

3.6 Salmonella

Summary

Number of confirmed cases 2009: 332
Number of probable cases 2009: 1
Crude incidence rate 2009: 7.9/100,000

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

There were 333 cases of salmonellosis in 2009. Of these 332 were laboratory confirmed and there was one case classified as probable that was not laboratory confirmed. In addition to the cases of salmonellosis, there were nine cases of *S. Typhi* and eight cases of

S. Paratyphi notified on CIDR. There were two fewer cases of paratyphoid detected by the clinical notification system than were identified by the NSRL in 2009. The National Salmonella Reference Laboratory (NSRL) based in Galway has been providing reference services nationally since 2000. In 2009 the NSRL analysed 366 human isolates submitted for *Salmonella* typing.

The national crude incidence rate (CIR) for salmonellosis in 2009 was 7.9 per 100,000 population which was a decrease compared to 2008 (10.6/100,000) as shown in figure 1. Figure 2 illustrates the regional variation in CIR during 2009. The highest CIR occurred in HSE-NW (10.1/100,000), representing an increase of 2.1 per 100,000 population compared to 2008. This was the only region to experience an increase in the regional CIR during 2009. The lowest CIR occurred in HSE-S (5.6/100,000), representing a decrease of 3.2 per 100,000 population compared to 2008. The largest decrease in regional CIR during 2009 was observed in HSE-M, with a decrease of 8.7 per 100,000 population.

The female:male ratio for the year was 0.9:1.1. In terms of age distribution, 21.6% of cases occurred in children

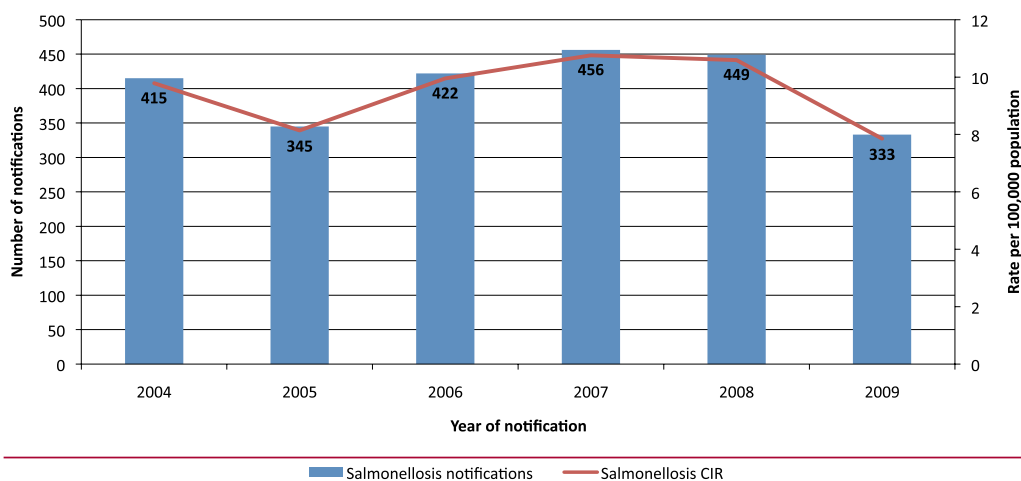


Figure 1: Salmonellosis notifications and crude incidence rate per 100,000 population by year of notification (CIDR)

under five. This is likely to be a reflection of clinicians more readily seeking clinical samples in that age group. This is also reflected in the age specific incidence rate (ASIR) with the 0-4 age group having the highest ASIR nationally (22.3/100,000 in females and 25.2/100,000 in males) in both sexes (figure 3).

The seasonality of salmonellosis notifications in Ireland during 2009 is shown in figure 4. The highest number of notifications occurred between May and October. Further examination of these data show that the highest number of travel associated salmonellosis notifications are reported during this period. These are expected seasonal increases that correlate with peak holiday

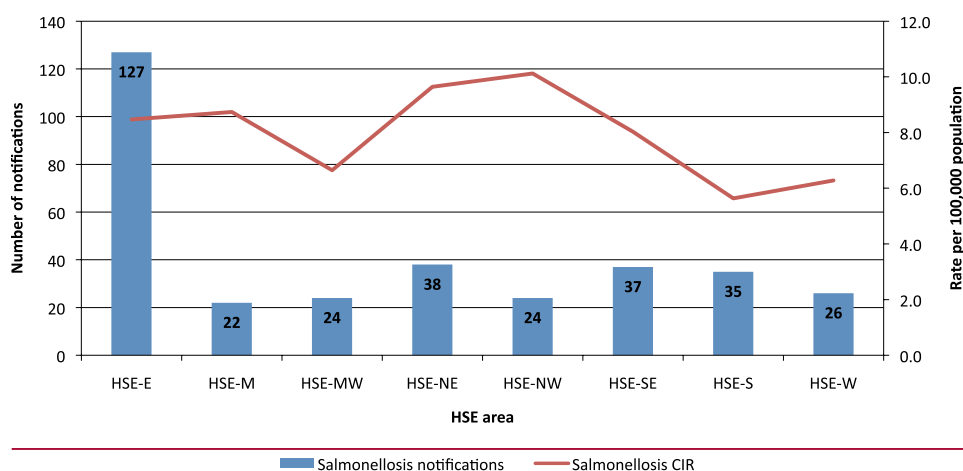


Figure 2: Salmonellosis notifications and crude incidence rate per 100,000 population by HSE area, 2009 (CIDR)

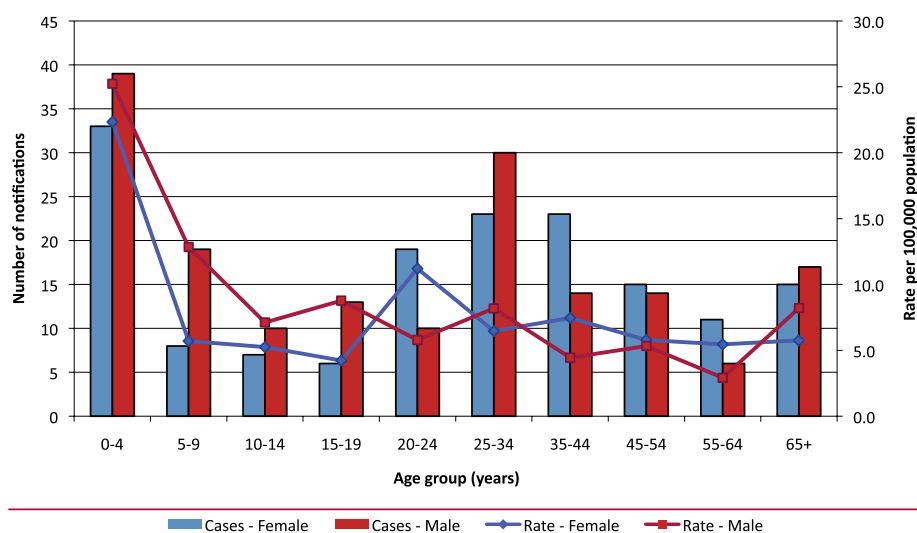


Figure 3: Salmonellosis notifications and age specific incidence rate per 100,000 population by age group (years) and sex, 2009 (CIDR)

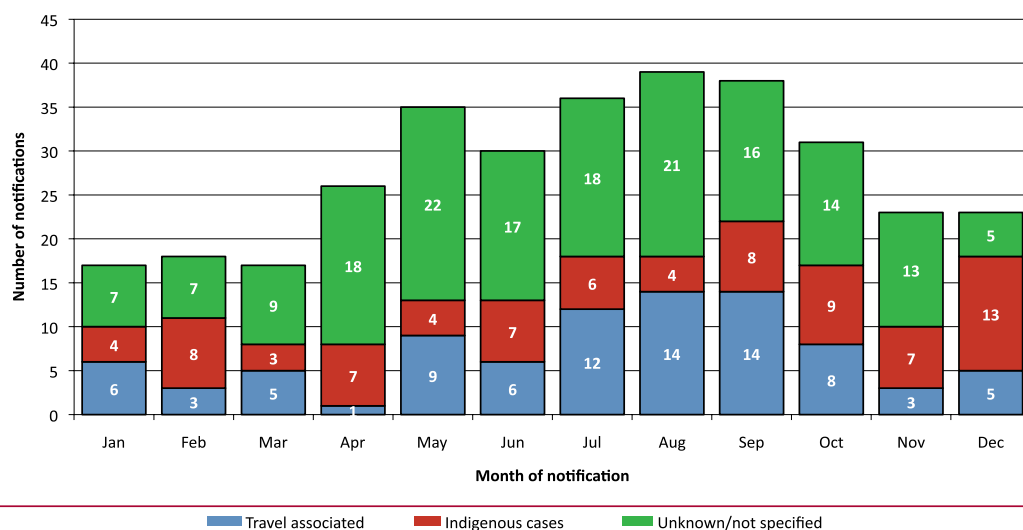


Figure 4: Salmonellosis notifications by month of notification and travel history, 2009 (CIDR)

periods and resultant increase of people travelling abroad.

Of the 333 cases notified on CIDR during 2009, travel history was provided for 166 cases (49.8%). Of the 166 cases where travel history was reported, 86 (51.8%) of salmonellosis cases were indigenous to Ireland and 80 cases (48.2%) reported a recent history of travel. Where travel history was documented, the three countries with highest occurrence of recent travel and subsequent development of salmonellosis were; Spain (n=20), Nigeria (n=9) and Thailand (n=5). When serotyping data are analysed by travel history, 44.2% of all travel associated cases are *S. Enteritidis* whereas 43.8% of cases indigenous to Ireland are *S. Typhimurium* (table 1).

During 2009, 366 human *Salmonella* isolates were referred to the NSRL for further typing, identifying 72 serotypes. Table 2 presents the most dominant serotypes detected during 2009. *S. Typhimurium* (n=118) was the most common serotype, followed by *S. Enteritidis* (n=87).

The NSRL conducted phage typing analysis on all *S. Typhimurium* and *S. Enteritidis* isolates. Phage types were assigned to all 118 *S. Typhimurium* human

isolates. DT193 (22.9%), DT104 (20.3%) and DT104b (11.9%) were the commonest phage types observed. All 87 *S. Enteritidis* isolated were typed. PT14b (23.0%), PT8 (14.9%), PT21 (12.6%) and PT1 (10.3%) were the dominant types.¹

Of the 366 human isolates analysed by the NSRL, 185 (50.5%) were fully sensitive to all antibiotics tested. The remaining 181 isolates exhibited some degree of antibiotic resistance. The three commonest resistance patterns⁺ seen were type ACSSuT (n=38, 10.4%) followed by ASSuT (n=36, 9.8%) and Na (n=35, 9.6%). Over 97% of human isolates with a resistance profile of ACSSuT or ASSuT were *S. Typhimurium* while 57.1% of human isolates with a resistance profile of Na were *S. Enteritidis*. One *S. Concord* isolate was resistant to nine antibiotics tested, one *S. Indiana* isolate was resistant to eight antibiotics tested and five *S. Kentucky* human isolates were resistant to seven antibiotics tested. Please refer to the NSRL's Annual Report 2009 for more detailed analysis of results¹.

The number of *S. Typhi* and *S. Paratyphi* cases diagnosed in Ireland remains elevated when compared to previous years. In 2009 there were nine cases of

Table 1: Percentage of Salmonellosis notifications by serotype and travel history, 2009 (CIDR)

<i>Salmonella</i> serotype	Travel associated (%)	Indigenous (%)	Travel history unknown (%)	Total (%)
<i>S. Enteritidis</i>	44.2	18.8	18.6	31.2
<i>S. Typhimurium</i>	11.6	43.8	35.3	25.2
Other serotypes	41.9	26.3	35.3	34.8
Serotype not specified	2.3	11.3	10.8	8.7
All serotypes	86	80	167	100.0

Table 2: Number and percentage of human *Salmonella* isolates by serotype, NSRL 2009.

<i>Salmonella</i> serotype	Number of isolates	% Isolates
Typhimurium*	118	32.2
Enteritidis	87	23.8
Unnamed	12	3.3
Typhi	11	3.0
Paratyphi A	9	2.5
Kentucky	7	1.9
Dublin	6	1.6
Agona	6	1.6
Java	6	1.6
Other	104	28.4
Total	366	100.0

*This includes 87 *S. Typhimurium* isolates and 31 isolates with serotype 4,5,12:i

⁺Where A= Ampicillin, C= Chloramphenicol, Na = Naladixic acid, S= Streptomycin, Su= Sulphonamide and T= Tetracycline

S. Typhi reported and eight cases of *S. Paratyphi* (two fewer cases of paratyphoid than were identified by the NSRL). Four of the *S. Typhi* had known recent travel history to India, two to Bangladesh and one each to Pakistan and the Phillipines. For the remaining typhoid case the travel history of the patient was unknown. In the *S. Paratyphi* cases three had known recent travel history to Pakistan, two to India and one each to Bangladesh and Chile. The remaining paratyphoid case's travel history was not specified.

There were 15 outbreaks of *Salmonella* during the year resulting in 93 persons ill, one death and an associated hospitalisation rate of 21.5% (n=20 cases). This is a decrease of 31.8% compared to the number of salmonellosis outbreaks reported in 2008. Twelve outbreaks were family outbreaks, nine of which were in private houses, two were travel associated and one occurred across an extended family. Of the two travel associated family outbreaks, one reported exposure in Spain. Three general outbreaks occurred in community locations. Table 3 outlines the number of salmonellosis outbreaks and number ill by outbreak location and outbreak transmission mode during 2009.

One general outbreak in HSE-NE was caused by a mixture of *Salmonella* Kentucky and *S. Agona* strains resulting in 35 cases of illness, seven of which were

laboratory confirmed. Although no specific food item was implicated, the outbreak was suspected to be food-borne as all cases attended one of two private parties served by a single food caterer.

A national outbreak of 12 laboratory confirmed cases of *S. Typhimurium* DT193 occurred in early summer 2009. No source was identified although food-borne transmission was again suspected.

A national outbreak of *S. Enteritidis* 14b occurred between November 2009 and March 2010². There were 19 confirmed cases, including one person who died.³ An outbreak of *S. Enteritidis* 14b occurred in the UK around the same time which was associated with imported eggs, however, no link was identified with eggs or any other food source for the Irish outbreak.

References

1. National *Salmonella* Reference Laboratory of Ireland, Annual Report for 2009.
2. <http://ndsc.newsweaver.ie/epiinsight/17zjkjbt5-i8xmmjicne>
3. <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19489>

Table 3: Number of salmonellosis outbreaks and number ill by outbreak location and outbreak transmission mode, 2009 (CIDR)

Location	Animal contact		Foodborne		Person-Person & Foodborne		Person-to-person		Unknown		Total	
	No. outbreaks	No. ill	No. outbreaks	No. ill	No. outbreaks	No. ill	No. outbreaks	No. ill	No. outbreaks	No. ill	No. outbreaks	No. ill
Community outbreak	0	0	3	66	0	0	0	0	0	0	3	66
Extended family	0	0	0	0	0	0	1	2	0	0	1	2
Private house	1	4	1	2	2	4	4	8	1	2	9	20
Travel related	0	0	1	2	0	0	0	0	1	3	2	5
Total	1	4	5	70	2	4	5	10	2	5	15	93