Noroviruses
Outbreak activity during August 1, 2012–2013
Five states, Minnesota, Ohio, Oregon, Tennessee, and Wisconsin, reported increased outbreak activity during 2012 compared with 2010. An electronic laboratory surveillance network that collects information on genetic sequences used the Pearson correlation coefficient to assess the correlation between the proportion of ED visits due to gastrointestinal disease over months of non-outbreak seasons and the proportion of ED visits due to gastrointestinal disease during outbreak seasons. 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.

Methods
Norovirus Outbreak Data and Analysis
- National Outbreak Reporting System (NORS)
  - Collects data on gastrointestinal outbreak investigations
- CDC-Noromonitor
  - Surveillance system for foodborne illness
- Epidemiologic surveillance:
  - CDC’s Multi-State Norovirus Surveillance System
- Surveillance System for Norovirus Outbreaks

Background
- Norovirus is one of the most common causes of gastrointestinal illness worldwide.
- The majority of norovirus outbreaks are caused by the GII.4 genotype.
- New GII.4 strains emerge every 2–3 years, replacing previously prevalent GII.4 strains.
- Emergence of new norovirus strains may lead to increased outbreak activity.

Objective
- To assess whether the emergence of the GII.4 Sydney strain was associated with an increase in norovirus outbreak activity.

Methods
Syndromic Surveillance Data and Analysis
- EpiCenter:
  - CDC’s statewide syndromic surveillance data from 178 emergency departments (ED) and urgent care facilities
- EpiNo: identifies on patient-level information
- To assess the association between GII.4 Sydney outbreaks and number of suspected and confirmed norovirus outbreaks, we used the Pearson correlation coefficient.

Conclusions
- During 2012–2013, GII.4 Sydney became the predominant norovirus outbreak strain in the United States.
- Emergence of GII.4 Sydney did not result in a substantial increase in norovirus outbreak activity in 2012 compared with the previous two years.
- The percentage of ED visits due to gastrointestinal disease over months of non-outbreak seasons and the proportion of ED visits due to gastrointestinal disease during outbreak seasons did not correlate with an increased number of outbreaks as compared with 2010–2012.
- The major proportion of GII.4 Sydney outbreaks during 2012–2013 did not correlate with an increased number of outbreaks as compared with 2010–2012.
- Norovirus is one of the most common causes of gastrointestinal illness worldwide.

Limitations
- Only five states participate in NoroSTAT.
- NoroSTAT data represent only a limited proportion of United States population from several regions of the country.
- Syndromic reporting may be incomplete.
- Genotype surveillance may be limited due to laboratory confirmation.
- The probability of norovirus as a causative agent is high when other causative agents are identified.
- NoroSTAT data may correlate with an increased number of outbreaks as compared with 2010–2012.

Table 1. Number of gastrointestinal (GI) illness and number of suspected and confirmed outbreaks by state during 2012–2013

<table>
<thead>
<tr>
<th>State</th>
<th>No. of confirmed outbreaks</th>
<th>No. of suspected outbreaks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon</td>
<td>123</td>
<td>45</td>
</tr>
<tr>
<td>Tennessee</td>
<td>123</td>
<td>45</td>
</tr>
<tr>
<td>Ohio</td>
<td>123</td>
<td>45</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>123</td>
<td>45</td>
</tr>
</tbody>
</table>

Table 2. Number and percentage of cases in outbreaks of acute gastrointestinal illness caused by norovirus, by symptoms, clinical outcomes, and risk of illness

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Risk of Illness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>10%</td>
</tr>
<tr>
<td>Abdominal cramps</td>
<td>20%</td>
</tr>
<tr>
<td>Vomiting</td>
<td>30%</td>
</tr>
</tbody>
</table>

Table 3. Proportion of emergency department and urgent care (ED) visits for gastrointestinal (GI) illness and number of suspected and confirmed norovirus outbreaks by week—EpiCenter syndromic surveillance system, August 1, 2010–July 1, 2011

<table>
<thead>
<tr>
<th>Week</th>
<th>GI Illness</th>
<th>norovirus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30%</td>
<td>10%</td>
</tr>
<tr>
<td>2</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>3</td>
<td>50%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Norovirus: Outcomes and Clinical Significance of the Emergent GII.4 Sydney Strain—United States, 2012–2013
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Notes
- The probability of norovirus as a causative agent is high when other causative agents are identified.
- Norovirus is one of the most common causes of gastrointestinal illness worldwide.

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