

Vaccine Preventable Diseases in Colorado

Surveillance Report: 2011



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INTRODUCTION

This report contains tables and graphs that summarize 2011 surveillance data for vaccine preventable diseases in Colorado. Colorado rates were calculated as cases per 100,000 population using 2011-based population final estimates from the Demography Section, Colorado Division of Local Government.

Table 1. Reported Cases of Vaccine Preventable Diseases*, Colorado, 2006 - 2011

Report Year	Invasive <i>H. influenzae</i> type b (Hib)	Hepatitis A	Acute Hepatitis B	Meningococcal Disease	Mumps	Pertussis	Invasive Pneumococcal Disease	Measles	Varicella [§]
2006	0	44	35	22	51	710	419	1	1503
2007	2	27	41	22	17	306	458	0	1089
2008	0	37	33	16	8	158	542	0	873
2009	3	53	35	24	6	201	623	0	515
2010	4	36	53	21	8	538	545	0	404
5-Year Median	3	37	35	22	8	306	541	0	873
2011	0	21	27	10	7	416	494	0	447

*During 2006-2011 no congenital rubella, diphtheria, tetanus, polio, or rubella cases were reported.

Table 2. Reported Cases and Rates of Selected Vaccine Preventable Diseases, Colorado and United States, 2011

Disease	Colorado		United States	
	Cases	Rate [§]	Cases*	Rate [§]
<i>H. influenzae</i> type b, invasive disease (<5 years)	0	0	8	<0.01
Hepatitis A	21	0.4	1,139	0.4
Acute Hepatitis B	27	0.5	2,495	0.8
Meningococcal Disease	10	0.2	674	0.2
Mumps	7	0.1	370	0.1
Pertussis	416	8.1	15,216	4.8
Invasive Pneumococcal Disease	494	9.7	12,885	4.1
Varicella	447	8.7	12,041	3.8

§ Per 100,000 population.

*Source, MMWR 2012;60(51); 1762-1775. US rates calculated using US Census Bureau Population Estimate.

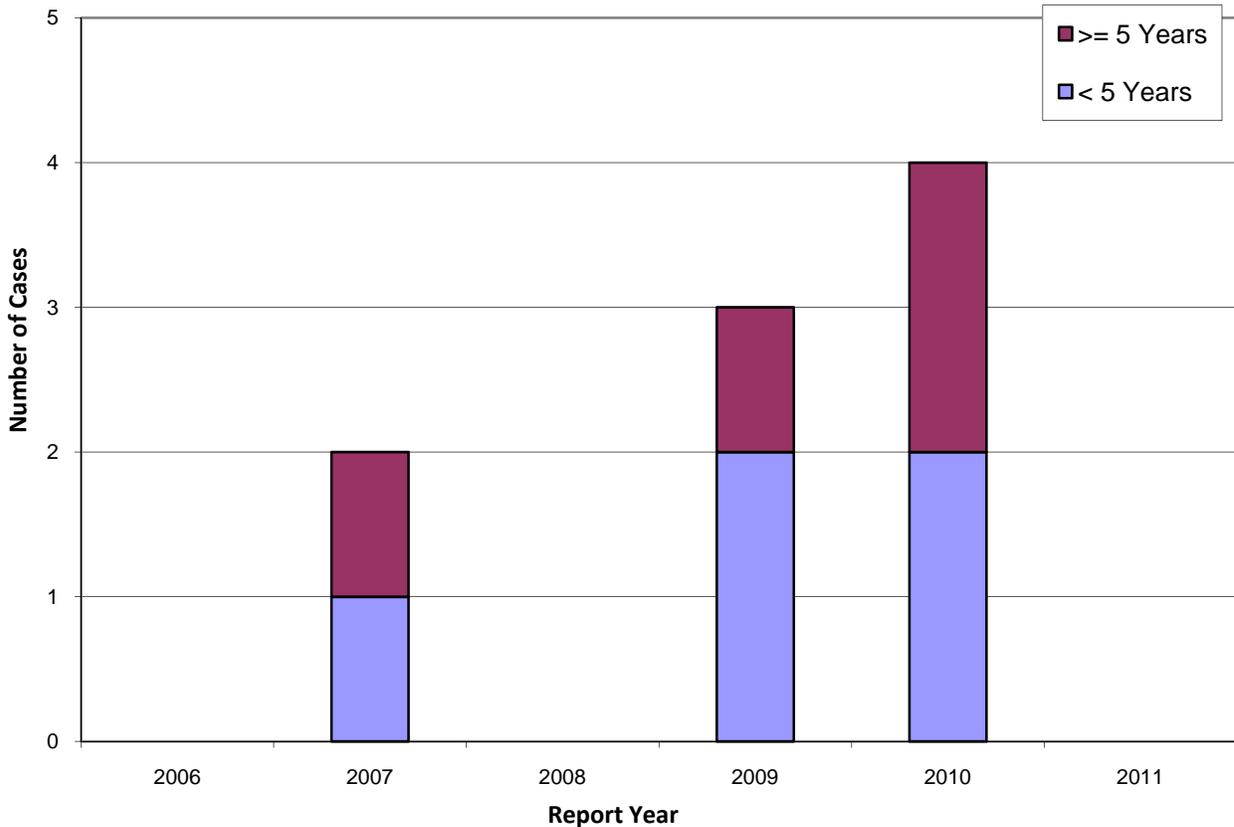
DIPHTHERIA

No cases of diphtheria were reported in Colorado or the United States during 2011. The last case of diphtheria reported in Colorado was in 1985.

HAEMOPHILUS INFLUENZAE type b (Hib)

There were no cases of invasive *Haemophilus influenzae* type b (Hib) disease reported during 2011 in Colorado. The last cases of Hib in Colorado were reported in 2010. They included two adults, an under-immunized (2 doses) 2-year-old, and a 1-year-old who had recently been adopted from Haiti with an unknown vaccination history.

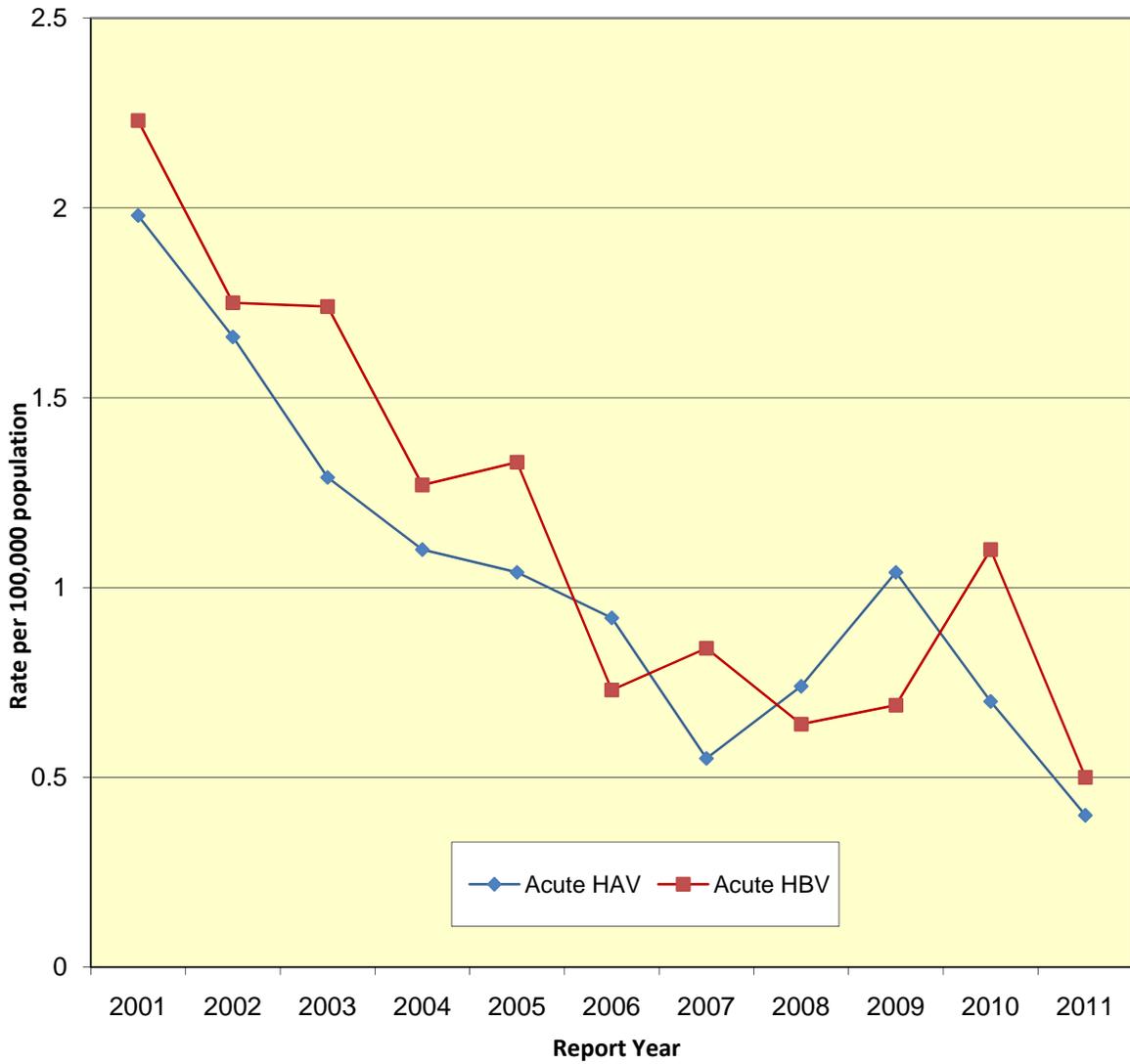
Figure 1. Reported Cases of Invasive *Haemophilus influenzae* type b (Hib) by Age Group, Colorado, 2006-2011



Note: Of the 5 cases < 5 years of age, 3 were unimmunized or underimmunized, one 2-month-old had 1 dose, and 1 had an unknown vaccination status.

HEPATITIS

Figure 2. Rates of Reported Acute Hepatitis A and B, Colorado, 2001 - 2011



Detailed surveillance summaries of Hepatitis A and Hepatitis B in Colorado are posted at: <http://www.colorado.gov/cs/Satellite/CDPHE-DCEED/CBON/1251607755473>

HEPATITIS A

Table 3. Reported Cases and Rates* of Hepatitis A by Age Group & Gender, Colorado 2011						
Age Group (years)	Male		Female		Total	
	Cases	Rate	Cases	Rate	Cases	Rate
< 1	0	0.0	0	0.0	0	0.0
1-4	0	0.0	1	0.7	1	0.4
5-9	0	0.0	0	0.0	0	0.0
10-14	0	0.0	0	0.0	0	0.0
15-19	0	0.0	2	1.2	2	0.6
20-39	4	0.5	2	0.3	6	0.4
≥ 40	5	0.4	7	0.6	12	0.5
TOTAL	9	0.4	12	0.5	21	0.4

* Per 100,000 population.

ACUTE HEPATITIS B

Table 4. Reported Cases and Rates* of Acute Hepatitis B by Age Group & Gender, Colorado, 2011						
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	0	0.0	1	0.3	1	0.1
30-39	3	0.8	2	0.6	5	0.7
40-49	8	2.2	1	0.3	9	1.3
50-59	4	1.1	1	0.3	5	0.7
≥ 60	3	0.8	4	0.9	7	0.8
TOTAL	18	0.7	9	0.4	27	0.5

* Per 100,000 population.

INFLUENZA

See Influenza Surveillance web page at:

<http://www.colorado.gov/cs/Satellite/CDPHE-DCEED/CBON/1251607766255>

MEASLES

There were no measles cases reported in Colorado during 2011. During the previous five years (2006 – 2010), one measles case was reported (in 2006). The case had a history of travel to Asia during the exposure period. During 2011, there were 212 measles cases reported in the United States.

MENINGOCOCCAL DISEASE

Figure 3. Rate of Meningococcal Disease by Year of Report, Colorado, 2002 - 2011

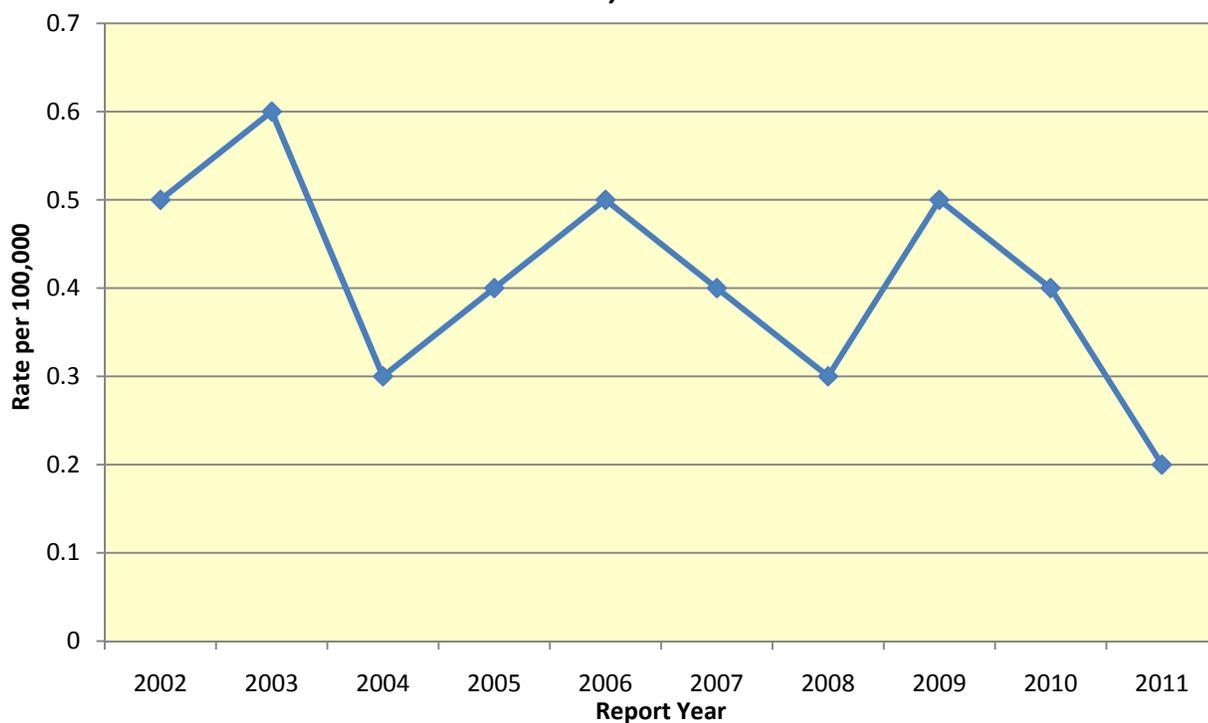


Table 5. Reported Cases, Rates*, and Case Fatality of Meningococcal Disease by Age Group, Colorado, 2011				
AGE GROUP (Years)	CASES	RATE*	DEATHS	
			Number	Percent of Cases
< 1	3	4.5	0	0.0
1 – 4	0	0.0	0	0.0
5 – 9	0	0.0	0	0.0
10 – 14	0	0.0	0	0.0
15 – 19	0	0.0	0	0.0
20 – 29	2	0.3	0	0.0
30 – 39	0	0.0	0	0.0
40 – 59	0	0.0	0	0.0
60 – 79	3	0.4	0	0.0
≥ 80	2	1.4	0	0.0
TOTAL	10	0.2	0	0.0

* Per 100, 000 population.

**Table 6. Reported Cases of Meningococcal Disease
by Serogroup, Colorado, 2011**

Serogroup	Cases	Percent of Cases
B	4	40.0
C	0	0
Y	6	60.0
W-135	0	0
Not Groupable	0	0
TOTAL	10	100.0

*Meningococcal vaccine contains antigens from serogroups A, C, Y and W-135. Of the 6 cases with disease caused by a vaccine-preventable serogroup, none were vaccinated against meningococcal disease, though none of these cases were in age groups routinely recommended to receive vaccination.

MUMPS

Figure 4. Rates of Reported Mumps Cases by Year of Report, Colorado and United States, 2003 - 2011

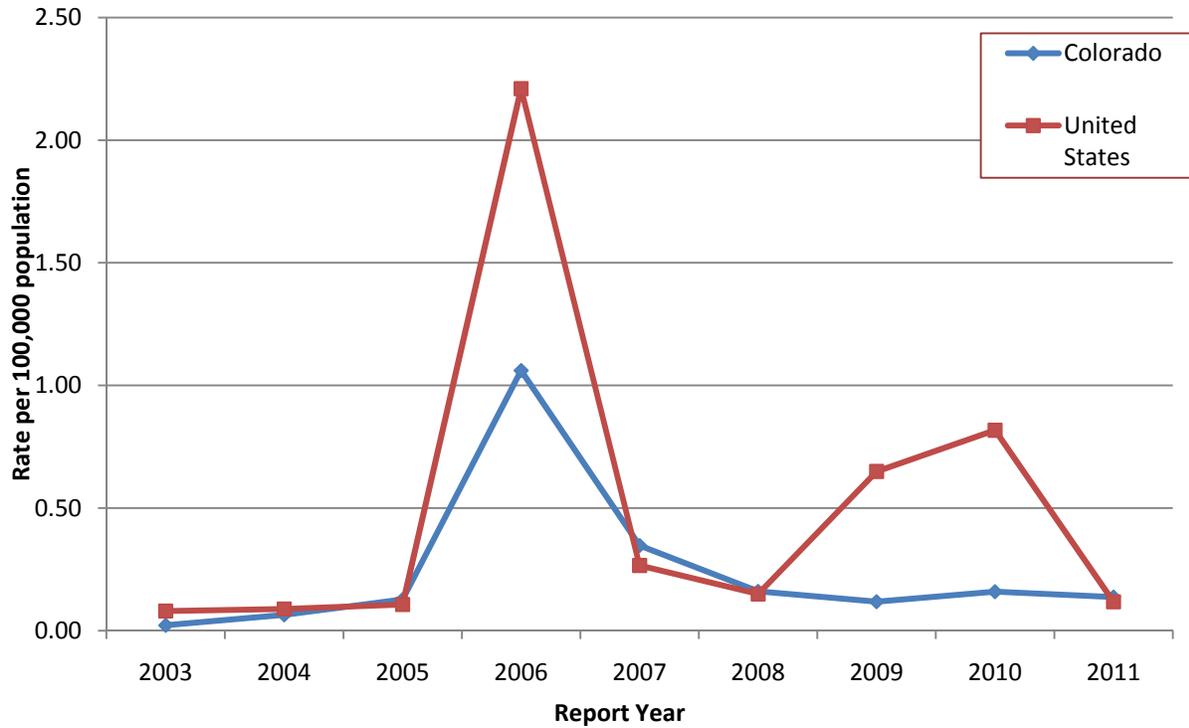


Table 8. Reported Cases and Percent of Mumps by Age Group, Colorado, 2011		
Age Group (Years)	Cases	Percent
<1	0	0.0
1 – 4	0	0.0
5 – 9	0	0.0
10 – 14	0	0.0
15 – 19	0	0.0
20 – 39	4	57.1
40+	3	42.9
TOTAL	7	100.0
* Two of the mumps cases reported having 1 dose of MMR vaccine and 1 case was unvaccinated. Vaccination history was unknown for 4 cases.		

PERTUSSIS

Figure 5. Rates of Reported Pertussis, Colorado and United States, 2000 - 2011*

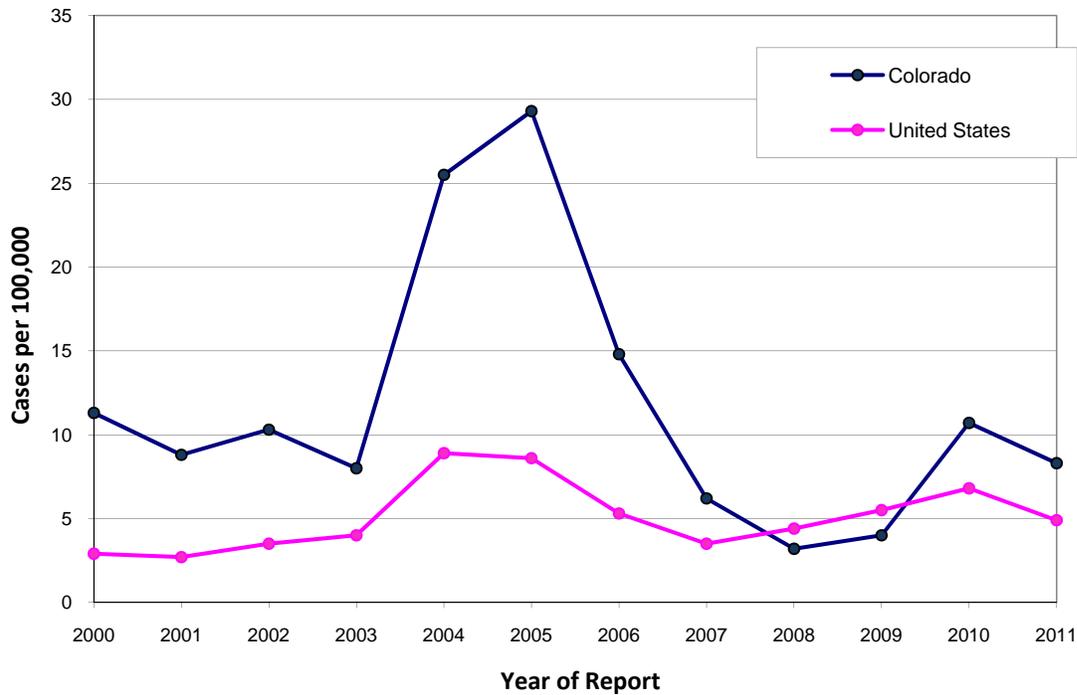


Table 9. Reported Cases and Rates of Pertussis by Age Group, Colorado, 2011			
Age Group (Years)	Cases	Percent	Rate*
<1	58	13.9	87.2
1 – 4	88	21.2	32.0
5 – 9	78	18.8	22.1
10 – 14	86	20.7	25.2
15 – 19	27	6.5	7.7
20 – 29	14	3.4	1.9
30 – 39	21	5.0	2.9
40 – 59	34	8.2	2.4
≥ 60	10	2.4	1.2
TOTAL	416	100.0	8.1

* Per 100,000 population.

**Table 10. Reported Cases and Rates* of Pertussis by County,
Colorado, 2006 – 2011**

County	Number of Cases by Year of Report							
	2006	2007	2008	2009	2010	5 Year Average	2011	2011 Rate*
ADAMS	69	13	7	13	56	31.6	54	12.0
ALAMOSA	1	0	0	0	1	0.4	0	*
ARAPAHOE	68	34	22	26	64	42.8	83	14.2
ARCHULETA	0	2	1	2	1	1.2	6	49.8
BACA	0	1	0	0	2	0.6	0	*
BENT	0	0	0	0	0	0.0	1	*
BOULDER	74	23	5	23	19	28.8	16	5.3
BROOMFIELD	11	10	2	0	6	5.8	4	7.0
CHAFFEE	2	0	0	0	2	0.8	0	*
CHEYENNE	0	1	0	0	0	0.2	0	*
CLEAR CREEK	2	1	3	0	3	1.8	2	*
CONEJOS	0	0	0	14	2	3.2	0	*
DELTA	17	3	1	0	7	5.6	1	*
DENVER	40	35	40	23	58	39.2	38	6.1
DOUGLAS	29	12	8	4	23	15.2	29	9.9
EAGLE	5	1	0	0	0	1.2	0	*
EL PASO	18	53	9	20	21	24.2	37	5.8
ELBERT	1	0	0	1	1	0.6	0	*
FREMONT	0	0	0	1	14	3.0	1	*
GARFIELD	12	2	0	3	4	4.2	0	*
GILPIN	4	0	0	0	0	0.8	3	55.0
GRAND	0	18	0	0	1	3.8	0	*
GUNNISON	0	0	0	0	4	0.8	0	*
HUERFANO	0	1	0	0	0	0.2	0	*
JEFFERSON	168	30	35	19	165	83.4	103	19.1
KIT CARSON	1	2	0	0	1	0.8	0	*

Table 10. continues on next page

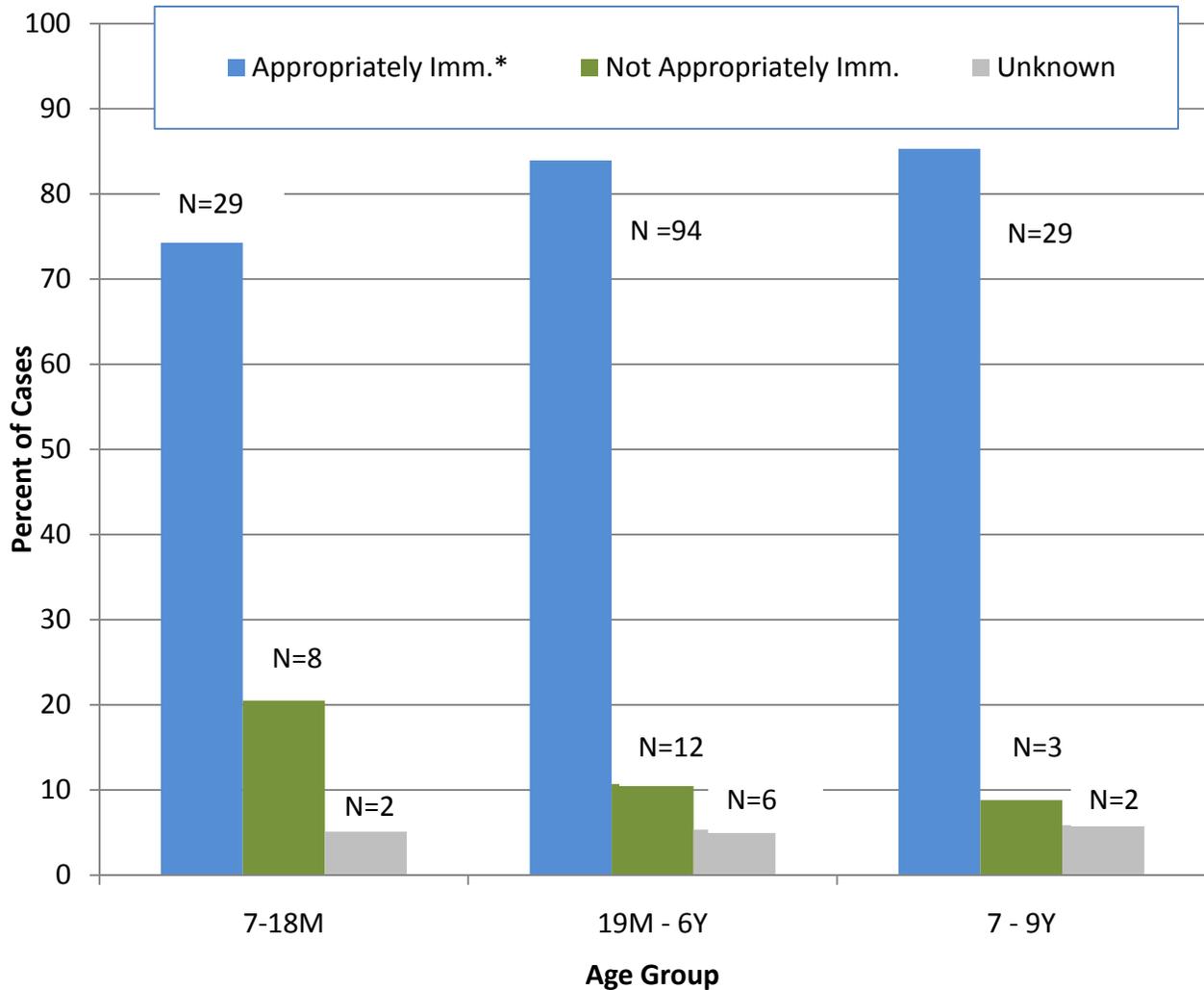
**Table 10. Reported Cases and Rates* of Pertussis by County,
Colorado, 2006 – 2011**

County**	Number of Cases by Year of Report							
	2006	2007	2008	2009	2010	5 Year Average	2011	2011 Rate*
LA PLATA	51	3	9	34	0	19.4	6	11.6
LAKE	0	1	0	0	0	0.2	0	*
LARIMER	29	24	8	2	8	14.2	7	2.3
LAS ANIMAS	0	0	0	0	1	0.2	0	*
LINCOLN	0	2	0	0	0	0.4	0	*
LOGAN	1	1	0	0	0	0.4	0	*
MESA	9	5	0	2	7	4.6	4	2.7
MOFFAT	0	0	0	0	1	0.2	2	*
MONTEZUMA	10	1	0	3	4	3.6	0	*
MONTROSE	15	3	0	0	1	3.8	2	*
MORGAN	1	1	0	0	0	0.4	0	*
OTERO	0	3	0	1	1	1.0	1	*
OURAY	10	1	0	0	0	2.2	0	*
PARK	0	3	0	0	1	0.8	2	*
PHILLIPS	0	0	0	1	1	0.4	0	*
PITKIN	2	0	1	2	1	1.2	0	*
PROWERS	0	0	0	0	1	0.2	0	*
PUEBLO	5	2	3	1	18	5.8	8	5.0
RIO GRANDE	0	1	0	1	2	0.8	0	*
ROUTT	1	1	0	0	1	0.6	0	*
SAGUACHE	0	1	0	0	0	0.2	0	*
SAN MIGUEL	2	2	0	0	0	0.8	0	*
SUMMIT	1	0	0	0	1	0.4	0	*
TELLER	1	7	2	0	21	6.2	0	*
WASHINGTON	0	0	0	0	2	0.4	1	*
WELD	50	2	2	4	10	13.6	5	1.9
YUMA	0	0	0	1	1	0.4	0	*
TOTAL	710	306	158	201	538	382.6	416	8.1

* Rates were not calculated for counties with < 3 pertussis cases during 2011. Caution should be used when interpreting rates based on small numbers of cases.

**There were no reported cases of pertussis 2006-2011 in the following counties: Costilla, Crowley, Custer, Dolores, Hinsdale, Jackson, Kiowa, Mineral, Rio Blanco, San Juan, and Sedgwick.

Figure 6. Percent of Reported Pertussis Cases Appropriately Immunized by Selected Age Groups, Colorado, 2011



*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 2011, there were 104 pertussis cases reported in the 10-17 year old age group in Colorado. Among these cases, 41 (39.4%) had received Tdap vaccine.

Table 11. Reported Pertussis-related Hospitalizations by Age Group, Colorado, 2011			
Age Group	Cases	Hospitalized	
		Number	Percent
< 6 Months	35	12	34.3
6 – 11 Months	23	1	4.3
1 – 4 Years	88	2	2.3
5 – 9 Years	78	1	1.3
10 – 14 Years	86	1	1.2
15 – 19 Years	27	0	0
20 – 29 Years	14	0	0
30 – 39 Years	21	0	0
40 – 59 Years	34	1	2.9
60+ Years	10	1	10.0
TOTAL	416	19	4.6

- Average # days hospitalized in 2011 = 4.1 days, median 3.0 days
- There were no reported cases with pertussis-associated seizures and 1 cases of pertussis-associated encephalopathy (23 years of age) during 2011.
- There were no reported pertussis deaths in Colorado during 2011.
- 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, 2011**

CASE CLASSIFICATION	Number	Percent
<u>Confirmed</u> [§] : Culture or PCR Positive	307	73.8
<u>Confirmed</u> [§] : Epidemiologically–linked to a PCR Positive Case	75	18.0
<u>Probable</u> [¶] : Physician Diagnosed Case	18	4.3
<u>Probable</u> [¶] : Serology Positive Only	14	3.4
<u>Probable</u> : Outbreak Situation*	2	0.5
TOTAL	416	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 and or DFA positive cases were reported during 2011. 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

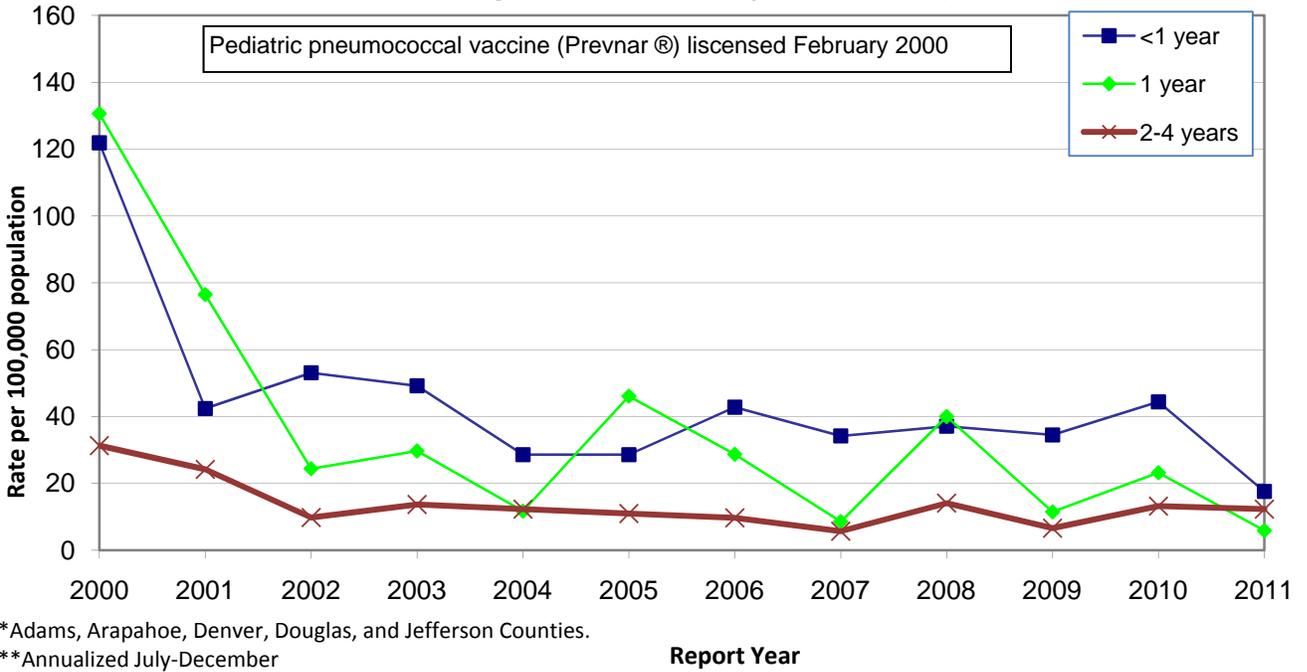
Table 13. Reported Cases, Rates, and Case Fatality of Invasive Pneumococcal Disease by Age Group, Colorado, 2011				
AGE GROUP (Years)	CASES	RATE*	DEATHS	
			Number	Percent of Cases
< 1	12	18.0	1	8.3
1 – 4	27	9.8	1	3.7
5 – 9	11	3.1	0	0.0
10 – 14	6	1.8	0	0.0
15 – 19	7	2.0	0	0.0
20 – 29	18	2.5	0	0.0
30 – 39	39	5.4	0	0.0
40 – 59	169	11.8	11	6.5
60 – 79	144	20.1	6	4.2
80 +	61	41.2	6	9.8
TOTAL	494	9.7	25	5.1

*Per 100,000 population.

Table 14. Reported Cases and Percents of Invasive Pneumococcal Disease in Children < 5 Years of Age by Vaccine Serotype, Denver Metro Area†, Colorado, 2011		
Serotype	Number of Cases	Percent of Cases
PCV7 Vaccine Serotype*	0	0.0
PCV13 additional Serotype**	9	42.9
Serotype not in either Vaccine	8	38.1
Not typed	4	19.0
TOTAL	21	100.0

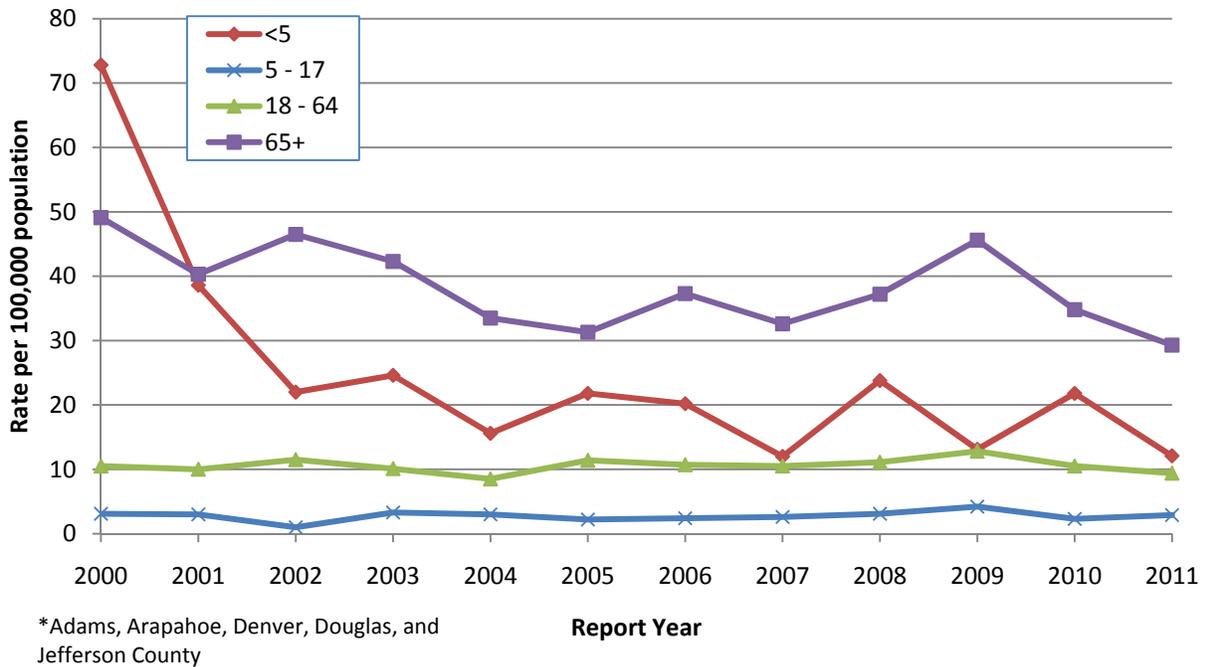
† Adams, Arapahoe, Denver, Douglas, and Jefferson counties.
 * Serotypes included in PCV7 (4, 6B, 9V, 14, 18C, 19F, 23F).
 ** Additional serotypes included in PCV13 and not PCV7 (1, 3, 5, 6A, 7F, 19A).

Figure 7. Rates of Reported Invasive Pneumococcal Disease in Children < 5 Years of Age: Denver Metropolitan Area*, 2000-2011



Percent change 2011 vs 2000 baseline: -86% in cases < 1 year, - 96% in cases age 1year, and - 61% in cases 2-4 years of age.

Figure 8. Rates of Reported Invasive Pneumococcal Disease by Age Group, Denver Metropolitan Area*, 2000 - 2011



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 2011. The last reported case of rubella in Colorado was in 2003.

TETANUS

There were no tetanus cases reported in Colorado during 2011. The last reported case of tetanus in Colorado was in 2005.

VARICELLA

Figure 9. Reported Rates of Varicella by Age Group and Report Year, Colorado, 2006 - 2011

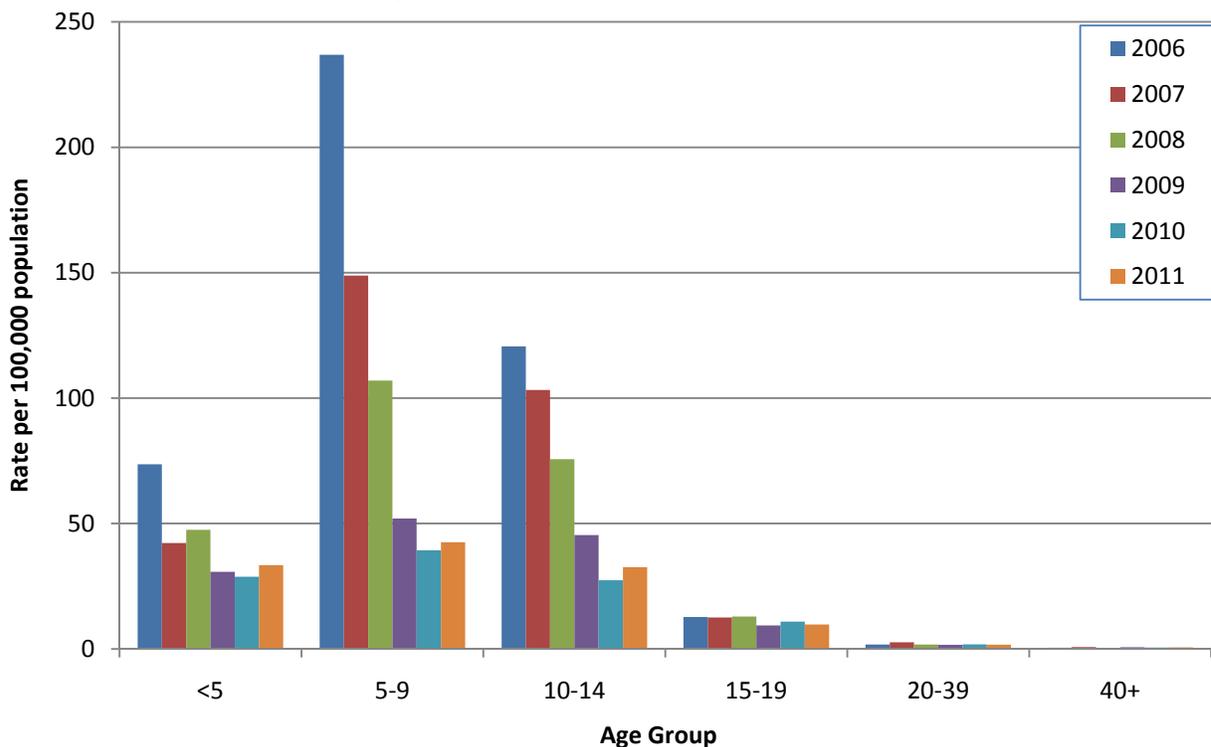


Table 15. Reported Cases and Rates of Varicella by Age Group, Colorado, 2011			
Age Group (Years)	Cases	Percent	Rate*
< 1	21	4.7	31.6
1 – 4	93	20.8	33.8
5 – 9	150	33.6	42.6
10 – 14	111	24.8	32.6
15 – 19	34	7.6	9.7
20 – 29	18	4.0	2.5
30 – 39	6	1.3	0.8
40 – 59	6	1.3	0.4
≥ 60	8	1.8	0.9
TOTAL	440**	100.0	8.7

* Rate per 100,000.
 **Age was unknown for 7 cases. Total number of reported cases = 447.

Table 16. Reported Cases of Varicella by Severity of Disease* and Vaccine Status, Colorado, 2011								
Severity of Disease	≥ 1 Dose of Vaccine		Unimmunized		Unknown Immunization Status		Total Cases	
	#	%	#	%	#	%	#	%
< 50 Lesions	51	22.0	34	22.5	38	59.4	123	27.5
50 – 500 Lesions	137	59.1	52	34.4	19	29.7	208	46.5
> 500 Lesions	42	18.1	61	40.4	7	10.9	110	24.6
Unknown	2	0.9	4	2.6	0	0.0	6	1.3
TOTAL	232	100.0	151	100.0	64	100.0	447	100.0

*Of the 447 varicella cases reported during 2011, a total of 13 (2.9 %) cases were hospitalized, 10 of the hospitalized cases (77%) were ≤18 years of age and 6 cases (46 %) were < 5 years of age. Hospitalization status was unknown for 67 (15%) cases. There were no varicella-associated deaths reported in 2011.