Tetanus Toxoid, Reduced Diphtheria Toxoid, and Acellular Pertussis (Tdap) Vaccination Among Adolescents in the United States, 2010-2012

Samantha K Kurosky,1 Keith L Davis,1 Sudeep J Karve2*

1 RTI Health Solutions, Research Triangle Park, NC, United States; 2AstraZeneca, Gaithersburg, MD, United States

BACKGROUND

• Pertussis, a highly communicable respiratory illness caused by the bacillus Bordetella pertussis, is often characterized by a prolonged paroxysmal cough and inspiratory whoop.
• Disease immunity decreases with age and acquired immunity wanes over time, leading to an increase in disease incidence among children at the age of greatest risk for severe pertussis complications and mortality.
• The primary method of pertussis prevention is vaccination with an acellular pertussis-containing vaccine.
• Table 1 shows the vaccination schedule recommended for children by the Advisory Committee on Immunization Practices (ACIP).

RESULTS

Table 1. Summary of Pertussis Vaccination Recommendations

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 years</td>
<td>DTaP primary series at 2, 4, and 6 months; single at 15 through 18 months</td>
</tr>
<tr>
<td>≥ 4 years</td>
<td>Tdap at age 11 through 12 years</td>
</tr>
</tbody>
</table>

• Despite recommendations for routine vaccination, pertussis remains a endemic in the United States. In 2011, 1.6% of reported cases, 17 years of age or younger, were reported to have had a previous pertussis vaccination at recommended ages. This proportion increased significantly to 74.14% in 2011 and to 91.83% in 2012 (P < 0.001).

• A greater proportion of mothers who had an adolescent well-child visit and the number of immunization providers increased significantly between 2011 and 2012 (P < 0.001).

• Increasing the proportion of adolescents who have had a well-child visit, and the number of immunization providers to more than one immunization provider, and a gap in health insurance coverage were associated with a decrease in vaccination completion.

• A higher level of mother’s education and living in a household above the federal poverty level were significantly associated with an increase in receipt of Tdap at ages 11 through 12 years compared with receipt at ages ≥ 14 years.

• Having a mother age 45 or no adolescent well-child visit, more than one immunization provider, and a gap in health insurance coverage were associated with a decrease in vaccination completion.

Table 2. Received and Promised Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tdap receipt</td>
<td>0.52</td>
<td>0.56</td>
<td>0.59</td>
</tr>
<tr>
<td>Number of providersb</td>
<td>0.52</td>
<td>0.56</td>
<td>0.59</td>
</tr>
<tr>
<td>Gap in health insurance coverage</td>
<td>0.65</td>
<td>0.67</td>
<td>0.68</td>
</tr>
<tr>
<td>Mother’s education</td>
<td>0.73</td>
<td>0.73</td>
<td>0.73</td>
</tr>
<tr>
<td>High school or above</td>
<td>0.73</td>
<td>0.73</td>
<td>0.73</td>
</tr>
<tr>
<td>Poverty level (ref)</td>
<td>0.91</td>
<td>0.91</td>
<td>0.91</td>
</tr>
<tr>
<td>Below poverty</td>
<td>0.86</td>
<td>0.86</td>
<td>0.86</td>
</tr>
<tr>
<td>≤ 44 years</td>
<td>0.91</td>
<td>0.91</td>
<td>0.91</td>
</tr>
</tbody>
</table>

• Tdap administration between 2010 and 2012.

• This proportion increased significantly to 74.14% in 2011 and to 91.83% in 2012 (P < 0.001).

• Tdap at ages 11 through 12 years may contribute to an increase in receipt of Tdap at ages ≥ 14 years.

• Although Tdap coverage rates exceeded national goals in 2012, 13 percentage point were achieved in 2010 to 2012, indicating that acceptance and accessibility of the vaccine may be increasing.

• Tdap is administered between the ages of 11 and 12 years for children who did not complete five doses of DTaP. This proportion increased signifi cantly to 74.14% in 2011 and to 91.83% in 2012 (P < 0.001).

• In the present study, we found a 13 percentage point increase in receipt of Tdap at the recommended ages (11 through 15 years) during the study period. This increase in receipt of Tdap may contribute to an increase in sustained immunity levels during a time when pertussis immunity may begin to wane.

• Despite the increase in timely vaccination, nearly one in four adolescents delayed Tdap vaccination. Furthermore, those who delayed vaccination were less likely to be in an average of 11 years (P = 0.017).

• Increasing Tdap vaccination among adolescents should incorporate strategies to increase acceptance and accessibility of the vaccine, improve the medical home, and reduce gaps in health insurance coverage.

CONCLUSIONS

• Vaccinating adolescents is a challenging task due to low rates of immunization visits, difficulty persuading adolescents to be vaccinated, and lack of parental consent, and out of pocket vaccine coverage. Nonetheless, the present study found receipt of Tdap vaccination increased over 10 percentage points between 2010 and 2012, indicating that acceptance and accessibility of the vaccine may be increasing.

• Tdap is administered between the ages of 11 and 12 years for children who did not complete five doses of DTaP. This proportion increased significantly to 74.14% in 2011 and to 91.83% in 2012 (P < 0.001).

• In the present study, we found a 13 percentage point increase in receipt of Tdap at the recommended ages (11 through 15 years) during the study period. This increase in receipt of Tdap vaccination at ages ≥ 14 years may contribute to an increase in sustained immunity levels during a time when pertussis immunity may begin to wane.

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• Increasing Tdap vaccination among adolescents should incorporate strategies to increase acceptance and accessibility of the vaccine, improve the medical home, and reduce gaps in health insurance coverage.

REFERENCES


CONTACT INFORMATION

Samantha Kurosky, R01 HD062076, RTI Health Solutions, 200 Research Drive, Research Triangle Park, NC 27709, Phone: +1-919-377-2606, Fax: +1-919-544-8293, Email: samantha.kurosky@rti.org

Samantha K Kurosky, Senior Health Outcomes Scientist

308 Park Offices Drive, Research Triangle Park, NC 27709
Phone: +1-919-377-7491
Fax: +1-919-544-8293
Email: samantha.kurosky@rti.org


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