68 WHO Member States reported 2013 rotavirus surveillance data. Globally, 73,189 children hospitalized with diarrhea were enrolled into surveillance and 66% were investigated for rotavirus diarrhea.

47 (69%) reporting Member States had at least one site that met quality criteria to be able to calculate rotavirus positivity during this reporting period (page 2).

Among children <1 year of age, median rotavirus positivity was 17% in Member States that introduced vaccine compared to 46% in non-rotavirus using Member States.

The WHO coordinated rotavirus sentinel hospital surveillance network was formed in 2008; this bulletin presents 2013 surveillance data reported by Member States as at October 2014.

Globally, 191 sentinel hospital sites in 68 WHO Member States and reported 2013 data to the WHO (Figure 1, Table 1), an increase from the 178 sites in 60 Member States that reported 2012 data. During both 2012 and 2013, over half the reporting sentinel sites were located in Member States that were eligible for surveillance funding from Gavi, the Vaccine Alliance (55% and 56% of sites, respectively.) Only in the Region of the Americas were the majority of sites located in non-Gavi eligible Member States.

During 2013, a total of 73,189 children <5 years of age were hospitalized for treatment of acute gastroenteritis and met the surveillance case definition (Table 1.) Almost half of these children were from the 83 sites in the Region of the Americas. Globally, stool specimens were collected from 66% of cases; some sentinel sites utilize a sampling strategy for the collection of stool specimens.

Five of the 6 WHO Regions met the 90% target for percent of stool specimens collected within 2 days of hospital admission. Globally, 95% of the collected stools were obtained within the recommended 2 days of hospitalization.

### Table 1: Number of countries and sites reporting data and number of children <5 years of age hospitalized for treatment of acute gastroenteritis and enrolled in the WHO Global Rotavirus Surveillance Network, January—December 2013

<table>
<thead>
<tr>
<th>WHO Region</th>
<th>Number of Member States Reporting (% GAVI)</th>
<th>Number of Sentinel Sites Reporting (% GAVI)</th>
<th>Number of Children &lt;5 Years of Age Hospitalized and Met Case Definition (% of Global Cases Hospitalized)</th>
<th>Number of Stool Specimens Collected (% of Regional Cases Hospitalized)</th>
<th>Number of Stool Specimens Collected within 2 Days of Admission (% of Regional Stool Specimens Collected) (Target=90%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFR</td>
<td>28 (86)</td>
<td>48 (88)</td>
<td>11,062 (15)</td>
<td>10,455 (95)</td>
<td>9,934 (95)</td>
</tr>
<tr>
<td>AMR</td>
<td>17 (29)</td>
<td>83 (25)</td>
<td>34,032 (46)</td>
<td>11,895 (35)</td>
<td>11,895 (100)</td>
</tr>
<tr>
<td>EUR</td>
<td>7 (57)</td>
<td>24 (63)</td>
<td>8,528 (12)</td>
<td>7,530 (88)</td>
<td>7,107 (91)</td>
</tr>
<tr>
<td>EUR</td>
<td>6 (100)</td>
<td>10 (100)</td>
<td>9,654 (13)</td>
<td>9,621 (98)</td>
<td>9,390 (100)</td>
</tr>
<tr>
<td>SEAR</td>
<td>4 (100)</td>
<td>10 (100)</td>
<td>3,608 (5)</td>
<td>2,750 (76)</td>
<td>1,959 (71)</td>
</tr>
<tr>
<td>WPR</td>
<td>6 (83)</td>
<td>16 (56)</td>
<td>6,355 (9)</td>
<td>6,084 (96)</td>
<td>3,583 (92)</td>
</tr>
<tr>
<td>Global</td>
<td>68 (71)</td>
<td>191 (56)</td>
<td>73,189 (100)</td>
<td>68,125 (96)</td>
<td>45,868 (95)</td>
</tr>
</tbody>
</table>

* Any child aged 0-59 months admitted for treatment of acute (i.e., 14 days) or bloody gastrointestinal illness to a sentinel hospital conducting surveillance. Excluded are children with bloody diarrhea and children transferred from another hospital.

**Notes:**

- Data from the WHO-coordinated Global Rotavirus Surveillance Network as at October 2014.
- Member State reported data but had not introduced rotavirus vaccine (n=44).
- Member State reported data and introduced rotavirus vaccine (n=24).
- Member State did not report data or not in rotavirus network.

**Special Points of Interest:**

- 68 WHO Member States reported 2013 rotavirus surveillance data. Globally, 73,189 children hospitalized with diarrhea were enrolled into surveillance and 66% were investigated for rotavirus diarrhea.
- 47 (69%) reporting Member States had at least one site that met quality criteria to be able to calculate rotavirus positivity during this reporting period (page 2).
- Among children <1 year of age, median rotavirus positivity was 17% in Member States that introduced vaccine compared to 46% in non-rotavirus using Member States.

**Inside This Issue:**

- Rotavirus Detection
- Rotavirus Genotype Data
- Conclusions
- Acknowledgements

**More Information**
Rotavirus detection is only calculated for sentinel sites that meet the following surveillance quality inclusion criteria:

1. Reported data for each month of the 12 month period. Due to the seasonality of rotavirus disease, annual rotavirus detection can only be calculated for sentinel sites that provided data to WHO for all 12 months.

2. Tested stool specimens from the following numbers of children <5 years of age enrolled in surveillance during the 12 month period:
   - ≥ 50 children in countries that have introduced rotavirus vaccine; or
   - ≥ 100 children in countries that have not introduced rotavirus vaccine.

Table 2: Numbers of reporting Member States, sentinel hospitals, and children <5 years of age hospitalized for treatment of acute gastroenteritis in sentinel hospitals that met inclusion criteria*, by WHO Region, WHO Global Rotavirus Surveillance Network, January—December 2013

Table: Numbers of reporting Member States, sentinel hospitals, and children <5 years of age hospitalized for treatment of acute gastroenteritis in sentinel hospitals that met inclusion criteria*, by WHO Region, WHO Global Rotavirus Surveillance Network, January—December 2013

<table>
<thead>
<tr>
<th>WHO Region</th>
<th>Number of Member States Reporting</th>
<th>Number of Sentinel Sites Reporting</th>
<th>Number of Children &lt;5 Years of Age Hospitalized and Met Case Definitiona (% of Global Cases Hospitalized)</th>
<th>Number of Stool Specimens Tested (% of Regional Cases Hospitalized) (Target=90%)</th>
<th>Number of Total Rotavirus Positivity</th>
<th>Medians of Country Positivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFR</td>
<td>15</td>
<td>21</td>
<td>7,431 (13)</td>
<td>6,850 (92)</td>
<td>2,554</td>
<td>33%</td>
</tr>
<tr>
<td>AMR</td>
<td>13</td>
<td>44</td>
<td>15,371 (44)</td>
<td>10,169 (40)</td>
<td>2,370</td>
<td>20%</td>
</tr>
<tr>
<td>EUR</td>
<td>4</td>
<td>12</td>
<td>7,664 (13)</td>
<td>6,583 (86)</td>
<td>1,964</td>
<td>27%</td>
</tr>
<tr>
<td>SEAR</td>
<td>6</td>
<td>9</td>
<td>9,372 (16)</td>
<td>9,130 (97)</td>
<td>2,662</td>
<td>22%</td>
</tr>
<tr>
<td>WPR</td>
<td>4</td>
<td>7</td>
<td>3,186 (5)</td>
<td>1,952 (61)</td>
<td>629</td>
<td>12%</td>
</tr>
<tr>
<td>Global</td>
<td>47</td>
<td>102</td>
<td>58,678 (100)</td>
<td>40,128 (68)</td>
<td>13,034</td>
<td>32%</td>
</tr>
</tbody>
</table>

*aAny child aged 0-59 months admitted for treatment of acute (i.e. 14 days) watery gastroenteritis/diarrhoea to a sentinel hospital conducting surveillance. Excluded are children with bloody diarrhoea and children transferred from another hospital.

Figure 2: Annual rotavirus detection positivity among sentinel hospitals that met inclusion criteria*, by WHO Member State, WHO Global Rotavirus Surveillance Network, January—December 2013

*Inclusion criteria: 1) Reported data for each month of the 12 month period, and 2) tested stool specimens from ≥ 50 children in Member States that introduced rotavirus vaccine or ≥ 100 children in Member States that have not introduced rotavirus vaccine.

Data from the WHO-coordinated Global Rotavirus Surveillance Network as at October 2014.
Rotavirus Detection Continued

Globally, 47 (69%) of the 68 Member States had at least one sentinel site that met inclusion criteria for calculation of rotavirus positivity (Tables 1, 2.) Twenty-two (47%) of these Member States had introduced rotavirus vaccine. Over half the children had stool specimens that tested positive for rotavirus in 8 Member States; none of which had introduced rotavirus vaccine (Figure 2.) Regional median rotavirus positivity ranged from 20% in the Americas where 11 of 13 Member States had introduced rotavirus vaccine to 53% in the Western Pacific where no Member States had introduced vaccine. Children <1 year of age in vaccine using Member States had a rotavirus positivity half that as children in non vaccine using Member States (medians of 17% versus 46%), (Figure 4.)

Rotavirus Genotype Data

The global rotavirus laboratory network is an important component of the WHO rotavirus surveillance network, designed to conduct high quality diagnostic testing for rotavirus diarrhea and characterize the prevalent strain genotypes in different countries and regions. Sentinel site laboratories carry out the initial EIA diagnostic testing of stool specimens from enrolled cases. National and regional reference laboratories provide quality control, confirmatory testing and perform molecular testing for RV genotyping and strain characterization.

In 2013, 110 sentinel sites laboratories, national, provincial and regional reference laboratories participated in the Global Rotavirus External Quality Assessment Programme monitored by WHO and the Rotavirus Global Reference Laboratory at the Centers for Disease Control and Prevention, Atlanta. All laboratories showed a high level of performance with 98% of laboratories achieving a passing score (>80%) for EIA testing and 88% of the 48 laboratories with genotyping capacities achieving a passing score for genotyping. Figure 4 shows countries that contributed to genotype data in 2013, and indicates global, regional reference and national laboratories. WHO has finalized guidelines for standardization of rotavirus specimens for genotyping and for linking clinical and laboratory data. During 2013, guidelines were unavailable; thus genotype data should be cautiously interpreted. Figures 5 and 6 show the distribution of the most prevalent genotypes reported globally and for each WHO region. The predominant genotypes worldwide were P[8],G1 with 25.3% followed by P[4],G2 with 12.5% and P[8],G12 with 10.0%. Variations in regional genotypes were found (Figure 6).

Table 3: Global Summary of Rotavirus Genotypes* by WHO regions, WHO Global Rotavirus Surveillance Network, January-December 2013

<table>
<thead>
<tr>
<th>Region</th>
<th>Total samples genotyped</th>
<th># of countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afr</td>
<td>2209</td>
<td>21</td>
</tr>
<tr>
<td>AMR</td>
<td>1100</td>
<td>10</td>
</tr>
<tr>
<td>EUR</td>
<td>157</td>
<td>3</td>
</tr>
<tr>
<td>EUR</td>
<td>812</td>
<td>7</td>
</tr>
<tr>
<td>SEAR</td>
<td>604</td>
<td>4</td>
</tr>
<tr>
<td>WPR</td>
<td>2413</td>
<td>7</td>
</tr>
<tr>
<td>Global</td>
<td>6295</td>
<td>52</td>
</tr>
</tbody>
</table>

*Work is currently ongoing to standardize sample selection for genotyping.

Data from the WHO-coordinated Global Rotavirus Laboratory Network as at October 2014.

Figure 4: WHO Member States that reported rotavirus genotype data, WHO Global Rotavirus Surveillance Network, January-December 2013

Figure 5: Global summary of rotavirus genotypes*, WHO Global Rotavirus Surveillance Network, January-December 2013

Figure 6: Median rotavirus positivity by age and rotavirus vaccine introduction status among sentinel sites that met inclusion criteria*, WHO Global Rotavirus Surveillance Network, January-December 2013
January—December 2013 Data

Sixty-eight Member States reported 2013 rotavirus sentinel hospital surveillance data to WHO as at October 2014. Of these, 47 (69%) Member States had at least one sentinel site that met quality inclusion criteria to calculate rotavirus positivity. Global median rotavirus detection was 31%. The Regional median rotavirus detection ranged from 20% in the Americas where 11 of 13 Member States had introduced rotavirus vaccine to 53% in the Western Pacific where no Member States had introduced vaccine. Children <1 year of age in vaccine using Member States had a rotavirus positivity half that as children in non vaccine using Member States (medians of 17% versus 46%), (Figure 4.)

Limitations

Surveillance data summarized at the global level has limitations and should be cautiously interpreted.

Conclusions

Acknowledgements

WHO gratefully acknowledges the dedicated efforts of the numerous individuals and organizations involved with compiling surveillance information, including Ministries of Health, sentinel hospitals, as well as the network of national, regional, and global, reference laboratories. WHO also gratefully acknowledges the financial support from GAVI that is provided eligible countries.

More Information

For surveillance: http://www.who.int/immunization/monitoring_surveillance/resources/NUVI/en/
For rotavirus disease and vaccine: http://www.who.int/immunization/diseases/rotavirus/en/
For immunization coverage: http://www.who.int/immunization/monitoring_surveillance/data/en/
For laboratory network: http://www.who.int/immunization/monitoring_surveillance/burden/laboratory/Rotavirus/en/
The World Health Organization (WHO) produces this bulletin twice a year to share data and activities from the WHO-coordinated global sentinel hospital surveillance network.

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