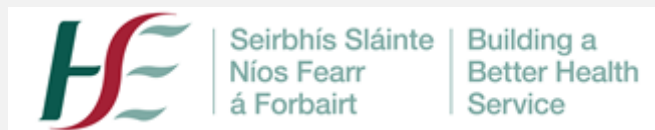


SURVEILLANCE OF INFECTIOUS INTESTINAL (IID), ZONOTIC AND VECTORBORNE DISEASE, AND OUTBREAKS OF INFECTIOUS DISEASE IN IRELAND



A quarterly report by the Health Protection Surveillance Centre in collaboration with the Departments of Public Health

Quarter 3–2018

December 2018

This is the third quarterly report for 2018 produced by the Gastroenteric Unit of the Health Protection Surveillance Centre.

The production of this quarterly report would not be possible without the valuable input and commitment from the Directors of Public Health, Specialists in Public Health Medicine, Surveillance Scientists, Clinical Microbiologists, General Practitioners, Hospital Clinicians, Infection Control, Environmental Health and laboratory personnel, and other professionals who provide the data for the HPSC's surveillance systems.

Note: Data are collected and analysed using the Computerised Infectious Disease Reporting (CIDR) system. The data in this report are provisional and will not be regarded as final until all returns are received and data have been validated.

OUTBREAK SURVEILLANCE

Table 1. General outbreaks of infectious intestinal disease (IID) in Q3, 2018

Month	HSE area	Location	No. ill *	No. Hosp.	Date Onset	Suspect mode of transmission	Disease
Jul	NW	Nursing home	4	0	02/07/2018	P-P	AIG
Jul	HPSC	Community outbreak	86	44	04/06/2018	Unknown	VTEC
Jul	S	Childcare facility			23/06/2018	P-P	VTEC
Jul	W	Childcare facility	20	4	20/06/2018	Unknown	VTEC
Jul	SE	Residential institution	2	0	06/07/2018	P-P & AB	AIG
Jul	S	Childcare facility			10/07/2018	P-P	Noroviral infection
Jul	S	Childcare facility	7	0	12/06/2018	P-P	VTEC
Jul	S	Childcare facility	5		01/07/2018	Not Specified	VTEC
Jul	NE	Nursing home	21	2	23/07/2018	P-P	Noroviral infection
Jul	E	Nursing home	14		28/07/2018	P-P	AIG
Aug	E	Other	2		01/05/2018	Unknown	Giardiasis
Aug	NE	Childcare facility	2		15/07/2018	Unknown	VTEC
Aug	E	Nursing home	11		19/07/2018	P-P	AIG
Aug	MW	Comm. Hosp/Long-stay unit	14		29/07/2018	P-P & AB	Noroviral infection
Aug	NW	Nursing home	13	2	04/08/2018	P-P	AIG
Aug	M	Nursing home	1	0	31/07/2018	Unknown	VTEC
Aug	SE	Comm. Hosp/Long-stay unit	30		08/08/2018	P-P	Noroviral infection
Aug	M	Hospital	3			Unknown	Noroviral infection
Aug	E	Hospital	6	6	20/08/2018	P-P	Noroviral infection
Aug	M	Hotel	3	0		Unknown	Noroviral infection
Aug	S	Nursing home			18/08/2018	P-P	Noroviral infection
Aug	NW	Residential institution	3		30/08/2018	P-P	AIG
Aug	W	Hotel	2	0		FB	Campylobacter infection
Sep	W	Nursing home	22	0	02/09/2018	P-P	Noroviral infection
Sep	E	Nursing home	37	0	31/08/2018	P-P & AB	Rotavirus infection
Sep	M	Comm. Hosp/Long-stay unit	14			Not Specified	Noroviral infection
Sep	S	Residential institution	4	0	04/09/2018	P-P	AIG
Sep	E	School	15		12/09/2018	P-P	AIG
Sep	NW	Nursing home	6	0	06/09/2018	P-P	Noroviral infection
Sep	NE	Residential institution	4	0	09/09/2018	P-P	AIG
Sep	S	Residential institution	7	0	16/09/2018	P-P	AIG
Sep	E	Comm. Hosp/Long-stay unit	2		24/09/2018	P-P	Noroviral infection
Sep	M	Comm. Hosp/Long-stay unit	4		18/09/2018	Unknown	Noroviral infection
Sep	NE	Residential institution	2			P-P	AIG
Sep	E	Nursing home	11		21/09/2018	P-P	Noroviral infection

P-P denotes Person-to-Person transmission, FB denotes foodborne, WB denotes waterborne; AB denotes airborne; AIG denotes Acute Infectious Gastroenteritis (unspecified); VTEC denotes infection with Verotoxigenic *E. coli*; NK=unknown

* Total numbers ill does not include asymptomatic cases

Table 2. Family outbreaks of infectious intestinal disease (IID) in Q3, 2018

Month	HSE area	Location	No. ill *	No. Hosp.	Date Onset	Suspect mode of transmission	Disease
Jul	M	Private house	1	0	11/06/2018	Unknown	VTEC
Jul	M	Private house				Unknown	VTEC
Jul	M	Private house	1	1		Unknown	VTEC
Jul	M	Private house	1	1	26/02/2018	Unknown	VTEC
Jul	M	Private house				Unknown	VTEC
Jul	M	Private house	1	0	02/07/2018	Unknown	VTEC
Jul	NW	Private house	3	1	28/06/2018	P-P	VTEC
Jul	M	Private house	1	1	04/07/2018	Unknown	VTEC
Jul	S	Private house	2	0	12/06/2018	P-P	VTEC
Jul	M	Travel related	1	0	01/07/2018	Unknown	VTEC
Jul	M	Private house	1	0	06/07/2018	WB & Animal	VTEC
Jul	E	Private house			25/06/2018	P-P & Animal	VTEC
Jul	M	Private house	2	0	13/07/2018	Unknown	VTEC
Jul	S	Private house	2	0		P-P	VTEC
Jul	W	Private house	2	0	04/07/2018	P-P & FB	VTEC
Jul	M	Private house	1	1	14/07/2018	Unknown	VTEC
Jul	M	Private house	1	0	02/07/2018	Unknown	VTEC
Jul	SE	Other	4	0	14/07/2018	Unknown	AIG
Jul	W	Private house	2		28/06/2018	Unknown	VTEC
Jul	M	Private house	1	0	23/07/2018	Unknown	VTEC
Jul	M	Private house	1	0	20/07/2018	Not Specified	VTEC
Aug	M	Private house	2	0	23/07/2018	Unknown	VTEC
Aug	SE	Private house	3	0	23/06/2018	P-P	Shigellosis
Aug	M	Private house	1			Unknown	VTEC
Aug	S	Private house	2		25/06/2018	P-P	VTEC
Aug	SE	Private house	2	0	15/06/2018	P-P & FB	VTEC
Aug	M	Not Specified				Not Specified	VTEC
Aug	W	Private house	2	0	11/07/2018	Not Specified	Cryptosporidiosis
Aug	E	Private house	3	2	24/07/2018	Unknown	VTEC
Aug	M	Private house				Unknown	VTEC
Aug	M	Private house	1	1	24/07/2018	Unknown	VTEC
Aug	NW	Private house	5	3	31/07/2018	P-P	Rotavirus infection
Aug	E	Private house	3			Unknown	Giardiasis
Aug	S	Private house	2	1	30/07/2018	P-P	VTEC
Aug	M	Private house	1	1		Unknown	VTEC
Aug	MW	Private house	1	0	01/12/2017	P-P	VTEC
Aug	MW	Private house	1	0	27/03/2018	P-P	VTEC
Aug	W	Private house	2	0	17/08/2018	Unknown	VTEC
Aug	W	Private house	2	0	05/08/2018	Unknown	VTEC
Aug	M	Private house	1		03/08/2018	Unknown	VTEC
Aug	M	Private house	2	0	14/08/2018	Unknown	VTEC
Aug	E	Private house	1			Unknown	VTEC
Aug	M	Travel related	2	0	24/07/2018	WB	Giardiasis
Aug	M	Private house	1			Not Specified	VTEC
Sep	M	Not Specified				Unknown	VTEC
Sep	M	Private house	1		30/08/2018	Unknown	VTEC
Sep	NE	Private house	1		21/07/2018	P-P	VTEC

Sep	E	Private house	2		22/08/2018	Unknown	VTEC
Sep	M	Not Specified			30/08/2018	Not Specified	VTEC
Sep	M	Not Specified			18/08/2018	Unknown	VTEC
Sep	M	Private house	1	1	21/08/2018	Unknown	VTEC
Sep	M	Private house	1	0	24/08/2018	Not Specified	VTEC
Sep	W	Private house	2		13/08/2018	P-P & Animal	VTEC
Sep	MW	Private house	3	0	15/08/2018	Unknown	VTEC
Sep	S	Private house	2	0	18/08/2018	P-P & FB	VTEC
Sep	MW	Private house			31/08/2018	P-P	VTEC
Sep	NW	Private house	2	2	25/08/2018	Unknown	Cryptosporidiosis
Sep	E	Unknown	3		10/08/2018	Unknown	Giardiasis
Sep	W	Private house	2	1	30/08/2018	P-P	VTEC
Sep	M	Private house	1		13/09/2018	Unknown	VTEC
Sep	M	Private house			11/09/2018	Unknown	VTEC
Sep	W	Private house	2	0	31/07/2018	P-P	VTEC
Sep	W	Private house	2		15/08/2018	P-P	VTEC
Sep	SE	Private house	1	1	12/09/2018	P-P	VTEC
Sep	S	Private house			04/09/2018	Animal contact	VTEC

P-P denotes Person-to-Person transmission, FB denotes foodborne, WB denotes waterborne; AB denotes airborne; AIG denotes Acute Infectious Gastroenteritis; VTEC denotes infection with Verotoxigenic *E. coli* NK denotes unknown

* Total numbers ill does not include asymptomatic cases

Table 3. Non-IID outbreaks in Q3, 2018

Month	HSE area	Type of outbreak	Location	No. ill *	No. Hosp.	Date Onset	Suspect mode of transmission	Organism
Jul	E	General	Hospital	2 colonised		20/06/2018	P-P	CPE
Jul	S	Family	Extended family			15/05/2018	P-P	Pertussis
Jul	S	General	Comm. Hosp/Long-stay unit	12		08/07/2018	P-P	Acute respiratory infection
Jul	NE	General	Hospital	2 colonised			P-P	Enterobacter cloacae oxa-48
Jul	E	General	Other	17	2	05/07/2018	P-P & AB	Measles
Jul	SE	General	Hospital	2 colonised			P-P	CPE
Jul	E	General	Hospital	2 colonised			P-P	CPE
Jul	W	General	Childcare facility	15	1	04/07/2018	Unknown	Adenovirus
Jul	SE	General	Hospital	6 colonised			Environmental / Fomite	CPE
Jul	SE	General	Hospital	4		16/07/2018	P-P	Acute respiratory infection
Aug	E	General	Hospital	3	3		Environmental / Fomite	Aspergillus
Aug	E	General	Hospital	2 colonised			P-P	CPE
Aug	MW	General	Community outbreak	6		25/07/2018	P-P & AB	Mumps
Aug	E	General	Hospital	3 colonised	3		P-P	CPE
Aug	S	General	Hospital	2 colonised			Not Specified	CPE
Aug	MW	General	Hospital	3	3	23/07/2018	P-P	MRSA
Aug	SE	General	Workplace	3	1	31/07/2018	P-P	Measles
Aug	S	General	Unknown	7	7		P-P	Viral meningitis
Sep	NE	Family	Private house	2	2		P-P	Influenza
Sep	NE	General	Hospital	2 colonised			P-P	CPE
Sep	W	General	Nursing home	7			P-P	Clostridium difficile

Month	HSE area	Type of outbreak	Location	No. ill *	No. Hosp.	Date Onset	Suspect mode of transmission	Organism
								infection
Sep	E	General	Hospital	4	4	05/09/2018	P-P	Clostridium difficile infection
Sep	E	General	Hospital	2	2	15/09/2018	P-P	Clostridium difficile infection
Sep	E	General	Comm. Hosp/Long-stay unit	2 colonised		06/09/2018	P-P	CPE

P-P denotes Person-to-Person transmission, WB denotes waterborne; AB denotes airborne; NK denotes unknown; CPE denotes Carbapenem-resistant Enterobacteriaceae; RSV denotes Respiratory syncytial virus; Pts denotes Patients.

* Total numbers ill does not include asymptomatic cases.

Since July 2001, outbreaks have been reported to HPSC. Preliminary information is provided by a public health professional when the outbreak is first notified. Further information is provided by the lead investigator once more complete data are available.

The data requested includes information on the source of reporting of the outbreak, the extent of the outbreak, mode of transmission, location, pathogen involved, laboratory investigation, morbidity and mortality data, suspect vehicle and factors contributing to the outbreak. The data provided are crucial in providing information on the reasons why the outbreak occurred, the factors that lead to the spread of disease and the lessons that can be learnt to prevent further such outbreaks.

Since the 1st January 2004, with the amendment to the Infectious Diseases Regulations (2003), there is a statutory requirement for medical practitioners and clinical directors of a diagnostic laboratory to notify to the medical officer of health 'any unusual clusters or changing patterns of any illness, and individual cases thereof, that may be of public health concern'.

Tables 1 and 2 present a line listing of all general and family outbreaks of IID reported to HPSC in the third quarter of 2018. There were 35 general and 65 family IID outbreaks reported during this period, resulting in at least 456 people being ill.

Norovirus (n=14) and Acute infectious gastroenteritis (n= 11) were responsible for the most general outbreaks of IID (71%).

Twenty-four general IID outbreaks were transmitted person-to-person/person-to-person & airborne (68%). Twenty-five general IID outbreaks (71%) were reported to have occurred in healthcare settings, i.e. hospitals or residential institutions, during this period.

The most common cause of family outbreaks of IID was VTEC (n=57) [88%]. Other pathogens responsible for family outbreaks in Q3 2018 were AIG, cryptosporidiosis, giardiasis, rotavirus and shigellosis (Table 2).

There were twenty-four non-IID outbreaks reported during Q3 2018 (Table 3). The most common cause of non IID outbreaks was during this period was CPE (Carbapenemase Producing Enterobacteriaceae) (n=9) [38%]. All CPE colonisations reported in Q3 2018 occurred in healthcare settings.

Table 4 outlines the outbreak rate per HSE-area for outbreaks notified during Q3 2018.

Table 4. Number of infectious disease outbreaks by HSE Area, Q3 2018

HSE Area	No. of outbreaks	Rate per 100,000 population
E	23	1.3
M	37	13.0
MW	7	2.0
NE	8	2.0
NW	7	3.0
SE	10	2.0
S	17	2.4
W	14	3.0
Total	123	2.6

NOTIFICATIONS OF INFECTIOUS INTESTINAL, ZONOTIC AND VECTORBORNE DISEASE

The number of notifications of infectious intestinal, zoonotic and vectorborne disease by HSE-Area for the third quarter of 2018 is shown in Table 5.

Table 5. Infectious intestinal, zoonotic and vectorborne disease notifications Q3, 2018 by HSE-Area

Infectious Intestinal Disease	E	M	MW	NE	NW	SE	S	W	Total
<i>Bacillus cereus</i> foodborne infection/intoxication	0	0	0	0	0	0	0	0	0
Botulism	0	0	0	0	0	0	0	0	0
<i>Campylobacter</i> infection ¹	308	49	59	77	33	93	127	74	820
Cholera	0	0	0	0	0	0	0	0	0
<i>Clostridium perfringens</i> (type A) food-borne disease	0	0	0	0	0	0	0	0	0
Cryptosporidiosis	18	13	5	4	4	9	12	16	81
Giardiasis	25	4	4	0	1	13	14	6	67
Listeriosis	4	1	0	0	0	3	0	2	10
Noroviral infection ²	115	16	17	22	3	2	34	13	222
Paratyphoid	~	~	~	~	~	~	~	~	2
Rotavirus infection ³	56	12	8	19	7	17	39	14	172
Salmonellosis	49	12	11	29	7	12	21	8	149
Shigellosis	19	0	7	2	1	5	3	0	37
Staphylococcal food poisoning	0	0	0	0	0	0	0	0	0
Typhoid	~	~	~	~	~	~	~	~	4
Verotoxigenic <i>Escherichia coli</i> infection	87	59	47	46	13	65	93	90	500
Yersiniosis	2	0	0	1	0	0	0	0	3
Zoonotic Disease									
Anthrax	0	0	0	0	0	0	0	0	0
Brucellosis	0	0	0	0	0	0	0	0	0
Echinococcosis	0	0	0	0	1	0	0	0	1
Leptospirosis	1	0	0	0	0	1	1	0	3
Plague	0	0	0	0	0	0	0	0	0
Q Fever	0	0	0	0	0	0	0	0	0
Rabies	0	0	0	0	0	0	0	0	0
Toxoplasmosis	3	0	1	0	0	1	0	1	6
Trichinosis	0	0	0	0	0	0	0	0	0
Vectorborne Disease									
Chikungunya disease	0	0	0	0	0	0	0	0	0
Dengue	4	0	1	0	0	0	0	0	5
Lyme disease (neuroborreliosis)	0	0	0	0	0	2	2	0	4
Malaria	7	1	0	1	0	4	2	1	16
Typhus	0	0	0	0	0	0	0	0	0
West Nile fever	0	0	0	0	0	0	0	0	0
Zika Virus Infection	0	0	0	0	0	0	0	0	0

¹ From August 2017, campylobacter notifications from HSE-East re based on laboratory testing results rather than patient episodes. Notifications from HSE-E may also refer to area of laboratory testing rather than area of patient residence.

² Between March 2013 and July 2017, norovirus notifications from HSE-East were based on laboratory testing results rather than patient episodes. Notifications from HSE-E may also refer to area of laboratory testing rather than area of patient residence.

³ Between March 2013 and July 2017, rotavirus notifications from HSE-East were based on laboratory testing results rather than patient episodes. Notifications from HSE-E may also refer to area of laboratory testing rather than area of patient residence.

SALMONELLA ENTERICA

Human salmonellosis (*S. enterica*) is a notifiable disease. The National *Salmonella*, *Shigella* and *Listeria* Reference Laboratory (NSSLRL) in Ireland was established in 2000 in the Dept. of Medical Microbiology, University College Hospital, Galway. This laboratory accepts *S. enterica* isolates from all clinical and food laboratories in Ireland for serotyping, phage typing and antimicrobial sensitivity testing. Table 6 shows the number of salmonellosis notifications by HSE-Area and month for the third quarter of 2018. Comparison of trends with previous years is shown in Figure 1.

Table 6. Salmonellosis notifications by HSE-Area and month, Q3 2018

Month	E	M	MW	NE	NW	SE	S	W	Total
Jul	12	3	7	4	4	1	7	0	38
Aug	19	4	2	4	0	4	11	4	48
Sep	18	5	2	21	3	7	3	4	63
Total	49	12	11	29	7	12	21	8	149

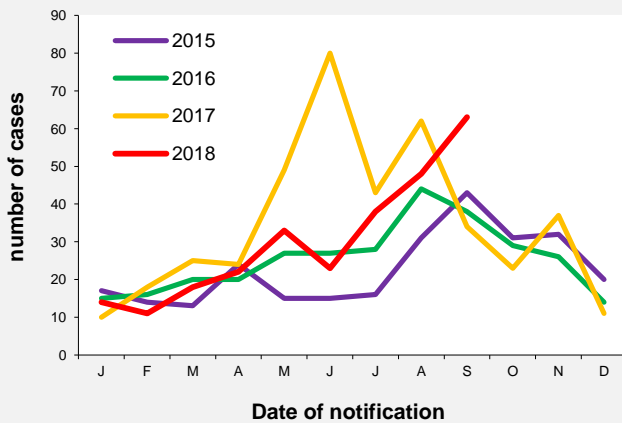


Figure 1. Seasonal distribution of human salmonellosis notifications, 2015 to end Q3 2018

Table 7 shows the serotypes for the *Salmonella* isolates typed by the NSSLRL in the third quarter of 2018 by HSE area (n=147). The commonest human serotypes reported this quarter were *S. Typhimurium** (n=45, 31%) and *S. Enteritidis* (n=31, 21%).

Table 7. Serotypes of human *Salmonella* isolates referred to NSSLRL Q3 2018

Serotype	E	M	MW	NE	NW	SE	S	W	Total
4,[5],12:i:-	7	3	1	11	0	1	5	0	28
Agama	0	0	1	0	1	0	0	0	2
Agona	2	0	0	0	0	0	1	0	3
Ajiobo	1	0	0	0	0	0	0	0	1
Bareilly	1	0	0	0	0	0	0	0	1
Bochum	0	0	0	0	1	0	0	0	1
Bovismorbificans	0	0	0	0	0	2	0	0	2
Braenderup	1	1	1	1	0	0	0	0	4
Bredeney	1	0	0	1	0	0	0	0	2
Chester	0	0	0	1	0	0	1	0	2
Coeln	1	0	0	0	0	0	0	0	1
Derby	1	0	0	0	0	0	0	0	1
Enteritidis	7	6	3	5	1	3	4	2	31
Goldcoast	0	0	0	0	0	0	0	1	1
Heidelberg	1	0	0	0	0	0	0	0	1
Idikan	1	0	0	0	0	0	0	0	1
IIIb 61:c:z35	1	0	0	0	0	0	0	0	1
Infantis	2	0	0	0	0	0	1	0	3
Isangi	0	0	0	0	0	1	0	0	1
Java	0	0	0	0	0	0	3	0	3
Kentucky	4	0	0	0	0	0	1	0	5
Kingston	2	0	0	0	0	0	0	0	2
Litchfield	1	0	0	0	0	0	0	0	1
London	1	0	0	0	0	0	0	0	1
Mbandaka	0	0	0	0	0	0	1	0	1
Newport	3	0	0	1	2	0	2	1	9
Panama	0	0	0	0	0	0	1	0	1
Paratyphi A	~	~	~	~	~	~	~	~	2
Rissen	1	0	0	0	0	1	0	0	2
Saintpaul	0	0	0	0	1	0	0	0	1
Schwarzengrund	2	0	0	0	0	0	0	0	2
Stanley	3	0	0	0	0	0	0	1	4
Teko	0	1	0	0	0	0	0	0	1
Teitelkebir	0	0	0	0	0	1	0	0	1
Thompson	0	0	0	0	1	0	0	0	1
Typhi	~	~	~	~	~	~	~	~	3
Typhimurium	4	1	3	1	1	3	2	2	17
Unnamed	1	0	0	0	0	0	0	0	1
Virchow	2	0	0	0	0	0	0	0	2
Total	53	12	9	21	8	13	24	7	147

Data Source: NSSLRL

*Includes 28 cases of monophasic *S. Typhimurium* 4,5,12:i:-

Table 8. Confirmed *Salmonella* notifications by serotype and travel status, Q3 2018 [n(%)]

Serotype	Indigenous	Travel-associated	Unk/not specified	Total
S. Enteritidis	8 (18%)	19 (26%)	6 (22%)	33 (23%)
S. Typhimurium*	19 (41%)	19 (26%)	8 (30%)	46 (32%)
Other	17 (37%)	32 (45%)	11 (41%)	60 (41%)
<i>Salmonella</i> spp	2 (4%)	2 (3%)	2 (7%)	6 (4%)
Total	46 (100%)	72 (100%)	27 (100%)	145 (100%)

Note: Data source CIDR. Travel status is inferred from *Country of Infection* variable on CIDR.

Note excludes probable notifications

* Includes monophasic *S. Typhimurium* 4,5,12:i:-

Table 8 shows the serotype distribution of confirmed *Salmonella* cases by travel status this quarter among salmonellosis notifications on CIDR. 49% (n=72) were travel-associated, 32% (n=46) were indigenous and for 27 cases, the country of infection was unknown/not specified.

S. Typhi* and *S. Paratyphi

There were four cases of typhoid reported in Q3 2018 – one associated with travel to East Africa and three associated with travel to the Indian Sub-Continent.

There were two cases of Paratyphoid notified this quarter, both associated with travel to India.

Outbreaks of *S. Typhi* and *S. Paratyphi*

There were no outbreaks of typhoid or paratyphoid notified in Q3 2018.

Outbreaks of salmonellosis

There were no outbreaks of salmonellosis notified in Q3 2018. (Tables 1 & 2).

VEROTOXIGENIC *E. COLI* (VTEC)

Verotoxigenic *E. coli* (VTEC) became a notifiable disease on January 1st 2012. Previously, VTEC were notified under the category of Enterohaemorrhagic *E. coli* between 2004 and 2011.

Five hundred cases of VTEC were notified this quarter, the regional distribution of which is shown in Table 9. This compares with 353 VTEC cases notified in Q3 2017 and 318 in Q3 2016 (figure 2).

Table 9 shows the number of VTEC cases reported by case classification and HSE-area and Table 10 shows the number of VTEC cases by serogroup and month, Q3 2018.

Table 9. Number VTEC notified by case classification and HSE-area, Q3 2018

Case classification	E	M	MW	NE	NW	SE	S	W	Total
Confirmed	85	46	42	38	13	63	92	77	456
Probable	2	13	5	8	0	2	1	13	44
Possible	0	0	0	0	0	0	0	0	0
Total	87	59	47	46	13	65	93	90	500

Table 10. VTEC notified by serogroup and month, Q3 2018

Month	O157	O26	Other	Total
Jul	78	70	67	215
Aug	18	38	84	140
Sep	40	34	71	145
Total	136	142	222	500

Twenty-four VTEC cases notified this quarter were reported as having developed HUS – ten O26, nine O157, one O146, one O146 and three ungroupable strains.

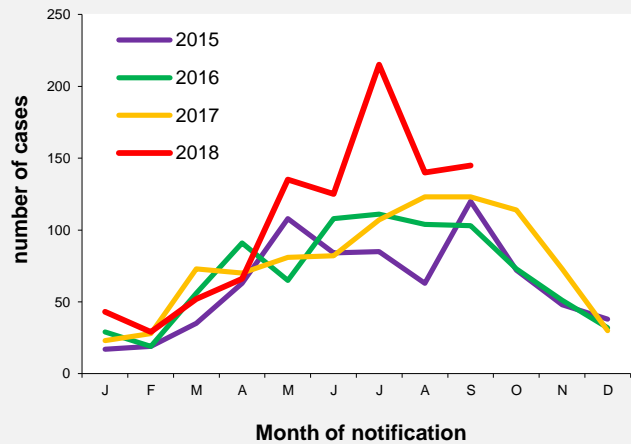


Figure 2. Seasonal distribution of VTEC cases notified 2015 to end Q3 2018

The HSE-DML Public Health Laboratory at Cherry Orchard Hospital, Dublin provides a national *E. coli* O157 and non-O157 diagnostic service for clinical samples, including *E. coli* serotyping, verotoxin detection and VTEC molecular typing. Table 11 shows the *vt* types of VTEC cases notified in Q3 2018.

Table 11. Verotoxin typing profiles of *E. coli* referred to the HSE DML Public Health Laboratory, Cherry Orchard Hospital in Q3 2018

Serogroup	<i>vt</i> 1	<i>vt</i> 2	<i>vt</i> 1+ <i>vt</i> 2	Not spec.	Total
O157	0	54	74	8	136
O26	24	1	113	4	142
Other	59	93	37	33	222
Total	83	148	224	45	500

Data Source: PHL Cherry Orchard

Outbreaks of VTEC infection

There were seven general and fifty-seven family outbreaks of VTEC infection reported during this quarter (Tables 1 & 2).

CAMPYLOBACTER

Human campylobacteriosis became a notifiable disease on January 1st 2004. Prior to this, human campylobacter infection was notified under the category of 'Food Poisoning (bacterial other than Salmonella)'. The notifications for the third quarter of 2018 are shown in Table 12. There were 820 cases of campylobacteriosis notified in Q3 2018 compared to 797 in the same period in 2017 and 759 in Q3 2016 (Figure 3).

From August 2017, campylobacter notifications from HSE-East are based on laboratory testing results rather than patient episodes. Notifications from HSE-E may also refer to area of laboratory testing rather than area of patient residence.

Table 12. Campylobacter notifications by HSE-Area and month, Q3 2018

Month	E	M	MW	NE	NW	SE	S	W	Total
Jul	92	24	30	23	12	36	39	27	283
Aug	120	14	15	31	11	39	56	28	314
Sep	96	11	14	23	10	18	32	19	223
Total	308	49	59	77	33	93	127	74	820

Outbreaks of Campylobacter infection

There was one general outbreak of campylobacteriosis reported in Q3 2018 (Tables 1 and 2).

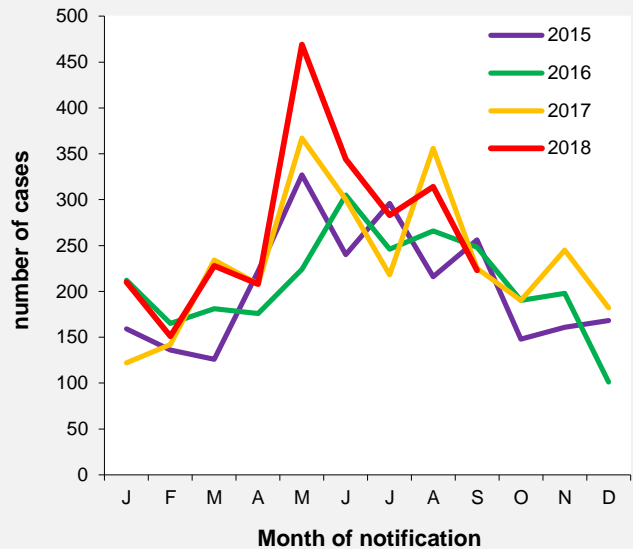


Figure 3. Seasonal distribution of Campylobacter notifications 2015 to end Q3 2018

CRYPTOSPORIDIUM

Human cryptosporidiosis became a notifiable disease on January 1st 2004. Prior to this, cryptosporidiosis was notifiable in Ireland only in young children under the category 'Gastroenteritis in Children Under 2'. In Q3 2018, 81 cases of cryptosporidiosis were notified (Table 13), compared to 108 in the same period in 2017 and 73 in Q3 2016 (Figure 4).

Table 13. Cryptosporidiosis notifications by HSE-Area and month, Q3 2018

Month	E	M	MW	NE	NW	SE	S	W	Total
Jul	4	2	2	2	1	2	6	5	24
Aug	5	6	2	1	0	3	4	6	27
Sep	9	5	1	1	3	4	2	5	30
Total	18	13	5	4	4	9	12	16	81

Outbreaks of cryptosporidiosis

There were two family outbreaks of cryptosporidiosis reported in quarter 3 2018 (Tables 1 and 2).

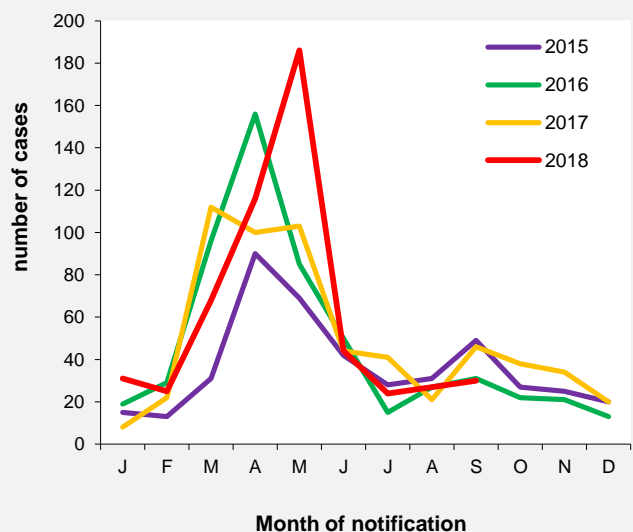


Figure 4. Seasonal distribution of cryptosporidiosis notifications 2015 to end Q3 2018

NOROVIRUS

Human noroviral infection became a notifiable disease on January 1st 2004. Since March 2013, norovirus notifications from HSE-East are based on laboratory testing results rather than patient episodes. Notifications from HSE-E may also refer to area of laboratory testing rather than area of patient residence.

There were 222 cases notified in the third quarter of 2018 (Table 14). These data are certainly an under-ascertainment of the true burden of disease due to this pathogen.

Table 14. Norovirus notifications by HSE-Area and month, Q3 2018

Month	E	M	MW	NE	NW	SE	S	W	Total
Jul	32	0	2	5	1	0	16	6	62
Aug	53	9	10	12	0	2	11	2	99
Sep	30	7	5	5	2	0	7	5	61
Total	115	16	17	22	3	2	34	13	222

Norovirus outbreaks

Norovirus or suspect viral aetiology is the commonest cause of outbreaks of acute

gastroenteritis in Ireland. In the third quarter of 2018, there were fourteen outbreaks confirmed as being caused by this virus, involving at least 136 people becoming ill, as outlined in tables 1 & 2. The seasonal trend is outlined in figure 5.

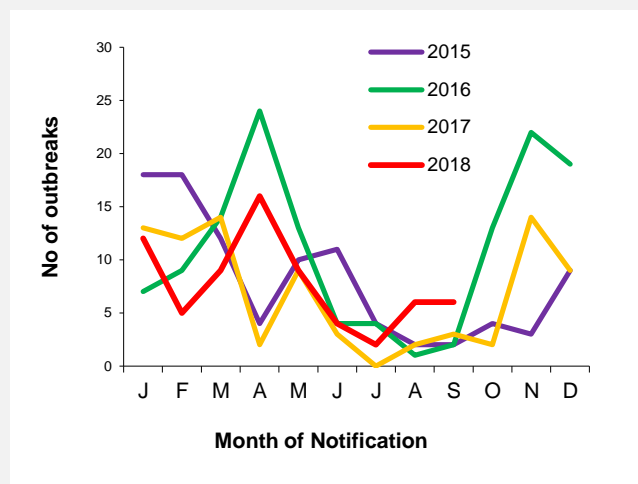


Figure 5. Seasonal distribution of confirmed norovirus outbreaks, 2015 to end Q3 2018

ROTAVIRUS INFECTION

Prior to 2004, rotavirus cases were notified under the “Gastroenteritis in children under two years” disease category. From 2004 to 2010, rotavirus was notifiable in all age groups under the “Acute Infectious Gastroenteritis” (AIG) disease category, until it became notifiable as a disease in its own right under the Infectious Diseases (Amendment) Regulations 2011 (S.I. No. 452 of 2011). Between March 2013 and July 2017, rotavirus notifications from HSE-East were based on laboratory testing results rather than patient episodes.

Rotavirus notifications for the third quarter of 2018 are shown in Table 15 and Figure 6.

Table 15. Rotavirus infection by HSE-Area and month, Q3 2018

Month	E	M	MW	NE	NW	SE	S	W	Total
Jul	21	8	4	6	1	10	17	5	72
Aug	14	3	3	8	3	7	17	2	57
Sep	21	1	1	5	3	0	5	7	43
Total	56	12	8	19	7	17	39	14	172

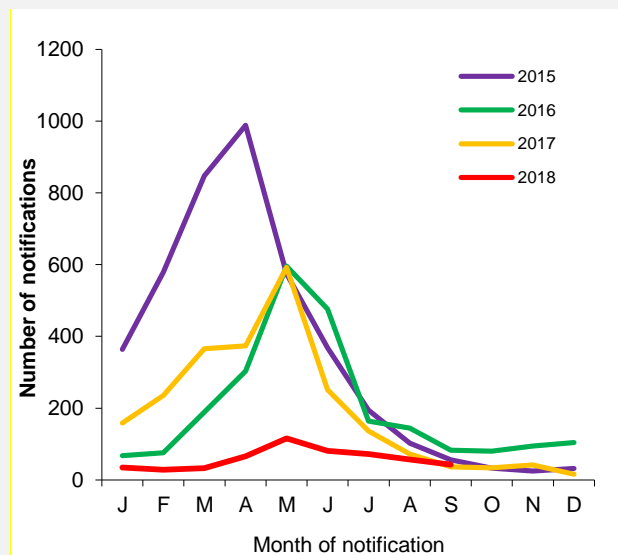


Figure 6. Seasonal distribution of rotavirus notifications, 2015 to end Q3 2018

Outbreaks of rotavirus

There was one family and one general outbreak of rotavirus notified this quarter (Table 2).

SHIGELLA

On January 1st 2004, infection with *Shigella* spp. became notifiable as 'Shigellosis'. Prior to this, it was notifiable as 'Bacillary Dysentery'.

During Q3 2018, thirty-seven cases of shigellosis were notified (Table 5). This compares with thirty-six cases notified in Q3 2017 and twenty-one in Q3 2016.

Eighteen cases were travel related and the country of infection was reported as Ireland for a further ten cases. The country of infection was reported as unknown/not specified for the remaining nine cases.

Twenty-one isolates were referred for typing to NSSLRL this quarter (Table 16).

Table 16: Species and serotype distribution of human *Shigella* isolates referred to the NSSLRL in Q3 2018

Serotype	Number of isolates
<i>Shigella flexneri</i> 1c	1
<i>Shigella flexneri</i> 2a	3
<i>Shigella flexneri</i> 6	1
<i>Shigella flexneri</i> Y variant	1
<i>Shigella sonnei</i>	15

Data Source: NSSLRL

Outbreaks of shigellosis

There was one family outbreak of shigellosis notified in Q2 2018 (Table 2).

GIARDIA

Human giardiasis became a notifiable disease on January 1st 2004. Prior to this, giardiasis was notifiable in Ireland only in young children under the category 'gastroenteritis in children under 2 years'.

During Quarter 3, 2018, sixty-seven cases of giardiasis were notified (Table 5); this compares with 70 cases notified in Q3 2017 and 44 in Q3 2016.

Fourteen cases were reported to have acquired their illness abroad. Country of infection was reported as Ireland for thirteen cases and 'not specified' or 'unknown' for the remaining forty cases.

Outbreaks of giardiasis

There was one general and four family outbreaks of giardiasis notified in Q3 2018 (Table 2).

LISTERIA

Human listeriosis became a notifiable disease on January 1st 2004. Prior to this, listeriosis was notified under the category of 'Food Poisoning (bacterial other than *Salmonella*)' or 'Bacterial Meningitis' as appropriate.

There were eight adult and two pregnancy related cases of listeriosis notified in Q3 2018, compared to two cases in quarter 3 2017 and four in quarter 3 2016.

Ten isolates were referred for typing to NSSLRL this quarter (Table 17).

Table 17: Serotypes of human *Listeria* isolates referred to the NSSLRL in Q3 2018

Serotype	Number of isolates
4b	6
1/2a	3
1/2b	1

Data Source: NSSLRL

Outbreaks of listeriosis

There were no outbreaks of listeriosis notified in Q3 2018 (Table 2).

FOODBORNE INTOXICATIONS

Bacillus cereus foodborne infection/intoxication, botulism, *Clostridium perfringens* (type A) foodborne disease and staphylococcal food poisoning became notifiable diseases on January 1st 2004. Prior to this, these diseases

were notified under the category of 'Food Poisoning (bacterial other than Salmonella)'. There were no cases of foodborne infection/intoxication reported in Q3 2018.

There were no cases of foodborne infection/intoxication reported in Q3 2018.

NON-IID ZONOTIC DISEASES

Non-IID zoonoses now notifiable include: anthrax, brucellosis, echinococcosis, leptospirosis, plague, Q fever, toxoplasmosis, trichinosis and rabies. The Q3 2018 notifications of these zoonotic diseases are reported by HSE-Area in Table 5.

Six cases of toxoplasmosis were notified in this quarter. This compares with eight cases notified in the same period in 2017 and eight cases in Q3 2016.

There were three cases of leptospirosis notified in Q3 2018. This compares with nine cases in Q3 2017 and seven cases in Q3 2016.

Two leptospirosis cases this quarter are believed to have acquired their infection occupationally while one case is associated with travel to South East Asia.

There were no cases of brucellosis notified in Q3 2018. This compares with none in Q3 2017 and none in the same period in 2016.

There was one case of echinococcosis reported in Q3 2018. This compares with no cases in the same period in 2017 and one case in Q3 2016.

There were no cases of trichinosis or Q Fever notified this quarter.

MALARIA

Malaria has been a notifiable disease for many years. The Q3 2018 notifications are reported in Table 5 by HSE-Area.

Sixteen cases of malaria were notified in Q3 2018. This compares with twenty-nine cases reported in Q3 2017 and forty-five in Q3 2016.

Fifteen cases this quarter were reported as *P. falciparum* and the organism was not specified for one case.

Eight cases were exposed in Sub-Saharan Africa. Country of infection is unknown/not specified for the remaining seven cases this quarter.

Six cases cited 'visiting family in country of origin' as their reason for travel while two cases reported business/professional travel. Travel information was not specified/unknown for the remaining seven cases this quarter.

OTHER NOTIFIABLE VECTORBORNE DISEASES

Under Infectious Diseases (Amendment) Regulations 2011 (S.I. No. 452 of 2011) (Sept 2011), Chikungunya disease, Dengue, Lyme disease (neuroborreliosis) and West Nile fever were made notifiable. Zika virus infection is a notifiable disease in Ireland under the Infectious Diseases (Amendment) Regulations 2016 (S.I. No. 276 of 2016).

The Q3 2018 notifications are reported in Table 5 by HSE-Area.

There were four cases of Lyme disease (neuroborreliosis) reported in Q3 2018. This

compares with four cases in the same period in 2017 and ten cases in Q3 2016.

There were five cases of Dengue fever notified in Q3 2018. This compares with four cases in the same period in 2017 and four cases in Q3 2016.

One case this quarter was associated with travel to the Caribbean. Country of infection was not specified for the remaining four cases.

There were no notifications of Chikungunya disease, West Nile or Zika virus infection fever this quarter.

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