



## IMMUNIZATIONS

### Summary and Purpose

Immunization is one of the most successful and cost-effective public health interventions in history. Federal and professional guidelines recommend childhood and adolescent immunizations to protect against a wide range of viral and bacterial infections whose consequences can include disease, permanent disabilities, and death. Many vaccines contribute to lifelong immunity, and are highly cost-effective public health investments. For every \$1 spent: the measles/mumps/rubella vaccine saves \$26; the diphtheria/tetanus/acellular pertussis vaccine saves \$27; and the perinatal hepatitis B vaccine saves almost \$15.<sup>1</sup>

Vaccinations are also an important topic to address during pregnancy, as the immunization status of a pregnant woman can affect both her and her baby's health. Some vaccine-preventable diseases can pose a serious risk to the health of a pregnant woman and that of her unborn baby, and a pregnant woman can pass on antibodies to vaccine-preventable diseases, which helps keep the baby safe until the baby is old enough to receive their own vaccines.

### March of Dimes Position

To improve mom and baby health across the country, March of Dimes supports efforts to ensure all moms and babies are up to date on all Centers for Disease Control and Prevention (CDC) recommended vaccinations. To achieve this, March of Dimes supports:

- Efforts to increase immunization coverage so that children and pregnant women are protected from vaccine-preventable diseases and to assure that diseases of the past do not return.
- Strong school immunization requirements and advocates against non-medical exemptions to vaccination.
- All eligible children and pregnant women completing the full immunization schedules recommended by the CDC.
- [The Advisory Committee on Immunization Practices \(ACIP\) recommendations](#) for pregnant women, in order to provide protection for both mother and baby against vaccine-preventable diseases, influenza (IIV or RIV), and pertussis (Tdap or Td).
- Efforts to ensure all families, no matter what their insurance status, can receive immunizations without cost sharing. No family should face financial barriers to full immunization.
- Education for health care providers, parents, and the general public about the importance of immunizations.
- Maintaining the regular immunization schedule for children and pregnant women during the COVID-19 pandemic.
- Providers offering alternative immunization settings for families during the COVID-19 pandemic (e.g. drive-up or outdoor immunization clinics).
- Prioritizing pregnant women and infants for immunization when a safe, effective COVID-19 vaccine is available.
- Including pregnant and lactating women in clinical vaccine trials and research.

## **Vaccine Effectiveness and Herd Immunity**

Public participation in immunization programs is critical to their effectiveness. To achieve effective protection, otherwise known as herd or community immunity, vaccinations must cover a certain percent of the population. This stops the disease from spreading and prevents outbreaks from occurring. The herd immunity threshold for vaccine-preventable diseases depends on how contagious a disease is — the more contagious it is, the higher the threshold to achieve immunity. For most diseases, 70-95% of eligible persons must be vaccinated to attain herd immunity.<sup>2,3</sup> Some people cannot be vaccinated due to allergies, age, or a compromised immune system, but are still protected by herd immunity. Vaccinating a certain percent of the population stops disease transmission even to those who are not vaccinated. Adverse events due to vaccines are extremely rare and are greatly outweighed by the benefits of preventing individual illness, its serious complications, and epidemics.

When immunization levels have dropped in various populations in recent decades, otherwise preventable infectious diseases have made dramatic comebacks. Measles is usually among the first to reappear when vaccination rates fall; it can cause pneumonia, other serious respiratory infections and encephalitis, the last of which can lead to permanent brain damage or death. According to the CDC, the United States experienced a record number of measles cases in 2019, with 1,282 reported cases in 31 states. This is the greatest number of cases since measles eradication was confirmed in the U.S. in 2000. Over 73% of the cases in 2019 were linked to large outbreaks in New York and were among people who had not been vaccinated against measles.<sup>4</sup> As community immunity weakens, risk of vaccine-preventable diseases to unvaccinated individuals increases. The CDC advises parents to protect their children by keeping their vaccination schedules up to date. A family refusing to vaccinate an individual child places the child at risk and increases the risk of infection for others in the community, including those who cannot be vaccinated for medical reasons.

If an unvaccinated child is exposed to infectious diseases, the child's body may not be strong enough to fight the disease. Before vaccines, many children died from diseases that vaccines now prevent, such as whooping cough, measles, and polio. Those same germs still exist today, but because babies are protected by vaccines, we do not see these diseases nearly as often.

## **Vaccines During Pregnancy**

Pregnancy provides an opportunity for health care providers to have regular contact with the patient and to obtain a thorough immunization history during a preconception or prenatal visit. Due to the theoretical risk of transmitting a virus or bacterial infection across the placenta and causing an infection in the baby, live-attenuated vaccines (which contain weakened forms of live viruses or bacteria), such as the MMR, HPV and chickenpox vaccine are not recommended during pregnancy.<sup>5</sup>

Two vaccines are strongly recommended during pregnancy: influenza and Tdap.<sup>6,7</sup> Influenza, a highly contagious acute respiratory infection, increases the risk of serious health complications during pregnancy, including cardiopulmonary complications.<sup>6,8</sup> ACIP recommends that all women who are pregnant during the flu season (October-May in the U.S.) receive the influenza vaccine.<sup>5</sup> The vaccine is safe to receive at any point in gestation. Pertussis or whooping cough is a highly contagious bacterial disease characterized by violent coughing fits.<sup>9</sup> In recent years, there have been significant increases in reported cases of pertussis in the U.S. The Tdap vaccine is given to pregnant women to provide some protection to infants from pertussis until they are old enough to be vaccinated themselves starting at 2 months of age. This is important because infants under 3 months of age have the highest rates of health complications and death associated with pertussis, and the percentage of pregnant women vaccinated with Tdap has been found to be low.<sup>10,11</sup> Pertussis can cause severe complications for babies which can include pneumonia and slowed or stopped breathing.<sup>9</sup> In addition to the mother being less likely to pass whooping cough to her infant, vaccination with Tdap provides some short-term protection through the antibodies that her body makes and passes to the baby before birth.

Updated September 2020

## References

- <sup>1</sup> Institute of Medicine. *Financing Vaccines in the 21st Century: Assuring Access and Availability*. The National Academies Press, 2003. Available at: <https://www.nap.edu/catalog/10782/financing-vaccines-in-the-21st-century-assuring-access-and-availability>
- <sup>2</sup> Plans-Rubió P. Evaluation of the establishment of herd immunity in the population by means of serological surveys and vaccination coverage. *Hum Vaccin Immunother*. 2012;8(2):184-188. doi:10.4161/hv.18444
- <sup>3</sup> Rodrigues CMC, Plotkin SA. Impact of Vaccines; Health, Economic and Social Perspectives. *Front Microbiol*. 2020;11:1526. doi:10.3389/fmicb.2020.01526
- <sup>4</sup> The Centers for Disease Control and Prevention (CDC). Measles Cases and Outbreaks. Available at: [www.cdc.gov/measles/casesoutbreaks.html](http://www.cdc.gov/measles/casesoutbreaks.html)
- <sup>5</sup> Ezeanolue E, Harriman K, Hunter P, Kroger A, Pellegrini C. General Best Practice Guidelines for Immunization. Best Practices Guidance of the Advisory Committee on Immunization Practices (ACIP). Available at: <https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html>
- <sup>6</sup> ACOG Committee Opinion No. 732: Influenza vaccination during pregnancy. *Obstet Gynecol*. 2018;131(4):e109-14. Available at: <https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2018/04/influenza-vaccination-during-pregnancy>
- <sup>7</sup> ACOG Committee Opinion No. 718: Update on immunization and pregnancy: tetanus, diphtheria, and pertussis vaccination. *Obstet Gynecol*. 2017;130(3):e153-e157. Available at: <https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2017/09/update-on-immunization-and-pregnancy-tetanus-diphtheria-and-pertussis-vaccination>
- <sup>8</sup> Cantu J, Tita AT. Management of influenza in pregnancy. *Am J Perinatol*. 2013;30(2):99-103.
- <sup>9</sup> CDC. Pertussis (Whooping Cough). Available at: <https://www.cdc.gov/pertussis/>
- <sup>10</sup> CDC. Updated recommendations for use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine (Tdap) in pregnant women and persons who have or anticipate having close contact with an infant aged <12 months—Advisory Committee on Immunization Practices (ACIP). *MMWR* 2011;60:1424–6. Available at: <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6041a4.htm>
- <sup>11</sup> CDC. Updated recommendations for the use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine (Tdap) in pregnant women – ACIP, 2012. *MMWR Morb Mortal Wkly Rep*. 2013; 62(7):131-5. Available at: <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6207a4.htm>