

Vaccine Preventable Diseases in Colorado

Surveillance Report: 2007



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Table of Contents

<u>Introduction</u>	Page 3
Table 1. Reported Cases of Vaccine Preventable Diseases, Colorado, 2002-2007	Page 3
Table 2. Reported Cases and Rates of Selected Vaccine Preventable Diseases, Colorado and United States, 2007	Page 3
<u>Diphtheria</u>	Page 4
<u>Haemophilus influenzae</u>	Page 4
Figure 1. Reported Invasive <i>Haemophilus influenzae</i> Serotype b Cases by Select Age Group, Colorado, 2003-2007	Page 4
<u>Hepatitis</u>	Page 5
Figure 2. Rates of Acute Hepatitis A and B, Colorado, 2001-2007	Page 5
<u>Hepatitis A</u>	Page 6
Table 3. Reported Hepatitis A Cases and Rates by Age Group & Gender, Colorado, 2007	Page 6
<u>Acute Hepatitis B</u>	Page 7
Table 4. Reported Acute Hepatitis B Cases and Rates by Age Group & Gender, Colorado, 2007	Page 7
<u>Influenza</u>	Page 7
<u>Measles</u>	Page 7
<u>Meningococcal Disease</u>	Page 8-9
Table 5. Reported Meningococcal Disease Cases, Rates and Case Fatality by Age Group, Colorado, 2007	Page 8
Table 6. Reported Meningococcal Disease Cases by Serogroup, Colorado, 2007	Page 8
Table 7. Reported Meningococcal Disease Cases 11-21 Years of Age by Immunization Status and Serogroup, Colorado 2007	Page 9
<u>Mumps</u>	Page 9-10
Figure 3. Reported Cases of Mumps, Colorado, 2003-2007	Page 9
Table 8. Reported Mumps Cases and Rates by Age Group, Colorado, 2007	Page 10
Table 9. Reported Mumps Cases by Age Group and Vaccination Status, Colorado, 2007	Page 10
<u>Pertussis</u>	Page 11-16
Figure 4. Reported Pertussis Rates, Colorado and United States, 1999-2007	Page 11
Table 10. Reported Pertussis Cases and Rates by County, Colorado, 2003-2007	Page 12-13
Table 11. Reported Pertussis Cases and Rates by Age Group, Colorado, 2007	Page 14
Figure 5. Immunization Status of Reported Pertussis Cases by Selected Age Groups, Colorado, 2007	Page 14
Table 12. Reported Pertussis-related Hospitalizations by Age Group, Colorado, 2007	Page 15
Table 13. Classification of Reported Pertussis Cases, Colorado, 2007	Page 16
<u>Pneumococcal Disease</u>	Page 17-19
Table 14. Reported Invasive Pneumococcal Disease Cases, Rates and Case Fatality by Age Group, Colorado, 2007	Page 17
Table 15. Reported Invasive Pneumococcal Disease Cases Less Than 5 Years of Age by Vaccine Serotype and Immunization Status, Denver Metro Area, Colorado, 2007	Page 17
Figure 6. Invasive Pneumococcal Disease Rates by Year & Age for Children < 5 Years: Denver Metro Area, Colorado, 2007	Page 18
Figure 7. Invasive Pneumococcal Disease Rates for Cases \geq 50 Years of Age, Denver Metropolitan Area, Colorado, 2001-2007	Page 19
<u>Polio</u>	Page 19
<u>Rubella</u>	Page 19
<u>Tetanus</u>	Page 19
<u>Varicella</u>	Page 20
Table 16. Reported Varicella Cases and Rates by Age Group, Colorado, 2007	Page 20
Table 17. Reported Varicella Cases by Severity of Disease and Vaccine Status, Colorado, 2007	Page 20

INTRODUCTION

This report summarizes 2007 surveillance data for vaccine preventable diseases in Colorado. Colorado rates were calculated as cases per 100,000 population using 2007-based population final estimates from the Demography Section, Colorado Division of Local Government.

Table 1. Reported Cases of Vaccine Preventable Diseases*, Colorado, 2002 - 2007

Report Year	Invasive H. flu serotype b	Hepatitis A	Acute Hepatitis B	Meningococcal Disease	Mumps	Pertussis	Invasive Pneumococcal Disease	Tetanus	Varicella [§]
2002	2	75	79	24	2	464	390	0	NA
2003	1	59	80	27	1	368	367	0	NA
2004	1	51	59	15	3	1185	331	3	2040 [§]
2005	2	49	63	19	6	1383	421	1	1797
2006	0	44	35	22	51	710	422	0	1503
5-Year Average	1.2	55.6	63.2	21.4	12.6	822	386.2	0.8	1780 [§]
2007	2	27	41	22	17	306	459	0	1089

* During 2002-2007 one case of rubella (2003) and two cases of measles (2004 and 2006) were reported. No congenital rubella, diphtheria, or polio cases were reported during 2002-2007.
[§] Varicella became a reportable disease January 30, 2004. The varicella average is a 3-year average, not a 5-year average.

Table 2. Reported Cases and Rates of Selected Vaccine Preventable Diseases[¶], Colorado and United States, 2007

Disease	Colorado		United States*	
	Cases	Rate [§]	Cases	Rate
Hepatitis A	27	0.5	2,979	1.0
Acute Hepatitis B	41	0.8	4,519	1.5
Meningococcal Disease	22	0.4	1,077	0.4
Mumps	17	0.3	800	0.3
Pertussis	306	6.2	10,454	3.5

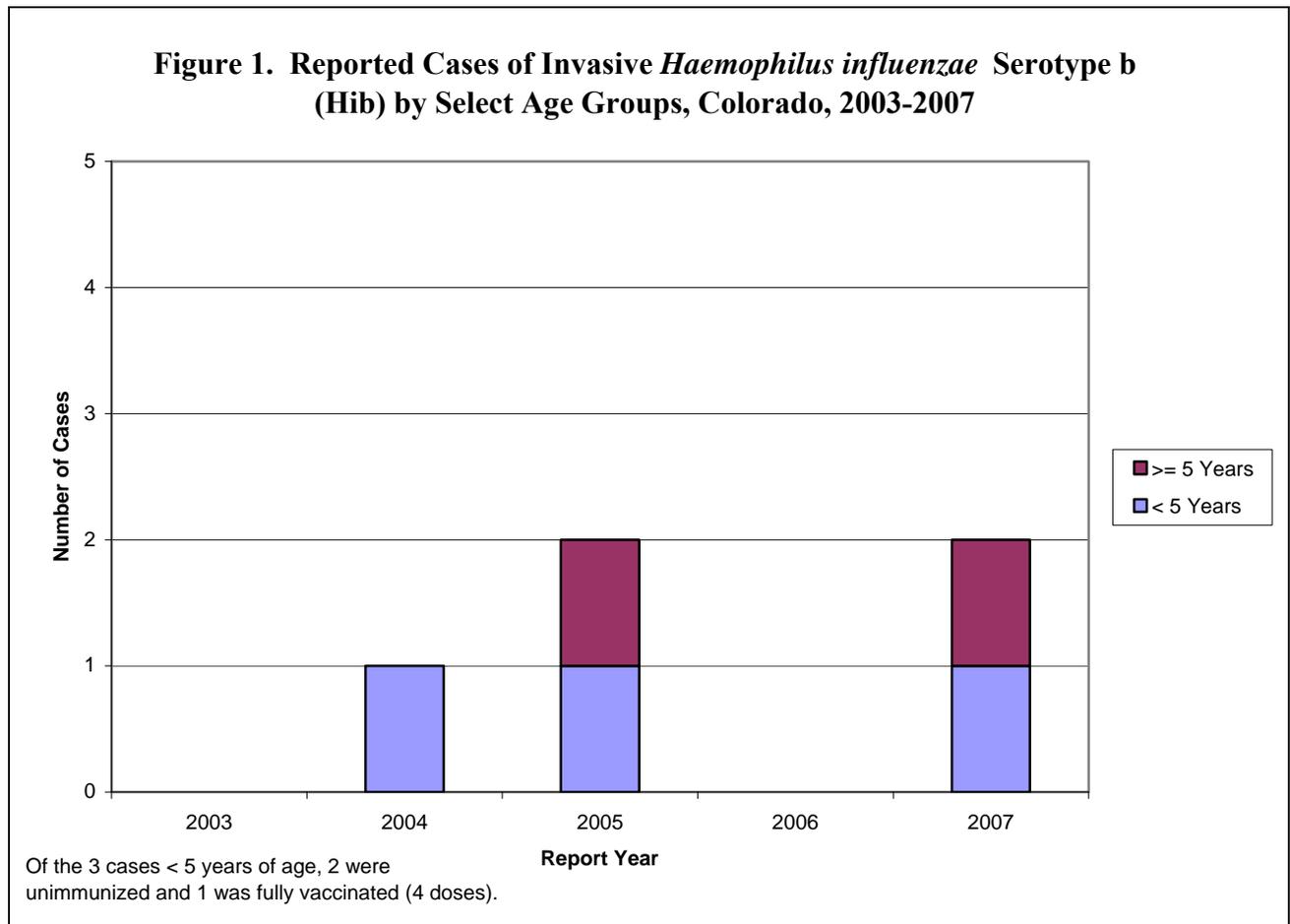
[¶] National rates of invasive *Haemophilus influenzae* serotype b, pneumococcal disease and varicella are not available.
[§] Per 100,000 population.
*Source, MMWR 2008;57:907-910. Rate per 100,000. US rates calculated using US Census Bureau 2007 Population Estimates Data Set.

DIPHTHERIA

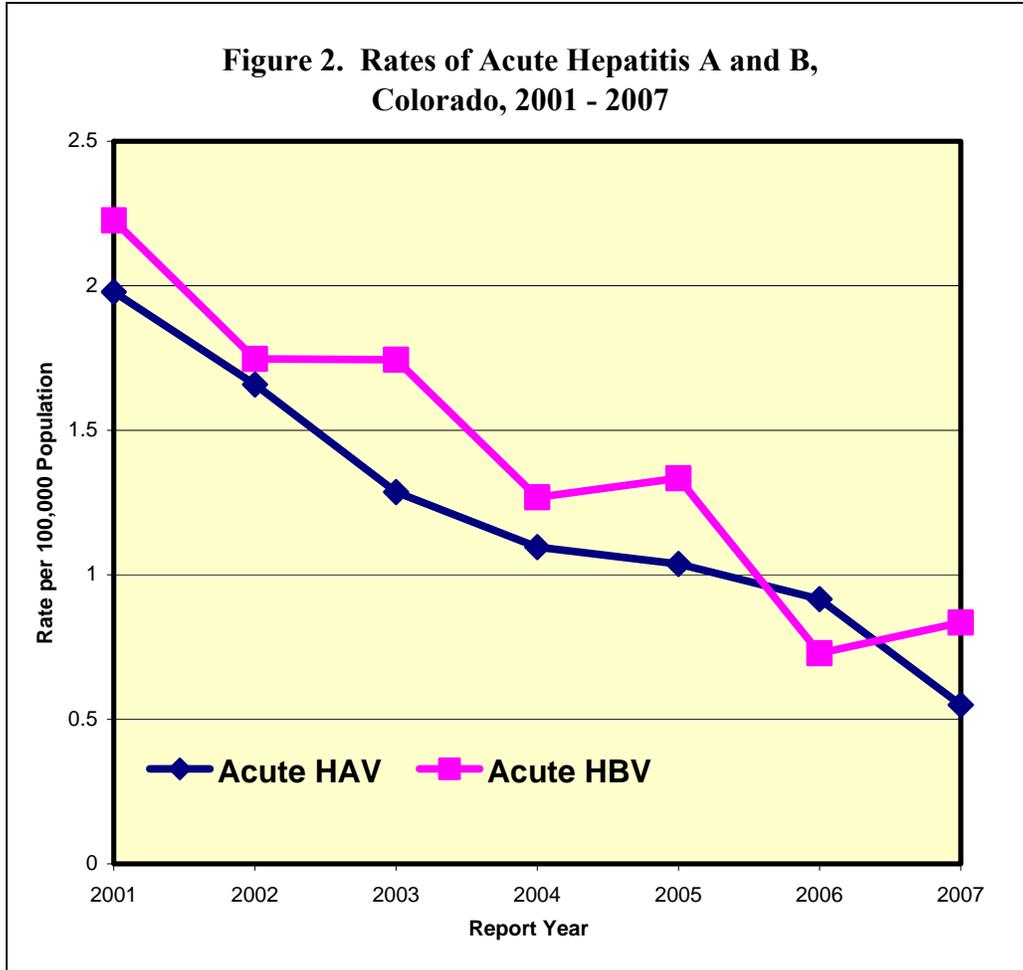
No diphtheria cases were reported in Colorado or the United States during 2007. The last case of diphtheria reported in Colorado was in 1985.

HAEMOPHILUS INFLUENZAE Serotype b (Hib)

In Colorado, only 2 cases of invasive *Haemophilus influenzae* serotype b (Hib) disease were reported during 2007, a 51-year-old El Paso county resident and an unimmunized 15-month-old child from southwest Colorado.



HEPATITIS



HEPATITIS A

Table 3. Reported Hepatitis A Cases and Rates* by Age Group & Gender, Colorado 2007						
Age Group (years)	Male		Female		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
< 1	0	0	0	0	0	0
1-4	2	1.4	0	0	2	0.9
5-9	0	0	0	0	0	0
10-14	0	0	1	0.6	1	0.3
15-19	0	0	2	1.1	2	0.6
20-39	3	0.4	6	0.9	9	0.6
≥ 40	8	0.8	5	0.5	13	0.6
Total	13	0.6	14	0.6	27	0.5

* Per 100,000 population.

ACUTE HEPATITIS B

Table 4. Reported Acute Hepatitis B Cases and Rates* by Age Group & Gender, Colorado, 2007						
Age Group (years)	Male		Female		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
< 15	0	0.0	0	0.0	0	0.0
15-19	0	0.0	0	0.0	0	0.0
20-29	10	2.8	0	0.0	10	1.5
30-39	9	2.4	4	1.2	13	1.8
40-49	9	2.3	2	0.5	11	1.5
50-59	4	1.2	3	0.9	7	1.0
≥ 60	0	0.0	0	0.0	0	0.0
Total	32	1.3	9	0.4	41	0.8

* Per 100,000 population.

INFLUENZA

See “Influenza Surveillance Summary, Colorado 2007 - 2008” at:

<http://www.cdphe.state.co.us/dc/Influenza/SummaryInfluenzaSeason07-08.pdf>

MEASLES

There were no measles cases reported in Colorado during 2007. During the previous five years (2002 – 2006), two measles cases were reported (one in 2004 and one in 2006). Both cases traveled to foreign countries during their exposure periods.

MENINGOCOCCAL DISEASE

Table 5. Reported Meningococcal Disease Cases, Rates* and Case Fatality by Age Group, Colorado, 2007				
AGE GROUP (Years)	CASES	RATE*	DEATHS[§]	
			Number	Percent of Cases
< 1	1	1.4	0	0
1 – 4	3	1.1	0	0
5 – 9	0	0.0	0	0
10 – 14	0	0.0	0	0
15 – 19	4	1.1	0	0
20 – 29	3	0.4	1	33.3
30 – 39	0	0.0	0	0
40 – 59	4	0.3	0	0
60 – 79	4	0.7	0	0
≥ 80	3	2.5	1	33.3
TOTAL	22	0.4	2	9.1

* Per 100, 000 population.
[§] One reported meningococcal disease fatality had serogroup B and the other had serogroup C.

Table 6. Reported Meningococcal Disease Cases by Serogroup, Colorado, 2007		
Serogroup	Cases	Percent of cases
A*	1	4.5
B	7	31.8
C	1	4.5
Y	11	50.0
W-135	1	4.5
Not Groupable	1	4.5
Total	22	100

* Case with serogroup A meningococcal disease returned from Senegal 3 days prior to onset.

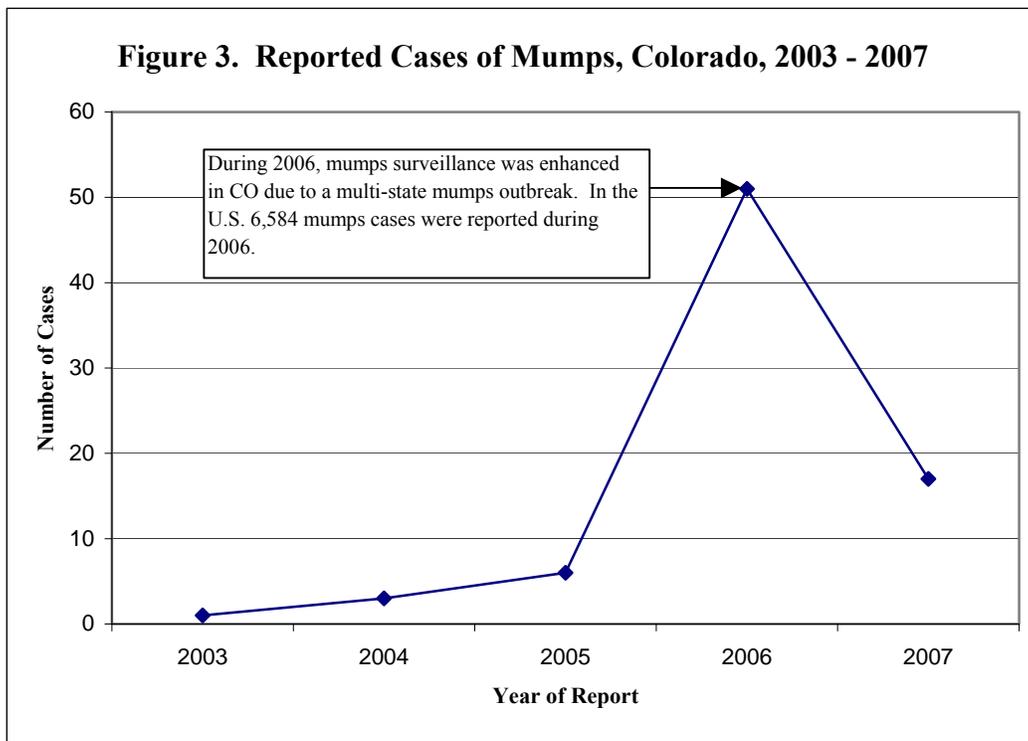
Table 7. Reported Meningococcal Disease Cases 11 – 21 Years of Age by Immunization Status* and Serogroup, Colorado, 2007

Age Group (Years)	Immunization Status		
	Immunized (Serogroup)	Unimmunized (Serogroup)	Unknown (Serogroup)
11 – 18	0	0	2 (1 B, 1 Y)
19 – 21	2 (1 B, 1 Y)	2 (1 C, 1 Y)	0
TOTAL	2 (1 B, 1 Y)	2 (1 C, 1 Y)	2 (1 B, 1 Y)

*Meningococcal vaccine contains antigens from serogroups A, C, Y and W-135.

MUMPS

Figure 3. Reported Cases of Mumps, Colorado, 2003 - 2007



**Table 8. Reported Mumps Cases and Rates*
by Age Group, Colorado, 2007**

Age Group (Years)	Cases [§]	Percent	Rate*
<1	0	0	0.0
1 – 4	3	17.6	1.1
5 – 9	6	35.3	1.8
10 – 14	0	0	0.0
15 – 19	1	5.9	0.3
20 – 29	3	17.6	0.4
30 – 39	2	11.8	0.3
40 - 59	1	5.9	0.1
60+	1	5.9	0.1
TOTAL	17	100.0	0.3

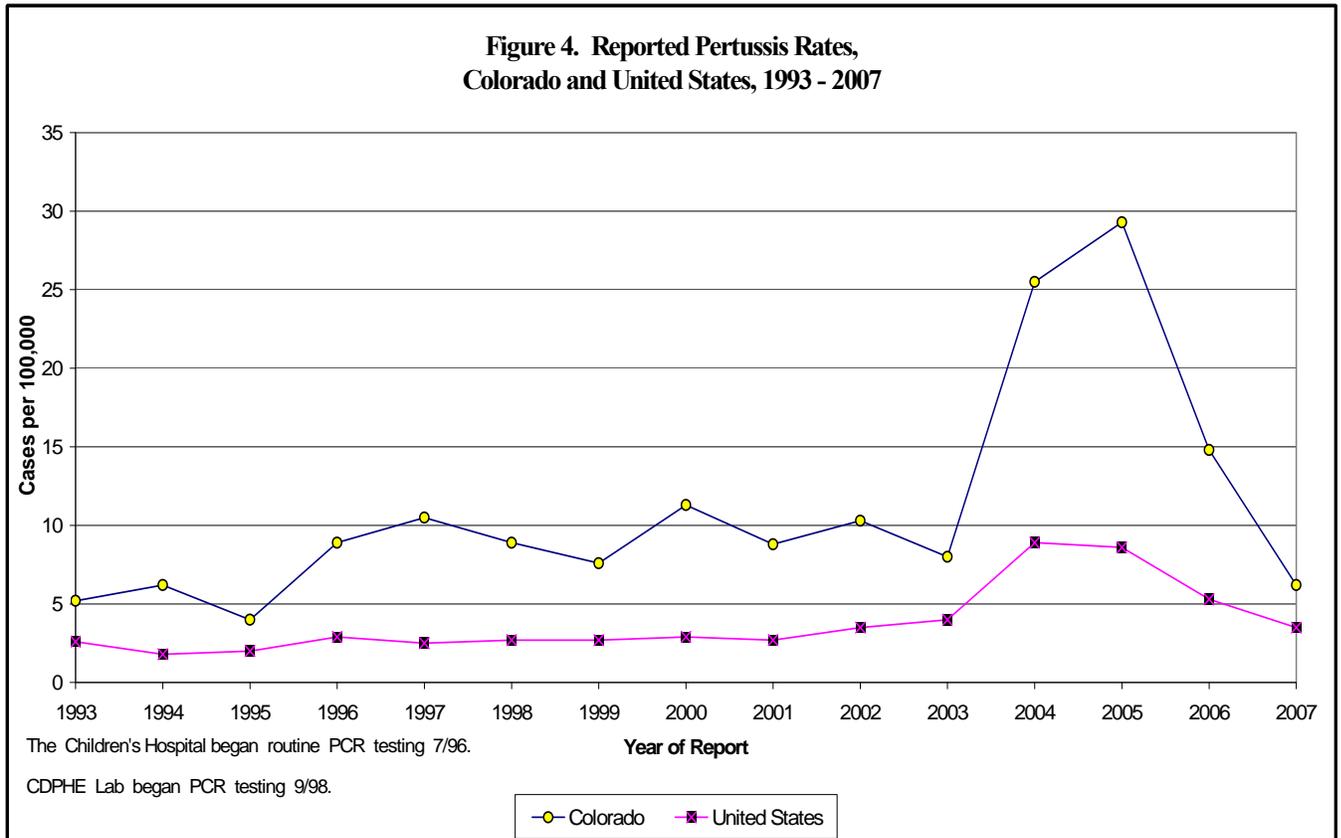
[§] Two cases were hospitalized, a 5-year-old child was hospitalized one day and a 56-year-old male was hospitalized 3 days with orchitis and meningitis.

* Per 100,000 population.

**Table 9. Reported Mumps Cases by Age Group and
Vaccination Status, Colorado, 2007**

Age Group	Number of Doses of Mumps Vaccine					Total
	0	1	2	3	Unknown	
<1	0	0	0	0	0	0
1 – 4	1	2	0	0	0	3
5 – 9	3	1	1	0	1	6
10 – 14	0	0	0	0	0	0
15 – 19	0	0	0	0	1	1
20 – 39	2	0	1	1	1	5
≥ 40	1	0	0	0	1	2
TOTAL	7	3	2	1	4	17

PERTUSSIS



**Table 10. Reported Pertussis Cases and Rates* by County,
Colorado, 2002 – 2007**

County	Number of Cases by Year of Report						2007 Rate*
	2002	2003	2004	2005	2006	2007	
Adams	44	24	128	119	69	13	3.1
Alamosa	1	0	6	1	1	0	*
Arapahoe	74	59	102	169	68	34	6.2
Archuleta	0	0	0	4	0	2	*
Baca	0	0	0	0	0	1	*
Bent	0	0	1	0	0	0	*
Boulder	31	47	175	115	74	23	7.9
Broomfield	10	6	23	16	11	10	18.6
Chaffee	0	2	1	9	2	0	*
Cheyenne	0	1	1	7	0	1	*
Clear Creek	0	4	3	5	2	1	*
Conejos	1	0	3	0	0	0	*
Costilla	0	1	2	0	0	0	*
Delta	6	1	26	5	17	3	9.7
Denver	84	39	78	175	40	35	5.9
Dolores	0	0	0	2	0	0	*
Douglas	10	27	43	55	29	12	4.3
Eagle	0	1	1	2	5	1	*
El Paso	6	15	35	62	18	53	9.1
Elbert	5	6	1	12	1	0	*
Fremont	3	1	3	5	0	0	*
Garfield	0	0	1	15	12	2	*
Gilpin	1	0	5	4	4	0	*
Grand	0	21	10	7	0	18	125.1
Huerfano	1	0	0	0	0	1	*
Jefferson	122	67	160	287	168	30	5.6
Kiowa	0	1	0	0	0	0	*
Kit Carson	0	0	1	0	1	2	*

Table 10. continues on next page

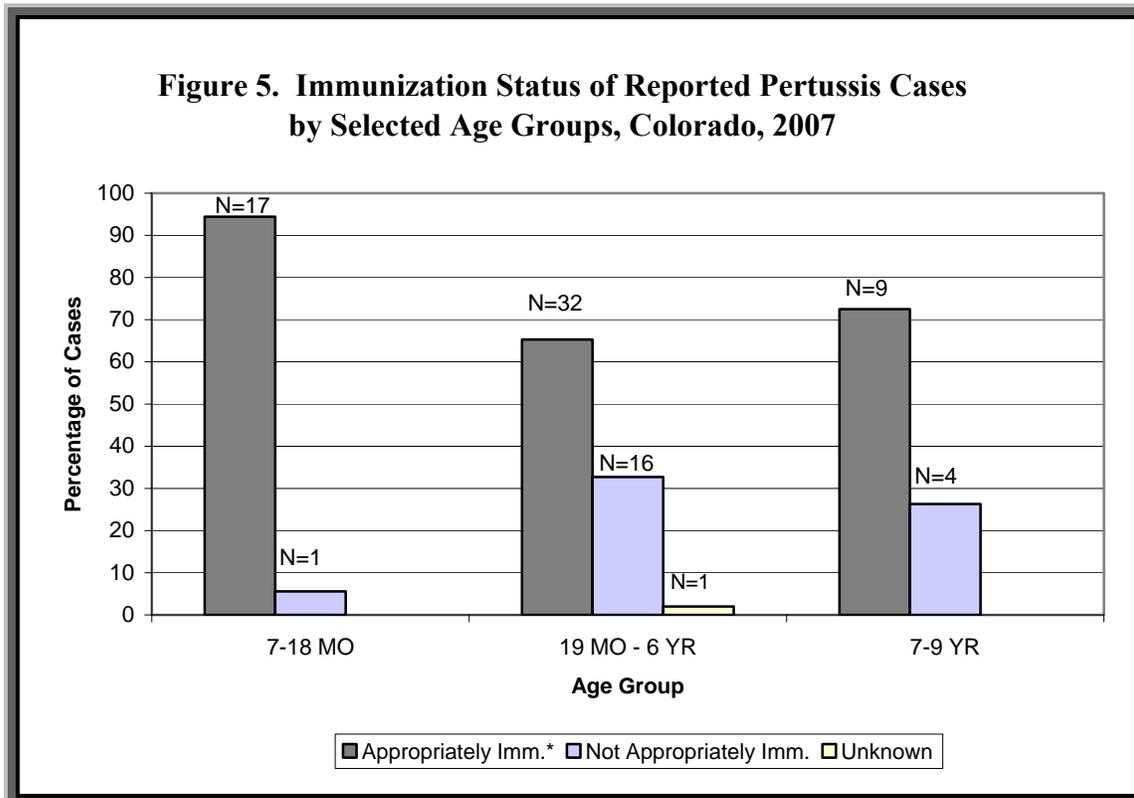
**Table 10. (Continued) Pertussis Cases and Rates* by County, Colorado,
2002-2007**

County	Number of Cases by Year of Report						2007 Rate*
	2002	2003	2004	2005	2006	2007	
La Plata	0	3	37	32	51	3	6.0
Lake	0	0	0	1	0	1	*
Larimer	35	8	140	80	29	24	8.5
Lincoln	0	0	0	0	0	2	*
Logan	0	0	2	21	1	1	*
Mesa	8	3	112	81	9	5	3.6
Moffat	0	0	2	0	0	0	*
Montezuma	0	0	0	12	10	1	*
Montrose	0	1	1	3	15	3	7.5
Morgan	1	0	4	1	1	1	*
Otero	0	0	19	1	0	3	15.7
Ouray	0	0	4	0	10	1	*
Park	0	0	0	2	0	3	17.6
Phillips	1	0	0	0	0	0	*
Pitkin	0	0	3	1	2	0	*
Prowers	0	0	3	11	0	0	*
Pueblo	5	2	27	17	5	2	*
Rio Blanco	0	0	0	4	0	0	*
Rio Grande	1	6	2	4	0	1	*
Routt	2	0	1	1	1	1	*
Saguache	4	1	0	0	0	1	*
San Miguel	0	0	1	0	2	2	*
Sedgwick	0	2	0	0	0	0	*
Summit	1	1	0	0	1	0	*
Teller	0	0	0	10	1	7	30.6
Washington	0	0	0	2	0	0	*
Weld	7	18	18	23	50	2	*
TOTAL	464	368	1185	1383	710	306	6.2

* Rates were not calculated for counties with < 3 pertussis cases during 2007. Caution should be used when interpreting rates based on small number of cases. The following counties reported no pertussis cases from 2002-2007: Crowley, Custer, Gunnison, Hinsdale, Jackson, Las Animas, Mineral, San Juan, and Yuma.

Table 11. Reported Cases and Rates of Pertussis by Age Group, Colorado, 2007			
Age Group (Years)	Cases	Percent	Rate*
<1	38	12.4	54.2
1 – 4	42	13.7	14.7
5 – 9	29	9.5	8.5
10 – 14	36	11.8	11.1
15 – 19	36	11.8	10.0
20 – 29	28	9.2	4.1
30 – 39	23	7.5	3.2
40 – 59	50	16.3	3.5
≥ 60	24	7.8	3.5
TOTAL	306	100.0	6.2

* Per 100,000 population.



*Appropriately immunized was defined using ACIP recommendations; 3 doses by age 7 months, 4 doses by age 19 months, and 5 doses by age 7 years or 4 doses by age 7 years if 4th dose was given at age 4 or older.

**Table 12. Reported Pertussis-related Hospitalizations*
by Age Group, Colorado, 2007**

Age Group	Cases	Hospitalized	
		Number	Percent
< 6 Months	27	16	59.3
6 – 11 Months	11	0	0
1 – 4 Years	42	3	7.1
5 – 9 Years	29	0	0
10 – 14 Years	38	0	0
15 – 19 Years	34	0	0
20 – 29 Years	28	0	0
30 – 39 Years	23	1	4.3
40 – 59 Years	51	3	5.9
60+ Years	23	3	13.0
TOTAL	306	26	8.5

* During 2007, there were 12 (3.9%) cases of x-ray-confirmed pneumonia (7 of the 12 [58.3%] cases with pneumonia were hospitalized). There were no reported cases of pertussis-associated seizures, encephalopathy, or death in Colorado.

**Table 13. Classification of Reported Pertussis Cases,
Colorado, 2007**

CASE CLASSIFICATION	Number	Percent
<u>Confirmed</u>[§]: PCR Positive	212	69.3
<u>Confirmed</u>[§]: Epidemiologically-linked to a PCR Positive Case	52	17.0
<u>Probable</u>[¶]: Physician Diagnosed Case	20	6.5
<u>Probable</u>[¶]: Serology Positive Only	16	5.2
<u>Probable</u>: Outbreak Situation*	6	2.0
TOTAL	306	100

§ Confirmed = Laboratory confirmed cases (culture positive or PCR positive and meet clinical case definition) or epidemiologically linked to a laboratory confirmed case and meet the clinical case definition. No culture positive or DFA positive cases were reported during 2007. Clinical Case Definition is a cough illness lasting at least 14 days with one of the following: paroxysms of coughing, inspiratory “whoop”, or post-tussive vomiting, without other apparent cause (as reported by a health care professional).

¶ Probable = Meets the clinical case definition, is not laboratory-confirmed, and is not epidemiologically linked to a laboratory confirmed case.

* In outbreak settings a case may be defined as a cough illness lasting ≥ 2 weeks.

PNEUMOCOCCAL DISEASE

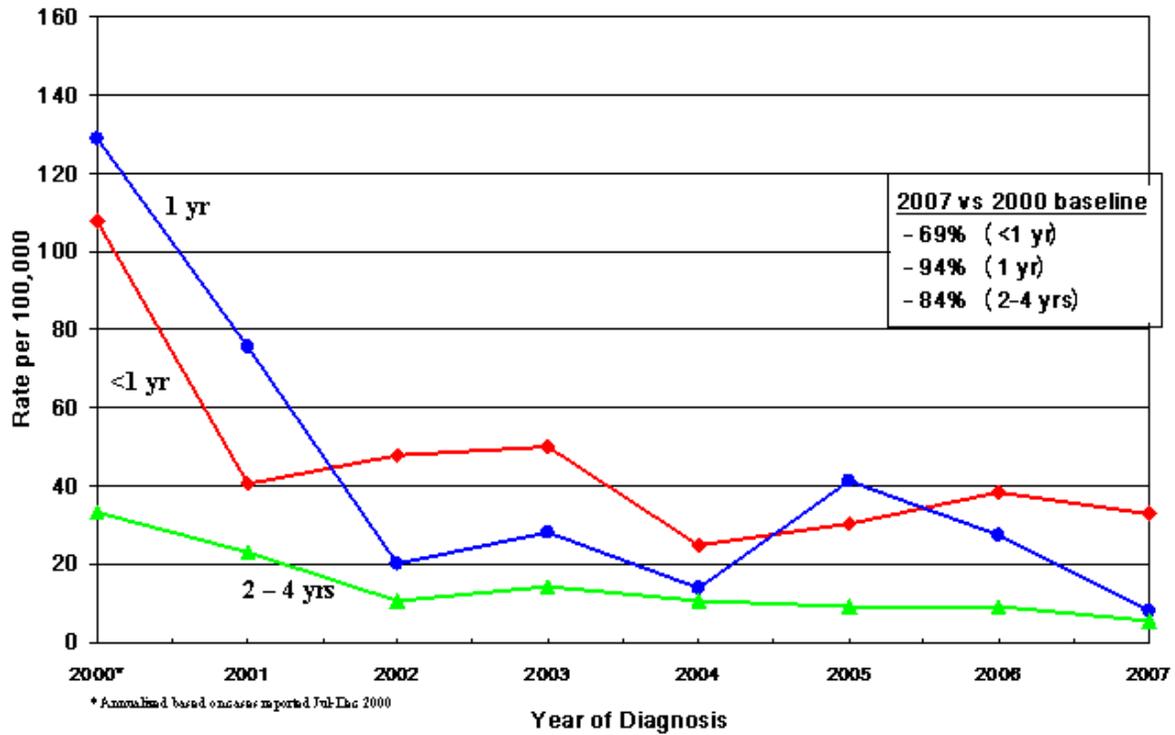
Table 14. Reported Invasive Pneumococcal Disease Cases, Rates and Case Fatality by Age Group, Colorado, 2007				
AGE GROUP (Years)	CASES	RATE*	DEATHS	
			Number	Percent of Cases
< 1	22	31.4	2	9.1
1 – 4	29	10.2	0	0
5 – 9	12	3.5	0	0
10 – 14	5	1.5	1	20.0
15 – 19	7	2.0	0	0
20 – 29	21	3.1	1	4.8
30 – 39	25	3.4	4	16.0
40 – 59	155	10.9	15	9.7
60 – 79	120	20.8	10	8.3
80 +	63	53.1	5	7.9
TOTAL	459	9.3	38	8.3

*Per 100,000 population.

Table 15. Reported Invasive Pneumococcal Disease Cases Less Than 5 Years of Age by Vaccine Serotype and Immunization Status, Denver Metro Area[¶], Colorado, 2007				
Serotype	Number of Cases	Vaccinated Prior to Onset (1+ doses)	Not Vaccinated Prior to Onset	Unknown Vaccine History
Vaccine Serotype*	1	0	0	1
Not in Vaccine[†]	15	13	1	1
Not typed	5	4	1	0
TOTAL	21	17	2	2

¶ Adams, Arapahoe, Denver, Douglas, and Jefferson counties.
 * Serotypes included in the Pneumococcal Conjugate Vaccine (4, 6B, 9V, 14, 18C, 19F, 23F)
 † Of the 15 cases with non-vaccine serotypes, 6 (40%) were serotype 7F and 4 (27%) were serotype 19A.

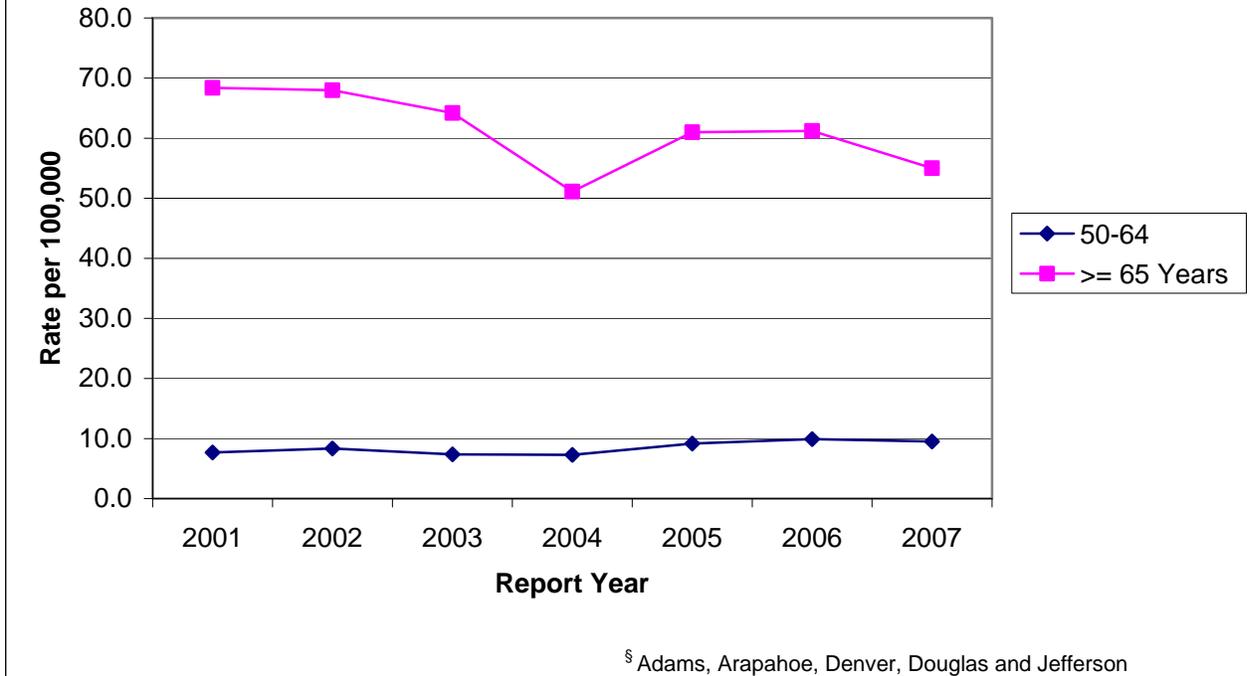
Figure 6. Invasive Pneumococcal Disease Rates by Year & Age Group for Children < 5 Years: Denver Metropolitan Area[†], 2000*-2007



Pediatric pneumococcal vaccine (Pneumovax[®]) licensed February 2000

[†] Adams, Arapahoe, Denver, Douglas, and Jefferson counties

Figure 7. Reported Invasive Pneumococcal Disease Rates for Adults \geq 50 Years of Age, Denver Metropolitan Area[§], 2001-2007



POLIO

In the United States, the last polio case caused by wild poliovirus was identified in 1979. In 1994, the World Health Organization certified the Western Hemisphere as free of wild poliovirus.

RUBELLA

There were no rubella cases reported in Colorado during 2007. During the previous five years (2002-2006), one rubella case was reported (2003).

TETANUS

There were no tetanus cases reported in Colorado during 2007. The previous five-year annual average (2002 – 2006) for tetanus was less than one case (0.8) per year.

VARICELLA

Table 16. Reported Varicella Cases[§] and Rates by Age Group, Colorado, 2007			
Age Group (Years)	Cases	Percent	Rate*
< 1	24	2.2	34.2
1 – 4	126	11.6	44.2
5 – 9	505	46.4	148.8
10 – 14	336	30.9	103.3
15 – 19	45	4.1	12.6
20 – 29	24	2.2	3.5
30 – 39	13	1.2	1.8
40 – 59	13	1.2	0.9
≥ 60	3	0.3	0.4
TOTAL	1,089	100.0	22.2

[§] Of the 988 cases with known report sources, 595 cases (60.2%) were reported from schools and 231 cases (23.4%) were reported by health care providers.
 * Rate per 100,000.

Table 17. Reported Varicella Cases by Severity of Disease* and Vaccine Status, Colorado, 2007								
Severity of Disease	≥ 1 Dose of Vaccine		Unimmunized		Unknown Immunization Status		Total Cases	
	#	%	#	%	#	%	#	%
< 50 Lesions	408	62	90	31	50	35	548	50
50 – 500 Lesions	182	28	142	49	20	14	344	32
> 500 Lesions	5	1	13	5	5	3	23	2
Unknown	64	10	42	15	68	48	174	16
TOTAL	659	100	287	100	143	100	1089	100

*Of the 1089 varicella cases reported during 2007, a total of 8 (0.7%) cases were hospitalized (87.5% of the hospitalized cases were ≤18 years of age and 62.5% were < 5 years of age). Hospitalization was unknown for 14 (1.3%) cases. There were no varicella-associated deaths reported in 2007.