

# Kindergarten School Immunization Survey 2015-16



# Introduction

The Colorado Board of Health sets rules for student immunization requirements for school attendance in rule 6 CCR 1009-2: Rules Pertaining to the Infant Immunization Program and the Immunization of Students Attending School. Since the 2013-2014 school year, the Board of Health rules for school immunizations have reflected the current Advisory Committee on Immunization Practices (ACIP) recommendations for valid vaccine doses. For a dose to be considered valid, it must have been given according to the minimum age and minimum intervals set by ACIP. Doses given too early or outside the recommended intervals are not counted when determining if a student meets the requirements.

To be in compliance with the Board of Health rules, students attending school must either:

- Be appropriately immunized with *valid* doses of the required vaccines or have evidence of immunity. The immunization requirements for kindergarteners in 2015-2016 are:
  - 5 Diphtheria, Tetanus, and Pertussis (DTaP) or 4 if the 4<sup>th</sup> dose is on or after 4<sup>th</sup> birthday.
  - 2 Measles, Mumps and Rubella (MMR).
  - 4 Polio or 3 if the 3<sup>rd</sup> dose is on or after the 4<sup>th</sup> birthday.
  - 3 Hepatitis B.
  - 2 Varicella.
- Be exempt from immunization. A parent or guardian is responsible to have their child immunized unless the child is exempted. In Colorado, parents may exempt from one or more vaccines by claiming a medical or non-medical exemption.
  - Medical exemption - a health practitioner indicates that the immunization would endanger the student's health or the student cannot be immunized due to other medical conditions.
  - Non-medical exemption -
    - Religious - the parent or guardian adheres to a religious belief whose teachings are opposed to immunizations.
    - Personal belief - the parent or guardian has a personal belief that is opposed to immunizations.
- Be "in process" - getting immunized but not fully immunized at the point of the survey collection. The parent or guardian has a written plan in place for obtaining any remaining required immunizations.

# Methods

The Colorado Immunization Branch (CIB) has conducted an annual survey, from 2004-2005 through 2015-2016, to assess compliance with school immunization rules. For the survey, a random sample of 350 students is selected from over 60,000 kindergarteners enrolled at public and private schools throughout Colorado. CIB provides training and support for school staff to identify and submit immunization information for the student(s) selected at their school. None of the information submitted contains personally identifiable information. The Colorado Department of Education determined that this school survey methodology is compliant with the Family Education Rights and Privacy Act (FERPA); review the [guidance document](#) for more information.

The survey collects immunization information from a sample of students because it is cost-prohibitive to collect data from all kindergarteners in Colorado using this methodology. For the 2015-2016 survey, data was collected for 350 students from 309 schools.

The information collected includes the number of days between birth and each dose of a required immunization; any medical or non-medical (religious or personal belief) exemptions claimed; and the student's history of disease for varicella. CIB analyzes the data submitted to determine immunization coverage and how many kindergarteners are in compliance with the school immunization rules.

The survey results are reported as a rate with a range or confidence interval (CI) where the true rate falls 95% of the time. If the confidence intervals overlap between years, the rates are not statistically different.

The criteria used to assess whether a student is up to date has changed as the Board of Health rules have been updated. The ACIP criteria for valid doses of MMR have been used since the school survey began in 2004-2005 because they were included in the Board of Health rules. The ACIP criteria for varicella have been included since it was introduced into the rules in the 2007-2008 school year. For the 2012-2013 survey, the ACIP criteria for DTaP were included. Since 2013-2014, the ACIP criteria were included for Polio and Hepatitis B.

# School Entry Immunization Coverage

Immunization coverage at school entry is reported through two measures: up to date and in compliance. Up to date is defined as being appropriately immunized for all required immunizations. In compliance includes the students who are up to date as well as any students who exempted from immunizations or who are in process of getting immunized.

The percentages or rates of kindergarteners who were up to date or in compliance with school immunization requirements are shown in Table 1. There were increases in the rate of students up to date for all vaccines, the rate of students in compliance, and the up-to-date rates for individual vaccines. The increases were not statistically significantly different from 2014-2015.

Table 1  
Kindergartners Up to Date and In Compliance Rates  
and 95% Confidence Intervals  
(Confidence Intervals)

	2014-15	2015-16
Up to Date for All Required Vaccines	73.4 (68.8-78.1)	74.9 (70.3-79.4)
In Compliance for All Required Vaccines	78.9 (74.6-83.2)	79.8 (75.2-83.7)
<b>Individual Vaccines</b>		
DTaP	84.3 (80.5-88.1)	86.6 (83.0-90.2)
Polio	81.4 (77.3-85.5)	82.3 (78.3-86.3)
MMR	86.9 (83.3-90.4)	87.1 (83.6-90.7)
Hepatitis B	86.9 (83.3-90.4)	90.3 (87.2-93.4)
Varicella	85.4 (81.7-89.1)	85.7 (82.0-89.4)

# Exemptions

The percentage of kindergarteners exempting from one or more vaccines was 4.3% in 2015-2016 and 5.4% in 2014-2015 (Table 2). The rate of students claiming exemptions has been consistent over the past three years.

Table 2  
**Kindergarteners Claiming Exemptions**  
 (Confidence Intervals)

School Year	2014-15	2015-16
Exemption Rates and 95% Confidence Intervals	5.4 (3.0-7.8)	4.3 (2.2-6.4)

The majority of exemptions claimed are for personal beliefs (Table 3). While some students took an exemption for every vaccine, others selectively took an exemption for one or more vaccines. For example, a student may have a personal belief exemption for MMR but be up to date for all other vaccines.

In both 2014-2015 and 2015-2016, there are some zeros reported in the religious and medical exemption table below. Although there were students claiming religious and medical exemptions during these years, the survey was not able to detect them because these students were not selected in the sample. Based on data from previous years, approximately 0.3% or fewer kindergartners claim medical and religious exemptions each year.

The percentage of students that were non-compliant (they did not have the required immunizations, did not claim an exemption and were not in process) remained the same at 20.2%. There was a slight increase in the number of students that did not have a school immunization record from 0.9% to 1.7%. These changes are not statistically significant, indicating no measurable differences from last year.

Table 3  
Kindergarteners Immunization Status Rates at School Entry

	2014-15	2015-16
Up to Date for All Required Vaccines Calculated using ACIP valid dose criteria	73.4	74.9
Personal Belief Exemption for All Required Vaccines	2.6	2.3
Personal Belief Exemption for One or More but not All Required Vaccines	2.5	1.7
Medical Exemption for All Required Vaccines	0 <sup>a</sup>	0 <sup>a</sup>
Medical Exemption for One or More but not all Required Vaccines	0 <sup>a</sup>	0 <sup>a</sup>
Religious Exemption for All Required Vaccines	0 <sup>b</sup>	0.3
Religious Exemption for One or More but not all Required Vaccines	0.3	0 <sup>c</sup>
In Process	1.1	0.6
Non-compliant students without all the required vaccines who were not In Process or had not claimed an exemption	20.3	20.2
No school immunization record	0.9	1.7

In the survey no exemptions were claimed for:

<sup>a</sup> Medical

<sup>b</sup> Religious for all vaccines

<sup>c</sup> Religious for one or more vaccines

# Future Considerations for School Immunization and Exemption Data

## Update on House Bill 14 - 1288 Implementation

Through a 2013 stakeholder engagement process, healthcare providers, public health, schools, parents and advocates from many organizations met over the course of six months to discuss and recommend proposed changes to personal belief exemption policies in Colorado. Some of the recommendations from this stakeholder process were implemented through the 2014 Colorado legislative session. House Bill 14 - 1288 (HB1288) went into effect July 1, 2014 and contained a number of requirements that are impacting the immunization and exemption rate data in Colorado, including:

- Schools/childcares are now required to make the immunization and exemption rates of their enrolled students publicly available, upon request. CDPHE is providing assistance to schools/childcares with the analysis and interpretation of the data;
- Colorado Board of Health (BOH) has approved the content of an online education module created by CIB, including the benefits and risks of immunization, evidence-based research, resources and information from credible scientific and public health organizations, and peer-reviewed studies;
- Colorado BOH was directed to make rules regarding the frequency of submitting immunization exemption forms; and
- CDPHE was directed to work with other state departments to develop joint immunization data collection and sharing policies.

Passage of HB1288 has led to growing interest in school immunization and exemption rates. Parents, advocates, public health, schools and the media have all accessed this data now that it is publicly available. Data transparency helps parents to make informed decisions about where to send their child to school, particularly those who have small children too young to be immunized, or a child with a medical condition that prohibits them from being vaccinated. Knowing that there is interest in the data also encourages schools to prioritize the time spent ensuring that their immunization records are complete with either a documented exemption or an up-to-date certificate of immunization on file for each student. Complete and accurate immunization records for all students provides information used to protect students from vaccine preventable diseases, particularly during an outbreak when those students who are not fully immunized may need to be kept out of school for their protection.

## New Colorado Board of Health School Immunization Rules

HB1288 resulted in the Colorado Board of Health (BOH) developing rules related to the frequency of submitting exemption forms. Colorado Revised Statute (C.R.S) § 25-4-901 and associated rule 6 CCR 1009-2 require schools and child care facilities to collect records documenting immunizations received and/or vaccine exemption for each student and to keep them on file.

Beginning July 1, 2016, parents claiming a non-medical exemption (personal belief or religious) for their children have to do so more often. Parents of students in kindergarten through 12th grade attending a public, private or parochial school must submit non-medical exemptions annually. Parents of children attending a licensed childcare facility must submit non-medical exemptions with the same frequency they would have vaccinated their child during a well child visit: at 2 months, 4 months, 6 months, 12 months and 18 months. Vaccine exemption forms are available at [www.colorado.gov/vaccineexemption](http://www.colorado.gov/vaccineexemption).

Parents/students may now choose to electronically submitting exemption forms to CDPHE or they may print forms and submit them directly to a school or childcare facility. If parents submit an exemption form to CDPHE, the exemption information is transferred to the Colorado Immunization Information System (CIIS) for viewing by the appropriate school or childcare facility. Parents/students continue to have the option to opt out of having their information in CIIS.

Beginning December 1, 2016, all schools and licensed child care will annually report aggregate immunization and exemption data to CDPHE. The data from the individual schools and child care facilities will be posted on the Department's website and available to parents, the media and others. This will change how data is collected for CDC's annual kindergarten immunization survey. Colorado will no longer conduct a simple random survey and will use the information submitted by schools and child cares to report Colorado immunization and exemption rates. This change in methods may impact the immunization, exemption, and compliance rates in future reports.

## Enhancements to CIIS

Authorized by C.R.S. 25-4-2403, CIIS, Colorado's immunization registry, is a statewide, confidential, life-long, population-based and web-based system that consolidates immunization records for more than 5.5 million Coloradans, including 99% of children 0 - 6 years of age. Currently, 92% of all school districts have access to CIIS.

CIIS enables public health, healthcare providers, schools, childcares, and health plans in Colorado to electronically track immunizations a person has received in a single location, thereby maintaining an ongoing and complete record to ensure that the person receives all recommended immunizations in a timely manner. CIIS offers value-added services that can support schools in meeting the requirements of HB1288 as well as Board of Health rule 6 CCR 1009-2, including: forecasting needed immunizations, generating official certificates of immunization and administrative records, identifying persons coming due or overdue for immunizations, and generating immunization coverage reports at the school level.



CIIS is in the process of adding additional features that will make the registry even more useful to schools. By the first quarter of 2017, CIIS plans to add new functionality and develop training materials for the following enhancements:

- Exemption Module - Add a module in the CIIS School application that will allow for easier and quicker documentation of student exemptions.
- Exemption Reports - Add a dual use report that will generate an aggregate exemption rate or line listing of students with an exemption (Note: the aggregate report is only useful if all of students in a school is associated with a school's profile)
- Student Roster Upload - Add a dual purpose feature that will allow schools to upload a roster of their students so they can be associated with the school's profile automatically in CIIS. Additionally, after uploading the roster, schools will have the option of downloading a report with all immunizations their student's have received so they can upload this information in their own electronic system.

## Conclusions

The national goals for school immunization coverage are outlined in the Healthy People 2020 (HP2020) objectives. The HP2020 goals are for 95% of kindergarteners to be appropriately immunized for DTaP, polio, MMR, hepatitis B and varicella. Colorado fell short of the HP2020 goal for all of the required vaccines. There is clearly a need to increase the number of kindergarteners who have received the required immunizations as they enter school, but we also need to improve the quality of school immunization data in Colorado.

The survey results indicate that over 25% of kindergarteners starting school in 2015-2016 did not have one or more of the required immunizations documented in their school immunization record (Table 1). This represents a slight, but not statistically significant decrease, of just 1.5% from last year. Due to lack of documentation, we are unable to determine if these students are protected from vaccine preventable diseases or if they have claimed an exemption and should be excluded from school during an outbreak. These kindergarteners were not in compliance with the Board of Health regulations required for attending school. This indicates that when these students registered either they were not identified as non-compliant or efforts by school staff to ensure the child received the required immunizations were not effective.

The challenges in interpreting the school rules that include the ACIP minimum interval requirements could have also contributed to the number of non-compliant students. Since the ACIP recommendations can be difficult for physicians, nurses, school staff and parents to interpret, Colorado's immunization registry, CIIS, can be a valuable tool to help follow the ACIP recommended schedule. The current school immunization rules align with the ACIP schedule, so schools can now use CIIS to review student records to determine if immunizations meet the ACIP valid dose requirements as well as generate accurate immunization rates. In the future, CIIS will offer more tools that will allow for easier documentation of exemptions and exemption rate calculation.

The immunization rates show that kindergartners are not adequately protected from vaccine preventable disease. Colorado’s school children may be vulnerable to outbreaks of pertussis, measles, mumps, and varicella. Colorado experienced a pertussis epidemic from 2012 - 2014, with the highest number of cases since the 1950s and nearly 1300 cases of pertussis reported in 2014 alone. In 2015, Colorado had 914 reported cases of pertussis, which is lower than the three-year epidemic but higher than the previous five-year baseline average. Colorado also had seven cases of mumps, 1 case of measles, and 313 cases of varicella reported in 2015.

Colorado’s kindergarten immunization coverage rates fall short of the levels needed to prevent disease as outlined in the HP2020 goals. The new frequency of submitting exemptions, and required immunization and exemption rate reporting by schools are likely to shine a light on areas where Colorado can improve vaccination rates and accuracy and timeliness of data collection. In order to better prevent transmission of vaccine preventable disease and protect our most vulnerable Coloradans, public health, healthcare providers and the education community need to work more closely together to ensure adequate immunization coverage levels and accurate data.

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