The current status of the National Typhoid and Paratyphoid Fever Surveillance System: Recent trends in reporting and completeness

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Background

Typhoid fever is caused by Salmonella enterica Typhi, and is rare in the United States. About 400 laboratory-confirmed infections are reported each year.

- Most typhoid fever cases are associated with travel.
- Two types of typhoid fever are commonly available in the US:
  - Paratyphoid fever is caused by Salmonella typhi Paratyphi A, Paratyphi B, and Paratyphi C.
  - Paratyphi B reports were included from this analysis.
- Paratyphoid fever is not nationally notifiable.
- Most paratyphoid fever cases are associated with travel; antimicrobial resistance is common.
- National Typhoid and Paratyphoid Fever Surveillance (NTPFS) has been collecting standardized information from state and local health departments and public health laboratories who collect and report typhoid and paratyphoid fever cases to CDC due to H1N1 or other pressing issues.
- Epidemiologic variables included:
  - Although vaccination status is often complete, specific vaccine type information is not.
  - Typhoid vaccine is generally high in NTPFS reports.
  - Although vaccination status is often complete, specific vaccine type information is not.

Methods

- Tabulated the annual number of typhoid and paratyphoid fever cases reported to NTPFS from 2000 to 2010.
- Compared the number of typhoid fever cases reported to NTPFS to the number of NNDSS reports.
- Evaluated report time:
  - From clinical isolation to completion of NTPFS report form.
- Calculated completeness of case information:
  - Created index variables for demographic and epidemiologic variables.
  - Demographic variables included: age, gender, race, travel destination status.
  - Typhoid and paratyphoid fever cases were excluded from this analysis.
- Propensity models for reporting by travel destination status.

Results

- From 2000 to 2010, a total of 3,182 typhoid fever cases were reported to NTPFS (average 307 cases/year).
- Complete cases are not always available when NTPFS reports are reported on when cases were isolated.
- The median time from observation to completion of the NTPFS report form has variable, with a median of 11 days in 2009.
- The number of typhoid fever cases reported to NTPFS and NNDSS has been similar since 2006; more cases were reported to NTPFS in 2010.
- From 2007 to 2010, 247 paratyphoid fever cases were reported (average 71 cases/year).
- The number of jurisdictions reporting paratyphoid fever cases increased over time.
- The median reporting time has varied widely, from a low of 5 days in 2008 to a high of 33 days in 2006.
- Paratyphoid fever is not nationally notifiable, therefore no comparison could be reported to NNDSS.

Table 1. National typhoid fever reporting statistics by year, National Typhoid and Paratyphoid Fever Surveillance (NTPFS), 2000-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of jurisdiction reporting typhoid cases</th>
<th>Paratyphoid cases reported (NNDSS)</th>
<th>NTPFS cases as a percentage of NNDSS</th>
<th>Proportion of reports with &quot;complete&quot; travel destination information</th>
<th>Proportion of reports with &quot;complete&quot; vaccine information</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>22</td>
<td>22</td>
<td>100%</td>
<td>94%</td>
<td>99%</td>
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<td>2001</td>
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<td>25</td>
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<td>94%</td>
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<tr>
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<td>25</td>
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<tr>
<td>2006</td>
<td>25</td>
<td>25</td>
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<td>94%</td>
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<tr>
<td>2007</td>
<td>25</td>
<td>25</td>
<td>100%</td>
<td>94%</td>
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<tr>
<td>2008</td>
<td>25</td>
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<td>2009</td>
<td>25</td>
<td>25</td>
<td>100%</td>
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</table>

Table 2. National paratyphoid fever reporting statistics by year, National Typhoid and Paratyphoid Fever Surveillance (NTPFS), 2007-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of jurisdictions reporting paratyphoid cases</th>
<th>NTPFS cases as a percentage of NNDSS</th>
<th>Proportion of reports with &quot;complete&quot; travel destination information</th>
<th>Proportion of reports with &quot;complete&quot; vaccine information</th>
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<td>2009</td>
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<td>94%</td>
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<tr>
<td>2010</td>
<td>3</td>
<td>3</td>
<td>100%</td>
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</table>

Table 3. Proposed 2- and 4-year national goals, National Typhoid and Paratyphoid Fever Surveillance (NTPFS)

<table>
<thead>
<tr>
<th>Goal</th>
<th>Proposed 2-year goal</th>
<th>Proposed 4-year goal</th>
<th>Number of jurisdictions reporting to NTPFS</th>
<th>NNDSS cases as a percentage of NNDSS</th>
<th>Proportion of reports with &quot;complete&quot; travel destination information</th>
<th>Proportion of reports with &quot;complete&quot; vaccine information</th>
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Proposed national goals

- Increase the number of states reporting to NTPFS.

- Ensure case reports forms are completed within 31 days of specimen isolation.

- Improve completeness of important demographic, epidemiologic, travel destination, vaccination and vaccine type variables.

Limitations

- Cannot distinguish between a state that did not report to NTPFS and a state that reported zero cases of typhoid and paratyphoid fever in a year.
- Cases of paratyphoid fever are not included in NNDSS and NTPFS.
- Some cases of paratyphoid fever may have been reported to typhoid fever as NNDSS.

Conclusions

- Reporting to NTPFS has increased relative to reporting to NNDSS over time.
- Perhaps related to states’ batching reports to CDC due to H1N1 or other pressing issues.
- Reporting timeliness is improving because NTPFS collects important epidemiologic, data, including travel and vaccination information, which are not captured in any other national surveillance system.

References


Acknowledgments

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

National Center for Emerging and Zoonotic Infectious Diseases

Dilation of Foodborne, Waterborne, and Entericinfectious Diseases