

# 3.6 Salmonella

## Summary

Number of confirmed cases: 269

Crude incidence rate: 5.9/100,000 population<sup>1</sup>

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 2015, 269 cases of salmonellosis were notified, corresponding to a crude incidence rate (CIR) of 5.9 per 100,000 population (figure 1). The annual CIR has remained consistently low over the last five years (2010-2014 mean: 6.8) compared to the previous five year (2005-2009: 9.3). The highest CIR in 2015 occurred in HSE-W (7.0) and the lowest in HSE-NW (3.9).

The highest age-specific incidence rate among both sexes was in children under 5 years of age (15.2). 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 (2.4). The male to female ratio was equal in all age groups apart from the 25-34 year age group (0.5:1.0) and the 45-54 year age group (1.4:1.0).

### Foreign travel as a risk factor for salmonellosis in Ireland

Country of infection was reported for over 90% of notifications in 2015. Where country of infection was reported, 45.5% of cases were travel associated. The number of travel associated cases peaked during the period August to October while indigenous cases peaked during September to November (Figure 2). High numbers of indigenous

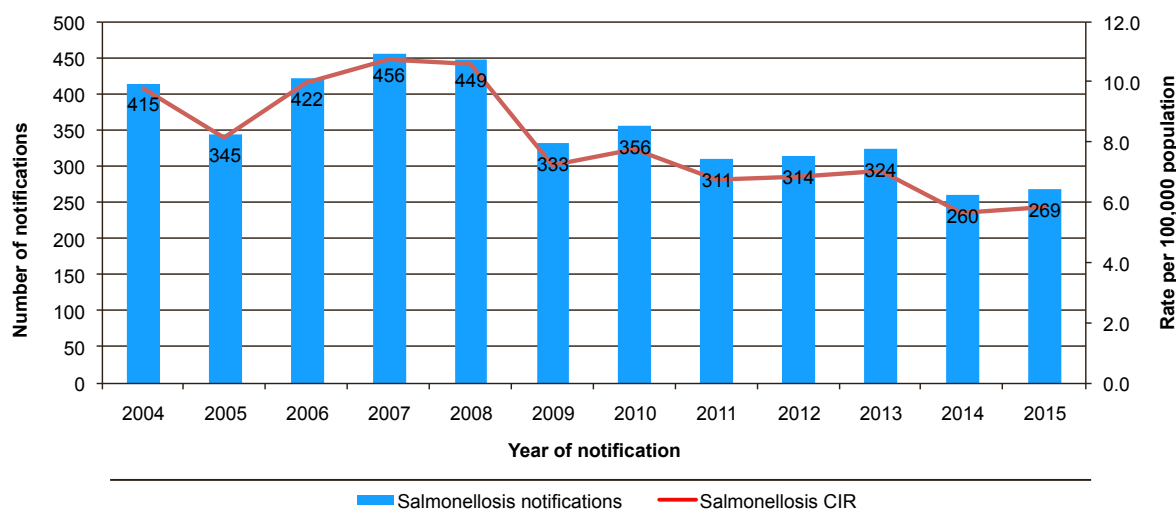


Figure 1: Salmonellosis notifications and CIR by year of notification (CIR)

cases were also observed in April and June. Among travel associated cases, the most common countries of infection reported were: Spain (n=22), Poland (n=9) and Thailand (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.

When serotyping data were analysed by travel history, almost half of all indigenous cases were infected with *S. Typhimurium* (or monophasic *S. Typhimurium*), with 'Other' serotypes making up a further 36.1% of cases. In contrast, *S. Enteritidis* features more prominently among travel-associated cases (36.0%) with just 15.8% of indigenous cases due to *S. Enteritidis* (table 1).

**Typhoid/Paratyphoid:**

In 2015 nine cases of typhoid and one case of paratyphoid (Paratyphi B) were notified. Of the nine *S. Typhi* cases, two each had travelled to India and Pakistan, one each

to Bangladesh, Nigeria and Uganda. The remaining two typhoid cases did not report country of infection. The paratyphoid case reported travel to Bolivia.

**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 2015, the NSSLRL analysed 272 human *Salmonella* isolates referred for further typing, including six typhoid and one paratyphoid. Figure 3 shows the trend in referral of isolates to NSSLRL by organism over time.

The NSSLRL conducted phage typing analysis on all 94 *S. Typhimurium* and all 68 *S. Enteritidis* isolates. Phage type DT193 (n=21) comprised 22.3% of all *S. Typhimurium* strains. Other currently important *S. Typhimurium* phage types included Untypable (14.9%) and DT104 (6.4%). Phage types

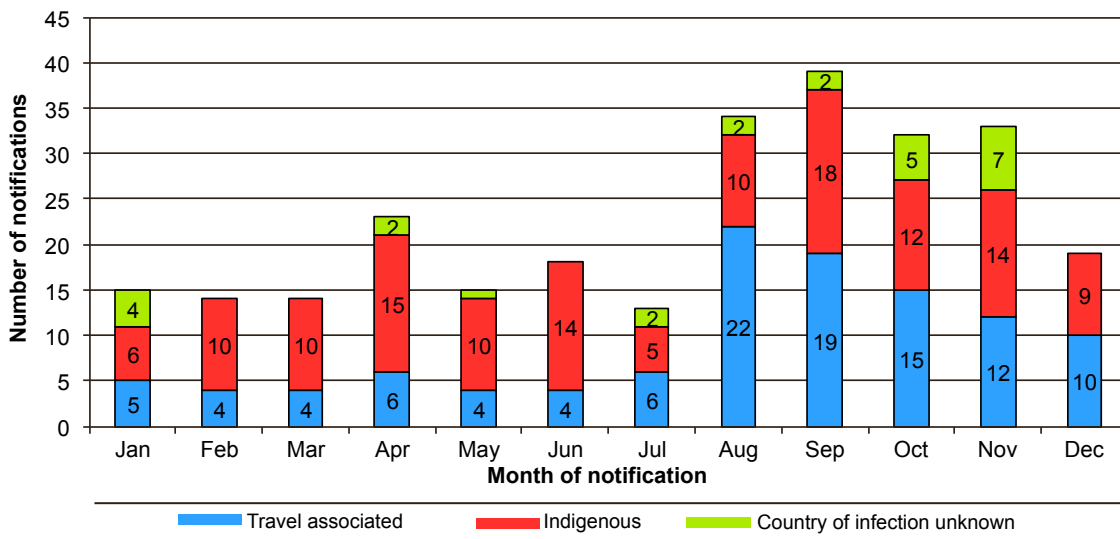


Figure 2: Salmonellosis notifications by month of notification and travel history, 2015 (CIDR)

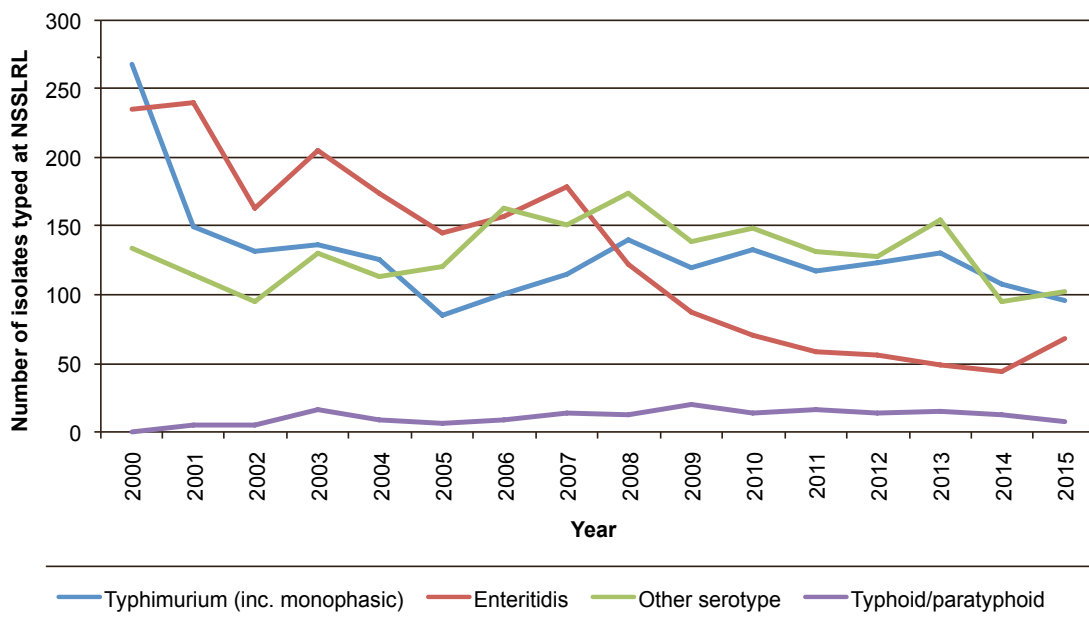


Figure 3: Annual number of Salmonella isolates referred to NSSLRL by serotype (NSSLRL)

PT21 (23.5%), PT8 (17.6%) and PT1 (16.2%) were the most common phage types observed among *S. Enteritidis* isolates.

Of the 272 isolates analysed for antimicrobial resistance, 137 (50.4%) were fully susceptible to all antimicrobials tested. The remaining 135 isolates exhibited some degree of antimicrobial resistance across 47 antibiograms. Thirty-seven isolates exhibited resistance to five or more antimicrobials among 25 antibiograms. The majority of isolates exhibiting this level of resistance were *S. Typhimurium* (54.1% of multi-drug resistant isolates). Overall, the commonest resistance pattern seen was resistance to ampicillin, streptomycin, sulphadiazine and tetracycline (ASSuT, n=35, 25.9% of resistant isolates). The ASSuT pattern was identified exclusively in *S. Typhimurium* isolates. Resistance to nalidixic acid and ciprofloxacin (NaCp, n=24, 17.8% of resistant isolates) was the second most common AMR profile among all isolates, This pattern was identified mainly in *S. Enteritidis* isolates (79.2%). The NSSLRL's Annual Report 2015 provides a more detailed analysis of clinical *Salmonella* typing results and a comparison with isolates from non-human sources.<sup>1</sup>

### Outbreaks

During 2015, nine outbreaks of salmonellosis were reported, comprising 22 cases of illness and one travel associated outbreak of typhoid with three associated cases of illness. Six family outbreaks occurred in private houses. Two general outbreaks occurred in community settings and one general outbreak occurred in a hospital. Four outbreaks were reported as due to person to person spread and one was due to animal contact while mode of transmission for the remaining four outbreaks was reported as unknown.

In consequence of the increasing recognition in recent years of fresh produce as a cause of gastrointestinal disease outbreaks, the National *Salmonella* Outbreak Trawling Questionnaire was recently expanded and updated. The form is available at <http://www.hpsc.ie/A-Z/Gastroenteric/Salmonellosis/SurveillancelInvestigativeForms/>

### References:

1. National *Salmonella* Reference Laboratory of Ireland, Annual Report for 2015. Available at: [http://www.nuigalway.ie/research/salmonella\\_lab/reports.html](http://www.nuigalway.ie/research/salmonella_lab/reports.html)

Table 1: *Salmonellosis* notifications by serotype and travel history, 2015 (CIDR)

<i>Salmonella</i> serotype	Travel associated		Indigenous		Travel history unknown	
	Number	%	Number	%	Number	%
<b>S. Typhimurium</b>	21	18.9	64	48.1	6	24.0
<b>S. Enteritidis</b>	40	36.0	21	15.8	8	32.0
<b>Other serotypes</b>	50	45.0	48	36.1	11	44.0
<b>All serotypes (n)</b>	<b>111</b>	<b>100.0</b>	<b>133</b>	<b>100.0</b>	<b>25</b>	<b>100.0</b>