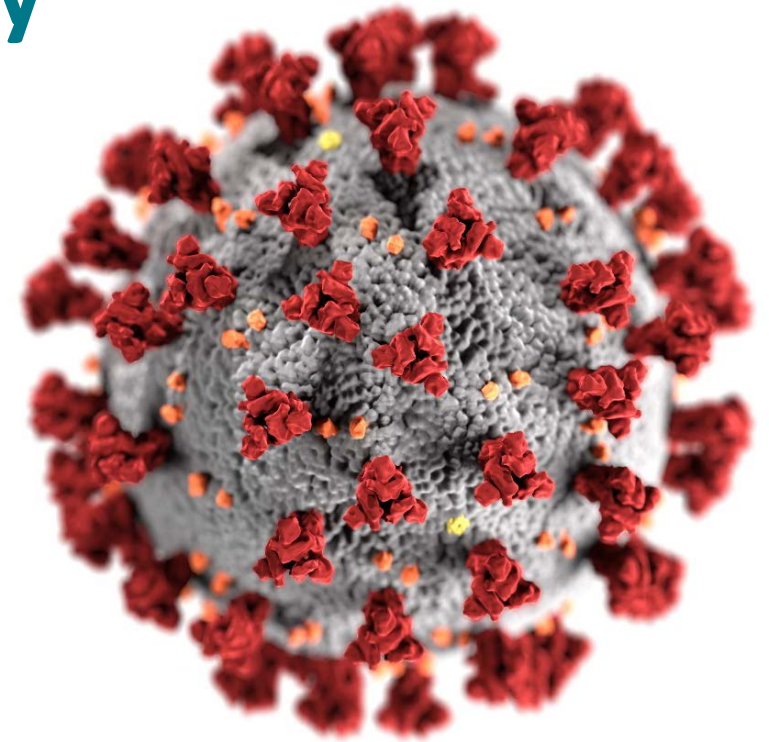


# CDC Coronavirus Disease 2019 Response

## Updates on COVID-19 and Pregnancy

Dana Meaney-Delman, MD, MPH FACOG  
Lead, Maternal Immunization

ACIP Meeting  
September 22, 2021



[cdc.gov/coronavirus](https://cdc.gov/coronavirus)

# Disclaimer

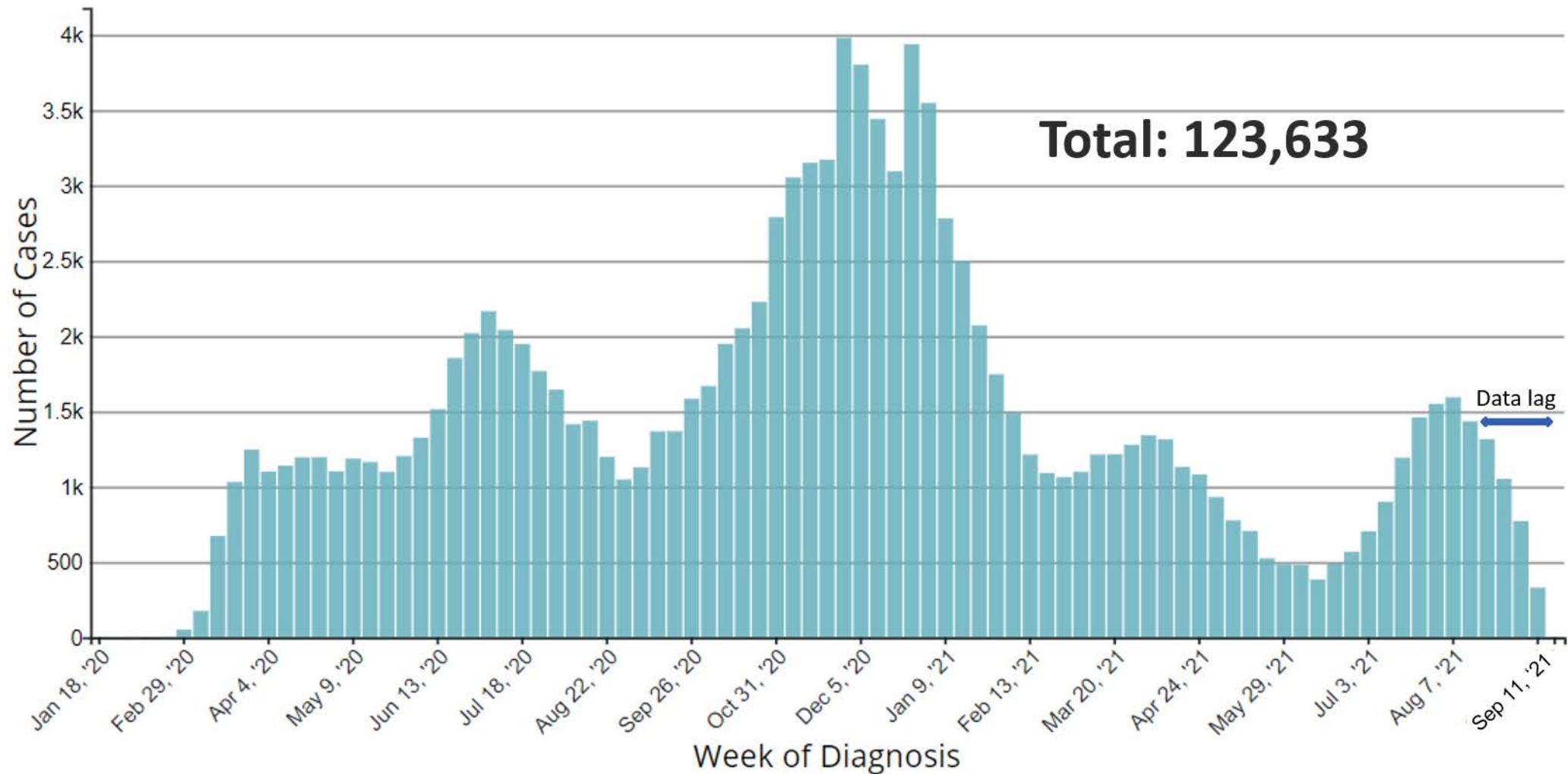
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- Mention of a product or company name is for identification purposes only and does not constitute endorsement by CDC.



# COVID-19 epidemiology among pregnant people



# Pregnant people with laboratory-confirmed SARS-CoV-2 infection (National COVID-19 Case Surveillance Data)\*

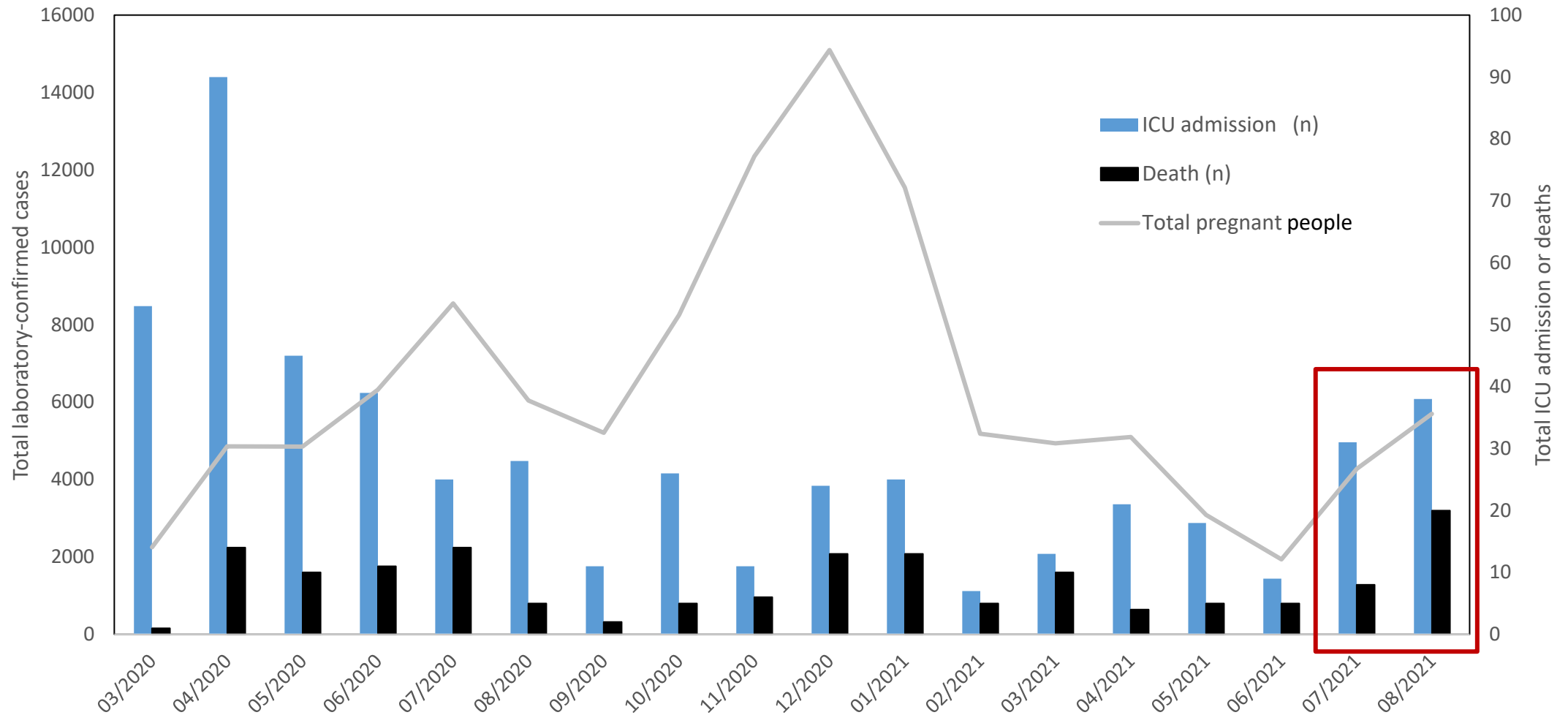


National COVID-19 case surveillance data: Pregnant people with laboratory-confirmed SARS-CoV-2 infection,\* Jan 22, 2020–Sep 13, 2021

\* Based on detection of SARS-CoV-2 in a clinical specimen by molecular amplification techniques

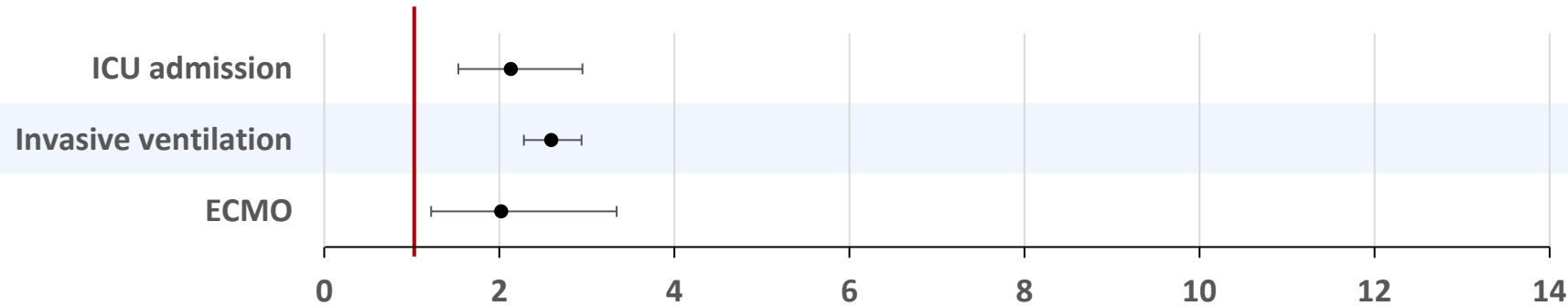
<https://covid.cdc.gov/covid-data-tracker/#pregnant-population>

# COVID-19 cases, ICU admission and death among pregnant people (National COVID-19 Case Surveillance Data; Jan 22, 2020 – Sep 13, 2021)



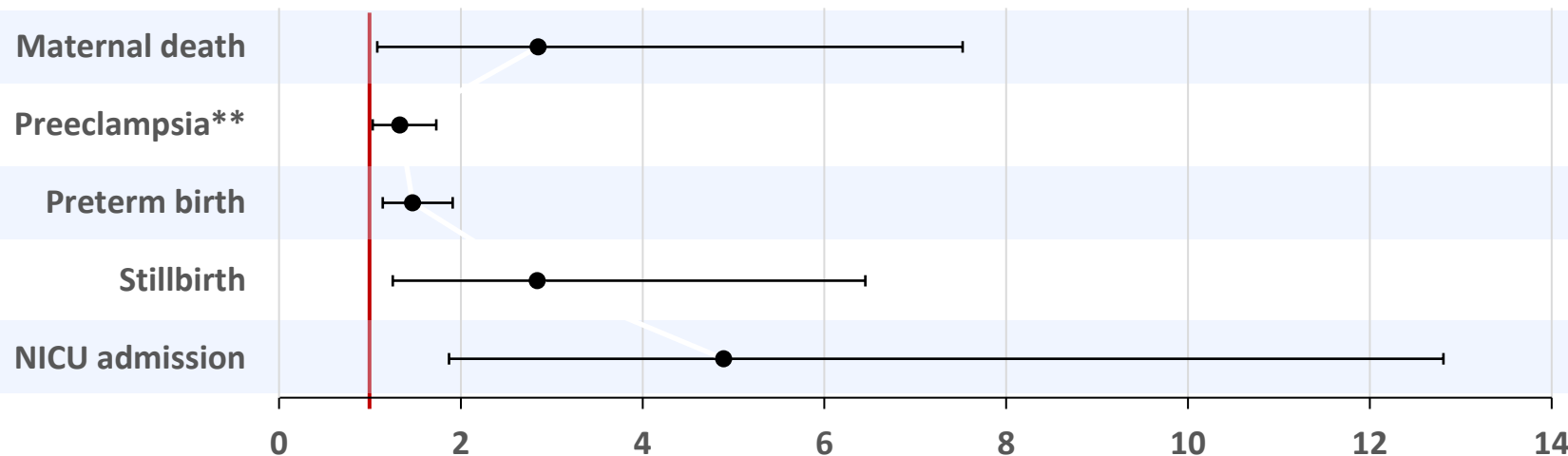
# Severe illness and adverse maternal, pregnancy, and neonatal outcomes among pregnant women with COVID-19

Compared with non-pregnant WRA\* with COVID-19



Outcome	Odds Ratios [95% CI]	Number of events / Total
ICU admission	2.13 (1.93-2.95)	10,184 / 601,108
Invasive ventilation	2.59 (2.28-2.94)	3,550 / 601,044
ECMO	2.02 (1.22-3.34)	137 / 461,936

Compared with pregnant women without COVID-19



Outcome	Odds Ratios [95% CI]	Number of events / Total
Maternal death	2.85 (1.08-7.52)	16 / 4,820
Preeclampsia**	1.33 (1.03-1.73)	28,326 / 424,344
Preterm birth	1.47 (1.14-1.91)	719 / 8,549
Stillbirth	2.84 (1.25-6.45)	35 / 5,794
NICU admission	4.89 (1.87-12.81)	848 / 5,873

Data from [Allotey, J et al.](#) unless otherwise noted; \*Women of reproductive age; \*\* Preeclampsia data from [Wei et al.](#); ECMO: Extracorporeal membrane oxygenation

# Severe illness and death for symptomatic pregnant women with COVID-19 compared to symptomatic nonpregnant women

Outcomes of Interest	No. (%) <sup>*</sup>		Crude RR (95% CI)	aRR (95% CI) <sup>†</sup>
	Symptomatic Pregnant women with COVID-19 (N = 23,434)	Symptomatic Nonpregnant women with COVID-19 (N = 386,028)		
<b>ICU Admission</b>	245 (1.1)	1,492 (0.4)	<b>2.7 (2.4-3.1)</b>	<b>3.0 (2.6-3.4)</b>
<b>Mechanical Ventilation</b>	67 (0.3)	412 (0.1)	<b>2.7 (2.1-3.5)</b>	<b>2.9 (2.2-3.8)</b>
<b>ECMO<sup>§</sup></b>	17 (0.1)	120 (0.0)	<b>2.3 (1.4-3.9)</b>	<b>2.4 (1.5-4.0)</b>
<b>Death</b>	34 (0.2)	447 (0.1)	<b>1.3 (0.9-1.8)</b>	<b>1.7 (1.2-2.4)</b>

\* Percentages calculated among total in pregnancy status group; those with missing data on outcomes were counted as not having the outcome

<sup>†</sup> Adjusted for age, race/ethnicity, and presence of underlying conditions. Nonpregnant women are the referent group.

<sup>§</sup> Extracorporeal membrane oxygenation

Zambrano LD, Ellington S, Strid P, et al. Update: Characteristics of Symptomatic Women of Reproductive Age with Laboratory-Confirmed SARS-CoV-2 Infection by Pregnancy Status — United States, January 22–October 3, 2020. MMWR Morb Mortal Wkly Rep. ePub: 2 November 2020.

DOI: <http://dx.doi.org/10.15585/mmwr.mm6944e3external> icon.

# Perinatal infection among neonates born to pregnant women with SARS-CoV-2 infection<sup>1</sup>

- 25,896 live born infants had  $\geq 1$  neonatal SARS-CoV-2 PCR test; 3,381 (13%) underwent PCR testing during the perinatal period
- 136 (4%) of those tested were PCR-positive
  - Nearly all were born to mothers with infection close to delivery (<14 days)
  - Positivity higher among those born preterm
- Other cohorts have estimated perinatal positivity to be 1-2%<sup>2</sup>



1. Data from Surveillance for Emerging Threats to Mothers and Babies Network <https://www.researchsquare.com/article/rs-491688/v1>

2. Mullins E, Hudak ML, Banerjee J, et al. Pregnancy and neonatal outcomes of COVID-19: coreporting of common outcomes from PAN-COVID and AAP-SONPM registries. *Ultrasound Obstet Gynecol.* 2021;57(4):573-581. doi:10.1002/uog.23619



# COVID-19 vaccine effectiveness in pregnancy



# Early data suggest receiving an mRNA COVID-19 vaccine during pregnancy reduces the risk for infection



- **Two Recent Studies from Israel**
  - **Objective:** Assess the association between receipt of mRNA COVID-19 vaccine and risk of infection among pregnant people
- **Methods:**
  - Retrospective cohort studies leveraging large state-mandated health care organizations
  - Vaccinated pregnant people were 1:1 matched to unvaccinated pregnant people by demographic and clinical characteristics

<https://jamanetwork.com/journals/jama/fullarticle/2782047>

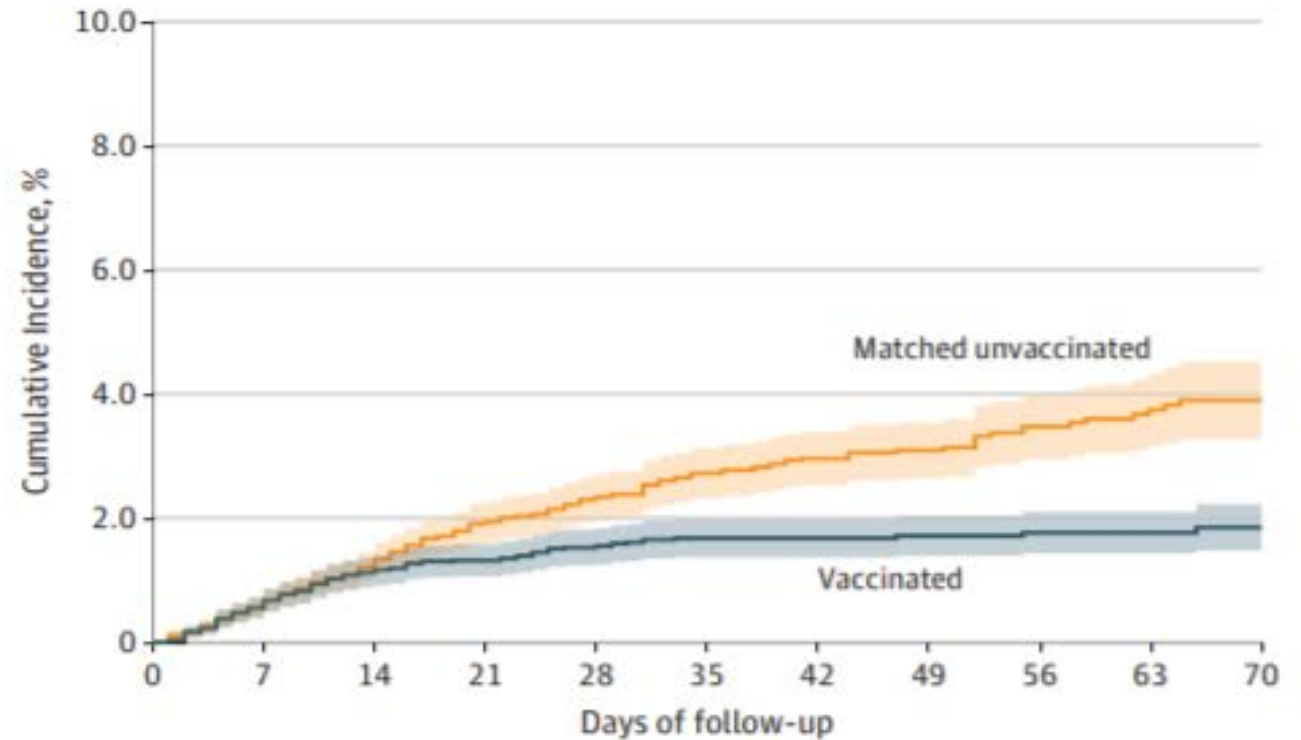
<https://www.nature.com/articles/s41591-021-01490-8>

# Early data suggest receiving an mRNA COVID-19 vaccine (BNT162b2) during pregnancy reduces the risk for infection

**Goldshtein et al.**

- 7,530 vaccinated pregnant people and 7,530 unvaccinated pregnant people
- Vaccination with mRNA COVID-19 vaccines lowered the risk of infection among pregnant people

Cumulative incidence of SARS-CoV-2 infection over time



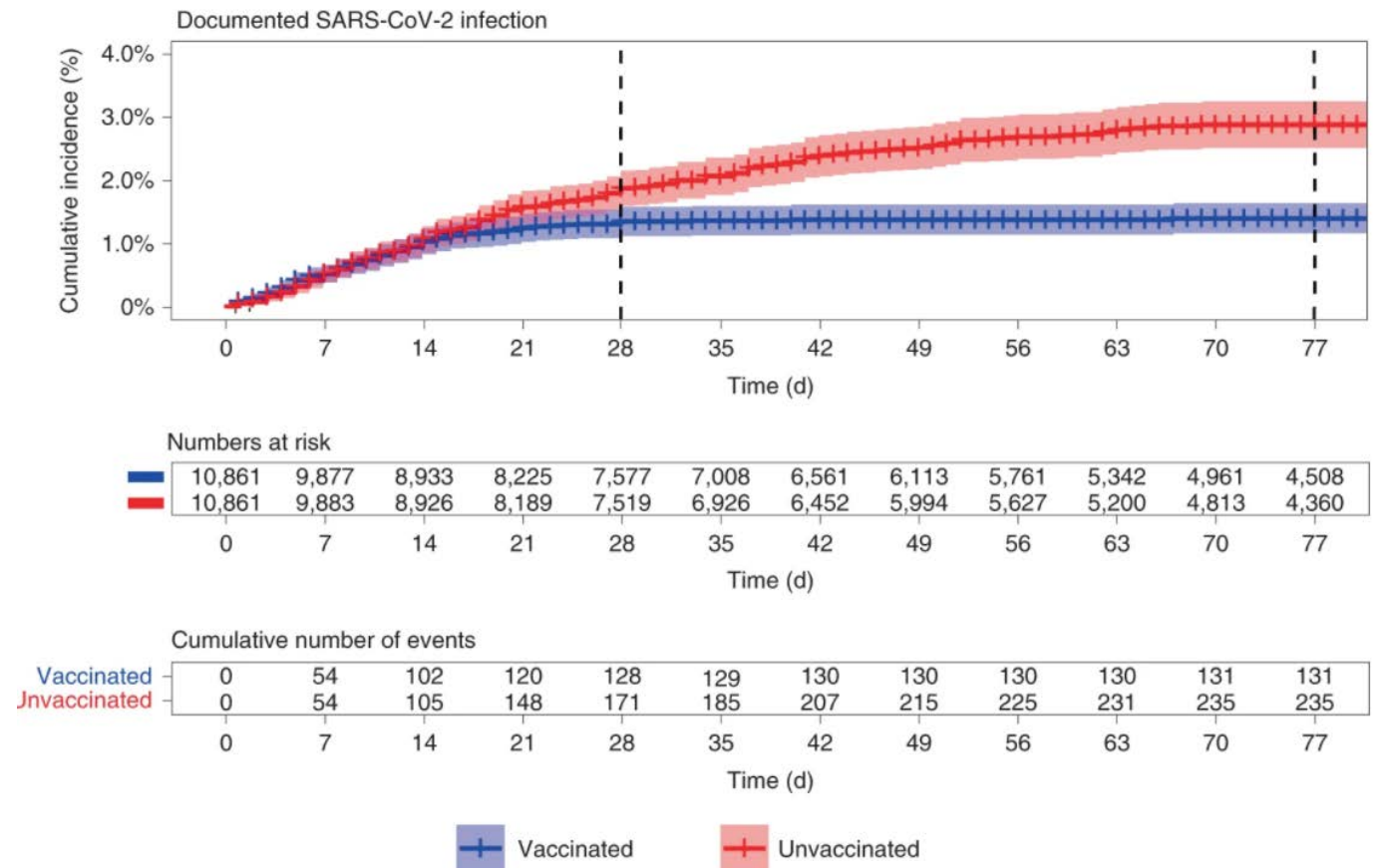
No. at risk											
Matched unvaccinated	7530	7446	6825	5661	4788	4023	3376	2327	1748	1295	955
Vaccinated	7530	7446	6825	5661	4788	4023	3376	2327	1748	1295	955
Cumulative No. of events											
Matched unvaccinated	0	51	99	137	158	175	184	188	196	200	202
Vaccinated	0	51	87	97	109	115	115	116	117	117	118

# Receipt of an mRNA COVID-19 vaccine (BNT162b2) during pregnancy reduces the risk for infection

## Dagan et al.

- Observational cohort: 10,861 vaccinated pregnant people and 10,861 unvaccinated pregnant people matched 1:1
- Vaccination with mRNA COVID-19 vaccines lowered the risk of infection among pregnant people

Cumulative incidence of SARS-CoV-2 infection over time  
(Time since 2<sup>nd</sup> dose)



# Vaccination during pregnancy: Studying protective effects on neonates

OBSTETRICS

## Coronavirus disease 2019 vaccine response in pregnant and lactating women: a cohort study



Kathryn J. Gray, MD, PhD; Evan A. Bordt, PhD; Caroline Atyeo, BS; Elizabeth Deriso, PhD; Babatunde Akinwunmi, MD, MPH, MMSc; Nicola Young, BA; Aranxta Medina Baez, BS; Lydia L. Shook, MD; Dana Cvrk, CNM; Kaitlyn James, PhD, MPH; Rose De Guzman, PhD; Sara Brigida, BA; Khady Diouf, MD; Ilona Goldfarb, MD, MPH; Lisa M. Bebell, MD; Lael M. Yonker, MD; Alessio Fasano, MD; S. Alireza Rabi, MD; Michal A. Elovitz, MD; Galit Alter, PhD; Andrea G. Edlow, MD, MSc

- COVID-19 mRNA vaccination generated robust humoral immunity in pregnant and lactating women
- Immunogenicity and reactogenicity similar to that observed in nonpregnant women
- Vaccine-induced immune response were significantly greater than the response to natural infection
- Immune transfer to neonates occurred via placenta and breastmilk

<https://pubmed.ncbi.nlm.nih.gov/33775692/>

## National Institutes of Health begins study of COVID-19 vaccination during pregnancy and postpartum: MOMI-VAX

Researchers will evaluate antibody responses in vaccinated participants and their infants

- 750 pregnant individuals and 250 postpartum individuals
- Participants and their infants followed through the first year after delivery
- Antibody testing on umbilical cord blood, breast milk and blood from infants two and six months after delivery

# COVID-19 vaccination in pregnancy: Updated clinical considerations



# Updated clinical considerations: COVID-19 vaccination during pregnancy and lactation

- COVID-19 vaccination is recommended for all people aged 12 years and older, **including people who are pregnant, breastfeeding, or who trying to get pregnant now or might become pregnant in the future.**
- Consistent with recommendations from professional medical organizations





# Summary: Evidence indicates benefits of COVID-19 vaccination during pregnancy outweigh potential risks



Pregnancy increases the risk for severe illness and death from COVID-19 and COVID-19 is associated with adverse maternal, pregnancy and neonatal outcomes

Data on the safety of receiving mRNA COVID-19 vaccine during pregnancy are reassuring

Receipt of an mRNA COVID-19 vaccine during pregnancy reduces the risk for infection

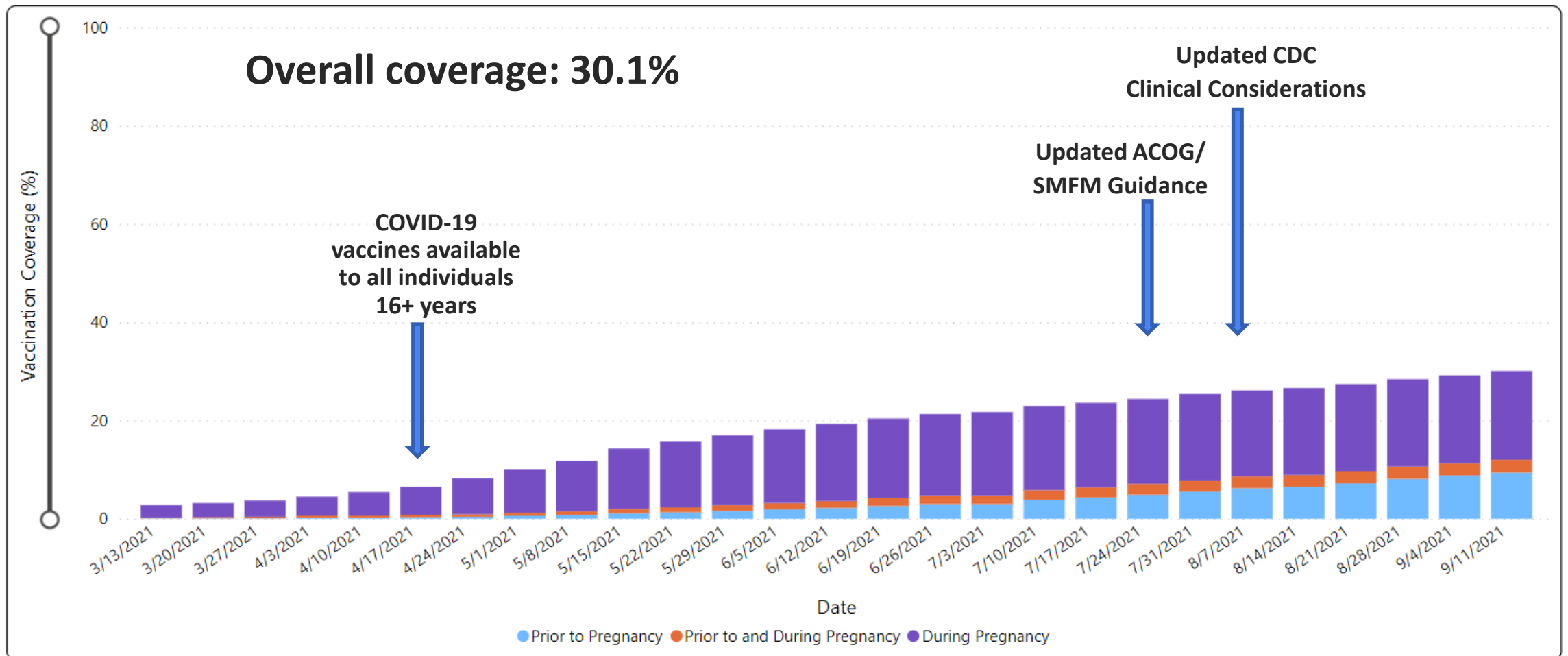
Vaccination during pregnancy results in maternal antibodies that have been detected in infant cord blood

Vaccination coverage for pregnant people is low



# COVID-19 vaccination coverage among pregnant people

Percent of pregnant people aged 18–49 years fully vaccinated with COVID-19 vaccine prior to and during pregnancy, by timing of vaccination and date reported to CDC—Vaccine Safety Datalink, United States, December 14, 2020–September 11, 2021



# CDC efforts to improve vaccination coverage for pregnant people

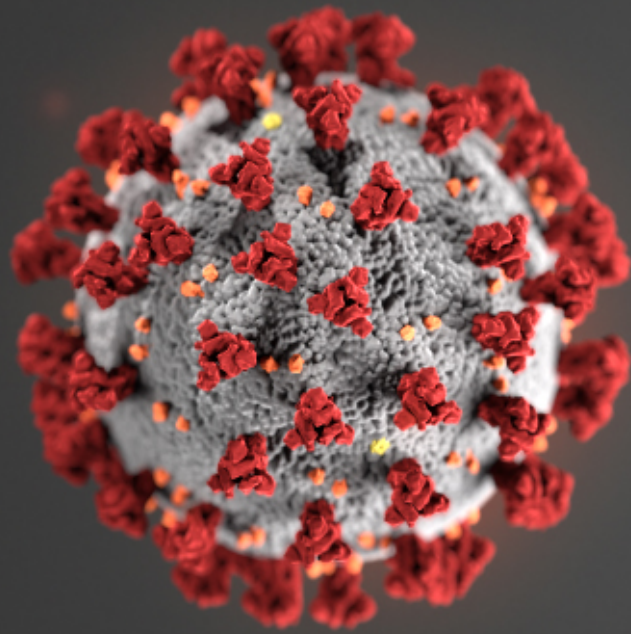
- Monitor and display trends
- Assess reasons for vaccine hesitancy and share personal stories
- Disseminate safety information
- Work with clinical organizations and encourage more clinicians to become a vaccine provider\*
- Provide resources to assist with vaccine discussions
- Ensure consistent messaging about COVID-19 vaccination for pregnant people
- Dispel myths about vaccine



# Acknowledgments

- Kara Polen
- CDC's COVID-19 Response:
  - Maternal Immunization Team
  - Pregnancy and Infant Linked Outcomes Team
  - Vaccine Task Force
- Advisory Committee on Immunization Practices
- CDC's National Center on Birth Defects and Developmental Disabilities
- CDC's Division of Reproductive Health
- CDC's National Center on Immunization and Respiratory Diseases
- State and Local Jurisdictions
- Clinical and Public Health Partners
- Healthcare Providers and Pregnant Persons





For more information, contact CDC  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348 [www.cdc.gov](http://www.cdc.gov)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

