

▶ Colorado 2005 Child Care Facility Survey



Colorado Department
of Public Health
and Environment

IMMUNIZATION PROGRAM

Colorado 2005 Child Care Facility Survey

Colorado Board of Health rules pertaining to the immunization of children require that a child attending a child care facility have the following vaccines based on age:

- 2–3 months
 - 1 DTaP
 - 1 Polio
 - 1 Hib
 - 1 Hep B
- 4–5 months
 - 2 DTaP
 - 2 Polio
 - 2 Hib
 - 2 Hep B
- 6–14 months
 - 3 DTaP
 - 2 Polio
 - 2 Hib or first Hib after 1 year of age
 - 2 Hepatitis B
- 15–17 months
 - 3 DTaP
 - 2 Polio
 - 1 MMR
 - 1 Hib
 - 2 Hep B
- 18 months to 4 years
 - 4 DTaP
 - 3 Polio
 - 1 MMR
 - 1 Hib
 - 3 Hep B
 - 1 Varicella or history of disease
- 5 years
 - 5 DTaP or 4th DTaP after 4th birthday
 - 4 Polio or 3rd Polio after 4th birthday
 - 2 MMR
 - 3 Hep B
 - 1 Varicella or history of disease

A Certificate of Immunization in the child care facility file is also required.

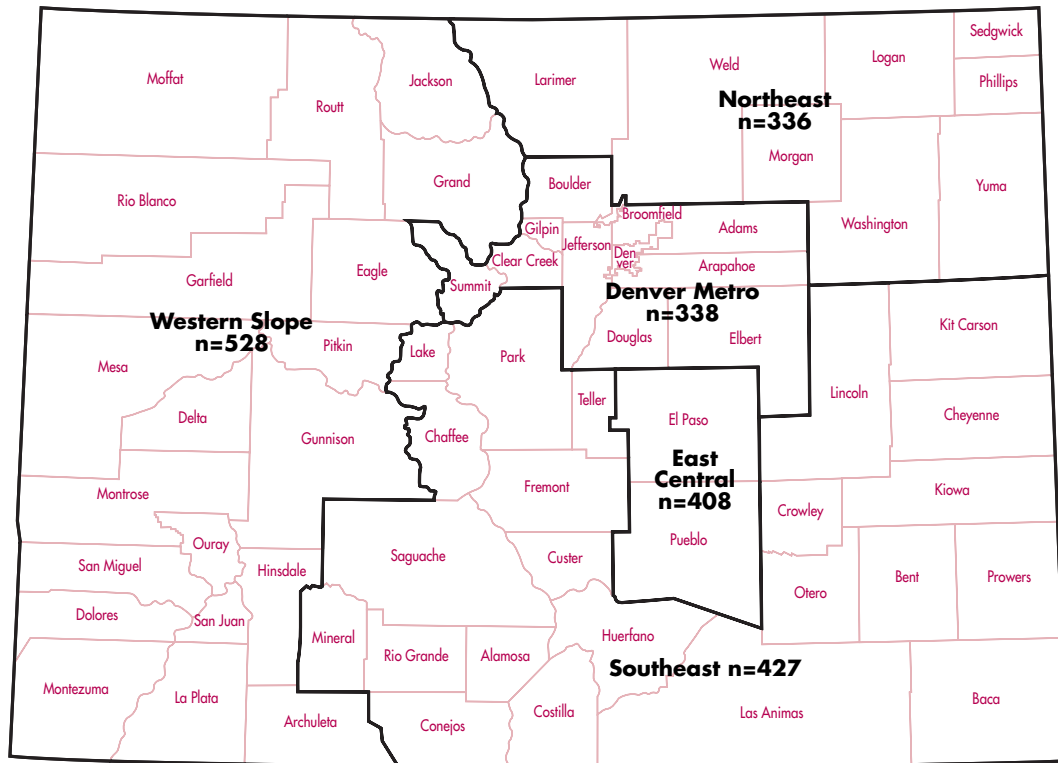
To ensure compliance with this rule, child care facilities are required to submit an Immunization Summary Report to the Colorado Department of Public Health and Environment. For the past several years, immunization data has been self-reported by child care facilities. In 2005, the Immunization Program at the Colorado Department of Public Health and Environment implemented a new method of collecting immunization data at child care facilities.

► Methods

Under this new system, the state was divided into five regions, and a random sample of child care facilities was selected from each region. The sample size per region was calculated based on the 2003 National Immunization Survey coverage estimate for 19–35 month olds of 67.5 percent. The higher the coverage rate, the smaller the sample needed to be. The sample size was not dependent on the number of child care facilities in a region but on the average number of children per child care facility. Thus, regions with a higher average number of children per child care facility would need to sample fewer child care facilities to achieve the same level of precision (± 10 percent). A map showing the counties assigned to each region and the number of children sampled in each region is shown below.

A random sample of 10 children was drawn at each child care facility. Local or state health department staff audited each child's immunization record. Information collected for children included age; gender; race; ethnicity; immunization document source, such as original document, photocopy or multiple documents; type of immunization document such as Certificate of Immunization, military record or other similar documents (See Table 2); vaccines administered with administration date; exemptions for medical, personal or religious reasons; and the country of birth. These data were analyzed to calculate the immunization coverage of children

Child Care Facility Survey, Regions Sampled



in child care facilities by region and statewide. State estimates were calculated by weighting the regional results. This ensured that each region was represented proportionally in the state estimates. Data were also analyzed to see if there were any factors statistically significantly associated with a child being up to date while attending a child care facility (Table 6).

Exemption information was collected for each of the required immunizations. Exemptions from vaccines were categorized in the following manner:

- Medical—medical exemptions for all vaccines
- Religious—religious exemptions for all vaccines
- Personal—personal exemptions for all vaccines
- In process—in the process of obtaining all the required vaccines
- Mixed exemptions—combination of medical, religious, or personal exemption or in process for all vaccines

- None—no exemptions taken for all vaccines
- Unknown—exemptions field was left blank for all vaccines
- Mixed other—combination of none or unknown for all vaccines
- No records—no records were in the child care facility file

This report will discuss the results from the immunization coverage analysis and the compliance of child care facilities in keeping the required immunization documents. In addition, this report will look at immunization exemptions, what shots were missing for children who were not up to date, and the up-to-date status by age and vaccine. The factors associated with being up to date when enrolled in a child care facility will be presented along with conclusions.

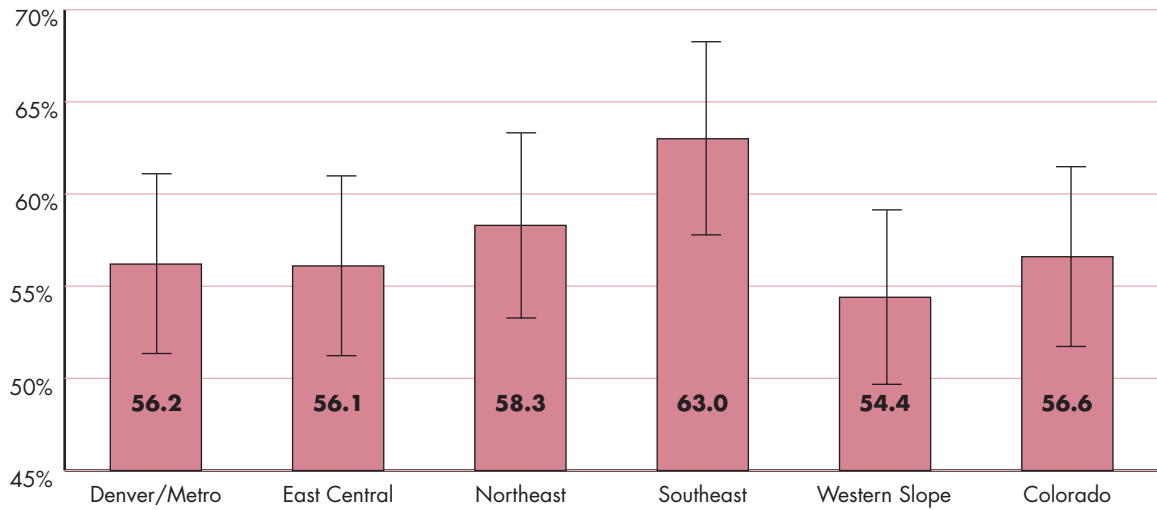


► Immunization Coverage

In child care facilities, 56.6 percent of children were up to date on their immunizations. Although the regional rates ranged from 54.4 percent to 63.0 percent, there was no statistical

difference among the regions. Also, there was no significant difference between the regional rates when compared to the state rate of children who were up to date.

Figure 1. Percentage of Children Up to Date in Child Care Facilities, by Region, Colorado Child Care Facility Survey, 2005



Error bars on the graph represent the 95 percent confidence interval for each point estimate. The upper and lower limit of the confidence interval represents the margin of error or the range of values where the true rate lies 95 percent of the time. Confidence intervals are used for data that are a sample of the population.



Table 1. By Vaccine and Region, Up-to-Date Status, Colorado Child Care Facility Survey, 2005

	DTaP	MMR	Polio	Hib	Hep B	Varicella	Combination of all
Weighted Colorado Estimate							
Up to Date in Child Care	71.8%	73.9%	78.7%	87.6%	80.2%	79.0%	56.6%
Not Up to Date in Child Care	28.2%	26.1%	21.3%	12.4%	19.8%	20.9%	43.4%
Denver/Metro							
Up to Date in Child Care	70.9%	73.2%	78.6%	85.9%	78.3%	77.7%	56.2%
Not Up to Date in Child Care	29.1%	26.8%	21.4%	14.1%	21.7%	22.3%	43.8%
East Central							
Up to Date in Child Care	73.0%	73.5%	76.2%	91.1%	81.6%	81.8%	56.1%
Not Up to Date in Child Care	27.0%	26.5%	23.8%	8.9%	18.4%	18.1%	43.9%
Northeast							
Up to Date in Child Care	77.3%	76.0%	82.1%	91.4%	84.2%	79.6%	58.3%
Not Up to Date in Child Care	22.7%	24.0%	17.9%	8.6%	15.8%	20.4%	41.7%
Southeast							
Up to Date in Child Care	73.8%	76.1%	82.7%	91.7%	87.3%	83.7%	63.0%
Not Up to Date in Child Care	26.2%	23.9%	17.3%	8.3%	12.7%	16.3%	37.0%
Western Slope							
Up to Date in Child Care	67.6%	75.7%	76.5%	86.9%	82.4%	81.3%	54.4%
Not Up to Date in Child Care	32.4%	24.3%	23.5%	13.1%	17.6%	18.7%	45.6%

Table 1 shows that most individual vaccine coverage levels were above 70 percent. The series coverage rates ranged from 54.4 percent to 63.0 percent. Since history of varicella disease is not routinely recorded on immunization records, varicella coverage levels may be even higher.



► Immunization Documents

Among all children in child care facilities an estimated 69.8 percent had a Certificate of Immunization or an approved alternate in their child care facility records. Table 2 lists the percentages of the variety of records available in the child's file that contained immunization information. Although a Certificate of Immunization or an approved alternate is required according to the Rules of the Colorado Board of Health, the percentage of children in compliance varied from 66.6 percent to 75.2 percent.

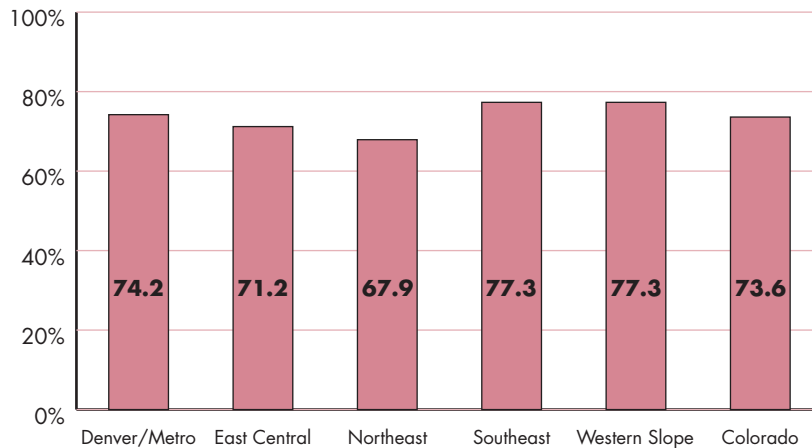
For children who were up to date, the percentage with a Certificate of Immunization or an approved alternate on file varied from almost 68 percent of children in the Northeast region to nearly 80 percent of the children in the Southeast region and on the Western Slope

(Figure 2). When the Certificate of Immunization was not available, immunization status was calculated using shot data available from the other types of child care facility records listed in Table 2.

Table 2. Percentage of Immunization Documents in Child Care Facility File by Region, Colorado Child Care Facility Survey, 2005

Immunization Document	Weighted Colorado Estimate		Denver/Metro		East Central		Northeast		Southeast		Western Slope	
	n	%	n	%	n	%	n	%	n	%	n	%
Certificate of Immunization	124711	64.9%	215	63.6%	256	62.7%	225	67.0%	293	68.6%	384	72.7%
School Record	20605	10.7%	34	10.1%	77	18.9%	34	10.1%	40	9.4%	20	3.8%
Alternate Approved Certificate	9366	4.9%	21	6.2%	16	3.9%	3	0.9%	17	4.0%	13	2.5%
Physician Record	33825	17.6%	50	14.8%	82	20.1%	68	20.2%	42	9.8%	180	34.1%
Yellow Card	16110	8.4%	27	8.0%	34	8.3%	14	4.2%	39	9.1%	88	16.7%
Military Record	742	0.4%	1	0.3%	6	1.5%	0	0.0%	0	0.0%	0	0.0%
Other	7255	3.8%	16	4.7%	4	1.0%	4	1.2%	15	3.5%	26	4.9%

Figure 2. Of Children Up to Date in Child Care Facilities, Percentage with Certificate of Immunization in File by Region, Colorado Child Care Facility Survey, 2005



► Exemptions

Table 3. Percentage of Children Up to Date and with Exemptions, by Region, Colorado Child Care Facility Survey, 2005

Exemptions	Colorado		Denver Metro		East Central		Northeast		Southeast		Western Slope	
	n	%	n	%	n	%	n	%	n	%	n	%
Up to Date	108765	56.6%	190	56.2%	229	56.1%	196	58.3%	269	63.0%	287	54.4%
Medical	18	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.2%	0	0.0%
Religious	37	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.5%	0	0.0%
Personal	1830	1.0%	2	0.6%	7	1.7%	2	0.6%	9	2.1%	12	2.3%
In process	557	0.3%	1	0.3%	2	0.5%	0	0.0%	4	0.9%	0	0.0%
Mixed exemptions	3075	1.6%	4	1.2%	6	1.5%	4	1.2%	6	1.4%	29	5.5%
None	27593	14.4%	45	13.3%	67	16.4%	50	14.9%	65	15.2%	92	17.4%
Unknown	755	0.4%	2	0.6%	0	0.0%	0	0.0%	1	0.2%	1	0.2%
Mixed other	37417	19.5%	67	19.8%	82	20.1%	69	20.5%	64	15.0%	87	16.5%
No records	12228	6.4%	27	8.0%	15	3.7%	15	4.5%	6	1.4%	20	3.8%
Total	192276	100.0%	338	100.0%	408	100.0%	336	100.0%	427	100.0%	528	100.0%

During the child care facility survey, exemption information was collected for each vaccine. The exemption field could be entered as medical, religious, personal, in process, none or left blank. Table 3 shows there were few children who exempted for medical or religious reasons for all of the required immunizations. Children who took a personal exemption for all of the required immunizations ranged from 0.6 percent in the Denver/Metro and Northeast regions to 2.3 percent on the Western Slope. Children taking different exemptions for different vaccines, as shown in the mixed exemption category (i.e. a medical exemption for DTaP and a personal exemption for MMR) ranged from 1.2 percent in the Denver/Metro and Northeast region to 5.5 percent on the Western Slope. The mixed other category included children with both none and unknown exemptions.

The percentage of children in child care facilities who took a medical, religious, or personal exemption or were in process or had some combination of these was:

- 2.9 percent for the weighted Colorado estimate
- 2.1 percent Denver/Metro
- 3.7 percent East Central
- 1.8 percent Northeast
- 5.1 percent Southeast
- 7.8 percent for the Western Slope.



To further explore immunization exemptions, the total number of exemptions taken by children who were not up to date is shown in Figure 3. The majority of children who were not

up to date had no exemption noted in the child care facility record (the mixed other and none categories).

Figure 3. For Children NOT Up to Date in Child Care, Percentage with Exemptions by Region, Colorado Child Care Facility Survey, 2005

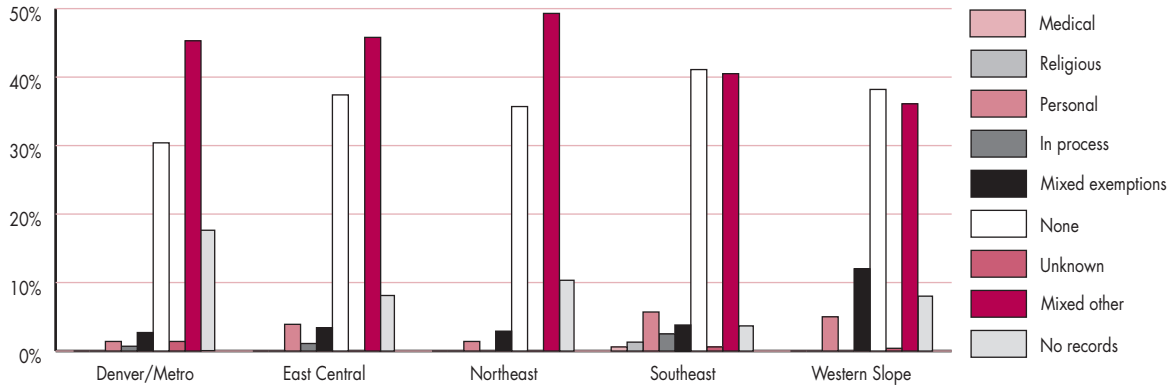


Table 4 lists the number and percentage of exemptions claimed by children who were NOT up to date by vaccine and by region. In general, most children who were NOT up to date had no exemption noted in their file. For these children, there was no information in the record as to why this child was NOT up to date for the required immunizations.

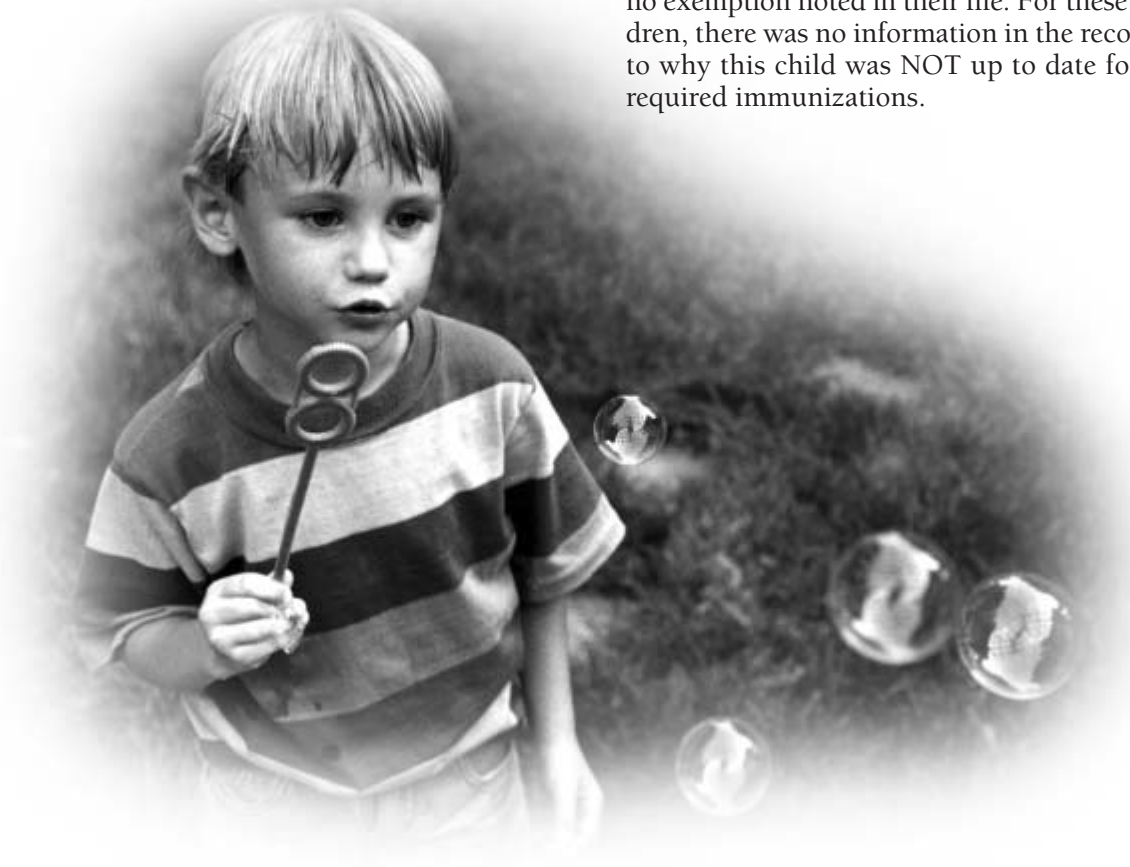


Table 4. Exemptions For NOT Up to Date by Vaccine, by Region, Colorado Child Care Facility Survey, 2005

	Weighted Colorado		Denver/ Metro		East Central		Northeast		Southeast		Western Slope	
	n	%	n	%	n	%	n	%	n	%	n	%
DTaP												
Medical	70	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.9%	0	0.0%
Religious	141	0.1%	0	0.0%	0	0.0%	0	0.0%	2	1.8%	0	0.0%
Personal	9112	4.7%	4	4.1%	7	6.4%	2	2.6%	9	8.0%	14	8.2%
In process	3654	1.9%	1	1.0%	4	3.6%	0	0.0%	6	5.4%	11	6.4%
None	128753	67.0%	61	62.2%	83	75.5%	58	76.3%	86	76.8%	120	70.2%
No records available	43209	22.5%	27	27.6%	15	13.6%	15	19.7%	6	5.4%	20	11.7%
Unknown	7336	3.8%	5	5.1%	1	0.9%	1	1.3%	2	1.8%	6	3.5%
Total	192276	100.0%	98	100.0%	110	100.0%	76	100.0%	112	100.0%	171	100.0%
MMR												
Medical	227	0.1%	0	0.0%	0	0.0%	0	0.0%	1	1.0%	1	0.9%
Religious	164	0.1%	0	0.0%	0	0.0%	0	0.0%	2	2.1%	0	0.0%
Personal	9518	5.0%	3	3.9%	5	5.2%	3	4.3%	9	9.4%	12	10.6%
In process	664	0.3%	0	0.0%	1	1.0%	0	0.0%	3	3.1%	1	0.9%
None	63473	33.0%	18	23.7%	51	52.6%	29	42.0%	45	46.9%	57	50.4%
No records available	43973	22.9%	22	28.9%	15	15.5%	11	15.9%	6	6.3%	9	8.0%
Unknown	74256	38.6%	33	43.4%	25	25.8%	26	37.7%	30	31.3%	33	29.2%
Total	192276	100.0%	76	100.0%	97	100.0%	69	100.0%	96	100.0%	113	100.0%
Hib												
Medical	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Religious	544	0.3%	0	0.0%	0	0.0%	0	0.0%	2	6.9%	0	0.0%
Personal	16557	8.6%	2	4.8%	4	13.3%	3	12.0%	7	24.1%	10	16.9%
In process	7688	4.0%	1	2.4%	3	10.0%	0	0.0%	3	10.3%	5	8.5%
None	28005	14.6%	7	16.7%	5	16.7%	2	8.0%	2	6.9%	5	8.5%
No records available	101859	53.0%	25	59.5%	12	40.0%	15	60.0%	6	20.7%	19	32.2%
Unknown	37622	19.6%	7	16.7%	6	20.0%	5	20.0%	9	31.0%	20	33.9%
Total	192276	100.0%	42	100.0%	30	100.0%	25	100.0%	29	100.0%	59	100.0%
Polio												
Medical	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Religious	213	0.1%	0	0.0%	0	0.0%	0	0.0%	2	2.7%	0	0.0%
Personal	12960	6.7%	4	5.6%	7	7.2%	4	6.7%	9	12.2%	15	12.1%
In process	4098	2.1%	1	1.4%	4	4.1%	0	0.0%	4	5.4%	7	5.6%
None	101613	52.8%	33	45.8%	66	68.0%	39	65.0%	49	66.2%	70	56.5%
No records available	57677	30.0%	27	37.5%	15	15.5%	15	25.0%	6	8.1%	20	16.1%
Unknown	15715	8.2%	7	9.7%	5	5.2%	2	3.3%	4	5.4%	12	9.7%
Total	192276	100.0%	72	100.0%	97	100.0%	60	100.0%	74	100.0%	124	100.0%
Hepatitis B												
Medical	82	0.0%	0	0.0%	0	0.0%	0	0.0%	1	1.0%	0	0.0%
Religious	164	0.1%	0	0.0%	0	0.0%	0	0.0%	2	2.1%	0	0.0%
Personal	10376	5.4%	2	2.7%	7	9.3%	3	5.7%	9	9.4%	15	16.1%
In process	3995	2.1%	1	1.4%	4	5.3%	0	0.0%	3	3.1%	4	4.3%
None	70383	36.6%	26	35.6%	29	38.7%	19	35.8%	45	46.9%	34	36.6%
No records available	59732	31.1%	27	37.0%	15	20.0%	15	28.3%	6	6.3%	20	21.5%
Unknown	47543	24.7%	17	23.3%	20	26.7%	16	30.2%	30	31.3%	20	21.5%
Total	192276	100.0%	73	100.0%	75	100.0%	53	100.0%	96	100.0%	93	100.0%
Varicella												
Medical	146	0.1%	0	0.0%	0	0.0%	0	0.0%	1	1.9%	0	0.0%
Religious	492	0.3%	0	0.0%	0	0.0%	0	0.0%	2	3.7%	1	1.2%
Personal	17450	9.1%	4	6.5%	7	10.9%	5	8.8%	9	16.7%	18	22.0%
In process	1489	0.8%	0	0.0%	1	1.6%	0	0.0%	6	11.1%	1	1.2%
None	4554	2.4%	1	1.6%	0	0.0%	0	0.0%	18	33.3%	0	0.0%
No records available	53580	27.9%	21	33.9%	15	23.4%	11	19.3%	6	11.1%	9	11.0%
Unknown	114565	59.6%	36	58.1%	41	64.1%	41	71.9%	12	22.2%	53	64.6%
Total	192276	100.0%	62	100.0%	64	100.0%	57	100.0%	54	100.0%	82	100.0%

► Reasons Why Children in Child Care Facilities Are Not Up to Date

Excluding children who had taken an exemption, other reasons why children were not up to date were analyzed for each vaccine. The number and percentage of children not up to date

and the reason why are listed in Table 5. A substantial percentage of children were not up to date because there were no immunization records on file in the child care facility.

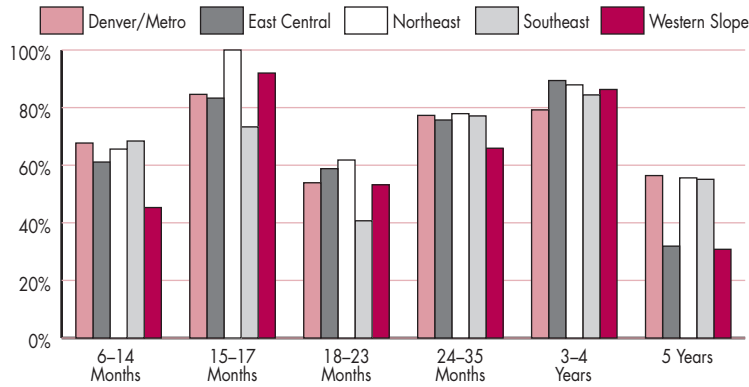
Table 5. Excluding Children with Exemptions, Reasons Why the Child was Not Up to Date by Vaccine and Region, Colorado Child Care Facility Survey, 2005

	Denver/Metro		East Central		Northeast		Southeast		Western Slope	
	n	%	n	%	n	%	n	%	n	%
DTaP										
Not enough shots for age	55	58.5%	52	50.5%	42	56.8%	63	63.0%	91	58.0%
4 shots at 5 yrs of age	11	11.7%	36	35.0%	17	23.0%	28	28.0%	46	29.3%
No records	28	29.8%	15	14.6%	15	20.3%	9	9.0%	20	12.7%
Total	94	100.0%	103	100.0%	74	100.0%	100	100.0%	157	100.0%
MMR										
No shot	33	45.2%	26	28.3%	26	39.4%	32	38.6%	34	34.0%
1 st shot < 1 year old	8	11.0%	14	15.2%	11	16.7%	12	14.5%	7	7.0%
No 2 nd shot at 5 yrs	10	13.7%	37	40.2%	18	27.3%	32	38.6%	50	50.0%
No records	22	30.1%	15	16.3%	11	16.7%	7	8.4%	9	9.0%
Total	73	100.0%	92	100.0%	66	100.0%	83	100.0%	100	100.0%
Hib										
1 st shot < 1 year old no 2 nd shot	7	17.5%	7	26.9%	6	27.3%	2	10.0%	23	46.9%
Shots	9	22.5%	7	26.9%	4	18.2%	10	50.0%	18	36.7%
No records	24	60.0%	12	46.2%	12	54.5%	8	40.0%	8	16.3%
Total	40	100.0%	26	100.0%	22	100.0%	20	100.0%	49	100.0%
Polio										
Not enough shots for age	28	41.2%	34	37.8%	23	41.1%	29	46.0%	47	43.1%
3 Shots at 5 yrs of age	12	17.6%	41	45.6%	18	32.1%	25	39.7%	42	38.5%
No records	28	41.2%	15	16.7%	15	26.8%	9	14.3%	20	18.3%
Total	68	100.0%	90	100.0%	56	100.0%	63	100.0%	109	100.0%
Hepatitis B										
Not enough shots for age	44	62.0%	53	77.9%	35	70.0%	36	85.7%	54	69.2%
No records	27	38.0%	15	22.1%	15	30.0%	6	14.3%	24	30.8%
Total	71	100.0%	68	100.0%	50	100.0%	42	100.0%	78	100.0%
Varicella										
No shot or history of disease	37	63.8%	42	73.7%	41	78.8%	42	82.4%	53	84.1%
No records	21	36.2%	15	26.3%	11	21.2%	9	17.6%	10	15.9%
Total	58	100.0%	57	100.0%	52	100.0%	51	100.0%	63	100.0%

The distribution of up-to-date status by age and vaccine is shown in the following figures. The required age, as specified by the Rules of the Colorado Board of Health, for vaccine administration was used to define the age groups in

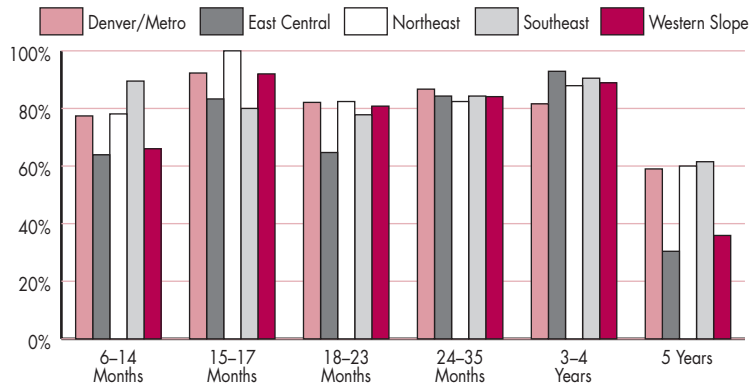
Figures 4–9. Since there were less than 10 children under six months of age included in each regional sample those age groups were dropped from the figures.

Figure 4. Percentage of Children Up To Date for DTaP in Child Care Facilities by Age Group and Region, Colorado Child Care Facility Survey, 2005



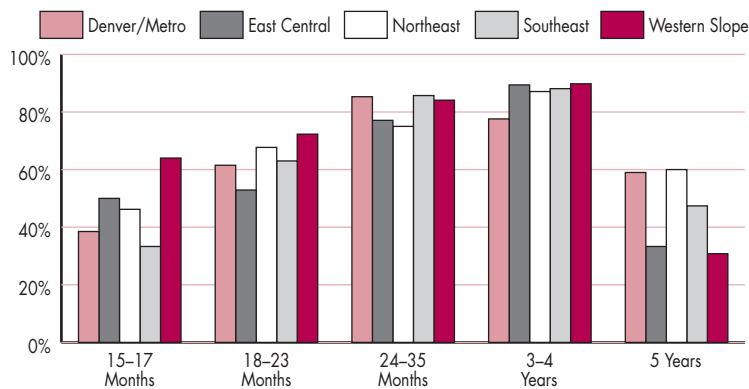
In most regions between 60 and 70 percent of the children 6–14 months had received the required 3 DTaP shots. But on the Western Slope only 45 percent had received 3 DTaP shots (Figure 4). At 18–23 months, when a fourth DTaP shot is required the rates dropped and ranged from 41 percent to 62 percent. At five years, when a fifth DTaP shot is required, the rates dropped dramatically and ranged from 31 percent to 56 percent.

Figure 5. Percentage of Children Up To Date for Polio in Child Care Facilities by Age Group and Region, Colorado Child Care Facility Survey, 2005



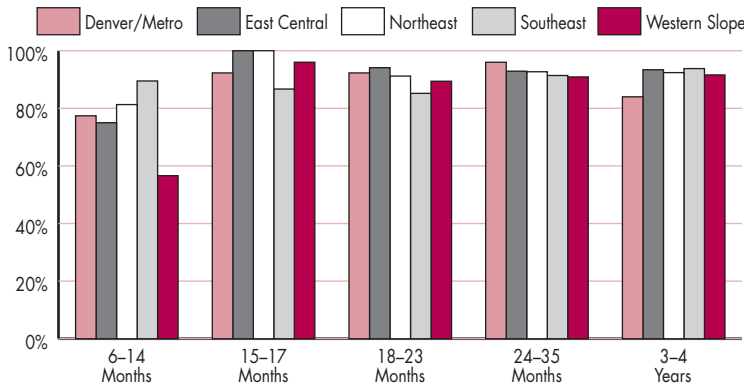
For polio, the percentages of children up to date dipped slightly at 18–23 months and again at five years, when additional polio shots are required (Figure 5). In general, however, with the exception of the five year olds, close to 80 percent or more of children were up to date for polio.

Figure 6. Percentage of Children Up To Date for MMR in Child Care Facilities by Age Group and Region, Colorado Child Care Facility Survey, 2005



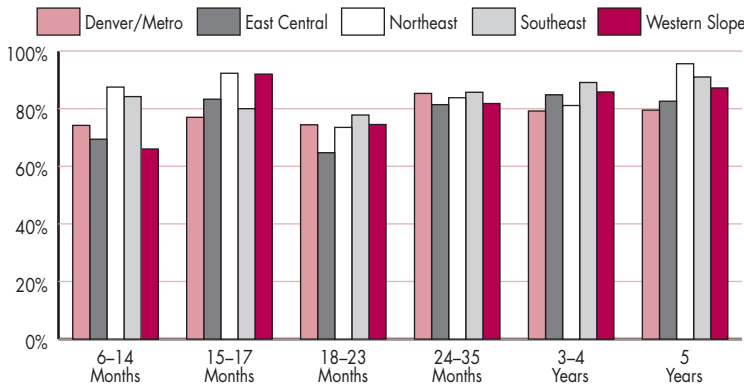
With the exception of the Western Slope, 50 percent or less of children 15–17 months of age in child care had received their first MMR shot (Figure 6). This percentage rises to nearly 90 percent for most regions except for Denver/Metro where 78 percent of children three to four years had received the required MMR shot. At five years, the percentage of children who had received the second required dose of MMR dropped sharply and ranged from only 30 to 60 percent.

Figure 7. Percentage of Children Up To Date for Hib in Child Care Facilities by Age Group and Region, Colorado Child Care Facility Survey, 2005



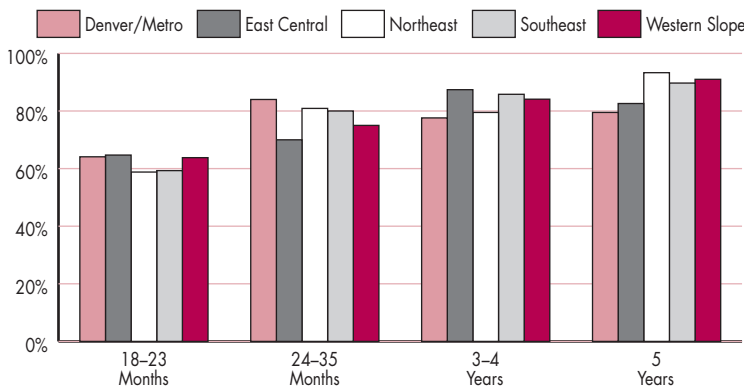
At 15 months of age, children in child care facilities were up to date on their Hib immunization over 85 percent of the time (Figure 7). Hib immunizations remained up to date over 80 percent of the time regardless of the child's age.

Figure 8. Percentage of Children Up To Date for Hep B in Child Care Facilities by Age Group and Region, Colorado Child Care Facility Survey, 2005



At 6–14 months of age, up to date status for Hepatitis B ranged from 66 percent to 87 percent (Figure 8). The percentage of children up to date for Hepatitis B fell at 18–23 months when the third dose is required, then continued to rise through five years of age.

Figure 9. Percentage of Children Up To Date for Varicella in Child Care Facilities by Age Group and Region, Colorado Child Care Facility Survey, 2005



Sixty to sixty-five percent of children were up to date for Varicella at 18–23 months of age (Figure 9). These percentages continued to rise through five years of age.

Figure 10. Percentage of Children Up to Date by Year of Age and Region, Colorado Child Care Facility Survey, 2005

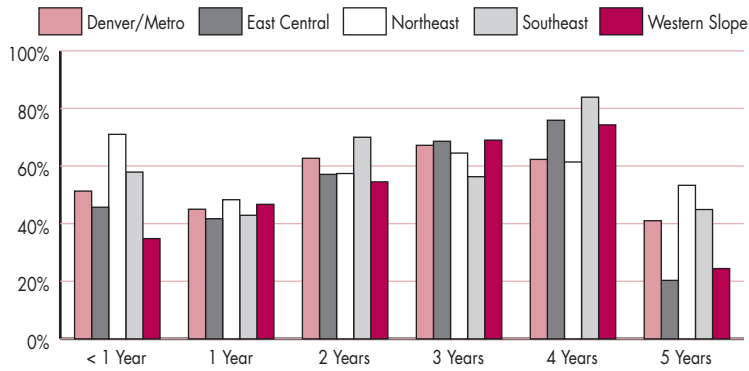


Figure 10 examines the percentage of children who are age appropriately immunized. For children less than one year of age only 35 percent were up to date on their immunizations on the Western Slope. At one year of age, less than half of the children in any region were appropriately immunized. In general, the percentage of children up to date increased as the child got older until a steep decline at five years of age.

► Factors Associated With Being Up to Date

Other data collected during the child care facility survey included the child's gender, race, ethnicity and country of birth (Table 6).

Table 6. Factors Associated with Being Up to Date at Child Care Facility Entry, Colorado Child Care Facility Survey, 2005

	Denver Metro		East Central		Northeast		Southeast		Western Slope	
Known Gender	n	% UTD	n	% UTD	n	% UTD	n	% UTD	n	% UTD
Male	192	60.4	216	57.4	166	59.9	227	65.6	261	52.9
Female	137	51.8	191	54.5	167	57.2	197	60.9	258	55.0
Race										
Asian	8	100.0	10	40.0	3	66.7	4	100.0	6	50.0
Black	19	52.6	24	37.5	2	100.0	5	80.0	7	57.1
Hispanic	20	55.0	56	69.6	27	77.8	91	65.9	42	47.6
White	195	60.5	308	55.5	292	56.8	301	62.5	407	55.3
Other	11	72.7	9	66.7	2	50.0	7	14.3	11	63.6
Unknown	84	42.9	1	0.0	10	50.0	19	63.1	55	50.9
Ethnicity										
Hispanic	33	57.6	97	68.0	39	76.9	132	65.9	74	51.4
Not Hispanic	195	63.6	304	52.6	271	56.5	263	62.4	384	55.5
Unknown	106	42.6	4	50.0	26	53.9	31	58.1	64	51.6
Day Care Type										
Center	143	55.2	173	59.5	78	64.1	221	61.5	244	52.1
Home	164	58.5	215	50.0	248	56.9	206	64.6	284	56.3
Other	31	51.6	20	85.0	10	60.0	0	0.0	0	0.0
Accept Kids who are not Up to Date										
Yes	164	50.0	139	52.4	222	57.9	249	58.2	363	53.2
No	166	50.0	269	63.3	114	59.0	178	69.7	152	58.6
Accept Kids who claim exemptions										
Yes	254	59.5	296	53.6	288	58.3	389	63.0	114	66.7
No	79	45.6	112	57.1	48	60.4	32	56.3	410	51.4
Country of Birth										
USA	196	59.2	371	56.9	299	58.9	366	59.8	443	53.7
Other	101	55.5	36	50.0	36	55.6	61	82.0	84	58.3

Lightly shaded areas indicate statistical significance.

There was no association between a child's immunization status and his or her gender or race (Table 6). Although there was no single factor statistically associated with being up to date across all five regions, the significant associations found include:

- Hispanic ethnicity versus non-Hispanic ethnicity was statistically associated with being up to date in the East Central and Northeast regions. Conversely, Hispanic ethnicity versus non-Hispanic ethnicity was statistically associated with a lower up-to-date rate in the Denver/Metro region.
- A child born out of the country was less likely to be up to date on his or her immunizations compared to a child born in the USA except on the Western Slope. This finding was statistically significant in the Southeast region. (Table 6).

- Facilities that refused to accept children with immunization exemptions had more children that were up to date with the exception of the Denver/Metro region where the percentages were equal. There was a statistical association with this factor in the East Central and Southeast regions. Children in facilities who did not accept children with exemptions were up to date 70 percent or less of the time. (Table 6).



► Conclusions

These data from the 2005 Child Care Facility Survey indicate that Colorado child care facilities are not in compliance with the Rules of the Colorado Board of Health. Immunization records in child care facilities found that only 56.6 percent of children had received the required vaccines and only 69.8 percent had approved immunization certificates on file.

Although the percentage of children up to date in child care facilities ranged from 54.4 percent to 63.0 percent between the five regions, these coverage rates were not statistically different. The low immunization coverage rate in children in child care facilities is a statewide problem and not specific to any given region.

For the children who were not up to date, most had no information in their record as to why they were not up to date. They were not in process nor had they taken an exemption. The assumption would be that the child care facility staff believed these children to be up to date on their immunizations. In the event of a pertussis outbreak, susceptible children would not have been able to be correctly identified.

Interestingly, facilities that indicated they did not accept children with exemptions had up to date rates of less than 70 percent. This supports the assumption that staff believes a child is up to date on their immunizations however, an analysis of the shot dates found they were not up to date.

When the coverage rates of individual vaccines were analyzed, the most common reasons that children were not up to date were that the children were missing shots, or they had no record of immunizations. It is likely that some percentage of the children who were not up to date had received the required vaccines but did not have the documentation in their child care facility files.

Examining up-to-date status by age and vaccine found that up-to-date status dropped for the age groups when an additional vaccine was required. This may be due to record keeping and reflect that child care providers are not updating immunization records. The low percentages of children 6–14 months who are up to date for DTaP is alarming in a state with rising incidence of pertussis.

There were factors statistically associated with a child being up to date in child care facilities. Hispanic ethnicity was associated with being more up to date than non-Hispanic ethnicity (East Central and Northeast regions) and with being less up to date than non-Hispanic ethnicity (Denver/Metro). Being born outside the USA was associated with being up to date in the southeast region of Colorado.

Supplemental funds to support this project were provided by the Centers for Disease Control and Prevention. Two local health departments used their own funds to over sample and thus, have reliable estimates for their county immunization rates. Other local public health agencies expressed an interest in over sampling to obtain their county-specific coverage rates. The Immunization Program is exploring avenues to provide funding for the increased number of audits associated with an over sample.

These data will be shared with state and local public health personnel, child care facility staff, and other interested individuals or organizations. These data will be used in efforts to increase the number of children who are up to date on their immunizations in child care facilities.



