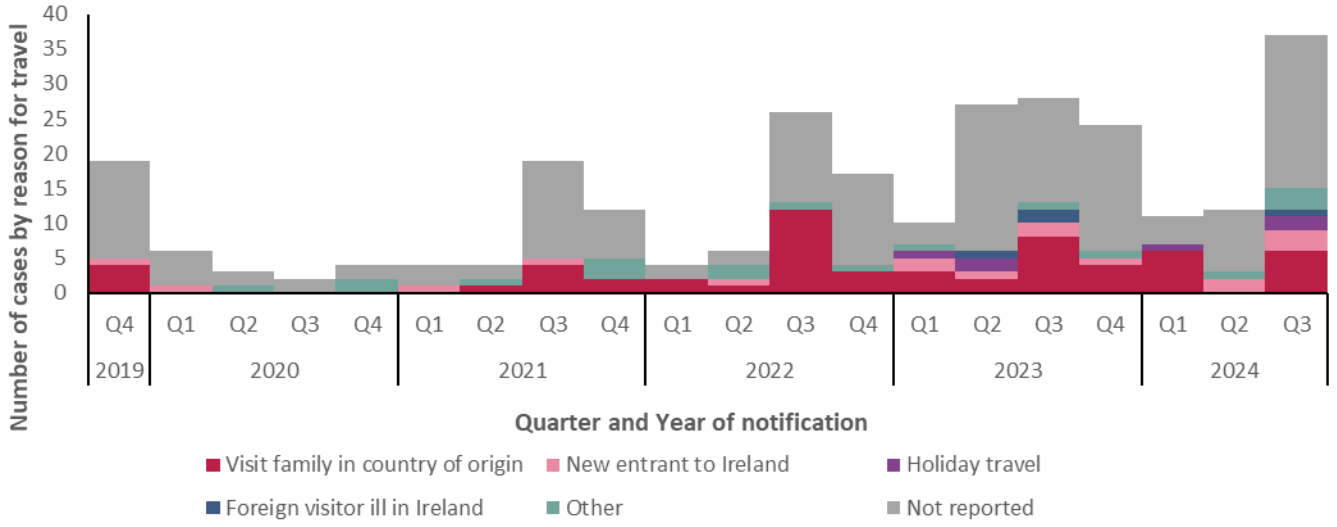
*The number of isolates sequenced in the NSSLRL may not match the number of cases notified, as dates are based on date received in the laboratory which may not align with notification date. Furthermore, additional isolates for mother/baby pairs may be sequenced in the NSSLRL but only the mother will be notified as a listeriosis case in line with the Irish case definition. Finally, some cases may have been confirmed by molecular methods only and isolates were not available for sequencing.

- Six cases of listeriosis notified in Q3 2024, unchanged from six cases notified in Q3 2023 but the total number of notifications for Q1-3 2024 (n=18) is slightly higher than for the same time period in 2023 (n=14)
- Four were adult/juvenile cases and two were pregnancy related/neonatal cases in Q3 2024
- Five clinical isolates of *Listeria monocytogenes* were sequenced in the NSSLRL*
- The most frequently seen serotypes in Q3 2024 were 1/2a and 1/2c
- There were no outbreaks of listeriosis notified in Q3 2024 but two isolates that were genetically related to other isolates were identified and investigated further during Q3 2024

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024 and National Salmonella, Shigella and Listeria Reference Laboratory (NSSLRL)

Malaria in Ireland, Q3 2024





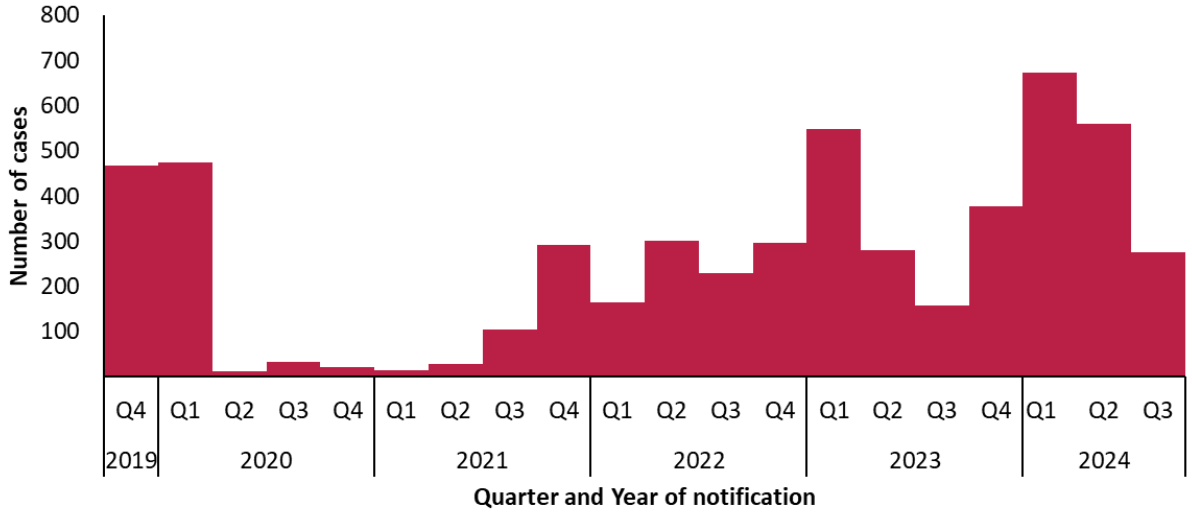
	Q3 2023	Q3 2024	% Change
Number of cases	28	37	+32%
Number hospitalised	12	19	+58%

- 37 cases of malaria reported in Q3 2024 in Ireland. This is 32% higher than Q3 2023 (n=28) and an increase of 236% compared to Q2 2024 (n=11)
- Visiting family in country of origin remains the most commonly reported reason for travel, and Nigeria remains the most commonly reported country of infection where known (6/15)*

*Data completeness for reason for travel and country of infection is low. Therefore, caution is advised when interpreting these data.

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21//10/2024

Norovirus and Acute Infectious Gastroenteritis (AIG) in Ireland, Q3 2024



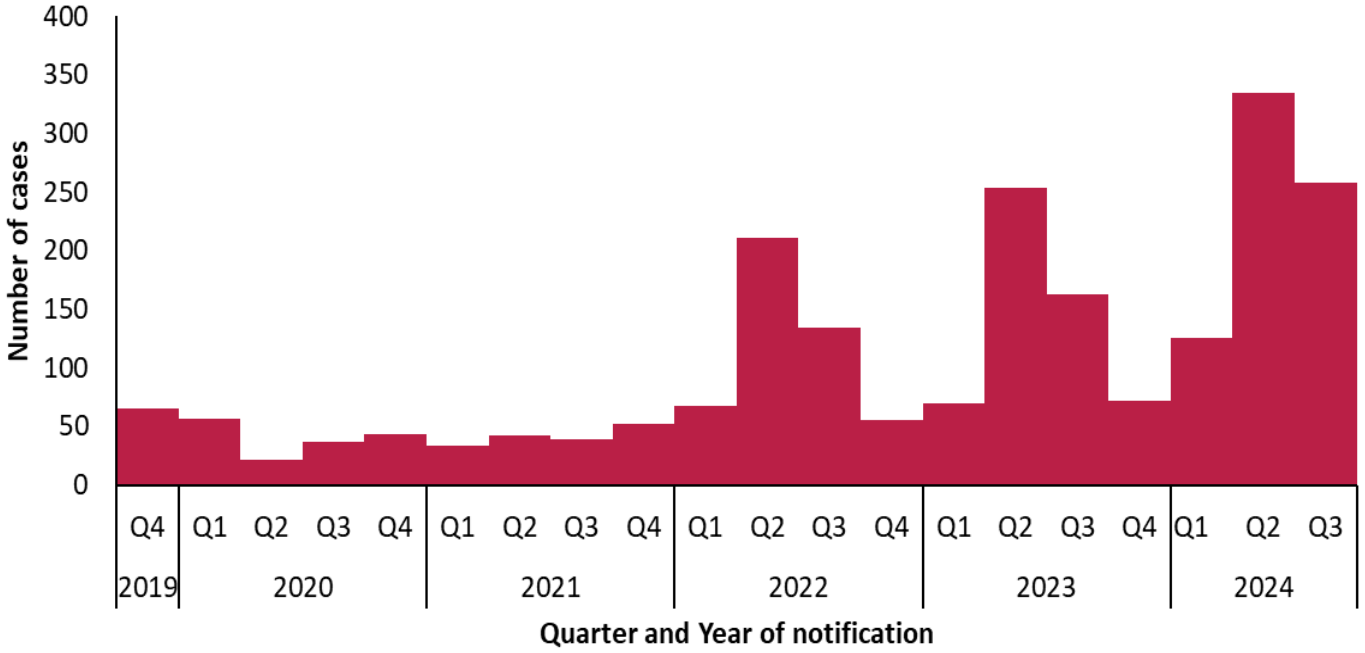
Location	Outbreaks (N)		Total Number ill		Median ill		Range ill	
	Noro	AIG	Noro	AIG	Noro	AIG	Noro	AIG
Hospital	10	0	78	0	7	0	2-22	0
Nursing home	13	8	236	60	14	6	3-51	2-19
Residential institution	0	6	0	33	0	5	0	4-8
Comm. Hosp/Long-stay unit	0	1	0	2	0	2	0	2-2
Other Health care settings	0	0	0	0	0	0	0	0
Non-healthcare settings	3	2	152	79	33	40	8-111	11-68
Total	26	17	466	174	54	53	3-111	2-68

- There were 276 notified cases of Norovirus infection in Q3 2024, this is higher than in Q3 2023 (n=157) but 51% lower than Q2 2024
- 26 Norovirus and 17 AIG outbreaks were reported in Q3 2024. Of these, 23 Norovirus and 15 AIG outbreaks occurred in health care settings (see table)
- The largest norovirus outbreak notified in 2023 was in a non-healthcare setting where the number ill was 111; this outbreak occurred in a social setting and the mode of transmission was person-to-person
- Of 36 representative samples from Q3 sequenced by the NVRL, GII.17 was the most common type at 79% (n=23); This change in predominant genotype, began in Ireland in February 2024, and has been reported elsewhere in Europe and the US[1]

[1] Eurosurveillance | Increased circulation of GII.17 noroviruses, six European countries and the United States, 2023 to 2024

Data sources: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024, the National Virus Reference Laboratory (NVRL) 24/10/2024

Rotavirus in Ireland, Q3 2024



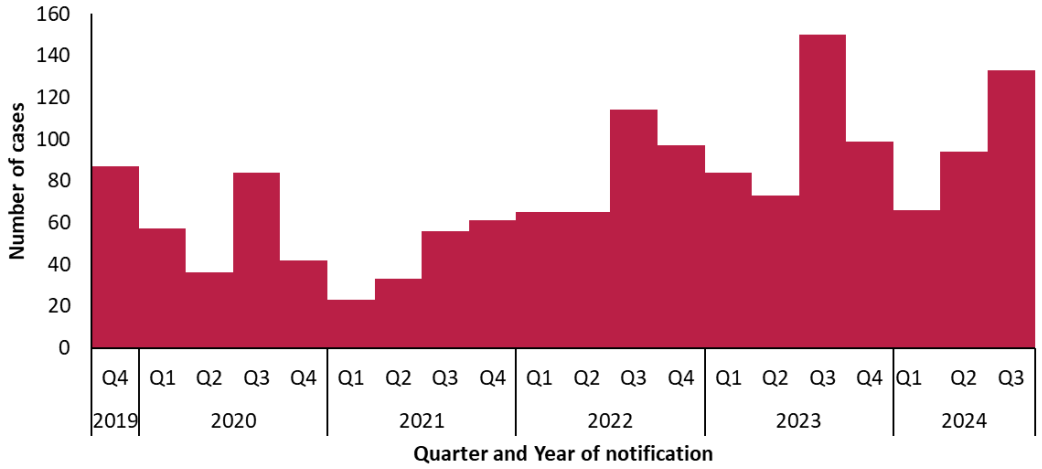
Type	Outbreaks (N)	Number ill	Median ill	Range ill
General	0	n/a	n/a	n/a
Family	0	n/a	n/a	n/a
Total	**0**	**n/a**	**n/a**	**n/a**

- 258 cases of Rotavirus were notified in Q3 2024, higher than 163 in Q3 2023
- Most cases were notified in those aged under 5 years (22% were aged <1 year, 17% were aged 1 year and 34% were aged 2-4 years at the time of notification)
- There were no Rotavirus outbreaks notified in Q3 2024, compared to one Rotavirus outbreak notified in Q3 2023
- Rotarix™ vaccine was introduced in Ireland in December 2016 for all babies born from 1st October 2016 onwards[2]
- Vaccine uptake for Rotavirus has been greater than 89% nationally at 24 months since introduced but remains below the target of ≥95%
- Quarterly and annual immunisation uptake statistics at 12 and 24 months of age for Rotavirus are available on the HPSC website at: https://www.hpsc.ie/a-z/vaccinepreventable/vaccination/immunisationuptakestatistics/

2. Rotavirus Annual Epidemiological Report 2018. Health Protection Surveillance Centre Available at: https://www.hpsc.ie/a-z/gastroenteric/rotavirus/epidemiologicaldata/annualreportsonrotavirus/2018_Rota_20190415_v1.1.pdf

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024

Salmonellosis in Ireland, Q3 2024



Serotype	Travel status			Total
	Domestic	Travel	Unknown	
Salmonella Enteritidis	7	14	3	24
Salmonella Typhimurium inc. monophasic Typhimurium	6	8	5	19
Other serotypes	36	26	28	90
Total	**49**	**48**	**36**	**133**

Outbreak Type	Number of outbreaks	Total number ill	Range number ill
Family	0	N/A	N/A
General	2	16	7-9
Total	**2**	**16**	**7-9**

- 133 cases of salmonellosis were notified in Q3 2024, decreased from 150 in Q3 2023
- Where travel history was known (n=97), 49% of cases were travel-associated and 51% were domestically-acquired
- An association with travel was more common among *S.* Enteritidis cases (58%), while 42% of *S.* Typhimurium cases were travel-associated; travel status was missing for 27% of cases so these data should be interpreted with caution
- Two national outbreaks of salmonellosis were notified in Q3 2024; one was foodborne linked to the consumption of duck eggs and the other was linked to international travel to Portugal

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024

Genomic analysis of non-typhoidal *Salmonella* in Ireland, Q3 2024

Serotype	Number of isolates	Proportion of isolates
Salmonella Enteritidis	29	22%
Salmonella Typhimurium inc. monophasic Typhimurium	24	18%
Salmonella Newport	8	6%
Salmonella Infantis	5	4%
Other serotypes	64	49%
Total	**130**	**100%**

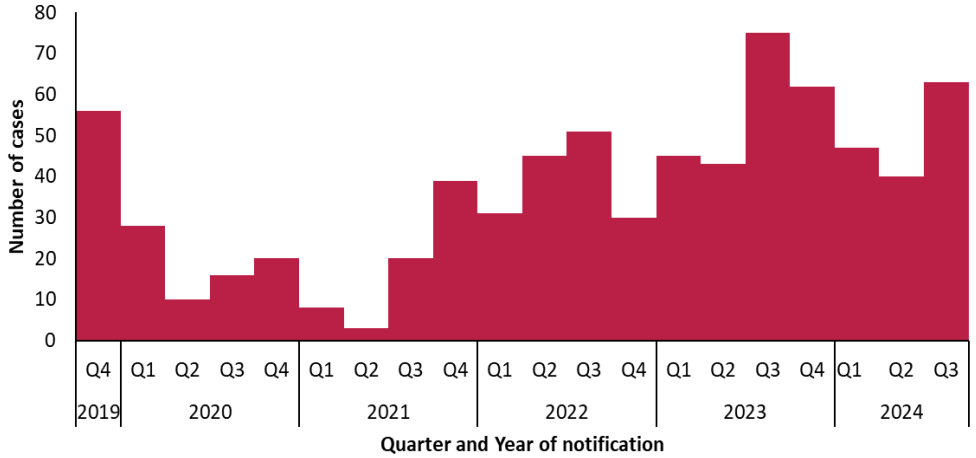
Specimen type	Number of isolates
Faeces	123
Blood	3
Urine	3
Abscess	1
Total	**130**

*The number of isolates sequenced in the NSSLRL may not match the number of cases notified, as dates are based on date received in the laboratory which may not align with notification date. Furthermore, isolates may be sequenced in the NSSLRL for cases that do not meet the criteria for notification under the Irish case definition.

Antimicrobial class	Isolates with resistance markers	
	Number	Proportion
Quinolones	69	53%
Ampicillin	26	20%
Tetracycline	24	18%
Sulphonamides	14	11%
Chloramphenicol	8	6%
Trimethoprim	8	6%
Aminoglycosides	5	4%
Third Generation Cephalosporins	1	1%
Azithromycin	0	0%

- 130 non-typhoidal *Salmonella* (NTS) isolates were sequenced in the NSSLRL in Q3 2024*
- The most frequently seen serotypes were *S*. Enteritidis and *S*. Typhimurium
- 2% of isolates were from bloodstream infections
- Antimicrobial resistance is predicted based on whole genome sequencing (WGS) data

Shigellosis in Ireland, Q3 2024



Travel	Child		Adult Female		Adult Male		Total	
	N	%	N	%	N	%	N	%
Domestic	1	8%	5	29%	12	36%	18	29%
Travel - Europe	1	8%	2	12%	9	27%	12	19%
Travel - Outside Europe	9	69%	9	53%	6	18%	24	38%
Unknown	2	15%	1	6%	6	18%	9	14%
Total	**13**	**100%**	**17**	**100%**	**33**	**100%**	**63**	**100%**

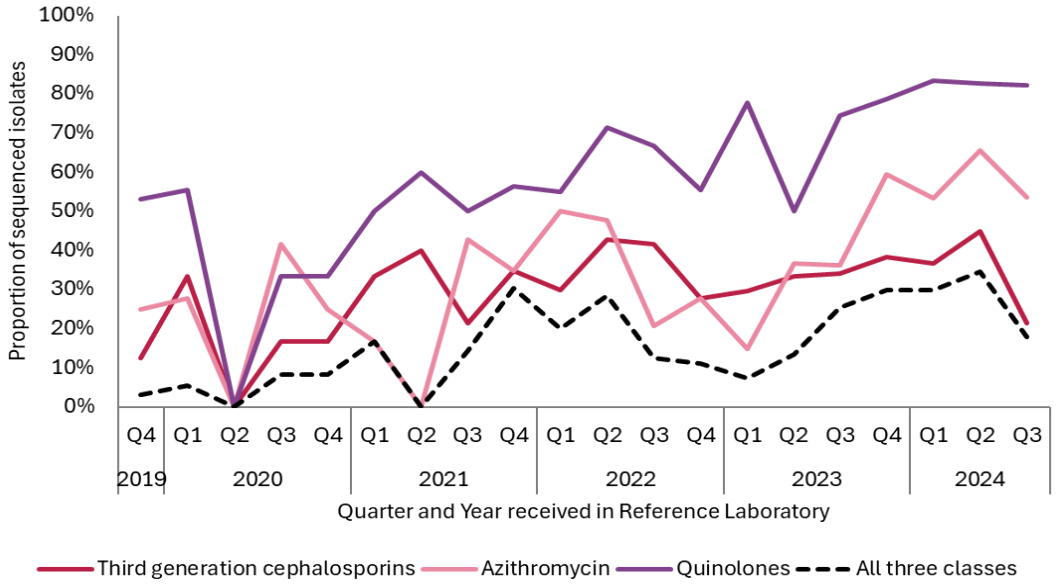
Outbreak Type	Number of outbreaks	Total number ill	Range number ill
Family	0	N/A	N/A
General	0	N/A	N/A
Total	**0**	**N/A**	**N/A**

- 63 cases of shigellosis were notified in Q3 2024 (37 confirmed and 26 probable), decreased from 75 in Q3 2023
- Where travel history was known (86%), 67% were associated with international travel and 33% were domestically-acquired
- Children and adult females were more likely to have been infected outside Europe, while adult males were more likely to have been infected in Ireland or another European country
- Adult males continued to be the group most affected as sexual transmission among gay, bisexual and other men who have sex with men (gbMSM) is a key feature of shigellosis in Ireland
- No outbreaks were notified during Q3 2024

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024

Genomic analysis of *Shigella* in Ireland, Q3 2024

Serotype	Number of isolates	Proportion of isolates
Shigella flexneri	16	57%
Shigella sonnei	11	39%
Shigella dysenteriae	1	4%
Total	**28**	**100%**

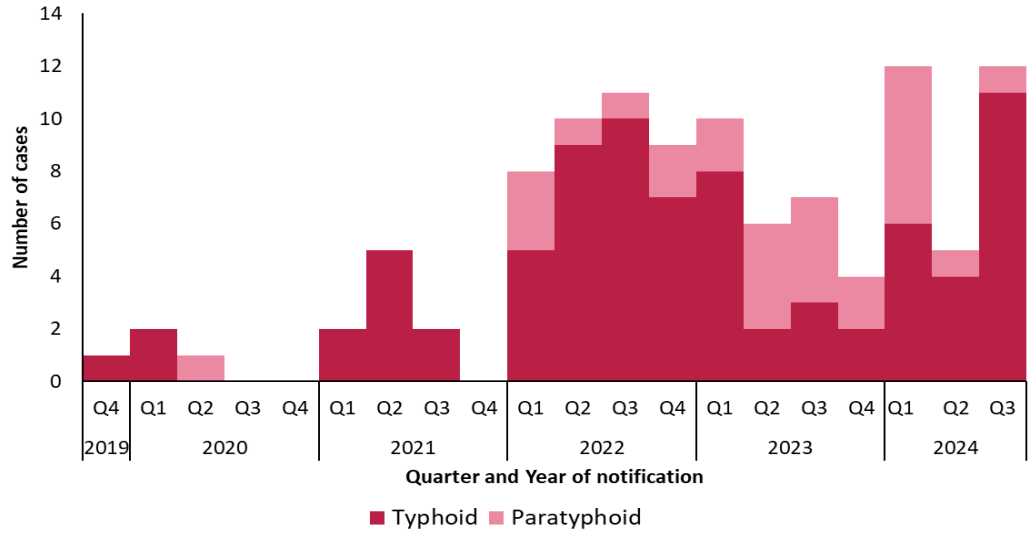


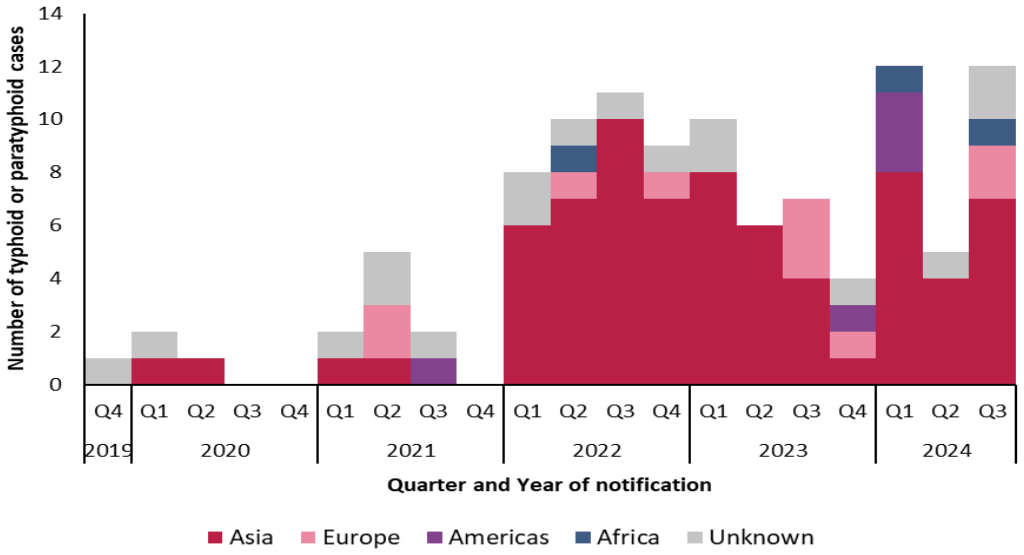
- 28 *Shigella* isolates were sequenced in the NSSLRL in Q3 2024*
- *S. flexneri* was the most frequently seen serotype
- Antimicrobial resistance is predicted based on whole genome sequencing (WGS) data:
  - 82% of isolates were predicted to be fluroquinolone resistant, increased from 74% in Q3 2023
  - 54% were predicted to be azithromycin resistant, increased from 36% in Q3 2023
  - 21% were predicted to be resistant to third generation cephalosporins, decreased from 34% in Q3 2023
  - 18% were predicted to be resistant to all three classes of antimicrobials, decreased from 26% in Q3 2023 and decreased from 30-34% in Q1 and Q2 2024

*The number of isolates sequenced in the NSSLRL may not match the number of cases notified, as dates are based on date received in the laboratory which may not align with notification date. Furthermore, according to the Irish case definition probable cases of shigellosis may be notified when *Shigella* spp. nucleic acid is detected in a clinical specimen in the absence of subsequent culture confirmation.

Data source: National Salmonella, Shigella and Listeria Reference Laboratory (NSSLRL)

Typhoid and Paratyphoid in Ireland, Q3 2024





- Eleven cases of typhoid were notified in Q3 2024, increased from three cases notified in Q3 2023 and increased from six and four cases notified in Q1 and Q2, respectively; this is the highest quarterly number of typhoid cases notified on CIDR since records began in 1988
- One case of paratyphoid was notified in Q3 2024, decreased from four cases notified in Q3 2023
- Where travel history was known (83%), 70% travelled to Asia (most frequently to Pakistan)
- One family outbreak of typhoid, with 3 linked cases was reported in Q3 2024
- Country of infection was reported as Ireland for two cases; these cases were linked to the family outbreak and transmission route was reported as person-to person transmission.

Ireland was reported as country of infection for a small number of cases. These infections were typically secondary infections, following return of a close contact from an endemic country or were laboratory-acquired infections.

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024

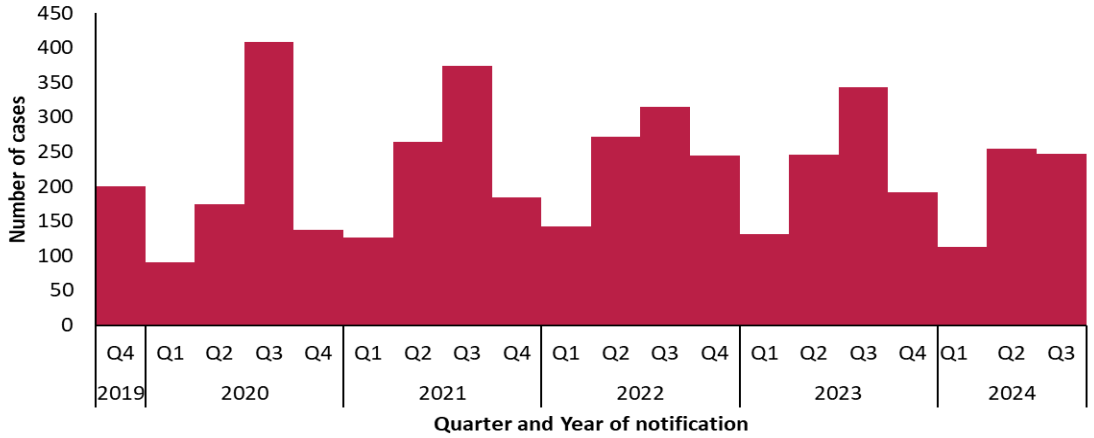
Genomic analysis of *Salmonella* Typhi and Paratyphi in Ireland, Q3 2024

Antimicrobial class	Isolates with resistance markers	
	Number	Proportion
Quinolones	11	100%
Ampicillin	7	64%
Sulphonamides	7	64%
Tetracycline	6	55%
Chloramphenicol	6	55%
Third Generation Cephalosporins	3	27%
Trimethoprim	0	0%
Aminoglycosides	0	0%
Azithromycin	0	0%

- Eleven isolates of *Salmonella* Typhi (n=10) and *S*. Paratyphi A (n=1) were sequenced in the NSSLRL in Q3 2024*
- Antimicrobial resistance is predicted based on whole genome sequencing (WGS) data:
  - All isolates sequenced were predicted to be resistant to quinolones, higher than 73% and 83% in Q1 and Q2, respectively
  - 27% were predicted to be resistant to third generation cephalosporins, decreased from 33% in Q2 2024; 18% of isolates sequenced Q1-Q3 2024 were predicted to be resistant to third generation cephalosporins, comparable to 15% in the same time period in 2023

*The number of isolates sequenced in the NSSLRL may not match the number of cases notified, as dates are based on date received in the laboratory which may not align with notification date. Furthermore, isolates may be sequenced in the NSSLRL for cases that do not meet the criteria for notification under the Irish case definitions for typhoid and paratyphoid.

VTEC in Ireland, Q3 2024



	Bloody diarrhoea		HUS	
	N	% (where known)	N	% (where known)
Yes	77	34%	10	6%
No	148	66%	160	94%
Unknown	7	N/A	34	N/A
Not specified	15	N/A	43	N/A
Total	**247**	**N/A**	**247**	**N/A**

Type	Outbreaks (N)	Number ill	Median ill	Range ill
General	4	13	3	2-5
Family	11	26	2	2-3
Total	**15**	**60**	**2**	**2-18**

- 247 cases of VTEC were notified in Q3 2024, decreased from 343 in Q3 2023
- 45% were admitted to hospital
- 10 (4%) cases of HUS in Q3 2024, compared to 9 (3%) cases of HUS in Q3 2023
- For Q1-3 2024, there were 23 cases of HUS compared to 24 HUS cases during Q1-3 2023
- 15 VTEC outbreaks were reported in Q3 2024; 4 were general outbreaks: 2 in childcare facilities (transmission reported as person to person) and 2 recreational activity outbreaks (1 waterborne and 1 reported as person to person transmission

Patient type	Number of cases	Proportion of cases
Hospital Inpatient	111	45%
GP Patient	94	38%
A&E Patient/Outpatient	34	14%
Other	4	1.5%
Unknown	4	1.5%
Total	**247**	**100%**

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024

Genomic analysis of VTEC in Ireland, Q3 2024

Serogroup	Verotoxin genes	N	%	*eae* positive		*ehxA* positive	
				N	%	N	%
E. coli O157	*vt1*	0	N/A	0	N/A	0	N/A
	vt2	31	76%	30	97%	31	100%
	vt1 + vt2	10	24%	9	90%	9	90%
E. coli O26	*vt1*	14	24%	13	93%	14	100%
	vt2	9	16%	8	89%	8	89%
	vt1 + vt2	34	60%	32	94%	32	94%
Other serogroups	*vt1*	30	38%	15	50%	21	70%
	vt2	20	25%	11	55%	9	45%
	vt1 + vt2	29	37%	7	24%	24	83%

- 177 isolates were sequenced in the VTEC Reference Laboratory*
- The most common serogroups reported among culture confirmed cases were as follows: O26 (32%; n=57), O157 (23%; n=41) and O145 (5%; n=8)
- All O157 were either VT2 (76%) or VT1+2 (24%)
- *eae* and *ehxA* positivity were higher for O157 and O26 isolates than for other serogroups

*The number of isolates sequenced in the Public Health Laboratory, Cherry Orchard (Reference Laboratory) may not match the number of cases notified, as dates are based on date received in the laboratory which may not align with notification date. Furthermore, isolates may be sequenced in the Reference Laboratory for cases that do not meet the criteria for notification under the Irish case definitions for VTEC.

Data source: Computerised Infectious Diseases Reporting (CIDR) system 21/10/2024 and Public Health Laboratory, Cherry Orchard 08/10/2024