

3.7 Salmonella

Summary

Number of confirmed cases: 302
 Crude incidence rate: 6.3/100,000 population

Salmonellosis typically presents clinically as an acute enterocolitis, with sudden onset of abdominal pain, diarrhoea, nausea, headache and occasionally vomiting. Fever is almost always present. Dehydration, especially amongst vulnerable populations such as infants, the immunocompromised and the elderly, may be severe. Invasive infection occurs in a proportion of cases. *S. Typhi* and *S. Paratyphi* can cause enteric fever, a severe systemic life threatening condition, but these are not common in Ireland and are almost invariably travel-associated.

The common reservoirs for non-typhoidal *Salmonella* are the intestinal tract of domestic and wild animals (including birds), which may result in a variety of foodstuffs, of both animal and plant origin, becoming contaminated with faecal organisms either directly or indirectly. The organism may also be transmitted through direct contact with infected animals or humans or faecally contaminated environments. Infected food handlers may also act as a source of

contamination for foodstuffs. Of particular concern is the number of cases of infection associated with direct contact with reptiles kept as companion animals.

During 2016, 302 cases of salmonellosis were notified, corresponding to a crude incidence rate (CIR) of 6.3 per 100,000 population (Figure 1). The annual CIR has been decreasing gradually over the last eight years (from 10.8/100,000 in 2007 to between 5.7 and 6.3 in the last three years). The 302 cases notified in 2016 represent a 12% increase compared to 2015. The highest CIR in 2016 occurred in HSE-M (8.9/100,000) and the lowest in HSE-NE (4.6/100,000).

The highest age-specific incidence rate among both sexes was in children under 5 years of age (19.9/100,000). This is likely to be influenced by clinicians more readily seeking clinical samples in that age group. The lowest age specific rate was observed in the 35-44 year age group (3.4/100,000). The male to female ratio was in general higher in children and adults under 25 years (1.4:1), and lower in adults 25 years and older (0.6:1).

Disease Severity

Diarrhoea was the most common symptom (94% of cases) among notified cases in 2016 (Table 1), followed by abdominal pain (80%). Bloody diarrhoea occurred among

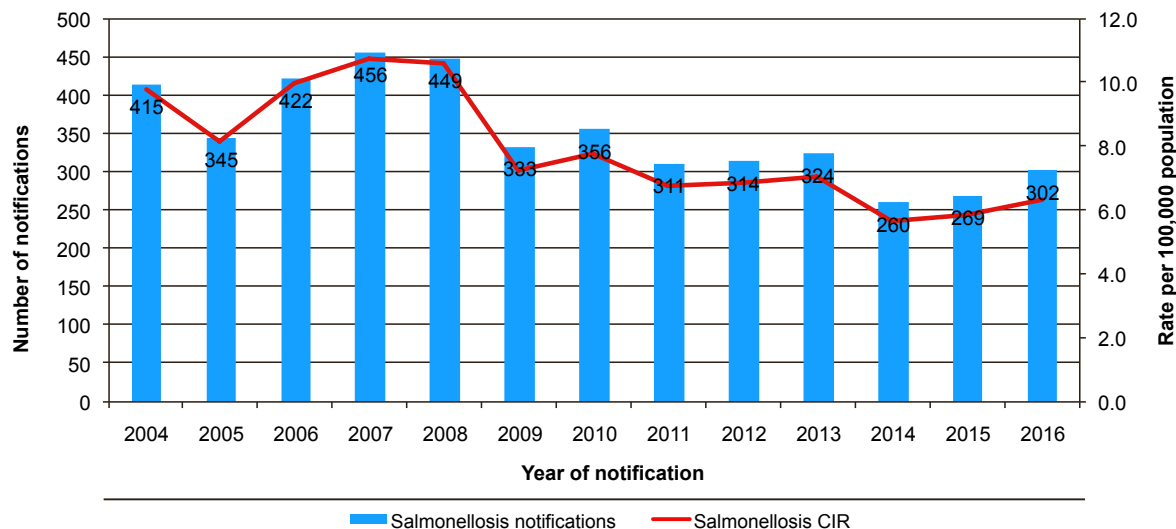


Figure 1: Salmonellosis notifications and CIR by year of notification (CIDR)

28% of cases. Median duration of illness was seven days (range 1-50 days), based on observations for 161 cases. Forty-one per cent of cases (121/292) were hospitalised. There was one death reported in an elderly woman as being due to salmonellosis among the notifications in 2016.

Foreign travel as a risk factor for salmonellosis in Ireland

Country of infection was reported for 91% of notifications in 2016. Where country of infection was reported, 46% of cases were travel-associated (126/275). Overall, case numbers peaked between May and November. This was true for both indigenous and travel-related cases, although there was less pronounced seasonal variation for indigenous cases than for travel-related cases (Figure 2).

Among travel associated cases (n=126), the most common countries of infection reported were Spain (n=38), Thailand (n=13), Poland (n=9) and Turkey (n=8). The popularity of a country as a travel destination is likely to be an important factor in determining the number of cases associated with each country.

As might be expected, cases who acquired their disease in Ireland or other parts of Europe were younger than cases who acquired their disease during long-haul travel (Table 2). Disease acquired in Ireland was more commonly caused by *S. Typhimurium* and monophasic *Typhimurium*

strains (40%) than by *S. Enteritidis* strains (20%), with other strains making up the remaining 40% of cases. By contrast, disease acquired in Europe was associated most commonly with *S. Enteritidis* (56%), followed by other strains (28%), with *S. Typhimurium* and monophasic *Typhimurium* strains accounting for only 16% of cases. For cases associated with acquisition in the rest of the world, non-*Enteritidis*, non-*Typhimurium* cases predominated (65%), *S. Enteritidis* accounting for 24% and *S. Typhimurium* and monophasic *Typhimurium* strains for 11% of cases (Table 2).

Animal contact as a risk factor

Contact with pets (in particular exotics like snakes and turtles), contact with pet food (e.g. frozen rodents), contact with wildlife (e.g. hedgehogs), and contact with cattle, have all been associated with an increased risk of salmonellosis, especially in children. In 2016, 36% (86/237) of salmonellosis cases reported contact with pets (five of which were reptiles), 4% (9/231) reported contact with farm animals, 2% (2/127) reported contact with wildlife, and 12% (22/189) reported contact with pet feed (none with frozen feeder rodents).

Typhoid/Paratyphoid:

In 2016 ten cases of typhoid were notified. All were associated with travel to Asia, principally Pakistan (n=5) and India (n=3). Four cases occurred in children aged 5 years or less. Seven paratyphoid cases were notified. Six were adult

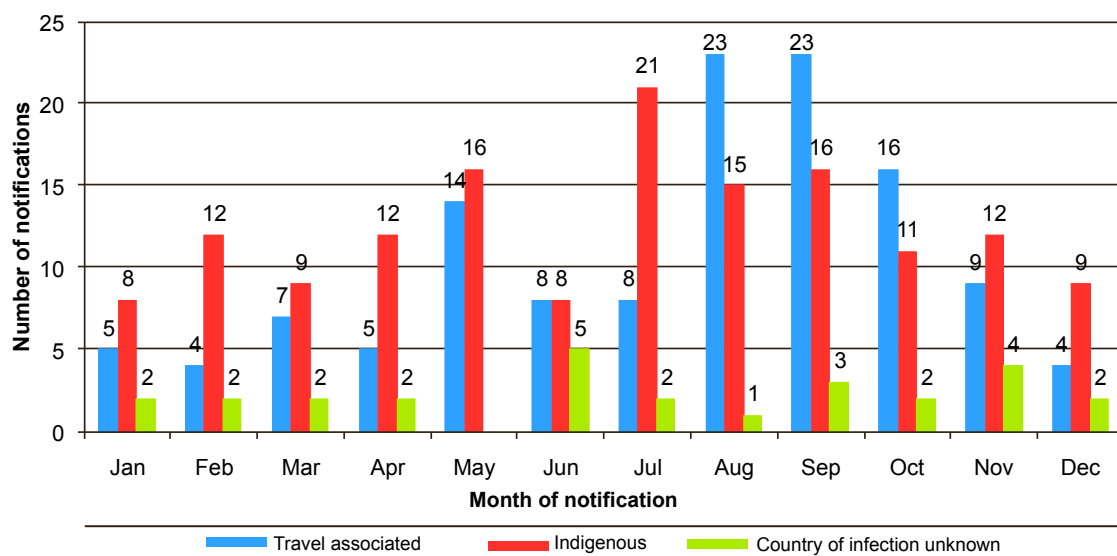


Figure 2: Salmonellosis notifications by month of notification and country of infection, 2016 (CIDR)

Table 1: Disease severity of notified salmonella cases 2016 (CIDR)

Symptom/disease feature	Number with Symptom	Number without Symptom	Number symptom Unknown	Percentage of cases with symptom (among known)
Diarrhoea	259	18	25	94%
Bloody diarrhoea	73	184	45	28%
Nausea	151	89	62	63%
Abdominal pain	199	50	53	80%
Fever	161	89	52	64%
Headache	58	134	110	30%
Myalgia	32	152	118	17%
Rash	13	183	106	7%

and one was a child. Six were associated with travel to Asia –all were *S. Paratyphi A*. For one elderly case of *S. Paratyphi B*, acquisition was reported to have been in Ireland.

National *Salmonella*, *Shigella* and *Listeria* Reference Laboratory (NSSLRL) data:

The National *Salmonella*, *Shigella* and *Listeria* Reference Laboratory (NSSLRL) based in Galway has been providing reference services nationally since 2000. In 2016, the NSSLRL analysed 310 human *Salmonella* isolates referred for further typing, including eleven *S. Typhi* and seven *S. Paratyphi*. Figure 3 shows the distribution of serotypes over this time period. Cases due to *S. Typhimurium* decreased by 10% compared to 2015, while those due to *S. Enteritidis* and other serotypes increased by 20% and 22% respectively.

More detail on the distribution of human *Salmonella* isolates by phage type and their resistance to antimicrobials is reported in the National *Salmonella*, *Shigella* & *Listeria* Reference Laboratory of Ireland, Annual Report for 2016¹. This report also details new developments in relation to the use of whole genome sequencing during 2017.

Outbreaks

During 2016, nine small outbreaks of salmonellosis were reported, comprising 24 cases of illness and four hospitalisations. Seven were in private homes while two involved extended family. Three outbreaks were reported as due to person to person spread, three were foodborne+/- person-to-person spread, two animal contact +/- person-to-person spread, while mode of transmission for the remaining outbreak was reported as unknown.

References:

National *Salmonella Shigella & Listeria* Reference Laboratory of Ireland, Annual Report for 2016. Available at: <http://www.saolta.ie/documents/nsslrl-annual-report-2016>

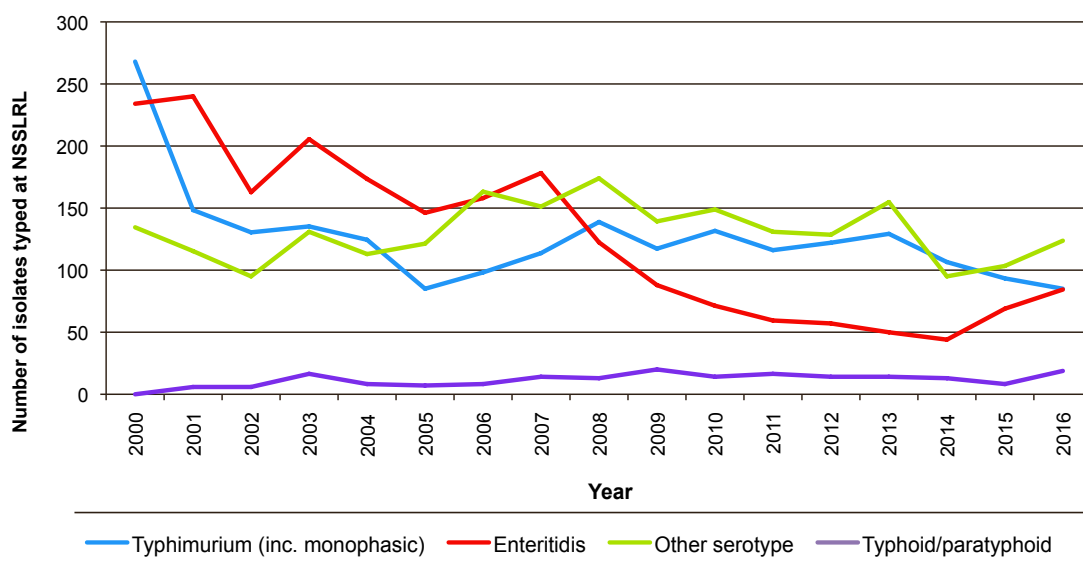


Figure 3: Annual number of *Salmonella* isolates referred to NSSLRL by serotype (NSSLRL)

Table 2: *Salmonellosis* notifications acquired in Ireland, Europe and Rest of the World by age group and serotype, 2016 (CIDR)

Characteristic	Ireland	Europe	Rest of the world	Unknown /Not Specified	Total	
Age group	<15 yrs	64	28	10	4	106
	15-44 yrs	41	15	35	14	105
	45-64 yrs	22	18	7	6	53
	65+ yrs	22	9	4	3	38
Serotype	Typhimurium	27	5	4	7	43
	4,[5],12:i:-	30	6	2	4	42
	Enteritidis	28	39	13	4	84
	Other	58	19	35	11	123
	Not specified	6	1	2	1	10
Total	149	70	56	27	302	