



New Hampshire Immunization Data 2006



New Hampshire Department of Health and Human Services
Division of Public Health Services
Bureau of Disease Control and Health Statistics
Immunization Program

New Hampshire Immunization Data

2006

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2006

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Introduction

Immunization belongs among the most successful existing disease prevention interventions available.⁽¹⁾ The introduction of routine immunizations has significantly influenced mortality and morbidity worldwide; due to immunization, a major disease, smallpox, has been globally eradicated. The United States government, the Centers for Disease Control and Prevention, the National Center for Immunization and Respiratory Diseases has established the Vaccine for Children program offering vaccines at low or no cost to uninsured or underinsured children. All state governments require children to be vaccinated with specified vaccines upon childcare and school entry.⁽²⁾ New Hampshire is committed to universal immunization coverage of all children 18 years of age and younger, and provides vaccines, which are funded by health insurers and federal and state governments, to every child in the state. The New Hampshire Immunization Program has been working towards reduction and/or elimination of vaccine-preventable diseases for a number of years by vaccine management and distribution, vaccination coverage assessment, community outreach, and public education. High immunization coverage, as well as accurate coverage assessment, is important for successful control of vaccine-preventable diseases. *New Hampshire Immunization Data 2006* is the first comprehensive compilation of immunization related data in New Hampshire.

Methods

The *New Hampshire Immunization Data 2006* is the collection of data from various data sources.

The National Immunization Survey and Behavioral Risk Factor Surveillance Survey data are presented with 95% confidence intervals. Because they are collected from a sample of the population, each estimate has a margin of error. The confidence interval reflects the degree of uncertainty for each estimate. For example, in 2005 the United States estimated vaccination coverage with one or more doses of varicella vaccine among children 19-35 months of age was 82.9 % with a 95% confidence interval 77.4%-88.4%. This can be interpreted to mean that our best estimate is that 82.9% of 19-35 months old children in United States had received one or more doses of varicella vaccine, but the range that is likely to capture the true value 95% of the time could be as low as 77.4% or as high as 88.4%. In other words, the estimate from the survey has a margin of error of +/- 5.5%. When comparing two estimates (e.g., between states or between years), an overlap in the confidence intervals indicates that the observed difference might be due to chance.

Public health surveillance is the systematic collection and interpretation of health-related data that provides information necessary for public health decision making. New Hampshire public health law RSA 141-C authorizes the reporting of selected communicable diseases, including vaccine-preventable diseases, to the New Hampshire Department of Health and Human Services. Comprehensive reporting contributes to timely disease identification and effective intervention. A surveillance summary of all reportable vaccine-preventable diseases is presented. Because the incidence of vaccine-preventable diseases in New Hampshire is low, actual case counts rather than rates are included.

Data Sources

National Immunization Survey

The National Immunization Survey is the primary tool for assessing immunization coverage among preschool-aged children in the United States. This random-digit-dial telephone survey is conducted annually by the Centers for Disease Control and Prevention (CDC) to obtain national, state, and selected urban-area estimates of vaccination coverage rates for U.S. children aged 19–35 months. Vaccination information obtained from the telephone survey is then validated by surveys that are mailed to the children's vaccination provider. The National Immunization Survey also collects children's entire provider-reported, influenza-vaccination histories. The National Immunization Survey data can be accessed on line at: <http://www.cdc.gov/nip/coverage/default.htm#NIS>.

School and Childcare Vaccination Surveys

State laws require that children be immunized if they attend a childcare facility and when they enter school. Immunization records of children entering school are reviewed each fall. In addition, states conduct studies to validate reports from schools. Results from these studies are used to ensure high vaccination levels in the population of children enrolled in schools. Periodic assessments also are conducted in childcare centers. A summary of the coverage results of children in schools, childcare centers, and Head Start programs is reported annually to the National Immunization Program. The most recent survey results can be viewed on the CDC- National Immunization Program website at: www.cdc.gov/nip/coverage/schoolsurv/overview.htm.

Behavioral Risk Factor Surveillance System

The Behavioral Risk Factor Surveillance System (BRFSS) is a population-based, random-digit dialed telephone survey of civilian, non-institutionalized adults, aged 18 years and older. The survey is coordinated by CDC and is conducted annually by all states. In New Hampshire, the Health Statistics and Data Management Section is responsible for the survey. The BRFSS includes questions on health behavior risk factors such as safety belt use, diet, weight control, immunization, oral health, diabetes, alcohol use, physical exercise, and preventive health screenings. The data are weighted to more accurately reflect the population by accounting for age, gender, and probability of selection. In New Hampshire, 6,038 interviews were completed in 2005. In this report, the national estimates are a calculation of the middle value (median) of all the state estimates. Selected New Hampshire and national data can be accessed on line at: <http://www.cdc.gov/brfss/>.

AFIX (Assessment, Feedback, Incentives, Exchange)

The National Center for Immunization and Respiratory Diseases leads efforts to validate and promote a quality improvement strategy called AFIX, which is now recommended nationwide as a standard of practice. Assessments are conducted in provider settings to identify immunization coverage levels at 24 months of age and pinpoint problem areas that the provider may not have known existed. Feedback of the assessment results are shared with the providers and their staff along with recommended strategies to improve immunization coverage levels. Incentives are used to motivate the provider and their staff to improve immunization practices. Health care information and resources are shared with the providers and their staff to facilitate improvement. The AFIX process enables providers and their staff to make data-based decisions on how to improve performance.

The New Hampshire Immunization Program nurses utilize the AFIX strategy to help public and private immunization providers diagnose service delivery problems, identify useful changes in policy and practice, and monitor and refine interventions. The CDC Comprehensive Clinic Assessment Software Application (CoCASA) software tool is used to assess immunization coverage levels in healthcare settings where immunizations are delivered. CoCASA also diagnoses and provides detailed reports on specific service delivery problems including: whether children start their series on time, vaccines that were spaced inappropriately, vaccines that could have been administered simultaneously, and when children drop out of the system.

The improved outcomes produced by AFIX through implementation of recommendations and best immunization practices can be quantified through AFIX participation over time. The efficacy of AFIX has been documented in published and unpublished studies. Several publications are available on CDC's AFIX website (www.cdc.gov/nip/afix).

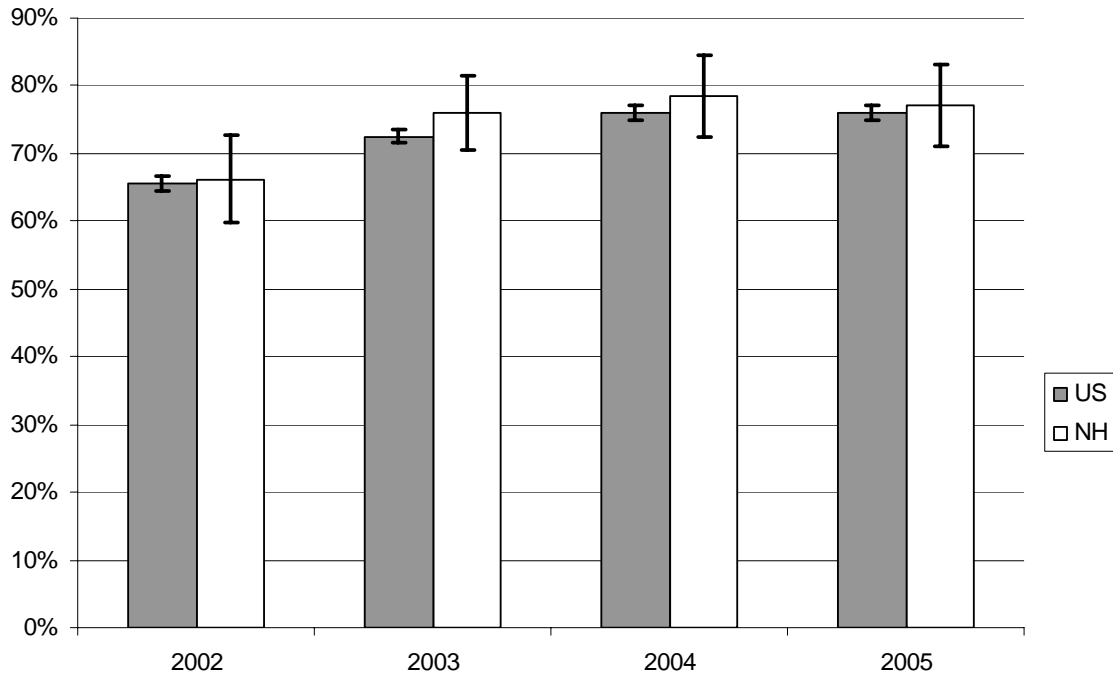
AFIX has been applied through the Vaccines for Children program to improve immunization coverage levels among young children. During the last decade, the Vaccines for Children program has enabled low income, underinsured, uninsured, and other eligible children to receive immunizations in a "medical home" (from a consistent provider at a single site) rather than being referred to the local health department or visiting nurse clinic for immunization.

Reported Cases of Vaccine-Preventable Diseases

The New Hampshire Department of Health and Human Services, Bureau of Disease Control and Health Statistics collects, analyzes, and interprets population-based infectious disease-related data, including data on vaccine-preventable diseases. Currently, the incidence of vaccine-preventable diseases is very low. This is attributable to high vaccination coverage in New Hampshire and the United States in general. CDC publishes the national surveillance data in the *Morbidity and Mortality Weekly Report*, available on-line at: <http://www.cdc.gov/mmwr/>.

National Immunization Survey

Estimated vaccination coverage with vaccination series 4:3:1:3:3:1** among children 19-35 months of age, United States and New Hampshire, 2002-2005

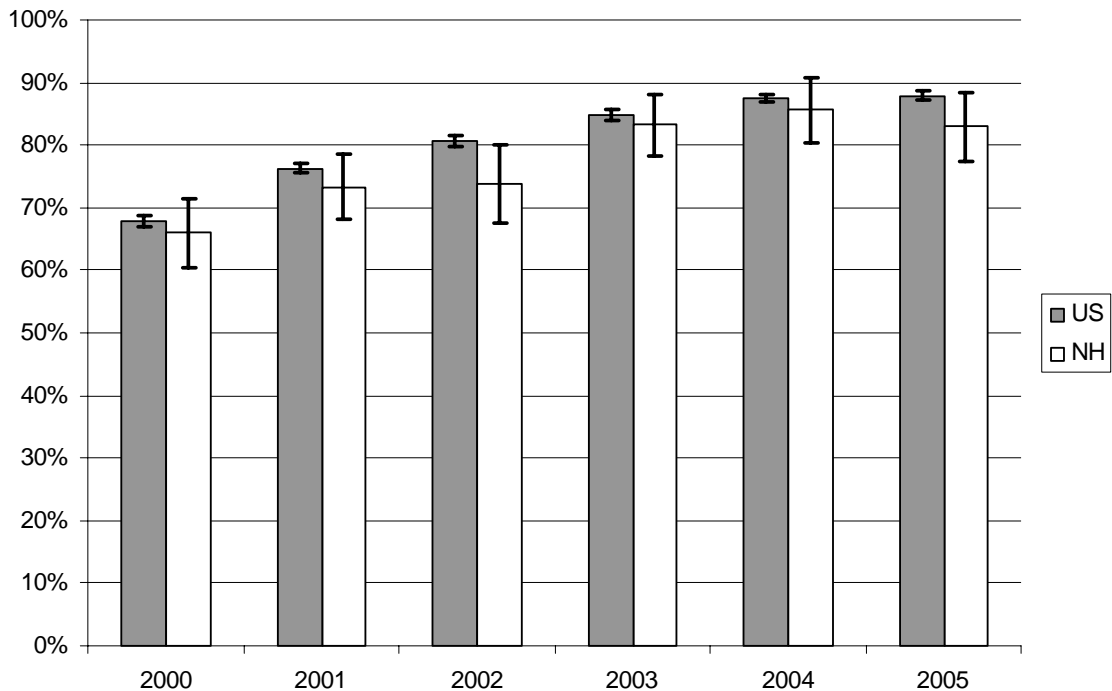


	4:3:1:3:3*		4:3:1:3:3:1**	
	US	NH	US	NH
2002	74.8 (73.8-75.8)	83.5 (78.5-88.5)	65.5 (64.4-66.6)	66.2 (59.7-72.7)
2003	79.4 (78.5-80.3)	86.5 (82.1-90.9)	72.5 (71.5-73.5)	76.1 (70.6-81.6)
2004	80.9 (80.0-81.8)	86.3 (81.2-91.4)	76.0 (75.0-77.0)	78.4 (72.4-84.4)
2005	80.8 (79.8-81.8)	82.8 (76.8-88.5)	76.1 (75.0-77.2)	77.1 (71.0-83.2)

* Four or more doses of DTP, three or more doses of poliovirus vaccine, one or more doses of any measles-containing vaccine, three or more doses of Hib, and three or more doses of HepB, see appendix for details.

**4:3:1:3:3 and one or more doses of varicella.

Estimated vaccination coverage with one or more doses of varicella vaccine among children 19-35 months of age, United States and New Hampshire, 2000-2004

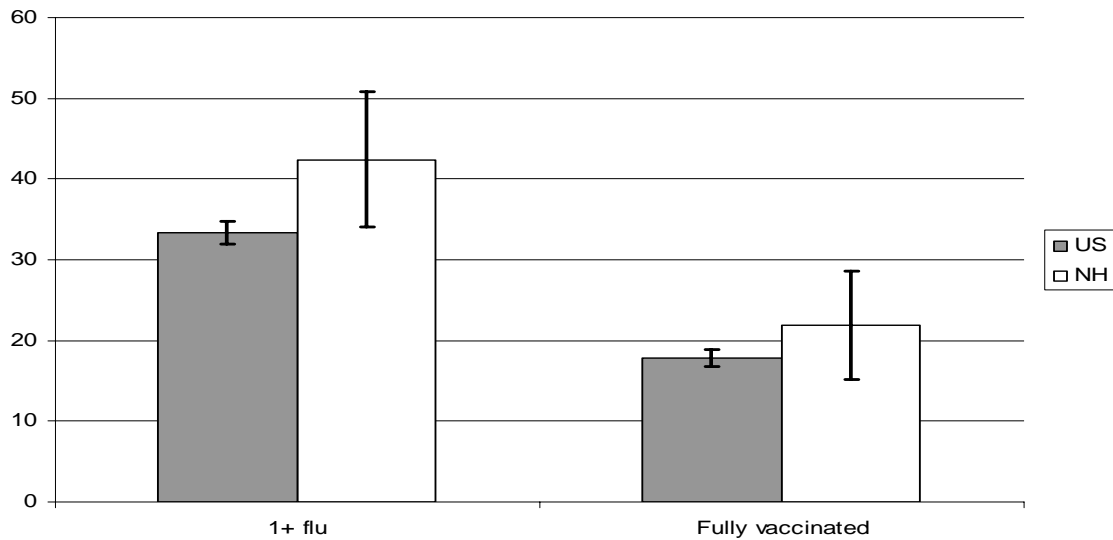


	United States	New Hampshire
2000	67.8 (66.9-68.7)	66.0 (60.5-71.5)
2001	76.3 (77.1-75.5)	73.3 (73.3-78.5)
2002	80.6 (79.7-81.5)	73.9 (67.7-80.1)
2003	84.8 (84.0-85.6)	83.3 (78.4-88.2)
2004	87.5 (86.8-88.2)	85.6 (80.3-90.9)
2005	87.9 (87.1-88.7)	82.9 (77.4-88.4)

Comment: The National Immunization Survey (NIS) provides on-going national and state estimates of vaccination coverage, including new vaccines as they are licensed and recommended for use among young children in the United States. The NIS also helps to track the progress towards *Healthy People 2010* goals.⁽³⁾ The *Healthy People 2010* objective is to increase and maintain vaccination coverage levels for universally recommended vaccines (4:3:1:3:3:1 series) among children 19-35 months of age at 90%. The 4:3:1:3:3:1 series stands for four or more doses of DTP, three or more doses of poliovirus vaccine, one or more doses of any measles-containing vaccine, three or more doses of Hib, three or more doses of HepB, and one or more doses of varicella. *Healthy People 2010* goal is to increase varicella vaccination coverage among young children to 90%.

One of the more recent recommendations of the Advisory Committee on Immunization Practices is to add a second dose of varicella vaccine for children and adults.

Estimated vaccination coverage with influenza vaccine among children 6-23 months of age, United States and New Hampshire, September-December 2004



	United States		New Hampshire	
	1+flu	Fully vaccinated	1+flu	Fully vaccinated
Sept-Dec 2004	33.4 (32.0-34.8)	17.8 (16.7-18.9)	42.4 (34.0-50.8)	21.9 (15.2-28.6)

1+flu - defined as receipt of one or more influenza vaccinations during September – December 31, 2004

Fully vaccinated - Children were considered fully vaccinated if they had:

- 1) received no doses of influenza vaccine before September 1, 2004, but then received two (2) doses from September 1 through either the date of interview or January 31, 2005,
or
- 2) received ≥ 1 dose of influenza vaccine before September 1, 2004, and then received ≥ 1 dose during September-December 2004.

Comment: Presented influenza vaccination-coverage measures represent a subset of children included in the 2005 National Immunization Survey. Only those children who were aged 6-23 months during the entire period of September – December 2004 and who had provider-verified immunization records are included.

School and Childcare Vaccination Survey

Estimated coverage for school entry vaccination, United States, 2005-06 school year

National Estimate*	Kindergarten	
	Percent coverage	Number of grantees reporting
Polio	95.5	49
DTaP	95.2	49
Measles	95.2	49
Mumps	95.9	46
Rubella	95.9	49
Hepatitis B	96.0	43
Varicella	96.0	41

*United States and District of Columbia, does not include US territories

Estimated coverage for school entry vaccination, New Hampshire, 2005-06 school year

New Hampshire Estimate	Kindergarten	
	Percent coverage	Number of fully** vaccinated children
Polio	96.1	10,722
DTaP	96.3	10,749
Measles	93.3	10,405
Mumps	97.7	10,899
Rubella	97.7	10,899
Hepatitis B	98.5	10,993
Varicella	99.1	11,062

** See appendix for details

Estimated coverage for middle-school vaccines, New Hampshire, 2005-06 school year

New Hampshire Estimate	Middle-school***	
	Percent coverage	Number of up-to-date students
Booster Td	97.6	15,465
Hep B series	98.8	15,659
MMR2 series	96.6	15,300
Varicella	99.1	15,693

***Middle school coverage estimated based on coverage in 7th grade

Estimated childcare coverage, New Hampshire, 2005-06 school year

New Hampshire Estimate	Childcare*	
	Percent coverage	Number of fully vaccinated children
Polio	98.1	25,187
DTaP	98.9	25,409
Measles	96.6	24,812
Mumps	96.6	24,812
Rubella	96.6	24,812
Hib**	77.1	19,803
Hepatitis B	96.9	24,878

*Assessed children were 19 months old and older

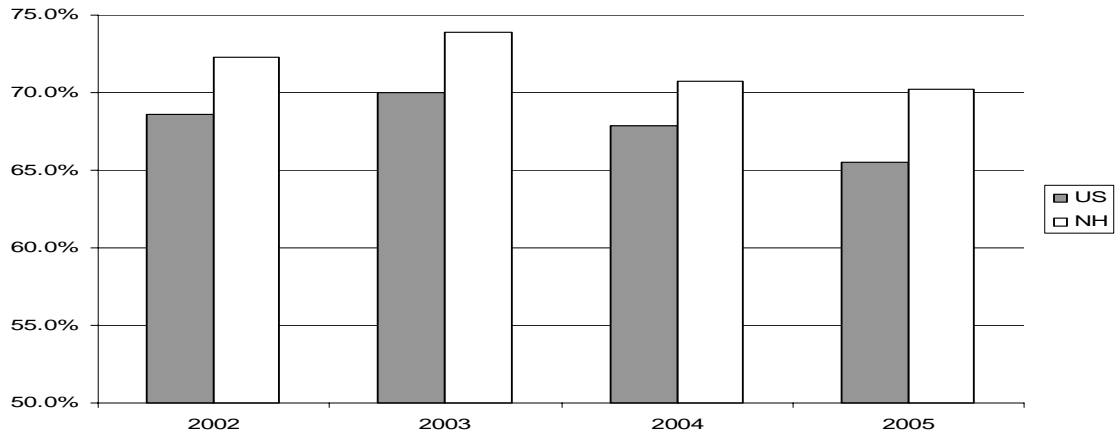
**Hib – *Haemophilus influenzae* type b

Comment: School and childcare vaccination surveys are the primary source of information on vaccination coverage of children in childcare, kindergarten, and seventh grades. Immunization coverage has been measured directly by a census of the vaccination status for all children.

Methods: Each school and childcare agency reviews the immunization status of every child, and compiles and reports the information annually to the New Hampshire Immunization Program. The New Hampshire Immunization Program then forwards the census data to CDC on an annual (schools) or biennial (childcare agencies) basis. There has been a concern with the validity of current data collection method as well as accuracy of collected data. Based on the findings from several epidemiologic studies, the CDC suggests changing the data collection method. The New Hampshire Immunization Program is presently developing a new methodology. In the future, data will be collected on a random sample of population and assessed directly by the New Hampshire Immunization Program nursing staff.

Behavioral Risk Factor Surveillance System

Adults 65 years old and older who have received a flu shot within the past year, New Hampshire and United States, 2002-2005



Adults 18 years old and older who have received a flu shot within the past year, New Hampshire, 2005

	%	95% CI
Total	29.1	27.7-30.4
Male	25.5	23.5-27.5
Female	32.5	30.7-34.3
Age		
18-24	21.3	15.0-27.7
25-34	13.4	10.8-15.9
35-44	15.5	13.1-17.8
45-54	22.9	20.4-25.5
55-64	35.3	32.1-38.5
65+	70.2	67.4-73.0
Income		
<15,000	41.2	35.7-46.7
15,000-24,999	37.6	33.2-42.0
25,000-34,999	33.3	28.7-38.0
35,000-49,999	29.2	25.5-32.9
50,000-74,999	25.5	22.6-28.5
75,000+	22.9	20.5-25.3
Education		
< 12 year	32.7	26.7-38.7
12 years	30.1	27.5-32.7
12-16 years	28.5	25.7-31.2
> 16 years	28.1	26.1-30.2

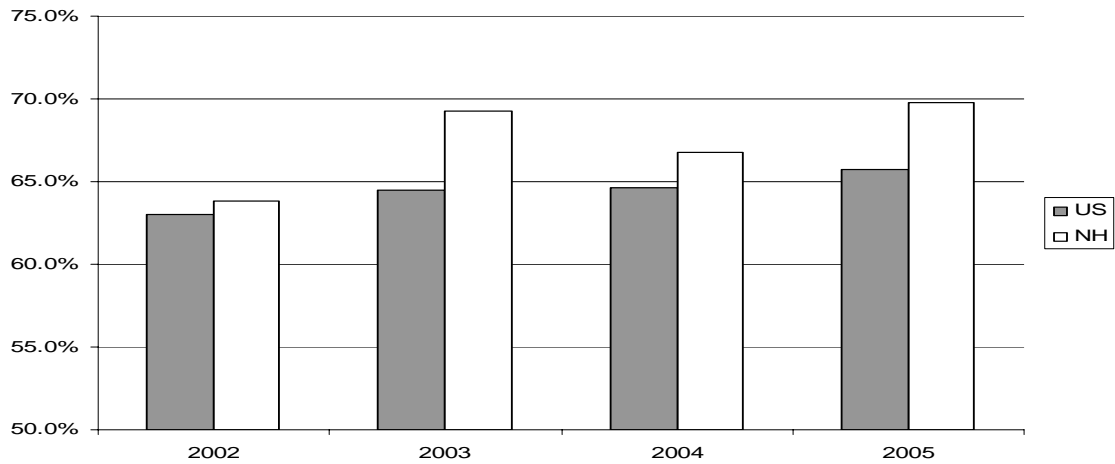
**Adults 18 years old and older who have received a flu spray within the past year,
New Hampshire, 2005**

	%	95% CI
Total	0.7	0.5-0.9
Male	0.9	0.5-1.3
Female	0.5	0.3-0.8
Age		
18-24	0.3	0.0-0.8
25-34	0.7	0.2-1.3
35-44	0.5	0.1-0.9
45-54	0.4	0.0-0.8
55-64	1.0	0.1-2.0
65+	1.2	0.5-1.9
Income		
<15,000	0.8	0.0-1.9
15,000-24,999	0.5	0.1-1.0
25,000-34,999	0.6	0.2-1.0
35,000-49,999	0.9	0.5-1.3
50,000-74,999	0.8	0.0-1.6
75,000+	0.8	0.0-1.8
Education		
< 12 year	0.8	0.1-1.6
12 years	1.0	0.1-1.8
12-16 years	1.0	0.4-1.7
> 16 years	0.5	0.1-0.8

Comment: Influenza (flu) is a contagious respiratory illness caused by viruses causing mild to severe illness that at times can lead to death. Complications include bacterial pneumonia, ear or sinus infections, dehydration, as well as worsening of chronic medical conditions. Persons who wish to reduce their chances of getting the flu should get vaccinated. Those who are at risk of having serious flu-related complications, or those who live with or care for high-risk persons should receive vaccination each year. Two types of influenza vaccine are available. Inactivated influenza vaccine (flu shot) and live attenuated influenza vaccine (flu spray). The inactivated vaccine is available in both pediatric and adult formulations. The live attenuated vaccine is approved by the U.S. Food and Drug Administration only for use among healthy persons 5-49 years of age. Annual influenza vaccination is recommended for those 50-years-old and older.⁽⁴⁾ The goal of the *Healthy People 2010* initiative is to increase the proportion of adults age 65 years old and older who are vaccinated annually against influenza to 90%.

Methods: The numerator included all persons ≥ 18 years of age who reported having a flu vaccination within the past year. The denominator included all persons ≥ 18 years of age who have responded to the question (excluding unknowns and refusals).

**Adults 65 years old and older who have ever had a pneumonia vaccination,
New Hampshire and United States, 2002-2005**



**Adults 18 years old and older who have ever had a pneumonia vaccination,
New Hampshire, 2005**

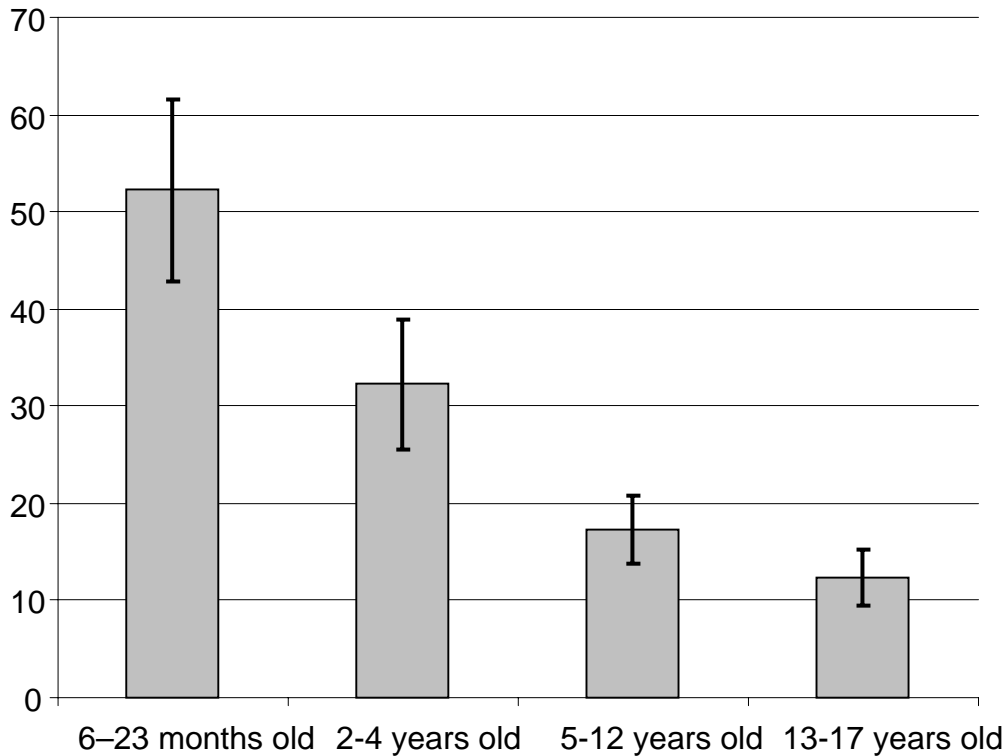
	%	95% CI
Total	23.0	21.7-24.3
Male	21.8	19.8-23.8
Female	24.0	22.4-25.6
Age		
18-24	12.2	6.3-18.0
25-34	8.4	6.0-10.9
35-44	8.2	6.3-10.2
45-54	13.6	11.4-15.9
55-64	24.3	21.3-27.2
65+	69.8	66.8-72.7
Income		
<15,000	42.4	36.7-48.0
15,000-24,999	35.8	31.3-40.2
25,000-34,999	27.9	23.6-32.2
35,000-49,999	24.0	20.3-27.7
50,000-74,999	16.9	14.4-19.5
75,000+	14.2	12.1-16.3
Education		
< 12 year	31.7	25.9-37.5
12 years	25.8	23.3-28.3
12-16 years	22.2	19.6-24.7
> 16 years	19.9	18.1-21.8

Comment: Disease caused by *Streptococcus pneumoniae* (pneumococcus) is an important cause of morbidity and mortality, especially among the very young, the elderly, and persons with certain high-risk conditions.⁽⁵⁾ The polysaccharide pneumococcal vaccine (PPV23) is recommended for individuals with certain chronic conditions and anyone 65 years old and older. The goal of the *Healthy People 2010* initiative is to increase the proportion of adults age 65 years old and older who were ever vaccinated against pneumococcal disease to 90%.

Methods: The numerator included all persons ≥ 18 years of age who reported ever receiving a pneumonia vaccination. The denominator included all persons ≥ 18 years of age who have responded to the question (excluding unknowns and refusals).

Children getting immunized against flu during previous 12 months as reported by adults 18 years old and older, New Hampshire, 2005

	%	95% CI
6–23 months old	52.2	42.8-61.7
2-4 years old	32.3	25.6-39.0
5-12 years old	17.2	13.7-20.7
13-17 years old	12.4	9.5-15.2

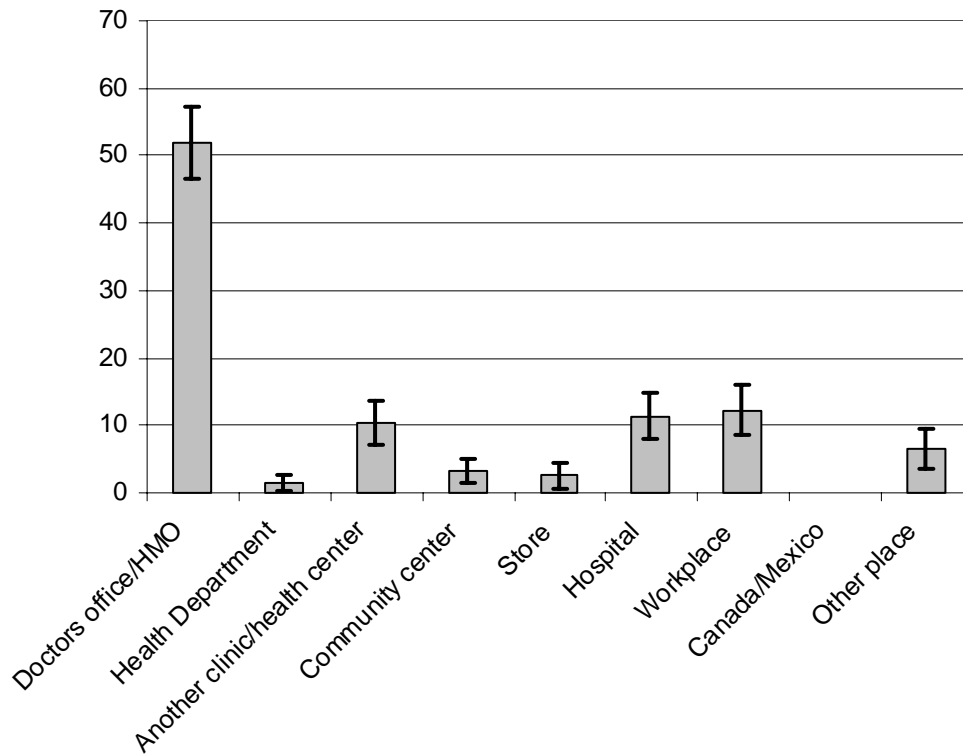


Comment: In 2005, the CDC had recommended routine influenza vaccination for all children 6 months to 23 months of age, persons 6 months to 18 years of age receiving chronic aspirin therapy, and persons older than 6 months with a chronic illness.⁽⁵⁾

Methods: The numerator included all children < 18 years of age who were reported receiving flu vaccination during the previous 12 months. The denominator included all children < 18 years of age for whom both (receiving either flu shot or flu vaccine sprayed in the nose) influenza related questions were answered by the adult respondents (excluding unknowns and refusals). Child influenza immunization module was asked from March to December 2005.

Adults 18 years old and older and location where they received their last flu vaccine, New Hampshire, 2005

	%	95% CI
Doctors office or HMO	51.9	49.2-54.6
Health Department	1.6	1.0-2.2
Another type of clinic or health center	10.4	8.8-12.1
Senior, recreation, or community center	3.2	2.4-4.1
Store	2.6	1.6-3.5
Hospital	11.4	9.7-13.1
Workplace	12.3	10.4-14.1
Canada/Mexico	0.1	0.0-0.3
Some other place	6.6	5.1-8.0

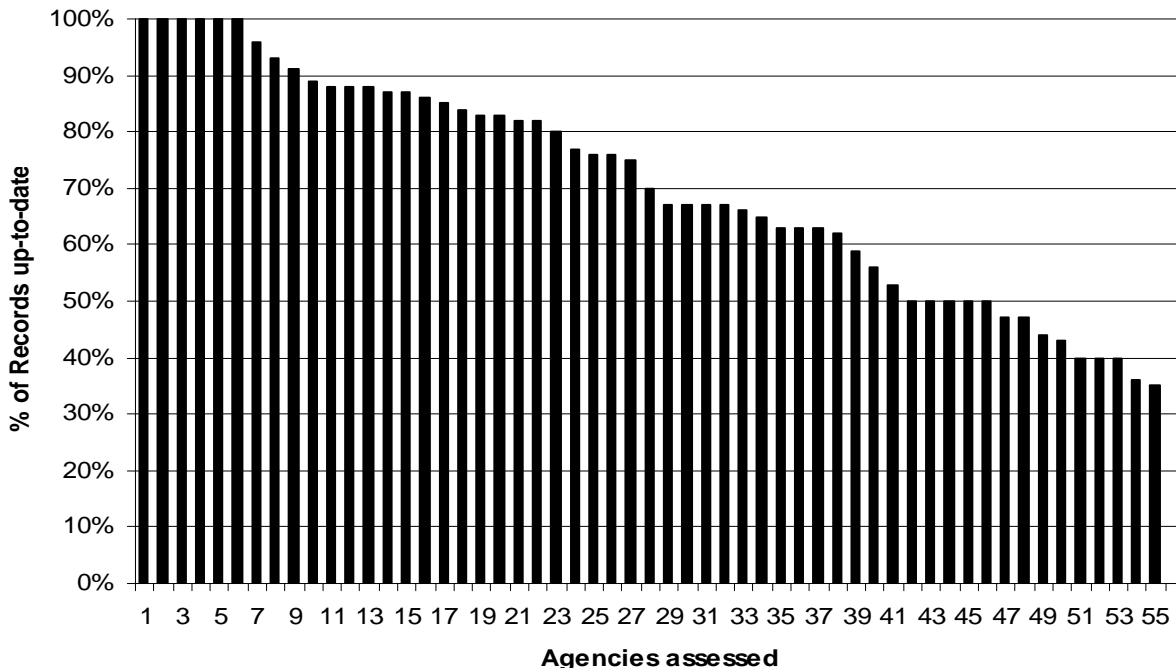


Comment: The majority of New Hampshire residents received their latest flu vaccine (whether it was an injection or nasal spray) in doctors' offices, at their workplace or at the hospital.

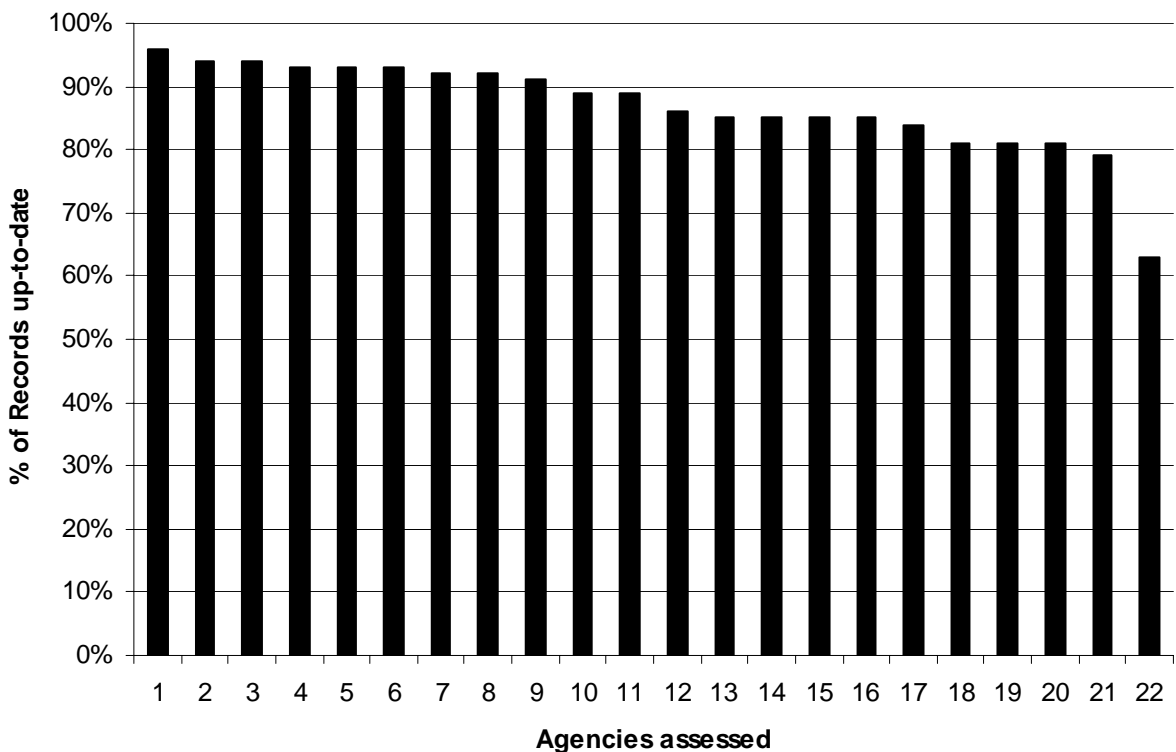
Methods: The numerator included persons ≥ 18 years of age who reported where they received their last influenza vaccination. The denominator included all persons ≥ 18 years of age who received flu vaccine during previous 12 months and have responded to the question (excluding unknowns and refusals).

AFIX

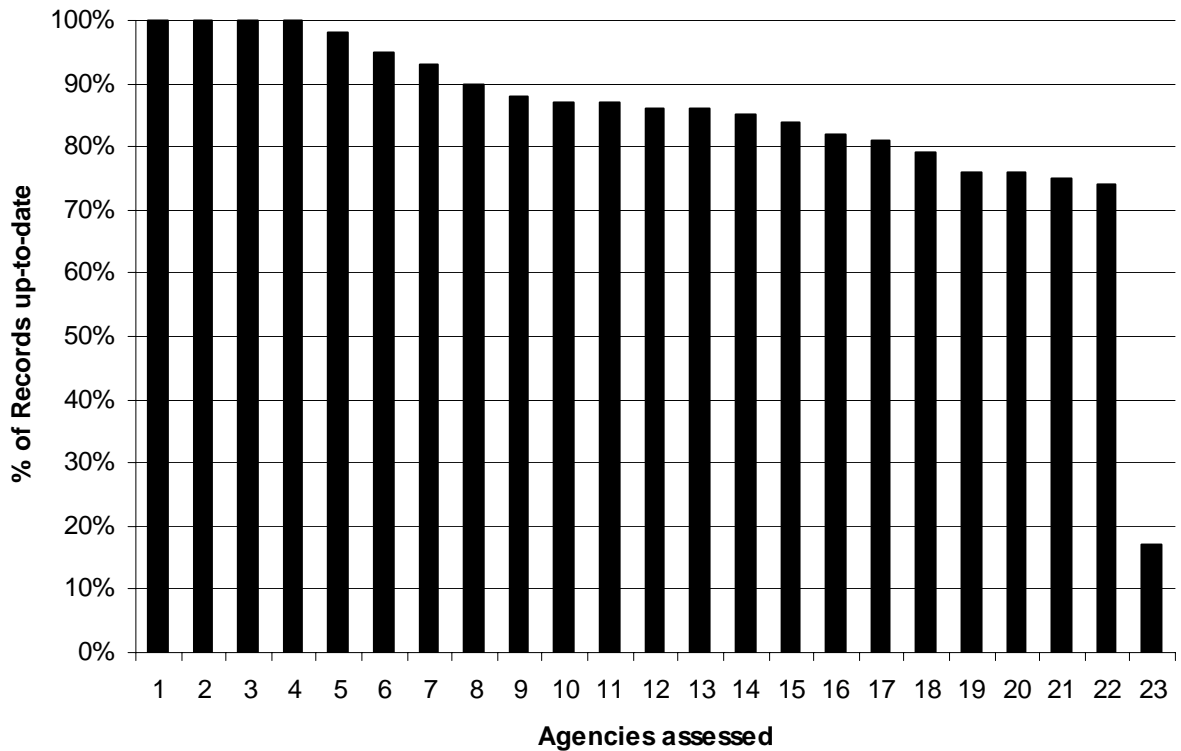
Immunization rates for 4:3:1:3:3:1 series at 24 months of age, assessed family practice offices, New Hampshire, 2006



Immunization rates for 4:3:1:3:3:1 series at 24 months of age, assessed pediatrics offices, New Hampshire, 2006



Immunization rates for 4:3:1:3:3:1 series at 24 months of age, assessed public offices, New Hampshire, 2006



Comment: AFIX is a quality improvement strategy that is used to raise immunization coverage levels and improve standards of practices at the provider level. The acronym stands for **A**ssessment, **F**eedback, **I**ncentives for recognition, and **eX**change of information.

Methods: The New Hampshire Immunization Program has been using the AFIX strategy since 1994. All vaccine providers are encouraged to participate in the AFIX process although the New Hampshire Immunization Program is particularly interested in including high-volume vaccine users. To date, over 170 NH providers (71%) are assessed on a rotating basis. In 2006, the New Hampshire Immunization Program assessed 101 provider practices; 78 were private practices and 23 were public. Public agencies include Federally Qualified Community Health Centers, Rural Health Clinics, and Visiting Nurse Associations. The immunization rates were assessed based on 4:3:1:3:3:1* criteria.

Data source: New Hampshire Department of Health and Human Services, Division of Public Health Services, Bureau of Disease Control and Health Statistics, Immunization Section.

* *Four or more doses of DTP, three or more doses of poliovirus vaccine, one or more doses of any measles-containing vaccine, three or more doses of Hib, three or more doses of HepB, and one dose of varicella vaccine.*

Vaccine-preventable Diseases

Incident cases of vaccine-preventable diseases, New Hampshire, 2001-2005

	2001	2002	2003	2004	2005
<i>H. influenzae</i> - invasive	7	14	20	22	9
Hepatitis A	18	12	19	27	82
Hepatitis B	17	25	24	43	30
Hepatitis B - perinatal	0	0	0	1	0
Measles	0	0	1	0	1
Mumps	0	5	2	1	1
<i>N. meningitidis</i>	15	14	12	7	12
Pertussis	31	80	120	134	186
Rubella	0	0	0	0	2
Tetanus	0	0	0	0	0
Varicella	NR*	NR	NR	NR	337

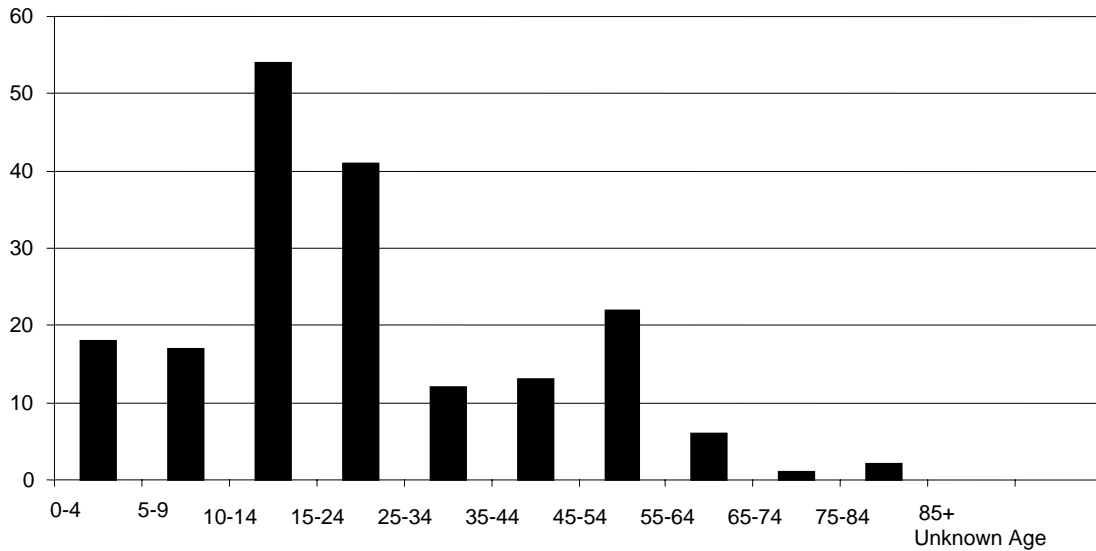
*NR – not reportable

Comment: Immunization is a foundation of preventive healthcare for children. The wide use of vaccines resulted in a major decline of morbidity and mortality from many infectious diseases. Ongoing disease surveillance detects changes in the incidence of reportable diseases. Surveillance data are used for the detection of epidemics, monitoring of changes in infectious agents, and evaluation of control and prevention measures.

Methods: The New Hampshire public health law RSA 141-C authorizes the reporting of selected communicable diseases to the Department of Health and Human Services. The Communicable Disease Surveillance Section is responsible for collection, analyses and dissemination of surveillance data.

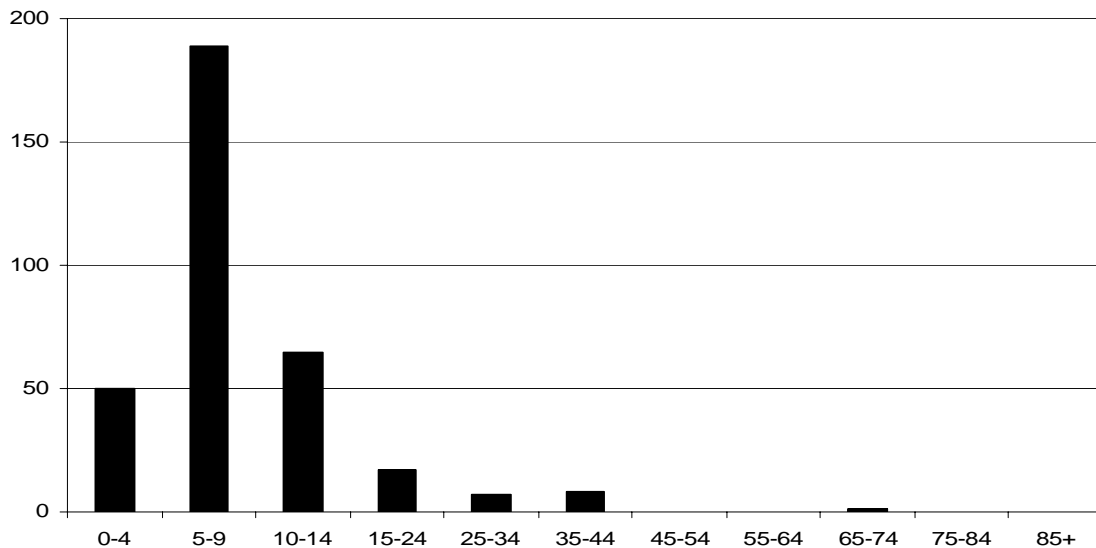
Data source: New Hampshire Department of Health and Human Services, Bureau of Disease Control and Health Statistics, Communicable Disease Surveillance Section.

Reported cases of pertussis, by age group, New Hampshire, 2005



Comment: Pertussis (whooping cough) is a highly contagious respiratory infection with periodically occurring outbreaks. Since widespread use of the vaccine, incidence of the disease has gradually declined. Historically in the United States, the highest incidence is seen in infancy. However, in recent years an increase has been seen in adolescents and young adults. In New Hampshire, children less than one year of age and those 10-19 years of age are most affected. A new booster vaccine, Tdap, introduced in 2005, is given routinely to adolescents and should impact pertussis rates for this age group in the future.

Reported cases of varicella, by age group, New Hampshire, 2005



Comment: Varicella is a generalized disease with a successive skin eruption that tends to be less abundant on the exposed parts of the body.

Methods: New Hampshire public health law RSA 141-C authorizes the reporting of selected communicable diseases. The list of reportable diseases is periodically assessed and revised based on the perceived needs. Prior to 1995, varicella cases were reportable by aggregate counts. Varicella was again added to the reportable diseases list in New Hampshire beginning January 1, 2005, and since that time, individual cases have been reported.

Data source: New Hampshire Department of Health and Human Services, Division of Public Health Services, Bureau of Disease Control and Health Statistics, Communicable Disease Surveillance Section.

Childhood Immunization

Immunization is a successful public health intervention that saves hundreds of lives and prevents thousands of illnesses each year. Some vaccines have been used since the 1940's, others were recommended just recently. At the present time, children are vaccinated against 13 diseases. Previously these diseases were a serious threat, but now with immunization, they are at their lowest occurrence in history.⁽⁶⁾

Comparison of 20th century estimated annual cases and 2004 reported cases of vaccine-preventable diseases (pre-1990 vaccines), United States

	Typical number of cases in pre-vaccine era	2004 cases	% decrease
Smallpox	29,005	0	100%
Diphtheria	21,053	0	100%
Measles	4,000,000	37	99.9%
Mumps	162,344	258	99.8%
Pertussis	192,752	25,827	86.6%
Polio (paralytic)	16,316	0	100%
Rubella	47,745	10	99.9%
Congenital Rubella Syndrome	152	0	100%
Tetanus	580	34	94.1%

Comparison of pre-vaccine era estimated annual cases and 2004 estimated cases of vaccine-preventable diseases (post-1990 vaccines), United States

	Typical number of cases in pre-vaccine era	2004 cases	% decrease
Hepatitis A	117,333	24,291	79.3%
Hepatitis B (acute)	66,232	17,358	73.8%
Hib (invasive)*	20,000	17	99.9%
Pneumococcus (invasive)	63,067	36,725	41.8%
Varicella	4,085,120	817,024	80%

*Hib – *Haemophilus influenzae* type b

Data source: National Immunization Program Annual Report, 2006⁽⁶⁾

It is recommended that the standard childhood immunization schedule be followed in order to achieve maximum protection. This schedule allows some flexibility and some children who miss a dose may catch up later. Three advisory bodies collaborate to issue a single schedule of routine childhood immunizations: the Advisory Committee on Immunization Practices, the American Academy of Pediatrics, and the American Academy of Family Physicians. The immunization schedule is continually evaluated to ensure the highest level of effectiveness, efficiency, and safety in childhood immunizations. The 2005 Recommended Childhood and Adolescent Immunization Schedule is on the page 26. The NHIP has developed a simplified immunization schedule for New Hampshire healthcare providers. The purpose of a

simplified immunization schedule is to consistently administer vaccines at the earliest possible time so that children are protected against vaccine-preventable diseases. This schedule includes all of the routinely recommended vaccines for young children and adolescents. In addition, minimum age and minimum intervals have been incorporated into this schedule. The New Hampshire Simplified Schedule is on page 27.

Vaccines are believed to be safe; however, like any medicine they can cause reactions. Most reactions are mild but some can be serious or life-threatening. In order to assure post-marketing vaccine safety, the Vaccine Adverse Event Reporting System (VAERS) was established. The VAERS system is a national public health surveillance system that collects reports of suspected vaccine-related injuries. Information about VAERS is available at www.vaers.hhs.gov.

The recent introduction of new vaccines for adolescents provides a unique opportunity for health promotion and education in this age group. Establishing a routine well visit for 11-12 year olds will promote and protect the health of our adolescent population and translate into healthier adulthood.

Recommended Vaccines for Adolescents

In 2005, the Food and Drug Administration licensed new vaccines to prevent pertussis (whooping cough) and meningococcal disease, and in 2006, a vaccine against human papilloma virus was licensed. The Advisory Committee on Immunization Practices has recommended these vaccines for routine use in adolescents. A quadrivalent conjugate vaccine is available to prevent an invasive meningococcal disease caused by *N. meningitidis* serogroups A, C, Y and W-135. Vaccines containing tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine are indicated for booster immunization against tetanus, diphtheria and pertussis.⁽⁶⁾ The Advisory Committee on Immunization Practices recommendations are available at: www.cdc.gov/nip/publications/acip-list.htm.

Human Papillomavirus

Genital human papillomavirus is the most common sexually transmitted virus in the United States. It is the major cause of cervical cancer in women. The American Cancer Society estimates that in 2006, over 9,710 women in the U.S. will be diagnosed with cervical cancer and 3,700 women will die due to cervical cancer. Every year, about 6.2 million people in the U.S. are infected with human papillomavirus, most commonly young women and men who are in their late teens and early 20s. Human papillomavirus is associated with several other types of cancer and causes precancerous genital lesions, genital warts, and warts in the upper respiratory tract. The newly developed vaccine protects against human papillomavirus types 16 and 18, which cause 70% of cervical cancers and types 6 and 11, which cause 90% of genital warts. The vaccine does not treat existing human papillomavirus infections or their complications, however females who already have been infected with one or more types of human papillomavirus would still get protection from the vaccine types they have not acquired.⁽⁷⁾ Currently available vaccine is licensed for females 9-26 years of age, and is recommended for administration in a three-dose series at the 11-12 year old well visit with a catch-up recommended for young women 13-26 years old who have not been previously vaccinated.

Meningococcal Disease

Meningococcal disease is caused by the bacterium *Neisseria meningitidis*. Throughout the world, five serogroups, A, B, C, Y, and W-135, cause most disease, with types B, C and Y being most frequent in the United States. Over 2,500 people get meningococcal disease in the U.S. each year. Even with appropriate antibiotic therapy, the case fatality rate of invasive meningococcal disease is 9-12%. The fatality rate of meningococemia is up to 40%. As many as 20% of survivors suffer from conditions such as hearing loss, neurological impairment, or loss of a limb.⁽⁵⁾ Two vaccines are currently available in the United States, the older meningococcal

polysaccharide vaccine and the new meningococcal conjugate vaccine. Both protect against the A, C, Y and W-135 serogroups but not serogroup B.⁽⁶⁾

Pertussis (whooping cough)

Following the introduction of routine childhood immunization against pertussis in the 1940s, the number of reported pertussis cases declined dramatically. Since then, however, the number of reported cases has been steadily increasing, especially among adolescents and adults. Possible reasons for the increase in reported pertussis cases include a true increase in the burden of the disease and an improvement in the detection and reporting. Newly introduced vaccine (Tdap) contains tetanus and diphtheria toxoid composition similar to adult tetanus and diphtheria toxoids vaccine (Td) with the addition of pertussis antigen. A single dose of Tdap is routinely recommended for adolescents aged 11-18 years.⁽⁶⁾

Currently, there are two licensed Tdap products: one for adolescents 10-18 years of age, and the second for adolescents and adults 11-64 years of age. No pertussis vaccine is currently approved for children 7-9 years of age or for persons older than 64 years.⁽⁵⁾

Hepatitis B, Varicella, Measles-Mumps-Rubella (MMR) and Other Vaccines

The rate of hepatitis B in adolescents hovered around 10 cases per 100,000 in the 1980s. A marked decline in the incidence accompanied the introduction of universal vaccination in the 1990s. A major decrease (72.5%) is documented for adolescents; the rate has fallen to about one case per 100,000.⁽⁶⁾ Hepatitis B vaccine is recommended for adolescents in a three-dose series if they were not vaccinated during childhood. MMR vaccine should be administered to all who did not receive two doses of MMR during childhood. Adolescents with specific health risks may need additional vaccines such as Hepatitis A, influenza, and pneumococcal vaccines.⁽⁵⁾ Two doses of varicella vaccine are recommended for all susceptible adolescents and adults. Adolescents and adults who have previously been vaccinated with a single dose of varicella vaccine should receive a second dose based on the Advisory Committee on Immunization Practices new varicella recommendations.

Recommended Childhood and Adolescent Immunization Schedule



UNITED STATES • 2006



Vaccine ▼	Age ▶	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	24 months	4-6 years	11-12 years	13-14 years	15 years	16-18 years
Hepatitis B ¹	HepB		HepB	HepB ¹	HepB			HepB Series							
Diphtheria, Tetanus, Pertussis ²			DTaP	DTaP	DTaP	DTaP			DTaP	Tdap	Tdap				
<i>Haemophilus influenzae</i> type b ³			Hib	Hib	Hib ³										
Inactivated Poliovirus			IPV	IPV	IPV			IPV							
Measles, Mumps, Rubella ⁴						MMR			MMR	MMR					
Varicella ⁵						Varicella			Varicella						
Meningococcal ⁶									MPSV4		MCV4	MCV4			
Pneumococcal ⁷			PCV	PCV	PCV	PCV			PCV	PPV					
Influenza ⁸						Influenza (Yearly)			Influenza (Yearly)						
Hepatitis A ⁹									HepA Series						

Vaccines within broken line are for selected populations

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2005, for children through age 18 years. Any dose not administered at the recommended age should be administered at any subsequent visit when indicated and feasible. ■ Indicates age groups that warrant special effort to administer those vaccines not previously administered. Additional vaccines may be licensed and recommended during the year. Licensed combination vaccines may be used whenever

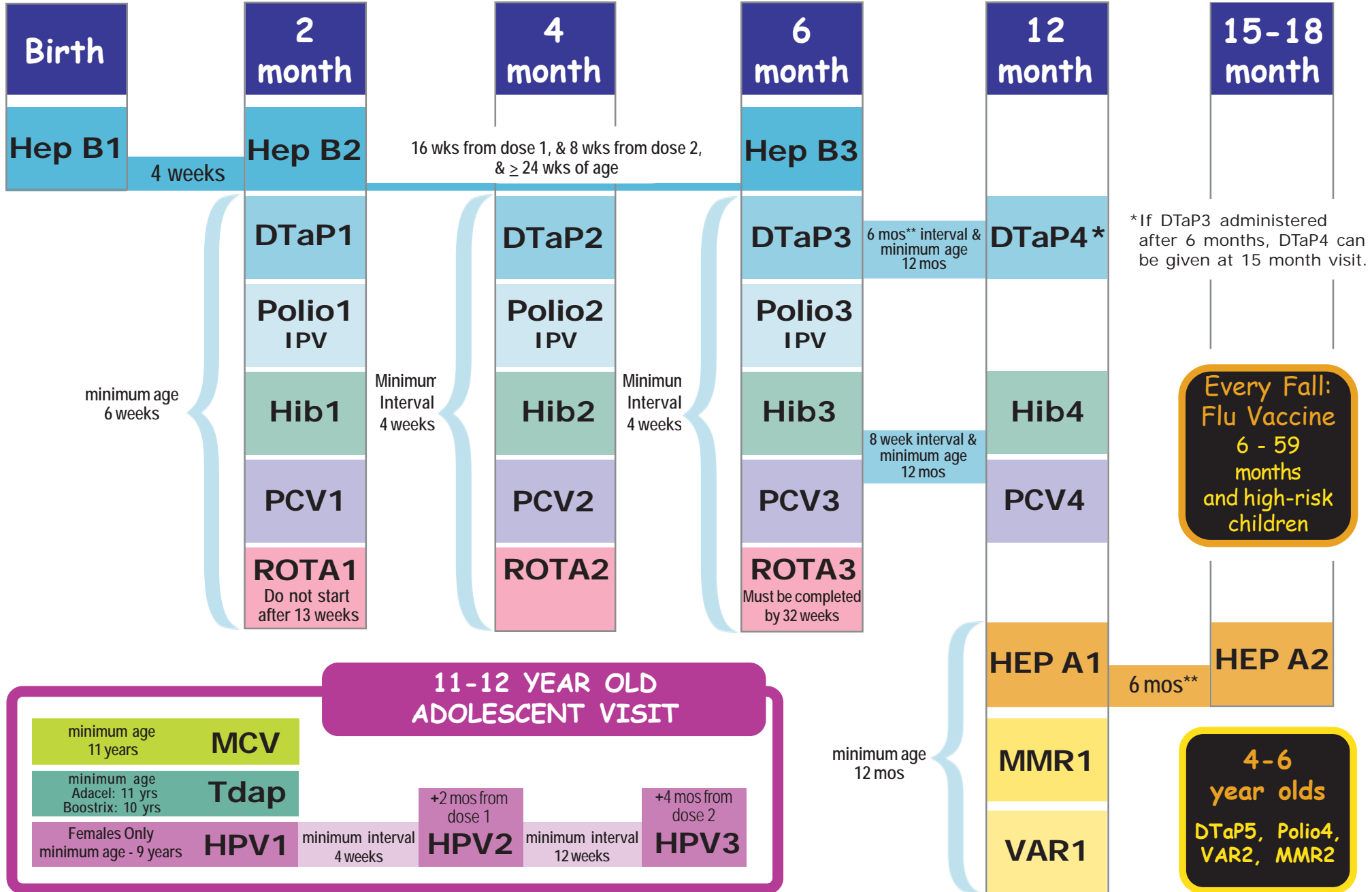
any components of the combination are indicated and other components of the vaccine are not contraindicated and if approved by the Food and Drug Administration for that dose of the series. Providers should consult the respective ACIP statement for detailed recommendations. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at www.vaers.hhs.gov or by telephone, 800-822-7967.

■ Range of recommended ages ■ Catch-up immunization ■ 11-12 year old assessment

FOOTNOTES:

New Hampshire Simplified Schedule

April 2007



*If DTaP3 administered after 6 months, DTaP4 can be given at 15 month visit.

Every Fall:
Flu Vaccine
6 - 59 months
and high-risk children

4-6
year olds
DTaP5, Polio4,
VAR2, MMR2

**Calendar months

Adult Immunization

Adults, like children, need immunizations. Billions of dollars are spent annually treating adults with vaccine-preventable diseases. It is estimated that 47,000 adults die every year from vaccine-preventable diseases, primarily influenza, pneumococcal disease, and hepatitis B.⁽⁸⁾ Other vaccine-preventable diseases that contribute to the disease burden are measles, mumps, rubella, diphtheria, tetanus, pertussis, hepatitis A, and human papillomavirus. The challenge of public health is to extend the success of childhood immunizations into adulthood.

Healthy People 2010 has set a goal of increasing adult immunization rates to 90% for influenza and pneumococcal vaccine in people 65 years of age and older. In 2005, New Hampshire's immunization rates for influenza and pneumococcal vaccine was 70% in people 65 years of age and older.⁽¹¹⁾

Currently, the New Hampshire Immunization Program provides telephone consultation to healthcare providers who have questions regarding adult immunizations. Vaccine information for adults is disseminated to family practices during pediatric immunization assessments. The New Hampshire Immunization Program annually provides information on influenza and pneumococcal vaccine through the Influenza Tool Kit, that is available on the New Hampshire Lung Association's website at: www.nhlung.org.

In New Hampshire, Senate Bill 438 was passed in 2004, requiring that all hospitals, residential facilities, adult daycare facilities, and assisted living facilities document evidence of influenza and pneumococcal vaccine administration for all consenting adult patients. Senate Bill 438 also requires offering influenza vaccination to all consenting employees and requires annual aggregate data reporting to the New Hampshire Department of Health and Human Services. The implementation of this bill will provide an avenue to increase the influenza and pneumococcal vaccination rates of individuals age 65 and older, as well as the influenza immunization rates for employees. The influenza immunization rate for healthcare workers was 42% in 2004.⁽¹²⁾

In order to assess the gaps in adult immunization practices, the New Hampshire Immunization Program is prioritizing adult immunization as a program initiative. In 2006, the New Hampshire Immunization Program conducted a survey of healthcare providers in order to determine the needs in this area. The results from the survey will be used to determine the immunization priorities for New Hampshire and to develop an adult immunization plan for the state.

Vaccines recommended for adults

Influenza

Particularly for anyone over 50 years of age and anyone who has certain medical conditions. One dose of influenza vaccine is recommended annually between October and December.

Pneumococcal

Recommended for persons 65 years of age and older and persons with certain medical conditions, such as chronic lung disease or immunosuppression.

Tetanus, Diphtheria, Pertussis (Tdap)

A one time booster dose of Tdap if it has been 10 years since the last Td for adults 64 years of age and younger.

Hepatitis A, Hepatitis B

Recommended for foreign travel and special medical situations.

Measles, Mumps, Rubella (MMR)

Recommended for anyone who has not been immunized, who does not have natural immunity, and in certain medical situations.

Chicken Pox (Varicella)

Recommended for anyone who is susceptible, who has not had the disease, or has not had the immunization.

Shingles (Zoster)

A new vaccine for persons age 60 and older.

Human Papilloma Virus

A new vaccine for young women 9-26 years of age for prevention of human papillomavirus and cervical cancer.

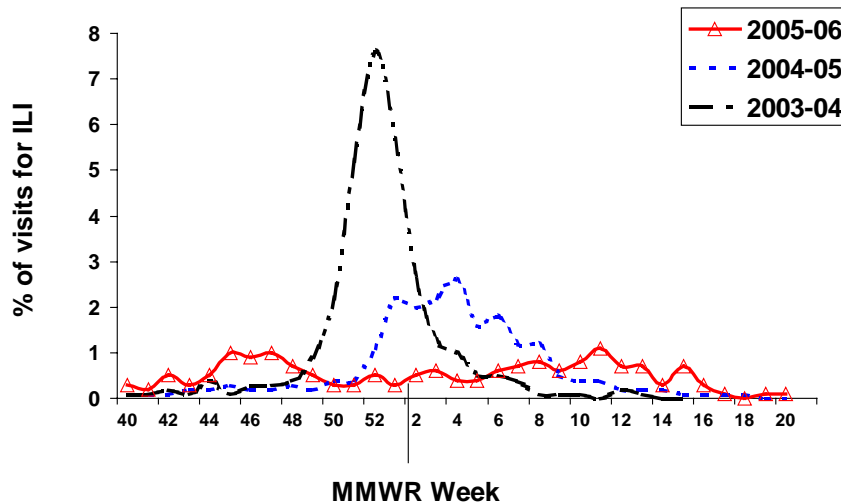
Vaccines for International Travel

Routine vaccines as well as vaccines that are specific to certain geographic regions.

It is advised that adults should consult with their primary care physician regarding recommendations for vaccines.

Influenza

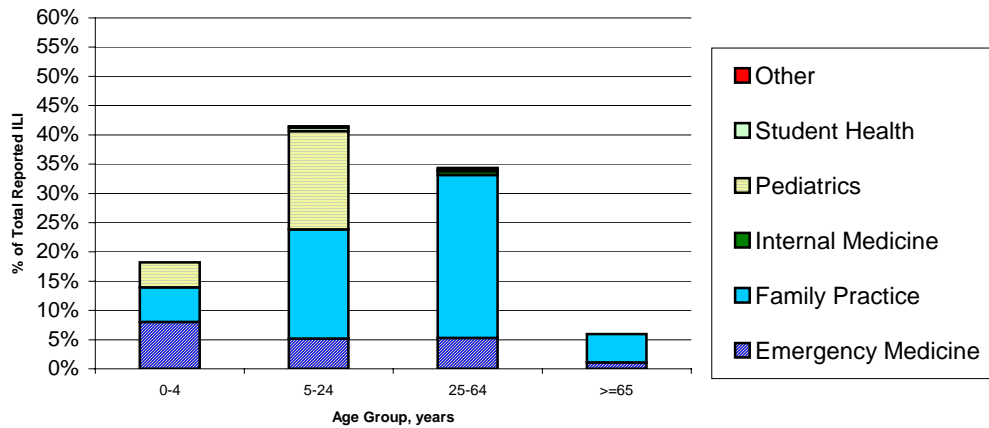
Percentage of visits for influenza-like illness reported by New Hampshire sentinel providers in 2005-06 and previous two (2) flu seasons



Comment: Influenza is an acute viral disease of the respiratory tract characterized by fever, headache, sore throat and cough. In New Hampshire, influenza is not a reportable disease, but surveillance systems are in place to help determine the extent of illness and current circulating influenza virus types. Influenza-like illness surveillance (ILI) is one of these systems.

Methods: For the 2005-06 influenza season, 26 volunteer healthcare providers in NH participated in the U.S. Influenza Sentinel Provider Surveillance System. Sentinel providers report weekly to the CDC the total number of patients seen for the week, and the number of patients by age group with ILI, defined as: 1) fever $\geq 100^{\circ}\text{F}$ and 2) cough and/or sore throat. Influenza activity peaked in the U.S. in early March 2006, with 25 states reporting widespread flu activity and 16 states reporting regional flu activity.

Influenza-like illness by age group and practice, New Hampshire sentinel providers, October 2, 2005 to May 20, 2006



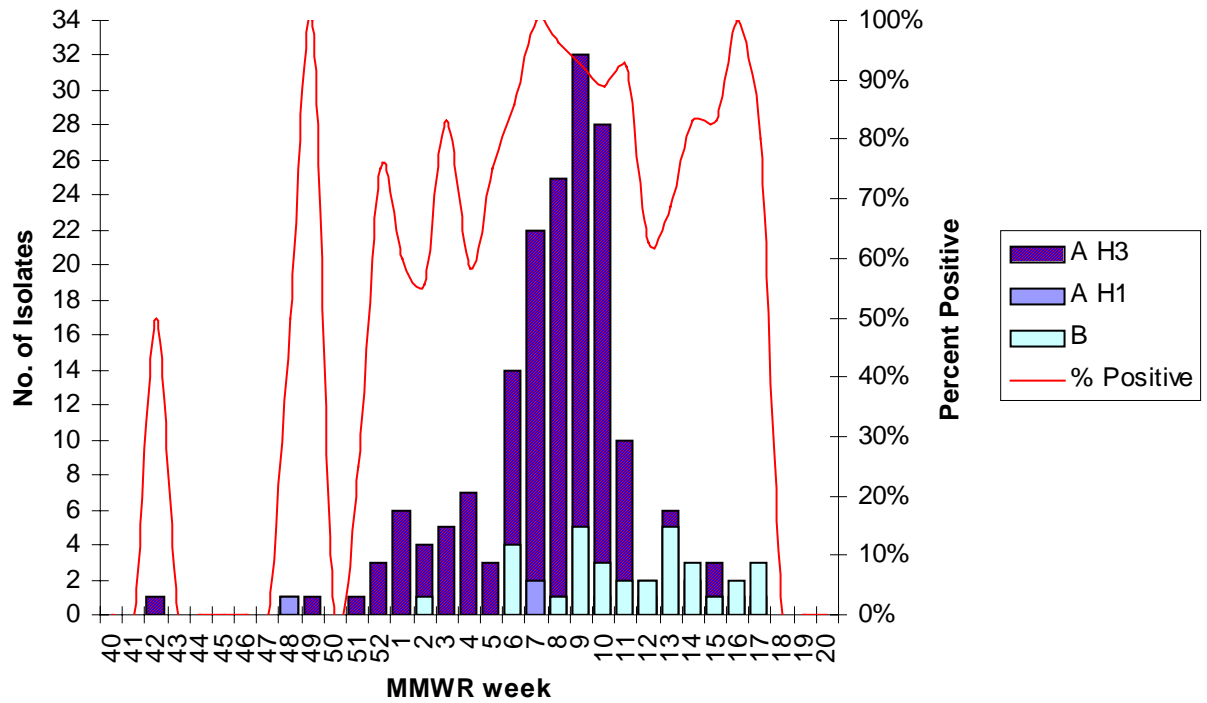
Patient visits for influenza-like illness by age group and practice type, New Hampshire sentinel providers, October 2, 2005 to May 20, 2006

Practice type	Age Group, years				Total ILI	Total Patient Visits
	0-4	5-24	25-64	>=65		
Emergency Medicine	73	47	48	10	178	28,115
Family Practice	53	169	252	44	518	96,785
Internal Medicine	0	0	6	0	6	11,976
Pediatrics	39	152	0	0	191	16,337
Student Health	0	5	2	0	7	12,729
Other	0	2	3	0	5	3,047
Total	165	375	311	54	905	168,989

Comment: In the 2005-06 influenza season, persons aged 5-24 years of age comprised the highest percentage of the total ILI reported by New Hampshire sentinel providers. This is similar to what has been reported each year since 2001, with the exception of the 2004-05 flu season. That year, persons aged 25-64 years of age comprised the highest percentage of the total ILI reported. Without complete patient population data for all sentinel provider practices, the actual rate of ILI cannot be calculated.

Methods: For the 2005-06 influenza season, 26 volunteer healthcare providers in NH participated in the U.S. Influenza Sentinel Provider Surveillance System. Sentinel providers report weekly to the CDC the total number of patients seen for the week, and the number of patients by age group with ILI, defined as: fever $\geq 100^{\circ}\text{F}$ and cough and/or sore throat.

Number and percent of specimens testing positive for influenza viruses, New Hampshire Public Health Laboratories, October 2, 2005 to May 20, 2006 (MMWR weeks 40 - 20).



Results of specimens received by New Hampshire Public Health Laboratories, 2005-06 influenza season (10/2/05 - 5/20/06)

Results	Number of specimens	Percentage of influenza isolates identified (n=217)
Influenza A H3	178	82%
Influenza A H1	7	3%
Influenza B	32	15%
Negative for influenza*	65	
Total†	282	

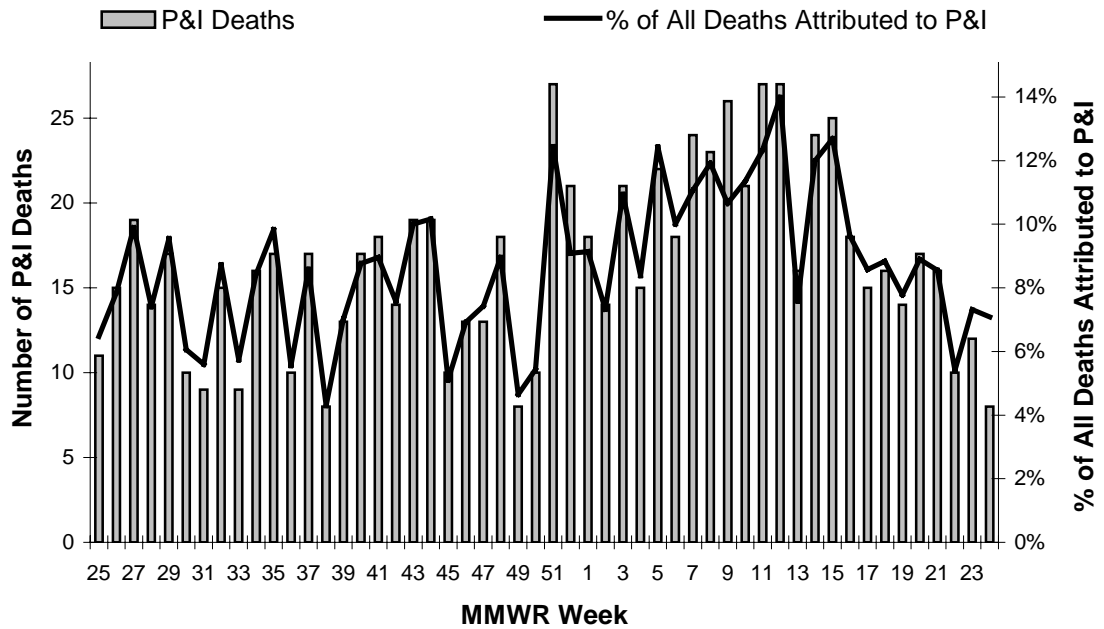
* Includes specimens positive for Adenovirus (n=7) and RSV (n=5)

† Does not include specimens sent in improper transport media (n=3) or too old to test (n=1)

Comment: The New Hampshire Public Health Laboratories receive specimens from sentinel providers, as well as other healthcare providers and hospitals for influenza testing. Specimens testing positive by rapid test are often sent to the Public Health Laboratories for confirmation and viral subtyping, resulting in the high percentage of positive specimens seen in the majority of weeks. In the U.S., influenza A (H3N2) viruses predominated overall, but influenza B viruses were isolated more frequently than influenza A viruses late in the season.

Methods: Results of all specimens for influenza testing received by the New Hampshire Public Health Laboratories are sent to Communicable Disease Surveillance Section staff for analysis and reporting.

Pneumonia and Influenza deaths in New Hampshire, July 2005 to June 2006



Comment: The proportion of deaths attributed to pneumonia and influenza is presented relative to all deaths recorded by New Hampshire’s Bureau of Vital Records. This includes resident and non-resident deaths that occurred within NH, and may not include deaths of New Hampshire residents that occurred out-of-state or cases being investigated by the Medical Examiner's office. A peak in deaths is noted in January and February, which is consistent with previous years and usually coincides with the peak in influenza activity.

Methods: Pneumonia and influenza deaths in New Hampshire are identified by looking at the text descriptions of the causes of death on the death certificate. The number of reported pneumonia and influenza deaths did not exceed the epidemic threshold at any time during the 2005-06 flu season.

Data sources: New Hampshire Department of Health and Human Services, Division of Public Health Services, Bureau of Disease Control and Health Statistics, Communicable Disease Surveillance Section.

Diseases Summary ^(9,10)

Diphtheria

Caused by: Bacterium — *Corynebacterium diphtheriae*

Spread by: Air, direct contact

Signs and Symptoms: Sore throat, mild fever, membrane in throat, swollen neck

Complications: Heart failure, paralysis, pneumonia, death

Hepatitis A

Caused by: Virus — Hepatitis A

Spread by: Personal contact; contaminated food or water

Signs and Symptoms: Fever, stomach pain, loss of appetite, fatigue, vomiting, jaundice, dark urine

Complications: Liver failure, death

Hepatitis B

Caused by: Virus — Hepatitis B

Spread by: Contact with blood or body fluids

Signs and Symptoms: Fever, headache, malaise, vomiting, arthritis

Complications: Chronic infection, cirrhosis, liver failure, liver cancer, death

Hib disease

Caused by: Bacterium — *Haemophilus influenzae* type b

Spread by: Air, direct contact

Signs and Symptoms: May be no symptoms unless bacteria enter blood

Complications: Meningitis, epiglottitis, pneumonia, arthritis, death

Human papillomavirus

Caused by: Virus — papillomavirus

Spread by: Direct contact, sexual contact

Signs and Symptoms: May be no symptoms, warts and verrucae

Complications: Strongly implicated in the etiology of cervical cancer

Influenza

Caused by: Virus — Influenza

Spread by: Air, direct contact

Signs and Symptoms: Fever, muscle pain, sore throat, cough

Complications: Pneumonia, Reye syndrome, myocarditis, death

Measles

Caused by: Virus — Measles

Spread by: Air, direct contact

Signs and Symptoms: Rash, fever, cough, runny nose, pinkeye

Complications: Pneumonia, ear infections, encephalitis, seizures, death

Mumps

Caused by: Virus — Mumps

Spread by: Air, direct contact

Signs and Symptoms: Swollen salivary glands, fever, headache, malaise, muscle pain

Complications: Meningitis, encephalitis, inflammation of testicles or ovaries, deafness

Pertussis

Caused by: Bacterium — *Bordetella pertussis*

Spread by: Air, direct contact

Signs and Symptoms: Severe cough, runny nose, fever

Complications: Pneumonia, seizures, brain disorders, ear infection, death

Pneumococcal disease

Caused by: Bacterium — *Streptococcus pneumoniae*

Spread by: Air, direct contact

Signs and Symptoms: Pneumonia (fever, chills, cough, chest pain)

Complications: Bacteremia (blood infection), meningitis, death

Polio

Caused by: Virus — Poliomyelitis

Spread by: Person to person

Signs and Symptoms: May be no symptoms, sore throat, fever, nausea

Complications: Paralysis, death

Rotaviral enteritis

Caused by: Virus — Rotavirus

Spread by: Person to person

Signs and Symptoms: Vomiting, watery diarrhea, fever

Complications: Dehydration, death

Rubella

Caused by: Virus — Rubella

Spread by: Air, direct contact

Signs and Symptoms: Rash, fever, lymphadeno-pathy, malaise

Complications: Encephalitis, arthritis/arthritis, hemorrhage, orchitis

Tetanus

Caused by: Bacterium — *Clostridium tetani*

Spread by: Exposure through breaks in skin

Signs and Symptoms: Stiffness in neck, difficulty swallowing, rigid abdominal muscles, muscle spasms, fever, sweating, elevated blood pressure

Complications: Broken bones, breathing difficulty, death

Varicella

Caused by: Virus — Varicella Zoster

Spread by: Air, direct contact

Signs and Symptoms: Rash, fever

Complications: Bacterial infections, meningitis, encephalitis, pneumonia, death

Terms and Definitions

Advisory Committee on Immunization Practices

The Advisory Committee on Immunization Practices consists of 15 experts in fields associated with immunization who have been selected by the Secretary of the U. S. Department of Health and Human Services to provide advice and guidance to the Secretary, the Assistant Secretary for Health, and the CDC on the most effective means to prevent vaccine-preventable diseases.

American Academy of Pediatrics

The American Academy of Pediatrics and its member pediatricians dedicate their efforts and resources to the health, safety, and wellbeing of infants, children, adolescents and young adults. The American Academy of Pediatrics has approximately 60,000 members in the United States, Canada and Latin America. Members include pediatricians, pediatric medical sub specialists and pediatric surgical specialists.

Confidence Interval

Confidence intervals are computed intervals with a given probability, e.g. 95%, that the true value of a variable is contained within the interval.

Healthy People 2010

Healthy People 2010 is a set of health objectives for the Nation to achieve over the first decade of the new century.

Vaccines for Children

The Vaccines for Children program provides immunizations for children who are uninsured, Medicaid eligible recipients, Native Americans, and Alaska Natives at their doctors' offices. The Vaccines for Children program also helps children whose insurance does not cover vaccinations when they are vaccinated at participating federally-qualified health centers or rural health clinics.

Vaccine Adverse Event Reporting System

The Vaccine Adverse Event Reporting System is a cooperative program for vaccine safety of the Centers for Disease Control and Prevention and the Food and Drug Administration. The Vaccine Adverse Event Reporting System is a post-marketing safety surveillance program, collecting information about adverse events (possible side effects) that occur after the administration of US-licensed vaccines.

Appendix

IMMUNIZATION MINIMUM DOSE REQUIREMENTS FOR CHILD CARE (3 MO. TO SCHOOL ENTRY) YEAR 2006/2007

The vaccines and doses below are minimum requirements for child care attendance.

The “Recommended Childhood and Adolescent Immunization Schedule, United States 2006” should be followed for the doses necessary for good preventive health. When following the “Recommended Childhood and Adolescent Immunization Schedule”, most children will begin their immunizations at birth to 2 months of age.

For all minimum intervals and age requirements, a 4-day grace period is acceptable.

By age: DTaP/DT/DTP*

3 - 4 months	At least one dose
5 - 6 months	At least two doses
7 - 18 months	At least three doses
19 months to school	At least four doses
Acceptable Intervals:	<ul style="list-style-type: none"> ■ Dose 1 shall have been administered at no less than 6 weeks of age. ■ Doses 2 and 3 shall be separated from the previous dose by a minimum of 4 weeks. ■ Dose 4 shall be separated by a minimum of 6 months from dose 3.

By age: HAEMOPHILUS INFLUENZAE TYPE B (HIB)*

3 - 4 months	At least one dose
5 - 6 months	At least two doses
7 - 15 months	At least three doses
16 - 59 months	Four doses with the last dose administered at 12 months or older. If less than four doses are documented, at least one dose must be administered after 15 months (12 months if 3 dose PedvaxHIB™ was used). HIB is not required for a child 60 months or older.
Acceptable Intervals:	<ul style="list-style-type: none"> ■ Dose 1 shall have been administered at no less than 6 weeks of age. Doses 2 and 3 shall be separated from the previous dose by a minimum of 4 weeks. ■ There must be 2 months between the final dose and the previous dose.

By age: POLIO (IPV/OPV)*

3 - 4 months	At least one dose
5 - 18 months	At least two doses
19 months to school	At least three doses
Acceptable Intervals:	<ul style="list-style-type: none"> ■ Dose 1 shall have been administered at no less than 6 weeks of age. ■ All subsequent doses shall be separated by a minimum of 4 weeks.

By age: MEASLES, MUMPS, AND RUBELLA (MMR)*

16 months to school	At least one
Acceptable Intervals:	■ Dose 1 administered on or after 12 months of age.

By age: HEPATITIS B*

3 – 4 months	At least one dose
5 – 18 months	At least two doses
19 months to school	At least three doses
Acceptable Intervals:	<ul style="list-style-type: none"> ■ Dose 1 usually administered at birth. ■ Doses 1 and 2 shall be separated by a minimum of 28 days. ■ Dose 3 shall be separated by a minimum of 4 months from dose 1, 2 months from dose 2, and administered on or after 24 weeks of age.

By age: VARICELLA (CHICKEN POX)*

19 months to school	■ One dose or history of disease as reported by parent or health care provider.
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***Brand Names for Vaccines:**

Diphtheria, Tetanus, acellular Pertussis, (DTaP/ DT/DTP):

Infanrix, Pediarix, DT, Tetramune, Act-Hib

Haemophilus Influenzae Type B, (HIB):

ActHIB, Pedvax HIB, Comvax, HibTITER.

Polio, (IPV/OPV):

IPOL or Pediarix

Measles, Mumps, Rubella, (MMR):

MMRII,
ProQuad (Combination of MMR and Varivax)

Hepatitis B (HepB):

Enerix B, Pediarix, Recombivax, or Comvax

Varicella(Chicken Pox, VAR):

Varivax,
ProQuad (Combination of MMR and Varivax)

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