

Vaccine Preventable Diseases in Colorado

Surveillance Report: 2008



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Table of Contents

<u>Introduction</u>	Page 3
Table 1. Reported Cases of Vaccine Preventable Diseases, Colorado, 2003-2008	Page 3
Table 2. Reported Cases and Rates of Selected Vaccine Preventable Diseases, Colorado and United States, 2008	Page 3
<u>Diphtheria</u>	Page 4
<u>Haemophilus influenzae</u>	Page 4
Figure 1. Reported Cases of Invasive <i>Haemophilus influenzae</i> Serotype b by Select Age Groups, Colorado, 2003-2008	Page 4
<u>Hepatitis</u>	Page 5
Figure 2. Rates of Acute Hepatitis A and B, Colorado, 2001-2008	Page 5
<u>Hepatitis A</u>	Page 6
Table 3. Reported Hepatitis A Cases and Rates by Age Group & Gender, Colorado, 2008	Page 6
<u>Acute Hepatitis B</u>	Page 7
Table 4. Reported Acute Hepatitis B Cases and Rates by Age Group & Gender, Colorado, 2008	Page 7
<u>Influenza</u>	Page 7
<u>Measles</u>	Page 7
<u>Meningococcal Disease</u>	Page 8-9
Figure 3. Rate of Meningococcal Disease by Year of Report, Colorado, 2002 - 2008	Page 8
Table 5. Reported Meningococcal Disease Cases, Rates and Case Fatality by Age Group, Colorado, 2008	Page 8
Table 6. Reported Meningococcal Disease Cases by Serogroup, Colorado, 2008	Page 9
Table 7. Reported Meningococcal Disease Cases 11-21 Years of Age by Immunization Status and Serogroup, Colorado 2008	Page 9
<u>Mumps</u>	Page 10
Figure 4. Rates of Reported Mumps Cases, Colorado, 2003-2008	Page 10
Table 8. Reported Mumps Cases by Age Group and Vaccination Status, Colorado, 2008	Page 10
<u>Pertussis</u>	Page 11-17
Figure 5. Rates of Reported Pertussis Cases, Colorado and United States, 1999-2008	Page 11
Table 9. Reported Pertussis Cases and Rates by County, Colorado, 2003-2008	Page 12-13
Table 10. Reported Pertussis Cases and Rates by Age Group, Colorado, 2008	Page 14
Figure 6. Percent of Reported Pertussis Cases by Age Group and Report Year, Colorado, 2004-2008	Page 14
Figure 7. Immunization Status of Reported Pertussis Cases by Selected Age Groups, Colorado, 2008	Page 15
Table 11. Reported Pertussis-related Hospitalizations by Age Group, Colorado, 2008	Page 16
Table 12. Classification of Reported Pertussis Cases, Colorado, 2008	Page 17
<u>Pneumococcal Disease</u>	Page 18-19
Table 13. Reported Invasive Pneumococcal Disease Cases, Rates and Case Fatality by Age Group, Colorado, 2008	Page 18
Table 14. Reported Invasive Pneumococcal Disease Cases Less Than 5 Years of Age by Vaccine Serotype and Immunization Status, Denver Metro Area, Colorado, 2008	Page 18
Figure 8. Rates of Reported invasive Pneumococcal Disease by Age Group, Denver Metro Area, 2002-2008	Page 19
Figure 9. Rates of Reported Invasive Pneumococcal Disease in Children < 5 Years of Age: Denver Metropolitan Area, Colorado, 2008	Page 19
<u>Polio, Rubella, and Tetanus</u>	Page 20
<u>Varicella</u>	Page 20-21
Figure 10. Rates of Reported Varicella Cases by Age Group and Report Year, Colorado, 2004-2008	Page 20
Table 15. Reported Varicella Cases and Rates by Age Group, Colorado, 2008	Page 21
Table 16. Reported Varicella Cases by Severity of Disease and Vaccine Status, Colorado, 2008	Page 21

INTRODUCTION

This report summarizes 2008 surveillance data for vaccine preventable diseases in Colorado. Colorado rates were calculated as cases per 100,000 population using 2008-based population final estimates from the Demography Section, Colorado Division of Local Government.

Table 1. Reported Cases of Vaccine Preventable Diseases*, Colorado, 2003 - 2008

Report Year	Invasive H. flu serotype b	Hepatitis A	Acute Hepatitis B	Meningococcal Disease	Mumps	Pertussis	Invasive Pneumococcal Disease	Tetanus	Varicella [§]
2003	0	59	80	27	1	368	367	0	NA
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	459	0	1089
5-Year Average	1.0	46.0	56.0	21.0	15.6	790.4	399.2	0.8	1285.8 [§]
2008	0	37	32	16	8	158	542	0	873

* During 2003-2008 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 2003-2008.

[§] Varicella became a reportable disease January 30, 2004. The varicella average is a 4-year average, not a 5-year average.

Table 2. Reported Cases and Rates of Selected Vaccine Preventable Diseases[¶], Colorado and United States, 2008

Disease	Colorado		United States*	
	Cases	Rate [§]	Cases	Rate [§]
Hepatitis A	37	0.7	2,585	0.8
Acute Hepatitis B	32	0.6	4,033	1.3
Meningococcal Disease	16	0.3	1,172	0.4
Mumps	8	0.2	454	0.1
Pertussis	158	3.2	13,278	4.4

[¶] National rates of invasive *Haemophilus influenzae* serotype b, pneumococcal disease and varicella are not available.

[§] Per 100,000 population.

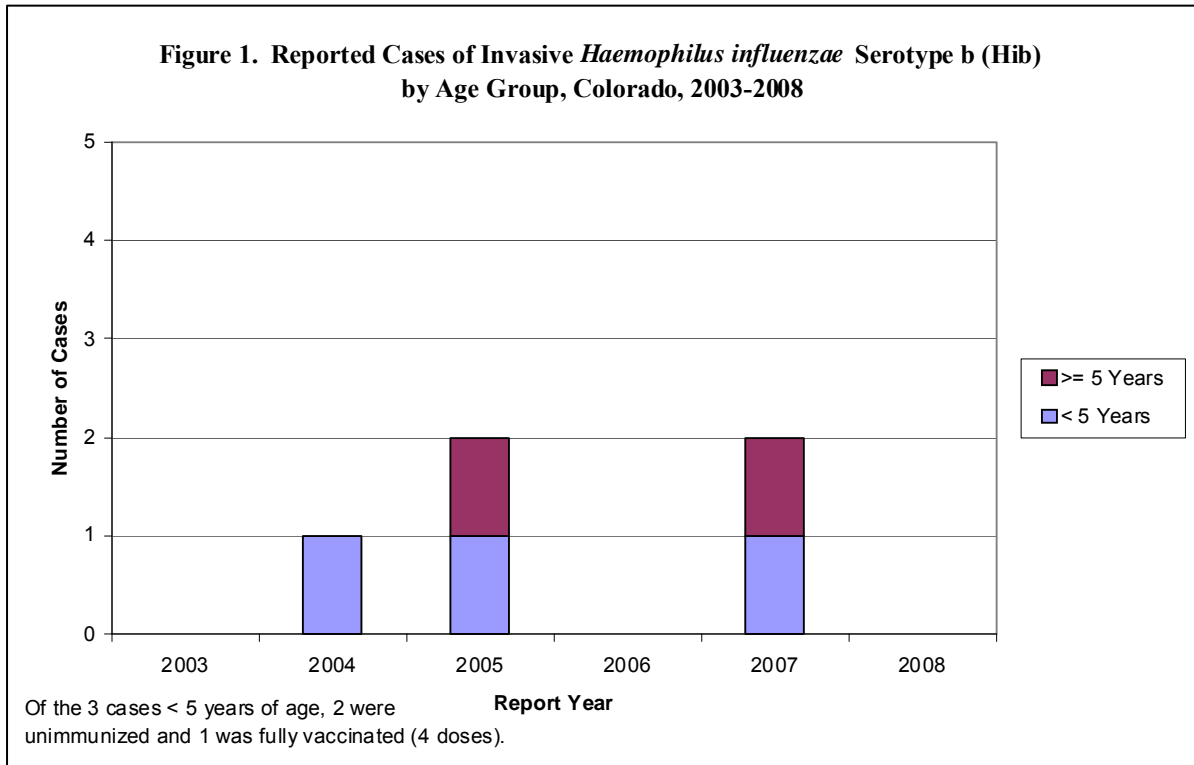
*Source, MMWR 2009;58:863-866. US rates calculated using US Census Bureau July 1, 2008 Resident Population Estimate released December 2009.

DIPHTHERIA

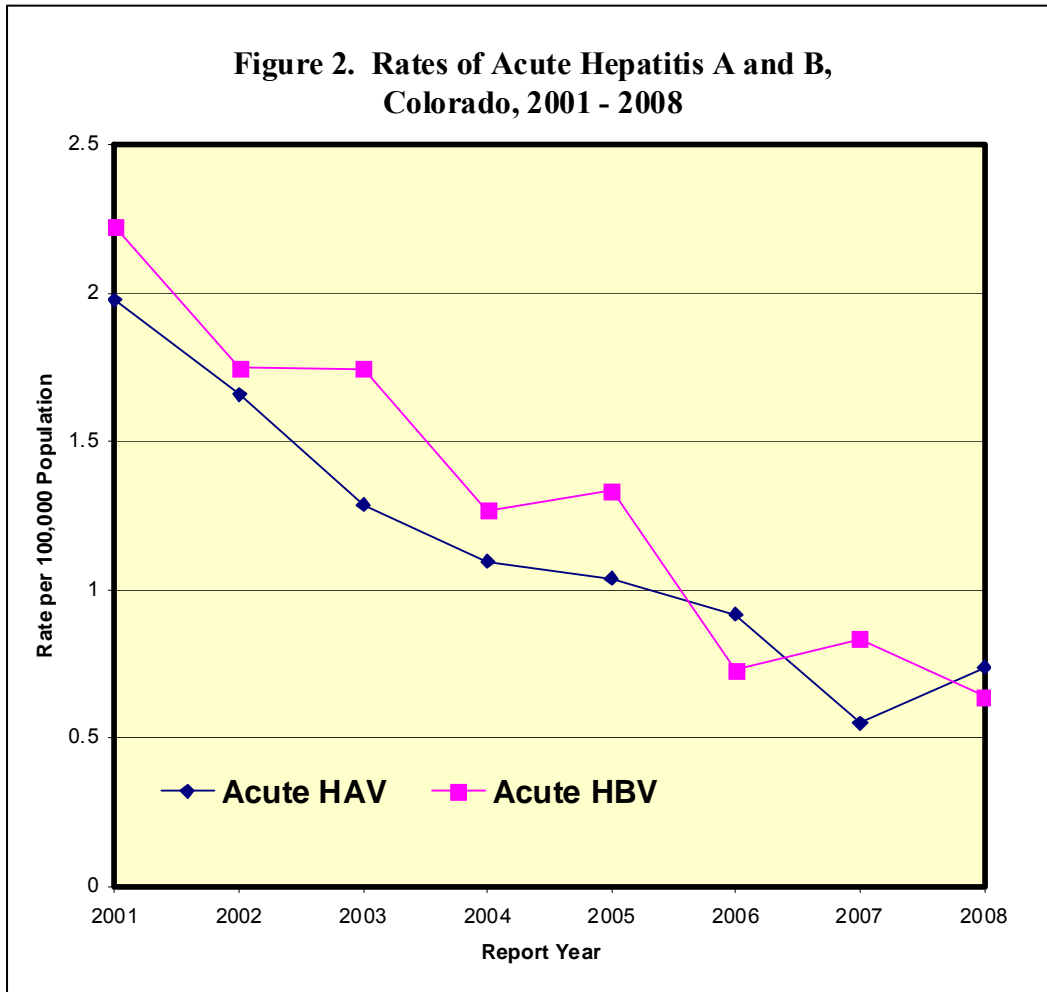
No cases of diphtheria were reported in Colorado or the United States during 2008. The last case of diphtheria reported in Colorado was in 1985.

HAEMOPHILUS INFLUENZAE Serotype b (Hib)

There were no cases of invasive *Haemophilus influenzae* serotype b (Hib) disease reported during 2008 in Colorado.



HEPATITIS



HEPATITIS A

Table 3. Reported Hepatitis A Cases and Rates* by Age Group & Gender, Colorado 2008						
Age Group (years)	Male		Female		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
< 1	0	0.0	0	0.0	0	0.0
1-4	2	1.4	1	0.7	3	1.0
5-9	0	0.0	0	0.0	0	0.0
10-14	1	0.6	0	0.0	1	0.3
15-19	0	0.0	7	4.0	7	1.9
20-39	7	0.9	2	0.3	9	0.6
≥ 40	8	0.8	9	0.8	17	0.8
Total	18	0.7	19	0.8	37	0.7

* Per 100,000 population.

ACUTE HEPATITIS B

Table 4. Reported Acute Hepatitis B Cases and Rates* by Age Group & Gender, Colorado, 2008						
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	1	0.6	1	0.3
20-29	0	0.0	1	0.3	1	0.1
30-39	6	1.6	2	0.6	8	1.1
40-49	12	3.1	2	0.5	14	1.9
50-59	5	1.4	0	0.0	5	0.7
≥ 60	0	0.0	3	0.8	3	0.4
Total	23	0.9	9	0.4	32	0.6

* Per 100,000 population.

INFLUENZA

See “Influenza Surveillance Summary, Colorado 2008 - 2009” at:

<http://www.cdphe.state.co.us/dc/Influenza/Influenza%20Surveillance%20Summary08-09.pdf>

MEASLES

There were no measles cases reported in Colorado during 2008. During the previous five years (2003 – 2007), two measles cases were reported (one in 2004 and one in 2006). Both cases traveled to foreign countries during their exposure periods. During 2008, there were 140 measles cases reported in the United States. This was the highest number of reported cases since 1996, when 508 measles cases were reported in the United States.

MENINGOCOCCAL DISEASE

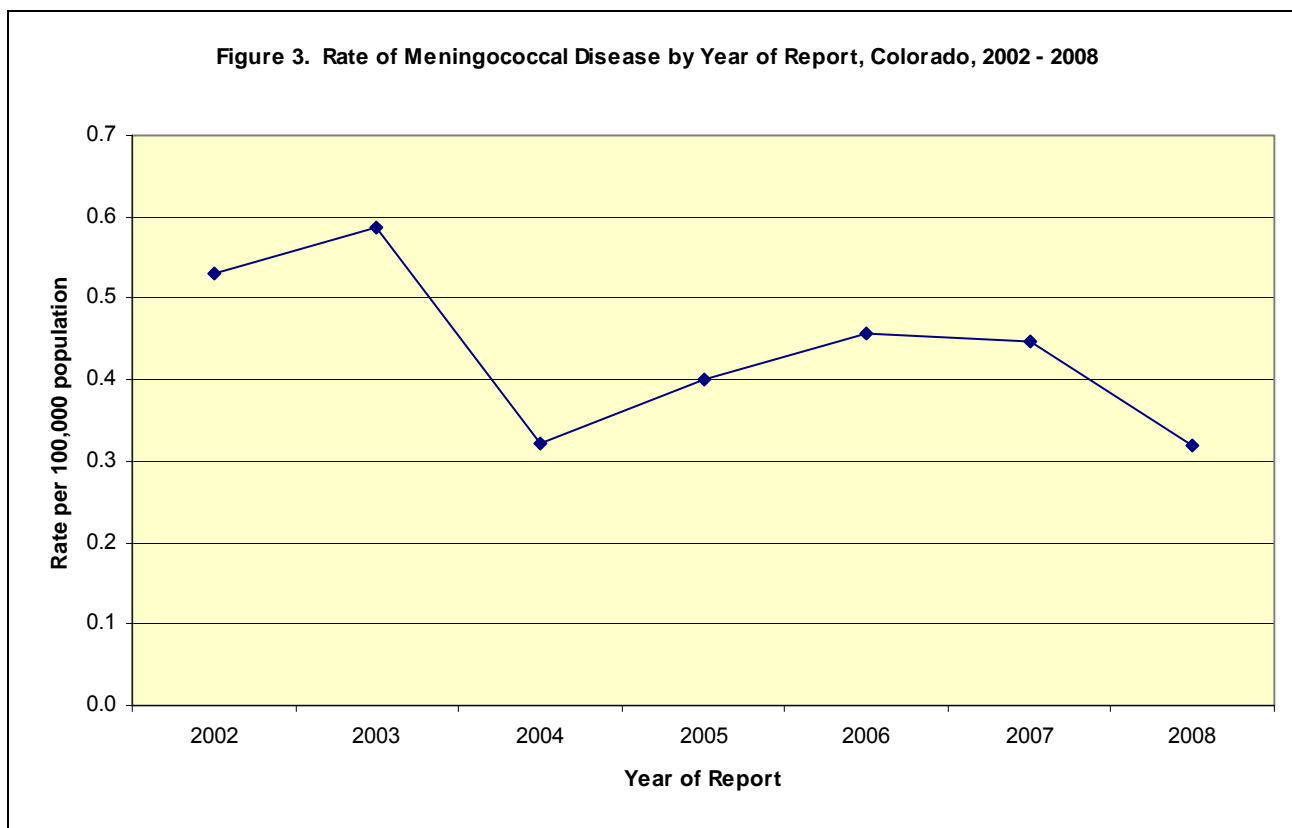


Table 5. Reported Meningococcal Disease Cases, Rates* and Case Fatality by Age Group, Colorado, 2008

AGE GROUP (Years)	CASES	RATE*	DEATHS [§]	
			Number	Percent of Cases
< 1	1	1.4	0	0.0
1 – 4	2	0.7	0	0.0
5 – 9	0	0.0	0	0.0
10 – 14	0	0.0	0	0.0
15 – 19	3	0.8	0	0.0
20 – 29	0	0.0	0	0.0
30 – 39	0	0.0	0	0.0
40 – 59	1	0.1	1	100.0
60 – 79	7	1.2	0	0.0
≥ 80	2	1.6	0	0.0
TOTAL	16	0.3	1	6.3

* Per 100, 000 population.
[§] The reported meningococcal disease fatality had serogroup Y.

Table 6. Reported Meningococcal Disease Cases by Serogroup, Colorado, 2008		
Serogroup	Cases	Percent of cases
A	0	0.0
B	4	25.0
C	1	6.3
Y	8	50.0
W-135	3	8.3
Not Groupable	0	0.0
Total	16	100.0

Table 7. Reported Meningococcal Disease Cases 11 – 21 Years of Age by Immunization Status* and Serogroup, Colorado, 2008		
Age Group (Years)	Immunization Status	
	Immunized (Serogroup)	Unimmunized (Serogroup)
11 – 18	1 (B – non-vaccine type)	1 (W-135 – vaccine type)
19 – 21	0	1 (W-135 – vaccine type)

*Meningococcal vaccine contains antigens from serogroups A, C, Y and W-135. Immunization status and serogroup information was available for all 3 cases in this age group.

MUMPS

Figure 4. Rates of Reported Mumps Cases by Year of Report, Colorado and United States, 2003 - 2008

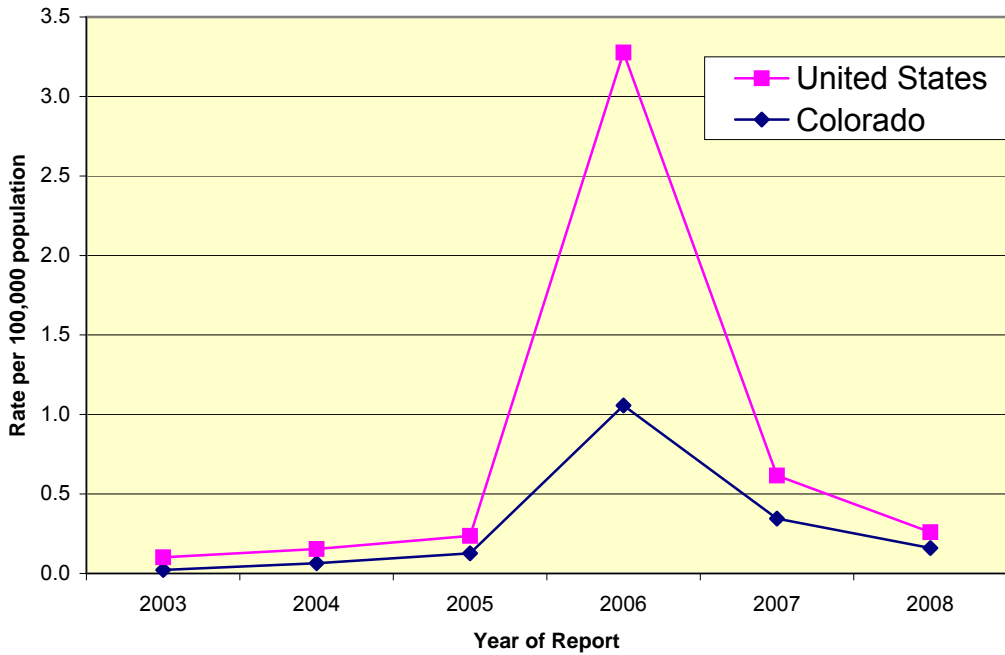
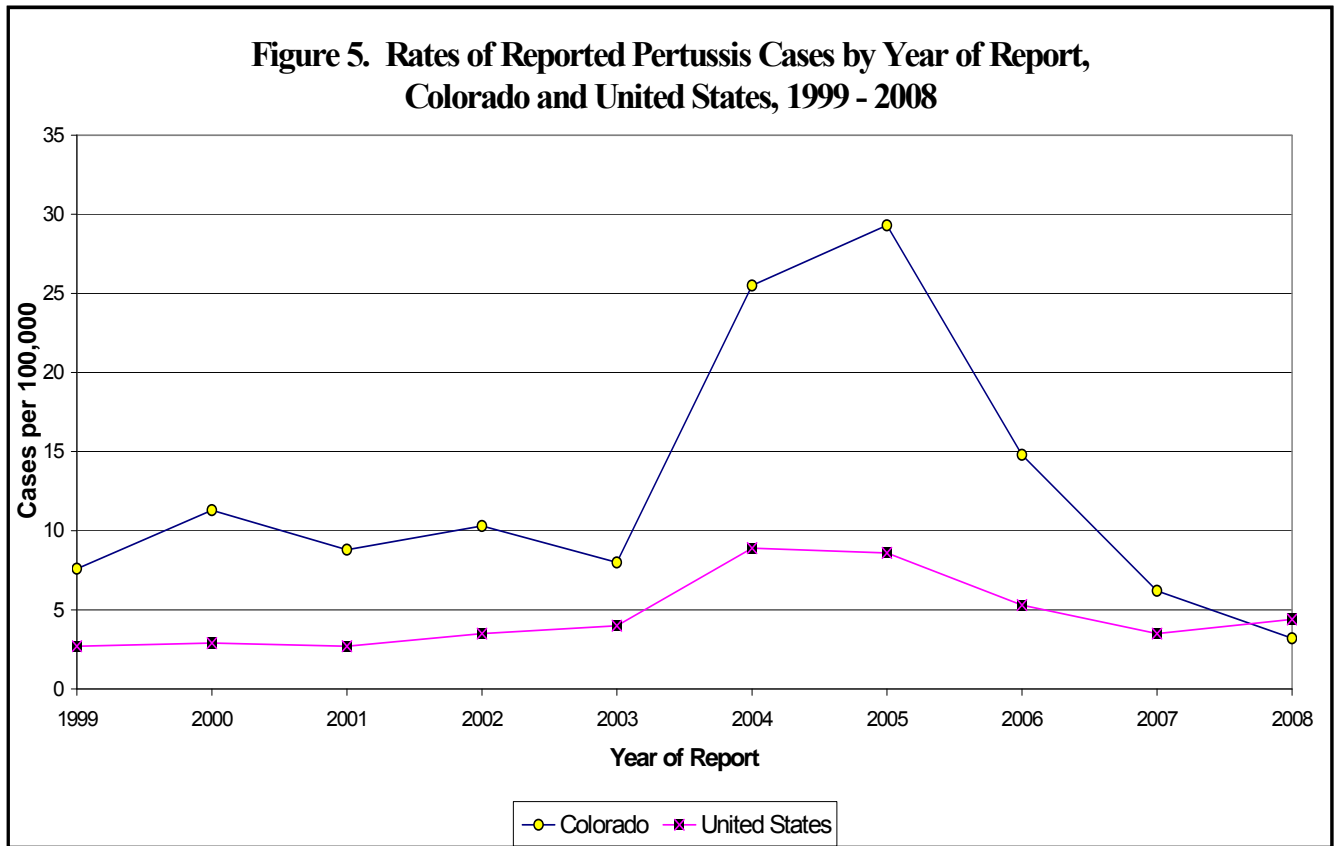


Table 8. Reported Mumps Cases by Age Group and Vaccination Status, Colorado, 2008

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	1	0	0	0	1
10 - 14	0	0	0	0	0
15 - 19	1	0	1	0	2
20 - 39	1	0	2	1	4
≥ 40	0	0	0	1	1
TOTAL	3	0	3	2	8

PERTUSSIS



**Table 9. Reported Pertussis Cases and Rates* by County,
Colorado, 2003 – 2008**

County	Number of Cases by Year of Report						2008 Rate*
	2003	2004	2005	2006	2007	2008	
Adams	24	128	119	69	13	7	1.6
Alamosa	0	6	1	1	0	0	*
Arapahoe	59	102	169	68	34	22	3.9
Archuleta	0	0	4	0	2	1	7.9
Baca	0	0	0	0	1	0	*
Bent	0	1	0	0	0	0	*
Boulder	47	175	115	74	23	5	1.7
Broomfield	6	23	16	11	10	2	*
Chaffee	2	1	9	2	0	0	*
Cheyenne	1	1	7	0	1	0	*
Clear Creek	4	3	5	2	1	3	31.8
Conejos	0	3	0	0	0	0	*
Costilla	1	2	0	0	0	0	*
Crowley	0	0	0	0	0	0	*
Custer	0	0	0	0	0	0	*
Delta	1	26	5	17	3	1	*
Denver	39	78	175	40	35	40	6.6
Dolores	0	0	2	0	0	0	*
Douglas	27	43	55	29	12	8	2.8
Eagle	1	1	2	5	1	0	*
El Paso	15	35	62	18	53	9	1.5
Elbert	6	1	12	1	0	0	*
Fremont	1	3	5	0	0	0	*
Garfield	0	1	15	12	2	0	*
Gilpin	0	5	4	4	0	0	*
Grand	21	10	7	0	18	0	*
Gunnison	0	0	0	0	0	0	*
Hinsdale	0	0	0	0	0	0	*
Huerfano	0	0	0	0	1	0	*
Jackson	0	0	0	0	0	0	*
Jefferson	67	160	287	168	30	35	6.4
Kiowa	1	0	0	0	0	0	*
Kit Carson	0	1	0	1	2	0	*

Table 10. continues on next page

**Table 9. (Continued) Pertussis Cases and Rates* by County, Colorado,
2003-2008**

County	Number of Cases by Year of Report						2008 Rate*
	2003	2004	2005	2006	2007	2008	
La Plata	3	37	32	51	3	9	17.7
Lake	0	0	1	0	1	0	*
Larimer	8	140	80	29	24	8	2.7
Las Animas	0	0	0	0	0	0	*
Lincoln	0	0	0	0	2	0	*
Logan	0	2	21	1	1	0	*
Mesa	3	112	81	9	5	0	*
Mineral	0	0	0	0	0	0	*
Moffat	0	2	0	0	0	0	*
Montezuma	0	0	12	10	1	0	*
Montrose	1	1	3	15	3	0	*
Morgan	0	4	1	1	1	0	*
Otero	0	19	1	0	3	0	*
Ouray	0	4	0	10	1	0	*
Park	0	0	2	0	3	0	*
Phillips	0	0	0	0	0	0	*
Pitkin	0	3	1	2	0	1	*
Prowers	0	3	11	0	0	0	*
Pueblo	2	27	17	5	2	3	1.9
Rio Blanco	0	0	4	0	0	0	*
Rio Grande	6	2	4	0	1	0	*
Routt	0	1	1	1	1	0	*
Saguache	1	0	0	0	1	0	*
San Miguel	0	1	0	2	2	0	*
San Juan	0	0	0	0	0	0	*
Sedgwick	2	0	0	0	0	0	*
Summit	1	0	0	1	0	0	*
Teller	0	0	10	1	7	2	*
Washington	0	0	2	0	0	0	*
Weld	18	18	23	50	2	2	*
Yuma	0	0	0	0	0	0	*
TOTAL	368	1185	1383	710	306	158	3.2

* Rates were not calculated for counties with < 3 pertussis cases during 2008. Caution should be used when interpreting rates based on small number of cases.

Table 10. Reported Cases and Rates of Pertussis by Age Group, Colorado, 2008			
Age Group (Years)	Cases	Percent	Rate*
<1	22	13.9	31.0
1 – 4	22	13.9	7.7
5 – 9	30	19.0	8.5
10 – 14	11	7.0	3.4
15 – 19	5	3.2	1.4
20 – 29	17	10.8	2.4
30 – 39	19	12.0	2.6
40 – 59	23	14.6	1.6
≥ 60	9	5.7	1.2
TOTAL	158	100.0	3.2

* Per 100,000 population.

Figure 6. Percent of Reported Pertussis Cases by Age Group and Report Year, Colorado, 2004-2008*

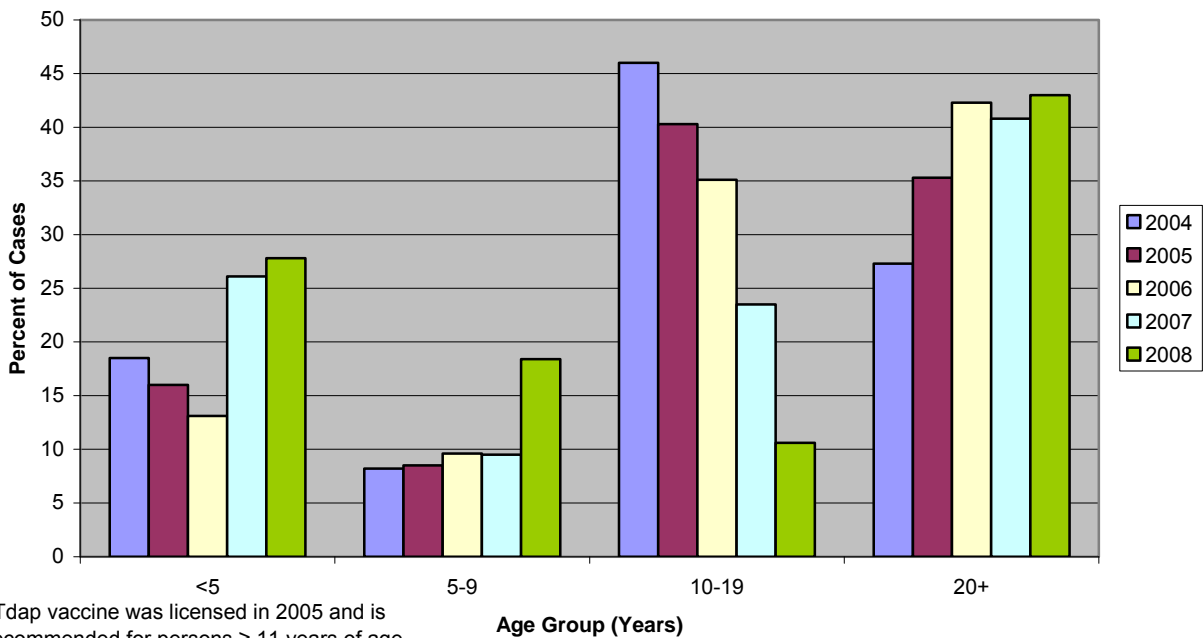
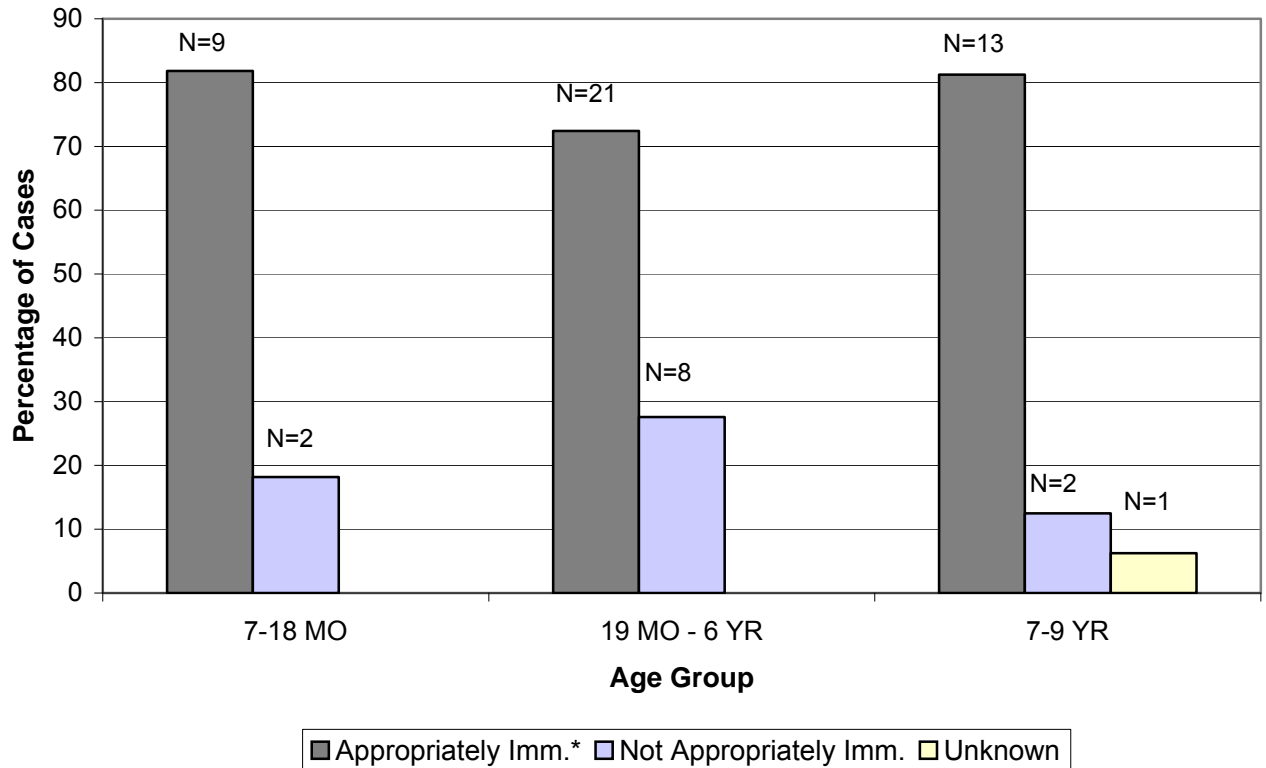


Figure 7. Immunization Status of Reported Pertussis Cases by Selected Age Groups, Colorado, 2008



*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 2008, there were 15 pertussis cases reported in the 10-17 year old age group in Colorado. Only 1 case in this age group, a 13-year-old adolescent, had received Tdap vaccine; this case was incompletely vaccinated with 4 doses of DTaP (dose 4 was given at 2 years of age) prior to Tdap vaccination.

**Table 11. Reported Pertussis-related Hospitalizations*
by Age Group, Colorado, 2008**

Age Group	Cases	Hospitalized	
		Number	Percent
< 6 Months	17	7	41.2
6 – 11 Months	5	0	0.0
1 – 4 Years	22	0	0.0
5 – 9 Years	30	1	3.3
10 – 14 Years	11	0	0.0
15 – 19 Years	5	1	20.0
20 – 29 Years	17	0	0.0
30 – 39 Years	19	0	0.0
40 – 59 Years	23	0	0.0
60+ Years	9	3	33.3
TOTAL	158	12	7.6

* During 2008, there were 7 (4.4 %) cases with x-ray-confirmed pneumonia (1 of the 7 [14.3 %] cases with pneumonia was hospitalized). There were no reported cases of pertussis-associated seizures, encephalopathy, or death in Colorado.

**Table 12. Classification of Reported Pertussis Cases,
Colorado, 2008**

CASE CLASSIFICATION	Number	Percent
<u>Confirmed</u> [§] : PCR Positive	95	60.1
<u>Confirmed</u> [§] : Epidemiologically–linked to a PCR Positive Case	42	26.6
<u>Probable</u> [¶] : Physician Diagnosed Case	9	5.7
<u>Probable</u> [¶] : Serology Positive Only	11	7.0
<u>Probable</u> : Outbreak Situation*	1	0.6
TOTAL	158	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 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 13. Reported Invasive Pneumococcal Disease Cases, Rates and Case Fatality by Age Group, Colorado, 2008				
AGE GROUP (Years)	CASES	RATE*	DEATHS	
			Number	Percent of Cases
< 1	17	23.9	1	5.9
1 – 4	44	15.3	0	0
5 – 9	18	5.1	0	0
10 – 14	6	1.8	1	16.7
15 – 19	4	1.1	0	0
20 – 29	27	3.8	1	3.7
30 – 39	37	5.1	3	8.1
40 – 59	182	12.6	6	3.3
60 – 79	143	23.7	10	7.0
80 +	64	52.5	10	15.6
TOTAL	542	10.8	32	5.9

*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, 2008				
Serotype	Number of Cases	Vaccinated Prior to Onset (1+ doses)	Not Vaccinated Prior to Onset	Unknown Vaccine History
Vaccine Serotype*	1**	1**	0	0
Not in Vaccine[†]	18	13	3	2
Not typed	23	16	2	5
TOTAL	42	30	5	7

¶ Adams, Arapahoe, Denver, Douglas, and Jefferson counties.
 * Serotypes included in the Pneumococcal Conjugate Vaccine (4, 6B, 9V, 14, 18C, 19F, 23F).
 ** 5-month-old infant with 2 vaccine doses and serotype 18C disease.
 † Of the 18 cases with non-vaccine serotypes, 5 (28%) were serotype 7F and 6 (33%) were serotype 19A.

Figure 8. Rates of Reported Invasive Pneumococcal Disease by Age Group, Denver Metro Area*, 2002-2008

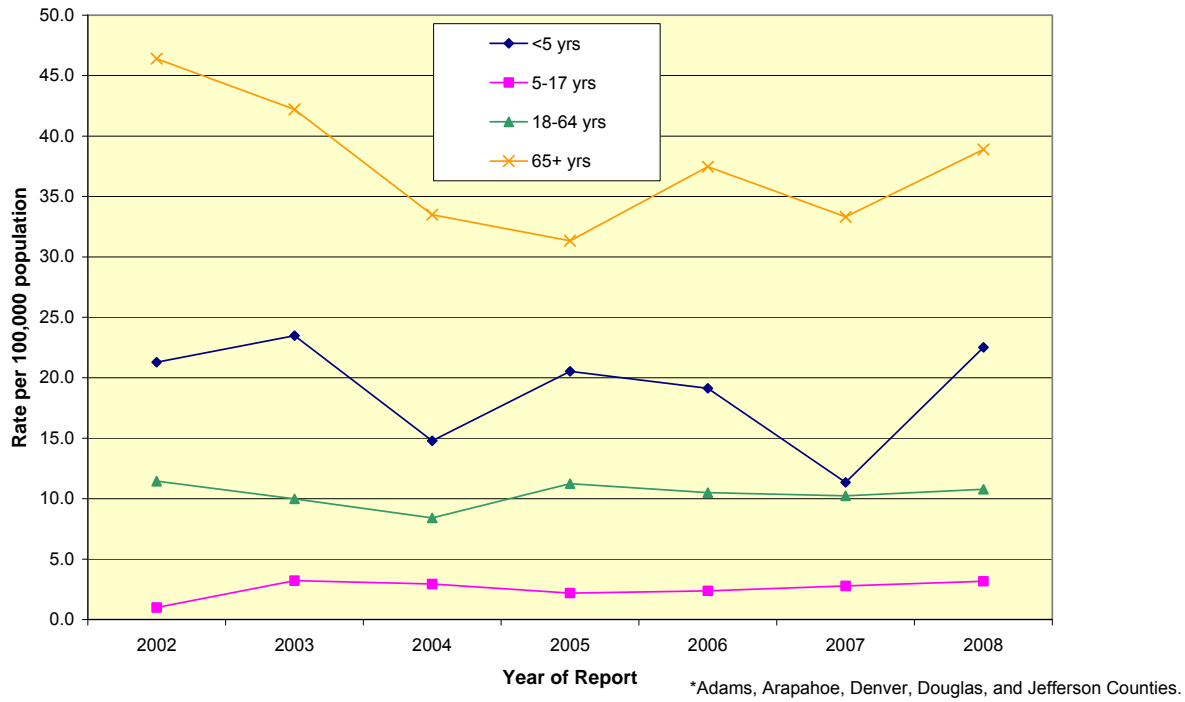
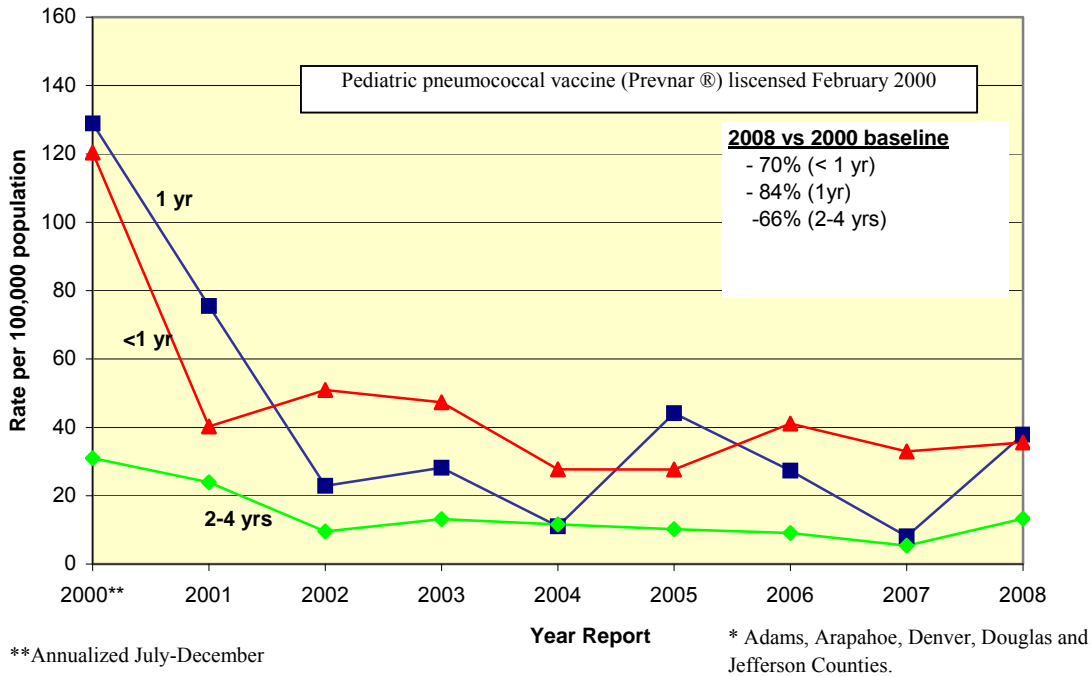


Figure 9. Rates of Reported Invasive Pneumococcal Disease in Children < 5 Years of Age: Denver Metropolitan Area*, 2000-2008



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 2008. During the previous five years (2003-2007), one rubella case was reported (2003).

TETANUS

There were no tetanus cases reported in Colorado during 2008. The previous five-year annual average (2003 – 2007) for tetanus was less than one case (0.8) per year.

VARICELLA

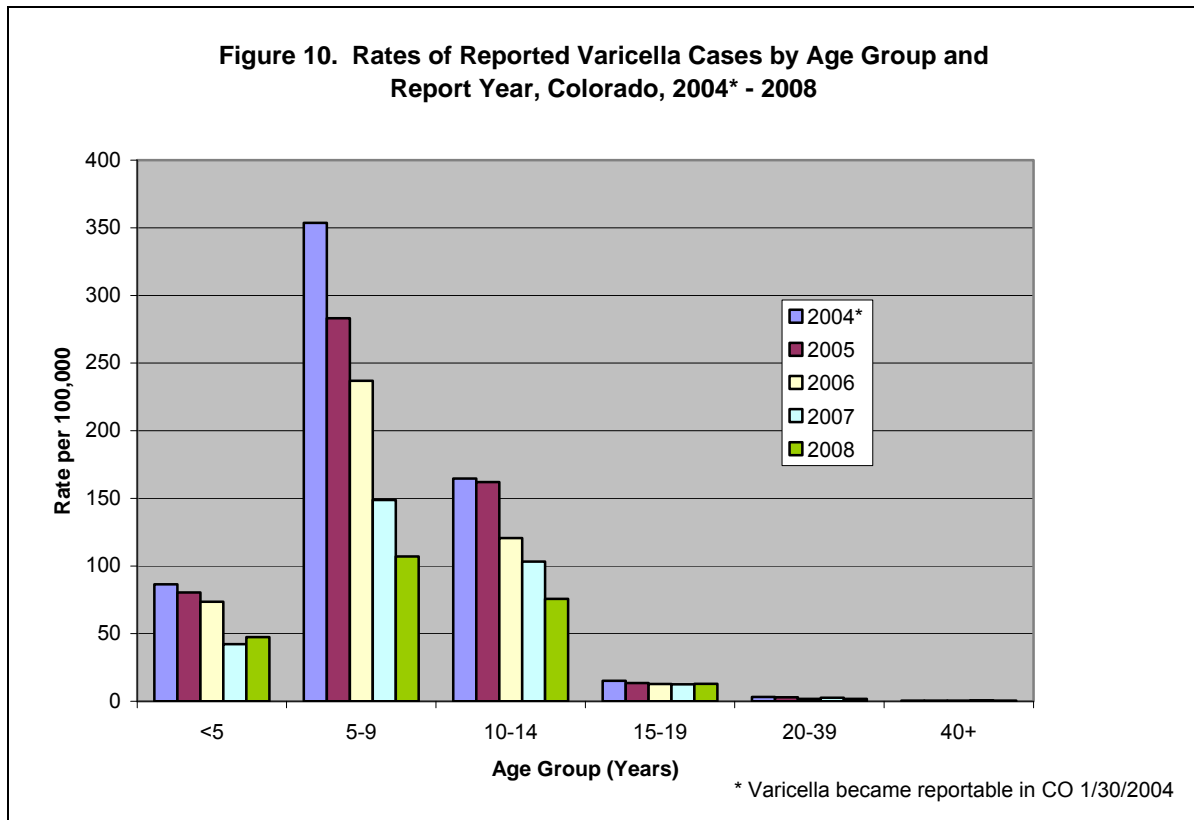


Table 15. Reported Varicella Cases[§] and Rates by Age Group, Colorado, 2008

Age Group (Years)	Cases	Percent	Rate*
< 1	35	4.0	49.2
1 – 4	133	15.2	46.3
5 – 9	377	43.2	107.0
10 – 14	247	28.3	75.7
15 – 19	47	5.4	12.9
20 – 29	14	1.6	2.0
30 – 39	11	1.3	1.5
40 – 59	7	0.8	0.5
≥ 60	2	0.2	0.3
TOTAL	873	100.0	17.4

[§] Of the 866 cases with known report sources, 480 cases (55.4%) were reported from schools and 167 cases (19.3%) were reported by health care providers.
 * Rate per 100,000.

Table 16. Reported Varicella Cases by Severity of Disease* and Vaccine Status, Colorado, 2008

Severity of Disease	≥ 1 Dose of Vaccine		Unimmunized		Unknown Immunization Status		Total Cases	
	#	%	#	%	#	%	#	%
< 50 Lesions	298	60	69	28	57	44	424	49
50 – 500 Lesions	127	26	104	43	24	18	255	29
> 500 Lesions	4	1	13	5	3	2	20	2
Unknown	69	14	58	24	47	36	174	20
TOTAL	498	100	244	100	131	100	873	100

*Of the 873 varicella cases reported during 2008, a total of 7 (0.5 %) cases were hospitalized, 5 of the hospitalized cases (71.4%) were ≤18 years of age and 3 cases (42.9 %) were < 5 years of age. Hospitalization was unknown for 51 (5.8 %) cases. There were no varicella-associated deaths reported in 2008.