

Vaccine Preventable Diseases in Colorado

Surveillance Report: 2012



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INTRODUCTION

This report contains tables and graphs that summarize 2012 surveillance data for vaccine preventable diseases in Colorado. Colorado rates were calculated as cases per 100,000 population using 2012-based population final estimates from the Demography Section, Colorado Division of Local Government.

Table 1. Reported Cases of Vaccine Preventable Diseases*, Colorado, 2007 - 2012

Report Year	Invasive <i>H. influenzae</i> type b (Hib)	Hepatitis A	Acute Hepatitis B	Meningococcal Disease	Mumps	Pertussis	Invasive Pneumococcal Disease	Varicella [§]
2007	2	27	41	22	17	306	458	1089
2008	0	37	33	16	8	158	542	873
2009	3	53	35	24	6	201	623	515
2010	4	36	53	21	8	538	545	404
2011	0	21	27	10	7	416	494	447
5-Year Average	1.8	34.8	37.8	18.6	9.5	323.8	532.4	665.6
2012	2	30	25	6	7	1432	432	484

*During 2007-2012 no congenital rubella, diphtheria, measles, polio, or rubella cases were reported. One tetanus case was reported during 2012.

Table 2. Reported Cases and Rates of Selected Vaccine Preventable Diseases, Colorado and United States, 2012

Disease	Colorado		United States	
	Cases	Rate [§]	Cases*	Rate [§]
<i>H. influenzae</i> type b, invasive disease (<5 years)	2	0.0	21	0.0
Hepatitis A	30	0.6	1,402	0.4
Acute Hepatitis B	25	0.5	2,950	0.9
Meningococcal Disease	6	0.1	502	0.2
Mumps	7	0.1	199	0.1
Pertussis	1,432	27.3	41,880	13.3
Invasive Pneumococcal Disease	432	8.3	12,887	4.1
Varicella	484	9.2	11,477	3.7

*Source, MMWR 2013;61(52); 719-732. US rates calculated using US Census Bureau Population Estimate.

§ Per 100,000 population.

DIPHTHERIA

No cases of diphtheria were reported in Colorado or the United States during 2012. The last case of diphtheria reported in Colorado was in 1985.

HAEMOPHILUS INFLUENZAE type b (Hib)

Table 3. Reported Cases, Rates, and Case Fatality of Invasive <i>Haemophilus influenzae</i> by Age Group, Colorado, 2012				
Age Group (Years)	Cases	Rate*	Deaths	
			Number	Percent of Cases
<1	2	3.1	0	0.0
1-4	2	0.7	0	0.0
5-9	2	0.6	0	0.0
10-14	1	0.3	0	0.0
15-19	0	-	0	0.0
20-29	1	0.1	0	0.0
30-39	4	0.6	0	0.0
40-59	13	0.9	3	23.1
60+	36	4.0	3	8.3
Total	61	1.2	6	9.8

*Per 100,000 population.

Table 4. Reported Cases of Invasive <i>Haemophilus influenzae</i> by Serotype, Colorado, 2012		
Serotype	Cases	Percent of cases
a	5	8.3
b	2	3.3
c	0	0.0
d	0	0.0
e	2	3.3
f	16	26.7
Nontypeable	35	58.3
TOTAL*	60	100.0

*One case had an unknown serotype. Total number of cases = 61.

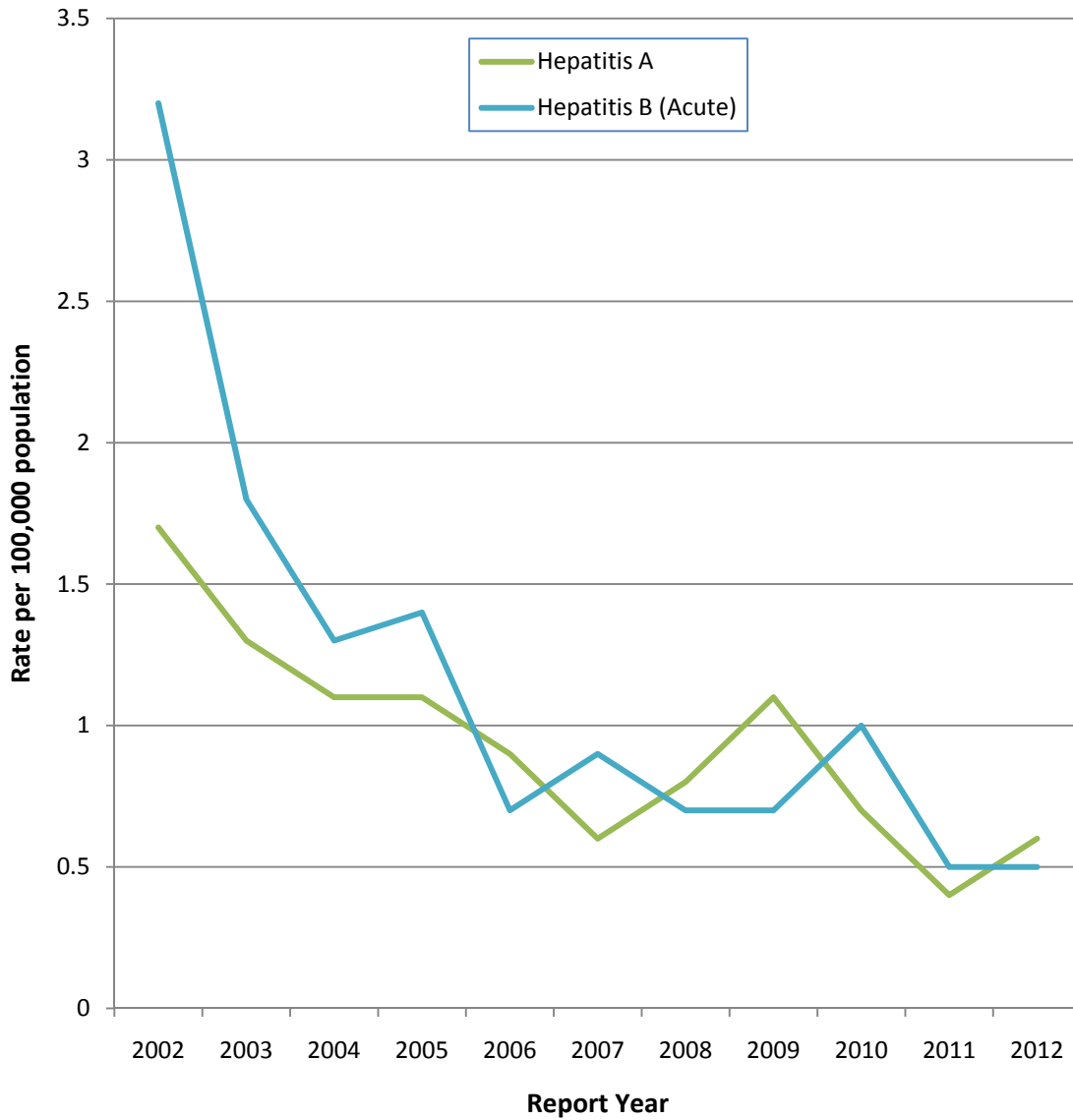
Figure 1. Reported Cases of Invasive *Haemophilus influenzae* type b (Hib) by Age Group, Colorado, 2006-2012



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 Hepatitis A and B, Colorado, 2002 - 2012



HEPATITIS A

Table 5. Reported Cases and Rates* of Hepatitis A by Age Group & Gender, Colorado 2012						
Age Group (years)	Male		Female		Total	
	Cases	Rate*	Cases	Rate*	Cases	Rate*
< 1	0	-	0	-	0	-
1-4	1	0.7	1	0.8	2	0.7
5-9	0	-	0	-	0	-
10-14	0	-	0	-	0	-
15-19	1	0.6	0	-	1	0.3
20-39	6	0.8	6	0.9	12	0.8
≥ 40	6	0.5	9	0.7	15	0.6
TOTAL	14	0.5	16	0.6	30	0.6

* Per 100,000 population.

ACUTE HEPATITIS B

Table 6. Reported Cases and Rates* of Acute Hepatitis B Cases by Age Group & Gender, Colorado, 2012						
Age Group (years)	Male		Female		Total	
	Cases	Rate*	Cases	Rate*	Cases	Rate*
< 15	0	-	0	-	0	-
15-19	0	-	0	-	0	-
20-29	2	0.5	3	0.9	5	0.7
30-39	4	1.1	3	0.9	7	1.0
40-49	8	2.2	1	0.3	9	1.3
50-59	3	0.8	1	0.3	4	0.5
≥ 60	0	-	0	-	0	-
TOTAL	17	0.7	8	0.3	25	0.5

* Per 100,000 population.

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

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 2012. During the previous ten years (2003 – 2012), two measles cases were reported (in 2004 and 2006). Both cases had a history of travel to Asia during the exposure period. During 2012, there were 55 measles cases reported in the United States.

MENINGOCOCCAL DISEASE

Figure 3. Rates of Meningococcal Disease by Year of Report, Colorado, 2002 - 2012

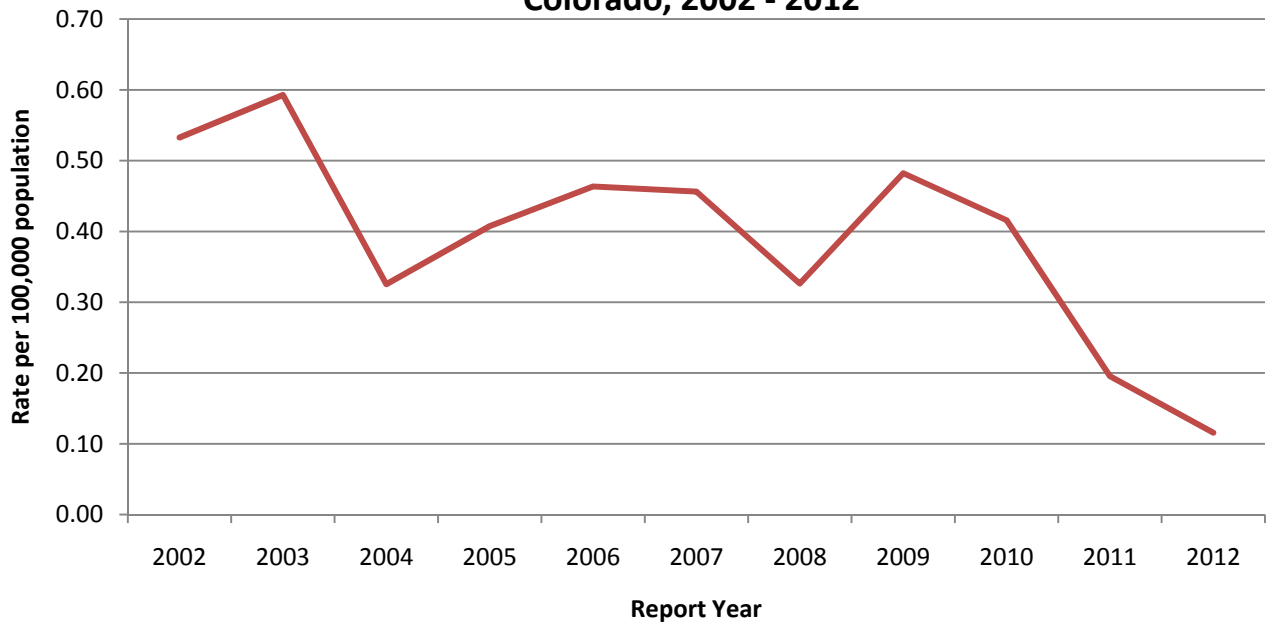


Figure 4. Rates of Meningococcal Disease by Age Group and Report Year, Colorado, 2008 - 2012

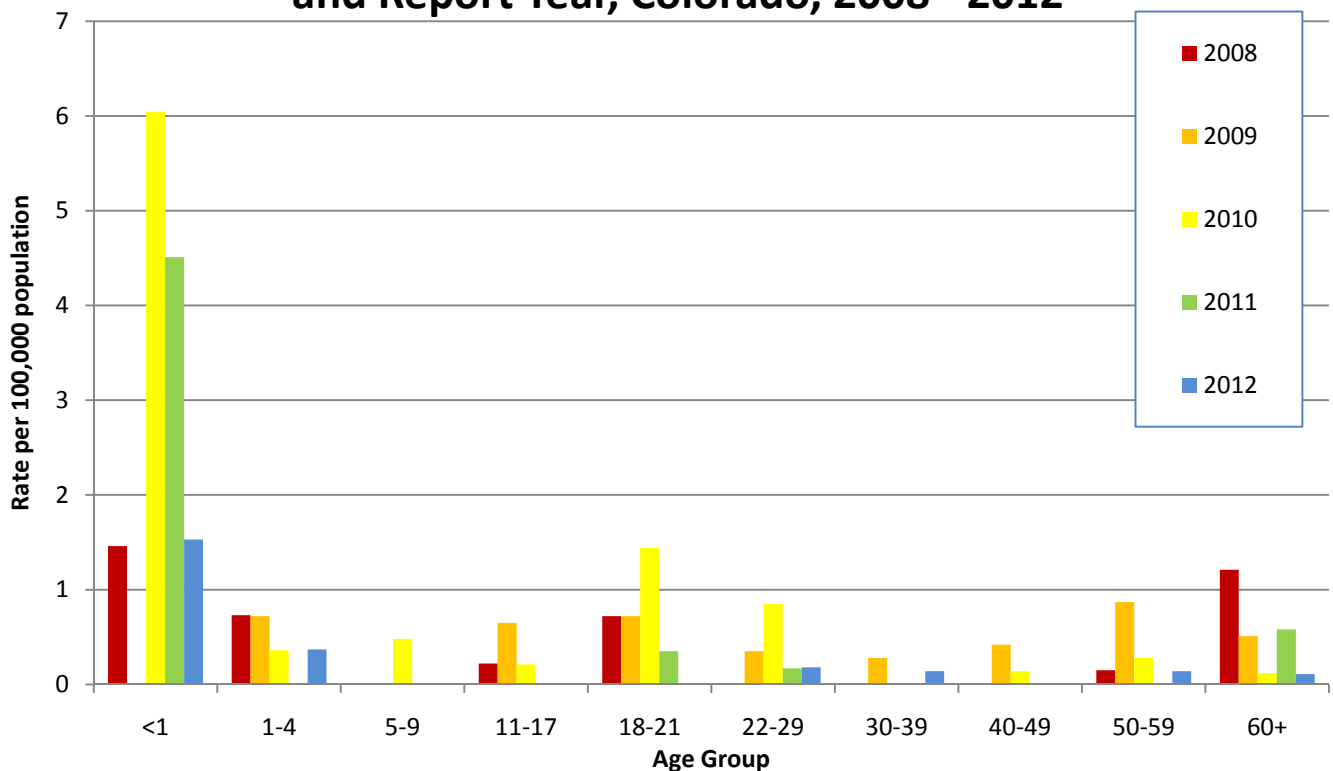


Table 7. Reported Cases, Rates*, and Case Fatality of Meningococcal Disease by Age Group, Colorado, 2012				
Age Group (Years)	Cases	Rate*	Deaths	
			Number	Percent of Cases
<1	1	1.5	0	0.0
1-4	1	0.4	0	0.0
5-9	0	-	0	0.0
10-14	0	-	0	0.0
15-19	0	-	0	0.0
20-29	1	0.1	0	0.0
30-39	1	0.1	0	0.0
40-59	1	0.1	0	0.0
60+	1	0.1	0	0.0
Total	6	0.1	0	0.0

* Per 100, 000 population.

Table 8. Reported Cases of Meningococcal Disease by Serogroup, Colorado, 2012		
Serogroup	Cases	Percent of cases
B	4	66.7
C	0	0.0
Y	2	33.3
W-135	0	0.0
Not Groupable	0	0.0
TOTAL	6	100.0

*Meningococcal vaccine contains antigens from serogroups A, C, Y and W-135. Of the 2 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 5. Rates of Reported Mumps Cases by Year of Report, Colorado and United States, 2003 - 2012

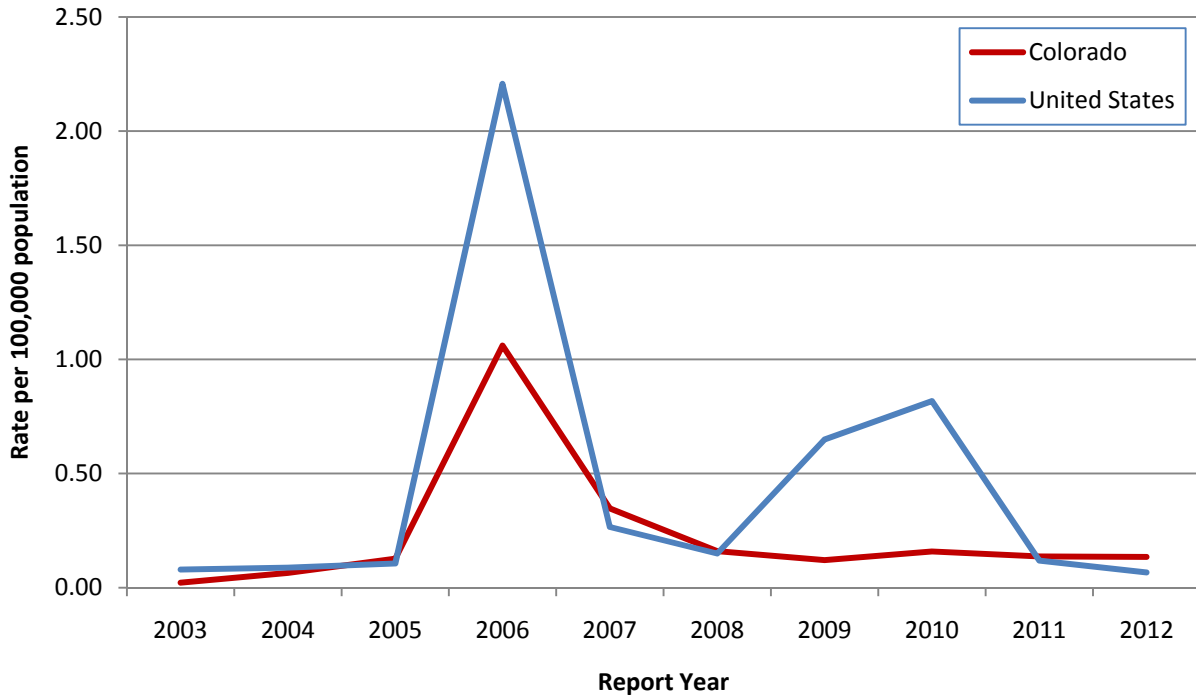


Table 9. Reported Cases of Mumps by Age Group and Number of MMR Vaccine Doses, Colorado, 2012					
Age Group (Years)	0 Doses	1 Dose	2 Doses	Unknown	Total Number of Cases
<1	0	0	0	0	0
1 – 4	1	0	0	0	1
5 – 9	0	1	1	0	2
10 – 14	0	0	1	0	1
15 – 19	0	0	0	0	0
20 – 39	0	0	0	1	1
40+	1	0	0	1	2
TOTAL	2	1	2	2	7

PERTUSSIS

During August 2012, the Colorado Department of Public Health and Environment began using the term “epidemic” to describe the increase in pertussis cases in Colorado.

Figure 6. Reported Pertussis Cases by Month and Year with Projected Baseline and Epidemic Thresholds, Colorado, 2003 - 2012

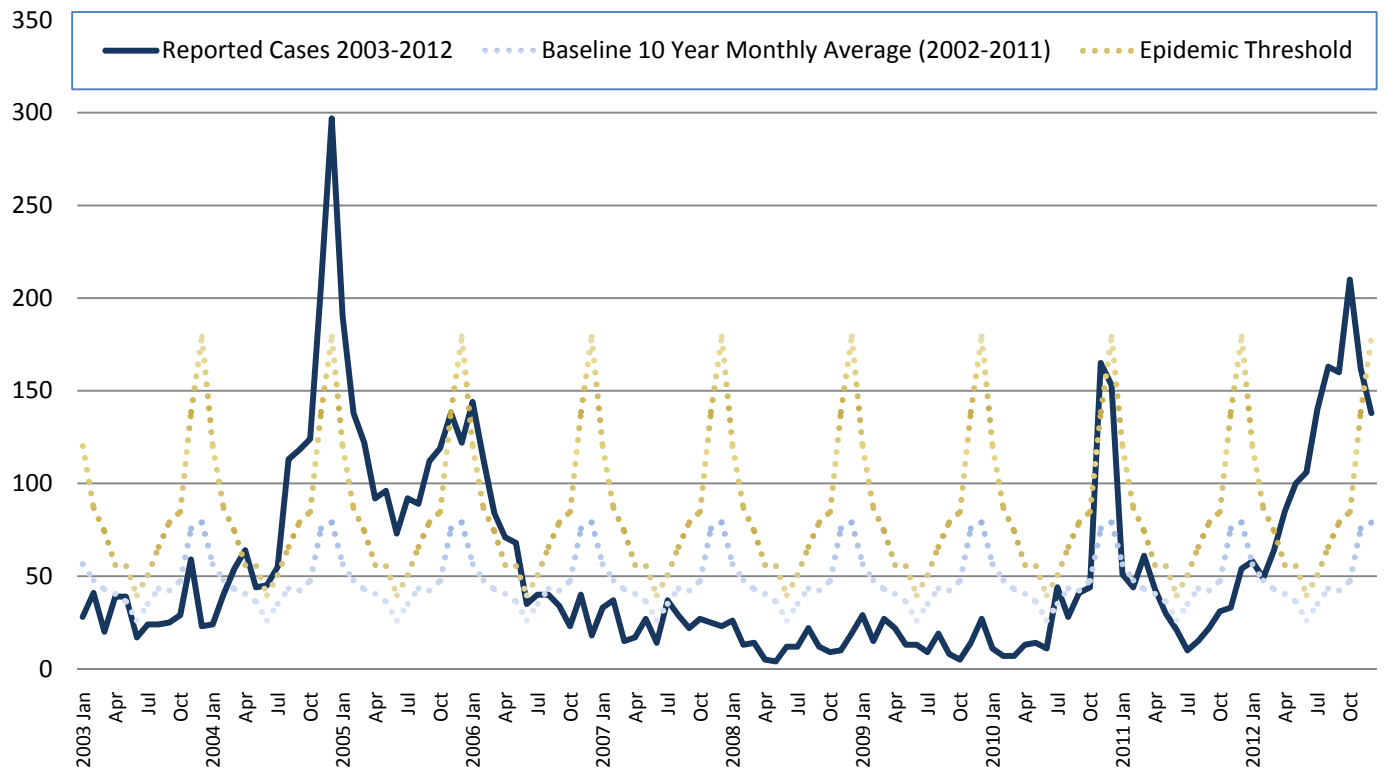


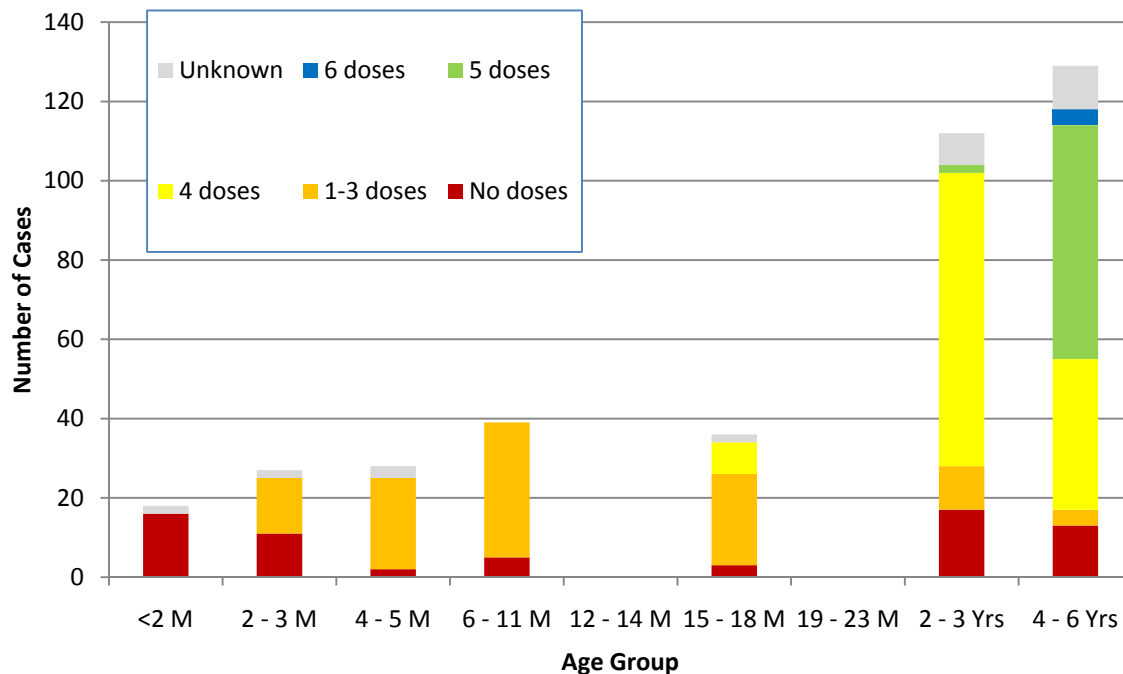
Table 10. Reported Cases, Rates*, and Hospitalization Status of Pertussis by Age Group, Colorado, 2012

AGE GROUP (Years)	CASES	RATE*	Hospitalized Cases	
			Number	Percent of Cases
<6 mo.	73	223.5	28	38.4
6 - 11 mo.	39	119.4	2	5.1
1 - 4	194	71.3	3	1.5
5 - 9	245	68.7	1	0.4
10 - 14	421	121.4	2	0.5
15 - 19	181	51.6	0	0.0
20 - 29	66	9.2	1	1.5
30 - 39	55	7.6	2	3.6
40 - 59	127	8.8	10	7.9
60+	31	3.4	5	16.1
Total	1432	27.3	54	3.8

*Per 100,000 population.

- Average # days hospitalized in 2012 = 5.7 days, median 4.5 days
- There was 1 reported pertussis death in Colorado during 2012, a person in the >60 year age group.

Figure 7. Reported Pertussis Cases by Age Group and Number of Vaccine Doses, Colorado, 2012



**Table 11. Reported Cases and Rates* of Pertussis by County,
Colorado, 2007 – 2012**

County**	Number of Cases by Year of Report							
	2007	2008	2009	2010	2011	5 Year Average	2012	2012 Rate*
ADAMS	13	7	13	56	54	28.6	206	44.8
ALAMOSA	0	0	0	1	0	0.2	0	*
ARAPAHOE	34	22	26	64	83	45.8	170	28.6
ARCHULETA	2	1	2	1	6	2.4	0	*
BACA	1	0	0	2	0	0.6	1	*
BENT	0	0	0	0	1	0.2	0	*
BOULDER	23	5	23	19	16	17.2	155	50.8
BROOMFIELD	10	2	0	6	4	4.4	35	60.0
CHAFFEE	0	0	0	2	0	0.4	5	27.7
CHEYENNE	1	0	0	0	0	0.2	0	*
CLEAR CREEK	1	3	0	3	2	1.8	1	*
CONEJOS	0	0	14	2	0	3.2	0	*
DELTA	3	1	0	7	1	2.4	8	26.2
DENVER	35	40	23	58	37	38.6	209	32.9
DOUGLAS	12	8	4	23	29	15.2	85	28.5
EAGLE	1	0	0	0	0	0.2	0	*
EL PASO	53	9	20	21	37	28	89	13.8
ELBERT	0	0	1	1	0	0.4	2	*
FREMONT	0	0	1	14	1	3.2	6	12.8
GARFIELD	2	0	3	4	0	1.8	0	*
GILPIN	0	0	0	0	3	0.6	1	*
GRAND	18	0	0	1	0	3.8	2	*
GUNNISON	0	0	0	4	0	0.8	0	*
HUERFANO	1	0	0	0	0	0.2	0	*
JEFFERSON	30	35	19	165	103	70.4	267	48.8
KIT CARSON	2	0	0	1	0	0.6	2	*

Table 11. continues on next page

**Table 11. Reported Cases and Rates* of Pertussis by County,
Colorado, 2007 – 2012**

County [§]	Number of Cases by Year of Report							
	2007	2008	2009	2010	2011	5 Year Average	2012	2012 Rate*
LA PLATA	3	9	34	0	6	10.4	3	5.7
LAKE	1	0	0	0	0	0.2	0	*
LARIMER	24	8	2	8	7	9.8	75	24.1
LAS ANIMAS	0	0	0	1	0	0.2	0	*
LINCOLN	2	0	0	0	0	0.4	1	*
LOGAN	1	0	0	0	0	0.2	1	*
MESA	5	0	2	7	4	3.6	14	9.5
MOFFAT	0	0	0	1	2	0.6	1	*
MONTEZUMA	1	0	3	4	0	1.6	0	*
MONTROSE	3	0	0	1	2	1.2	5	12.3
MORGAN	1	0	0	0	0	0.2	1	*
OTERO	3	0	1	1	1	1.2	1	*
OURAY	1	0	0	0	0	0.2	0	*
PARK	3	0	0	1	2	1.2	0	*
PHILLIPS	0	0	1	1	0	0.4	0	*
PITKIN	0	1	2	1	0	0.8	0	*
PROWERS	0	0	0	1	0	0.2	3	24.2
PUEBLO	2	3	1	18	8	6.4	8	5.0
RIO GRANDE	1	0	1	2	0	0.8	1	*
ROUTT	1	0	0	1	0	0.4	1	*
SAGUACHE	1	0	0	0	0	0.2	1	*
SAN MIGUEL	2	0	0	0	0	0.4	0	*
SUMMIT	0	0	0	1	0	0.2	1	*
TELLER	7	2	0	21	0	6	6	25.6
WASHINGTON	0	0	0	2	1	0.6	0	*
WELD	2	2	4	10	5	4.6	68	25.8
YUMA	0	0	1	1	0	0.4	0	*
Total	306	158	201	538	415	323.6	1432	27.3

*Per 100,000 population. Rates were not calculated for counties with < 3 pertussis cases during 2012. Caution should be used when interpreting rates based on small numbers of cases.

[§]There were no reported cases of pertussis 2007-2012 in the following counties: Costilla, Crowley, Custer, Dolores, Hinsdale, Jackson, Kiowa, Mineral, Rio Blanco, San Juan, and Sedgwick.

**Table 12. Classification of Reported Pertussis Cases,
Colorado, 2012**

CASE CLASSIFICATION	Number	Percent
<u>Confirmed</u> *: Culture or PCR Positive	1121	78.3
<u>Confirmed</u> *: Epidemiologically-linked to a PCR Positive Case	208	14.5
<u>Probable</u> §: Physician Diagnosed Case	53	3.7
<u>Probable</u> §: Serology Positive Only	43	3.0
<u>Probable</u> ¶: Outbreak Situation	7	0.5
TOTAL	1432	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. 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.

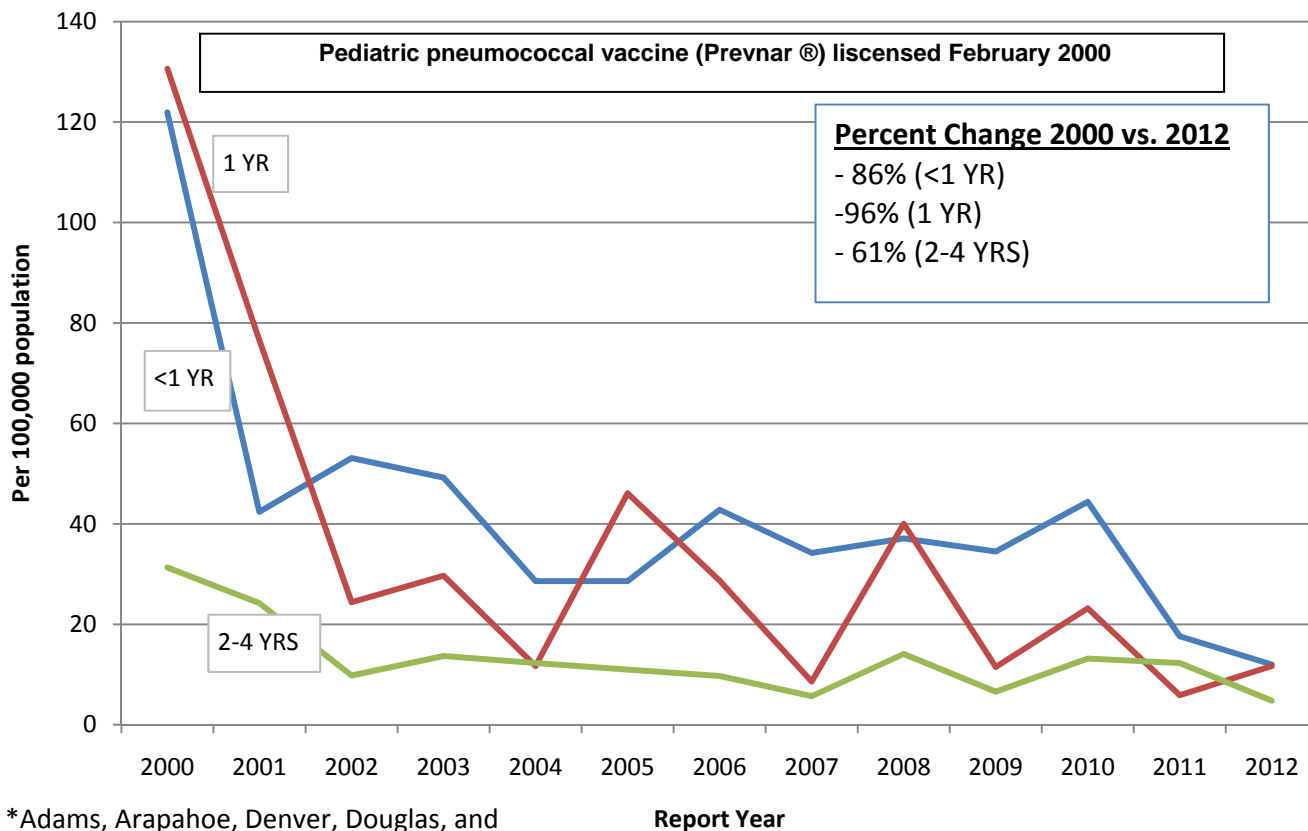
PNEUMOCOCCAL DISEASE

Table 13. Reported Cases, Rates*, and Case Fatality of Invasive Pneumococcal Disease by Age Group, Colorado, 2012				
Age Group (Years)	Cases	Rate*	Deaths	
			Number	Percent of Cases
<1	10	15.3	0	0.0
1-4	24	8.8	0	0.0
5-9	7	2.0	0	0.0
10-14	5	1.4	0	0.0
15-19	8	2.3	2	25.0
20-29	20	2.8	2	10.0
30-39	24	3.3	1	4.2
40-59	145	10.0	5	3.4
60+	187	20.5	10	5.3
Total	432	8.3	20	4.6

*Per 100,000 population.

Following the introduction of the 7-valent pneumococcal conjugate vaccine (PCV7) in 2000, dramatic declines in invasive pneumococcal disease (IPD) were reported among children less than 5 years of age, in particular, children 1 year of age and younger. Before introduction of PCV7, rates of IPD among children less than 1 year were around 122 cases per 100,000 population. After the introduction of PCV7, rates of disease dropped to less than 30 cases per 100,000 by 2004 (see Figure 8).

Figure 8. Rates of Invasive Pneumococcal Disease in Children < 5 Years of Age: Denver Metropolitan Area*, 2000-2012



*Adams, Arapahoe, Denver, Douglas, and Jefferson County

Rates also decreased in other age groups following the use of PCV7. During 2002 – 2004, rates decreased 18% in those 65 years of age and older and 15% in those 18-64 years of age. However, a steady increase in disease, likely due to non-PCV7 serotypes, was observed in all age groups during 2004 – 2009. The introduction of the 13-valent pneumococcal conjugate vaccine (PCV13) in February of 2010 reversed this trend and the number of cases of invasive disease due to the 6 additional serotypes covered by the vaccine have decreased (Figure 10).

Figure 9. Rates of Invasive Pneumococcal Disease by Age Group, Colorado, 2002 - 2012

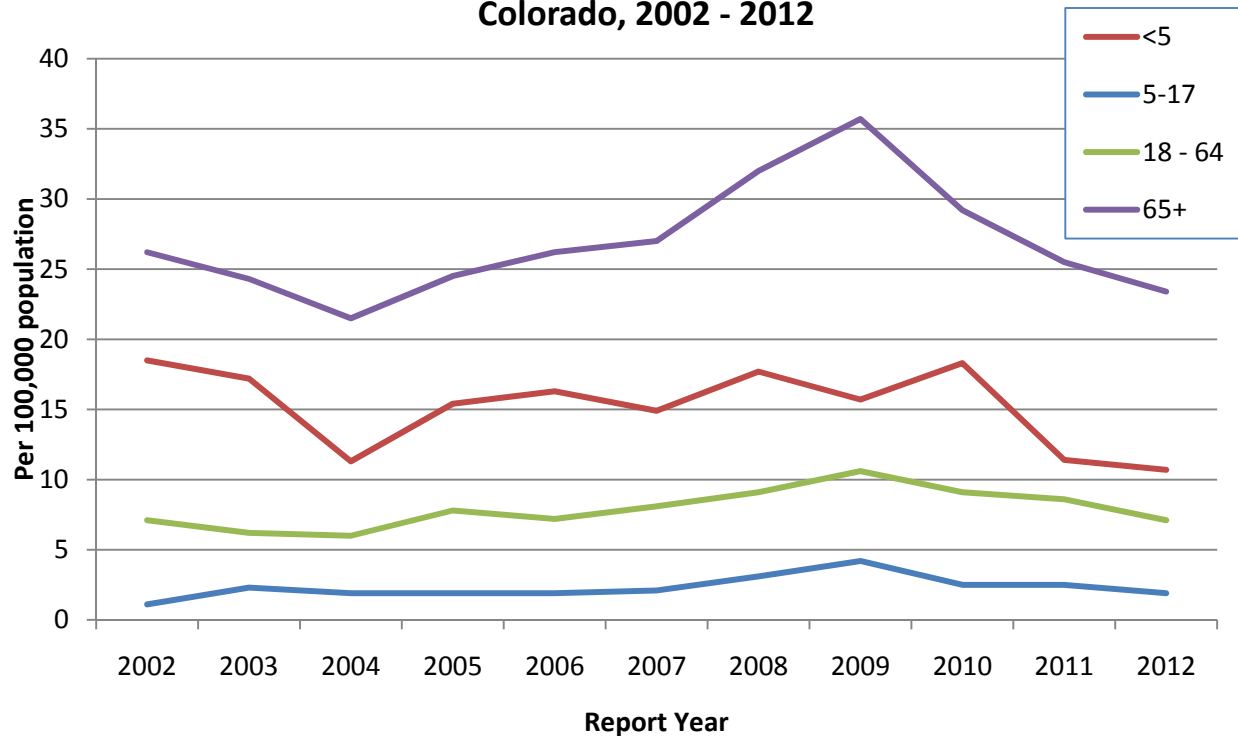
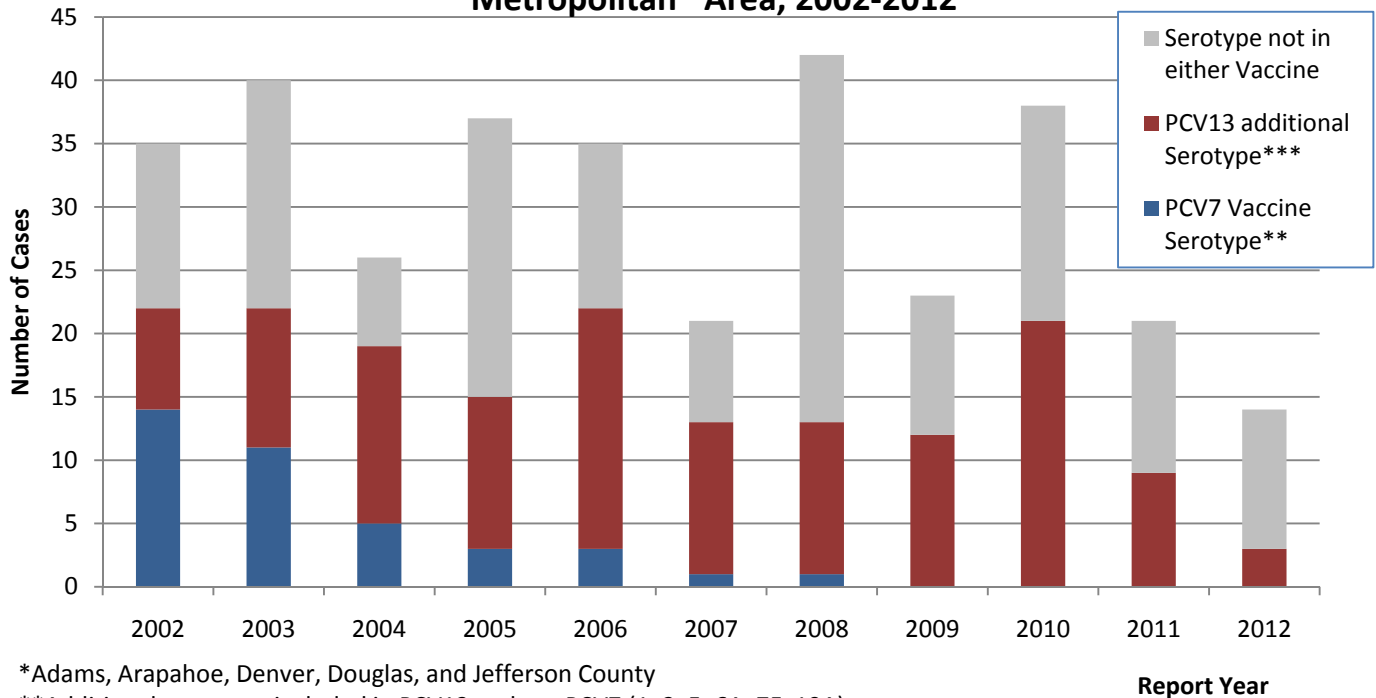


Figure 10. Reported Cases of Invasive Pneumococcal Disease Less Than 5 Years of Age by Vaccine Serotype and Report Year, Denver Metropolitan* Area, 2002-2012



*Adams, Arapahoe, Denver, Douglas, and Jefferson County

**Additional serotypes included in PCV13 and not PCV7 (1, 3, 5, 6A, 7F, 19A).

***Serotypes included in PCV7 (4, 6B, 9V, 14, 18C, 19F, 23F).

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 2012. The last reported case of rubella in Colorado was in 2003.

TETANUS

During the previous ten years (2003-2012) there were 5 cases of tetanus reported in Colorado (3 in 2004, 1 in 2005, and 1 in 2012). The 2012 case was an adult male who at received 5 doses of DTaP as a child and a Tdap in 2008. He recovered from his illness.

VARICELLA

Figure 11. Rates of Varicella by Age Group and Report Year, Colorado, 2007 - 2012

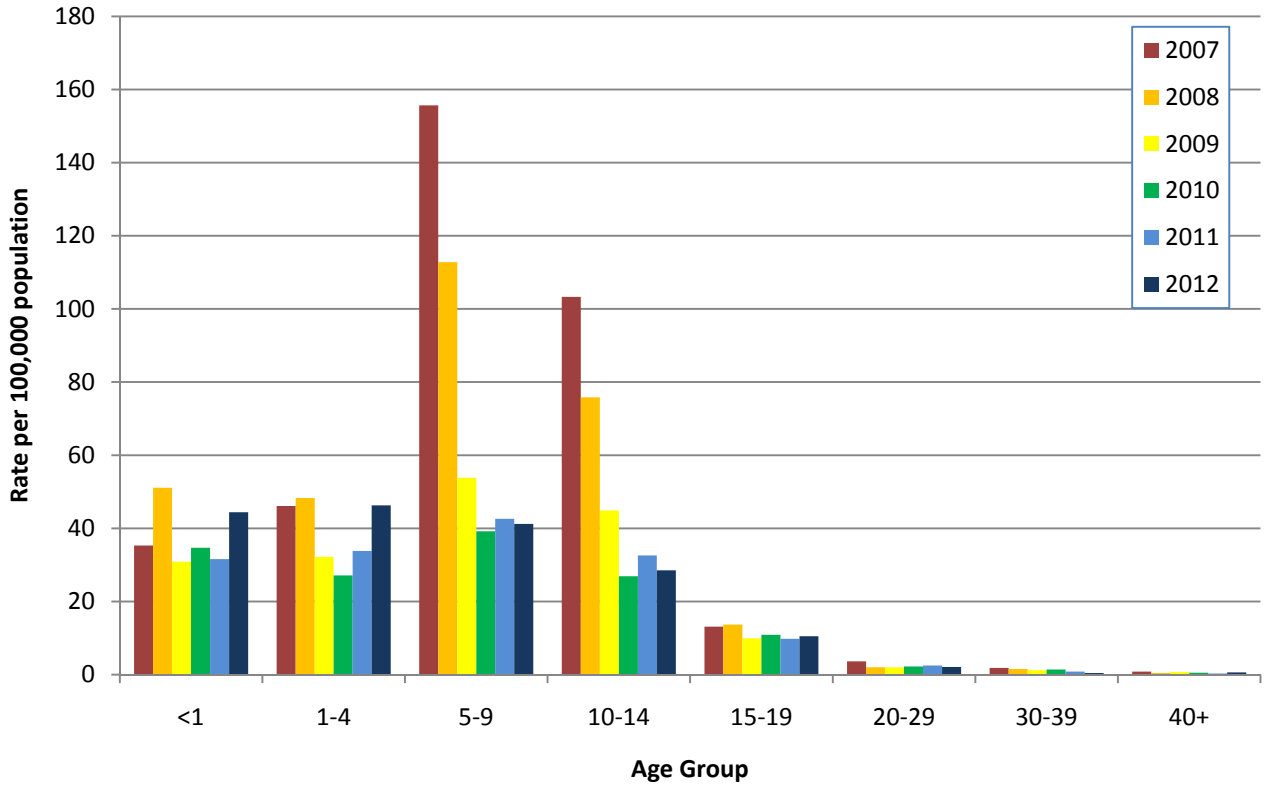


Table 14. Reported Cases, Rates*, and Hospitalization of Varicella by Age Group, Colorado, 2012

Age Group (Years)	Cases	Rate*	Hospitalized Cases	
			Number	Percent of Cases
<1	29	44.4	1	3.4
1-4	126	46.3	1	0.8
5-9	147	41.2	2	1.4
10-14	99	28.5	3	3.0
15-19	37	10.5	1	2.7
20-29	15	2.1	0	0.0
30-39	3	0.4	0	0.0
40-59	11	0.8	0	0.0
60+	2	0.2	1	50.0
Total	479	9.2	9	1.9

*Per 100,000 population.