

Vaccine Preventable Diseases in Colorado

Surveillance Report: 2009



Colorado Department of Public Health and Environment

Communicable Disease Epidemiology Program
4300 Cherry Creek Drive South
Denver, CO 80246

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INTRODUCTION

This report contains tables and graphs that summarize 2009 surveillance data for vaccine preventable diseases in Colorado. Colorado rates were calculated as cases per 100,000 population using 2009-based population final estimates from the Demography Section, Colorado Division of Local Government.

Table 1. Reported Cases of Vaccine Preventable Diseases*, Colorado, 2004 - 2009

Report Year	Invasive <i>H. influenzae</i> type b	Hepatitis A	Acute Hepatitis B	Meningococcal Disease	Mumps	Pertussis	Invasive Pneumococcal Disease	Tetanus	Varicella [§]
2004	1	51	59	15	3	1185	331	3	2040
2005	2	49	65	19	6	1383	420	1	1797
2006	0	44	35	22	51	710	419	0	1503
2007	2	27	41	22	17	306	458	0	1089
2008	0	37	33	16	8	158	542	0	873
5-Year Median	1	44	41	19	8	710	420	0	1503
2009	3**	53	35	24	6	201	623	0	515 [§]

* During 2004-2009 two cases of measles (2004 and 2006) were reported. No congenital rubella, diphtheria, polio or rubella cases were reported.
 **2 of the Hib cases reported during 2009 were <1 year of age and 1 Hib case was an adult.
 § Varicella became a reportable disease January 30, 2004, so 2004 data represent 11 months of reporting.

Table 2. Reported Cases and Rates of Selected Vaccine Preventable Diseases[¶], Colorado and United States, 2009

Disease	Colorado		United States	
	Cases	Rate [§]	Cases*	Rate [§]
Hepatitis A	53	1.0	1,987	0.6
Acute Hepatitis B	35	0.7	3,405	1.1
Meningococcal Disease	24	0.5	980	0.3
Mumps	6	0.1	1,991	0.6
Pertussis	201	4.0	16,858	5.5

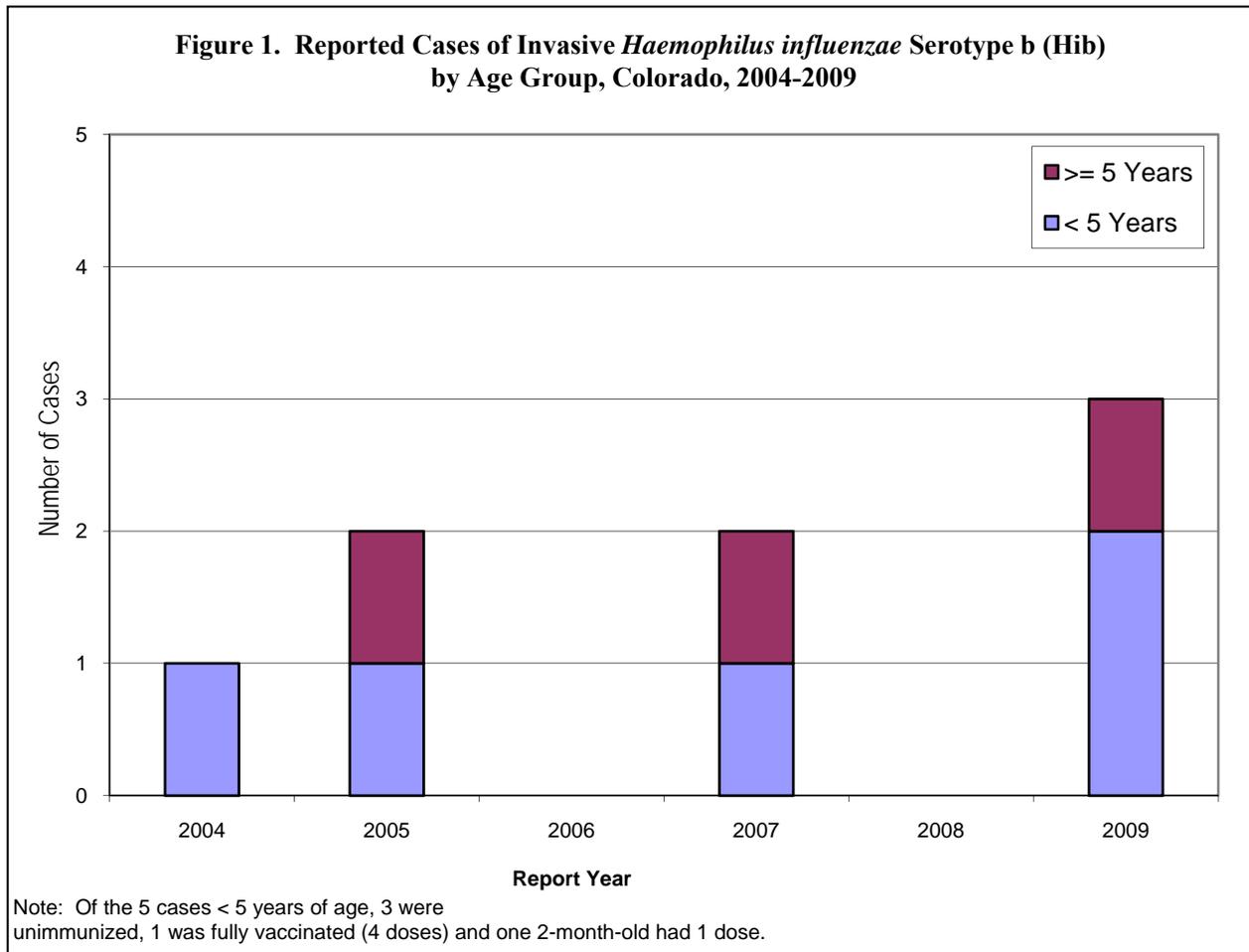
¶ National rates of invasive *Haemophilus influenzae* type b, invasive pneumococcal disease and varicella were not available.
 § Per 100,000 population.
 *Source, MMWR 2010;59:1025-1039. US rates calculated using US Census Bureau July 1, 2009 Resident Population Estimate released December 2009.

DIPHTHERIA

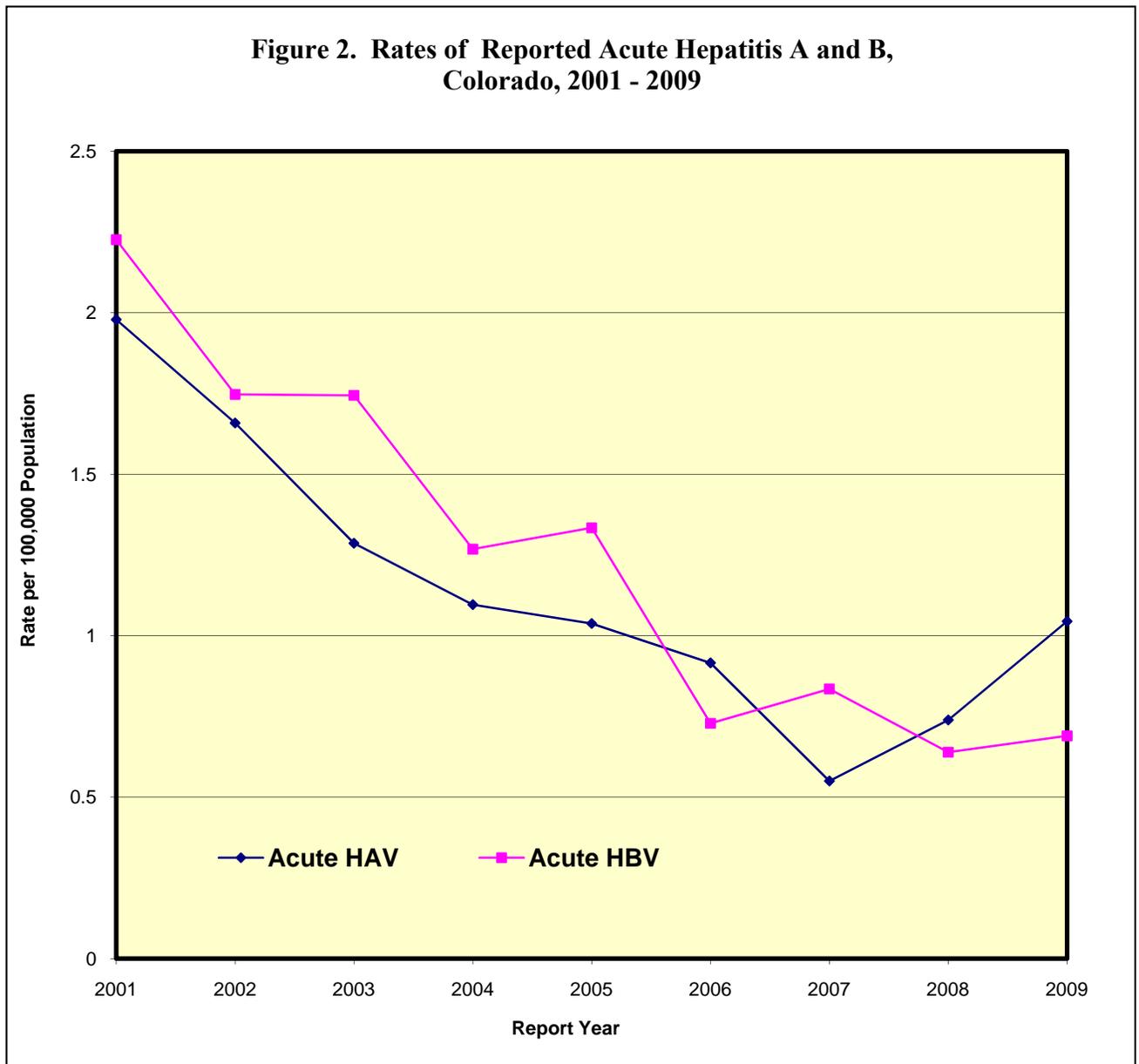
No cases of diphtheria were reported in Colorado or the United States during 2009. The last case of diphtheria reported in Colorado was in 1985.

HAEMOPHILUS INFLUENZAE type b (Hib)

There were three cases of invasive *Haemophilus influenzae* type b (Hib) disease reported during 2009 in Colorado. Of the three cases, one was an adult, one was an unimmunized 10-month-old infant, and one was a 2-month-old infant with a history of receiving 1 Hib vaccination.



HEPATITIS



Detailed surveillance summaries of Hepatitis A and Hepatitis B in Colorado are posted at:
www.cdphe.state.co.us/dc/hepatitis/data.html

HEPATITIS A

Table 3. Reported Hepatitis A Cases and Rates* by Age Group & Gender, Colorado 2009						
Age Group (years)	Male		Female		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
< 1	1	2.8	1	2.9	2	2.8
1-4	1	0.7	0	0.0	1	0.3
5-9	2	1.1	0	0.0	2	0.6
10-14	3	1.8	1	0.6	4	1.2
15-19	4	2.2	0	0.0	4	1.1
20-39	7	0.9	11	1.6	18	1.3
≥ 40	12	1.1	10	0.9	22	1.0
Total	30	1.2	23	0.9	53	1.0

* Per 100,000 population.

ACUTE HEPATITIS B

Table 4. Reported Acute Hepatitis B Cases and Rates* by Age Group & Gender, Colorado, 2009						
Age Group (years)	Male		Female		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
< 15	0	0.0	0	0.0	0	0.0
15-19	1	0.5	0	0.0	1	0.3
20-29	4	1.1	0	0.0	4	0.6
30-39	5	1.3	2	0.6	7	1.0
40-49	7	1.8	5	1.4	12	1.6
50-59	4	1.1	0	0.0	4	0.6
≥ 60	1	0.3	6	1.4	7	0.9
Total	22	0.9	13	0.5	35	0.7

* Per 100,000 population.

INFLUENZA

See Influenza Surveillance web page at:
www.cdphe.state.co.us/dc/Influenza/index.html

MEASLES

There were no measles cases reported in Colorado during 2009. During the previous five years (2004 – 2008), two measles cases were reported (one in 2004 and one in 2006). Both cases traveled to foreign countries during their exposure periods. During 2009, there were 71 measles cases reported in the United States.

MENINGOCOCCAL DISEASE

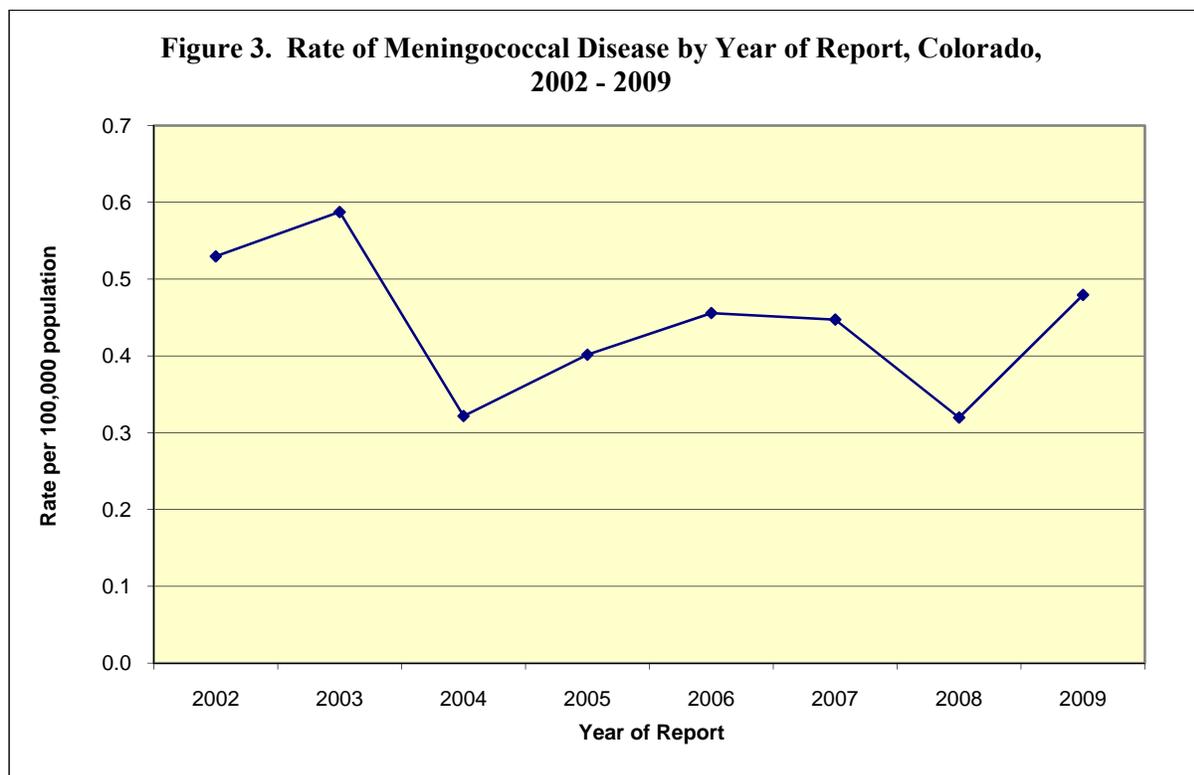


Table 5. Reported Meningococcal Disease Cases, Rates* and Case Fatality by Age Group, Colorado, 2009				
AGE GROUP (Years)	CASES	RATE*	DEATHS[§]	
			Number	Percent of Cases
< 1	0	0.0	0	0.0
1 - 4	2	0.7	1	50.0
5 - 9	0	0.0	0	0.0
10 - 14	0	0.0	0	0.0
15 - 19	4	1.1	0	0.0
20 - 29	3	0.4	1	33.3
30 - 39	2	0.3	0	0.0
40 - 59	9	0.6	1	11.1
60 - 79	2	0.3	0	0.0
≥ 80	2	1.5	0	0.0
TOTAL	24	0.5	3	12.5

* Per 100, 000 population.
[§] The fatal cases had serogroup B (1yo), C (23 yo) , and W-135 (54yo).

Table 6. Reported Meningococcal Disease Cases by Serogroup, Colorado, 2009		
Serogroup	Cases	Percent of cases
B	4	16.7
C	6	25.0
Y	12	50.0
W-135	1	2.4
Not Groupable	1	2.4
Total	24	100.0

Table 7. Reported Meningococcal Disease Cases 11 – 21 Years of Age by Immunization Status* and Serogroup, Colorado, 2009		
Age Group (Years)	Immunization Status	
	Immunized (Serogroup)	Unimmunized (Serogroup)
11 – 18	2 (C & Y – vaccine types)	2 (B – non-vaccine type & C – vaccine type)
19 – 21	1 (Y – vaccine type)	0

*Meningococcal vaccine contains antigens from serogroups A, C, Y and W-135. Immunization status and serogroup information was available for all 5 cases in this age group.

MUMPS

Figure 4. Rates of Reported Mumps Cases by Year of Report, Colorado and United States, 2003 - 2009

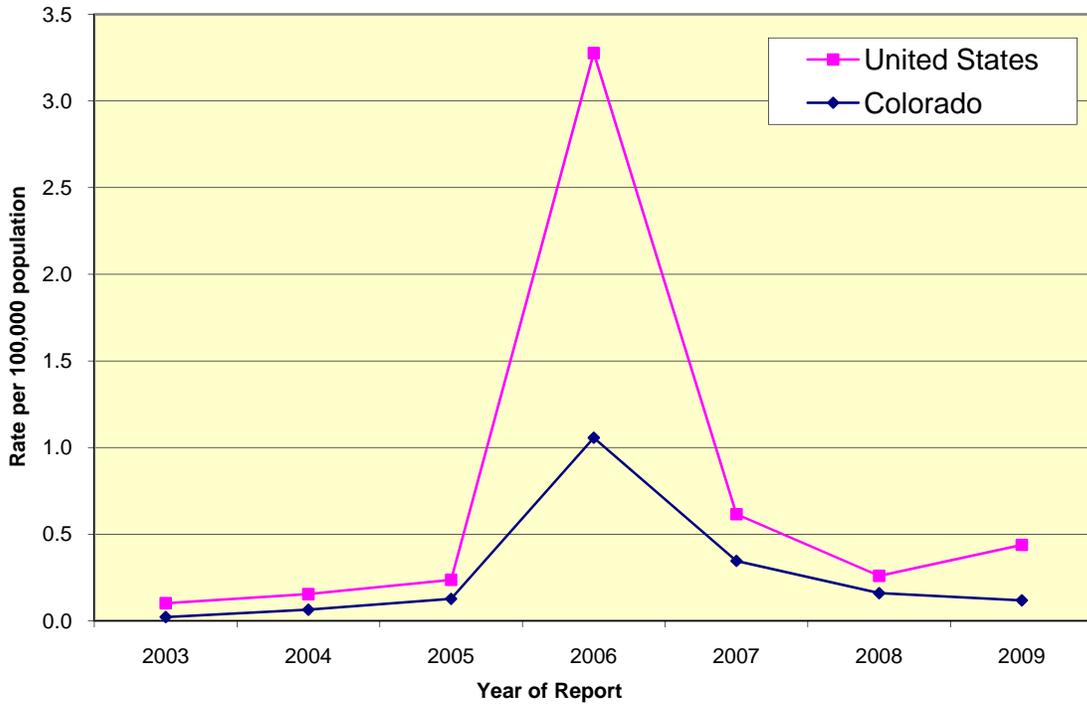


Table 8. Reported Mumps Cases by Age Group and Vaccination Status, Colorado, 2009

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

PERTUSSIS

Figure 5. Rates of Reported Pertussis Cases by Year of Report, Colorado and United States, 2000 - 2009

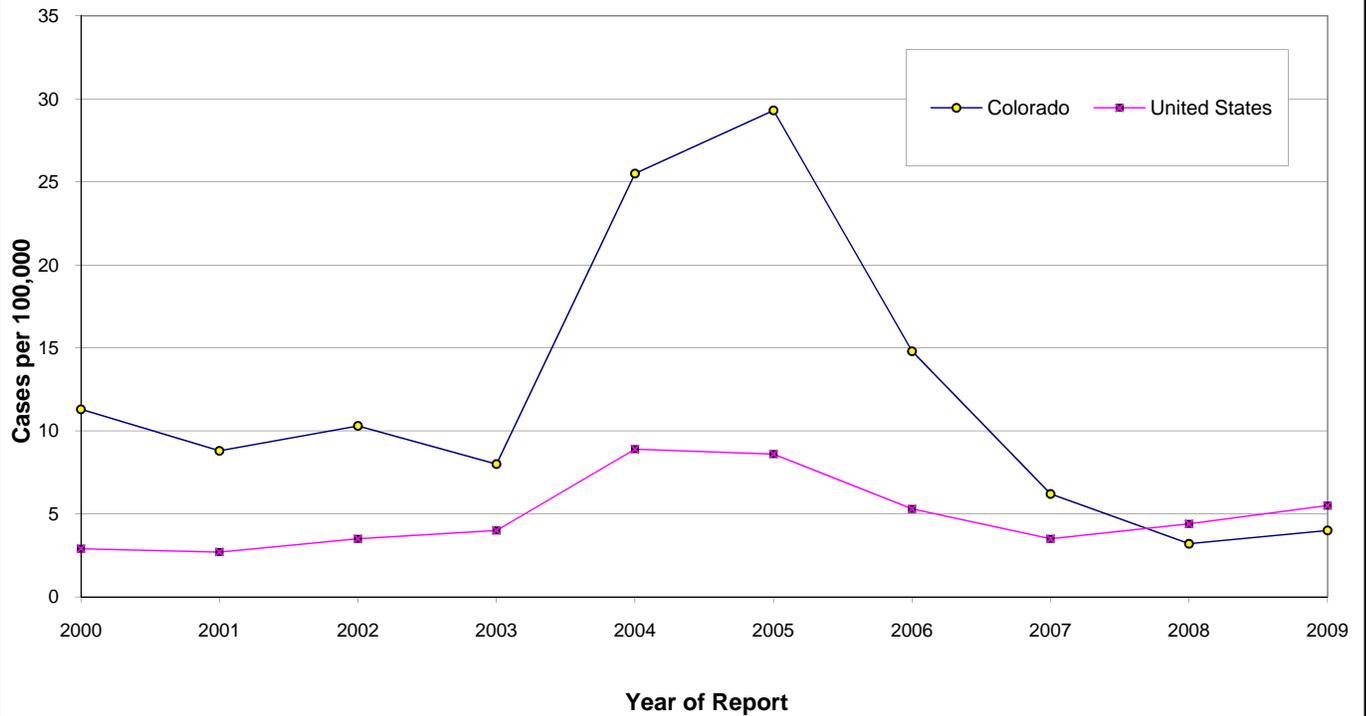


Table 9. Reported Cases and Rates of Pertussis by Age Group, Colorado, 2009

Age Group (Years)	Cases	Percent	Rate*
<1	28	13.9	39.6
1 – 4	29	14.4	10.1
5 – 9	49	24.4	13.8
10 – 14	24	11.9	7.3
15 – 19	13	6.5	3.6
20 – 29	19	9.5	2.6
30 – 39	12	6.0	1.7
40 – 59	20	10	1.4
≥ 60	7	3.5	0.9
TOTAL	201	100	4.0

* Per 100,000 population.

**Table 10. Reported Pertussis Cases and Rates* by County,
Colorado, 2004 – 2009**

County	Number of Cases by Year of Report						2009 Rate*
	2004	2005	2006	2007	2008	2009	
Adams	128	119	69	13	7	13	2.9
Alamosa	6	1	1	0	0	0	*
Arapahoe	102	169	68	34	22	26	4.5
Archuleta	0	4	0	2	1	2	*
Baca	0	0	0	1	0	0	*
Bent	1	0	0	0	0	0	*
Boulder	175	115	74	23	5	23	7.6
Broomfield	23	16	11	10	2	0	*
Chaffee	1	9	2	0	0	0	*
Cheyenne	1	7	0	1	0	0	*
Clear Creek	3	5	2	1	3	0	*
Conejos	3	0	0	0	0	14**	172.1
Costilla	2	0	0	0	0	0	*
Crowley	0	0	0	0	0	0	*
Custer	0	0	0	0	0	0	*
Delta	26	5	17	3	1	0	*
Denver	78	175	40	35	40	23	3.7
Dolores	0	2	0	0	0	0	*
Douglas	43	55	29	12	8	4	1.4
Eagle	1	2	5	1	0	0	*
El Paso	35	62	18	53	9	20	3.3
Elbert	1	12	1	0	0	1	*
Fremont	3	5	0	0	0	1	*
Garfield	1	15	12	2	0	3	5.2
Gilpin	5	4	4	0	0	0	*
Grand	10	7	0	18	0	0	*
Gunnison	0	0	0	0	0	0	*
Hinsdale	0	0	0	0	0	0	*
Huerfano	0	0	0	1	0	0	*
Jackson	0	0	0	0	0	0	*
Jefferson	160	287	168	30	35	19	3.5
Kiowa	0	0	0	0	0	0	*
Kit Carson	1	0	1	2	0	0	*

Table 10. continues on next page

**Table 10. (Continued) Pertussis Cases and Rates* by County, Colorado,
2004-2009**

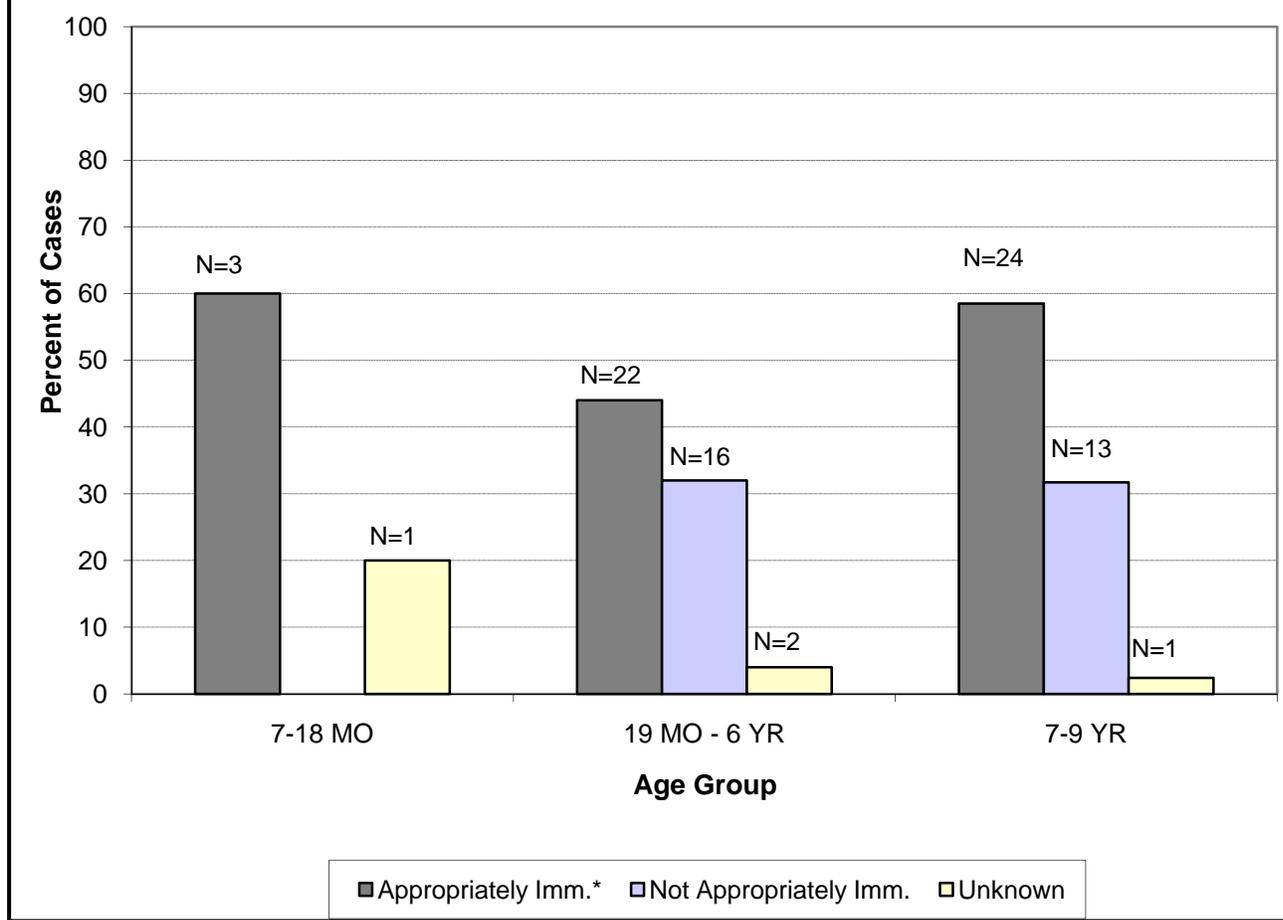
County	Number of Cases by Year of Report						2009 Rate*
	2004	2005	2006	2007	2008	2009	
La Plata	37	32	51	3	9	34 [§]	65.8
Lake	0	1	0	1	0	0	*
Larimer	140	80	29	24	8	2	*
Las Animas	0	0	0	0	0	0	*
Lincoln	0	0	0	2	0	0	*
Logan	2	21	1	1	0	0	*
Mesa	112	81	9	5	0	2	*
Mineral	0	0	0	0	0	0	*
Moffat	2	0	0	0	0	0	*
Montezuma	0	12	10	1	0	3	11.7
Montrose	1	3	15	3	0	0	*
Morgan	4	1	1	1	0	0	*
Otero	19	1	0	3	0	1	*
Ouray	4	0	10	1	0	0	*
Park	0	2	0	3	0	0	*
Phillips	0	0	0	0	0	1	*
Pitkin	3	1	2	0	1	2	*
Prowers	3	11	0	0	0	0	*
Pueblo	27	17	5	2	3	1	*
Rio Blanco	0	4	0	0	0	0	*
Rio Grande	2	4	0	1	0	1	*
Routt	1	1	1	1	0	0	*
Saguache	0	0	0	1	0	0	*
San Miguel	1	0	2	2	0	0	*
San Juan	0	0	0	0	0	0	*
Sedgwick	0	0	0	0	0	0	*
Summit	0	0	1	0	0	0	*
Teller	0	10	1	7	2	0	*
Washington	0	2	0	0	0	0	*
Weld	18	23	50	2	2	4	1.6
Yuma	0	0	0	0	0	1	*
TOTAL	1185	1383	710	306	158	201	4.0

* Rates were not calculated for counties with < 3 pertussis cases during 2009. Caution should be used when interpreting rates based on small number of cases.

**These 14 cases are from one outbreak associated with an extended family in Conejos County's Amish community.

§ 24 of the 34 cases from LaPlata County were part of a community-wide pertussis outbreak.

Figure 6. Percent of Reported Pertussis Cases Appropriately Immunized by Selected Age Groups, Colorado, 2009



*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.

During 2009, there were 33 pertussis cases reported in the 10-17 year old age group in Colorado. In this age group 11 cases (33.3%) had received Tdap vaccine; the Tdap booster was the sixth pertussis vaccination for 9 of the cases. The other 2 cases that received Tdap had incomplete DTaP vaccination histories.

**Table 11. Reported Pertussis-related Hospitalizations*
by Age Group, Colorado, 2009**

Age Group	Cases	Hospitalized	
		Number	Percent
< 6 Months	19	12	63.2
6 – 11 Months	9	1	11.1
1 – 4 Years	29	1	3.4
5 – 9 Years	49	0	0.0
10 – 14 Years	24	0	0.0
15 – 19 Years	13	0	0.0
20 – 29 Years	19	3	15.8
30 – 39 Years	12	0	0.0
40 – 59 Years	20	2	10.0
60+ Years	7	0	0.0
TOTAL	201	19	9.5

- Average # days hospitalized in 2009 = 9.6 days, median 8.0 days
- There were no reported cases of pertussis-associated seizures, encephalopathy, or death in Colorado during 2009.
- The last reported pertussis-associated deaths occurred during 2005, when 2 infants < 2 months of age died due to pertussis infection.

**Table 12. Classification of Reported Pertussis Cases,
Colorado, 2009**

CASE CLASSIFICATION	Number	Percent
<u>Confirmed</u> [§] : PCR Positive	118	58.7
<u>Confirmed</u> [§] : Epidemiologically–linked to a PCR Positive Case	54	26.9
<u>Probable</u> [¶] : Physician Diagnosed Case	9	4.5
<u>Probable</u> [¶] : Serology Positive Only	12	5.9
<u>Probable</u> : Outbreak Situation*	8	4.0
TOTAL	201	100.0

§ 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 2009. 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 13. Reported Invasive Pneumococcal Disease Cases, Rates and Case Fatality by Age Group, Colorado, 2009				
AGE GROUP (Years)	CASES	RATE*	DEATHS	
			Number	Percent of Cases
< 1	24	33.9	3	12.5
1 – 4	30	10.4	1	3.3
5 – 9	21	5.9	0	0
10 – 14	12	3.7	2	16.7
15 – 19	6	1.7	0	0
20 – 29	35	4.9	1	2.9
30 – 39	41	5.7	0	0
40 – 59	224	15.4	15	6.7
60 – 79	170	26.3	19	11.2
80 +	60	46.0	10	16.7
TOTAL	623	12.3	51	8.2

*Per 100,000 population.

Table 14. Reported Invasive Pneumococcal Disease Cases Less Than 5 Years of Age by Vaccine Serotype and Immunization Status, Denver Metro Area[¶], Colorado, 2009				
Serotype	Number of Cases	Vaccinated Prior to Onset (1+ doses)	Not Vaccinated Prior to Onset	Unknown Vaccine History
Vaccine Serotype*	0	0	0	0
Not in Vaccine[†]	18	13	1	4
Not typed	5	4	1	0
TOTAL	23	17	2	4

¶ Adams, Arapahoe, Denver, Douglas, and Jefferson counties.
 * Serotypes included in the Pneumococcal Conjugate Vaccine (4, 6B, 9V, 14, 18C, 19F, 23F).
 † Of the 18 cases with non-vaccine serotypes, 5 (28%) were serotype 19A and 7 (39%) were serotype 7F.

Figure 7. Rates of Reported Invasive Pneumococcal Disease in Children < 5 Years of Age: Denver Metropolitan Area*, 2000-2009

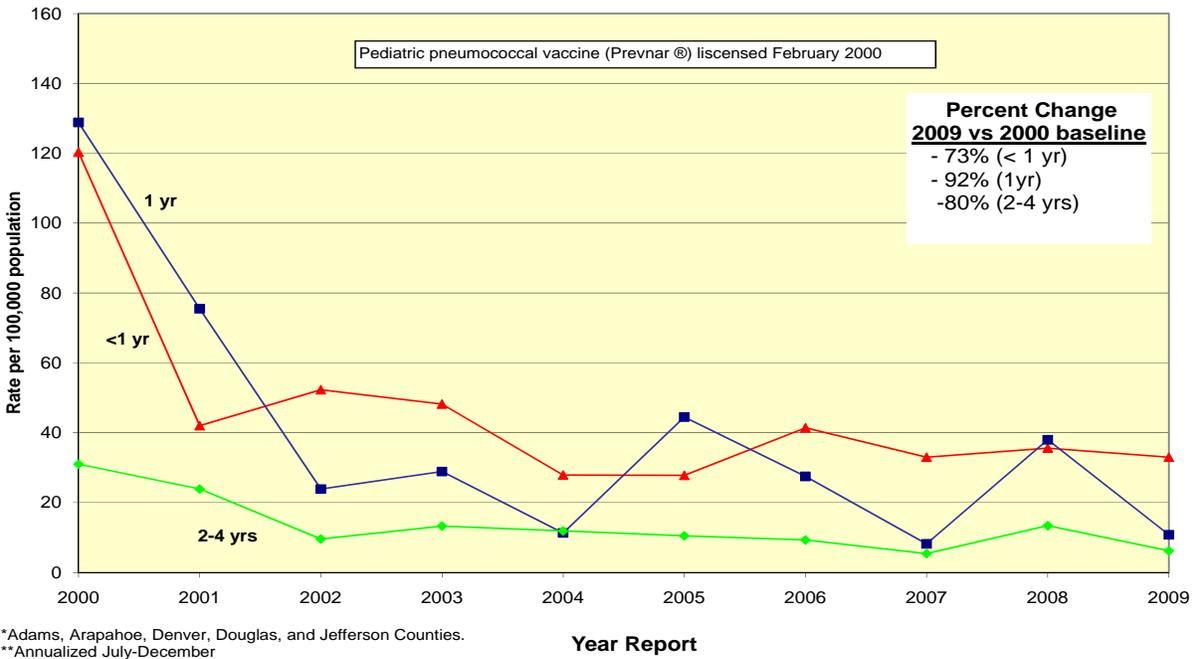
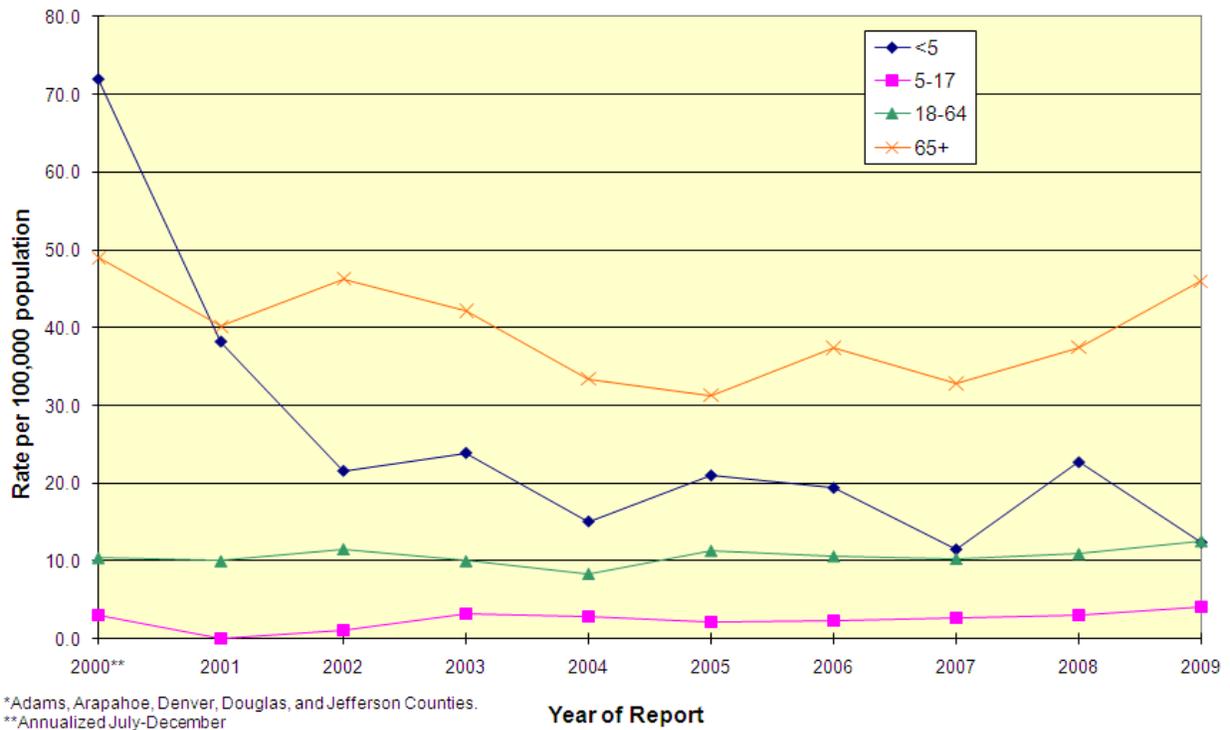


Figure 8. Rates of Reported Invasive Pneumococcal Disease by Age Group, Denver Metropolitan Area*, 2000 - 2009**



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 2009. The last reported case of rubella in Colorado was in 2003.

TETANUS

There were no tetanus cases reported in Colorado during 2009. The five-year annual average (2004 – 2008) for tetanus was less than one case (0.8) per year.

VARICELLA

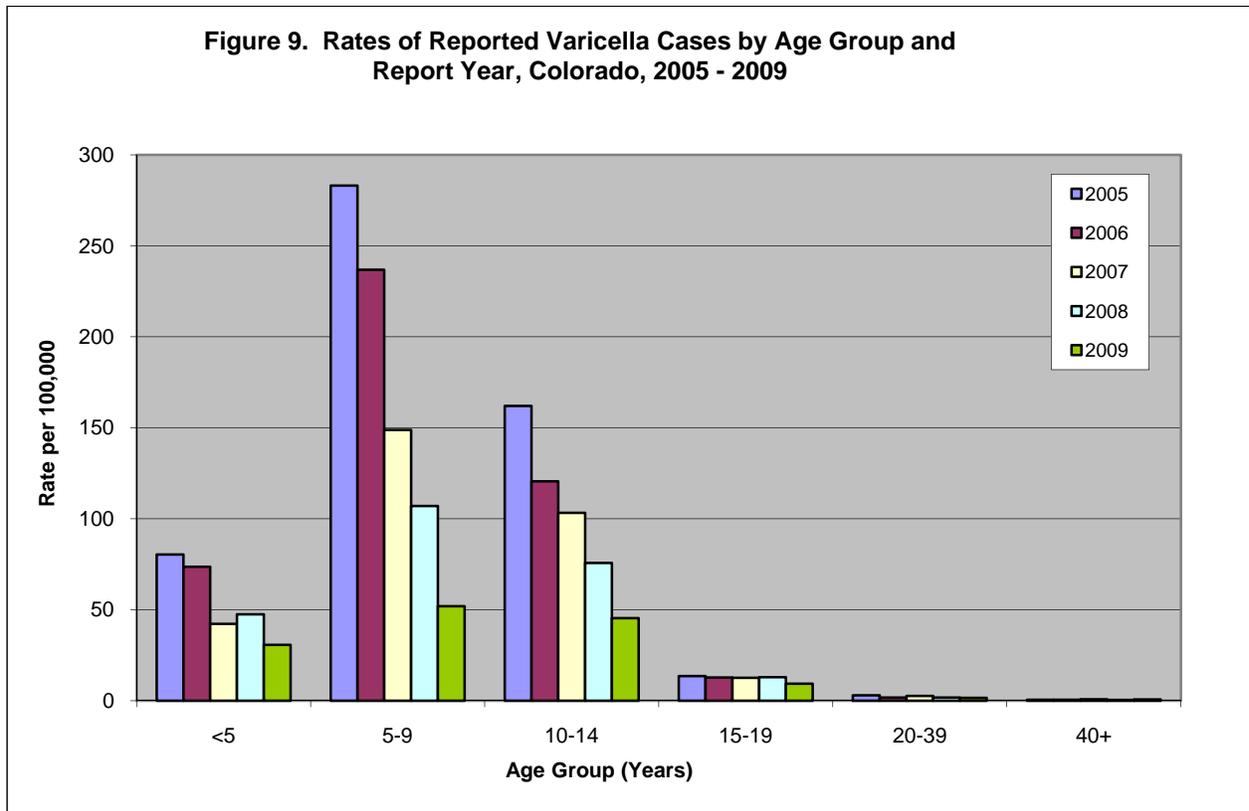


Table 15. Reported Varicella Cases[§] and Rates by Age Group, Colorado, 2009

Age Group (Years)	Cases	Percent	Rate*
< 1	21	4.1	29.7
1 – 4	89	17.3	31.0
5 – 9	184	35.7	52.0
10 – 14	149	28.9	45.4
15 – 19	34	6.6	9.4
20 – 29	14	2.7	1.9
30 – 39	9	1.7	1.3
40 – 59	11	2.1	0.8
≥ 60	4	0.8	0.5
TOTAL	515	100.0	10.1

[§] Of the 471 cases with known report sources, 313 cases (66.5 %) were reported from schools/pre-school/childcare and 107 cases (22.7 %) were reported by health care providers. Of the 313 cases reported from schools/preschools, 281 reports (90%) included the full name of the case.
* Rate per 100,000.

Table 16. Reported Varicella Cases by Severity of Disease* and Vaccine Status, Colorado, 2009

Severity of Disease	≥ 1 Dose of Vaccine		Unimmunized		Unknown Immunization Status		Total Cases	
	#	%	#	%	#	%	#	%
< 50 Lesions	187	59.4	37	28.7	29	40.9	253	49.1
50 – 500 Lesions	66	21.0	66	51.2	16	22.5	148	28.7
> 500 Lesions	1	0.3	3	2.3	2	2.8	6	1.2
Unknown	61	19.3	23	17.8	24	33.8	108	21.0
TOTAL	315	100.0	129	100.0	71	100.0	515	100.0

*Of the 515 varicella cases reported during 2009, a total of 7 (1.4 %) cases were hospitalized, 3 of the hospitalized cases (43%) were ≤18 years of age and 2 cases (29 %) were < 5 years of age. Hospitalization status was unknown for 43 (8 %) cases. There were no varicella-associated deaths reported in 2009.