



ARIZONA DEPARTMENT OF HEALTH SERVICES

Arizona Vaccine News

Karen Lewis, M.D.

Medical Director

Arizona Immunization Program Office

October 26, 2021

Douglas A. Ducey | Governor Don Herrington | Interim Director

150 North 18th Avenue, Suite 260, Phoenix, AZ 85007-3247 P | 602-364-3630 F | 602-364-3285 W | azdhs.gov

Health and Wellness for all Arizonans

Newsletter Topics

COVID-19 AND COVID-19 VACCINES

- **A Graphic Demonstration of the Effectiveness of mRNA Vaccines Against COVID-19**
- **Pregnant Women Need COVID-19 Vaccination**
- **ACOG Again Recommends COVID-19 Vaccine During Pregnancy and Lactation**
- **COVID-19 Vaccinated Mothers have SARS-CoV-2 Antibodies in Breast Milk and Serum**
- **Re-infection with SARS-CoV-2 Is Twice as Likely if Not Vaccinated After First Infection**
- **COVID-19 Vaccine Booster Doses Give Added Protection**
- **Breakthrough Infections in Vaccinated People Are Milder**
- **COVID-19 Breakthrough Infections in Fully Vaccinated Health Care Workers**
- **COVID-19 Vaccine Effectiveness in the U.S.**
- **mRNA Vaccines Effective Against COVID-19 Associated Hospitalizations**
- **Effectiveness of COVID-19 Vaccines in Preventing Hospitalization in the Elderly**
- **Effectiveness of mRNA COVID-19 Vaccines in Nursing Home Residents**
- **Pfizer-BioNTech COVID-19 Vaccine Effectiveness in Protecting Health Care Workers**
- **Effectiveness of COVID-19 Vaccines Against the Delta Variant**
- **Benefits of COVID-19 Vaccines Outweigh the Risks of Rare Side Effects**
- **Graph of Risks with COVID-19 Vaccine Compared to Risks from COVID-19 Infection**
- **COVID-19 Vaccinated Adolescents Protected Against COVID-19 Hospitalization**
- **Likelihood of Parents Choosing COVID-19 Vaccination for Their Children**

LITERATURE ON VACCINES AND VACCINE-PREVENTABLE DISEASES

- **Malaria Vaccine Approval by WHO**
- **Oral Human Papillomavirus Infections Can Occur in Infants and Young Children**
- **Recombinant Zoster Vaccination Shows Persistent Efficacy**
- **Triumphs of Vaccination in Review**



INFLUENZA AND INFLUENZA VACCINES

- **Prevention and Control of Seasonal Influenza with Vaccines, 2021–22 Influenza Season**

RESOURCES

- **CDC Tools for Talking to Parents About Vaccines**
- **Up-To-Date CDC Recommendations about COVID-19 Vaccines**

COVID-19 AND COVID-19 VACCINES

INFLUENZA AND INFLUENZA VACCINES

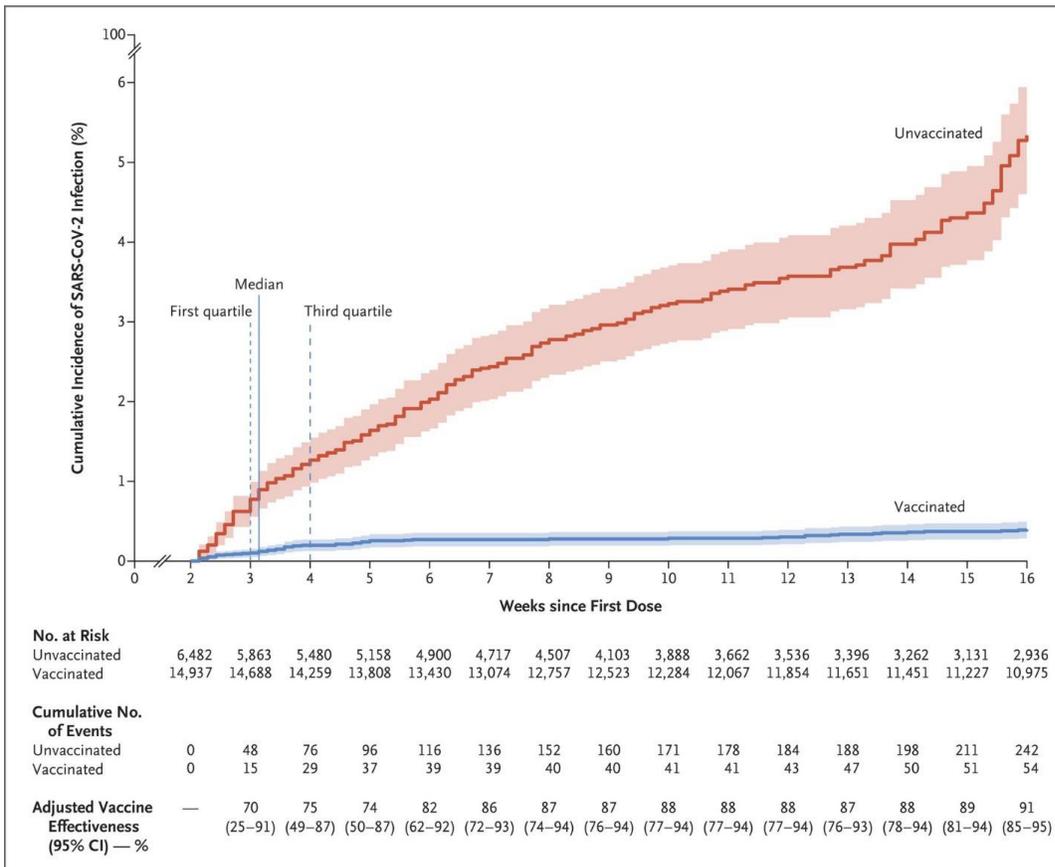
- **Prevention and Control of Seasonal Influenza with Vaccines, 2021–22 Influenza Season**

RESOURCES

- **CDC Tools for Talking to Parents About Vaccines**
- **Up-To-Date CDC Recommendations about COVID-19 Vaccines**

A Graphic Demonstration of the Effectiveness of mRNA Vaccines Against COVID-19

- The following graph shows the collective incidence of SARS-CoV-2 infection in unvaccinated people as compared to vaccinated people.



INFLUENZA AND INFLUENZA VACCINES

- **Prevention and Control of Seasonal Influenza with Vaccines, 2021–22 Influenza Season**

RESOURCES

- **CDC Tools for Talking to Parents About Vaccines**
- **Up-To-Date CDC Recommendations about COVID-19 Vaccines**

Pregnant Women Need COVID-19 Vaccination

- As of September 27, 2021, more than 125,000 laboratory-confirmed COVID-19 cases have been reported in pregnant women, including more than 22,000 hospitalized cases and 161 deaths.
- CDC's urgent call for COVID-19 vaccination includes those who are pregnant, recently pregnant (including those who are lactating), who are trying to become pregnant now, or who might become pregnant in the future.

See the CDC Health Advisory, [September 29, 2021](#).

ACOG Again Recommends COVID-19 Vaccine During Pregnancy and Lactation

- The American College of Obstetricians and Gynecologists (ACOG) recommends that all eligible persons greater than age 12 years, including pregnant and lactating individuals, receive a COVID-19 vaccine or vaccine series.
- Pregnant and recently pregnant patients with COVID-19 are at increased risk of more severe illness compared with nonpregnant peers.
 - They are at an increased risk of ICU admission, need for mechanical ventilation, and death.
 - Those with obesity and diabetes may be at an even higher risk of severe illness.

See ACOG's Practice Advisory, [October 1, 2021](#).

mRNA COVID-19 Vaccinated Mothers have SARS-CoV-2 Antibodies in Breast Milk and Serum

- Immunoglobulin A (IgA) and immunoglobulin G (IgG) were found both in breast milk and serum samples of lactating health care workers.
- Immunoglobulin levels were higher after the 2nd vaccine than after the 1st.

See *Breastfeeding Medicine*, [August 20, 2021](#), ahead of print.

Re-infection with SARS-CoV-2 Is Twice as Likely if Not Vaccinated After First Infection

- Among Kentucky residents infected with SARS-CoV-2 in 2020, those who were not vaccinated after SARS-CoV-2 infection had a 2.34 higher risk of reinfection compared to those fully vaccinated with COVID-19 vaccine after infection.
- All eligible persons should be offered COVID-19 vaccination, including those with previous SARS-CoV-2 infection, to reduce their risk for future SARS-CoV-2 infection.

See *Morbidity and Mortality Weekly Report* (MMWR), [August 13, 2021](#).

COVID-19 Vaccine Booster Doses Give Added Protection

- The effect of a COVID-19 booster dose following at least 5 months after an initial two-dose primary series of Pfizer-BioNTech vaccine was studied among people ≥ 60 years old in Israel.

- The rate of SARS-CoV-2 infection was lower in the booster group than in the nonbooster group by a factor of 11.3 and the rate of severe illness was lower by a factor of 19.5.

See NEJM, [October 6, 2021](#).

Breakthrough Infections in Vaccinated People Are Milder

- Fully vaccinated individuals who develop breakthrough infections are about half as likely as unvaccinated people to report symptoms lasting at least four weeks after infection.
- Vaccinated people who developed symptoms are half as likely to report multiple symptoms in the first week of illness and their symptoms are milder.
- Also, people with a breakthrough infection are about a third as likely to report any severe symptoms and they are more than 70% less likely to require hospitalization.

See the NIH Director's Blog, [September 14, 2021](#).

COVID-19 Breakthrough Infections in Fully Vaccinated Health Care Workers.

- Among 1,497 fully vaccinated health care workers followed for four months after COVID-19 vaccination, 39 SARS-CoV-2 breakthrough infections (2.6%) were found.
- Most breakthrough cases were mild (67%) or asymptomatic (33%), although 19% had persistent symptoms of over 6 weeks.
- A total of 29 of the 39 (74%) breakthrough cases patients had a high viral load ([Ct](#) value <30) at some point during their infection. However, of these patients, only 17 (59%) had a positive result on concurrent rapid antigen detection tests.
- No secondary COVID-19 infections were documented.

See NEJM, [July 28, 2021](#) for more details on the breakthrough cases.

COVID-19 Vaccine Effectiveness in the U.S.

- Two doses of mRNA COVID-19 vaccines gave protection against SARS-CoV-2 infection as following: Requiring hospitalization (vaccine efficacy [VE]=89%); ICU admission (VE=90%); or an emergency department or urgent care clinic visit (VE=91%).
- The Janssen vaccine protected against laboratory-confirmed SARS-CoV-2 infection as follows: Hospitalization (VE=68%); Requiring an emergency department or urgent care clinic visit (VE=73%).

See NEJM, [October 6, 2021](#).

mRNA Vaccines Effective Against COVID-19 Associated Hospitalizations

- Individuals who had received two doses of an mRNA COVID-19 vaccine were followed for 24 weeks after vaccination to assess vaccine efficacy (VE) against hospitalization.
 - From March-May 2021, the alpha variant predominated in the U.S.
 - From June-July, the delta variant was the predominant SARS-CoV-2 variant.
- Overall VE against hospitalization for COVID-19 was 86% over the full surveillance period, including 90% among patients without immunocompromising conditions and 63% among patients with immunocompromising conditions.
- VE among patients with illness onset during March–May was 87% and among those with illness onset during June–July was 84%.

See MMWR, [August 27, 2021](#).



Effectiveness of COVID-19 Vaccines in Preventing Hospitalization in Adults Aged ≥ 65 Years

- Between January-April 2021 in the U.S.:
 - Among adults aged 65–74 years, effectiveness of full vaccination for preventing hospitalization was 96% for Pfizer-BioNTech, 96% for Moderna, and 84% for Janssen COVID-19 vaccines.
 - Among adults aged ≥ 75 years, effectiveness of full vaccination for preventing hospitalization was 91% for Pfizer-BioNTech, 96% for Moderna, and 85% for Janssen COVID-19 vaccines.

See MMWR, [August 13, 2021](#).

Effectiveness of mRNA COVID-19 Vaccines in Nursing Home Residents

- From March to May 2021, mRNA COVID-19 vaccines were 74.7% effective in preventing COVID-19.
- During June to July 2021 when the delta variant predominated, vaccine effectiveness fell to 53%.
- Whether waning immunity or the circulating delta variant or both were the cause of the decrease could not be determined.

See MMWR, [August 27, 2021](#).

Pfizer-BioNTech COVID-19 Vaccine Effectiveness in Protecting Health Care Workers

- Health care workers (HCWs) who completed the vaccination schedule by the end of January 2021 were matched with HCWs who had refused vaccination. Both groups were followed for seventy days.
- Vaccine efficacy against documented SARS-CoV-2 infection was:
 - During 14–20 days after first dose: 61.9%
 - During 21–27 days after first dose: 87.9%
 - After 7 or more days after second dose: 96.0%.

See the *Journal of Infectious Diseases* (JID), [August 1, 2021](#).

Effectiveness of COVID-19 Vaccines Against the Delta Variant

- In England, the effectiveness after one dose of either Pfizer-BioNTech COVID-19 vaccine or AstraZeneca COVID-19 vaccine was 48.7% among those infected with the alpha variant and 30.7% among those infected with the delta variant.
- With the Pfizer-BioNTech COVID-19 vaccine, the effectiveness after two doses was 93.7% for persons infected with the alpha variant and 88.0% for those infected with the delta variant.
- With the AstraZeneca CoV-19 vaccine, the effectiveness after two doses was 74.5% among persons with the alpha variant and 67.0% among those with the delta variant.

See NEJM, [August 12, 2021](#).



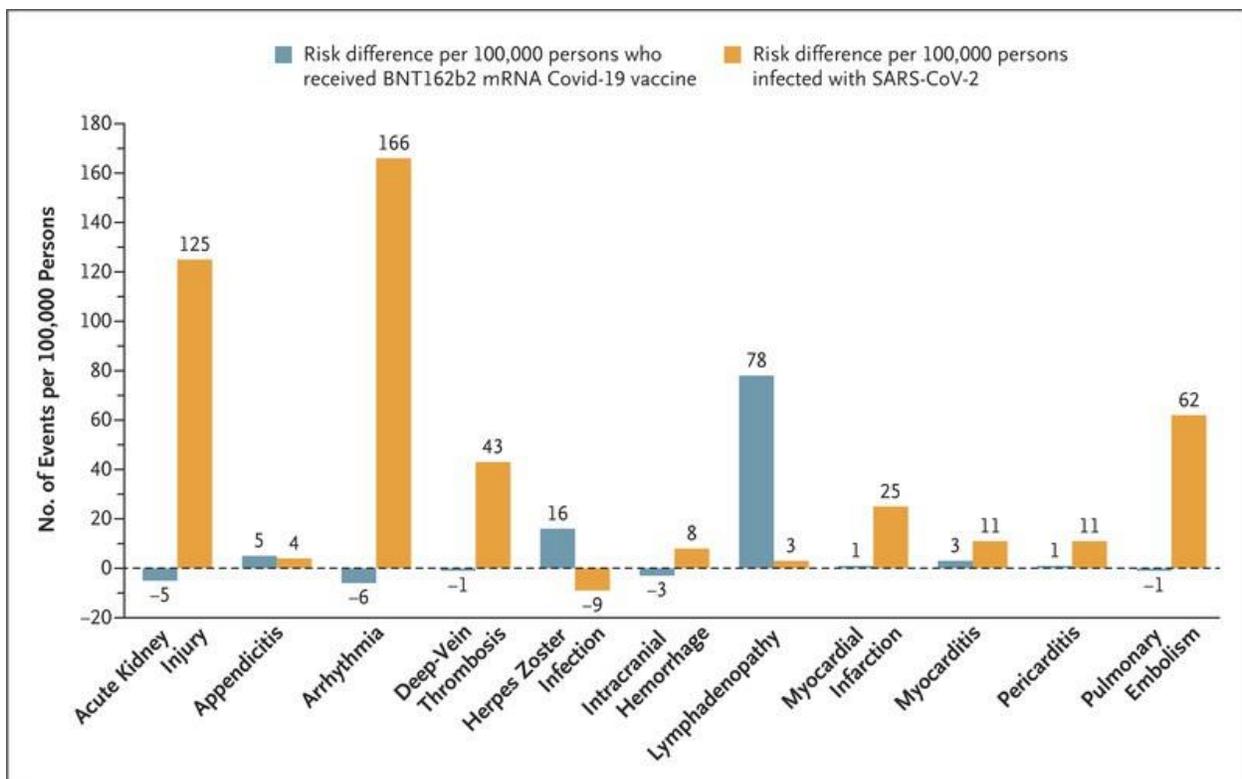
Benefits of COVID-19 Vaccines Outweigh the Risks of Rare Side Effects

- Rare serious adverse events have been reported after COVID-19 vaccination, including Guillain-Barré syndrome and thrombosis with thrombocytopenia syndrome (TTS) after Janssen COVID-19 vaccine, and myocarditis after mRNA COVID-19 vaccines (Pfizer-BioNTech and Moderna).
- The Advisory Committee on Immunization Practices (ACIP) reviewed updated benefit-risk analyses after Janssen and mRNA COVID-19 vaccination and concluded that the benefits outweigh the risks for rare serious adverse events after COVID-19 vaccination.

For more details, see MMWR, [August 13, 2021](#).

Risks with Pfizer-BioNTech COVID-19 Vaccine Compared to Risks from COVID-19 Infection

- The following graph shows the absolute excess risk for 11 clinical entities in relation to either Pfizer-BioNTech COVID-19 vaccine (turquoise) or COVID-19 infection (orange).
- Events about the “0 line” mean increased risk per 100,000 persons. Below the “0 line” means decreased risk.
- Axillary lymphadenopathy is a known event after mRNA vaccines, so it is not surprising that there is an increased risk compared to COVID-19 infection.
- The majority of the other events, including myocarditis and pericarditis, was higher with COVID-19 infection than with COVID-19 vaccine.



See NEJM, [September 16, 2021](#) for more details on COVID-19 vaccine safety.



COVID-19 Vaccinated Adolescents Protected Against COVID-19 Hospitalization

- Between June-September in the U.S. during high delta variant circulation
 - Two doses of Pfizer-BioNTech COVID-19 vaccine was 93% protective in preventing adolescents from being hospitalized due to COVID-19.
 - 97% of adolescents who were hospitalized with COVID-19 had not received a COVID-19 vaccine.
 - There were no ICU admissions among adolescents hospitalized due to COVID-19 who had received COVID-19 vaccine.

See MMWR, [October 22, 2021](#).

Likelihood of Parents Choosing COVID-19 Vaccination for Their Children

- In February-March 2021, an internet survey was taken of 1,745 parents as to how likely they were to have their child receive a COVID-19 vaccine.
 - The responses were: very likely (28%), somewhat likely (18%), somewhat unlikely (9%), very unlikely (33%), and unsure (12%).
 - The factors that were associated with parents being more likely to have their child receive COVID-19 vaccine included if they were parents of older children, if the parents had a bachelor's or higher degree, or if the parents had already received or were likely to receive a COVID-19 vaccine.
- Parental concerns centered around vaccine safety and side-effects.
- The child's doctor is a key trusted source of information about COVID-19 vaccine.

See *Pediatrics*, [October 2021](#).

LITERATURE ON VACCINES AND VACCINE-PREVENTABLE DISEASES

Malaria Vaccine Approval by WHO

- The World Health Organization (WHO) has approved the use of a new malaria vaccine, RTS,S, an adjuvanted recombinant protein vaccine.
- In 2019, there were 229 million cases of malaria identified, with 409,000 deaths, two-thirds of whom were younger than 5 years and living in sub-Saharan Africa.
- RTS,S targets the sporozoite phase of the malaria lifecycle, by blocking liver infection.
- Clinical [trials](#) showed that children receiving three doses of RTS,S plus a booster dose, between 5 and 17 months of age, would have a 29% reduced risk of severe malaria.
- When combined with seasonal malaria chemoprevention, RTS,S can reduce death from malaria by over 70%.
- For a disease that kills a child every 2 minutes, a vaccine with even just 30% efficacy will have a significant effect on improving child survival.

See the *Lancet*, [October 16, 2021](#).



Oral Human Papillomavirus Infections Can Occur in Infants and Young Children

- In a six-year study starting at birth, oral samples from 331 children in Finland were tested for 24 HPV genotypes.
- Oral HPV prevalence ranged from 22.8% at birth to 8.7% at a 36-month visit.
- Although most of the oral HPV infections were cleared during the 6-year follow-up period, persistent oral HPV infection was found in 14.9% of these children.
- Persistent, oral, high-risk HPV infection for children was associated with oral HPV carriage of the mother at birth and seroconversion of the mother to high-risk HPV during follow-up.
- HPV vaccination of adolescents and women could decrease the risk of oral HPV infection in their children.

See *Emerging Infectious Diseases*, [March 2021](#).

Recombinant Zoster Vaccination Shows Persistent Efficacy

- Individuals aged ≥ 50 years old were followed for 5-7 years after recombinant zoster vaccination. Efficacy against shingles remained high at 84%.

See *Clinical Infectious Diseases*, [July 20, 2021](#); corrected proof.

Triumphs of Vaccination in Review

- This supplement contains in-depth reviews of vaccines for pertussis, *Haemophilus influenzae* type b, rotavirus, hepatitis B, pneumococci (conjugate vaccines), rubella, human papillomavirus, smallpox, varicella, polio, influenza, measles, and zoster.
- All these articles are written by vaccine experts who give detailed reviews of history and present issues and successes with these vaccines.

See *JID*, [October 1, 2021](#), supplement 4.

INFLUENZA AND INFLUENZA VACCINES

Prevention and Control of Seasonal Influenza with Vaccines, 2021–22 Influenza Season

- All seasonal influenza vaccines in the US for the 2021–22 season will be quadrivalent.
- Both influenza A components are new for this season; B components are the same.
- The approved age for the cell culture–based inactivated influenza vaccine, Flucelvax® Quadrivalent (ccIV4), has changed from age ≥ 2 years to age ≥ 6 months.*
- Influenza vaccines can be co-administered with COVID-19 vaccine and other vaccines.
- Vaccination soon after seasonal influenza vaccine becomes available can be considered for pregnant women in their third trimester to allow for transplacental transfer of influenza antibodies to their infants.
 - For nonpregnant adults, vaccination in July and August should be avoided *unless* there is concern that later vaccination might not be possible.



- Precautions for influenza vaccine use:
 - A history of a severe allergic reaction to a previous dose of any egg-based inactivated influenza vaccine (IIV), live-attenuated influenza vaccine (LAIV), or recombinant influenza vaccine (RIV) of any valency is a precaution to cclIV4.
 - A history of a severe allergic reaction to a previous dose of any egg-based IIV, cclIV, or LAIV of any valency is a precaution to use of RIV4.
- Contraindications for influenza vaccine use:
 - For cclIV4, history of a severe allergic reaction (e.g., anaphylaxis) to cclIV of any valency or any component of cclIV4 is a contraindication to future use of cclIV4.
 - For RIV4, history of a severe allergic reaction (e.g., anaphylaxis) to RIV of any valency or any component of RIV4 is a contraindication to future use of RIV4.

MMWR, [August 27, 2021](#) (RR-5).

* On October 14, 2021, the Food and Drug Administration approved the use of Flucelvax® Quadrivalent (cclIV) for ages [6 months and above](#). An ACIP [presentation](#) on October 20, 2021 explained that CDC plans to add this age change for Flucelvax® Quadrivalent to CDC's online version of the [Table](#) of available influenza vaccines for the 2021-22 season.

RESOURCES

CDC Tools for Talking to Parents About Vaccines

- [Quick Responses](#) to Questions about Infant Vaccines and about HPV Vaccine.
- Talking with Parents about Vaccines for [Infants](#).
- [Preparing for Questions](#) that Parents May Ask about Vaccines.

Up-To-Date CDC Recommendations about COVID-19 Vaccines

- The "[Interim Clinical Considerations](#) for Use of COVID-19 Vaccines Currently Approved or Authorized in the United States" is continually updated with CDC's COVID-19 vaccine recommendations. The latest update was on October 25, 2021.
- Please feel free to distribute ADHS' *Arizona Vaccine News* to any of your partners who may be interested.
 - If you wish to subscribe or unsubscribe, email karen.lewis@azdhs.gov.
 - Past issues of *Arizona Vaccine News* are found at <https://www.azdhs.gov/preparedness/epidemiology-disease-control/immunization/index.php#news>.