Enteric fever (typhoid and paratyphoid) in England, Wales and Northern Ireland: 2013
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About Public Health England

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Introduction

Enteric fever (also known as typhoid and paratyphoid) is an illness caused by the bacteria *Salmonella enterica* serovar Typhi (typhoid) or Paratyphi A, B and C (paratyphoid). Classic typhoid fever is a serious disease and can be life-threatening unless treated promptly with antibiotics. The disease may last several weeks and convalescence takes some time. Paratyphoid is typically milder than typhoid and of shorter duration.

Typhoid and paratyphoid are almost exclusively acquired abroad through the ingestion of heavily contaminated food and water. These diseases are prevalent in regions of the world where sanitation is poor.

This report summarises the epidemiology of laboratory-confirmed symptomatic cases of *S. Typhi* (typhoid) and *S. Paratyphi* (paratyphoid) reported in England, Wales and Northern Ireland in 2013. It includes both reference laboratory and enhanced enteric fever surveillance data. Provisional data is available on a quarterly basis in the Health Protection Report [1].

Data sources

Symptomatic cases of *Salmonella Typhi* and *Paratyphi* confirmed by the Public Health England (PHE) Salmonella Reference Service (SRS), within the Gastrointestinal Bacteria Reference Unit (GBRU). Data from 2006 onwards was extracted from the laboratory database using ‘date received by the laboratory’. Epidemiological information for cases reported from May 2006 onwards was obtained from enhanced enteric fever surveillance [2]. Reports have been deduplicated so that only individual cases are reported.

All data was analysed using MS Excel.
General trend

In 2013, 312 laboratory-confirmed symptomatic cases of S. Typhi and S. Paratyphi were reported by the PHE Salmonella Reference Service in England, Wales and Northern Ireland (EWNI), a 12% decrease compared to 354 cases reported in 2012 continuing the downward trend in cases reported since 2010 [Figure 1]. In 2013, 59% of cases were caused by S. Typhi and 41% to S. Paratyphi A and B [Table 1].

Table 1. Laboratory-confirmed symptomatic cases of enteric fever, England, Wales and Northern Ireland by organism: 2006 – 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>S. Typhi</th>
<th>S. Paratyphi A</th>
<th>S. Paratyphi B</th>
<th>S. Paratyphi C</th>
<th>Mixed infection</th>
<th>Total</th>
<th>% S. Typhi</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>227</td>
<td>267</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>502</td>
<td>45.2%</td>
</tr>
<tr>
<td>2007</td>
<td>254</td>
<td>208</td>
<td>15</td>
<td>1</td>
<td>2</td>
<td>480</td>
<td>52.9%</td>
</tr>
<tr>
<td>2008</td>
<td>267</td>
<td>235</td>
<td>18</td>
<td>-</td>
<td>-</td>
<td>520</td>
<td>51.3%</td>
</tr>
<tr>
<td>2009</td>
<td>247</td>
<td>185</td>
<td>25</td>
<td>-</td>
<td>-</td>
<td>457</td>
<td>54.1%</td>
</tr>
<tr>
<td>2010</td>
<td>285</td>
<td>211</td>
<td>16</td>
<td>-</td>
<td>-</td>
<td>512</td>
<td>55.7%</td>
</tr>
<tr>
<td>2011</td>
<td>253</td>
<td>219</td>
<td>7</td>
<td>-</td>
<td>1</td>
<td>480</td>
<td>52.7%</td>
</tr>
<tr>
<td>2012</td>
<td>177</td>
<td>162</td>
<td>12</td>
<td>2</td>
<td>1</td>
<td>354</td>
<td>49.9%</td>
</tr>
<tr>
<td>2013</td>
<td>185</td>
<td>121</td>
<td>6</td>
<td>-</td>
<td>-</td>
<td>312</td>
<td>59.3%</td>
</tr>
</tbody>
</table>

Figure 1. Laboratory-confirmed cases of S. Typhi and S. Paratyphi*, with % change for each year, England, Wales and Northern Ireland: 2006 – 2013

*S. Typhi % change
All S. Paratyphi % change
S. Typhi cases
All S. Paratyphi cases

* Mixed infections were excluded
Age and sex

In 2013, age and sex were known for all 312 cases; just under half were adults aged between 20 and 39 years [Figure 2] with a median age of 27 years. Those aged 16 years and under accounted for 23% of cases, with 1.0% (N=3) of the total in children under two years (and thus ineligible for vaccination). Overall, there were slightly more males (53%) than females, with males predominating in the younger age groups.

Figure 2. Laboratory-confirmed cases of enteric fever, England, Wales and Northern Ireland by age and sex: 2013 (N=312)

Geographical distribution

London continues to report the largest proportion of cases in England (35%), although there was a 15% decrease in cases reported in 2013 compared to 2012. Cases in Wales and Surrey, Sussex, Kent PHE Centre (PHEC) doubled in 2013 compared to 2012 [Table 2]. All cases in both these regions were travel-associated, with no obvious explanation for the increases.
Table 2. Laboratory-confirmed cases of S. Typhi and S. Paratyphi, England, Wales and Northern Ireland by geographical distribution: 2012 and 2013

<table>
<thead>
<tr>
<th>Geographical area</th>
<th>2013</th>
<th>2012</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>London PHEC</td>
<td>106</td>
<td>125</td>
<td>-15%</td>
</tr>
<tr>
<td>West Midlands PHEC</td>
<td>34</td>
<td>41</td>
<td>-17%</td>
</tr>
<tr>
<td>East Midlands PHEC</td>
<td>24</td>
<td>18</td>
<td>33%</td>
</tr>
<tr>
<td>Thames Valley PHEC</td>
<td>22</td>
<td>26</td>
<td>-15%</td>
</tr>
<tr>
<td>Sussex, Surrey and Kent PHEC</td>
<td>21</td>
<td>11</td>
<td>91%</td>
</tr>
<tr>
<td>South Midlands and Hertfordshire PHEC</td>
<td>18</td>
<td>14</td>
<td>29%</td>
</tr>
<tr>
<td>Yorkshire and Humber PHEC</td>
<td>17</td>
<td>38</td>
<td>-55%</td>
</tr>
<tr>
<td>Greater Manchester PHEC</td>
<td>15</td>
<td>25</td>
<td>-40%</td>
</tr>
<tr>
<td>Cumbria and Lancashire PHEC</td>
<td>9</td>
<td>8</td>
<td>13%</td>
</tr>
<tr>
<td>Avon, Gloucestershire and Wiltshire PHEC</td>
<td>8</td>
<td>14</td>
<td>-43%</td>
</tr>
<tr>
<td>Wessex PHEC</td>
<td>8</td>
<td>6</td>
<td>33%</td>
</tr>
<tr>
<td>Cheshire and Merseyside PHEC</td>
<td>6</td>
<td>5</td>
<td>20%</td>
</tr>
<tr>
<td>Anglia and Essex PHEC</td>
<td>6</td>
<td>4</td>
<td>50%</td>
</tr>
<tr>
<td>North East PHEC</td>
<td>4</td>
<td>4</td>
<td>0%</td>
</tr>
<tr>
<td>Devon, Cornwall and Somerset PHEC</td>
<td>2</td>
<td>8</td>
<td>-75%</td>
</tr>
<tr>
<td><strong>England total</strong></td>
<td>300</td>
<td>347</td>
<td>-14%</td>
</tr>
<tr>
<td>Wales</td>
<td>11</td>
<td>5</td>
<td>120%</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>1</td>
<td>2</td>
<td>-50%</td>
</tr>
<tr>
<td><strong>EWNI total</strong></td>
<td>312</td>
<td>354</td>
<td>-12%</td>
</tr>
</tbody>
</table>

Travel history

Travel history reporting for enteric fever has vastly improved since enhanced surveillance began in May 2006 [Figure 3]. In 2013, 99.7% of laboratory-confirmed cases of S.Typhi and S. Paratyphi had travel history information, mostly from enhanced surveillance or, where this was missing, from the sending laboratory request form. In 2013, 96% of confirmed cases (300/312) were presumed acquired abroad, of these 277/300 (92%) were travelling abroad from EWNI (presumed UK residents) and the remainder were foreign visitors to EWNI (N=14) or new entrants to EWNI (N=9). For 11 cases no travel abroad was reported and for one case, travel history was not stated.
The most common reason for travel for cases that travelled abroad from EWNI was to visit friends and relatives (VFR) (248/277, 90%) [Figure 4]. The majority travelled to countries of their ethnic origin, mostly to countries in the Indian sub-continent (ISC) [Table 3].

**Figure 4.** Reason for travel for laboratory-confirmed cases of enteric fever that travelled abroad from England, Wales and Northern Ireland: 2013 (N=277)
Table 3. Countries of travel and ethnicity for laboratory-confirmed cases of enteric fever that travelled abroad from England, Wales and Northern Ireland to visit friends and relatives: 2013 (N=205 cases*)

<table>
<thead>
<tr>
<th>Presumed country of infection</th>
<th>Indian</th>
<th>Pakistani</th>
<th>Bangladesh</th>
<th>Black African</th>
<th>Other/mixed</th>
<th>Not stated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>94</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>99</td>
</tr>
<tr>
<td>Pakistan</td>
<td>-</td>
<td>59</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>4</td>
<td>66</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>1</td>
<td>-</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>23</td>
</tr>
<tr>
<td>Nepal</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Other Asia</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>102</td>
<td>60</td>
<td>20</td>
<td>3</td>
<td>17</td>
<td>11</td>
<td>213</td>
</tr>
</tbody>
</table>

* Note that some cases travelled to more than one country; all countries are included in this table so the totals in the table will be higher than the actual number of cases.

Reasons for travel, other than visiting friends and relatives (N=55), included holidays (39), business/work (paid and voluntary) (9) and other reasons including study, pilgrimage, and group expeditions (7). Some of these cases travelled to more than one country including: India (29), Nepal (8), other parts of the ISC (4), South East Asia (11), North Africa/Middle East (5), Sub-Saharan Africa (4), South and Central America (4) plus Barbados and Turkey (1 each). Barbados is not a typical risk country for typhoid as defined by the National Travel Health Network and Centre but has been designated as a travel-associated case in the absence of an obvious source of infection in the UK.

Non travel-associated cases

In 2013, there were 11 confirmed cases of symptomatic enteric fever where no travel abroad was reported, seven were caused by S. Typhi and four S. Paratyphi A.

- two cases were part of two family clusters, each linked to an asymptomatic case and either could have been the source of the other
- three cases had travelled to an endemic area but not within the typical incubation period
- the remaining cases had no information regarding a potential source of infection

An additional nine confirmed infections in asymptomatic cases or carriers were also reported, of which seven were presumed to be carriers and information on the other three was not available.
Probable and possible cases

In 2013, there were 20 probable and three possible cases of enteric fever as defined in the Public Health Operational Guidelines for Enteric Fever [3]. All but two were returning travellers, one was a new entrant and one did not travel abroad. Travel history information for the probable and possible cases is detailed in Table 4.

Table 4. Regions of and reason for travel for probable and possible cases of enteric fever that travelled abroad from England, Wales and Northern Ireland: 2013 (N=21 cases*)

<table>
<thead>
<tr>
<th>World region of travel</th>
<th>Business</th>
<th>Holiday</th>
<th>Other</th>
<th>VFR</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian sub continent</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>Sub-Saharan and Southern Africa</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>South East Asia</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Europe</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>South America</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>14</td>
<td>22</td>
</tr>
</tbody>
</table>

* Note that some cases travelled to more than one country; all countries are included in this table so the totals in the table will be higher than the actual number of cases.

References

