# THE GIFT OF MATERNAL ANTIBODY: PROTECTION FROM BIRTH

## Children continue to die each year from vaccine-preventable diseases

Among the 5.3 million deaths in children under 5 years in 2019[1]:

**21.7%** were vaccine-preventable[1]

**46.0%** occurred in neonates[1]

Neonates are **too young** for some vaccines and are vulnerable to infections[2]

## Pregnant women are susceptible to infections and are at risk of developing severe disease

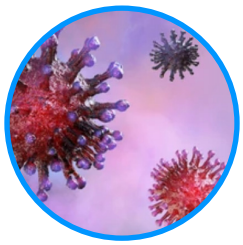
Pregnancy alters a mother's innate and adaptive immune response, making her more susceptible to infections such as influenza and COVID-19, and putting her at increased risk of developing complications that may cause health problems for mother and fetus.[3,4]

## Maternal immunization is a tried-and-tested strategy to reduce neonatal deaths

Vaccinating pregnant women is not a new concept[5]; the use of smallpox vaccines in pregnant mothers dates back to the 18th century.[6]

- **1960s** — Study of tetanus toxoid in pregnant women[5,6]; Pregnant women prioritized for inactivated influenza vaccine (US)[5]
- **1970s/1980s** — DTaP available for pregnant women[5]
- **1988** — World Health Assembly's call to eliminate[a] tetanus[5]
- **1997** — US CDC endorsed using influenza vaccines in pregnant women[5]
- **2012 onwards** — More vaccines against respiratory viruses become available for pregnant women[6]

Tetanus vaccination programs contributed to a **97% reduction** in tetanus-related neonatal deaths from 1988 to 2018[7]



Influenza maternal immunization programs contribute to a **~50% decrease** in infections in mothers and infants ≤24 weeks of age[8]

[a]Defined as <1 neonatal case per 1000 live births in every district in the country each year.

## Vaccination in pregnancy protects babies through the transfer of antibodies from mother to child, thereby closing the window of vulnerability[9]

Vaccination in pregnancy is a form of passive immunization where antibodies produced by the mother are transferred to the fetus via an active, regulated process.[10] It allows the infant to be protected by maternal antibodies before their immune system matures.[9]

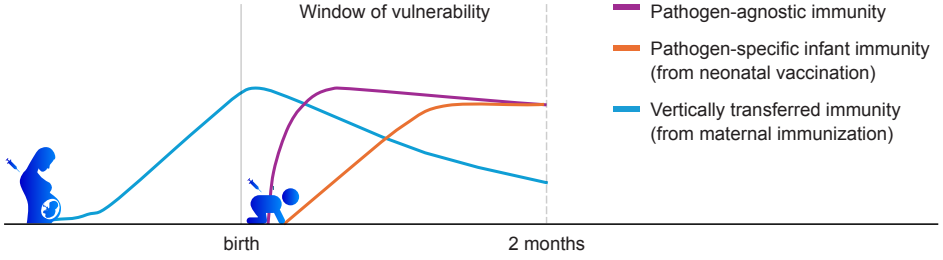



Figure adapted from Kollmann TR, et al. *Science*. 2020;369:612–5.

Pfizer

# THE GIFT OF MATERNAL ANTIBODY: PROTECTION FROM BIRTH

## Frequently asked questions

### Q: When is the best time to vaccinate during pregnancy?

The best time to vaccinate varies for different vaccines because the transfer efficiencies of different IgG subclasses are not the same.[11-13]

Vaccines against COVID-19 and influenza, for instance, can be given any time during pregnancy; the use of such vaccines may coincide with seasonality (if applicable).[13]

Other vaccines such as those against tetanus are recommended to be given during the third trimester to maximize maternal antibody response and transfer to the infant.[14]

### Q: Is there a maximum number of vaccines an expectant mother can receive? How should we prioritize?

Theoretically, there isn't a maximum number of vaccines a pregnant woman can receive. In terms of prioritization, each country needs to consider the burden of disease in their region. For example, in regions where influenza is seasonal, vaccination should be considered if the baby is to be born during the flu season. Co-administration of Tdap and influenza vaccines was not associated with an increased risk of adverse events or birth outcomes compared with sequential administration.[14]

### Q: Is it necessary to give Tdap for every pregnancy even if they are 2 years apart?

Yes, the goal of Tdap vaccination is to protect the infant during the vulnerable neonatal period so this is needed for each pregnancy.[15]

### Q: Is vaccinating pregnant women reliable?

Vaccines used in pregnant women for influenza, tetanus or pertussis have a favorable safety record. A meta-analysis of clinical trials of vaccines currently available for pregnant women found no increased risk of negative pregnancy outcomes.[16,17] Although adverse events may happen after vaccination, the burden of infections for an unvaccinated mother far outweighs the risk of side effects.[18]

### Q: Is the baby protected if the mother gives birth shortly after vaccination?

Fetal antibody titers generally rise approximately 2 weeks after maternal vaccination.[11] Therefore, if the baby is born within 2 weeks of the mother receiving a vaccine, it can be assumed that the baby is not protected.

---

## Steps to promote maternal immunization[19]

**ACTIVELY DISCUSS** with and **INFORM** patients on vaccination in pregnancy, highlighting:

1. The safety and efficacy of vaccines available for pregnant women
2. Risk of infections among neonates
3. Risk of infections among pregnant women and the potential sequelae

For adaptation by local teams: For more information about maternal immunization, please visit [link to be tailored by local teams] or contact [local teams to include Pfizer contact].

This material is developed for healthcare professionals in Emerging Markets only. Please refer to guidelines and recommendations for local practice.

DTaP, tetanus, diphtheria and acellular pertussis vaccine for younger children; Tdap, tetanus, diphtheria and acellular pertussis vaccine for older children and adults; Td, tetanus and diphtheria vaccine.

**References: 1.** Perin J, et al. *Lancet Child Adolesc Health*. 2022;6:106–15; **2.** Omer SB. *N Engl J Med*. 2017;376:1256–67; **3.** Oseghale O, et al. *Viruses*. 2022;14:2729; **4.** Rojas-Suarez J, Miranda J. *Clin Chest Med*. 2023;44:373–84; **5.** Mackin DW, Walker SP. *Best Pract Res Clin Obstet Gynaecol*. 2021;76:13–22; **6.** Sobanjo-ter Meulen A, et al. *Clin Infect Dis*. 2016;63:S123–33; **7.** World Health Organization. Tetanus Fact Sheet. 2023. Available at: https://www.who.int/news-room/fact-sheets/detail/tetanus. Accessed: 14 May 2024; **8.** Madhi SA, et al. *N Engl J Med*. 2014;371:918–31; **9.** Kollmann TR, et al. *Science*. 2020;369:612–5; **10.** Albrecht M, Arch PC. *Frontiers Immunol*. 2020;11:555; **11.** Vojtek I, et al. *Ann Med*. 2018;50:193–208; **12.** Palmeira P, et al. *Clin Dev Immunol*. 2012; 985646; **13.** Rand CM, Olson-Chen C. *Pediatr Clin North Am*. 2023;70:259–69; **14.** Sukumaran L, et al. *Obstet Gynecol*. 2015;126:1069–74; **15.** CDC Vaccine Information Statements Tdap 2021. Available at: www.cdc.gov/vaccines/hcp/vis/vis-statements/tdap.html. Accessed: 18 July 2024; **16.** de Bruin O, et al. *BMJ Glob Health*. 2023;8:e012376; **17.** Giles ML, et al. *Hum Vaccines Immunother*. 2019;15:689–99; **18.** Centers for Disease Control (US). *Morb Mortal Wkly Rep*. 2011;60 (2); **19.** Sebghati M, Khalil A. *Best Pract Res Clin Obstet Gynaecol*. 2021:76:53–65.



Pfizer