



Iowa Immunization Program

2022

State Immunization Data Report

Bureau of Immunization and TB
Division of Public Health
Iowa Department of Health and Human Services
July 20, 2023

Public Health
IOWA HHS

TABLE OF CONTENTS

- List of Figures and Tables..... 2
- Introduction 3
- Iowa Immunization Registry Information System (IRIS) 4
- Iowa Public Health Tracking Portal..... 5
- Childhood Immunizations**..... 6
 - Vaccines Included in Childhood Immunization Data..... 7
 - 2022 Iowa Childhood Immunization Data..... 8
- Adolescent Immunizations** 10
 - Vaccines Included in Adolescent Immunization Data 11
 - 2022 Iowa Adolescent Immunization Data 12
- Human Papillomavirus (HPV) Vaccine** 14
 - 2022 Iowa HPV Immunization Data..... 15
- Impact of COVID-19 on Childhood and Adolescent Immunization Rates..... 18
- Current strategies to improve childhood and adolescent vaccination rates:..... 19
- School and Child Care Audits** 20
 - Types of School and Child Care Immunization Certificates 21
 - 2022-23 School Immunization Audit Data. 22
 - 2022-23 Child Care Immunization Audit Data..... 24
- Impact of Missed Immunizations, Immunization Exemptions, and Vaccine Hesitancy..... 26
- Adult Immunizations**..... 27
 - 2022 Adult Immunization Data..... 28
- Influenza Vaccine**..... 30
 - 2022-23 Influenza (Flu) Vaccinations in Iowa..... 31
- Summary of 2022 Immunization Rates in Iowa:..... 33
- Future Directions..... 34
- Additional Resources..... 35
- References 35

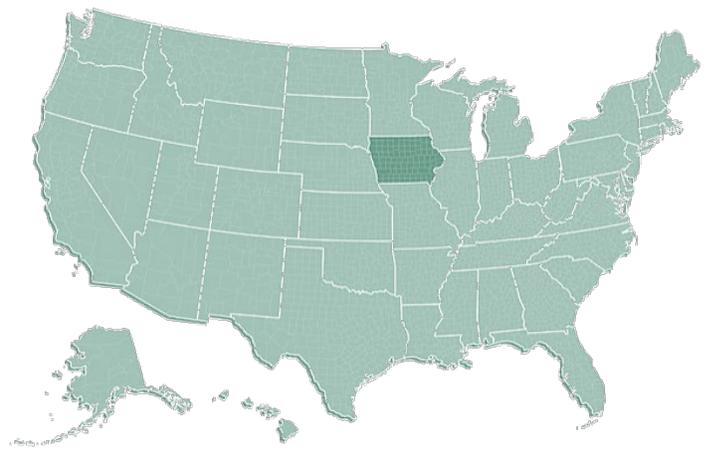
LIST OF FIGURES AND TABLES

FIGURES

Figure 1. Map of 2022 childhood 4:3:1:3:3:1:4 vaccine series completion – 2-year-olds in Iowa.....	8
Figure 2. Iowa childhood (2-year-olds) immunization rates by vaccine type in 2022.....	9
Figure 3. Iowa childhood (2-year-olds) 4:3:1:3:3:1:4 vaccine series completion over time (2013-2022).....	9
Figure 4. Map of 2022 adolescent 3:1:2:1:2 vaccine series completion - 13-15-year-olds in Iowa.....	12
Figure 5. 2022 adolescent immunizations in Iowa by vaccine type.....	13
Figure 6. Iowa adolescent 3:1:2:1:2 vaccine series completion over time (2013-2022).....	13
Figure 7. Map of 2022 HPV vaccine series completion in adolescents in Iowa.....	15
Figure 8. Map of HPV vaccine series initiated among adolescents in Iowa.....	16
Figure 9. HPV vaccination rates in Iowa over time (2018-2022).....	16
Figure 10. 2022 HPV immunization rates compared with Td/Tdap and Meningococcal vaccine coverage in Iowa.....	17
Figure 11. Percent of under- and un-immunized students in Iowa over time (2012-2023).....	23
Figure 12. Percent of under- and un-immunized students in Iowa by type of exemption or certificate.....	23
Figure 13. Percent of under- and un-immunized children in licensed child care in Iowa over time (2012-2023).....	25
Figure 14. Percent of under- and un-immunized children in licensed child care in Iowa by type of exemption or certificate (2012-2023).....	25
Figure 15. 2022 adult immunization coverage rates by vaccine type.....	29
Figure 16. Adult immunization coverage rates by vaccine type (2018-2022).....	29
Figure 17. Map of influenza vaccine coverage during the 2022-23 flu season in Iowa.....	31
Figure 18. Iowa influenza vaccination rates over time (2017-2022).....	32
Figure 19. Iowa influenza vaccination rates by age group over time.....	32

TABLES

Table 1. 2022 school immunization audit data by immunization certificate type.....	22
Table 2. 2022 child care immunization audit data by immunization certificate type.....	24
Table 3. Vaccines included in Iowa's adult immunization data.....	28



INTRODUCTION

Vaccines are considered to be one of the greatest public health achievements of the 20th century and one of the most economical health interventions. Vaccines teach the immune system how to recognize and fight bacteria and viruses before an infection can happen. Vaccines provide protection without a person getting sick and suffering the complications of a disease.

For every \$1 spent on vaccines given routinely to children, the U.S. saves \$10.90 in medical costs by averting costs to treat diseases. A study from the Centers for Disease Control and Prevention reports vaccines administered to children and infants born between 1994 and 2018 will prevent 419 million illnesses, help avoid 936,000 deaths and save nearly \$1.9 trillion in total societal costs.

Achieving and maintaining high vaccination rates are two of the most important safeguards to prevent the spread of vaccine-preventable diseases. Many diseases are now rare due to the achievement of high immunization rates. However, the absence of these diseases no longer serves as a reminder of the severity and potential life-threatening complications of vaccine preventable diseases. Immunization rates in Iowa are consistent with or exceed national averages.

While immunization rates remain high, pockets of populations not immunized leave people and their communities more susceptible to vaccine preventable diseases. Viruses and bacteria causing vaccine-preventable diseases still exist and can be passed to people who are not protected by vaccines. Healthcare providers are an essential stakeholder in achieving and maintaining high vaccination rates.

This report is intended to provide an overview of the current state of immunization rates in Iowa based on data published on the Iowa Public Health Tracking Portal. The portal includes data for childhood, adolescent, and adult immunizations, as well as Human Papillomavirus (HPV), influenza, and COVID-19 vaccines. Immunization rates are based on data from Iowa's Immunization Registry Information System (IRIS). The purpose of the public health tracking portal is to provide Iowa healthcare providers, state and local partners, and the general public with information regarding immunization coverage in Iowa. This information can be used to guide strategies to improve immunization practices and identify areas with low vaccination coverage and increased risk for vaccine preventable disease.



Iowa Immunization Registry Information System (IRIS)

Iowa's Immunization Registry Information System (IRIS) is a secure, confidential, repository of individual immunization records from participating public and private healthcare providers.

- IRIS contains patient records from all ages and is used to keep patients on schedule for their recommended immunizations.
- Data from IRIS is used to calculate county and state immunization rates for specific populations, including 2-year-old children, adolescents, and adults, and for specific vaccines, including HPV, influenza, and COVID-19.
- School and child care audit assessment data is collected in IRIS to ensure attendees receive the required immunizations.

Data Considerations and Limitations:

- The quality of data in IRIS and the calculated coverage rates are dependent upon healthcare provider participation in the registry and collection of information on doses administered prior to the launch of IRIS in 2001.
- The data may include individuals that no longer reside in Iowa, but still have an active record in IRIS. These records may affect the overall immunization rate.
- IRIS does not routinely receive immunization data from other states. This limitation may affect the vaccine coverage in counties that border other states and among residents who received vaccines prior to 2001.

IRIS is the best source in which to assess immunization rates in Iowa.

High IRIS participation among healthcare providers captures the majority of immunizations administered throughout Iowa and provides the most complete dataset to calculate and evaluate immunization coverage.

Iowa Public Health Tracking Portal

The **Iowa Public Health Tracking Portal** provides immunization and assessment data for Iowa healthcare providers and local partners in order to:

1. Track progress towards goals
2. Improve immunization practices
3. Guide strategies to improve immunization service and delivery
4. Identify pockets of under- and un-immunized populations

What does the data tell us?

- Portal data provides information regarding vaccine coverage by vaccine type or series in Iowa residents.
- This data is used to identify if immunization rates are increasing or decreasing over time in order to help guide interventions and target population with low vaccination coverage.
- Data included in this report is based on data from the Iowa Public Health Tracking Portal using the **IRIS population denominator** for childhood, adolescent, HPV, and adult vaccinations and census denominator for influenza vaccination rates. More information regarding Census vs. IRIS population denominator can be found [here](#).
- A data summary for COVID-19 vaccine is not available due to the ongoing campaign and monthly data updates. Most recent data regarding COVID-19 vaccine administrations can be found on the [COVID-19 portal page](#).

Data Available on the Iowa Public Health Tracking Portal:

- Childhood Immunizations
- Adolescent Immunizations
- Adult Immunizations
- Human Papillomavirus (HPV) Vaccine
- School and Child Care Audits
- Influenza Vaccine
- COVID-19 Vaccine



CHILDHOOD IMMUNIZATIONS

Vaccines teach the immune system how to recognize and fight bacteria and viruses before an infection can occur. Vaccines provide protection without a child experiencing the complications of a disease.

The Advisory Committee on Immunization Practices (ACIP) develops written recommendations for the routine administration of vaccines, along with schedules regarding the appropriate timing, dosage and contraindications. The recommended vaccines for 2-year-olds can be found [here](#).

Who is included in Childhood Immunization Data?

- Includes patients served by both public and private healthcare providers with a record in IRIS that have a zip code and are an “active” patient within a healthcare provider organization.
- The 2022 data includes children that turned **2 years old** in 2022. These children were born between 01/01/2020 - 12/31/2020.

Vaccines Included in Childhood Immunization Data

Childhood immunization data includes the percent of children that received the ACIP recommended doses of the following vaccines by 24 months of age (2 years old):

- 4 DTaP - Diphtheria, Tetanus, and Pertussis
- 3 Polio - Poliovirus
- 1 MMR – Mumps, Measles, and Rubella
- 3 Hib - Haemophilus Influenzae Type B
- 3 Hepatitis B – Hepatitis B
- 1 Varicella – Varicella (Chickenpox)
- 4 PCV - Pneumococcal

4:3:1:3:3:1:4 Vaccine Series:

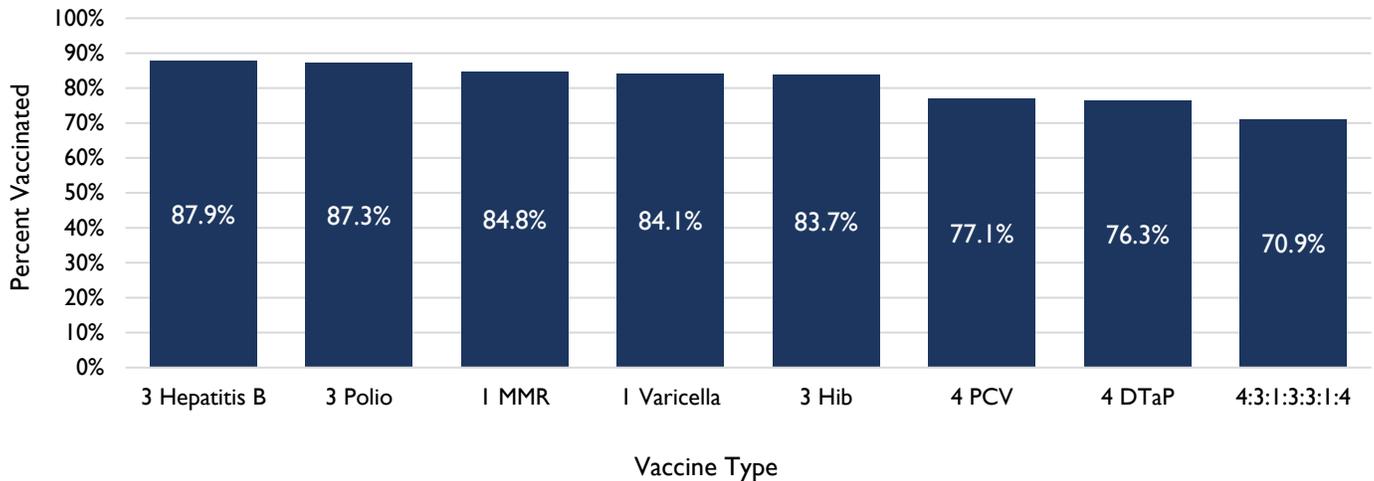
By 24 months of age, children that have received all recommended vaccines and doses based on ACIP recommendations for the following vaccines: 4 doses DTaP, 3 doses Polio, 1 dose MMR, 3 doses Hib, 3 doses Hepatitis B, 1 dose Varicella, and 4 doses PCV.



Childhood Immunization Rates by Vaccine Type

Figure 2 shows Iowa childhood vaccination rates by specific vaccine type and 4:3:1:3:3:1:4 vaccine series completion. Similar to previous years, Hepatitis B had the highest coverage rate at 87.9%, followed by Polio and MMR. PCV and DTaP had the lowest coverage rates at 77.1% and 76.3%, respectively. Differences in vaccine series completion by vaccine type may be impacted by several factors including number of doses and minimum interval requirements, parental safety concerns and vaccine hesitancy toward specific vaccines, and missed opportunities to vaccinate during medical encounters.

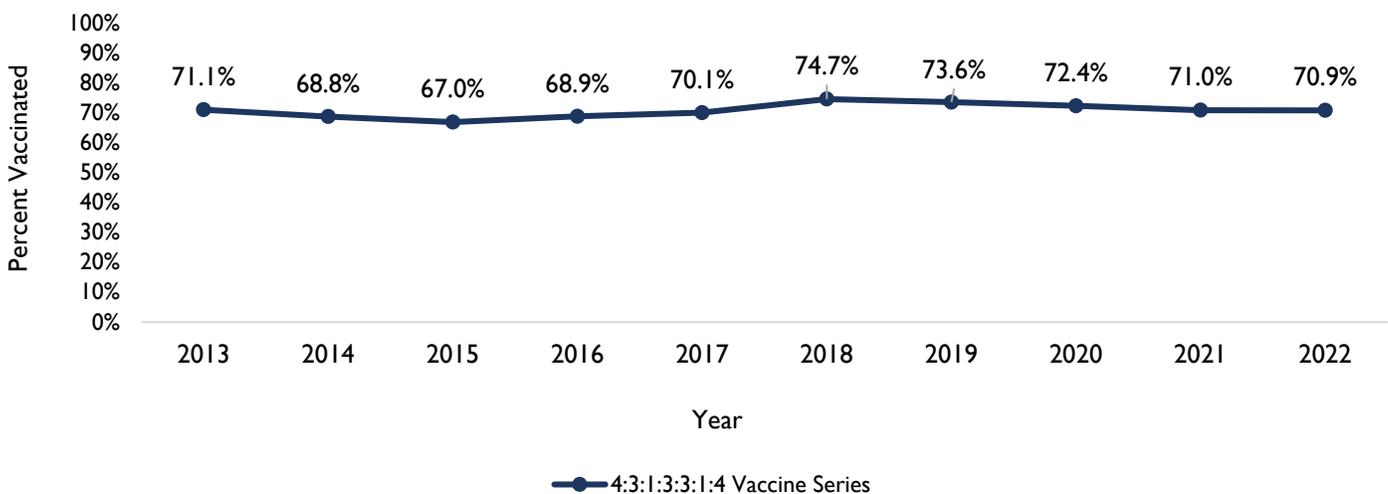
Figure 2. Iowa childhood (2-year-olds) immunization rates by vaccine type in 2022



Childhood Immunization Rates Over Time

Childhood 4:3:1:3:3:1:4 vaccine series completion rates in Iowa have fluctuated overtime (Figure 3) but since 2018, have been decreasing. Decreases between 2020-2022 can most likely be attributed to the COVID-19 pandemic and a reduction in non-COVID-19 related healthcare visits. Increased efforts are needed to get all children back on track with their routine immunizations in order to protect against vaccine preventable diseases.

Figure 3. Iowa childhood (2-year-olds) 4:3:1:3:3:1:4 vaccine series completion over time (2013-2022)



ADOLESCENT IMMUNIZATIONS

Adolescent immunizations are an important step to prevent illness and stay healthy. As kids get older, protection from some childhood vaccines begins to wear off; boosters are necessary to prolong protection. Older kids are at risk for diseases that could affect them throughout their lifetime.

Health checkups and sports or camp physicals are good opportunities for adolescents to receive recommended vaccines. Vaccines protect not only the health of adolescents but also their friends, families and communities.

The recommended vaccines for adolescents can be found [here](#).

Who is included in Adolescent Immunization Data?

- Includes patients served by both public and private healthcare providers with a record in IRIS that have a zip code and are an “active” patient within a healthcare provider organization.
- 2022 data include adolescents born between 1/1/2006 - 12/31/2008.

Vaccines Included in Adolescent Immunization Data

Adolescent immunization data includes the percent of adolescents (13-15-year-olds) that received the recommended doses of the following vaccines:

- 3 Hepatitis B – Hepatitis B
- 1 Meningococcal - Meningococcal
- 2 MMR – Mumps, Measles, and Rubella
- 1 Td/Tdap – Tetanus, Diphtheria, and Pertussis
- 2 Varicella – Varicella (Chickenpox)

3:1:2:1:2 Vaccine Series:

Adolescents (13-15-year-olds) that have received all recommended vaccines: 3 doses Hepatitis B, 1 dose Meningococcal, 2 doses MMR, 1 dose Td or Tdap, and 2 doses Varicella vaccine series.



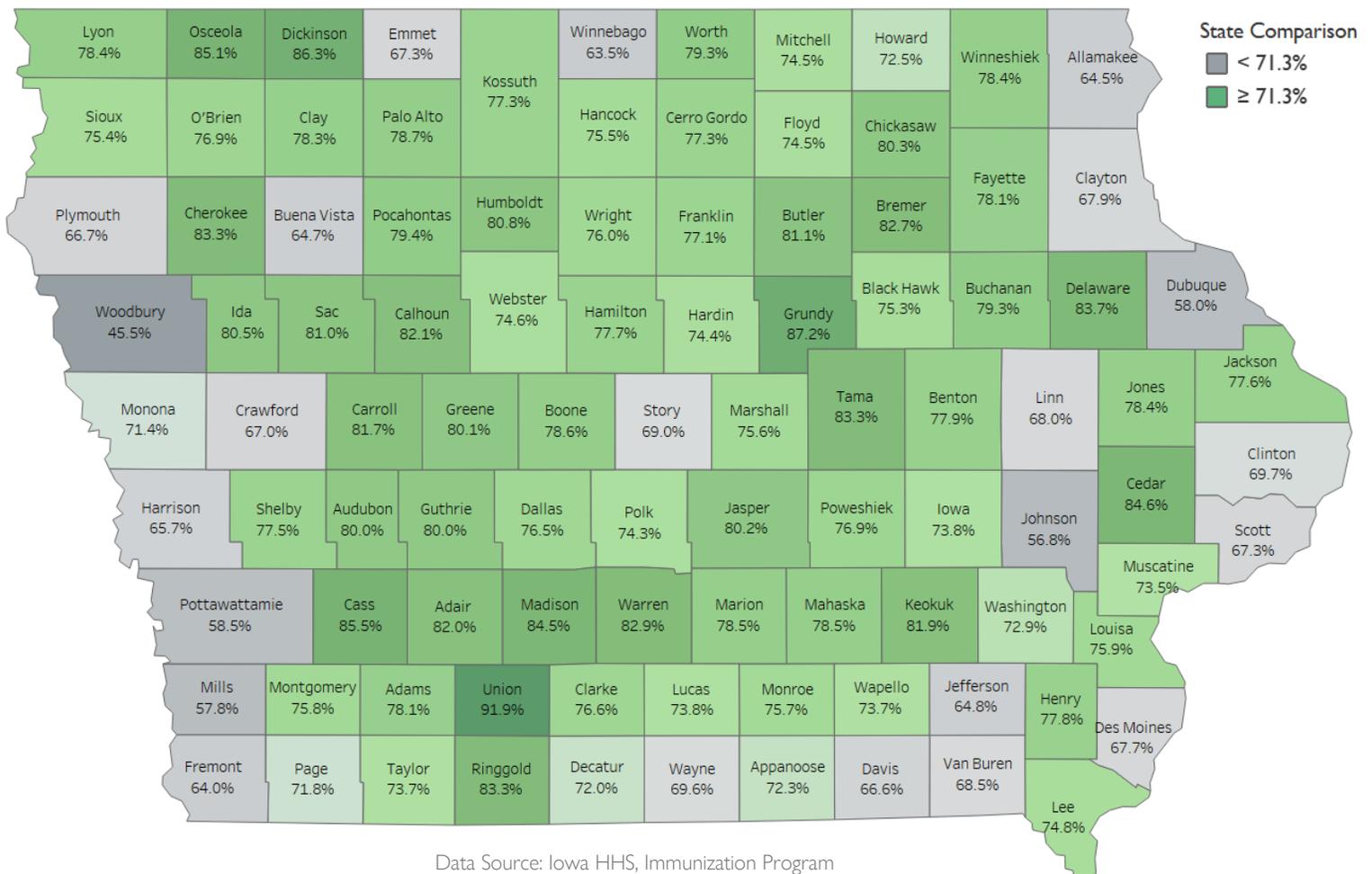
2022 Iowa Adolescent Immunization Data

(Coverage rates based on the IRIS population denominator)

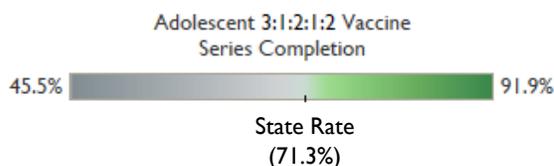
71.3%

During 2022, 71.3% of 13-15-year-olds completed the 3:1:2:1:2 vaccine series in Iowa and were up to date on all recommended immunizations. Series completion across counties ranged from 45.5 – 91.9% (Figure 4). Counties presented in green were at or above the state coverage rate (71.3%) in 2022 while counties presented in grey were below the state coverage rate.

Figure 4. Map of 2022 adolescent 3:1:2:1:2 vaccine series completion - 13-15-year-olds in Iowa



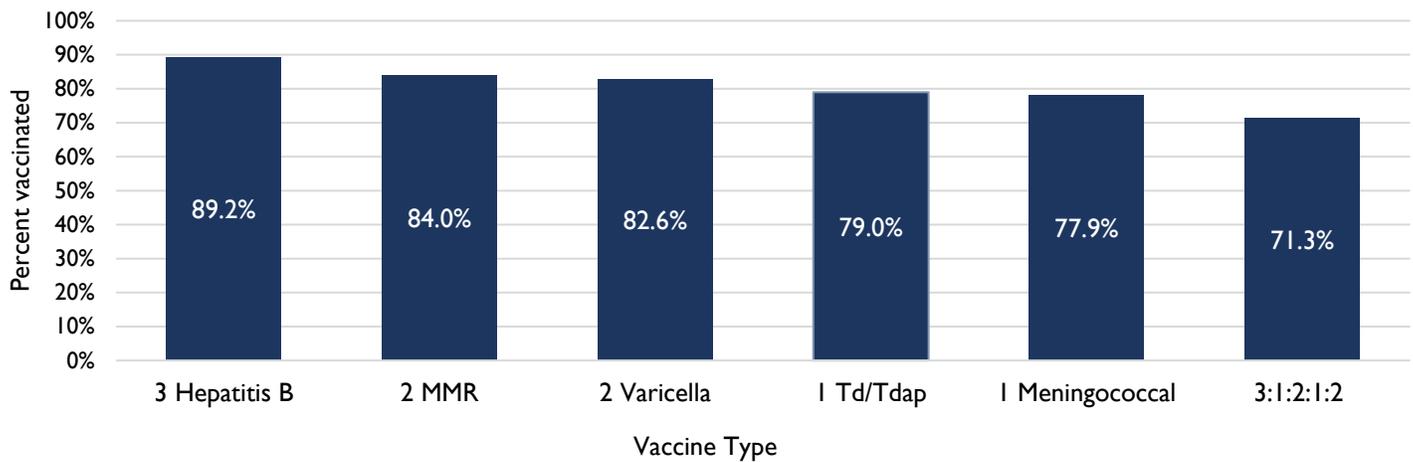
Data Source: Iowa HHS, Immunization Program



Adolescent Immunization Rates by Vaccine Type

Figure 5 shows Iowa adolescent vaccination rates by specific vaccine type and 3:1:2:1:2 vaccine series completion. Similar to childhood immunization rates, Hepatitis B had the highest coverage rate at 89.2%, followed by MMR and Varicella. Despite only requiring one dose, Td/Tdap and Meningococcal vaccine had the lowest coverage rates at 79.0% and 77.9%, respectively. Previous years have had similar trends in vaccine coverage rates by vaccine type, with Hepatitis B historically having the highest coverage. Differences in timing of receiving these vaccines based on ACIP age recommendations may contribute to these differences in coverage rates. The Hepatitis B, MMR, and Varicella vaccines are all recommended during childhood while Td/Tdap and Meningococcal vaccines are not recommended until 11 or 12 years of age.

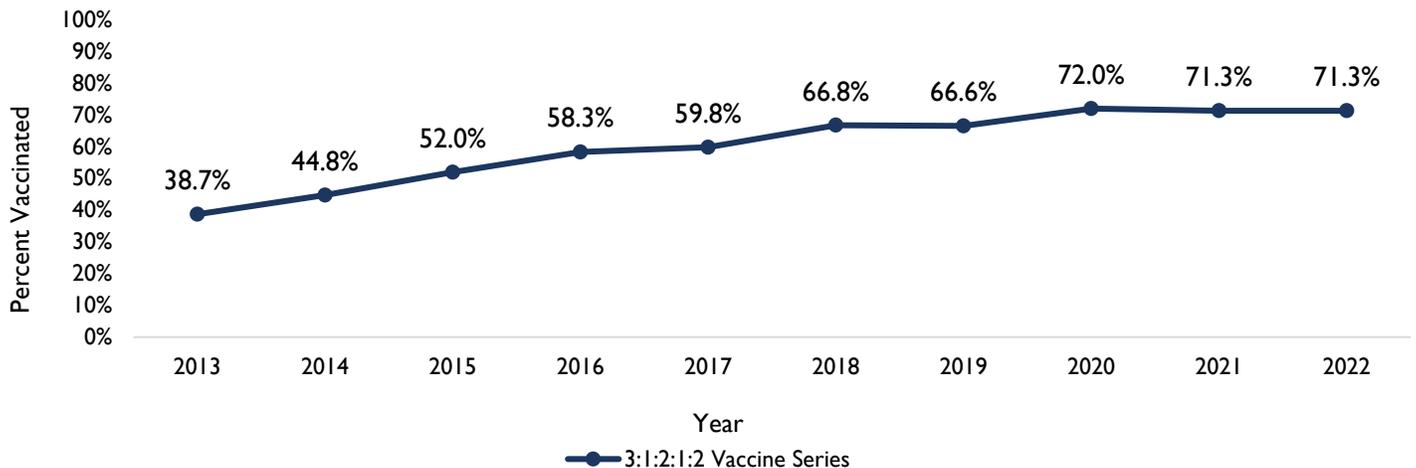
Figure 5. 2022 adolescent immunizations in Iowa by vaccine type



Adolescent Immunization Rates Over Time

Due to continued efforts and interventions to improve adolescent immunization rates, there has been a significant increase in immunization rates in Iowa since 2011 for the 3:1:3:1:2 vaccine series (Figure 6). Despite these improvements, many adolescents do not have regular preventative care visits compared to younger children and parents may be less likely to be aware of when booster doses and immunizations are needed. In order to reduce missed opportunities to vaccinate adolescents, it is important for Iowa healthcare providers to consider all possible opportunities to vaccinate during all medical encounters.

Figure 6. Iowa adolescent 3:1:2:1:2 vaccine series completion over time (2013-2022)



HUMAN PAPILLOMAVIRUS (HPV) VACCINE

Human papillomavirus (HPV) is a virus almost everyone will be infected with at some point in their lives. In most cases, HPV goes away on its own and people infected with the virus never knew they had it. However, when HPV does not go away, it can cause health problems such as genital warts and cancer. Cancer often takes years to develop after a person is infected with HPV.

HPV associated cancers include six types: cervical, vulvar, vaginal, anal, penile and oropharyngeal (throat). HPV vaccination can prevent these cancers from ever developing. Every year, HPV causes approximately **31,500** cancers in the United States, which includes an estimated **262** Iowans. In fact, HPV-related cancers kill more people every year than polio, measles, tetanus, and chickenpox (varicella) combined before vaccines for these diseases were developed. However, over 80 percent of these cancers can be prevented with the HPV vaccine.

Vaccinating adolescents now with HPV vaccine can provide protection throughout their lives.

Who should get the HPV vaccine and when?

- Both girls and boys should start the HPV vaccination series at age 11-12 years. All 11-12-year-olds should get a 2-shot series of HPV vaccine at least 6 months apart.
- The vaccination series can be started as early as age 9. All older teens and young adults are recommended to complete the HPV vaccine series if they have not already done so.
- A 3-dose series is needed for those with weakened immune systems and those 15 years of age and older.

Who is included in this data?

- Adolescents that were 13-15 years old during 2021. This includes adolescents born between 01/01/2007 - 12/31/2009.

2022 Iowa HPV Immunization Data

(Coverage rates based on the IRIS population denominator)

During 2022, 45.7% of adolescents aged 13 to 15 years old in Iowa completed the 2 or 3-dose HPV vaccine series. An additional 15.6% (24,648 adolescents) received at least one HPV vaccine but did not complete the 2 or 3-dose series. Of the HPV immunizations administered to adolescents in Iowa in 2022, 47.9% were received by females, 44.6% were received by males, and 1.8% of individuals had unknown gender reported in IRIS.

Iowa HPV vaccine series completion by county ranged from 21.0% to 58.6% (Figure 7). Counties presented in green were at or above the state coverage rate (45.7%) in 2022 while counties presented in grey were below the state coverage rate.

45.7%
of adolescents in Iowa completed the 2 or 3-dose HPV vaccine series and were protected against HPV in 2022.

Figure 7. Map of 2022 HPV vaccine series completion in adolescents in Iowa

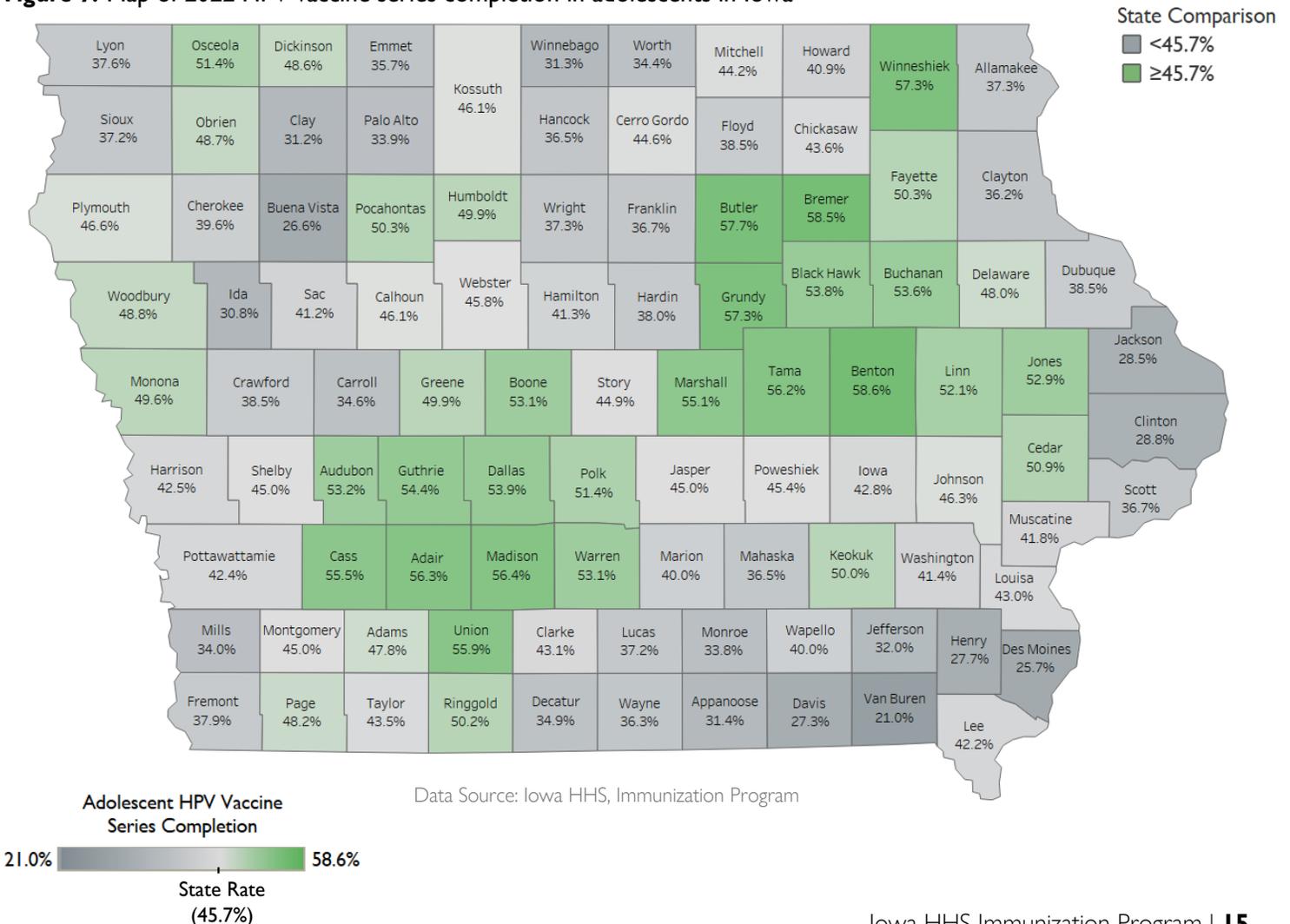
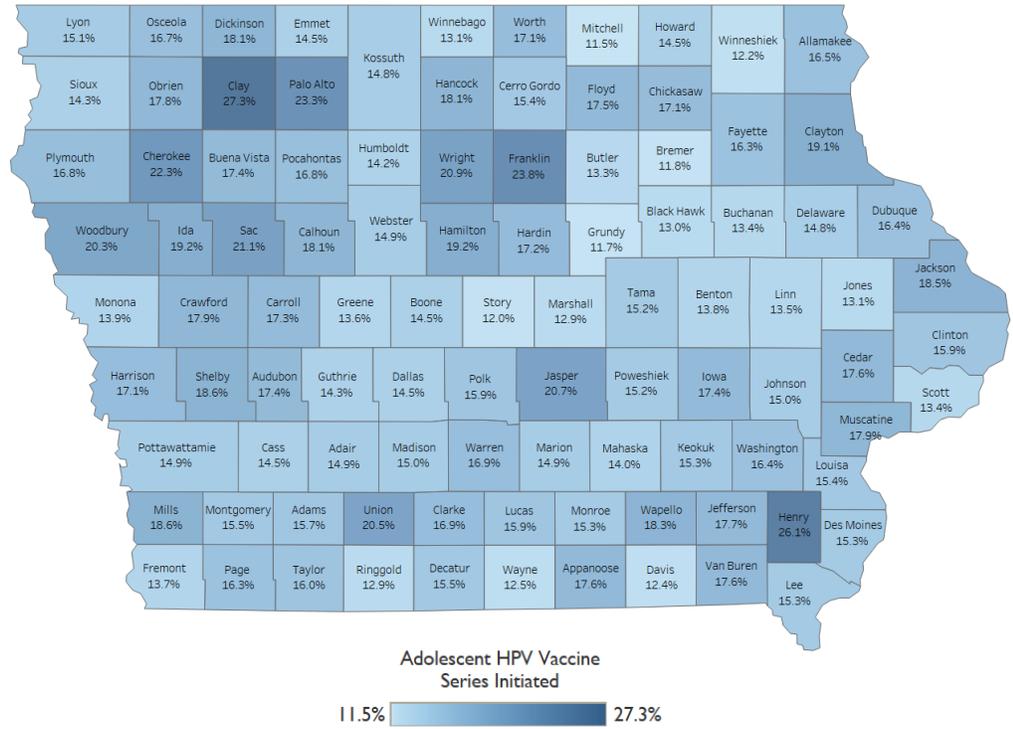


Figure 8. Map of HPV vaccine series initiated among adolescents in Iowa

HPV Vaccine Series Initiated:

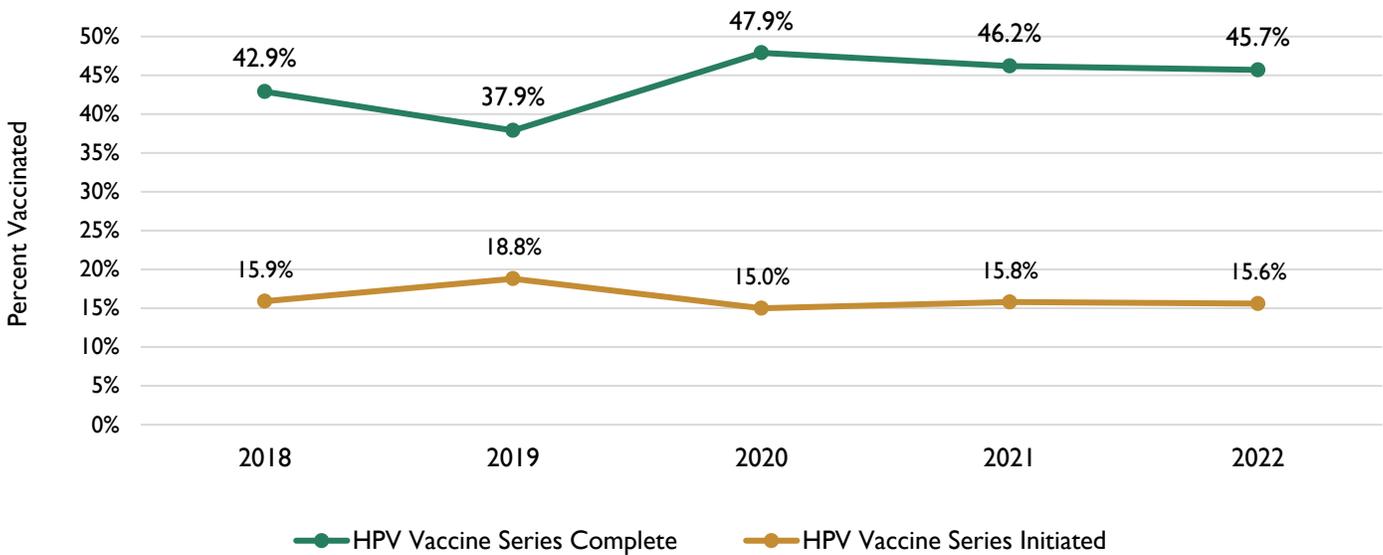
HPV vaccine series initiated includes adolescents 13-15 years of age who received at least one dose of the HPV vaccine series but have not completed the series. Statewide, 15.6% of adolescents initiated but did not complete the HPV vaccine series in 2022. County rates ranged from 11.5% to 27.3% (Figure 8). Although receiving at least one HPV vaccine is better than no HPV vaccine, completing the vaccine series provides the greatest protection against HPV infection.



HPV Vaccination: Series completion over time

In 2022 there was a slight decrease in HPV vaccination coverage with only 45.7% of 13-15-year-olds being fully protected against HPV in Iowa (Figure 9). Over the past few years, there has been an increased effort to improve HPV vaccination coverage among adolescents in order to protect against HPV related cancers and other complications related to HPV infection. Although Iowa's HPV vaccination coverage saw a 10% increase in vaccine series completion from 2019 to 2020, the percent of adolescents fully protected against HPV in Iowa is still well below the Healthy People 2030 goal of 80% series completion.

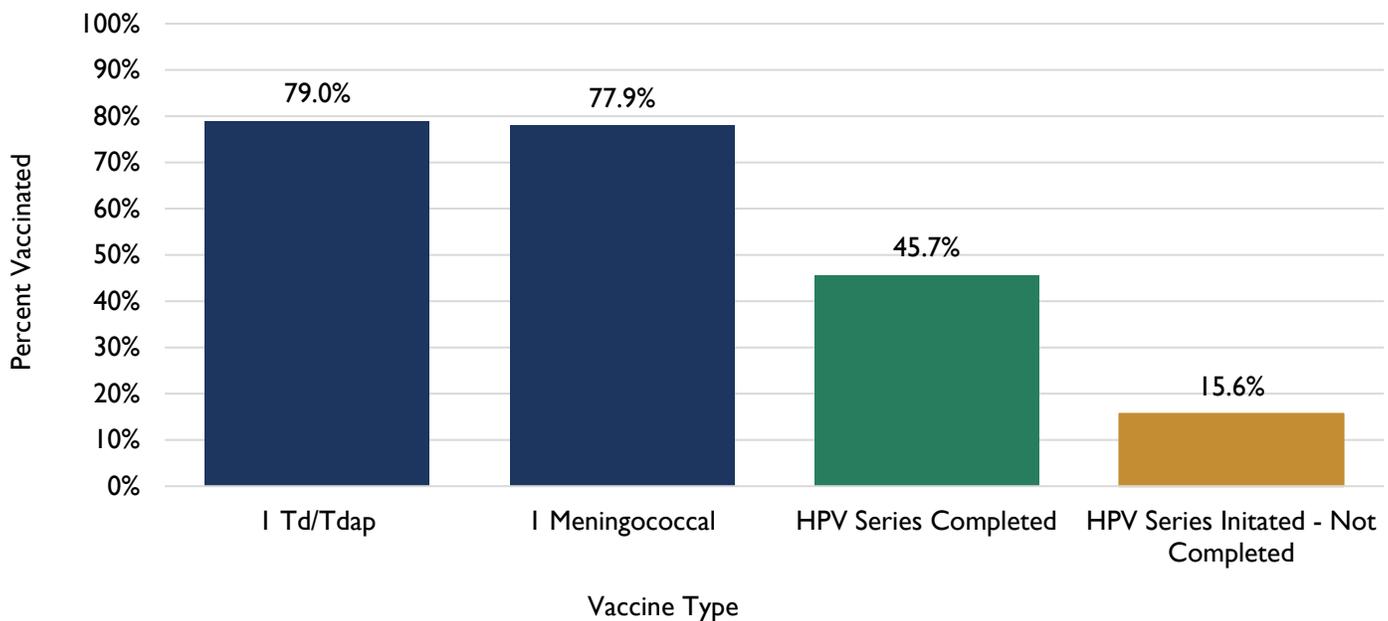
Figure 9. HPV vaccination rates in Iowa over time (2018-2022)



HPV vaccination rates compared with other adolescent vaccines in 2022

HPV vaccination coverage continues to be **lower** than Td/Tdap and Meningococcal vaccine rates. Only 45.7% of Iowa adolescents completed the HPV vaccine series in 2022 compared to 79.0% and 77.9% for Td/Tdap and Meningococcal vaccines, respectively (**Figure 10**). This difference highlights the disparities between HPV and other vaccinations in the adolescent platform. Increased HPV vaccination efforts in Iowa are needed to protect adolescents throughout their lives and prevent HPV-related cancers.

Figure 10. 2022 HPV immunization rates compared with Td/Tdap and Meningococcal vaccine coverage in Iowa.



Why are HPV vaccination rates lower than other adolescent vaccines?

- HPV vaccine is not required to attend school compared to the other adolescent vaccines.
- Limited public knowledge and understanding of HPV infections and the vaccine.
- Misinformation surrounding the safety and efficacy of HPV vaccine.
- Missed opportunities to administer HPV vaccine at the same time as Td/Tdap and Meningococcal vaccine.

Impact of COVID-19 on Childhood and Adolescent Immunization Rates

- Reports indicate administration of routine immunizations were affected by the COVID-19 pandemic both nationally and globally, with decreases in vaccine uptake following the implementation of social distancing recommendations.^{1,2,3}
- Adolescent immunizations were less affected by the pandemic compared to children, most likely due to school vaccination requirements continuing during the pandemic despite a transition to online learning and due to ACIP's recommendations of fewer vaccines administered during adolescence.

Routine Immunizations on Schedule for Everyone (RISE) Initiative:

Due to the impacts of the COVID-19 pandemic on routine immunizations, the Centers for Disease Control and Prevention (CDC) has created the “Let’s Rise” initiative to “provide actionable strategies, resources, and data to support getting all Americans back on-schedule with their routine immunizations to protect everyone from vaccine-preventable disease and disability.” The goal of the initiative is to ensure that everyone can catch up on routine vaccination by providing strategies and resources for health care professionals and partners to utilize. More information on the “Let’s Rise” Initiative by the CDC can be found [here](#).

COVID-19 Pandemic Effects on Routine Vaccination **Let's RISE**

CDC is launching a new initiative **Let's RISE** - Routine Immunizations on-Schedule for Everyone

- The COVID-19 pandemic caused disruptions** in routine health services including vaccinations for adults and children.
- Routine vaccine orders and administration** are rebounding but unevenly. The rebound may be insufficient to catch up everyone that missed a vaccine dose in 2020 and 2021.
- The full impact of the COVID-19 pandemic** on routine vaccination coverage will take time to determine.
- While we continue to investigate, CDC is** prioritizing getting everyone caught-up on routine immunizations that were missed or delayed and continuing to strengthen adult vaccination rates above pre-pandemic levels.

LEARN MORE: Routine Immunizations on Schedule for Everyone | 2022 Data Review
www.cdc.gov/vaccines/partners/routine-immunizations-lets-rise.html

Source: Centers for Disease Control and Prevention⁴

Iowa HHS Immunization Program

Current strategies to improve childhood and adolescent vaccination rates:

1. Educate healthcare providers to offer strong and clear vaccine recommendations to their patients.
 - When a provider offers a strong and clear recommendation, patients are 4 to 5 times more likely to be vaccinated.
2. Continue data cleansing processes in IRIS to improve data quality and ensure accurate immunization coverage rates.
3. Minimize missed vaccination opportunities during health care visits and identify barriers to ensure timely access to recommended vaccines.
4. Maintain at least one VFC program provider in each of Iowa's 99 counties.
 - VFC program provider availability in each of Iowa's 99 counties is essential to ensuring eligible children are protected against vaccine preventable diseases.
5. Continue to provide the most current immunization data to all healthcare providers and local public health agencies to inform immunization practices and outreach.

SCHOOL AND CHILD CARE AUDITS

What are school and child care audits?

School and child care audits are conducted annually and are assessments of children attending licensed child care centers or elementary or secondary school to ensure attendees have received the required vaccines. Local public health agencies (LPHA) perform annual assessments of immunization records for children in licensed child care centers, and students enrolled in public, private, and parochial K-12 schools.

Why vaccinate child care and school-aged kids?

Achieving and maintaining high vaccination rates are the most important safeguards to prevent the spread of vaccine-preventable diseases. Studies have found individuals claiming exemptions from immunization are at a greater risk of contracting vaccine-preventable diseases. States with lower immunization rates have higher rates of vaccine-preventable diseases.

Iowa School and Child Care Immunization Requirements

Data Note: Data represents a snapshot in time and is subject to change as students with provisional certificates complete required vaccinations and students with invalid or no certificates provide appropriate documentation. Antigen specific data not available. Data as of 5/2/2023.

TYPES OF SCHOOL AND CHILD CARE IMMUNIZATION CERTIFICATES

- **Certificate of Immunization:** Issued when the applicant has a record of age-appropriate immunizations that meet the requirement for licensed child care or school enrollment.
- **Provisional Certificate of Immunization:** Issued when the applicant has received at least one dose of each of the required vaccines but has not completed all required immunizations or is a transfer student from another U.S. school system.
- **Certificate of Immunization Exemption - Medical:** Iowa law allows for medical exemption to immunization when required immunizations would be injurious to the health and wellbeing of the applicant or any member of the applicant's family or household or required vaccine would violate minimum interval spacing.
- **Certificate of Immunization Exemption - Religious:** Iowa law allows for religious exemption to immunization when immunizations conflict with a genuine and sincere religious belief, and is not based merely on philosophical, scientific, moral, personal or medical opposition to immunizations.
- **Invalid or No Certificate:** Total number of students not compliant with Iowa law (does not have a valid Certificate of Immunization, Provisional Certificate of Immunization, or Certificate of Immunization Exemption [Medical or Religious]).
- **Valid Immunization Certificates:** Total number of students compliant with Iowa law. This value is calculated by adding the number of valid Certificate of Immunization, Provisional Certificate of Immunization, and Certificate of Immunization Exemption [Medical or Religious]).

2022-23 School Immunization Audit Data

During the 2022-2023 school year, records from 523,155 students in kindergarten through 12th grade attending Iowa schools were analyzed to calculate statewide vaccination coverage levels. Of these students, 94.2% had a certificate of immunization and were fully vaccinated by law (Table 1). Students with provisional certificates made up 1.8% (9,459 records) of the total while students with invalid or no immunization certificate represented 1.1% (5,677 records). Additionally, 2.6% of students were reported to have a religious Certificate of Immunization Exemption representing 13,761 students, while 0.2% (1,281 records) were reported to have a medical Certificate of Immunization Exemption.

Table 1. 2022 school immunization audit data by immunization certificate type

Immunization Certificate Type	Percent of Students	Number of Students
Certificate of Immunization	94.2%	492,977
Provisional Certificate	1.8%	9,459
Religious Immunization Exemption	2.6%	13,761
Medical Immunization Exemption	0.2%	1,281
Invalid or No Certificate	1.1%	5,677
Total number of students with records analyzed: 523,155		

Under- and Un-immunized Students:

Under- and un-immunized students represent the number of students that are not fully protected against vaccine-preventable disease. This includes students with a religious or medical exemption, a provisional certificate, invalid certificate, or no certificate of immunization. During the 2022-23 school year, 30,178 students (5.8%) were under- or un-immunized.

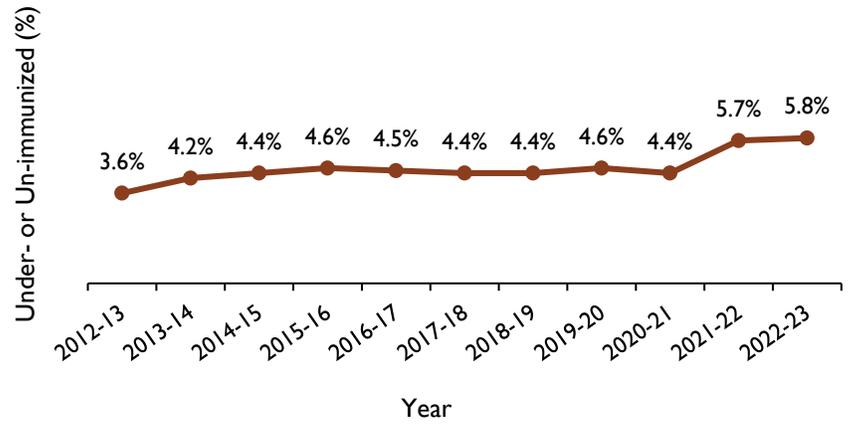
30,178

students were under- or un-immunized during the 2022-23 school year.

Changes Over Time: Under- and Un-Immunized Students

Although there was only a 0.1% increase in the percent of under- and un-immunized students compared to last year (Figure 11), the number of under- and un-immunized students increased 1.8%, which is an increase of 528 records. As more students become under- or un-immunized, there is a greater risk of vaccine preventable disease outbreaks in the school setting.

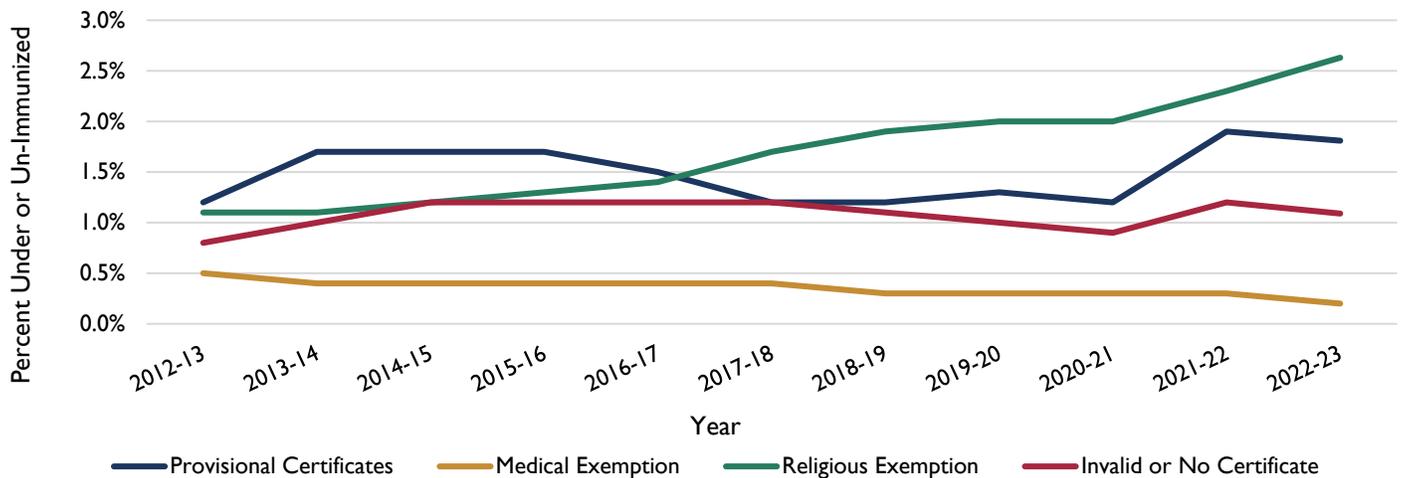
Figure 11. Percent of under- and un-immunized students in Iowa over time (2012-2023)



Changes Over Time: Under- and Un-immunized Students by Type of Exemption or Certificate

Although the 2022-23 school year saw a decrease in provisional certificates, medical exemptions, and invalid or no certificates, religious exemptions continue to increase (Figure 12). Of the 30,178 under- or un-immunized students, 13,761 had a religious exemption, making up over 46% of under- and un-immunized students during the year. Provisional certificates made up 31% of under- and un-immunized students, followed by invalid or no certificates (19%) and medical exemptions (4%). During the 2021-22 school year, there was large increase in provisional certificates most likely caused by the COVID-19 pandemic. The percent of students with provisional certificates and invalid or no certificates slightly decreased compared to last year but are still above pre-pandemic rates.

Figure 12. Percent of under- and un-immunized students in Iowa by type of exemption or certificate



2022-23 Child Care Immunization Audit Data

During the 2022-23 school year, records from 93,161 children attending licensed child care centers in Iowa were analyzed to calculate statewide vaccination coverage levels. Of these children, 93.2% had a certificate of immunization and were fully vaccinated by law (Table 2). Child care participants with provisional certificates made up 1.4% (1,332 records) of the total, while students with invalid or no immunization certificate represented 3.5% (3,292 records). Additionally, 1.8% of students were reported to have a religious Certificate of Immunization Exemption representing 1,332 students while 0.1% (94 records) were reported to have a medical Certificate of Immunization Exemption.

Table 2. 2022 child care immunization audit data by immunization certificate type

Immunization Certificate Type	Percent of children in licensed child care	Number of Children
Certificate of Immunization	93.2%	86,790
Provisional Certificate	1.4%	1,332
Religious Immunization Exemption	1.8%	1,653
Medical Immunization Exemption	0.1%	94
Invalid or No Certificate	3.5%	3,292
Total number of children with records analyzed: 93,161		

Under- and Un-Immunized Children in Licensed Child Care:

Similar to school audit data, under- and un-immunized children in licensed child care represent the number of students that are not fully protected against vaccine-preventable disease. This includes students with a religious or medical exemption, a provisional certificate, invalid certificate, or no certificate of immunization. During the 2022-23 school year, 6.8% of children enrolled in licensed child care were under- or un-immunized (6,371 records). The number of under- and un-immunized children increased 5.4% from the previous school year (326 records), however, there was also a 3.1% increase in records audited compared to the previous year.

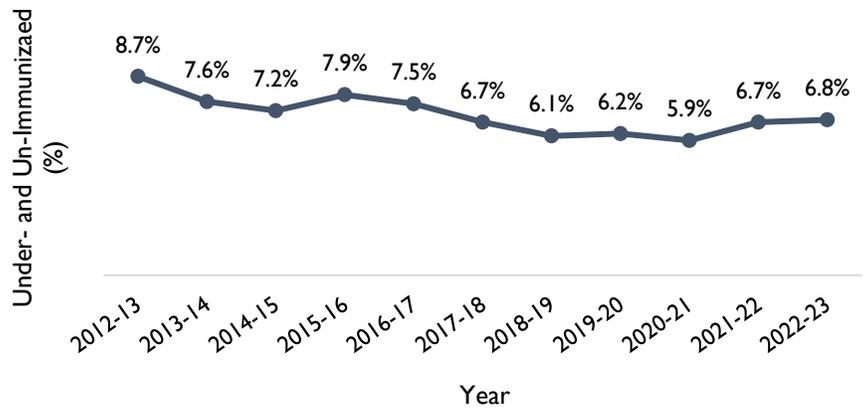
6,371

children in licensed child care were under- or un-immunized during the 2022-23 school year.

Changes Over Time: Under- and Un-Immunized Children

Similar to the school audit data, the percent of under- and un-immunized children in licensed child care increased 0.1% compared to the 2021-22 school year, while the number increased 5.4% (326 records). Although the percent of under- and un-immunized children in licensed child care has decreased over the last 10 years, there has been a 0.9% increase (1,656 children) over the last two years (Figure 13).

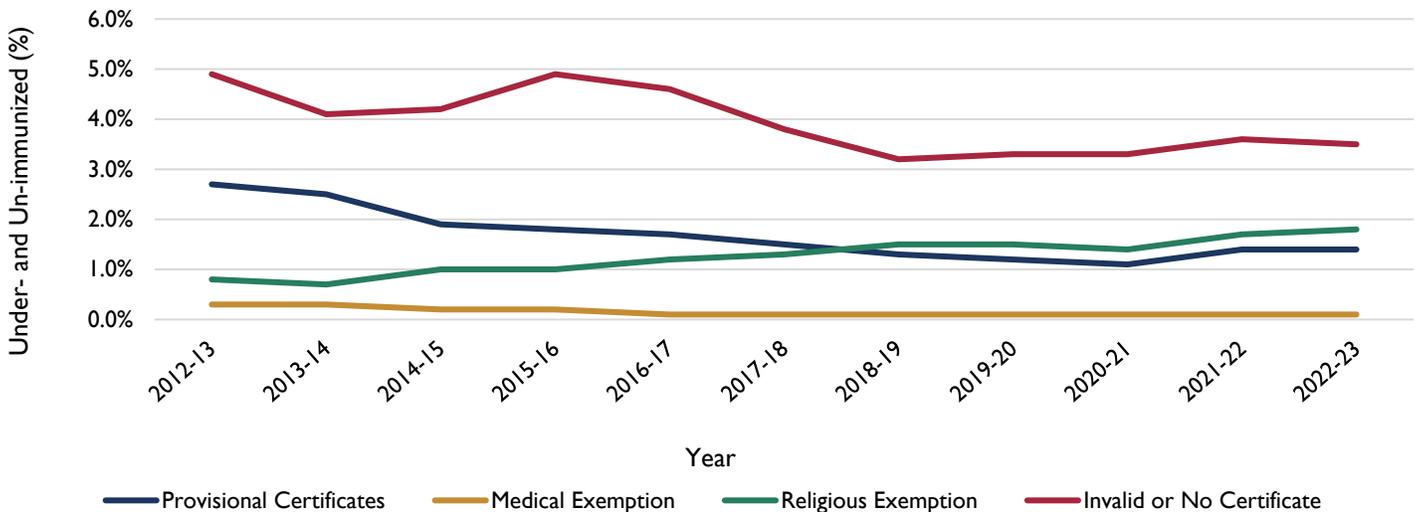
Figure 13. Percent of under- and un-immunized children in licensed child care in Iowa over time (2012-2023)



Changes Over Time: Under- and Un-immunized Children by Type of Exemption or Certificate

There were minimal changes in the percent of under- and un-immunized children in licensed child care by type of exemption or certificate compared to the 2021-22 school year and only the percent of religious exemptions had a slight increase of 0.1% (Figure 14). Similar to the school audit data, religious exemptions for children in licensed child care have been increasing since 2011. Although the percent of invalid or no certificate slightly decreased 0.1% during the most recent school year, invalid or no certificate continues to make up the largest percent of under- and un-immunized children at 3.5%, while provisional and medical exemptions remained the same at 1.4% and 0.1%, respectively.

Figure 14. Percent of under- and un-immunized children in licensed child care in Iowa by type of exemption or certificate (2012-2023)



Impact of Missed Immunizations, Immunization Exemptions, and Vaccine Hesitancy

Missed Immunizations: When a child does not receive all the recommended immunizations, they are at **greater risk** of vaccine-preventable diseases throughout the years and into adolescents and adulthood. It is never too late to catch up on missed immunizations. The CDC provides a recommended catch up schedule for children and adolescents whose vaccinations have been delayed.

[Catch-up Immunization Schedule for Children and Adolescents](#)

Immunization Exemptions:

In 2019, 1,274 cases of measles were confirmed in the United States, with the majority of cases being among people not vaccinated against measles.⁵ This is the greatest number of cases reported in the U.S since 1992. Areas with higher rates of immunization exemptions are more likely to have vaccine-preventable disease outbreaks. Studies demonstrate children with exemptions were **22 times more likely to have had measles and 5.9 times more likely to acquire pertussis** than children who had not been exempted from vaccination.⁶ Data regarding under- and un-immunized children provides an understanding of the barriers to achieving complete vaccination and disease protection at schools and child care facilities. The Immunization Program continues to monitor immunization exemption rates, identify clusters of unimmunized children and provide education and information to address vaccine safety concerns.

Vaccine Hesitancy:

In 2019, the World Health Organization (WHO) included vaccine hesitancy as **one of the ten threats to global health**. This reluctance or refusal to vaccinate threatens the progress made to reduce and eliminate vaccine-preventable diseases. As misinformation regarding immunizations and vaccine safety continues to spread, it is more important than ever to ensure clear and effective communication of immunization information.

Missed immunizations, immunization exemptions, and vaccine hesitancy increase the risk of resurgence in vaccine preventable infections.

Following ACIP's recommended routine vaccine schedule, catching up on missed immunizations, and addressing vaccine safety concerns help to protect individuals and communities from vaccine-preventable diseases.

ADULT IMMUNIZATIONS

With time, immunity from childhood vaccines can wear off, leaving adults at risk for diseases. The Advisory Committee on Immunization Practices (ACIP) provides recommendations for the routine administration of vaccines, along with schedules outlining the appropriate timing, dosage, and contraindications. The recommended vaccines for adults can be found [here](#).

More information about the Iowa Adult Immunization Program can be found [here](#).

Adult immunization data:

Includes the percent of Iowa residents that received the recommended doses of Tdap, HPV, Pneumococcal, Hepatitis A, and Zoster vaccine, based on recommended age groups.

2022 Adult Immunization Data

In 2022, the Iowa Immunization Program made several updates to the Public Health Tracking Portal including the addition of the Adult Immunization portal page. Adult immunization data includes the percent of Iowa residents (19 years and older) that have received the recommended doses of the following vaccines (**Table 3**) based on the recommended age groups:

Table 3. Vaccines included in Iowa's adult immunization data

Vaccine Type	Age Group	Recommended Doses
1 Tdap	19-64 Years	1
HPV (Completed Series)	19-26 Years	2 or 3
Hep A (Completed Series)	19-49 Years	2 or 3
Hep B (Completed Series)	19-59 Years	2, 3, or 4
Zoster (Completed Series)	50+ Years	2

*The CDC recommends that adults should routinely receive a Tdap vaccine booster every 10 years. Adults are also recommended to receive an annual influenza vaccine and the COVID-19 vaccine.

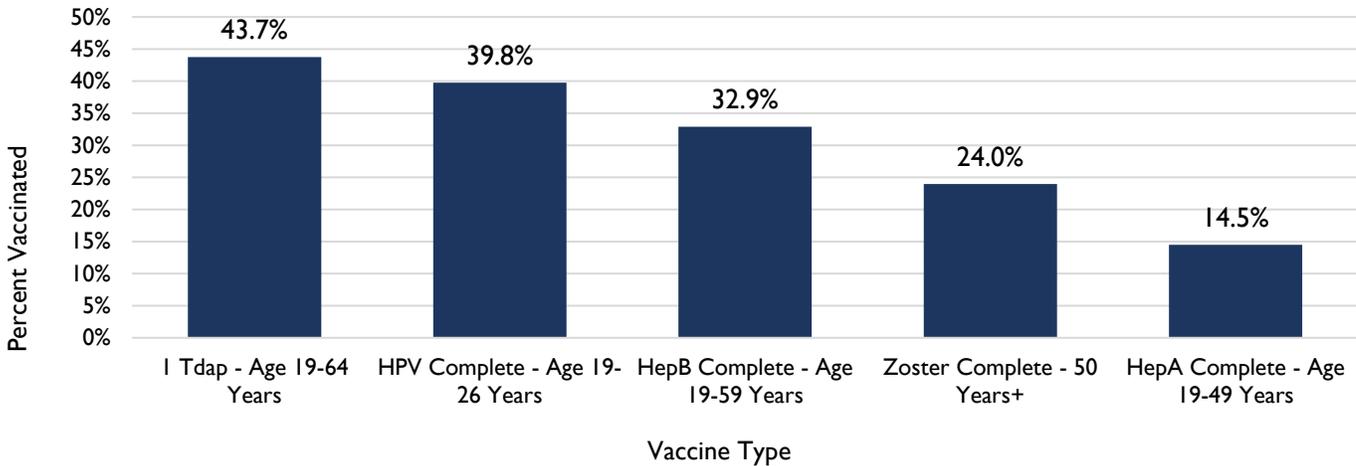
Adult Vaccines Protect Against:

- **Tdap Vaccine:** Protects against three bacterial diseases: tetanus, diphtheria, and pertussis.
- **HPV Vaccine:** Protects against the most common types of human papillomavirus, which are responsible for 90 percent of cervical cancers and genital warts.
- **Hepatitis A Vaccine:** Protects against a highly contagious liver disease caused by the hepatitis A virus.
- **Hepatitis B Vaccine:** Protects against liver infection caused by the hepatitis B virus.
- **Zoster Vaccine:** Protects against shingles, a disease that causes a painful rash often with blisters and may lead to long-term nerve pain.

Adult Immunization Rates by Vaccine

In 2022, 43.7% of adults between 19-64 years old had received at least 1 dose of Tdap vaccine, the highest coverage rate of any adult vaccine (Figure 15). HPV vaccine series completion had the second highest coverage rate (39.8%) followed by Hepatitis B vaccine (32.9%). Zoster and Hepatitis A vaccine series completion had the lowest coverage rates at 24.0% and 14.5%, respectively. It is important to note that differences in coverage rates across vaccine types are primarily due to differences in recommended age ranges and disease risk.

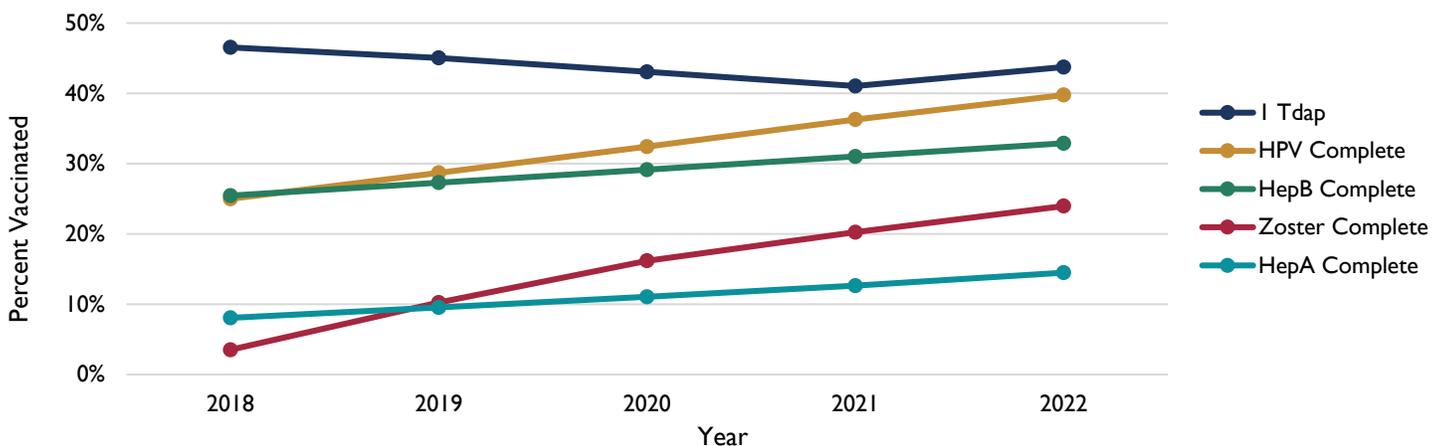
Figure 15. 2022 adult immunization coverage rates by vaccine type



Adult Immunization Rates Over Time

The Tdap vaccine saw a decrease in adult immunization coverage from 2018 to 2021 but increased in 2022. All other adult immunization coverage rates have steadily increased since 2018 (Figure 16). It is important to continue efforts in increasing adult coverage rates across all vaccine types in order to protect adults and communities from vaccine-preventable diseases. Adult immunizations are important as they not only provide protection against the disease itself, but also prevents serious illness and complications from the disease.

Figure 16. Adult immunization coverage rates by vaccine type (2018-2022)



INFLUENZA VACCINE

The annual influenza vaccine is the best way to protect against the flu and its potentially severe complications. It is recommended for everyone 6 months and older to receive the flu vaccine each year. The flu vaccine causes antibodies to develop in the body approximately two weeks after vaccination. These antibodies provide protection against infection when the viruses are circulating.

The flu vaccine can protect against influenza and its potentially serious complications. Vaccination of high-risk persons is especially important to decrease the risk of severe flu illness. Getting vaccinated not only protects the individual, but also prevents spread of the disease to family, friends, and co-workers.

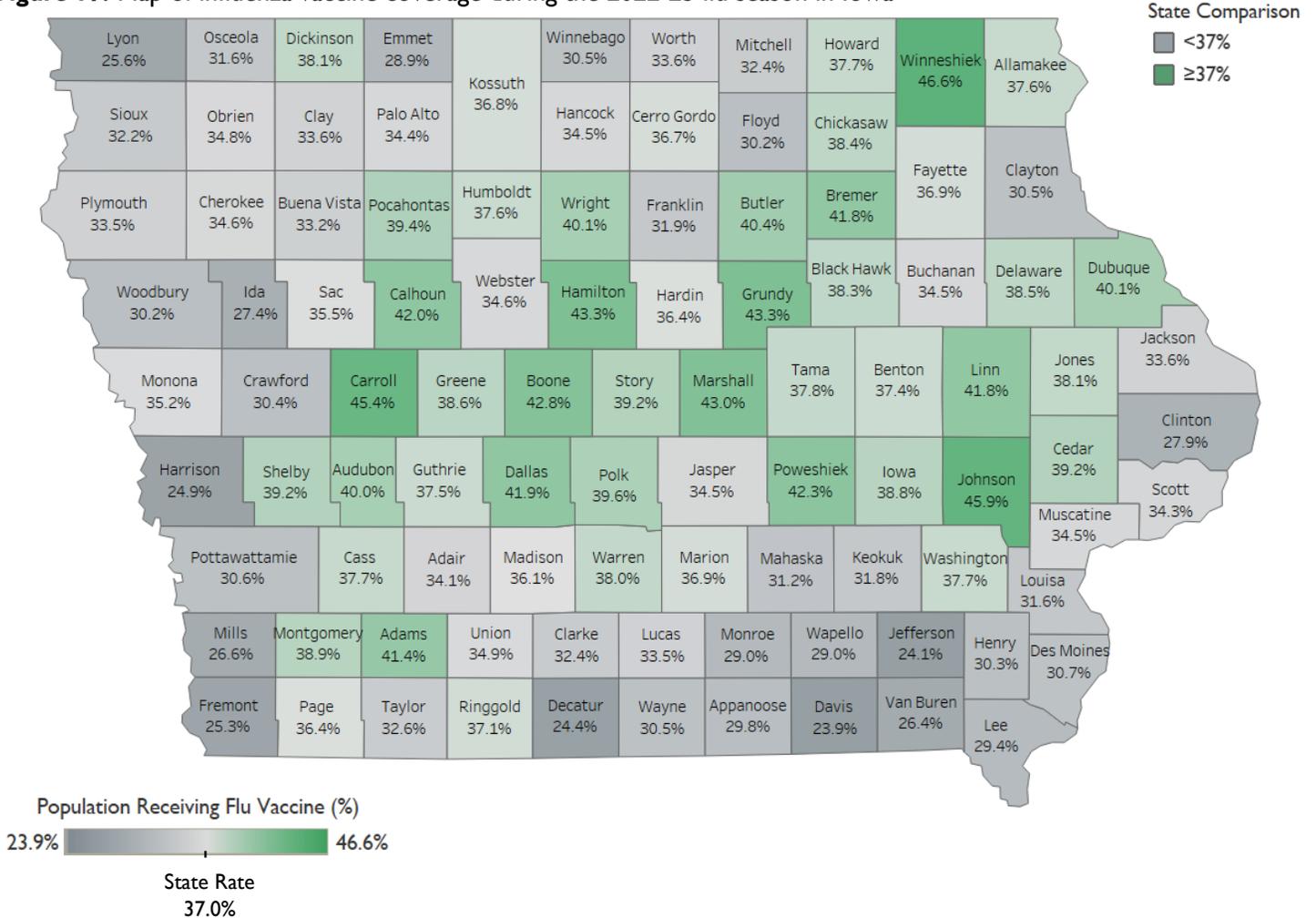
Influenza: A contagious infection of the nose, throat and lungs caused by a virus. The typical influenza season lasts from August to May. The flu is generally spread to others when an infected person coughs or sneezes. It can cause mild to severe illness and in some circumstances, can lead to death. Flu symptoms include a cough, fever, chills, sore throat, muscle or body aches, runny or stuffy nose, headache and fatigue.

2022-23 Influenza (Flu) Vaccinations in Iowa

37.0%
of Iowans received an influenza vaccine during the 2022-2023 season.

During the 2022-23 flu season, 37.0% (1,171,810 individuals) of Iowans received an influenza vaccine. This is a large increase compared to last year's coverage rate of 33.9%. Influenza vaccination rates by county ranged from 23.9% – 46.6% (Figure 17). Counties presented in green were at or above the state coverage rate (37.0%) in 2022 while counties in grey were below the state coverage rate.

Figure 17. Map of influenza vaccine coverage during the 2022-23 flu season in Iowa

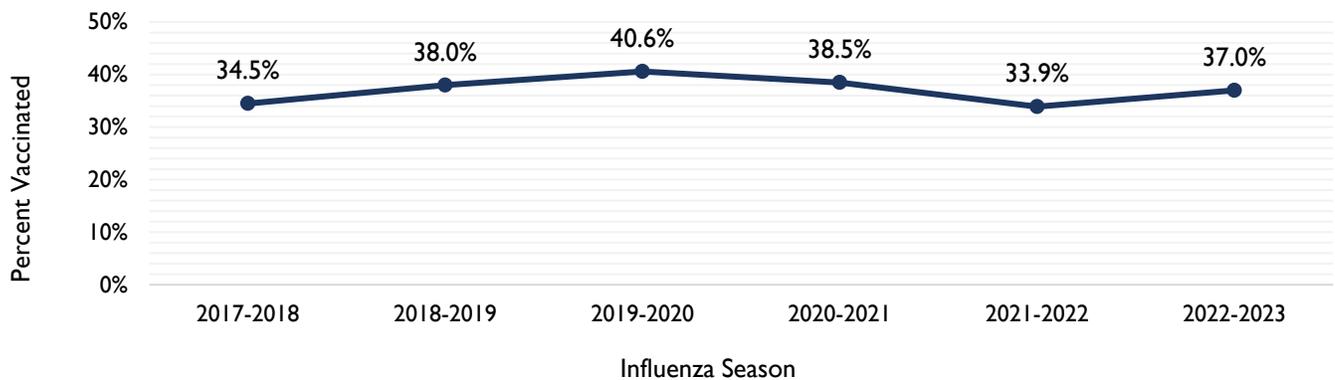


Data Note: Seasonal influenza vaccination data in Iowa is based on doses reported to IRIS for Iowans and includes data reported between August 1, 2022 – May 31, 2023. Data as of 6/10/2023.

Influenza Vaccination Rates Over Time

Although the 2022-23 season saw an increase in influenza vaccine coverage compared to last year, influenza vaccine coverage continues to remain low (Figure 18). The [Healthy People 2030](#) goal is to increase the proportion of persons who are vaccinated annually against seasonal influenza to 70% coverage and receiving an annual influenza vaccine is the best way to protect against the flu and its potentially serious complications. The Iowa Immunization Program continues to evaluate immunization rates in order to guide resources and address population needs.

Figure 18. Iowa influenza vaccination rates over time (2017-2022)

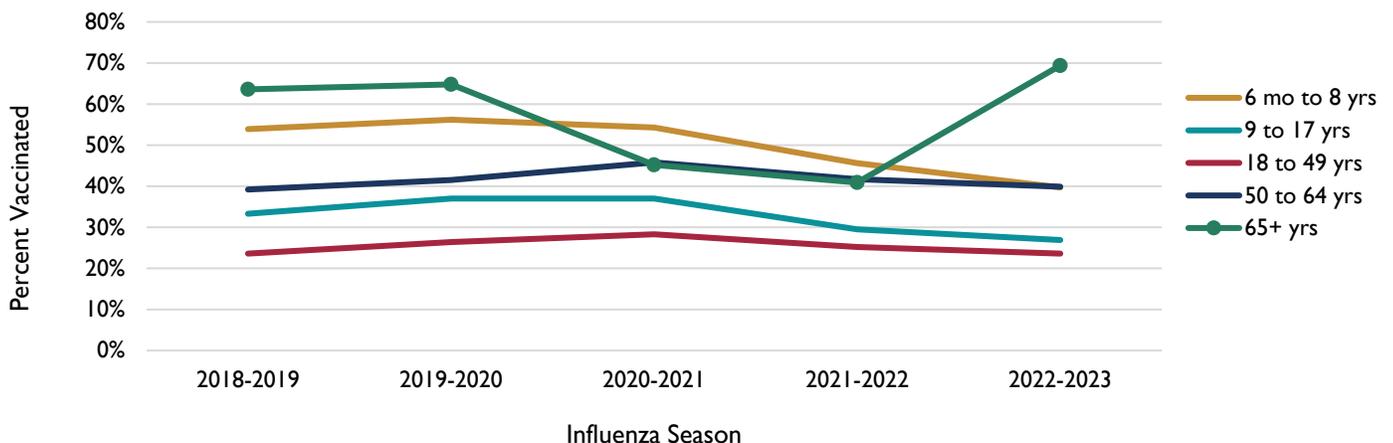


Influenza vaccination rates by age group

Individuals 65 years and older had the highest vaccination coverage during the 2022-23 flu season at 69.4%. This is a substantial increase compared to last year's coverage of only 40.9% and the highest coverage for this age group in the last 4 years. Individuals 65 years and older are at greater risk for severe illness from the flu so it is important to continue efforts in ensuring this vulnerable population is protected. The 50 to 64 years age group had the second highest coverage rate at 39.9%, followed by the 6 months to 8 years age group.

Despite an overall increase in influenza coverage in Iowa residents, only the 65 years and older age group had an increase in influenza vaccine coverage compared to last year. Additionally, less than a quarter (23.6%) of 18-49-year-olds in Iowa were vaccinated against influenza. This age group continuously has the lowest coverage rates of any age group despite being the most active and social group (Figure 19). Focusing on improving vaccination rates in this population will help reduce the spread of annual influenza and protect other vulnerable populations from severe illness.

Figure 19. Iowa influenza vaccination rates by age group over time



Summary of 2022 Immunization Rates in Iowa:

- Overall, childhood and adolescent vaccine series completion rates in 2022 were very similar to that of 2021.
- Childhood vaccine series completion for the 4:3:1:3:3:1:4 vaccine series was 70.9% in 2022 while the adolescent 3:1:2:1:2 vaccine series completion rate was 71.3%, the same rate as 2021.
- Childhood vaccine series completion rates have been decreasing since 2018, most likely result of the COVID-19 pandemic and disruptions to routine well-child visits.
- Although adolescent vaccination rates were less impacted by the pandemic, HPV vaccination rates continue to decrease and remain significantly lower than other adolescent vaccines.
 - During 2022, only 45.7% of Iowa adolescents completed the 2 or 3-dose HPV vaccine series and were fully protected against HPV.
- School and licensed child care centers saw a slight increase in the percent of under- and un-immunized students and child care participants compared to last year. The majority under- and un-immunized students had religious exemptions while the majority of child care participants had invalid or no immunization certificates.
- In 2022, the Iowa Immunization Program published adult immunization data to the public health tracking portal for the first time. Adult vaccine coverage rates vary based on age group recommendations and disease risk but over the years, Tdap vaccine consistently has had the highest coverage rates of any adult vaccine.
- During the 2022-23 influenza season, 37% of Iowa residents received the influenza vaccine which is a large increase compared to last year's coverage. The 65+ age group saw a large increase in coverage compared to last year while coverage for all other age groups slightly decreased.

Future Directions

Future directions and strategies to improve vaccination rates in Iowa:

1. Continue data cleansing practices in IRIS, including matching birth and death certificates to IRIS records, merging fragmented records, and supporting bidirectional data exchange with electronic health records.
2. Participate in the IZ Gateway to receive immunization data in IRIS for Iowa residents from other participating states and jurisdictions.
3. Analyze missed opportunities for HPV vaccination among adolescents by provider type and rurality and share findings with vaccination partners.
4. Evaluate immunization rates by county and specific populations in order to guide resources and address population needs.
5. Analyze and evaluate impacts of COVID-19 pandemic on routine vaccinations and coverage rates.
6. Continue to provide updated immunization coverage data to the public and healthcare providers on the Iowa Public Health Tracking Portal.
7. Continue ongoing programmatic activities to improve immunization coverage rates and increase vaccine administration by managing the Iowa VFC Program and quality improvement activities.

Additional Resources

- Childhood Immunizations
 - [Childhood Immunization Information and Resources](#)
- Adolescent Immunizations
 - [Adolescent Immunization Information and Resources](#)
- HPV Vaccine
 - [HPV Vaccine Information and Resources](#)
- School and Child Care Audit
 - [School and Child Care Audit Information and Resources](#)
- Adult Immunizations
 - [Adult Immunization Information and Resources](#)
- Influenza Vaccine
 - [Influenza Vaccine Information and Resources](#)

References

1. Santoli JM, Lindley MC, DeSilva MB, et al. Effects of the COVID-19 Pandemic on Routine Pediatric Vaccine Ordering and Administration — United States, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:591–593. DOI: <http://dx.doi.org/10.15585/mmwr.mm6919e2>
2. Global partners announce a new effort – “The Big Catch-up” – to vaccination millions of children and restore immunization progress lost during the pandemic. World Health Organization. 2023 April 24. <https://www.who.int/news/item/24-04-2023-global-partners-announce-a-new-effort-the-big-catch-up-to-vaccinate-millions-of-children-and-restore-immunization-progress-lost-during-the-pandemic>
3. Ota MOC, Badur S, Romano-Mazzotti L, Friedland LR. Impact of COVID-19 pandemic on routine immunization. *Ann Med*. 2021 Dec;53(1):2286-2297. doi: 10.1080/07853890.2021.2009128. PMID: 34854789; PMCID: PMC8648038
4. https://www.cdc.gov/vaccines/partners/downloads/RISE_Infographic.pdf
5. Measles cases and outbreaks. Centers for Disease Control and Prevention. <https://www.cdc.gov/measles/cases-outbreaks.html>. Published September 6, 2022.
6. Feikin DR, Lezotte DC, Hamman RF, Salmon DA, Chen RT, Hoffman RE. Individual and community risks of measles and pertussis associated with personal exemptions to immunization. *JAMA* 2000; 284:3145-50.