Salmonellosis in the South East: Review 2002 to 2010

Marrita Mahon and Sarah Doyle
Public Health Department, HSE South East, Kilkenny

Introduction

Salmonellosis is a notifiable disease most commonly manifested by acute entercolitis with sudden onset of headache, abdominal pain, fever, diarrhoea, nausea and sometimes vomiting.

Notifications of Salmonellosis from throughout Ireland are stored centrally on the Computerised Infectious Disease Reporting database. The core dataset comprises demographic and clinical information, but since mid-2011, microbiological details and information on exposure to risk-factors for Salmonellosis such as travel, contact with animals or drinking inadequately treated water may also be recorded.

Since 2002, a local database detailing demographic, clinical and microbiological information, as well as details of exposure to risk-factors for all cases notified from Local Health Areas in the South East has been maintained in the Public Health Department in Kilkenny.

The South East comprises four HSE Local Health Areas -Carlow-Kilkenny, South Tipperary, Waterford and Wexford. The region is mainly rural with mostly small to medium sized towns and one large centre of population –Waterford City.

The aim of this study was to review the data gathered in the South East between 2002 and 2010 to allow comparison with national data on risk-factor exposure which will be available from now on.

Methods

Details of Salmonellosis cases, notified to the Public Health Department in Kilkenny between 2002 and 2010 and stored on an SPSS database were examined using the Analysis tools available in SPSS and Excel. Crude incidence rates (CIR) and age-specific incidence rates (ASIR) were calculated using population data from the 2006 census.

Results

Notifications, crude incidence rates and gender:

From 2002 to 2010 between 33 and 66 cases of Salmonellosis cases were notified annually giving a total of 404 cases for the nine years examined. Overall the male:female ratio was 1:1, with slight variation year-on-year (Figure 1).

From 2002 to 2005, the CIR of Salmonellosis notifications in the South East was generally above the national CIR, but between 2005 and 2010, the CIR of Salmonellosis cases was generally below the national CIR. (Figure 2).

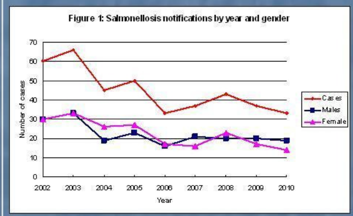

Figure 1: Salmonellosis notifications by year and gender

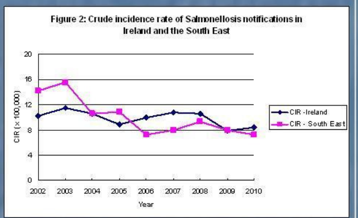

Figure 2: Crude incidence rate of Salmonellosis notifications in Ireland and the South East

Outbreaks:

Twenty outbreaks were detected over the time period examined, accounting for 63 notified cases. Eighteen of the outbreaks comprised two to four cases and occurred in household settings or among family, extended family or friends who travelled abroad together. There were two general outbreaks between 2002 and 2010, one in 2002, occurred in a hospital and resulted in 11 cases. The second, a community outbreak of Salmonella Agona, resulted in six cases in 2005.

Age and hospitalisation:

Twenty two percent of cases occurred in children under five years of age. This was also reflected in the ASIR with the 0 – 4 years age group having the highest ASIR (269.4/100,000). ASIRs for other age groups ranged from 23.7 to 112.5/100,000 (Figure 3).

Over the years examined, 47% of Salmonellosis cases notified were hospitalised. The highest hospitalisation rate occurred in the 60+ years age group (73%). Length of stay ranged from overnight to 37 days with a mean length of stay of 4.5 days and median of 2 days.

Seasonal trends and travel:

The seasonality of Salmonellosis cases notified between 2002 and 2010 is shown in figure 4. Overall, 53% of cases were notified between mid-May (week 25) and the end of September (week 40). While the exact timing of the peak varied year from year through high summer months, overall the cases peaked in mid to late August. (Figure 4).

Information on foreign travel was available for 356 cases, of which 164 (46%) had travelled abroad in the two weeks before becoming ill. Of those who reported travel abroad, 132 (80%) were notified between weeks 21 to 44 (mid-May to end October). Notification of indigenous case was somewhat more evenly spread throughout the year, but peaked in weeks 33 – 36 (mid to late August) (Figure 4).

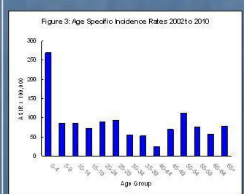

Figure 3: Age Specific Incidence Rates 2002 to 2010

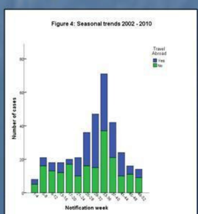

Figure 4: Seasonal trends 2002 - 2010

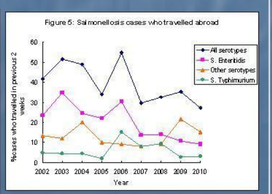

Figure 5: Salmonellosis cases who travelled abroad

Serotypes:

Over the nine years examined, 394 salmonella isolates were forwarded to the National Salmonella, Shigella and Listeria Reference Laboratory for serotyping. Fifty nine serotypes were identified. *S.* Typhimurium (n = 143) and *S.* Enteritidis (n = 129) were the most common serotypes, followed by *S.* Virchow (n = 12) and *S.* Agona (n = 10).

Travel:

The proportion of Salmonellosis cases who reported travel in the two weeks prior to becoming ill peaked at 55% in 2006, but has since declined and stabilised at 30 to 35% of cases (Figure 5).

Travel and serotypes:

The numbers of *S.* Enteritidis cases peaked in 2003, when 37 cases (56% of total Salmonellosis cases) were notified, but has since declined with only 4 (12%) cases reported in 2010 (Figure 6a). There was less variation in the numbers of *S.* Typhimurium cases notified during the time period examined. Eleven to 19 cases were notified each year with the exceptions of 2002 when 27 cases were notified and 2006 when seven cases were notified (Figure 6b). With regards to other serotypes, 12 to 17 cases were notified annually (Figure 6c).

The overall decline in the number of *S.* Enteritidis cases is mirrored by the decline in the number of *S.* Enteritidis cases who have travelled abroad in the two weeks before becoming ill (Figures 5, 6a). Over the nine years examined, between 40 and 78% of *S.* Enteritidis cases had travelled abroad in the two weeks before illness onset. For *S.* Typhimurium, there was little variation in the number of cases who reported foreign travel prior to becoming ill -one to five cases per year, and with the exception of 2006, this accounted for six to twenty percent annually. For other serotypes, between 19 and 66% of cases reported foreign travel in the two weeks before becoming ill (Figures 5, 6c).

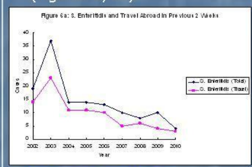

Figure 6a: S. Enteritidis and Travel Abroad in Previous 2 Weeks

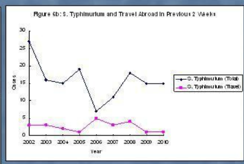

Figure 6b: S. Typhimurium and Travel Abroad in Previous 2 Weeks

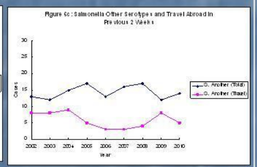

Figure 6c: Salmonella Other Serotypes and Travel Abroad in Previous 2 Weeks

Contact with animals:

Details of contact with a wide variety of animals including common pets and farm animals, fowl, reptiles and rodents are captured in the South East database. Overall 43% of cases reported animal contact in the two weeks before becoming ill. However, if indigenous cases only or indigenous *S.* Typhimurium cases only are included in the analysis this figure rises to 61 and73% respectively. The most common animal contact described was with dogs and cattle (Table 1).

Contact with reptiles:

Between 2002 and 2010, 13 cases reported recent contact with reptiles. The Salmonella serotypes of these cases are shown in Table 2. Nine cases were infected with serotypes not commonly detected in Ireland. Six cases were under five years old and seven of the cases were hospitalised.

Table 1: Salmonellosis cases reporting contact with animals

	Any animals	Dogs	Cattle
All cases	43%	29%	6%
Indigenous cases	61%	40%	11%
Indigenous *S.* Typhimurium cases	73%	52%	20%

Table 2: Salmonella serotypes isolated from cases reporting contact with reptiles

Serotype	Cases	Serotype	Cases
S. Enteritidis	3	*S.* Thompson	1
S. diarizone	2	*S.* Ponoma	1
S. Typhimurium	1	*S.* Litchfield	1
S. Indiana	1	*S.* Branederup	1
S. Infantis	1	*S.* Minnesota	1

Drinking water source at home:

Information on the type of drinking water supply to cases' homes was available for 323 cases notified from 2002 to 2010. Of those who provided information, 223 (69%) were connected to a public water supply, 18 (6%) were connected to a group water scheme and 82 (25%) received water from a private well.

Discussion

Over the nine yeas examined, children under five years were the age group most frequently notified with Salmonellosis. This is likely to be, at least in part, a reflection of clinicians more readily seeking clinical samples in that age group.

Almost half of all cases notified and three quarters of cases over 60 years were admitted to hospital. This possibly reflects the severity of illness in those seeking medical attention for the symptoms of Salmonellosis and the vulnerability of older people to severe symptoms.

Salmonellosis notifications peaked in the South East in 2002 - 2003 and have generally declined since. The local CIR for these two years was above the national CIR. Our data strongly suggest that the higher numbers of Salmonellosis cases notified from the South East in the earlier part of the decade were related to *S.* Enteritidis infections acquired abroad. Previous papers from the South East[1] and more recently nationally[2] have highlighted the contribution of travel-related *S.* Enteritidis infections to Salmonellosis notifications figures in Ireland. Travel-related Salmonellosis peaked in the South East in 2006. *S.* Enteritidis and serotypes other than *S.* Typhimurium are the most commonly reported serotypes in cases who have travelled aboard.

The data from the South East show that indigenous Salmonellosis is dominated by *S.* Typhimurium and almost three quarters of these cases reported animal contact, in particular contact with dogs or cattle. A small number of indigenous Salmonellosis cases reported direct or indirect contact with reptiles. Details of some of these cases were published previously[3] and the South East Zoonoses Committee have published a leaflet highlighting the risk of Salmonellosis in young children living in households with pet reptiles[4].

Despite the fact that only 10% of homes in the South East use private wells as a drinking water source, one quarter of South East Salmonellosis cases consumed water from a private well source. The importance of securing and maintaining private wells against contamination and of regularly testing private well water has been highlighted in a South East Zoonoses Committee leaflet[5].

References

1. South Eastern Health Board. 2008: Salmonellosis in the SEHB 2002 – 2003: A travel-related disease. Communicable Disease Update. 3(2):2
2. HPSC. 2010: Indigenous Salmonellosis low in Ireland. Epi-Insight. 11(3)
3. O'Byrne, AM and Mahon MM. 2008: Reptile-associated Salmonellosis in Residents in the South East of Ireland, 2005-07. Eurosurveillance. 13(15), 10 April 2008
4. SE Zoonoses Committee. Keeping Healthy with your Reptile. Available at http://www.waterfordcoco.ie/en/services/veterinaryservices/publications/Keeping%20Healthy%20with%20your%20Reptile.pdf
5. SE Zoonoses Committee How Well is your Water. Available at http://www.kilkennycoco.ie/resources/How%20Well%20is%20your%20Water.pdf

Presented by Marrita Mahon, Department of Public Health, HSE South (South East) at the FPHM Summer Scientific Meeting, Dublin, May 2012