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## Number of shigellosis cases in Ireland remain low

### Introduction

In the last decade, the number of cases of shigellosis in Ireland has been low in comparison to the number of cases notified in the early 1990s (Figure 1). *Shigella spp.*, however, remains a common cause of gastrointestinal illness in developing countries, and many sporadic cases notified in Ireland are now identified as being travel-associated.

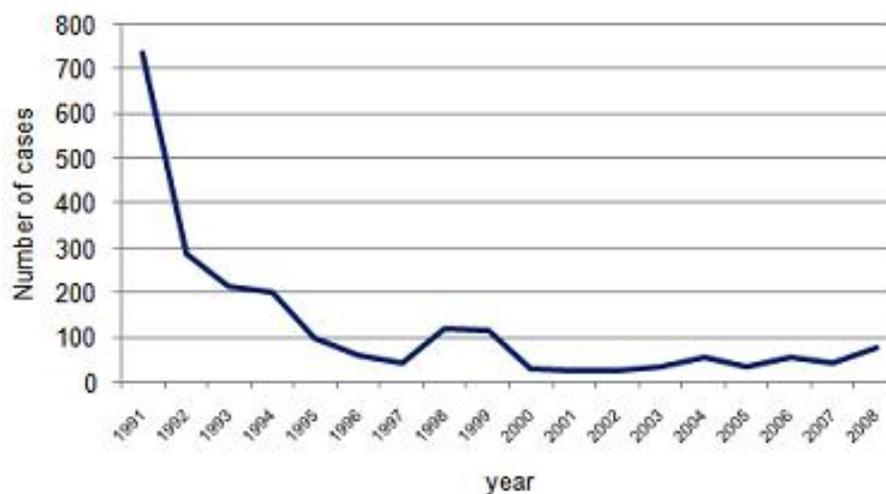


Figure 1: Annual number of shigellosis notifications, Ireland 1991-2008

Data source: CIDR

Humans are the main reservoirs for infection, and person-to-person spread is commonly reported during outbreaks. Between 2004 and 2008, there were 11 outbreaks of shigellosis reported in Ireland, six family outbreaks and five general outbreaks.<sup>3</sup> Among the general outbreaks, there were two crèche outbreaks, one community outbreak, one outbreak in a private house, and one outbreak related to exposure in Egypt<sup>1,2</sup>. The crèche, community and private house outbreaks were reported as being due to person-to-person spread. The mode of transmission for the travel-related outbreak was unknown.<sup>3</sup>

Moreover, risks also remain from food, with at least four general outbreaks having been reported in Scandanavia in 2009 associated with imported fresh produce.<sup>4-8</sup> The foods implicated included sugar peas and baby corn eaten raw.

Here we review shigellosis notification data in Ireland (stored in the Computerised Infectious Disease Reporting database, CIDR), and data on isolates referred to the National Salmonella Reference Laboratory

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(NSRL) for the period 2004-2008.

**Disease incidence**

Between 2004 and 2008, on average, there were 53 notifications per annum, equating to an average annual crude incidence rate (CIR) of 1.25 (95% CI 0.91-1.58) per 100,000 population. This compares to an average CIR across EU Member States in 2007 of 2.1 per 100,000 (range 0.0-9.7 per 100,000).<sup>9</sup>

Within the EU, the highest reported incidence rate was in children under 5 years of age, however, in countries where the highest notification rate was in middle aged adults, the majority of cases were travel-associated.<sup>9</sup> In four of the five study years in Ireland, the highest number of cases was reported in the age group 25-44 years (Figure 2). In 2004 and 2008, the occurrence of two outbreaks in crèche settings resulted in relatively high numbers of cases also in those years in children under 5 years of age. Female cases outnumbered male cases 1.3:1, especially among adult cases (data not shown).

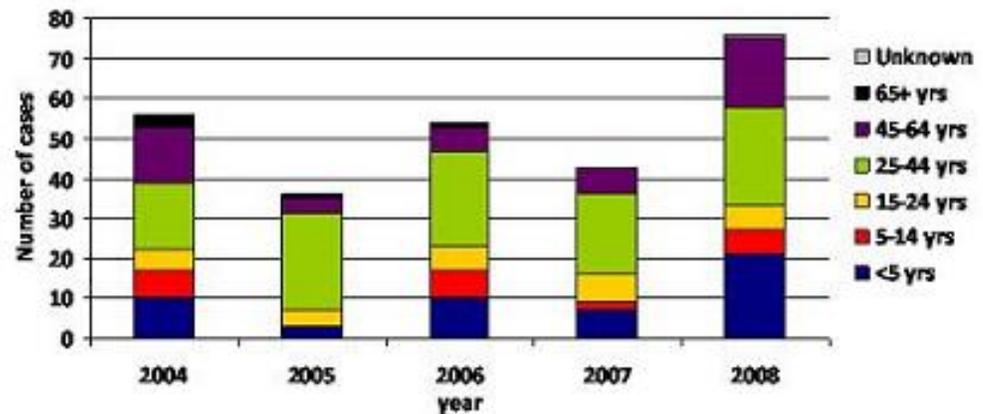


Figure 2. Age distribution shigellosis notification by year, Ireland 2004-2008

Data source: CIDR

**Contribution of foreign travel**

Information on travel history is very valuable for clarifying the contribution of foreign travel to the disease burden, and for reviewing surveillance data for possible indigenous clusters. Overall, *Country of infection* information was provided for 38% (101/265) of cases in the notification dataset in the five year period, although this improved considerably during the time period and was available for almost two-thirds (49/76) of notifications in 2008. Among these 101 cases, the *Country of infection* of approximately one third was reported as Ireland (described hereafter as 'Indigenous'), and for the other two thirds of cases, a *Country of infection* other than Ireland was reported (described hereafter as 'Travel-associated').

Table 1. Confirmed shigellosis notifications by species and country/region of infection, Ireland 2004-2008

Species	Ireland	Asia	North Africa	Sub-Saharan Africa	Central America	Europe excl. Ireland	Not specified/Unknown	Grand Total
<i>boydii</i>	1	4		1			8	14
<i>dysenteriae</i>		1						1
<i>flexneri</i>	3	13	6	5	1	1	50	79
<i>sonnei</i>	17	13	7	5	3	2	95	142
species	3	2	1				10	16
Probable cases	12						1	13
Grand Total	36	33	14	11	4	3	164	265

Asia and Africa were the most common destinations reported among travel-associated cases (Table 1), with few cases reported associated with travel to Europe. Among cases with known travel history, travel-associated cases outnumbered indigenous cases (Figure 3) between 2004 and 2007, although this may reflect a bias in favour of completion of this variable when cases are travel-related. In 2008, with the occurrence of two indigenous general outbreaks, indigenous cases were reported with a slightly greater frequency than travel-associated cases. In general, adult cases were more likely to be travel-associated than paediatric cases (data not shown).

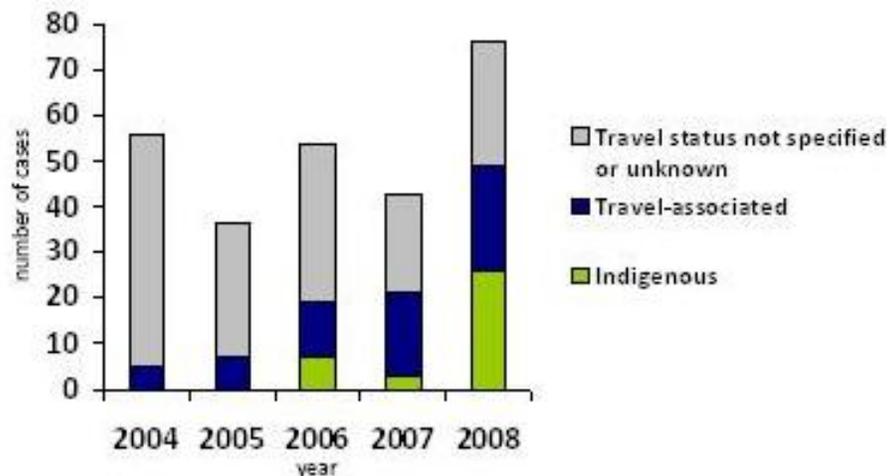


Figure 3. Annual number of cases by travel status, Ireland 2004-2008

Data source: CIDR

### Seasonal distribution

Between 2004 and 2008, the highest number of cases was reported in summer months (Table 2), although in Q2 2008 and Q4 2004, indigenous crèche outbreaks strongly influenced the seasonal distribution at those times (data not shown). The seasonal distribution of cases in Ireland appears to be strongly influenced by travel, with summer cases being more likely to be travel-associated (Table 2).

Table 2. Shigellosis notifications by quarter and travel status, Ireland 2004-2008

Travel status	Q1	Q2	Q3	Q4	Total
Indigenous	3	24	7	2	36
Travel-associated	9	13	27	16	65
Not specified or unknown	34	26	59	45	164
<b>Total</b>	<b>46</b>	<b>63</b>	<b>93</b>	<b>63</b>	<b>265</b>

## Species distribution

Over the 5 years, the majority of cases were reported as confirmed cases, except in 2008 when 13 probable cases were reported on the basis of being epidemiologically linked to confirmed cases within an outbreak. Among confirmed cases, *Shigella sonnei* was consistently the most common species reported (56% overall -range 50-66% across the five years), while *S. flexneri* accounted for around 30% of cases (range 27-35% across the five years). The species distribution of cases by country/region of infection is reported in Table 1. Among indigenous cases, *S. sonnei* was the most common species notified, while other species were more commonly associated with exposure abroad (Table 1).

## Laboratory investigations by the National Salmonella Reference Laboratory

More detailed typing of *Shigella* isolates can provide useful information on the relatedness of strains which can be used by public health personnel to outline/provide evidence for links between cases during investigations of case clusters. The National Salmonella Reference Laboratory (NSRL) in University College Hospital, Galway can provide laboratory services for speciation, serotyping, antimicrobial resistance profiling, and where appropriate, molecular typing of *Shigella* isolates by Pulsed Field Gel Electrophoresis (PFGE).

The number of *Shigella* isolates referred to the NSRL has increased in recent years. In 2008, 43 human *Shigella* isolates were referred to the NSRL, representing 68% of all confirmed cases notified. The species/serotype distribution of isolates referred to NSRL is reported in Table 3.

Table 3: Species/serotypes of isolates referred to NSRL, Ireland 2004-2008

Strain	2004	2005	2006	2007	2008
<i>Shigella boydii</i>	1			2	4
<i>Shigella boydii</i> 19					1
<i>Shigella dysenteriae</i>			1		
<i>Shigella dysenteriae</i> type 1				1	
<i>Shigella flexneri</i> 1a			1		
<i>Shigella flexneri</i> 1b			2	4	2
<i>Shigella flexneri</i> 2a		4	5	3	7
<i>Shigella flexneri</i> 2b				1	1
<i>Shigella flexneri</i> 3a	1	1			3
<i>Shigella flexneri</i> 3b					1
<i>Shigella flexneri</i> 4				1	2
<i>Shigella flexneri</i> 4a				1	
<i>Shigella flexneri</i> 6			4	1	
<i>Shigella flexneri</i> Y				1	
<i>Shigella sonnei</i>	3	8	7	5	22
<b>Number of isolates referred to NSRL</b>	<b>5</b>	<b>13</b>	<b>20</b>	<b>20</b>	<b>43</b>
<b>Number notifications of confirmed cases</b>	<b>56</b>	<b>36</b>	<b>54</b>	<b>43</b>	<b>63</b>
<b>Isolates referred to NSRL/ confirmed cases notified (%)</b>	<b>9%</b>	<b>36%</b>	<b>37%</b>	<b>47%</b>	<b>68%</b>

During investigation of the community outbreak of shigellosis in the HSE-MW, molecular typing (PFGE) of isolates was used at NSRL to compare the relatedness of strains and confirmed the likelihood that most of the cases were epidemiologically-linked.<sup>1</sup>

## Summary

In summary, shigellosis epidemiology in Ireland appears to be strongly influenced by travel, in particular among adult cases and during summer months. Travel to Asia and Africa appears to confer a higher risk than travel to Europe. The completeness of data on the *Country of infection* of cases has improved considerably over the last five years, and as it continues to improve, it should increase the validity of the conclusions that can be drawn about the epidemiology of shigellosis in Ireland. The occurrence of two indigenous general outbreaks in 2008 in Ireland, and the occurrence of several foodborne outbreaks in Scandinavia associated with imported fresh produce<sup>4-8</sup>, makes reporting of this variable particularly important for the prompt identification of indigenous clusters.

*Shigella* has been designated by the European Centre for Disease Prevention and Control as one of six priority gastroenteric pathogens at European level (along with *Campylobacter*, *Salmonella*, VTEC, *Listeria* and *Yersinia*). The continuing potential for foodborne outbreaks in the EU means that surveillance for shigellosis remains important, both for the identification of indigenous outbreaks, and for the identification of cases/clusters that could be part of larger international outbreaks associated with internationally-distributed foodstuffs. The continued referral of *Shigella* isolates to NSRL by primary hospital laboratories has the potential to play a key role in this work, and is much appreciated.

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