## Vaccine-preventable diseases in upstate New York

### Reported cases (rates per 100,000 people) of select vaccine-preventable diseases* (all ages), 2012

<table>
<thead>
<tr>
<th>Region</th>
<th>Total cases</th>
<th>Influenza cases</th>
<th>Pertussis cases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New York State</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total cases</td>
<td>27,342</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza cases</td>
<td>22,158</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pertussis cases</td>
<td>3,171</td>
<td></td>
<td></td>
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<tr>
<td><strong>Central New York Region</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total cases</td>
<td>4,236</td>
<td></td>
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</tr>
<tr>
<td>Influenza cases</td>
<td>3,867</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pertussis cases</td>
<td>258</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Upstate New York</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total cases</td>
<td>13,085</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza cases</td>
<td>11,198</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pertussis cases</td>
<td>1,321</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Southern Tier Region</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total cases</td>
<td>1,615</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza cases</td>
<td>1,101</td>
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<td></td>
</tr>
<tr>
<td>Pertussis cases</td>
<td>349</td>
<td></td>
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<tr>
<td><strong>Western New York Region</strong></td>
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</tr>
<tr>
<td>Total cases</td>
<td>1,641</td>
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</tr>
<tr>
<td>Influenza cases</td>
<td>1,332</td>
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<td></td>
</tr>
<tr>
<td>Pertussis cases</td>
<td>240</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Finger Lakes Region</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total cases</td>
<td>2,653</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza cases</td>
<td>2,235</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pertussis cases</td>
<td>293</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Utica/Rome/North Country Region</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total cases</td>
<td>2,940</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza cases</td>
<td>2,663</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pertussis cases</td>
<td>181</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Vaccine-preventable diseases include diphtheria, hepatitis A, hepatitis B, hepatitis B acute, hepatitis B perinatal, influenza, measles, meningococcal, mumps, pertussis, pneumococcal, rubella and tetanus.


Note: Upstate New York refers to the New York counties highlighted on this map.

Although the rates of most vaccine-preventable illnesses in the U.S. have reached historic lows, a small percentage of Americans forgoes immunizations, thereby raising the public health threat of avoidable disease outbreaks.¹ According to the Centers for Disease Control and Prevention, widespread vaccination has eradicated smallpox and made the occurrence of diseases such as polio and diphtheria exceedingly rare, but outbreaks of other diseases continue to pose risks.²

The true burden of vaccine-preventable diseases is undercounted, because many cases go undiagnosed, and some diseases, such as varicella (chicken pox), are not reported in New York state.

The incidence of most of the 13 vaccine-preventable diseases included in this report was low in upstate New York and New York state in 2012, compared to the pre-vaccine era. An uptick in influenza in upstate New York brought the overall incidence of vaccine-preventable illnesses in upstate New York (263.7 per 100,000) higher than the statewide figure (139.7 per 100,000). Influenza and pertussis cases together accounted for about 96 percent of total reported vaccine-preventable illnesses in upstate New York and 93 percent of total reported preventable illnesses statewide.

Central New York had the highest number of reported vaccine-preventable cases (4,236) and the highest vaccine-preventable rate (392.3 per 100,000), compared to other upstate New York regions. In upstate New York in 2012, the influenza rate was highest in Central New York (358.1 per 100,000), and the pertussis rate was highest in the Southern Tier (47.5 per 100,000).
The vital role of vaccines in public health

Vaccines have been pivotal to safely and effectively controlling — even eradicating — infectious diseases and are aptly ranked among the top public health prevention strategies. The CDC estimates that for each group of children of the same age who are immunized, the return on investment for childhood immunization is:

- 33,000 lives saved
- 14 million cases prevented
- $9.9 billion in health care costs saved
- $33.4 billion in indirect costs saved

If the vaccinations in use today were stopped, many diseases that are now controlled could become common again. As an example, almost all Americans contracted measles before the vaccine became available in 1963. The disease rate decreased more than 99 percent after widespread vaccination. If it were stopped, rates could increase to those of the pre-vaccine era. If vaccinations were eliminated, preventable diseases could resurge and threaten future generations.

Even with vaccines available, Americans still contract vaccine-preventable illnesses, such as pneumonia and influenza. About 42,000 adults and 300 children die from vaccine-preventable illnesses in the U.S. every year.

About this report

The purpose of this report is to document the incidence of vaccine-preventable diseases, closely examine prevalent diseases and their deleterious effects (such as hospitalizations and deaths) and analyze the progress in improving immunization rates in upstate New York, New York state and the U.S.

Common vaccine misconceptions, compiled by the Centers for Disease Control and Prevention, World Health Organization and the College of Physicians of Philadelphia, also appear throughout this report.

The report includes available data for the years 2011 through 2012 and a regional analysis, which describes:

- The reported cases of vaccine-preventable diseases during 2012;
- The hospitalizations caused by pneumonia and/or influenza from 2009 through 2011 and deaths from pneumonia in 2011;
- The pertussis incidence rates from 2010-2012, including the national outbreak in 2012;
- The self-reported immunization rates for influenza, pneumonia and tetanus and/or pertussis in 2011;
- The upstate New York, New York state and national childhood immunization rates* (ages 19 months to 35 months) in 2011.

*Childhood immunization rates include the recommended doses of DTaP, polio, MMR, Hib, hepatitis B, varicella and pneumococcal conjugate vaccines.

A guide to vaccines, vaccinations, and immunizations

- Vaccine: Product that produces immunity from a disease, administered through needle injections, by mouth, or by aerosol.
- Vaccination: Injection of a killed or weakened organism that produces immunity in the body against that organism.
- Immunization: Process of becoming protected from a disease. Vaccines cause immunization. Some diseases also cause immunization after an individual recovers from the disease.

Key findings

With the exception of influenza and pertussis, very few vaccine-preventable diseases were reported statewide during 2012, and the adult self-reported immunization rates in 2011 were below 2017 state and 2020 national goals.

- Influenza incidence was higher in upstate New York (225.7 per 100,000) than New York state (113.2 per 100,000) in 2012.

- In 2011, 32.6 percent of upstate New York adults ages 18 to 64 reported having a seasonal flu shot within the previous year, whereas 61.7 percent of adults 65 and older reported having the vaccine. Adults ages 18 to 24 reported the lowest vaccination rate (18.8 percent).

- Upstate New York adults reported low rates of pneumococcal lifetime vaccination (30.9 percent); 11.5 percent reported not knowing if they had received a pneumococcal vaccination.

- Due to the nationwide pertussis outbreak in 2012, pertussis rates across the country were high. Compared to the 50 states and District of Columbia, upstate New York ranked 14th-highest in pertussis incidence (26.6 per 100,000) and was higher than the state rate (16.2 per 100,000) and national rate (15.4 per 100,000).

- Upstate New York’s childhood immunization rate* (54.5 percent) was lower than the state rate (65.1 percent) and national rate (68.5 percent) in 2011.

*Childhood immunization rates include the recommended doses of DTaP, polio, MMR, Hib, hepatitis B, varicella and pneumococcal conjugate vaccines.

#1 MISCONCEPTION
Better hygiene and sanitation are the cause of disease reduction, not vaccines.

FACT
Improved socioeconomic conditions, better nutrition and advances in antibiotics have undoubtedly decreased the disease rate and increased disease survival rates. However data before and after vaccine availability indicate that the largest drop in disease rates occurs after vaccine implementation. According to the CDC and WHO, if vaccinations were stopped, uncommon and deadly diseases such as polio and measles would re-emerge.
Vaccine-preventable diseases before and after vaccines were licensed in the United States

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**Pre-vaccine era cases:**
- Pertussis (whooping cough):
  - 147,000 reported cases and about 8,000 deaths each year in the early 1940's.
- Tetanus (lockjaw):
  - 1,314 cases per year, 20% of cases end in death.
- Diphtheria:
  - 100,000 to 200,000 cases each year in the 1920's. More than 15,000 deaths in 1921.
- Measles:
  - Nearly every American had measles. Each year 3 - 4 million cases and hundreds died.
- Mumps:
  - Estimated 212,000 cases in 1964.
- Polio:
  - 13,000 to 20,000 cases per year.
- Haemophilus Influenzae Type (Hib):
  - Average of 20,000 severe cases per year among children younger than five and 1,000 deaths.
- Pneumococcal:
  - Children had 700 cases of meningitis, 13,000 blood infections, five million ear infections and 200 deaths each year.
- Varicella (chicken pox):
  - Nearly all Americans had varicella (4 million cases, 11,000 hospitalizations, 100 deaths per year).
- Rubella (German measles):
  - Estimated 212,000 cases in 1964.
- Hepatitis B:
  - 26,000 cases reported each year in the 1980's.
- Influenza:
  - 500,000 deaths from "Spanish flu" in 1918-1919.
- Polio:
  - Since mid-1980's deaths of 3,000 to 49,000 each year.
- Mumps:
  - 229 cases.
- Pneumococcal:
  - Average of 20,000 severe cases per year among children younger than five and 1,000 deaths.
- Varicella (chicken pox):
  - 30 cases among children younger than five.

**Post-vaccine era cases:**
- Pertussis (whooping cough):
  - (2012): 48,277 cases (considered a cyclical outbreak and the greatest number of cases since 62,786 were reported in 1955).
- Tetanus (lockjaw):
  - (2012): 37 cases.
- Diphtheria:
- Measles:
  - (2012): 34 indigenous cases, 21 imported cases.
- Mumps:
  - (2012): 229 cases.
- Polio:
  - (2012): 0 cases.
- Pneumococcal:
  - (2012): 15,635 cases.
- Haemophilus Influenzae Type (Hib):
  - (2012): 30 cases among children younger than five.
- Varicella (chicken pox):
  - (2012): 13,447 cases, 3 deaths.

Sources: See Data sources and methods.
Reported vaccine-preventable diseases among all New Yorkers

Upstate New York rates higher than New York state rates, 2012

The low vaccine-preventable illness rates in upstate New York and statewide can be attributed to effective infectious disease control, including use of vaccines.

- Across New York state, the year 2012 witnessed low to nonexistent rates for diphtheria, hepatitis A, hepatitis B, measles, meningococcal, mumps, rubella and tetanus, with slightly higher pneumococcal rates (.9 per 100,000).

- Upstate New York’s influenza rate (225.7 per 100,000) was twice the state rate (113.2 per 100,000).

- A national pertussis outbreak resulted in higher rates in upstate New York (26.6 per 100,000) than New York state (16.2 per 100,000). (Refer to pertussis section for further details.)

**FACT**

Vaccines have reduced the number of vaccine-preventable diseases, and some are at very low levels in the United States, however some are still prevalent in the country and epidemic in the world. Travelers can unknowingly bring a disease to the U.S. The CDC and WHO recommend vaccination as the best method of protection. Some individuals cannot be vaccinated for medical reasons and rely on others to be vaccinated to ensure disease prevention.

**MISCONCEPTION #2**

Vaccine-preventable diseases are close to being eliminated in the United States, so vaccination is not necessary.
Influenza and pertussis accounted for the majority of vaccine-preventable disease instances (per 100,000 people) across upstate New York regions in 2012

* Other vaccine-preventable diseases include diphtheria, hepatitis A, hepatitis B acute, hepatitis B perinatal, measles, mumps, meningococcal, pneumococcal, rubella and tetanus.


Population data: The U.S. Census Bureau

Central New York had the highest influenza rate (358.1 per 100,000), and the Southern Tier had the highest pertussis rate (47.5 per 100,000) in 2012. Western New York had the lowest influenza rate (71.5 per 100,000) and pertussis rate (22.7 per 100,000) compared to the other regions.

MISCONCEPTION

Vaccine “hot lots” increase adverse events and deaths.

FACT

The “hot lot” concept is misused in the vaccine context, according to the CDC and WHO. There is no evidence that one vaccine batch is more or less safe than another. Vaccine reactions are reported to the federal government’s Vaccine Adverse Event Reporting System, which shows that no vaccine lot in the modern era has been deemed unsafe. The Food and Drug Administration licenses vaccine manufacturing facilities and vaccine products and can immediately recall a lot if it’s found to be unsafe.
A closer look at prevalent vaccine-preventable diseases:
Influenza and many pneumonia cases

There are various causes of pneumonia, including vaccine-preventable pneumococcal disease, which is one of the most common causes of severe pneumonia.

Pneumonia and influenza combined were once the leading causes of death among Americans. In 2011, pneumonia was the ninth leading cause of death, and influenza was the seventh leading cause of death among adults age 65 and older.

Every year in America, influenza causes an average of 200,000 hospitalizations and 23,600 deaths. About 90 percent of deaths due to influenza complications occur in people 65 years and older.

In the United States in 2010, pneumonia led to 1.1 million hospitalizations and 50,000 deaths.

Since at least 2002 in New York state, pneumonia and influenza together have been the fifth leading cause of death among females and adults age 75 and older. Among upstate New York females during 2012, pneumonia and influenza together were the fifth leading cause of death in Broome, Cayuga, Essex, Fulton, Orleans, and Steuben counties. Among upstate New York males during 2012, pneumonia and influenza together were the fourth leading cause of death in Genesee County and fifth leading cause of death in Allegany, Chenango, Delaware and Montgomery counties.

The majority of people who get a disease have been vaccinated.

MISCONCEPTION

That statement, while technically true, is grossly misleading because it is only a fraction of a percent of those who are vaccinated who are at risk of getting the disease while 100 percent of those who are unvaccinated are at risk. Most vaccines are 85-95 percent effective. During outbreaks, more vaccinated people contract the disease than unvaccinated people because the raw number of vaccinated people in the United States is far greater than those who are unvaccinated.

According to the CDC and WHO, if measles were to break out in a high school with 1,000 students who never had the disease, the five students who didn’t have two doses of the measles vaccine would all contract the disease. Of the 995 fully vaccinated students, only seven students, or about 0.7 percent, would become infected. Using this example, vaccine critics would be misleading if they simply said seven students who were vaccinated got the disease but only five unvaccinated students got the disease because they did not tell the rest of the key facts.
Pneumonia hospitalizations (rates per 10,000) and deaths (rates per 100,000) in upstate New York and New York state, 2009-2011

<table>
<thead>
<tr>
<th>New York State</th>
<th>Upstate New York</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalizations:</td>
<td></td>
</tr>
<tr>
<td>Pneumonia/flu, age 65+:</td>
<td>96,647 (122.3)</td>
</tr>
<tr>
<td>Pneumonia, age 0-4:</td>
<td>15,982 (45.1)</td>
</tr>
<tr>
<td>Pneumonia deaths, 2011:</td>
<td>4,808 (24.6)</td>
</tr>
<tr>
<td>Pneumonia/flu, age 65+:</td>
<td>32,946 (148.4)</td>
</tr>
<tr>
<td>Pneumonia, age 0-4:</td>
<td>3,079 (37.4)</td>
</tr>
<tr>
<td>Pneumonia deaths, 2011:</td>
<td>1,119 (22.6)</td>
</tr>
</tbody>
</table>

**Central New York Region**

<table>
<thead>
<tr>
<th>Hospitalizations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumonia/flu, age 65+:</td>
</tr>
<tr>
<td>Pneumonia, age 0-4:</td>
</tr>
<tr>
<td>Pneumonia deaths, 2011:</td>
</tr>
</tbody>
</table>

**Finger Lakes Region**

<table>
<thead>
<tr>
<th>Hospitalizations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumonia/flu, age 65+:</td>
</tr>
<tr>
<td>Pneumonia, age 0-4:</td>
</tr>
<tr>
<td>Pneumonia deaths, 2011:</td>
</tr>
</tbody>
</table>

**Western New York Region**

<table>
<thead>
<tr>
<th>Hospitalizations:</th>
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</thead>
<tbody>
<tr>
<td>Pneumonia/flu, age 65+:</td>
</tr>
<tr>
<td>Pneumonia, age 0-4:</td>
</tr>
<tr>
<td>Pneumonia deaths, 2011:</td>
</tr>
</tbody>
</table>

**Southern Tier Region**

<table>
<thead>
<tr>
<th>Hospitalizations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumonia/flu, age 65+:</td>
</tr>
<tr>
<td>Pneumonia, age 0-4:</td>
</tr>
<tr>
<td>Pneumonia deaths, 2011:</td>
</tr>
</tbody>
</table>

Upstate New York’s three-year pneumonia and influenza hospitalization rate for adults 65 and older (148.4 per 10,000) was higher than the state rate (122.3 per 10,000). The state’s pneumonia hospitalization rate for children age 0 to 4 (45.1 per 10,000) was higher than upstate New York’s rate (37.4 per 10,000).

The Southern Tier had higher hospitalization rates for both age groups (184.7 per 10,000 adults age 65 and older and 48.6 per 10,000 children ages 0 to 4), compared to the other regions from 2009 to 2011. The Finger Lakes had the lowest hospitalization rates (122.8 per 10,000 adults age 65 and older and 27.0 per 10,000 children ages 0 to 4). New York state had a higher pneumonia death rate (24.6 per 100,000) than upstate New York (22.6 per 100,000). The Southern Tier region had the highest pneumonia death rate (27.7 per 100,000) in 2011 compared to other upstate New York regions.
Influenza and many pneumonia cases can be prevented with proper vaccination

At-risk populations
Pneumonia often is a complication of a pre-existing condition or infection, such as influenza.\textsuperscript{14}

Individuals at high risk for becoming sick with pneumonia or developing serious flu-related complications are:\textsuperscript{15,16,17}

- Adults 65 years and older,
- Children younger than 5 years,
- Individuals with underlying medical conditions,
- Individuals who have asthma.

Other individuals at high risk for developing serious flu-related complications are:\textsuperscript{18}

- Women who are pregnant during flu season,
- Those who are of American Indian and Alaskan native heritage,
- Residents of nursing homes and other chronic care facilities.

Costs
The economic burden of influenza in the U.S. ranges from $71.3 billion to $166 billion, with much of the cost attributed to indirect costs, such as time off from work and lost productivity.\textsuperscript{19}

Available vaccines
The seasonal flu vaccine protects against influenza,\textsuperscript{20} and while vaccines cannot prevent every type of pneumonia, vaccinations are critical to reducing the occurrence of pneumonias. Several vaccines prevent the bacteria and viruses (including pneumococcus, haemophilus influenzae type b, pertussis, varicella, measles and influenza) that cause pneumonia.\textsuperscript{21} Two pneumococcal vaccines protect against more than 90 types of bacteria that cause pneumonia.\textsuperscript{22}

- Pneumococcal conjugate vaccine is used for children younger than age 2 and adults with certain immune deficiency conditions.
- Pneumococcal polysaccharide vaccine is used for adults 65 and older, children and younger adults with high-risk conditions and adults 19 to 64 who smoke or have asthma.\textsuperscript{23}

Influenza vaccination goals \textsuperscript{24,25}

<table>
<thead>
<tr>
<th>Program</th>
<th>Population</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy People 2020</td>
<td>• Ages 6 months* to 64 years, including pregnant women</td>
<td>80%</td>
</tr>
<tr>
<td>Healthy People 2020</td>
<td>• High-risk (noninstitutionalized) adults ages 18 to 64 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Institutionalized adults (18 and older)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Adults 65 and older</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Health care personnel</td>
<td></td>
</tr>
<tr>
<td>New York State Prevention Agenda 2013-2017</td>
<td>• Adults ages 65 and older</td>
<td>75.1%</td>
</tr>
</tbody>
</table>

*Note: children ages 6 months to 23 months may receive one to two doses, depending on age appropriateness and previous doses received
Self-reported influenza vaccination rates in upstate New York, 2011

Higher rates among older adults, but rates are still below nationwide goals

In 2011, all regional upstate New York self-reported influenza vaccination rates were below the national goal of having a 90 percent flu immunization rate among adults age 65 and older and the national goal of having an 80 percent immunization rate among people ages 18 to 64. Adults ages 65 and older were also below the New York state goal of having a 75.1 percent flu immunization rate in this age group.

Adults ages 65 years and older had higher self-reported influenza vaccination rates than adults ages 18 to 64 across regions, with the age 65 and older age group’s vaccination rate ranging from 71.7 percent in the Finger Lakes to 51.2 percent in Central New York. The vaccination rates for adults ages 18 to 64 ranged from 36.4 percent in the Finger Lakes to 28.3 percent in the Southern Tier.

Of the parents who responded about the vaccination rates of their children, 53.6 percent reported that their child had the vaccine in the previous year (data not shown), indicating that adults ages 18 to 64 were more likely to have their children vaccinated against the flu than to have themselves vaccinated.

#5 MISCONCEPTION

Influenza is just a nuisance, and the vaccine is not very effective.

FACT

Influenza kills 300,000 to 500,000 people worldwide every year. Children, pregnant women, the elderly and people with chronic conditions are at a high risk for infection and death. Influenza vaccination is the best way to ensure immunity from severe flu and to prevent it from spreading to others.
Rates of upstate New York adults who reported having the seasonal flu shot in the previous year, by age, 2011

Flu immunization rates increase with age, leaving younger adults unprotected

To request access: http://www.health.ny.gov/statistics/brfss/

Adults ages 18 to 24 had the lowest flu vaccination rates in 2011 (18.8 percent). Immunization rates generally increased with age, with the highest rate being among adults ages 65 and older (61.7 percent). Flu shot rates in all age groups were below the Healthy People 2020 goals, and upstate New Yorkers ages 65 and older were about 13 percentage points below the statewide 2017 goal (75.1 percent).

#6 MISCONCEPTION
Simultaneously giving a child multiple vaccines for different diseases causes harmful side effects and overloads the child’s immune system.

FACT
Scientific evidence suggests that simultaneous vaccinations do not adversely affect the normal childhood immune system. The CDC’s Advisory Committee on Immunization Practices and the American Academy of Pediatrics recommends concurrent administration.
The proportion of upstate New York adults who reported ever having a pneumococcal vaccine was only 30.9 percent, and 11.5 percent were unsure or did not know, indicating a lack of awareness about personal immunizations.

The Utica/Rome/North Country region had the highest self-reported lifetime pneumococcal vaccination rate (35.9 percent), and the Southern Tier had the lowest rate (19.7 percent), which was almost 10 percentage points lower than the rate in any other region.

The “not sure/don’t know” percentage among respondents was about 10 percent in all regions, with the highest rate (13.5 percent) being in Western New York.

### Pneumococcal vaccination goals

<table>
<thead>
<tr>
<th>Program</th>
<th>Population</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy People 2020</td>
<td>• High-risk (noninstitutionalized) adults ages 18 to 64 years</td>
<td>60%</td>
</tr>
<tr>
<td>Healthy People 2020</td>
<td>• Children ages 19 months to 35 months (at least 4 doses of pneumococcal conjugate vaccine)</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>• Institutionalized adults (18 and older) in long-term care or nursing homes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Adults ages 65 and older</td>
<td></td>
</tr>
<tr>
<td>New York State Prevention Agenda 2013-2017</td>
<td>• Adults ages 65 and older</td>
<td>71.7%</td>
</tr>
</tbody>
</table>
Self-reported pneumococcal vaccination rates in upstate New York, by age, 2011

Low immunization rates among adults younger than 65

In the U.S., adults account for 90 percent of pneumococcal cases and more than 95 percent of pneumococcal deaths.28 The disease can kill one in four to five people ages 65 and older.29

- The lowest self-reported pneumococcal vaccination percentage among upstate New Yorkers was among adults ages 25 to 34 (13.2 percent), which was the age group that had the highest percent of people not knowing if they had ever received the vaccine (23.2 percent).

- The self-reported pneumococcal vaccination rate was highest among adults 65 and older, as 70.6 percent reported having had the vaccine in their lifetime, and only 4.2 percent reported being unsure. This age group nearly reached the state 2017 goal of 71.7 percent.

- Despite having a higher rate, the percent of 65 and older upstate New Yorkers who had the pneumococcal vaccination is still short of the Healthy People 2020 goal of having 90 percent of people vaccinated.

To request access: http://www.health.ny.gov/statistics/brfss/

#7 MISCONCEPTION

Vaccines cause autism.

FACT

A 1998 study that is now discredited raised concerns about the measles, mumps and rubella vaccine causing autism. The journal, The Lancet, that published the original study removed the article in 2010 after finding it to be fraudulent. The author lost his license to practice medicine. The scare led to decreased MMR vaccination rates and increased outbreaks.
A closer look at prevalent vaccine-preventable diseases: Pertussis (whooping cough)

Pertussis spiked in 2012, the year of the largest national outbreak since 1955

Highly contagious, severe outcomes
Pertussis is a respiratory illness spread by coughing, sneezing and close contact among people. It can cause life-threatening complications in infants and children and complications from coughing in adults. About 50 percent of infected infants younger than 1 year are hospitalized. Of hospitalized infants, serious complications include:

- Apnea (67 percent)
- Pneumonia (23 percent)
- Convulsions (1.6 percent)
- Death (1.6 percent)
- Encephalopathy (0.4 percent)

An infected person can spread the disease to up to 15 people, and unvaccinated children are eight times more likely to become infected than children who receive the five recommended vaccine doses. The disease most commonly affects infants and young children, who get it when it’s passed on by household members:

- Mothers are responsible for 30 percent to 40 percent of infant cases
- Household members are responsible for 80 percent of infant infections

1 infected person can spread the disease to up to 15 people
Vaccination
Before pertussis immunization began in the 1940s, it was one of the most widespread childhood diseases. The U.S. had more than 200,000 cases each year.\textsuperscript{36} Now, after years of widespread vaccination, the disease typically affects 10,000 to 40,000 people, and 10 to 20 deaths are reported annually. A three- to five-year cyclical outbreak trend has been evident since the 1980s. The CDC reports that the high incidence trend may be due to increased awareness, improved diagnostic tests and reporting, more bacteria in circulation and fading immunity.\textsuperscript{37}

Recent outbreak
In 2012, the U.S. experienced the largest pertussis outbreak since 1955, demonstrating the three- to five-year cyclical nature of the disease. Compared to the 50 states and District of Columbia, New York state’s incidence (16.2 per 100,000) ranked 18th highest, and upstate New York’s incidence (26.6 per 100,000) ranked 14th highest. The New York state and upstate New York incidence rates ranked higher than the national rate (15.4 per 100,000), which represents 48,277 cases in all.\textsuperscript{38,39}

Available vaccines
• The DTaP (diphteria-tetanus-acellular pertussis) vaccine is given in five doses to children starting at 2 months and continuing through age 6.\textsuperscript{40}

• The Tdap (tetanus-diphtheria-accelerated pertussis) booster shot is given to preteens, teenagers and adults in place of one tetanus-diphtheria booster that was to have been given every 10 years.\textsuperscript{41} The Tdap booster helps maintain immunity and is particularly important for adults who are around infants, due to the highly contagious nature of pertussis.\textsuperscript{42}

The CDC recommends that pregnant women receive the Tdap vaccine during each pregnancy to protect the baby from whooping cough, because babies are at greatest risk of catching this potentially deadly disease in their first few weeks of life.\textsuperscript{43}

<table>
<thead>
<tr>
<th>Program</th>
<th>Population</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy People 2020</td>
<td>Children younger than 1 year</td>
<td>2,500 cases per year</td>
</tr>
<tr>
<td>Healthy People 2020</td>
<td>Adolescents ages 11 years to 18 years</td>
<td>2,000 cases per year</td>
</tr>
<tr>
<td>Healthy People 2020</td>
<td>Children by age 19 months to 35 months (4 doses of DTaP)</td>
<td>90%</td>
</tr>
<tr>
<td>Healthy People 2020</td>
<td>Children in kindergarten (4 doses of DTaP)</td>
<td>95%</td>
</tr>
<tr>
<td>Healthy People 2020</td>
<td>Adolescents by age 13 years to 15 years (1 dose of Tdap booster)</td>
<td>80%</td>
</tr>
</tbody>
</table>
Cyclical trend evident: Reported pertussis incidence rate (per 100,000), 2010-2012

Upstate New York rate is higher than state and national rates

Population data: The U.S. Census Bureau

Upstate New York’s reported pertussis incidence rate has been higher than statewide and national rates since 2010. In 2012, the rates in each geographical area peaked, with the upstate New York rate (26.6 per 100,000) being almost double that of the state (16.2 per 100,000) and nation (15.4 per 100,000).
Self-reported adult diphtheria-tetanus-acellular pertussis booster immunization rates, upstate New York, 2011

- A majority of upstate New York adults (75.3 percent) reported having had a tetanus shot in the past 10 years, and 8.5 percent were unsure whether they had a tetanus shot or not.

- Only 15.2 percent of upstate New York adults reported that their most recent tetanus shot included the pertussis vaccine; 43 percent reported not knowing if pertussis was included, and 17 percent reported that their doctor did not say whether or not pertussis was included.

#8 MISCONCEPTION

Vaccines cause harmful side effects, including death.

FACT

According to the CDC and WHO, vaccines are very safe. Any adverse events associated with vaccines are temporary and minor and can be relieved with acetaminophen. The low number of deaths caused by vaccines makes it difficult to statistically calculate risk. A person is much more likely to be severely injured by a vaccine preventable disease than by a vaccine.
Childhood immunization: Importance of disease prevention

The CDC Advisory Committee on Immunization Practices and the state recommend and require child immunizations to reduce and/or eliminate the number of serious or life-threatening vaccine-preventable illnesses. The recommended vaccine schedule is designed to build babies’ immune systems in case of disease exposure. Hundreds of research projects conducted by the medical community, government and nonprofit organizations have continuously proven vaccine safety and effectiveness, however highly publicized false claims have led to decreased immunization rates and increasing measles, mumps and pertussis outbreaks.

To prevent communicable illnesses, statewide laws require children to receive certain vaccines before entering child care facilities and/or school, starting with kindergarten and continuing through their college years.


<table>
<thead>
<tr>
<th>Vaccines</th>
<th>Prekindergarten (Day care, Head Start, Nursery or Pre-k)</th>
<th>Kindergarten</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria and tetanus toxoid-containing vaccine and pertussis vaccine (DTaP/DTP/Tdap)</td>
<td>4 doses</td>
<td>4 to 5 doses</td>
</tr>
<tr>
<td>Polio vaccine (IPV/OPV)</td>
<td>3 doses</td>
<td>3 to 5 doses</td>
</tr>
<tr>
<td>Measles, mumps and rubella vaccine (MMR)</td>
<td>1 dose</td>
<td>1 dose</td>
</tr>
<tr>
<td>Hepatitis B vaccine</td>
<td>3 doses</td>
<td>3 doses</td>
</tr>
<tr>
<td>Varicella (chicken pox) vaccine</td>
<td>1 dose</td>
<td>2 doses</td>
</tr>
<tr>
<td>Haemophilus influenzae type b conjugate vaccine (Hib)</td>
<td>1 to 4 doses</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Pneumococcal conjugate vaccine (PCV)</td>
<td>1 to 4 doses</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

New York state and the nation have set goals to increase child immunization rates, including the recommended doses of DTaP, polio, MMR, Hib, hepatitis B, varicella and PCV vaccines, otherwise referred to as the 4:3:1:3:3:1:4 series.

State and national goals for the recommended immunization series*47,48

<table>
<thead>
<tr>
<th>Program</th>
<th>Population</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy People 2020</td>
<td>• Children ages 19 months to 35 months</td>
<td>80%</td>
</tr>
<tr>
<td>New York State Prevention Agenda 2013-2017</td>
<td>• Children ages 19 months to 35 months</td>
<td>80%</td>
</tr>
</tbody>
</table>

* 4:3:1:3:3:1:4 immunization series includes 4+ doses of DTaP, 3+ doses of polio, 1+ dose of MMR, 3+ doses of Hib, 3+ doses of Hep B, 1+ dose of varicella, and 4+ doses of PCV.

The national rate for the recommended vaccination series among children ages 19 months to 35 months was 44.3 percent in 2009 and increased to 68.5 percent in 2011. However, New York state and upstate New York’s percentages are lagging behind the nation and even farther from the 80 percent goal.
**Reported vaccination** rates among children ages 19 months to 35 months, 2011

**Upstate New York rates are lower than New York state and national rates**

In 2011, the United States and New York state’s vaccination rates for children ages 19 months to 35 months were below the Healthy People 2020 and NYS Prevention Agenda 2013-2017 target rate of 80 percent:

- Upstate New York’s rate (54.5 percent) was more than 10 percentage points lower than the state rate (65.1 percent) and national rate (68.5 percent).
- Upstate New York’s 2011 regional child vaccination rates ranged from 56.4 percent in Central New York to 51.2 percent in Utica/Rome/North Country in 2011.

* 4:3:1:3:1:4 immunization series includes 4+ doses of DTaP, 3+ doses of polio, 1+ dose of MMR, 3+ doses of Hib, 3+ doses of Hep B, 1+ dose of varicella, and 4+ doses of PCV.


Vaccine-preventable disease and vaccination reporting in New York state

Reporting of suspected or confirmed communicable diseases is required by the New York State Sanitary Code (10NYCRR 2.10). Physicians, school nurses, laboratory directors, infection control practitioners, day care center directors, health care facilities, state institutions and all other individuals/locations that provide health care services are required to report communicable diseases.

Communicable vaccine-preventable diseases include diphtheria, hepatitis A, hepatitis B acute, hepatitis B perinatal, laboratory-confirmed influenza, measles, meningococcal, mumps, pertussis, rubella, pneumococcal and tetanus. The data presented in this report, which are useful for examining overall trends and at-risk population trends, represent only a portion of the true burden of vaccine-preventable illnesses in the state. Many cases go undiagnosed, and some highly prevalent diseases, such as varicella (chicken pox), are not reported at all.50

The New York State Legislature passed the Immunization Registry Law, effective in 2008, which requires health care providers to report all immunizations administered to individuals ages 18 years and younger with the person’s immunization histories to the New York State Department of Health using the New York State Immunization Information System. The data presented in that report may not represent the true percentages, because some immunizations remain unreported to the New York State Immunization Information System.51
Recommended Immunization Schedules

**Adults**

The 2014 Adult Immunization Schedule was approved by the Centers for Disease Control and Prevention’s Advisory Committee on Immunization Practices and the professional societies of family practice, internal medicine, obstetrics/gynecology and nurse-midwives. The schedule describes the most current recommendations for adult vaccinations.¹²

### 2014 Recommended Immunizations for Adults by Age

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>19-21 years</th>
<th>22-26 years</th>
<th>27-49 years</th>
<th>50-59 years</th>
<th>60-64 years</th>
<th>65+ years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza (Flu)</td>
<td></td>
<td></td>
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<tr>
<td>Tetanus, diphtheria, pertussis (Td/Tdap)</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Varicella (Chickenpox)</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>HPV Vaccine for Women¹³⁴</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>HPV Vaccine for Men³⁴</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoster (Shingles)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)³</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal (PCV13)³</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal (PPSV23)³</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A⁴</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B⁴</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenza type b (Hib)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Boxes this color show that the vaccine is recommended for all adults who have not been vaccinated, unless your healthcare professional tells you that you cannot safely receive the vaccine or that you do not need it.

Boxes this color show when the vaccine is recommended for adults with certain risks related to their health, job or lifestyle that put them at higher risk for serious diseases. Talk to your healthcare professional to see if you are at higher risk.

### FOOTNOTES:

1. Influenza vaccine: There are several flu vaccines available—talk to your healthcare professional about which flu vaccine is right for you.
2. Td/Tdap vaccine: Pregnant women are recommended to get Tdap vaccine with each pregnancy in the third trimester to increase protection for infants who are too young for vaccination, but at highest risk for severe illness and death from pertussis (whooping cough). People who have not had Tdap vaccine since age 11 should get a dose of Tdap followed by Td booster doses every 10 years.
3. Varicella, HPV, MMR, Hepatitis A, Hepatitis B vaccine: These vaccines are needed for adults who didn’t get these vaccines when they were children.
4. HPV vaccine: There are two HPV vaccines, but only one, HPV (Gardasil®), should be given to men. Gay men or men who have sex with men who are 22 through 26 years old should get HPV vaccine if they haven’t already started or completed the series.
5. Zoster vaccine: You should get the zoster vaccine even if you’ve had shingles before.
6. MMR vaccine: If you were born in 1957 or after, and don’t have a record of being vaccinated or having had these infections, talk to your healthcare professional about how many doses you may need.
7. Pneumococcal vaccine: There are two different types of pneumococcal vaccines: PCV13 and PPSV23. Talk with your healthcare professional to find out if one or both pneumococcal vaccines are recommended for you.

If you are traveling outside of the United States, you may need additional vaccines. Ask your healthcare professional which vaccines you may need.

For more information, call toll free 1-800-CDC-INFO (1-800-232-4636) or visit http://www.cdc.gov/vaccines

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http://www.cdc.gov/vaccines/schedules/easy-to-read/adult.html
### 2014 Recommended Immunizations for Adults by Medical Condition

**Pregnancy**
- Get a flu vaccine every year

**HIV Infection**
- CD4 count is less than 200
- CD4 count is 200 or greater

**Kidney disease or poor kidney function**

**Asplenia**
- (if you do not have a spleen or it does not work well)

**Heart disease, chronic lung disease, chronic alcoholism**

**Diabetes**
- (Type 1 and Type 2)

**Chronic Liver Disease**

#### If you have this health condition,

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Pregnancy</th>
<th>Weakened immune system (not human immunodeficiency virus [HIV])</th>
<th>HIV Infection</th>
<th>Kidney disease or poor kidney function</th>
<th>Asplenia</th>
<th>Heart disease, chronic lung disease, chronic alcoholism</th>
<th>Diabetes</th>
<th>Chronic Liver Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza (Flu)</td>
<td>Get a flu vaccine every year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, pertussis (Td/Tdap)</td>
<td>1 dose Tdap each pregnancy</td>
<td></td>
<td></td>
<td>Get Tdap vaccine once, then a Td booster every 10 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella (Chickenpox)*</td>
<td>SHOULD NOT GET VACCINE</td>
<td></td>
<td>2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPV Vaccine for Women*</td>
<td>3 doses through age 26 years</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPV Vaccine for Men*</td>
<td>3 doses through age 21 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoster (Shingles)</td>
<td>SHOULD NOT GET VACCINE</td>
<td></td>
<td></td>
<td>1 dose for those 60 years and older</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)*</td>
<td>SHOULD NOT GET VACCINE</td>
<td></td>
<td></td>
<td>1 or 2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal (PCV13)*</td>
<td>1 dose</td>
<td></td>
<td></td>
<td>1 or 2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal (PPSV23)*</td>
<td>1 or 2 doses</td>
<td></td>
<td></td>
<td>1 or 2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal</td>
<td>1 or more doses</td>
<td></td>
<td>1 or more doses</td>
<td>1 or more doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A*</td>
<td>2 doses</td>
<td></td>
<td></td>
<td>2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B*</td>
<td>3 doses</td>
<td></td>
<td>3 doses</td>
<td>3 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenzae type b (Hib)</td>
<td>1 or 3 doses</td>
<td></td>
<td></td>
<td>1 or 3 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Footnotes:**
1. Influenza vaccine: There are several flu vaccines available—talk to your healthcare professional about which flu vaccine is right for you.
2. Td/Tdap vaccine: Pregnant women are recommended to get Tdap vaccine with each pregnancy in the third trimester to increase protection for infants who are too young for vaccination but at highest risk for severe illness and death from pertussis (whooping cough). People who have not had Tdap vaccine since age 11 should get a dose of Tdap followed by Td booster doses every 10 years.
3. Varicella, HPV, MMR, Hepatitis A, Hepatitis B vaccine: These vaccines are needed for adults who didn’t get these vaccines when they were children.
4. HPV vaccine: There are two HPV vaccines, but only one, HPV (Gardasil®), should be given to men. Gay men or men who have sex with men who are 22 through 26 years old should get HPV vaccine if they haven’t already started or completed the series.
5. Zoster vaccine: You should get the zoster vaccine even if you’ve had shingles before.
6. MMR vaccine: If you were born in 1957 or after, and don’t have a record of being vaccinated or having had these infections, talk to your healthcare professional about how many doses you may need.
7. Pneumococcal vaccine: There are two different types of pneumococcal vaccines: PCV13 and PPSV23. Talk with your healthcare professional to find out if one or both pneumococcal vaccines are recommended for you.
8. If you are traveling outside of the United States, you may need additional vaccines. Ask your healthcare professional which vaccines you may need.

**For more information, call toll free 1-800-CDC-INFO (1-800-232-4636) or visit http://www.cdc.gov/vaccines**
Recommended Immunization Schedules (continued)

Children

The recommended schedules for children are reviewed each year. They have been approved by the Centers for Disease Control and Prevention’s Advisory Committee on Immunization Practices and the professional societies of pediatrics, family physicians and obstetricians and gynecologists. The most recent was published by the Centers for Disease Control and Prevention in February 2014.53

<table>
<thead>
<tr>
<th>Age Range</th>
<th>HepB</th>
<th>DTaP</th>
<th>Hib</th>
<th>PCV</th>
<th>IPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth</td>
<td>HepB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 month</td>
<td>HepB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 months</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4 months</td>
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<tr>
<td>6 months</td>
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<tr>
<td>12 months</td>
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<td>15 months</td>
<td></td>
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<tr>
<td>18 months</td>
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<tr>
<td>19–23</td>
<td></td>
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<tr>
<td>2–3 years</td>
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</tr>
<tr>
<td>4–6 years</td>
<td></td>
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</tr>
</tbody>
</table>

NOTE: If your child misses a shot, you don’t need to start over, just go back to your child’s doctor for the next shot. Talk with your child’s doctor if you have questions about vaccines.

FOOTNOTES:

* Two doses given at least four weeks apart are recommended for children aged 6 months through 8 years of age who are getting a flu vaccine for the first time and for some other children in this age group.

† Two doses of HepA vaccine are needed for lasting protection. The first dose of HepA vaccine should be given between 12 months and 23 months of age. The second dose should be given 6 to 18 months later. HepA vaccination may be given to any child 12 months and older to protect against HepA. Children and adolescents who did not receive the HepA vaccine and are at high risk, should be vaccinated against HepA.

If your child has any medical conditions that put him at risk for infection or is traveling outside the United States, talk to your child’s doctor about additional vaccines that he may need.

For more information, call toll free 1-800-CDC-INFO (1-800-232-4636) or visit http://www.cdc.gov/vaccines

## Recommended Immunization Schedules (continued)

### 2014 Recommended Immunizations for Children from 7 Through 18 Years Old

<table>
<thead>
<tr>
<th>7–10 YEARS</th>
<th>11–12 YEARS</th>
<th>13–18 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tdap¹</td>
<td>Tdap</td>
<td>Tdap</td>
</tr>
<tr>
<td>MCV4</td>
<td>Human Papillomavirus (HPV) Vaccine (3 Doses)²</td>
<td>HPV</td>
</tr>
<tr>
<td></td>
<td>Meningococcal Conjugate Vaccine (MCV4) Dose ³</td>
<td>MCV4 Dose ³</td>
</tr>
<tr>
<td></td>
<td>Influenza (Yearly)⁴</td>
<td>Booster at age 16 years</td>
</tr>
<tr>
<td></td>
<td>Pneumococcal Vaccine⁵</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hepatitis A (HepA) Vaccine Series⁶</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hepatitis B (HepB) Vaccine Series</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inactivated Polio Vaccine (IPV) Series</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Measles, Mumps, Rubella (MMR) Vaccine Series</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Varicella Vaccine Series</td>
<td></td>
</tr>
</tbody>
</table>

These shaded boxes indicate when the vaccine is recommended for all children unless your doctor tells you that your child cannot safely receive the vaccine.

These shaded boxes indicate the vaccine should be given if a child is catching up on missed vaccines.

These shaded boxes indicate the vaccine is recommended for children with certain health conditions that put them at high risk for serious diseases. Note that healthy children can get the HepA series⁶. See vaccine-specific recommendations at www.cdc.gov/vaccines/pubs/ACIP-list.htm.

### Footnotes

1. Tdap vaccine is combination vaccine that is recommended at age 11 or 12 to protect against tetanus, diphtheria and pertussis. If your child has not received any or all of the DTap vaccine series, or if you don’t know if your child has received these shots, your child needs a single dose of Tdap when they are 7–10 years old. Talk to your child’s health care provider to find out if they need additional catch-up vaccines.

2. All 11 or 12 year olds — both girls and boys — should receive 3 doses of HPV vaccine to protect against HPV-related disease. Either HPV vaccine (Cervarix® or Gardasil®) can be given to girls and young women; only one HPV vaccine (Gardasil®) can be given to boys and young men.

3. Meningococcal conjugate vaccine (MCV) is recommended at age 11 or 12. A booster shot is recommended at age 16. Teens who received MCV for the first time at age 13 through 15 years will need a one-time booster dose between the ages of 16 and 18 years. If your teenager missed getting the vaccine altogether, ask their health care provider about getting it now, especially if your teenager is about to move into a college dorm or military barracks.

4. Everyone 6 months of age and older—including preteens and teens—should get a flu vaccine every year. Children under the age of 9 years may require more than one dose. Talk to your child’s health care provider to find out if they need more than one dose.

5. Pneumococcal Conjugate Vaccine (PCV13) and Pneumococcal Polysaccharide Vaccine (PPSV23) are recommended for some children 6 through 18 years old with certain medical conditions that place them at high risk. Talk to your healthcare provider about pneumococcal vaccines and what factors may place your child at high risk for pneumococcal disease.

6. Hepatitis A vaccination is recommended for older children with certain medical conditions that place them at high risk. HepA vaccine is licensed, safe, and effective for all children of all ages. Even if your child is not at high risk, you may decide you want your child protected against HepA. Talk to your healthcare provider about HepA vaccine and what factors may place your child at high risk for HepA.

For more information, call toll free 1-800-CDC-INFO (1-800-232-4636) or visit http://www.cdc.gov/vaccines/teens

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http://www.cdc.gov/vaccines/schedules/easy-to-read/preteen-teen.html
Data sources and methods

Vaccine-preventable disease cases, 2012: New York State Department of Health and Centers for Disease Control and Prevention
Reported vaccine-preventable illness data in upstate New York and New York state were obtained from the New York State Department of Health’s 2012 Communicable Disease Annual Reports, “Reported Cases by Disease and County – 2012.”

Pneumonia and flu hospitalization and/or death rates, 2009-2011: New York State Department of Health
Reported pneumonia/influenza hospitalization data in upstate New York and New York state were obtained from the New York State Department of Health Community Health Indicator Reports-Communicable Disease Indicators, “Pneumonia/flu hospitalization rate (Aged 65 years and older) per 10,000” and “Pneumonia hospitalization rate per 10,000 - Aged 0-4 years,” which are derived from the 2009-2011 Statewide Planning and Research Cooperative System.

Pneumonia mortality data in upstate New York and New York state were obtained from the New York State Department of Health’s Vital Statistics of New York State 2011, “Selected Causes of Death by Resident County New York State, 2011.”

Pertussis incidence, 2010-2012: New York State Department of Health and Centers for Disease Control and Prevention
Upstate New York and New York state pertussis rates were obtained from the New York State Department of Health Community Health Indicator Reports-Communicable Disease Indicators, “Pertussis incidence per 100,000” and “Reported Cases by Disease and County: LGV – Pertussis.”
http://www.health.ny.gov/statistics/chac/general/g30.htm
http://www.health.ny.gov/statistics/diseases/communicable/2012/cases/5.htm

National pertussis incidence data were obtained from the Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Reports, “Summary of Notifiable Diseases-United States, 2011” and “Final 2012 Reports of Nationally Notifiable Infectious Diseases.”
http://www.cdc.gov/mmwr/pdf/wk/mm6053.pdf
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6233a6.htm

Childhood immunization rates: New York State Department of Health
Children ages 19 months to 35 months immunization data were obtained from the New York State Department of Health’s Indicators for Tracking Public Health Priority Areas, “Percentage of children with 4:3:1:3:1:4 immunization series - Aged 19-35 months,” which was derived from the 2011 New York State Immunization Information System (NYSIIS) Data.

Population figures: U.S. Census Bureau
Population figures for upstate New York, used as denominators to calculate vaccine-preventable disease rates, were obtained from the U.S. Census Bureau:
http://www.census.gov/popest/data/counties/asrh/2012/CC-EST2012-ALLDATA.html

Population figures for the U.S. were obtained from the U.S. Census Bureau:
http://www.census.gov/popest/data/national/totals/2012/index.html
Data sources and methods (continued)

The vaccine misconceptions were obtained from these sources:
Centers for Disease Control and Prevention. “Some Common Misconceptions.”
http://www.cdc.gov/vaccines/vac-gen/6mishome.htm

World Health Organization. “Six common misconceptions about immunization.”
http://www.who.int/vaccine_safety/initiative/detection/immunization_misconceptions/en/

World Health Organization. “What are some of the myths-and facts-about vaccination?”
http://www.who.int/features/qa/84/en/

The College of Physicians of Philadelphia. “Misconceptions about Vaccines.”
http://www.historyofvaccines.org/content/articles/misconceptions-about-vaccines

of Pneumococcal Infections, Including the Use of Pneumococcal Conjugate Vaccine (Prevnar),
Pneumococcal Polysaccharide Vaccine, and Antibiotic Prophylaxis.”
http://pediatrics.aappublications.org/content/106/2/362.long

Centers for Disease Control and Prevention “Immunization Safety and Autism.”
http://www.cdc.gov/vaccinesafety/00_pdf/CDCStudiesonVaccinesandAutism.pdf


Adult immunization rates: New York State Department of Health’s Behavioral Risk Factor
Surveillance System
The adult immunization figures in this report were obtained from the 2011 New York State
Department of Health’s Behavioral Risk Factor Surveillance System. This is an ongoing, state-
based, random telephone survey of the non-institutionalized civilian adult population ages 18 and
older. State and national data are compiled and reported by the Centers for Disease Control and
Prevention.

The BRFSS questionnaire asks respondents:

• “Now I will ask you questions about seasonal flu vaccine. There are two ways to get the
seasonal flu vaccine, one is a shot in the arm and the other is a spray, mist, or drop in the
nose called FluMist™. During the past 12 months, have you had either a seasonal flu shot
or a seasonal flu vaccine that was sprayed in your nose?

• During the past 12 months, has [your child, he/she] had a seasonal flu vaccination? There
are two types of flu vaccinations. One is a shot and the other is a spray in the nose.

• A pneumonia shot or pneumococcal vaccine is usually given only once or twice in a person’s
lifetime and is different from the flu shot. Have you ever had a pneumonia shot?

• Have you received a tetanus shot in the past 10 years?

• There are currently two types of tetanus shots available for adults. One contains the tetanus
diphtheria vaccine. The other type contains tetanus diphtheria and pertussis or whooping
cough vaccine. Did your doctor say your recent tetanus shot included the pertussis or
whooping cough vaccine?”

To request access to the BRFSS data: http://www.health.ny.gov/statistics/brfss/
Data sources and methods (continued)

The vaccine timeline and history of pre-vaccination and post-vaccination eras drawn from these multiple sources:

http://www.cdc.gov/vaccines/pubs/pinkbook/index.html

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6233a6.htm

Centers for Disease Control and Prevention. “What Would Happen If We Stopped Vaccinations?”
http://www.cdc.gov/vaccines/vac-gen/whatifstop.htm

Immunization Action Coalition. Questions and Answers Information about the disease and vaccines for chickenpox (varicella), diphtheria, haemophilus influenzae type b (hib), measles, mumps, pneumococcus, polio, tetanus
http://www.immunize.org/

Immunization Action Coalition. “Vaccine Timeline.”
http://www.immunize.org/timeline/

WebMD. Causes and Evolution of Influenza (Flu). Reviewed by David T. Derrer, MD on August 16, 2014
http://www.webmd.com/cold-and-flu/information-influenza
Endnotes

http://www.cdc.gov/VACCINES/vpd-vac/

http://www.cdc.gov/vaccines/vac-gen/why.htm/


http://www.cdc.gov/vaccines/vac-gen/whatifstop.htm

http://www.immunizationinfo.org/vaccines/measles

7 Healthy People 2020. “Immunization and Infectious Diseases: Overview.”

http://www.cdc.gov/pneumococcal/about/infection-types.html


15 New York State Department of Health. “Influenza (Flu) Fact Sheet.”

http://www.cdc.gov/features/pneumonia/

17 New York State Department of Health. “Influenza (Flu) Fact Sheet.”

18 ibid.

http://www.slideshare.net/PhRMA/ph-rama-vaccinefactbook2013

20 New York State Department of Health. “Influenza (Flu) Fact Sheet.”

21 Centers for Disease Control and Prevention. “Pneumonia Can Be Prevented - Vaccines Can Help.”

http://www.cdc.gov/pneumococcal/about/prevention.html

23 ibid.


27 New York State Department of Health. “Focus Area 2: Prevent Vaccine-Preventable Diseases.”

http://www.cdc.gov/pneumococcal/about/facts.html

http://www.adultvaccination.com/pneumococcal_vaccine_vaccination_adult_immunization.htm

http://www.cdc.gov/pertussis/about/causes-transmission.html

http://www.cdc.gov/Pertussis/about/complications.html
Ibid.

http://www.cdc.gov/pertussis/about/faq.html


http://www.cdc.gov/vaccines/hcp/vis/vis-statements/dtap.html

37 Centers for Disease Control and Prevention. “Pertussis Frequently Asked Questions.”

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6233a6.htm

http://www.health.ny.gov/statistics/diseases/communicable/2012/cases5.htm

http://www.cdc.gov/vaccines/hcp/vis/vis-statements/dtap.html

http://www.cdc.gov/pertussis/about/prevention.html

42 Ibid.

43 Centers for Disease Control and Prevention. “Get Whooping Cough Vaccine While You Are Pregnant.”

44 Healthy People 2020. “Immunization and Infectious Diseases: Objectives.”


47 Healthy People 2020. “Immunization and Infectious Diseases: Objectives.”

48 New York State Department of Health. “Focus Area 2: Prevent Vaccine-Preventable Diseases.”


https://www.health.ny.gov/professionals/diseases/reporting/communicable

https://www.health.ny.gov/prevention/immunization/information_system/

http://annals.org/article.aspx?articleid=1819123