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

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

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

Quarter 2–2017 **October 2017**

This is the second quarterly report for 2017 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.

Table 1. General outbreaks of infectious intestinal disease (IID) in Q2, 2017

Month	HSE area	Location	No. ill *	No. Hosp.	Date Onset	Suspect mode of transmission	Disease
Apr	E	Residential institution	4	-	03/04/2017	P-P	AIG
Apr	E	Other	-	-	19/03/2017	P-P & Animal	Cryptosporidiosis
Apr	NW	Residential institution	4	0	02/04/2017	P-P	AIG
Apr	NE	Hospital	5	-	-	P-P	AIG
Apr	S	Residential institution	2	-	-	P-P	VTEC
Apr	NE	Other	1	-	-	WB	VTEC
Apr	E	Hospital	21	-	10/04/2017	P-P & AB	Norovirus
Apr	MW	Residential institution	30	-	13/04/2017	AB	Rotavirus
Apr	NW	Comm. Hosp/Long-stay unit	2	1	26/04/2017	Not Specified	Norovirus
Apr	NW	Hospital	-	-	-	Not Specified	AIG
May	MW	Hospital	3	-	20/12/2016	Environmental / Fomite	Clostridium difficile
May	E	Nursing home	14	-	21/04/2017	P-P & AB	Norovirus
May	E	Retail outlet	8	1	05/05/2017	FB	Staphylococcal food poisoning
May	M	Nursing home	3	0	-	P-P & AB	Norovirus
May	W	Nursing home	31	-	19/04/2017	P-P	Norovirus
May	SE	Nursing home	34	-	15/05/2017	P-P	Norovirus
May	NW	Residential institution	3	0	10/05/2017	P-P	AIG
May	NE	Other	5	-	-	P-P	AIG
May	W	Comm. Hosp/Long-stay unit	13	-	13/05/2017	P-P	AIG
May	W	Nursing home	30	-	12/05/2017	P-P	AIG
May	E	Other	51	5	13/05/2017	Unknown	Salmonellosis
May	S	Nursing home	30	0	15/05/2017	P-P	Norovirus
May	W	Childcare facility	11	2	18/05/2017	Unknown	AIG
May	W	Hospital	4	4	-	P-P	Norovirus
May	W	Nursing home	13	0	26/05/2017	P-P	Norovirus
May	E	Nursing home	14	0	08/05/2017	P-P & AB	AIG
May	E	Residential institution		-	22/05/2017	P-P & AB	AIG
May	SE	Comm. Hosp/Long-stay unit	13	-	28/05/2017	P-P	Norovirus
May	S	Childcare facility	2	-	01/05/2017	P-P	Norovirus
May	W	Other	2	0	-	P-P	AIG
Jun	M	Hospital	18	-	-	P-P & AB	Norovirus
Jun	S	Nursing home	6	0	29/05/2017	P-P	AIG
Jun	NE	Residential institution	3	0	05/06/2017	P-P & AB	AIG
Jun	E	Nursing home	18	-	01/02/2017	P-P	AIG
Jun	S	Comm. Hosp/Long-stay unit	17	0	11/06/2017	P-P	Norovirus
Jun	E	Nursing home	7	-	10/06/2017	P-P	AIG
Jun	W	Hospital	4	4	-	P-P	Norovirus
Jun	M	Childcare facility	9	2	12/06/2017	Unknown	VTEC
Jun	W	Childcare facility	12	1	14/06/2017	P-P	Rotavirus
Jun	M	Childcare facility	1	1	19/06/2017	Unknown	VTEC

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 Q2, 2017

Month	HSE area	Location	No. ill *	No. Hosp.	Date Onset	Suspect mode of transmission	Disease
Apr	SE	Private house	5	1	01/03/2017	P-P	VTEC
Apr	NE	Private house	1	-	29/03/2017	Unknown	VTEC
Apr	MW	Private house	2	0	25/03/2017	P-P	VTEC
Apr	NW	Private house	2	2	-	Not Specified	Rotavirus
Apr	M	Private house	1	1	11/04/2017	Unknown	VTEC
Apr	MW	Private house	-	-	31/03/2017	P-P	VTEC
Apr	M	Private house	3	0	28/03/2017	Animal contact	VTEC
Apr	MW	Private house	2	0	10/03/2017	P-P	VTEC
Apr	M	Private house	1	1	21/04/2017	Animal contact	VTEC
May	MW	Not Specified	1	-	03/04/2017	P-P	VTEC
May	M	Private house	2	-	13/04/2017	P-P	Giardiasis
May	M	Private house	3	0	14/04/2017	Not Specified	VTEC
May	NW	Private house	2	2	-	Not Specified	Rotavirus
May	W	Private house	2	1	30/04/2017	P-P	VTEC
May	SE	Private house	1	0	09/04/2017	Unknown	VTEC
May	SE	Private house	2	1	17/04/2017	Unknown	Cryptosporidiosis
May	S	Private house	2	0	25/04/2017	P-P	Cryptosporidiosis
May	S	Private house	2	0	08/05/2017	P-P & FB	VTEC
May	S	Private house	2	0	08/04/2017	Animal contact	VTEC
May	W	Private house	2	0	11/05/2017	P-P	VTEC
May	M	Private house	1	1	19/05/2017	Unknown	VTEC
May	MW	Private house	1	0	28/04/2017	P-P	VTEC
May	W	Private house	2	2	-	P-P	Rotavirus
May	M	Private house	-	-	23/05/2017	Unknown	VTEC
May	S	Private house	2	2	15/05/2017	Unknown	Cryptosporidiosis
May	W	Private house	-	-	-	Unknown	Campylobacter
Jun	M	Not Specified	-	-	29/05/2017	Not Specified	VTEC
Jun	M	Private house	-	-	30/05/2017	Not Specified	VTEC
Jun	W	Private house	1	0	05/05/2017	P-P	VTEC
Jun	E	Travel related	2	0	24/05/2017	Unknown	Campylobacter
Jun	S	Private house	3	-	08/05/2017	P-P & Animal	VTEC
Jun	M	Private house	-	-	11/06/2017	Unknown	VTEC
Jun	MW	Extended family	-	-	05/06/2017	P-P	VTEC
Jun	S	Not Specified	2	1	21/05/2017	Animal contact	Salmonellosis
Jun	S	Private house	2	1	19/05/2017	P-P & WB	VTEC
Jun	M	Private house	1	1	19/06/2017	Not Specified	VTEC
Jun	W	Private house	2	2		P-P	Rotavirus
Jun	E	Private house	3	-	09/06/2017	Other	Cryptosporidiosis
Jun	M	Private house	3	-	19/06/2017	WB	Cryptosporidiosis
Jun	M	Private house	1	0	18/06/2017	Unknown	VTEC
Jun	W	Private house	2	2	-	P-P	Rotavirus
Jun	W	Private house	3	-	29/05/2017	P-P	VTEC
Jun	M	Public house		-	16/06/2017	Unknown	VTEC
Jun	S	Private house	2	0	10/06/2017	P-P & Animal	VTEC
Jun	E	Private house	5	0	14/06/2017	WB	Campylobacter

Jun	MW	Private house	2	0	07/05/2017	P-P	VTEC
Jun	W	Private house	2	0	10/06/2017	P-P	VTEC
Jun	MW	Private house	2	-	12/06/2017	P-P	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 Q2, 2017

Month	HSE area	Type of outbreak	Location	No. ill *	No. Hosp.	Date Onset	Suspect mode of transmission	Organism
Apr	MW	General	Hospital	4 pts colonised	-	-	Environmental / Fomite	KPC, carbepenemase producing
Apr	S	General	Comm. Hosp/Long-stay unit	9	0	30/03/2017	P-P & AB	Influenza
Apr	W	Family	Private house	2	0	28/03/2017	P-P	Mumps
Apr	W	General	Coach tour	4	2	22/04/2017	P-P	Influenza
Apr	NW	General	Nursing home	6	2	19/04/2017	Not Specified	Acute respiratory infection
May	S	General	Comm. Hosp/Long-stay unit	24	1	24/04/2017	P-P & AB	Influenza
May	E	Family	Private house	3	0	10/04/2017	P-P & AB	Pertussis
May	NW	General	Nursing home	19	0	04/05/2017	P-P	Acute respiratory infection
May	MW	Family	Private house	3	1	19/04/2017	AB	Pertussis
May	NW	General	Nursing home	21	0	10/05/2017	P-P	Influenza
May	SE	General	Childcare facility	8	-	03/05/2017	P-P	Suspected Varicella
May	S	General	Nursing home	14	0	16/05/2017	P-P & AB	Acute respiratory infection
May	NW	General	Comm. Hosp/Long-stay unit	7	-	-	Not Specified	Influenza
May	S	General	Nursing home	3	0	24/05/2017	P-P & AB	Acute respiratory infection
Jun	NW	General	Nursing home	7	0	29/05/2017	Not Specified	Acute respiratory infection
Jun	MW	General	Hospital	3 pts colonised	-	-	Environmental / Fomite	KPC enterobacters
Jun	S	General	School	2	-	18/05/2017	P-P	Mumps
Jun	SE	Family	Private house	2	0	01/05/2017	AB	Pertussis
Jun	W	General	Comm. Hosp/Long-stay unit	3	0	-	P-P	MRSA (conjunctivitis)
Jun	SE	Family	Private house	2	2	-	P-P	Viral meningitis
Jun	NW	Family	Private house	3	0	20/05/2017	P-P	Pertussis
Jun	S	General	Nursing home	9	1	11/06/2017	P-P	Acute respiratory infection
Jun	S	Family	Private house	4	0	24/04/2017	P-P	Pertussis
Jun	SE	Family	Private house	2	-	-	AB	Influenza
Jun	SE	General	Hospital	4 pts colonised	-	15/04/2017	Unknown	MRSA
Jun	W	Family	Private house	2	2	-	P-P	Viral meningitis
Jun	NW	General	Nursing home	14	2	20/06/2017	P-P & AB	RSV
Jun	SE	General	Hospital	3 pts colonised	-	-	Unknown	Enterobacter cloacae OXA 48
Jun	SE	General	Community outbreak	2	0	10/05/2016	P-P	Pertussis

P-P denotes Person-to-Person transmission, WB denotes waterborne; AB denotes airborne; IDU denotes Injecting Drug Use; NK denotes unknown; CRE denotes Carbapenemresistant Enterobacteriaceae; KPC denotes Klebsiella pneumoniae carbapenemase; 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 second quarter of 2017. There were 40 general and 48 family IID outbreaks reported during this period, resulting in at least 530 people being ill.

Acute infectious gastroenteritis (n=16) was responsible for the most general outbreaks of IID (33%), followed by Norovirus (n=30).

The most common cause of family outbreaks of IID was VTEC (n=33) [69%]. Other pathogens responsible for family outbreaks in Q2 2017 were campylobacteriosis, cryptosporidiosis, giardiasis, rotavirus and salmonellosis. (Table 2).

Twenty-nine general IID outbreaks were transmitted person-to-person/person-to-person & airborne (72%). Twenty-nine general IID outbreaks (72%) were reported to have occurred in healthcare settings, i.e. hospitals or residential institutions, during this period.

There were twenty-nine non-IID outbreaks reported during Q2 2017 (Table 3). The most common causes of non IID outbreaks was during this period were influenza, acute respiratory infection and pertussis, with six outbreaks of each reported.

Table 4 outlines the outbreak rate per HSE-area for outbreaks notified during Q2 2017.

Table 4. Number of infectious disease outbreaks by HSE Area, Q2 2017

HSE Area	No. of outbreaks	Rate per 100,000 population
E	14	1.0
M	18	6.3
MW	13	3.4
NE	5	1.1
NW	13	5.0
SE	12	2.4
S	20	3.0
W	22	4.9
Total	**117**	**2.5**

NOTIFICATIONS OF INFECTIOUS INTESTINAL, ZOONOTIC AND VECTORBORNE DISEASE

The number of notifications of infectious intestinal, zoonotic and vectorborne disease by HSE-Area for the second quarter of 2017 is shown in Table 5.

Table 5. Infectious intestinal, zoonotic and vectorborne disease notifications Q2, 2017 by HSE-Area

Infectious Intestinal Disease	E	M	MW	NE	NW	SE	S	W	Total
Bacillus cereus foodborne infection/intoxication	0	0	0	0	0	0	0	0	**0**
Botulism	0	0	0	0	0	0	0	0	**0**
Campylobacter infection	252	55	70	61	32	144	143	118	**875**
Cholera	0	0	0	0	0	0	0	0	**0**
Clostridium perfringens (type A) food-borne disease	0	0	0	0	0	0	0	0	**0**
Cryptosporidiosis	29	45	18	11	15	25	61	43	**247**
Giardiasis	12	1	0	1	0	10	21	8	**53**
Listeriosis	1	0	0	0	0	0	1	0	**2**
Noroviral infection [a1]	150	19	7	19	5	7	15	14	**236**
Paratyphoid	~	~	~	~	~	~	~	~	**2**
Rotavirus infection[b1]	352	128	72	79	111	164	210	101	**1217**
Salmonellosis	106	6	3	4	0	14	13	7	**153**
Shigellosis	13	2	2	0	0	2	2	0	**21**
Staphylococcal food poisoning	3	0	0	0	0	0	0	0	**3**
Typhoid	~	~	~	~	~	~	~	~	**2**
Verotoxigenic *Escherichia coli* infection	21	29	40	19	9	35	40	40	**233**
Yersiniosis	2	0	0	1	0	1	0	0	**4**
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	0	0	0	0	**0**
Leptospirosis	0	0	0	0	0	1	0	0	**1**
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	1	0	0	1	0	0	1	0	**3**
Trichinosis	0	0	0	0	0	0	0	0	**0**
Vectorborne Disease									
Chikungunya disease	0	0	0	0	0	0	0	0	**0**
Dengue	0	0	0	0	0	0	0	0	**0**
Lyme disease (neuroborreliosis)	0	0	2	0	1	0	0	1	**4**
Malaria	16	1	0	3	0	0	0	1	**21**
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	1	0	0	0	0	0	0	0	**1**

[1] Since March 2013, norovirus and rotavirus 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.

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 second quarter of 2017. Comparison of trends with previous years is shown in Figure 1.

Table 6. Salmonellosis notifications by HSE-Area and month, Q2 2017

Month	E	M	MW	NE	NW	SE	S	W	Total
Apr	13	1	0	2	0	3	1	4	**24**
May	33	3	0	1	0	4	7	1	**49**
Jun	60	2	3	1	0	7	5	2	**80**
Total	**106**	**6**	**3**	**4**	**0**	**14**	**13**	**7**	**153**

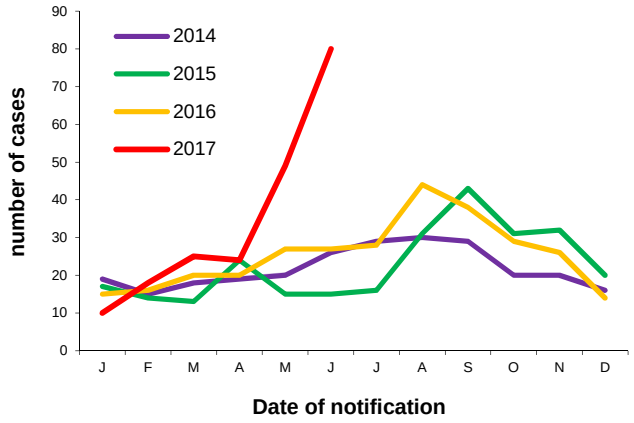

Figure 1. Seasonal distribution of human salmonellosis notifications, 2014 to end Q2 2017

Table 7 shows the serotypes for the *Salmonella* isolates typed by the NSSLRL in the second quarter of 2017 by HSE area (n=108). The commonest human serotype reported this quarter was S Brandenburg (see outbreak section below). *S.* Typhimurium[†] (n=24, 22%) was also commonly reported.

Table 8 shows the serotype distribution of confirmed *Salmonella* notifications by travel status this quarter among salmonellosis notifications on CIDR. 22% (n=26) were travel-associated, 55% (n=64) were indigenous and for 27 cases, the country of infection was unknown/not specified.

Outbreaks of salmonellosis

There was one general and one family outbreak of salmonellosis notified in Q2 2017 (Tables 1 &2). The general outbreak comprises 35 confirmed S Brandenburg cases and 36 epidemiologically linked probable cases notified during May and June.

Table 7. Serotypes of human *S. enterica* isolates referred to NSSLRL Q2 2017

Serotype	E	M	MW	NE	NW	SE	S	W	Total
4,[5],12:i:-	2	1	0	1	0	2	2	0	**8**
Adjame	2	0	0	0	0	0	0	0	**2**
Agona	0	1	0	0	0	0	0	0	**1**
Altona	1	0	0	0	0	0	0	0	**1**
Brandenburg	35	1	0	0	0	0	0	0	**36**
Chester	0	0	0	0	0	2	1	0	**3**
Durham	1	0	0	0	0	0	0	0	**1**
Eastbourne	0	0	0	0	0	0	0	1	**1**
Enteritidis	4	1	1	0	0	1	1	0	**8**
Give	1	0	0	0	0	0	0	0	**1**
Hadar	1	0	0	0	0	0	0	1	**2**
Hato	1	0	0	0	0	0	0	0	**1**
Hvittingfoss	1	0	0	0	0	0	0	0	**1**
Muenster	0	1	0	0	0	0	0	0	**1**
Napoli	0	0	1	0	0	0	0	0	**1**
Newport	4	0	0	0	0	0	3	2	**9**
Panama	1	0	0	0	0	0	0	0	**1**
Paratyphi A	~	~	~	~	~	~	~	~	**2**
Ruiru	0	0	0	0	0	0	0	1	**1**
Saintpaul	1	0	0	0	0	0	0	0	**1**
Szentes	0	1	0	0	0	0	0	0	**1**
Tudu	0	0	0	1	0	1	0	0	**2**
Typhi	~	~	~	~	~	~	~	~	**2**
Typhimurium	6	0	1	0	0	4	5	0	**16**
Unnamed	1	0	0	0	0	1	0	1	**3**
Virchow	0	0	0	0	0	0	0	1	**1**
Weltevreden	0	0	0	0	0	1	0	0	**1**
Grand Total	**64**	**6**	**3**	**2**	**1**	**13**	**12**	**7**	**108**

Data Source: NSSLRL

Table 8. Confirmed *Salmonella* notifications by serotype and travel status, Q2 2017 [n(%)]

Serotype	Indigenous	Travel-associated	Unk/not specified	Total
***S.* Enteritidis**	2 (3%)	7 (27%)	1 (5%)	**10 (9%)**
S.* Typhimurium	15 (22%)	4 (15%)	8 (36%)	**27 (23%)**
Other	50 (72%)	15 (58%)	12 (55%)	**77 (66%)**
***Salmonella* spp**	2 (3%)	0 (0%)	1 (5%)	**2 (2%)**
Total	**69 (100%)**	**26 (100%)**	**22 (100%)**	**117 (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:-

[†]includes 8 cases of monophasic *S.*Typhimurium 4,5,12:i:-

S. Typhi and S. Paratyphi

There were two cases of typhoid reported to CIDR in Q2 2017, one was associated with travel to Africa and the country of infection is unknown for the second case.

There were two cases of paratyphoid reported this quarter, one of which was associated with travel to the Indian Sub-Continent. The country of infection is unknown for the second case.

Outbreaks of S. Typhi and S. Paratyphi

There were no outbreaks of typhoid or paratyphoid notified in Q2 2017.

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.

Two hundred and thirty-three cases of VTEC were notified this quarter, the regional distribution of which is shown in Table 9. This compares with 261 VTEC cases notified in Q2 2016 and 249 in Q2 2015 (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, Q2 2017.

Table 9. Number VTEC notified by case classification and HSE-area, Q2 2017

Case classification	E	M	MW	NE	NW	SE	S	W	Total
Confirmed	21	23	35	19	9	33	35	38	213
Probable	0	6	5	0	0	2	5	2	20
Possible	0	0	0	0	0	0	0	0	0
Total	**21**	**29**	**40**	**19**	**9**	**35**	**40**	**40**	**233**

Table 10. VTEC notified by serogroup and month, Q2 2017

Month	O157	O26	Other	Total
Apr	13	19	38	**70**
May	14	29	39	**82**
Jun	12	40	32	**84**
Total	**39**	**88**	**109**	**236**

Five VTEC cases notified this quarter were reported as having developed HUS – one O103, and four O145.

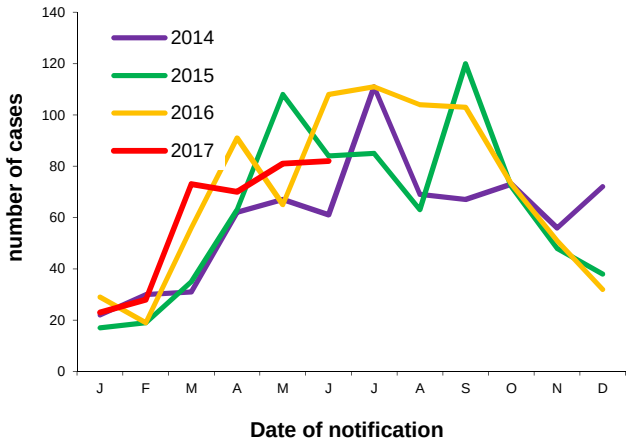

Figure 2. Seasonal distribution of VTEC cases notified 2014 to end Q2 2017

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 Q2 2017.

Table 11. Verotoxin typing profiles of *E. coli* referred to the HSE DML Public Health Laboratory, Cherry Orchard Hospital in Q2 2017

Serogroup	*vt1*	*vt2*	*vt1+vt2*	Not spec.	Total
O157	0	23	11	5	**39**
O26	33	3	45	8	**89**
Other	41	29	26	9	**105**
Total	**74**	**55**	**82**	**22**	**233**

Data Source: PHL Cherry Orchard

Outbreaks of VTEC infection

During this quarter, four general and thirty-three family outbreaks of VTEC infection were reported (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 second quarter of 2017 are shown in Table 12. There were 875 cases of campylobacteriosis notified in Q2 2017 compared to 705 in the same period in 2016 and 784 in Q2 2015 (Figure 3).

Table 12. *Campylobacter* notifications by HSE-Area and month, Q2 2017

Month	E	M	MW	NE	NW	SE	S	W	Total
Apr	68	15	11	12	8	32	31	31	**208**
May	93	20	28	28	17	59	71	51	**367**
Jun	91	20	31	21	7	53	41	36	**300**
Total	**252**	**55**	**70**	**61**	**32**	**144**	**143**	**118**	**875**

Outbreaks of *Campylobacter* infection

There were three family outbreaks of campylobacteriosis reported in Q2 2017 (Tables 1 and 2).

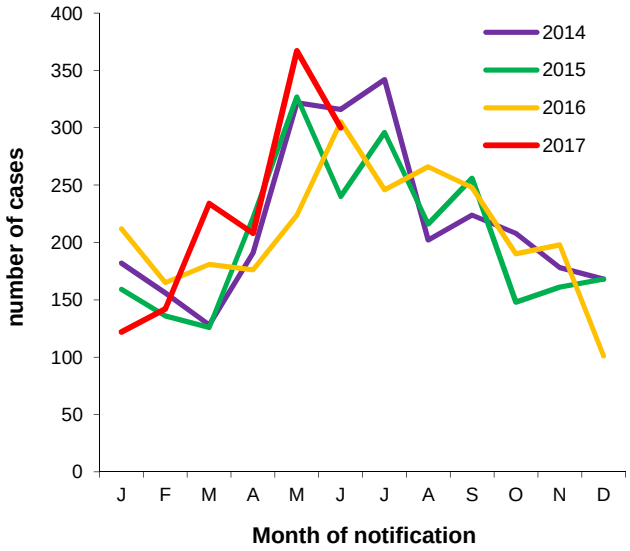

Figure 3. Seasonal distribution of *Campylobacter* notifications 2014 to end Q2 2017

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 Q2 2017, 247 cases of cryptosporidiosis were notified (Table 13), compared to 288 in the same period in 2016 and 201 in Q2 2015 (Figure 4).

Table 13. Cryptosporidiosis notifications by HSE-Area and month, Q2 2017

Month	E	M	MW	NE	NW	SE	S	W	Total
Apr	11	22	8	3	4	9	27	16	**100**
May	13	13	7	5	7	10	28	20	**103**
Jun	5	10	3	3	4	6	6	7	**44**
Total	**29**	**45**	**18**	**11**	**15**	**25**	**61**	**43**	**247**

Outbreaks of cryptosporidiosis

There was one general and five family outbreaks of cryptosporidiosis reported in quarter 2 2017. (Tables 1 and 2).

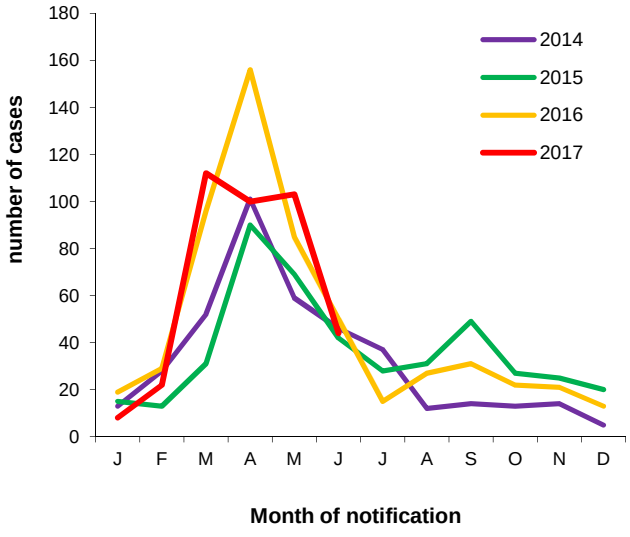

Figure 4. Seasonal distribution of cryptosporidiosis notifications 2014 to end Q2 2017

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 236 cases notified in the second quarter of 2017 (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, Q2 2017

Month	E	M	MW	NE	NW	SE	S	W	Total
Apr	54	12	0	8	0	1	3	1	**79**
May	60	3	4	5	3	4	4	8	**91**
Jun	36	4	3	6	2	2	8	5	**66**
Total	**150**	**19**	**7**	**19**	**5**	**7**	**15**	**14**	**236**

Norovirus outbreaks

Norovirus or suspect viral aetiology is the commonest cause of outbreaks of acute gastroenteritis in Ireland. In the first quarter of 2017, there were fourteen outbreaks confirmed as being caused by this virus, involving at least 206 people becoming ill, as outlined in tables 1 & 2. The seasonal trend is outlined in figure 5.

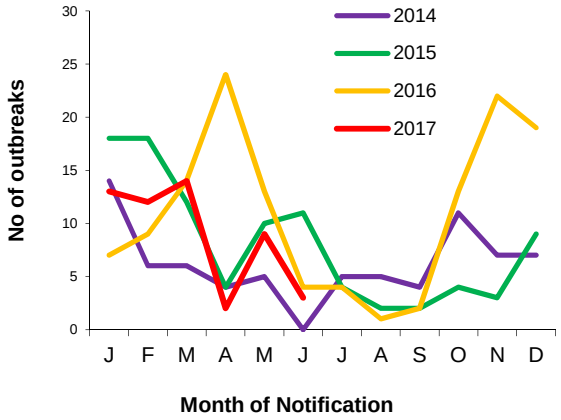

Figure 5. Seasonal distribution of confirmed norovirus outbreaks, 2014 to end Q2 2017

SHIGELLA

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

During Q2 2017, twenty-one cases of shigellosis were notified (Table 5). This compares with eighteen cases notified in Q2 2016 and twelve in Q2 2015.

Nine cases were travel related and the county of infection was reported as Ireland for a futher ten cases. The country of infection was reported as unknown/not specified for the remaining two cases.

Table 15: Species and serotype distribution of Q2 2017 human *Shigella* isolates referred to the NSSLRL.

Serotype	Number of isolates
Shigella flexneri 1b	1
Shigella flexneri 1c	1
Shigella flexneri 2	1
Shigella flexneri 2a	4
Shigella flexneri 2b	1
Shigella flexneri 5b	1
Shigella sonnei	7
Total	**16**

Data Source: NSSLRL

Outbreaks of shigellosis

There were no outbreaks of shigellosis notified in Q2 2017 (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 2, 2017, fifty-three cases of giardiasis were notified (Table 5); this compares with 58 cases notified in Q2 2016 and 19 in Q2 2015.

Ten cases were reported to have acquired their illness abroad. Country of infection was reported as Ireland for seven cases and 'not specified' or 'unknown' for the remaining thirty-six cases.

Outbreaks of giardiasis

There was one family outbreak of giardiasis notified in Q2 2017. (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 two adult cases of listeriosis notified in Q2 2017, compared to two cases in quarter 2 2016 and seven in quarter 2 2015.

Outbreaks of listeriosis

There were outbreaks of listeriosis notified in Q2 2017. (Table 2).

Both isolates were referred for typing to NSSLRL this quarter (Table 16).

Table 16: Serotypes of Q2 2017 human *Listeria* isolates referred to the NSSLRL

Serotype	Number of isolates
1/2a	2

Data Source: NSSLRL

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). Since March 2013, rotavirus 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.

Rotavirus notifications for the second quarter of 2017 are shown in Table 17 and Figure 6.

Table 17. Rotavirus infection by HSE-Area and month, Q2 2017

Month	E	M	MW	NE	NW	SE	S	W	Total
Apr	124	42	21	18	34	48	57	30	**374**
May	160	51	42	43	61	89	104	42	**592**
Jun	68	35	9	18	16	27	49	29	**251**
Total	**352**	**128**	**72**	**79**	**111**	**164**	**210**	**101**	**1217**

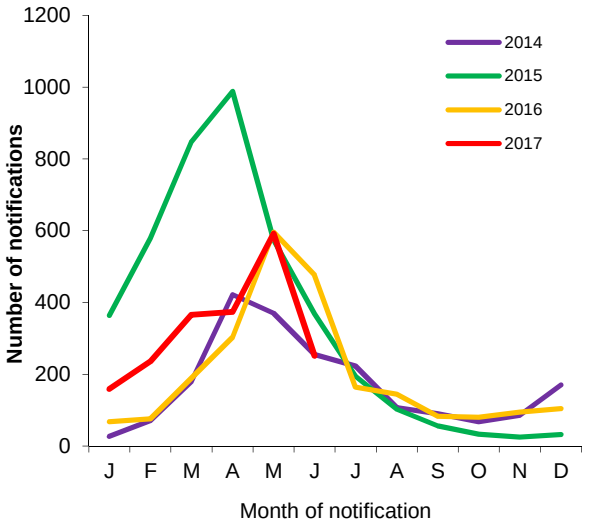

Figure 6. Seasonal distribution of rotavirus notifications, 2014 to end Q2 2017

Outbreaks of rotavirus

There were two general and five outbreaks of rotavirus notified this quarter (Table 2).

FOODBORNE INTOXICATIONS

Bacillus cereus foodborne infection/intoxication, botulism, *Clostridium perfringens* (type A) food-borne 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 three cases of staphylococcal food poisoning notified in Q2 2017 (all three were linked to general foodborne outbreak reported in Table 1)

NON-IID ZOONOTIC DISEASES

Non-IID zoonoses now notifiable include: anthrax, brucellosis, echinococcosis, leptospirosis, plague, Q fever, toxoplasmosis, trichinosis and rabies. The Q2 2017 notifications of these zoonotic diseases are reported by HSE-Area in Table 5.

Three cases of toxoplasmosis were notified in this quarter. This compares with two cases notified in the same period in 2016 and seven cases in Q2 2015.

There was one case of leptospirosis notified in Q2 2017. This compares with one case in Q2 2016 and three cases in Q2 2015.

The source of infection for the case of leptospirosis notified this quarter is unknown.

There were no cases of brucellosis, echinococcosis trichinosis or Q Fever notified in Q2 2017.

MALARIA

Malaria has been a notifiable disease for many years. The Q2 2017 notifications are reported in Table 5 by HSE-Area.

Twenty-one cases of malaria were notified in Q2 2017. This compares with nineteen cases reported in Q2 2016 and sixteen in Q2 2015.

All twenty-one cases this quarter were reported as *P. falciparum.*

Five cases was exposed in Sub-Saharan Africa while country of infection is unknown/not specified for the remaining sixteen cases this quarter.

The reason for travel for one case was reported as 'visiting family in country of origin', one case was in an Irish citizen living abroad and the reason for travel was not specified/unknown for the remaining nineteen cases.

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).

All medical practitioners and laboratories are required to notify cases of Zika virus infection to the Medical Officer of Health. A full suite of guidance for health care professionals and the general public, including travel advice, is available at www.hpsc.ie

The Q2 2017 notifications are reported in Table 5 by HSE-Area.

There were four cases of Lyme disease (neuroborreliosis) reported in Q2 2017.

There was one case of Zika virus infection associated with travel to an affected area.

There were no notifications of Chikungunya disease, Dengue fever or West Nile fever this quarter.

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