Supplemental Online Content

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**eFigure1.** Flow Figure for Hospitalizations and ED/UC Visits Among Pregnant People (Unvaccinated or With 1 Vaccine Dose Received During Pregnancy)

**eFigure 2.** mRNA COVID-19 Vaccine Effectiveness Against Laboratory-Confirmed COVID-19–Associated Emergency Department and Urgent Care Encounter Among Pregnant People

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Regardless of Pregnancy Status at Time of Vaccination, VISION Network, 10 States, June 1, 2021, to June 2, 2022

eFigure 3. mRNA COVID-19 Vaccine Effectiveness Against Laboratory-Confirmed COVID-19–Associated Hospitalizations Among Pregnant People Regardless of Pregnancy Status at Time of Vaccination, VISION Network, 10 states, June 1, 2021, to June 2, 2022

eFigure 4. mRNA COVID-19 Vaccine Effectiveness Against Laboratory-Confirmed COVID-19–Associated Emergency Department and Urgent Care Encounter Among Pregnant People Who Did Not Have a Prior Positive SARS-CoV-2 Infection, VISION Network, 10 States, June 1, 2021, to June 2, 2022

This supplemental material has been provided by the authors to give readers additional information about their work.
**eTable 1. VISION Network Site Methods for Ascertainment of Gestational Age at Vaccination and the CLI Event and Whether the CLI Event Was Associated With Delivery**

| Site   | Source of information to estimate gestational age at vaccination and CLI event                                                                                                                                                                                                 | Source of information used to ascertain whether the CLI event was associated with delivery                                                                 |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KPNW   | Kaiser Permanente Center for Effectiveness and Safety Research (CESR) pregnancy algorithm, which is an algorithm related to the Vaccine Safety Datalink (VSD) algorithm\(^1\)\(^2\) that also incorporates additional laboratory and ultrasound information.               | Kaiser Permanente Center for Effectiveness and Safety Research (CESR) pregnancy algorithm, which is an algorithm related to the Vaccine Safety Datalink (VSD) algorithm\(^1\)\(^2\) that also incorporates additional laboratory and ultrasound information. |
| HP     | VSD algorithm\(^1\)\(^2\)                                                                                                                                                                                                                                               | VSD algorithm\(^1\)\(^2\)                                                                                                                                 |
| KPNC   | VSD algorithm\(^1\)\(^2\)                                                                                                                                                                                                                                               | VSD algorithm\(^1\)\(^2\)                                                                                                                                 |
| IM     | Health system creates pregnancy data tables for active members that include estimated delivery date. Estimated delivery date is used to estimate a pregnancy start date which is then used to estimate gestational age associated with any subsequent events during pregnancy. The estimated delivery date is populated with an actual delivery date when delivery occurs within the hospital system. | Health system captures a delivery date for people who deliver within the hospital system.                                                                     |
| UCO    | A pregnancy flag and pregnancy start and end dates are captured as fields in the EPIC chart; these fields are pulled into pregnancy data tables and used to estimate gestational age.                                                                                       | A delivery flag is included in the EPIC chart.                                                                                                                 |
| CU     | The health system captures data field for pregnancy end dates. The estimated date of delivery date is used to calculate pregnancy begin date and gestational age associated with any subsequent events during pregnancy.                                                   | The health system has a flag for delivery.                                                                                                                     |
| RG     | RG uses a Health Information Exchange (HIE) network for their data source rather than an Electronic Health Records (EHR) system\(^3\). Pregnancy flag created by screening all health system encounters +/- 30 days of the CLI event for ICD codes related to pregnancy or delivery (ICD code list based on VSD algorithm\(^1\)\(^2\)) GA is determined using pregnancy start date, if captured. If not, any gestational age-related ICD codes captured +/- 7 days of the CLI event were used to estimate a pregnancy begin date which were used to estimate gestational age at the time of vaccination and CLI event. Gestational age was available for ~55% of records. | If the HIE network captured a delivery date for the patient, this date is used. If a delivery date is not available, the ICD codes associated with the CLI event were screened for delivery indicators. |
| BSWH   | The health system creates pregnancy data tables for active patients that include Estimated Delivery Date (EDD). EDD is used to estimate a Pregnancy Start Date which is used to estimate Gestational Age associated with any subsequent encounters during pregnancy. If the EDD is missing, the last menstrual period (LMP) or the antenatal visit ICD codes that include gestational age are used to estimate the EDD. | The health system captures a Delivery Date for deliveries within the hospital system.                                                                        |

1. Naleway AL, Gold R, Kurosky S, et al. Identifying pregnancy episodes, outcomes, and mother-infant pairs in the Vaccine Safety Datalink. Vaccine 2013;31(27):2898-903. (In eng). DOI: 10.1016/j.vaccine.2013.03.069.
2. Naleway AL, Crane B, Irving SA, et al. Vaccine Safety Datalink infrastructure enhancements for evaluating the safety of maternal vaccination. Ther Adv Drug Saf 2021;12:204209862111021233. (In eng). DOI: 10.1177/204209862111021233.
3. Overhage JM. The Indiana Health Information Exchange. In: Dixon BE, editor. Health Information Exchange: Navigating and Managing a Network of Health Information Systems. 1 ed. Waltham, MA: Academic Press; 2016. p. 267-79.
| Disease Condition | ICD-10 Codes | ICD-9 Codes |
|-------------------|--------------|-------------|
| **COVID-19 Pneumonia** | | |
| Pneumonia due to SARS-associated coronavirus | J12.81 | N/A |
| Pneumonia due to coronavirus disease 2019 | J12.82 | N/A |
| **Influenza Pneumonia** | | |
| Influenza due to identified novel influenza A virus with pneumonia | J09.X1 | 488.81 |
| Influenza due to other identified influenza virus with pneumonia | J10.0 | N/A |
| Influenza due to other identified influenza virus with unspecified type of pneumonia | J10.00 | 487.0 |
| Influenza due to other identified influenza virus with the same other identified influenza virus pneumonia | J10.01 | 487.0 |
| Influenza due to other identified influenza virus with other specified pneumonia | J10.08 | 487.0, 488.11 |
| Influenza due to unidentified influenza virus with pneumonia | J11.0 | N/A |
| Influenza due to unidentified influenza virus with unspecified type of pneumonia | J11.00 | 487.0 |
| Influenza due to unidentified influenza virus with specified pneumonia | J11.08 | 487.0 |
| Influenza with pneumonia | N/A | 487* |
| **Other Viral Pneumonia** | | |
| | J12* | 480* |
| **Bacterial and Other Pneumonia** | | |
| Streptococcus pneumoniae pneumonia | J13 | 481 |
| Hemophilus influenzae pneumonia | J14 | 482.2 |
| Other bacterial pneumonia | J15* | 482* |
| Pneumonia due to other specified organism | J16* | 483* |
| Pneumonia in infectious diseases classified elsewhere | J17 | 484* |
| Pneumonia, unspecified organism | J18* | 486 |
| Influenza Disease | J09*, J10.1, J10.2, J10.8*, J11.1, J11.2, J11.8* | 488* |
| Acute respiratory distress syndrome | J80 | 518.82 |
| COPD with acute exacerbation | J44.1 | 491.21 |
| Asthma acute exacerbation | J45.21, J45.22, J45.31, J45.32, J45.41, J45.42, J45.51, J45.52, J45.901, J45.902 | 493.01, 493.02, 493.11, 493.12, 493.21, 493.22, 493.91, 493.92 |
| Respiratory failure | | |
| Acute respiratory failure | J96.0* | 518.81 |
| Acute and chronic respiratory failure | J96.2* | 518.84 |
| Respiratory arrest | R09.2 | 799.1 |

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### Other acute lower respiratory tract infections

| Condition                                           | Code  | ICD-10 Code |
|-----------------------------------------------------|-------|-------------|
| Acute bronchitis                                    | J20*  | 466.0       |
| Acute bronchiolitis                                 | J21*  | 466.1*      |
| Unspecified acute lower respiratory infection       | J22   | 519.8       |
| Bronchitis, not specified as acute or chronic       | J40   | 490         |
| COPD with acute lower respiratory infection         | J44.0 | 491.22      |
| Simple and mucopurulent chronic bronchitis          | J41*  | 491*        |
| Unspecified chronic bronchitis                      | J42   | 491.9       |
| Emphysema                                           | J43*  | 492*        |
| Bronchiectasis                                      | J47*  | 494*        |
| Abscess of lung and mediastinum                     | J85   | 513         |
| Gangrene and necrosis of lung                       | J85.0 | N/A         |
| Abscess of lung without pneumonia                   | J85.2 | 513.0       |
| Abscess of mediastinum                              | J85.3 | 513.1       |
| Abscess of lung with pneumonia                      | J85.1 | 513.0       |
| Pyothorax                                           | J86*  | 510*        |
| Acute and chronic sinusitis                         | J01*, J32* | 461*,473* |
| Acute upper respiratory tract infections            | J00*, J02*-J06* | 460*, 462*-465* |

### Signs and symptoms of acute respiratory illness

| Symptom                                             | Code  | ICD-10 Code |
|-----------------------------------------------------|-------|-------------|
| Hemoptysis                                          | R04.2 | 786.3       |
| Cough                                               | R05, R05.1, R05.2, R05.4, R05.8, RO5.9 | 786.2 |
| Dyspnea unspecified                                 | R06.00| 786.09      |
| Shortness of breath                                 | R06.02| 786.05      |
| Acute respiratory distress                          | R06.03| N/A         |
| Stridor                                             | R06.1 | 786.1       |
| Wheezing                                            | R06.2 | 786.07      |
| Other abnormalities of breathing                     | R06.8 | N/A         |
| Apnea, not elsewhere classified                     | R06.81| 786.03      |
| Tachypnea, NEC                                      | R06.82| 786.06      |
| Other abnormalities of breathing/ Other symptoms involving head & neck | R06.89| 784.99     |
| Other dyspnea and respiratory abnormality           | N/A   | 786.09      |
| Other symptoms involving respiratory system and chest| N/A   | 786.9       |
| Chest pain on breathing/ painful respiration         | R07.1 | 786.52      |
| Asphyxia and hypoxemia                              | R09.0*| N/A         |
| Asphyxia                                            | R09.01| 799.01      |
| Hypoxemia                                           | R09.02| 799.02      |
| Pleurisy                                            | R09.1 | 511.0       |
| Respiratory arrest                                  | R09.2 | 799.1       |
| Abnormal sputum                                     | R09.3 | 786.4       |
| Other specified symptoms and signs involving the circulatory and respiratory systems | R09.8* | 478.19, 784.91, 786.7 |
| Signs and symptoms of acute febrile illness |  |
| Fever | R50* | N/A |
| Fever presenting with conditions classified elsewhere | R50.81 | 780.61 |
| Fever unspecified | R50.9 | 780.60 |
| Chills (without fever) | R68.83 | 780.64 |
| Signs and symptoms of acute non-respiratory illness** |  |
| Diarrhea | R19.7 | 787.91 |
| Disturbance of smell and taste | R43* | N/A |
| Unspecified disturbances of smell and taste | R43.9 | 781.1, V41.5 |
| Headache | R51* | 784.0 |
| Myalgia | M79.1* | 729.1 |
| Sepsis - Symptoms and signs specifically associated with systemic inflammation and infection | R65* | 785.52 |
| Other malaise | R53.81 | 780.79 |
| Other fatigue | R53.83 | 780.79 |
| Shock, unspecified | R57.9 | 785.5 |
| Debility unspecified | N/A | 799.3 |
| Altered level of consciousness / altered mental status | R41.82, R40* | 780.97, 780.0* |
| Weakness | R53.1 | 780.79 |
| Nausea and Vomiting | R11.* | 787* |
| Rash and other nonspecific skin eruption | R21.* | 782.1 |
| Abdominal pain | R10* | 789* |

* Includes all sub-codes
** Records for which these codes were the sole CLI criteria visit were excluded from the analysis of CLI hospitalizations (but included for the analysis of CLI ED/UC encounter)
| VISION Partner | Delta Predominance Start Date | Omicron Predominance Start Date | Composition of geographic areas defined for each VISION partner site |
|----------------|-------------------------------|---------------------------------|---------------------------------------------------------------------|
| Baylor Scott & White Health (BSWH) | September 11, 2021 (study period begin date) | December 16, 2021 | State: Texas Region 1: Anderson, Andrews, Angelina, Archer, Armstrong, Bailey, Baylor, Borden, Bowie, Briscoe, Brown, Callahan, Camp, Carson, Cass, Castro, Cherokee, Childress, Clay, Cochran, Coke, Coleman, Collin, Collingsworth, Comanche, Cooke, Cottle, Crosby, Dallam, Dallas, Dawson, Deaf Smith, Delta, Denton, Dickens, Donley, Eastland, Ector, Ellis, Erath, Fannin, Fisher, Floyd, Foard, Franklin, Freestone, Gaines, Glasscock, Gray, Grayson, Gregg, Grimes, Hale, Hall, Hansford, Hardeman, Harrison, Hartley, Haskell, Hemphill, Henderson, Hockley, Hood, Hopkins, Houston, Howard, Hunt, Hutchinson, Jack, Jasper, Johnson, Hones, Kaufman, Kent, King, Knox, Lamar, Lamb, Leon, Lipscomb, Lubbock, Lynn, Madison, Marion, Martin, Midland, Mitchell, Montague, Montgomery, Moore, Morris, Motley, Nacogdoches, Navarro, Newton, Nolan, Ochiltree, Oldman, Palo Pinto, Panola, Parker, Parmer, Polk, Potter, Rains, Randall, Red River, Roberts, Rockwall, Runnels, Rusk, Sabine, San Augustine, San Jacinto, Seurly, Shackelford, Shelby, Sherman, Smith, Somervell, Stephens, Sterling, Stonewall, Swisher, Tarrant, Taylor, Terry, Throckmorton, Titus, Trinity, Tyler, Upshur, Van Zandt, Walker, Waller, Wheeler, Wichita, Wilbarger, Winkler, Wise, Wood, Yoakum and Young counties Region 2: Aransas, Atascosa, Austin, Bandera, Bastrop, Bee, Bell, Bexar, Blanco, Bosque, Brazoria, Brazos, Brewster, Brooks, Burleson, Burnet, Caldwell, Calhoun, Cameron, Chambers, Colorado, Comal, Concho, Coryell, Crace, Crockett, Culberson, Dewitt, Dimmit, Duval, Edwards, El Paso, Falls, Fayette, Fort Bend, Frio, Galveston, Gillespie, Goliad, Gonzales, Guadalupe, Hamilton, Hardin, Harris, Hays, Hildago, Hill, Hudspeth, Irion, Jackson, Jeff Davis, Jefferson, Jim Hogg, Jim Wells, Karnes, Kendall, Kenedy, Kerr, Kimble, Kinney, Kelberg, La Salle, Lampasas, Lavaca, Lee, Liberty, Limestone, Live Oak, Llano, Loving, Mason, Matagorda, Maverick, McCulloch, McLennan, McMullen, Medina, Menard, Milam, Mills, Nueces, Orange, Pecos, Presidio, Reagan, Real, Reeves, Refugio, Robertson, San Patricio, San Saba, Schleicher, Starr, Sutton, Terrell, Tom Green, Travis, Upton, Uvalde, Val Verde, Victoria, Ward, Washington, Webb, Wharton, Willacy, Williamson, Wilson, Zapata, and Zavala counties |
| Columbia University (CUIMC) | June 30, 2021 | December 18, 2022 | State: New York Region 1: Bronx county, Kings county, New York County, Queens county, Richmond County |
| HealthPartners (HP) | July 1, 2021 | December 25, 2021 | State: Minnesota Region 1: Hennepin and Ramsey counties; Region 2: Polk, St. Croix and Washington, Mcleod and Renville counties |
| Intermountain Healthcare (IH) | June 1, 2021 | December 24, 2021 | State: Utah Region 1: Box Elder county and Cache counties; Region 2: Davis County; Region 3: Tooele and Salt Lake counties; Region 4: Utah county; Region 5: Summit and Wasatch counties; |
| Organization | Date | End Date | Region Details |
|--------------|------|----------|----------------|
| Kaiser Permanente Northern California (KPNC) | June 23, 2021 | December 21, 2021 | Region 6: Weber County; Region 7: Sanpete, Sevier and Millard counties; Region 8: Garfield, Iron and Washington counties. |
| Kaiser Permanente Northwest (KPNW) | June 30, 2021 | December 24, 2021 | State: California Region 1: Fresno County; Region 2: Stanislaus county; Region 3: Placer and Sacramento counties; Region 4: Alameda, Contra Costa, Marin, San Francisco, and San Mateo counties; Region 5: Santa Clara county; Region 6: Sonoma county; Region 7: San Joaquin county; Region 8: Solano county. |
| Regenstrief Institute (RG) | July 3, 2021 | December 26, 2021 | State: Oregon Region 1: Multnomah, Washington, Clackamas, Clatsop, and Yamhill counties; State: Washington Region 2: King, Chelan, Clark, Pacific, Spokane and Cowlitz counties; Oregon Region 3: Benton, Deschutes, Harney, Lane, Linn, Marion, Polk, Umatilla, and Wasco counties. |
| University of Colorado (UCO) | June 3, 2021 | December 19, 2021 | State: Indiana Region 1: Jasper, Lake, La Porte, Newton, Porter; Region 2: Elkhart, Fulton, Kosciusko, Marshall, Pulaski, St. Joseph, Starke; Region 3: Adams, Allen, DeKalb, Huntington, Lagrange, Miami, Noble, Steuben, Wabash, Wells, Whitley; Region 4: Benton, Carroll, Cass, Clinton, Fountain, Tippecanoe, Montgomery, Warren, White; Region 5: Boone, Johnson, Hamilton, Hancock, Hendricks, Marion, Morgan, Shelby; Region 6: Blackford, Delaware, Fayette, Grant, Henry, Howard, Jay, Madison, Randolph, Rush, Tipton, Union, Wayne; Region 7: Clay, Greene, Owen, Parke, Putnam, Sullivan, Vermillion, Vigo; Region 8: Bartholomew, Brown, Jackson, Lawrence, Monroe, Orange, Washington; Region 9: Clark, Dearborn, Decatur, Floyd, Franklin, Harrison, Jefferson, Jennings, Ohio, Ripley, Scott, Switzerland; Region 10: Crawford, Daviess, Dubois, Gibson, Knox, Martin, Spencer, Perry, Pike, Posey, Vanderburgh, Warrick; Region 11: all encounters missing county information. |
eTable 4. Characteristics of Hospitalizations Among Pregnant People With COVID-19–Like Illnessa by COVID-19 mRNA Vaccination Status (Regardless of Pregnancy Status at Time of Vaccination) and SARS-CoV-2 Test Result, 10 States, June 1, 2021, to June 2, 2022b

| Characteristic                                      | Total, No. (Column %) | No. (Row %) | mRNA COVID-19 Vaccination Status | Positive SARS-CoV-2 Test Result | SMD** |
|-----------------------------------------------------|-----------------------|-------------|----------------------------------|---------------------------------|-------|
|                                                     |                       |             | Unvaccinated                     | 2 doses (14-149 days earlier)   | 2 doses (≥150 days earlier) | 3 doses (7-119 days earlier) | 3 doses (≥120 days earlier) |                             |       |
| All Hospitalizations                                 | 1073                  | 670         | 123                              | 169                             | 84                             | 27                             | 351                            |       |
| Pregnancy trimester of CLI event                    |                       |             |                                  |                                 |                                |                                |                                 |       |
| 1st                                                 | 39 (3.6)              | 30 (76.9)   | 2 (5.1)                          | 3 (7.7)                         | 3 (7.7)                        | 1 (2.6)                        | 18 (46.2)                       | 0.29  |
| 2nd                                                 | 183 (17.1)            | 135 (73.8)  | 12 (6.6)                         | 26 (14.2)                       | 7 (3.8)                        | 3 (1.6)                        | 77 (42.1)                       | 0.23  |
| 3rd                                                 | 851 (79.3)            | 505 (59.3)  | 109 (12.8)                       | 140 (16.5)                      | 74 (8.7)                       | 23 (2.7)                       | 256 (30.1)                      | 0.49  |
| CLI event associated with delivery                  |                       |             |                                  |                                 |                                |                                |                                 |       |
| No                                                  | 378 (35.2)            | 263 (69.6)  | 34 (9.0)                         | 47 (12.4)                       | 21 (5.6)                       | 13 (3.4)                       | 178 (47.1)                      | 0.25  |
| Yes                                                 | 695 (64.8)            | 407 (58.6)  | 89 (12.8)                        | 122 (17.6)                      | 63 (9.1)                       | 14 (2.0)                       | 173 (24.9)                      | 0.49  |
| Variant predominance period                         |                       |             |                                  |                                 |                                |                                |                                 |       |
| B.1.617.2 (Delta)                                    | 706 (65.8)            | 498 (70.5)  | 102 (14.4)                       | 83 (11.8)                       | 23 (3.3)                       | 0 (0.0)                        | 258 (36.5)                      | 1.06  |
| B.1.1.529 (Omicron)                                 | 367 (34.2)            | 172 (46.9)  | 21 (5.7)                         | 86 (23.4)                       | 61 (16.6)                      | 27 (7.4)                       | 93 (25.3)                       | 0.25  |
| Sites                                               |                       |             |                                  |                                 |                                |                                |                                 |       |
| Baylor Scott & White Health                         | 39 (3.6)              | 27 (69.2)   | 5 (12.8)                         | 6 (15.4)                        | 1 (2.6)                        | 0 (0.0)                        | 8 (20.5)                        |       |
| Columbia University                                 | 90 (8.4)              | 50 (55.6)   | 13 (14.4)                        | 22 (24.4)                       | 4 (4.4)                        | 1 (1.1)                        | 17 (18.9)                       |       |
| HealthPartners                                      | 19 (1.8)              | 11 (57.9)   | 1 (5.3)                          | 4 (21.1)                        | 2 (10.5)                       | 1 (5.3)                        | 5 (26.3)                        |       |
| Intermountain Healthcare                           | 115 (10.7)            | 83 (72.2)   | 7 (6.1)                          | 19 (16.5)                       | 5 (4.3)                        | 1 (0.9)                        | 27 (23.5)                       |       |
| Kaiser Permanente Northern California               | 385 (35.9)            | 192 (49.9)  | 55 (14.3)                        | 76 (19.7)                       | 47 (12.2)                      | 15 (3.9)                       | 142 (36.9)                      |       |
| Kaiser Permanente Northwest                         | 73 (6.8)              | 38 (52.1)   | 9 (12.3)                         | 9 (12.3)                        | 12 (16.4)                      | 5 (6.8)                        | 20 (27.4)                       |       |
| Regenstrif Institute                               | 183 (17.2)            | 147 (80.3)  | 16 (8.7)                         | 9 (4.9)                         | 8 (4.4)                        | 3 (1.6)                        | 85 (46.4)                       |       |
| University of Colorado                              | 169 (15.8)            | 122 (72.2)  | 17 (10.1)                        | 24 (14.2)                       | 5 (3.0)                        | 1 (0.6)                        | 47 (27.8)                       |       |
| Age (yrs)                                           |                       |             |                                  |                                 |                                |                                |                                 |       |
| 18-24                                               | 179 (16.7)            | 143 (79.9)  | 18 (10.1)                        | 15 (8.4)                        | 3 (1.7)                        | 0 (0.0)                        | 54 (30.2)                       | 0.62  |
| 25-34                                               | 577 (53.8)            | 379 (65.7)  | 64 (11.1)                        | 86 (14.9)                       | 35 (6.1)                       | 13 (2.3)                       | 200 (34.7)                      | 0.10  |
| 35-45                                               | 317 (29.5)            | 148 (46.7)  | 41 (12.9)                        | 68 (21.5)                       | 46 (14.5)                      | 14 (4.4)                       | 97 (30.6)                       |       |
| Race/ethnicity                                      |                       |             |                                  |                                 |                                |                                |                                 |       |

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| Category                        | Hispanic | Non-Hispanic Black | Non-Hispanic Other | Non-Hispanic White | Unknown | Chronic respiratory condition | Chronic non respiratory condition | ICU | Immunocompromised status | History of SARS-CoV-2 infection | Total vaccinated | Vaccine product | Timing of first dose | Timing of second dose |
|--------------------------------|----------|--------------------|--------------------|--------------------|---------|-------------------------------|-----------------------------------|-----|--------------------------|--------------------------------|-----------------|----------------|---------------------|-------------------|
|特价ort| 269 (25.1) | 130 (12.1) | 162 (15.1) | 473 (44.1) | 39 (3.6) | 0.40 | 0.26 |
|特价ort| 167 (62.1) | 97 (74.6) | 80 (49.4) | 305 (64.5) | 21 (53.8) | 0.40 | 0.26 |
|特价ort| 31 (11.5) | 10 (7.7) | 23 (14.2) | 53 (11.2) | 6 (15.4) | 0.40 | 0.26 |
|特价ort| 51 (19.0) | 15 (11.5) | 33 (20.4) | 64 (13.5) | 6 (12.8) | 0.40 | 0.26 |
|特价ort| 15 (5.6) | 8 (6.2) | 20 (12.3) | 36 (7.6) | 1 (2.6)  | 0.40 | 0.26 |
|特价ort| 5 (1.9) | 0 (0.0) | 6 (3.7) | 15 (3.2) | 12 (30.8) | 0.40 | 0.26 |
|特价ort| 80 (29.7) | 63 (48.5) | 51 (31.5) | 145 (30.7) | 0.40 | 0.26 |
|特价ort| 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 |
|特价ort| 80 (29.7) | 63 (48.5) | 51 (31.5) | 145 (30.7) | 0.26 | 0.26 |

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|               | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester | 2nd trimester | 3rd trimester |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| **Timing of third dose** | 292           |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| 1st trimester | 10 (3.4)      | 0 (0.0)       | 0 (0.0)       | 0 (0.0)       | 2 (20.0)      | 2 (20.0)      | 8 (80.0)      | NA            | 2 (20.0)      |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| 2nd trimester | 52 (17.8)     | 0 (0.0)       | 0 (0.0)       | 0 (0.0)       | 36 (69.2)     | 16 (30.8)     |               |               | 4 (7.7)       |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| 3rd trimester | 44 (15.1)     | 0 (0.0)       | 0 (0.0)       | 0 (0.0)       | 44 (100.0)    | 0 (0.0)       |               |               | 3 (6.8)       |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| **2 Doses**   |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| **2 doses during current pregnancy** |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| No            | 118 (40.4)    | 0 (0.0)       | 4 (3.4)       | 114 (96.6)    | 0 (0.0)       | 0 (0.0)       | NA            | 18 (15.3)     | 0.55          |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| Yes           | 174 (59.6)    | 0 (0.0)       | 119 (68.4)    | 55 (31.6)     | 0 (0.0)       | 0 (0.0)       | 10 (5.7)      |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| **Timing of first dose** |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| **Timing of 2nd dose** |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| before current pregnancy |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| before current pregnancy |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| 1st trimester | 10 (3.4)      | 0 (0.0)       | 0 (0.0)       | 0 (0.0)       | 2 (20.0)      | 8 (80.0)      |               |               | 2 (20.0)      |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| 2nd trimester | 52 (17.8)     | 0 (0.0)       | 0 (0.0)       | 0 (0.0)       | 36 (69.2)     | 16 (30.8)     |               |               | 4 (7.7)       |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| 3rd trimester | 44 (15.1)     | 0 (0.0)       | 0 (0.0)       | 0 (0.0)       | 44 (100.0)    | 0 (0.0)       |               |               | 3 (6.8)       |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| **3 Doses**   |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| **3 doses during current pregnancy** |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| No            | 98 (88.3)     | 0 (0.0)       | 0 (0.0)       | 0 (0.0)       | 71 (72.4)     | 27 (27.6)     | NA            | 10 (10.2)     | 0.54          |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| Yes           | 13 (11.7)     | 0 (0.0)       | 0 (0.0)       | 0 (0.0)       | 13 (100.0)    | 0 (0.0)       | 0 (0.0)       |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| **Timing of first dose** |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| **Timing of 2nd dose** |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| before current pregnancy |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| before current pregnancy |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| 1st trimester | 25 (8.6)      | 0 (0.0)       | 0 (0.0)       | 0 (0.0)       | 25 (8.6)      | 0 (0.0)       | 0 (0.0)       |               | 25 (8.6)      |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| 2nd trimester | 72 (24.3)     | 0 (0.0)       | 0 (0.0)       | 0 (0.0)       | 72 (24.3)     | 0 (0.0)       | 0 (0.0)       |               | 72 (24.3)     |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| 3rd trimester | 132 (44.5)    | 0 (0.0)       | 0 (0.0)       | 0 (0.0)       | 132 (44.5)    | 0 (0.0)       | 0 (0.0)       |               | 132 (44.5)    |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |

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| Time Period                  | 1st trimester | 2nd trimester | 3rd trimester | 4th trimester |
|-----------------------------|---------------|---------------|---------------|---------------|
| Before current pregnancy    | 8             | 0             | 1             |               |
| 1st trimester               | 1             | 0             | 0             |               |
| 2nd trimester               | 1             | 0             | 0             |               |
| 3rd trimester               | 12            | 0             | 0             |               |

Abbreviations: ICD-9 = International Classification of Diseases, Ninth Revision; ICD-10 = International Classification of Diseases, Tenth Revision; SMD = standardized mean or proportion difference.

Medical events with an encounter or discharge code consistent with COVID-19–like illness were included, using ICD-9 and ICD-10. Four categories of codes were considered: 1) acute respiratory illness, including respiratory failure, viral or bacterial pneumonia, asthma exacerbation, influenza, and viral illness not otherwise specified; 2) non-respiratory COVID-19–like illness diagnoses including cause-unspecified gastroenteritis, thrombosis, and acute myocarditis; 3) respiratory signs and symptoms consistent with COVID-19–like illness, including hemoptysis, cough, dyspnea, painful respiration, or hypoxemia; 4) signs and symptoms of acute febrile illness. One code in any of the four categories was sufficient for inclusion. Clinician-ordered molecular assays (e.g., real-time reverse transcription–polymerase chain reaction) for SARS-CoV-2 occurring ≤14 days before to <72 hours after the encounter date were included.

Partners contributing data on medical events were in California (estimated start date of Delta predominance June 23, estimated start date of Omicron predominance: December 21), Colorado (estimated start date of Delta predominance June 3, estimated start date of Omicron predominance December 19), Indiana (estimated start date of Delta predominance July 3, estimated start date of Omicron predominance December 26), Minnesota and Wisconsin (estimated start date of Delta predominance July 1, estimated start date of Omicron predominance December 25), New York (estimated start date of Delta predominance June 30, estimated start date of Omicron predominance December 18), Oregon (estimated start date of Delta predominance June 30, estimated start date of Omicron predominance December 24), Texas (estimated start date of Delta predominance September 11, estimated start date of Omicron predominance December 16), Utah (estimated start date of Delta predominance June 1, estimated start date of Omicron predominance December 24), and Washington (estimated start date Delta predominance June 30, estimated start date of Omicron predominance December 24). The study period began in September 2021 for partners located in Texas.

An absolute standardized mean or proportion difference (SMD) ≥0.20 indicates a non-negligible difference in the distribution of characteristics for vaccinated categories versus unvaccinated patients and for positive versus negative test results. When calculating SMDs for differences in characteristics across COVID-19 vaccination status, investigators calculated SMD as the average of the three absolute values of the SMD for unvaccinated versus each vaccination status category individually (unvaccinated versus 2 doses 14-149 days earlier, unvaccinated versus 2-dose >=150 days earlier, and unvaccinated versus 3 mRNA doses ≥7 days earlier). All SMDs are reported as the absolute SMD. Additionally, the average SMD calculation comparing Negative SARS-CoV-2 Test Result and Positive SARS-CoV-2 Test Result was generated by directly calculating the SMD for Negative SARS-CoV-2 Test Result and Positive SARS-CoV-2 Test Result.

Vaccination was defined as having received the listed number of doses of COVID-19 Pfizer-BioNTech BNT162b2 or Moderna mRNA-1273 vaccine ≥14 days (for 2 doses) or ≥7 days (for 3 doses) before the medical event index date, which was the date of respiratory specimen collection associated with the most recent positive or negative SARS-CoV-2 test result before medical event or the admission date if testing only occurred after the admission.

Unknown race/ethnicity includes Asian, Native Hawaiian or other Pacific islander, American Indian or Alaska Native, other not listed, and multiple races.

Chronic respiratory condition was defined as the presence of discharge code for asthma, COPD, or other lung disease using diagnosis codes from the ICD-9 and ICD-10.

Chronic non-respiratory condition was defined as the presence of discharge code for heart failure, ischemic heart disease, hypertension, other heart disease, stroke, other cerebrovascular disease, diabetes type I or II, other diabetes, metabolic disease, clinical obesity, clinically underweight, renal disease, liver disease, blood disorder, immunosuppression, organ transplant, cancer, neurological disorder, musculoskeletal disorder, Down Syndrome, and dementia.

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Table 5. Characteristics of Emergency Department and Urgent Care Encounters Among Pregnant People With COVID-19–Like Illness* by COVID-19 mRNA Vaccination Status (Regardless of Pregnancy Status at Time of Vaccination) and SARS-CoV-2 Test Result, 10 States, June 1, 2021, to June 2, 2022b

| Characteristic                               | Total, No. (Column %) | No. (Row %) | mRNA COVID-19 Vaccination Status | SMD** | No. (Row %) | Positive SARS-CoV-2 Test Result | SMD** |
|----------------------------------------------|-----------------------|-------------|----------------------------------|--------|-------------|----------------------------------|--------|
| All ED/UC CLI encounters                      | 6196                  | 3380        | 862                              | 1366   | 433         | 155                              | 1141   |
| Pregnancy trimester of CLI event              |                       |             |                                  |        |             |                                  |        |
| 1st                                           | 2165 (34.9)           | 1095 (50.6) | 363 (16.8)                       | 515 (23.8) | 139 (6.4) | 53 (2.4)                       | 0.12   |
| 2nd                                           | 2200 (35.5)           | 1208 (54.9) | 275 (12.5)                       | 505 (23.0) | 152 (6.9) | 60 (2.7)                       | 0.12   |
| 3rd                                           | 1831 (29.6)           | 1077 (58.8) | 224 (12.2)                       | 346 (18.9) | 142 (7.8) | 42 (2.3)                       |        |
| Pregnancy trimester of CLI event              |                       |             |                                  |        |             |                                  |        |
| 1st                                           |                       |             |                                  |        |             |                                  |        |
| 2nd                                           |                       |             |                                  |        |             |                                  |        |
| 3rd                                           |                       |             |                                  |        |             |                                  |        |
| CLI event associated with delivery            |                       |             |                                  |        |             |                                  |        |
| No                                            | 5725 (92.4)           | 3107 (54.3) | 808 (14.1)                       | 1258 (22.0) | 406 (7.1) | 146 (2.6)                       | 0.06   |
| Yes                                           | 471 (7.6)             | 273 (58.0)  | 54 (11.5)                        | 108 (22.9) | 27 (5.7)  | 9 (1.9)                         | 0.01   |
| Variant predominance period                   |                       |             |                                  |        |             |                                  |        |
| B.1.617.2 (Delta)                             | 3635 (58.7)           | 2282 (62.8) | 623 (17.1)                       | 636 (17.5) | 91 (2.5)  | 3 (0.1)                         | 0.87   |
| B.1.1.529 (Omicron)                           | 2561 (41.3)           | 1098 (42.9) | 239 (9.3)                        | 730 (28.5) | 342 (13.4) | 152 (5.9)                       | 0.36   |
| Sites                                         |                       |             |                                  |        |             |                                  |        |
| Baylor Scott & White Health                   | 111 (1.8)             | 73 (65.8)   | 14 (12.6)                        | 21 (18.9) | 2 (1.8)   | 1 (0.9)                         | 0.63   |
| Columbia University                           | 294 (4.7)             | 192 (65.3)  | 50 (17.0)                        | 38 (12.9) | 13 (4.4)  | 1 (0.3)                         | 0.33   |
| HealthPartners                                | 433 (7.0)             | 183 (42.3)  | 65 (15.0)                        | 115 (26.6) | 45 (10.4) | 25 (5.8)                        |        |
| Intermountain Healthcare                      | 2095 (33.8)           | 1213 (57.9) | 281 (13.4)                       | 439 (21.0) | 122 (5.8) | 40 (1.9)                        |        |
| Kaiser Permanente Northern California         | 1561 (25.2)           | 636 (40.7)  | 285 (18.3)                       | 434 (27.8) | 156 (10.0) | 50 (3.2)                        |        |
| Kaiser Permanente Northwest                   | 535 (8.6)             | 223 (41.7)  | 72 (13.5)                        | 156 (29.2) | 59 (11.0) | 25 (4.7)                        |        |
| Regenstrief Institute                         | 690 (11.1)            | 550 (79.7)  | 48 (7.0)                         | 70 (10.1) | 18 (2.6)  | 4 (0.6)                         |        |
| University of Colorado                        | 477 (7.7)             | 310 (65.0)  | 47 (9.9)                         | 93 (19.5) | 18 (3.8)  | 9 (1.9)                         |        |
| Age (yrs)                                     |                       |             |                                  |        |             |                                  |        |
| 18-24                                        | 1606 (25.9)           | 1139 (70.9) | 178 (11.1)                       | 241 (15.0) | 35 (2.2)  | 13 (0.8)                        | 0.57   |
| 25-34                                        | 3527 (56.9)           | 1833 (52.0) | 493 (14.0)                       | 847 (24.0) | 265 (7.5) | 89 (2.5)                        | 0.04   |
| 35-45                                        | 1063 (17.1)           | 408 (38.4)  | 191 (18.0)                       | 278 (26.2) | 133 (12.5) | 53 (5.0)                        |        |
| Race/ethnicity                                |                       |             |                                  |        |             |                                  |        |

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| Hispanic | 1637 (26.4) | 869 (53.1) | 262 (16.0) | 377 (23.0) | 107 (6.5) | 22 (1.3) | 299 (18.3) | 0.38 | 0.12 |
| Non-Hispanic Black | 690 (11.1) | 464 (76.2) | 80 (11.6) | 114 (16.5) | 23 (3.3) | 9 (1.3) | 163 (23.6) | 0.38 | 0.12 |
| Non-Hispanic Other†‡ | 604 (9.7) | 220 (36.4) | 95 (15.7) | 189 (31.3) | 71 (11.8) | 29 (4.8) | 100 (16.6) | 0.38 | 0.12 |
| Non-Hispanic White | 3080 (49.7) | 1702 (55.3) | 410 (13.3) | 655 (21.3) | 223 (7.2) | 90 (2.9) | 543 (17.6) | 0.38 | 0.12 |
| Unknown | 185 (3.0) | 125 (67.6) | 15 (8.1) | 31 (16.8) | 9 (4.9) | 5 (2.7) | 36 (19.5) | 0.38 | 0.12 |
| **Chronic respiratory condition**¶¶ | | | | | | | | |
| No | 5773 (93.2) | 3116 (54.0) | 818 (14.2) | 1287 (22.3) | 402 (7.0) | 150 (2.6) | 1057 (18.3) | 0.10 | 0.03 |
| Yes | 423 (6.8) | 264 (62.4) | 44 (10.4) | 79 (18.7) | 31 (7.3) | 5 (1.2) | 84 (19.9) | 0.10 | 0.03 |
| **Chronic non respiratory condition***** | | | | | | | | |
| No | 5727 (92.4) | 3098 (51.4) | 812 (14.2) | 1272 (22.2) | 402 (7.0) | 143 (2.5) | 1051 (18.4) | 0.06 | 0.02 |
| Yes | 469 (7.6) | 282 (60.1) | 50 (10.7) | 94 (20.0) | 31 (6.6) | 12 (2.6) | 90 (19.2) | 0.06 | 0.02 |
| **ICU** | | | | | | | | |
| No | 6164 (99.5) | 3356 (54.4) | 862 (14.0) | 1361 (22.1) | 431 (7.0) | 154 (2.5) | 1133 (18.4) | 0.05 | 0.03 |
| Yes | 32 (0.5) | 24 (75.0) | 0 (0.0) | 5 (15.6) | 2 (6.2) | 1 (3.1) | 8 (25.0) | 0.05 | 0.03 |
| **Immunocompromised status** | | | | | | | | |
| No | 6166 (99.5) | 3362 (54.5) | 859 (13.9) | 1360 (22.1) | 430 (7.0) | 155 (2.5) | 1136 (18.4) | 0.04 | 0.01 |
| Yes | 30 (0.5) | 18 (60.0) | 3 (10.0) | 6 (20.0) | 3 (10.0) | 0 (0.0) | 5 (16.7) | 0.04 | 0.01 |
| **History of SARS-CoV-2 infection** | | | | | | | | |
| No | 5361 (86.5) | 2940 (54.8) | 749 (14.0) | 1168 (21.8) | 379 (7.1) | 125 (2.3) | 1066 (19.9) | 0.06 | 0.28 |
| Yes | 835 (13.5) | 440 (52.7) | 113 (13.5) | 198 (23.7) | 54 (6.5) | 30 (3.6) | 75 (9.0) | 0.06 | 0.28 |
| **Total vaccinated** | 2816 | 0 | 862 | 1366 | 433 | 155 | 373 | NA | NA |
| **Vaccine product** | | | | | | | | |
| Combination of mRNA products | 71 (2.5) | 0 (0.0) | 1 (1.4) | 3 (4.2) | 51 (7.1) | 16 (22.5) | 5 (7.0) | 0.17 | 0.17 |
| Moderna | 899 (31.9) | 0 (0.0) | 244 (27.1) | 490 (54.5) | 126 (14.0) | 39 (4.3) | 100 (11.1) | 0.17 | 0.17 |
| Pfizer-BioNTech | 1846 (65.6) | 0 (0.0) | 617 (33.4) | 873 (47.3) | 256 (13.9) | 100 (5.4) | 268 (14.5) | 0.17 | 0.17 |
| **Timing of first dose** | 2816 | | | | | | | |
| before current pregnancy | 2268 (80.5) | 0 (0.0) | 436 (19.2) | 1255 (55.3) | 422 (18.6) | 155 (6.8) | 316 (13.9) | 0.17 | 0.17 |
| 1st trimester | 341 (12.1) | 0 (0.0) | 224 (65.7) | 106 (31.1) | 11 (3.2) | 0 (0.0) | 34 (10.0) | 0.17 | 0.17 |
| 2nd trimester | 192 (6.8) | 0 (0.0) | 187 (97.4) | 5 (2.6) | 0 (0.0) | 0 (0.0) | 23 (12.0) | 0.17 | 0.17 |
| 3rd trimester | 15 (0.5) | 0 (0.0) | 15 (100.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0.17 | 0.17 |
| **Timing of second dose** | 2816 | | | | | | | |
| before current pregnancy | 2074 (73.7) | 0 (0.0) | 339 (16.3) | 1168 (56.3) | 412 (19.9) | 155 (7.5) | 291 (14.0) | 0.18 | 0.18 |
| 1st trimester | 465 (16.5) | 0 (0.0) | 263 (56.6) | 181 (38.9) | 21 (4.5) | 0 (0.0) | 55 (11.8) | 0.18 | 0.18 |

**Note:**
- NaN indicates not applicable.
- The table contains data from a study on vaccination status among pregnant women.
| Timing of third dose | 588 |
|---------------------|-----|
| 1st trimester       |     |
| 2nd trimester       |     |
| 3rd trimester       |     |

| 2 Doses |
|---------|
| 2 doses during current pregnancy |
| No      | Yes   |

| Timing of first dose | Timing of 2nd dose | Timing of 3rd dose |
|----------------------|--------------------|-------------------|
| before current pregnancy | before current pregnancy | before current pregnancy |
| before current pregnancy | 1st trimester | 95 | 87 |
| before current pregnancy | 2nd trimester | 2 | 0 |
| 1st trimester | 1st trimester | 168 | 94 |
| 1st trimester | 2nd trimester | 54 | 12 |
| 1st trimester | 3rd trimester | 2 | 0 |
| 2nd trimester | 2nd trimester | 161 | 5 |
| 2nd trimester | 3rd trimester | 26 | 0 |
| 3rd trimester | 3rd trimester | 15 | 0 |

| 3 Doses |
|---------|
| 3 doses during current pregnancy |
| No      | Yes   |

| Timing of first dose | Timing of 2nd dose | Timing of 3rd dose |
|----------------------|--------------------|-------------------|
| before current pregnancy | before current pregnancy | before current pregnancy |
| before current pregnancy | 1st trimester | 134 | 46 |
| before current pregnancy | 2nd trimester | 166 | 19 |

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before current pregnancy before current pregnancy 3rd trimester
before current pregnancy 1st trimester 2nd trimester
before current pregnancy 1st trimester 3rd trimester 1st trimester 1st trimester 3rd trimester

| before current pregnancy | before current pregnancy | 3rd trimester | 30 | 0 | 0 |
|-------------------------|-------------------------|--------------|----|---|---|
| 1st trimester | 2nd trimester | | 1 | 0 | 0 |
| 1st trimester | 3rd trimester | | 9 | 0 | 3 |
| 1st trimester | 3rd trimester | | 11 | 0 | 1 |

Abbreviations: ICD-9 = International Classification of Diseases, Ninth Revision; ICD-10 = International Classification of Diseases, Tenth Revision; SMD = standardized mean or proportion difference.

a Medical events with an encounter or discharge code consistent with COVID-19–like illness were included, using ICD-9 and ICD-10. Four categories of codes were considered: 1) acute respiratory illness, including respiratory failure, viral or bacterial pneumonia, asthma exacerbation, influenza, and viral illness not otherwise specified; 2) non-respiratory COVID-19–like illness diagnoses including cause-unspecified gastroenteritis, thrombosis, and acute myocarditis; 3) respiratory signs and symptoms consistent with COVID-19–like illness, including hemoptysis, cough, dyspnea, painful respiration, or hypoxemia; 4) signs and symptoms of acute febrile illness. One code in any of the four categories was sufficient for inclusion. Clinician-ordered molecular assays (e.g., real-time reverse transcription–polymerase chain reaction) for SARS-CoV-2 occurring ≤14 days before to <72 hours after the encounter date were included.

b Partners contributing data on medical events were in California (estimated start date of Delta predominance June 23, estimated start date of Omicron predominance: December 21), Colorado (estimated start date of Delta predominance June 3, estimated start date of Omicron predominance December 26), Indiana (estimated start date of Delta predominance July 3, estimated start date of Omicron predominance December 26), Minnesota and Wisconsin (estimated start date of Delta predominance July 1, estimated start date of Omicron predominance December 25), New York (estimated start date of Delta predominance June 30, estimated start date of Omicron predominance December 18), Oregon (estimated start date of Delta predominance June 30, estimated start date of Omicron predominance December 24), Texas (estimated start date of Delta predominance September 11, estimated start date of Omicron predominance December 16), Utah (estimated start date of Delta predominance June 1, estimated start date of Omicron predominance December 24), and Washington (estimated start date of Delta predominance June 30, estimated start date of Omicron predominance December 24). The study period began in September 2021 for partners located in Texas.

c An absolute standardized mean or proportion difference (SMD) ≥0.20 indicates a non-negligible difference in the distribution of characteristics for vaccinated categories versus unvaccinated patients and for positive versus negative test results. When calculating SMDs for differences in characteristics across COVID-19 vaccination status, investigators calculated SMD as the average of the three absolute values of the SMD for unvaccinated versus each vaccination status category individually (unvaccinated versus 2 doses 14-149 days earlier, unvaccinated versus 2-dose ≥150 days earlier, and unvaccinated versus 3 mRNA doses ≥7 days earlier). All SMDs are reported as the absolute SMD. Additionally, the average SMD calculation comparing Negative SARS-CoV-2 Test Result and Positive SARS-CoV-2 Test Result was generated by directly calculating the SMD for Negative SARS-CoV-2 Test Result and Positive SARS-CoV-2 Test Result.

d Vaccination was defined as having received the listed number of doses of COVID-19 Pfizer-BioNTech BNT162b2 or Moderna mRNA-1273 vaccine ≥14 days (for 2 doses) or ≥7 days (for 3 doses) before the medical event index date, which was the date of respiratory specimen collection associated with the most recent positive or negative SARS-CoV-2 test result before medical event or the admission date if testing only occurred after the admission.

e Unknown race/ethnicity includes Asian, Native Hawaiian or other Pacific islander, American Indian or Alaska Native, other not listed, and multiple races.

f Chronic respiratory condition was defined as the presence of discharge code for asthma, COPD, or other lung disease using diagnosis codes from the ICD-9 and ICD-10.

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eTable 6. Characteristics of COVID-19–Like Illness Hospitalizations Among Nonpregnant Women Aged 18 to 45 Years With COVID-19–Like Illness\textsuperscript{a} by COVID-19 BNT162b2 Vaccination Status and SARS-CoV-2 Test Result, 10 States, June 1, 2021, to June 2, 2022\textsuperscript{b}

| Characteristic                                      | Total, No. (Column %) | mRNA COVID-19 Vaccination Status | SMD** | No. (Row %) | SMD** |
|-----------------------------------------------------|-----------------------|-----------------------------------|-------|-------------|-------|
|                                                     |                       | Unvaccinated 2 doses (14-149 days earlier) 2 doses (≥150 days earlier) 3 doses\textsuperscript{b} (7-119 days earlier) 3 doses\textsuperscript{b} (≥120 days earlier) |       |             |       |
| All CLI Hospitalizations                             | 9297                  | 6011 955 1563 549 219            | 2849  |             |       |
| Variant predominance period                          |                       |                                   |       |             |       |
| B.1.617.2 (Delta)                                    | 5703 (61.3)           | 4095 (71.8) 747 (13.1) 728 (12.8) 130 (2.3) 3 (0.1) | 0.91  | 2067 (36.2) | 0.34  |
| B.1.1.529 (Omicron)                                  | 3594 (38.7)           | 1916 (53.3) 208 (5.8) 835 (23.2) 419 (11.7) 216 (6.0) | 0.55  | 782 (21.8)  |       |
| Sites                                               |                       |                                   |       |             |       |
| Baylor Scott & White Health                         | 1916 (20.6)           | 1279 (66.8) 127 (6.6) 385 (20.1) 80 (4.2) 45 (2.3) | 463 (24.2) |                |       |
| Columbia University                                 | 665 (7.2)             | 318 (47.8) 120 (18.0) 155 (23.3) 53 (8.0) 19 (2.9) | 100 (15.0) |                |       |
| HealthPartners                                      | 415 (4.5)             | 236 (56.9) 49 (11.8) 70 (16.9) 40 (9.6) 20 (4.8) | 118 (28.4) |                |       |
| Intermountain Healthcare                            | 1096 (11.8)           | 688 (62.8) 117 (10.7) 192 (17.5) 72 (6.6) 27 (2.5) | 299 (27.3) |                |       |
| Kaiser Permanente Northern California               | 1454 (15.6)           | 764 (52.5) 194 (13.3) 272 (18.7) 159 (10.9) 65 (4.5) | 667 (45.9) |                |       |
| Kaiser Permanente Northwest                         | 338 (3.6)             | 184 (54.4) 38 (11.2) 73 (21.6) 33 (9.8) 10 (3.0) | 90 (26.6)  |                |       |
| Regenstrief Institute                               | 2301 (24.7)           | 1778 (77.3) 174 (7.6) 258 (11.2) 72 (3.1) 19 (0.8) | 848 (36.9) |                |       |
| University of Colorado                              | 1112 (12.0)           | 764 (68.7) 136 (12.2) 158 (14.2) 40 (3.6) 14 (1.3) | 264 (23.7) |                |       |
| Age (yrs)                                           |                       |                                   |       |             |       |
| 18-24                                               | 1264 (13.6)           | 840 (66.5) 142 (11.2) 198 (15.7) 66 (5.2) 18 (1.4) | 257 (20.3) |                |       |
| 25-34                                               | 2883 (31.0)           | 1951 (67.7) 281 (9.7) 459 (15.9) 130 (4.5) 62 (2.2) | 881 (30.6) |                |       |
| 35-45                                               | 5150 (55.4)           | 3220 (62.5) 532 (10.3) 906 (17.6) 353 (6.9) 139 (2.7) | 1711 (33.2) |                |       |
| Race/ethnicity                                      |                       |                                   |       |             |       |
| Hispanic                                            | 1909 (20.5)           | 1200 (62.9) 220 (11.5) 338 (17.7) 112 (5.9) 39 (2.0) | 692 (36.2) |                |       |
| Non-Hispanic Black                                  | 1756 (18.9)           | 1231 (70.1) 160 (9.1) 260 (14.8) 73 (4.2) 32 (1.8) | 503 (28.6) |                |       |
| Non-Hispanic Other\textsuperscript{§§}             | 803 (8.6)             | 428 (53.3) 114 (14.2) 161 (20.0) 72 (9.0) 28 (3.5) | 250 (31.1) |                |       |
| Non-Hispanic White                                  | 4441 (47.8)           | 2866 (64.5) 431 (9.7) 755 (17.0) 275 (6.2) 114 (2.6) | 1264 (28.5) |                |       |
| Unknown                                             | 388 (4.2)             | 286 (73.7) 30 (7.7) 49 (12.6) 17 (4.4) 6 (1.5) | 140 (36.1)  |                |       |
| Chronic respiratory condition\textsuperscript{¶¶}   |                       |                                   |       |             |       |
| No                                                  | 3353 (36.1)           | 2020 (60.2) 414 (12.3) 617 (18.4) 204 (6.1) 98 (2.9) | 780 (23.3) |                | 0.27  |
| Yes                                                 | 5944 (63.9)           | 3991 (67.1) 541 (9.1) 946 (15.9) 345 (5.8) 121 (2.0) | 2069 (34.8) |                |       |

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| Chronic non respiratory condition*** |  |  |  |  |  |  |  |  |
|-------------------------------------|--|---|---|---|---|---|---|---|
| No                                  | 1992 (21.4) | 1457 (73.1) | 158 (7.9) | 249 (12.5) | 92 (4.6) | 36 (1.8) | 0.20 | 707 (35.5) | 0.12 |
| Yes                                 | 7305 (78.6) | 4554 (62.3) | 797 (10.9) | 1314 (18.0) | 457 (6.3) | 183 (2.5) | 0.04 | 2142 (29.3) | 0.12 |
| ICU                                 |  |  |  |  |  |  |  |  |
| No                                  | 7415 (79.8) | 4813 (64.9) | 743 (10.0) | 1235 (16.7) | 444 (6.0) | 180 (2.4) | 0.04 | 2368 (31.9) | 0.12 |
| Yes                                 | 1882 (20.2) | 1198 (63.7) | 212 (11.3) | 328 (17.4) | 105 (5.6) | 39 (2.1) | 0.04 | 481 (25.6) | 0.12 |
| Immunocompromised status            |  |  |  |  |  |  |  |  |
| No                                  | 7458 (80.2) | 5100 (68.4) | 692 (9.3) | 1158 (15.5) | 368 (4.9) | 140 (1.9) | 0.37 | 2506 (33.6) | 0.16 |
| Yes                                 | 1839 (19.8) | 911 (49.5) | 263 (14.3) | 405 (22.0) | 181 (9.8) | 79 (4.3) | 0.37 | 343 (18.7) | 0.16 |
| History of SARS-CoV-2 infection     |  |  |  |  |  |  |  |  |
| No                                  | 8316 (89.4) | 5484 (65.9) | 835 (10.0) | 1338 (16.1) | 471 (5.7) | 188 (2.3) | 0.16 | 2759 (33.2) | 0.39 |
| Yes                                 | 981 (10.6) | 527 (53.7) | 120 (12.2) | 225 (22.9) | 78 (8.0) | 31 (3.2) | 0.16 | 90 (9.2) | 0.39 |
| Total vaccinated                    | 3286 | 0 | 955 | 1563 | 549 | 219 | 0.16 | 346 | 0.19 |
| Vaccine product                     |  |  |  |  |  |  |  |  |
| Combination of mRNA products        | 63 (1.9) | 0 (0.0) | 5 (7.9) | 2 (3.2) | 45 (71.4) | 11 (17.5) |  | 5 (7.9) | 0.19 |
| Moderna                             | 1178 (35.8) | 0 (0.0) | 335 (28.4) | 573 (48.6) | 195 (16.6) | 75 (6.4) |  | 98 (8.3) | 0.19 |
| Pfizer-BioNTech                     | 2045 (62.2) | 0 (0.0) | 615 (30.1) | 988 (48.3) | 309 (15.1) | 133 (6.5) |  | 243 (11.9) | 0.19 |

Abbreviations: ICD-9 = International Classification of Diseases, Ninth Revision; ICD-10 = International Classification of Diseases, Tenth Revision; SMD = standardized mean or proportion difference.

aMedical events with an encounter or discharge code consistent with COVID-19–like illness were included, using ICD-9 and ICD-10. Four categories of codes were considered: 1) acute respiratory illness, including respiratory failure, viral or bacterial pneumonia, asthma exacerbation, influenza, and viral illness not otherwise specified; 2) non-respiratory COVID-19–like illness diagnoses including cause-unspecified gastroenteritis, thrombosis, and acute myocarditis; 3) respiratory signs and symptoms consistent with COVID-19–like illness, including hemoptysis, cough, dyspnea, painful respiration, or hypoxemia; 4) signs and symptoms of acute febrile illness. One code in any of the four categories was sufficient for inclusion. Clinician-ordered molecular assays (e.g., real-time reverse transcription–polymerase chain reaction) for SARS-CoV-2 occurring ≤14 days before to <72 hours after the encounter date were included.

bPartners contributing data on medical events were in California (estimated start date of Delta predominance June 23, estimated start date of Omicron predominance: December 21), Colorado (estimated start date of Delta predominance June 3, estimated start date of Omicron predominance December 19), Indiana (estimated start date of Delta predominance July 3, estimated start date of Omicron predominance December 26), Minnesota and Wisconsin (estimated start date of Delta predominance July 1, estimated start date of Omicron predominance December 25), New York (estimated start date of Delta predominance June 30, estimated start date of Omicron predominance December 18), Oregon (estimated start date of Delta predominance June 30, estimated start date of Omicron predominance December 24), Texas (estimated start date of Delta predominance September 11, estimated start date of Omicron predominance December 16), Utah (estimated start date of Delta predominance June 1, estimated start date of Omicron predominance December 24), and Washington (estimated start date Delta predominance June 30, estimated start date of Omicron predominance December 24). The study period began in September 2021 for partners located in Texas.
An absolute standardized mean or proportion difference (SMD) ≥0.20 indicates a non-negligible difference in the distribution of characteristics for vaccinated categories versus unvaccinated patients and for positive versus negative test results. When calculating SMDs for differences in characteristics across COVID-19 vaccination status, investigators calculated SMD as the average of the three absolute values of the SMD for unvaccinated versus each vaccination status category individually (unvaccinated versus 2 doses 14-149 days earlier, unvaccinated versus 2-dose ≥150 days earlier, and unvaccinated versus 3 mRNA doses ≥7 days earlier). All SMDs are reported as the absolute SMD. Additionally, the average SMD calculation comparing Negative SARS-CoV-2 Test Result and Positive SARS-CoV-2 Test Result was generated by directly calculating the SMD for Negative SARS-CoV-2 Test Result and Positive SARS-CoV-2 Test Result.

Vaccination was defined as having received the listed number of doses of COVID-19 Pfizer-BioNTech BNT162b2 or Moderna mRNA-1273 vaccine ≥14 days (for 2 doses) or ≥7 days (for 3 doses) before the medical event index date, which was the date of respiratory specimen collection associated with the most recent positive or negative SARS-CoV-2 test result before medical event or the admission date if testing only occurred after the admission.

Unknown race/ethnicity includes Asian, Native Hawaiian or other Pacific islander, American Indian or Alaska Native, other not listed, and multiple races.

Chronic respiratory condition was defined as the presence of discharge code for asthma, COPD, or other lung disease using diagnosis codes from the ICD-9 and ICD-10.

Chronic non-respiratory condition was defined as the presence of discharge code for heart failure, ischemic heart disease, hypertension, other heart disease, stroke, other cerebrovascular disease, diabetes type I or II, other diabetes, metabolic disease, clinical obesity, clinically underweight, renal disease, liver disease, blood disorder, immunosuppression, organ transplant, cancer, neurological disorder, musculoskeletal disorder, Down Syndrome, and dementia.
eTable 7. Characteristics of Emergency Department and Urgent Care Encounters Among Nonpregnant Women Aged 18 to 45 Years With COVID-19–Like Illnessa by COVID-19 BNT162b2 Vaccination Status and SARS-CoV-2 Test Result, 10 States, June 1, 2021, to June 2, 2022b

| Characteristic | Total, No. (Column %) | No. (Row %) | mRNA COVID-19 Vaccination Status | SMD** | No. (Row %) | SMD** |
|----------------|----------------------|-------------|----------------------------------|-------|-------------|-------|
|                |                      |             | Unvaccinated                      |       | Positive    |       |
|                |                      |             | 2 doses (14-149 days earlier)     |       | SARS-CoV-2  |       |
|                |                      |             | 2 doses (≥150 days earlier)       |       | Test Result |       |
|                |                      |             | 3 doses (7-119 days earlier)      |       |             |       |
|                |                      |             | 3 doses (≥120 days earlier)       |       |             |       |
| All ED/UC CLI Visits | 154289           | 77332       | 22400                            | 37538 | 11982       | 5037  |
| Variant predominance period |     |             |                                  |       |             |       |
| B.1.617.2 (Delta) | 85057 (55.1)   | 45588 (53.6) | 17523 (20.6)                     | 19280 (22.7) | 2608 (3.1) | 58 (0.1) |
| B.1.1.529 (Omicron) | 69232 (44.9) | 31744 (45.9) | 4877 (7.0)                       | 18258 (26.4) | 9374 (13.5) | 4979 (7.2) |
| Sites |     |             |                                  |       |             |       |
| Baylor Scott & White Health | 21039 (13.6) | 14652 (69.6) | 1570 (7.5)                       | 3964 (18.8) | 585 (2.8) | 268 (1.3) |
| Columbia University | 4278 (2.8) | 2394 (56.0) | 647 (15.1)                       | 949 (22.2) | 223 (5.2) | 65 (1.5) |
| HealthPartners | 22232 (14.4) | 8002 (36.0) | 3676 (16.5)                      | 6522 (29.3) | 2653 (11.9) | 1379 (6.2) |
| Intermountain Healthcare | 41193 (26.7) | 18572 (45.1) | 6815 (16.5)                      | 11192 (27.2) | 3270 (7.9) | 1344 (3.3) |
| Kaiser Permanente Northern California | 18656 (12.1) | 5879 (31.5) | 3830 (20.5)                      | 5253 (28.2) | 2582 (13.8) | 1112 (6.0) |
| Kaiser Permanente Northwest | 9607 (6.2) | 3683 (38.3) | 1614 (16.8)                      | 2715 (28.3) | 1103 (11.5) | 492 (5.1) |
| Regenstrief Institute | 21512 (13.9) | 14949 (69.5) | 2333 (10.8)                      | 3250 (15.1) | 810 (3.8) | 170 (0.8) |
| University of Colorado | 15772 (10.2) | 9201 (58.3) | 1915 (12.1)                      | 3693 (23.4) | 756 (4.8) | 207 (1.3) |
| Age (yrs) |     |             |                                  |       |             |       |
| 18-24 | 41987 (27.2) | 22872 (54.5) | 6426 (15.3)                      | 9582 (22.8) | 2317 (5.5) | 790 (1.9) |
| 25-34 | 56587 (36.7) | 29584 (52.3) | 8058 (14.2)                      | 13093 (23.1) | 4137 (7.3) | 1715 (3.0) |
| 35-45 | 55715 (36.1) | 24876 (44.6) | 7916 (14.2)                      | 14863 (26.7) | 5528 (9.9) | 2532 (4.5) |
| Race/ethnicity |     |             |                                  |       |             |       |
| Hispanic | 29237 (18.9) | 14660 (50.1) | 4515 (15.4)                      | 7154 (24.5) | 2131 (7.3) | 777 (2.7) |
| Non-Hispanic Black | 19650 (12.7) | 12739 (64.8) | 2550 (13.0)                      | 3367 (17.1) | 713 (3.6) | 281 (1.4) |
| Non-Hispanic Other c | 12506 (8.1) | 4710 (37.7) | 2138 (17.1)                      | 3527 (28.2) | 1459 (11.7) | 672 (5.4) |
| Non-Hispanic White | 86290 (55.9) | 41396 (48.0) | 12322 (14.3)                     | 22140 (25.7) | 7242 (8.4) | 3190 (3.7) |
| Unknown | 6606 (4.3) | 3827 (57.9) | 875 (13.2)                       | 1350 (20.4) | 437 (6.6) | 117 (1.8) |
| Chronic respiratory condition d |     |             |                                  |       |             |       |
| No | 139446 (90.4) | 69499 (49.8) | 20389 (14.6)                     | 34098 (24.5) | 10876 (7.8) | 4584 (3.3) |
| Yes | 14843 (9.6) | 7833 (52.8) | 2011 (13.5)                      | 3440 (23.2) | 1106 (7.5) | 453 (3.1) |

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### Chronic non respiratory condition

|          | No | Yes |
|----------|----|-----|
| **Total** | 137189 (88.9) | 17100 (11.1) |
| **ICU**  | 68118 (49.7) | 20144 (14.7) |
| **2020** | 33790 (24.6) | 1281 (7.5) |
| **2021** | 10701 (7.8) | 601 (3.5) |
| **2022** | 4436 (3.2) | 4436 (3.2) |
| **p-value** | 0.04 | 0.03 |

### ICU

|          | No | Yes |
|----------|----|-----|
| **Total** | 152696 (99.0) | 1593 (1.0) |
| **ICU**  | 76289 (50.0) | 1043 (65.5) |
| **2020** | 22241 (14.6) | 273 (17.1) |
| **2021** | 37265 (24.4) | 72 (4.5) |
| **2022** | 11910 (7.8) | 46 (2.9) |
| **p-value** | 0.06 | 0.01 |

### Immunocompromised status

|          | No | Yes |
|----------|----|-----|
| **Total** | 151927 (98.5) | 2362 (1.5) |
| **ICU**  | 76225 (50.2) | 1107 (46.9) |
| **2020** | 22109 (14.6) | 291 (12.3) |
| **2021** | 36981 (24.3) | 557 (23.6) |
| **2022** | 11731 (7.7) | 251 (10.6) |
| **p-value** | 0.05 | 0.03 |

### History of SARS-CoV-2 infection

|          | No | Yes |
|----------|----|-----|
| **Total** | 134934 (87.5) | 19355 (12.5) |
| **ICU**  | 67700 (50.2) | 9632 (49.8) |
| **2020** | 19620 (14.5) | 2780 (14.4) |
| **2021** | 32810 (24.3) | 4728 (24.4) |
| **2022** | 10506 (7.8) | 1476 (7.6) |
| **p-value** | 0.02 | 0.25 |

### Total vaccinated

|          | 76957 | 0 | 22400 | 37538 | 11982 | 219 |
|----------|-------|---|-------|-------|-------|-----|
| **Vaccine product** | NA | 203 | 203 | 2699 | 1759 | 5037 |

### Abbreviations: ICD-9 = International Classification of Diseases, Ninth Revision; ICD-10 = International Classification of Diseases, Tenth Revision; SMD = standardized mean or proportion difference.

*a*Medical events with an encounter or discharge code consistent with COVID-19–like illness were included, using ICD-9 and ICD-10. Four categories of codes were considered: 1) acute respiratory illness, including respiratory failure, viral or bacterial pneumonia, asthma exacerbation, influenza, and viral illness not otherwise specified; 2) non-respiratory COVID-19–like illness diagnoses including cause-unspecified gastroenteritis, thrombosis, and acute myocarditis; 3) respiratory signs and symptoms consistent with COVID-19–like illness, including hemoptysis, cough, dyspnea, painful respiration, or hypoxemia; 4) signs and symptoms of acute febrile illness. One code in any of the four categories was sufficient for inclusion. Clinician-ordered molecular assays (e.g., real-time reverse transcription–polymerase chain reaction) for SARS-CoV-2 occurring ≤14 days before to <72 hours after the encounter date were included.

*b*Partners contributing data on medical events were in California (estimated start date of Delta predominance June 23, estimated start date of Omicron predominance: December 21), Colorado (estimated start date of Delta predominance June 3, estimated start date of Omicron predominance December 19), Indiana (estimated start date of Delta predominance July 3, estimated start date of Omicron predominance December 26), Minnesota and Wisconsin (estimated start date of Delta predominance July 1, estimated start date of Omicron predominance December 25), New York (estimated start date of Delta predominance June 30, estimated start date of Omicron predominance December 18), Oregon (estimated start date of Delta predominance June 30, estimated start date of Omicron predominance December 24), Texas (estimated start date of Delta predominance September 11, estimated start date of Omicron predominance December 16), Utah (estimated start date of Delta predominance June 1, estimated start date of Omicron predominance December 24), and Washington (estimated start date Delta predominance June 30, estimated start date of Omicron predominance December 24). The study period began in September 2021 for partners located in Texas.
An absolute standardized mean or proportion difference (SMD) ≥0.20 indicates a non-negligible difference in the distribution of characteristics for vaccinated categories versus unvaccinated patients and for positive versus negative test results. When calculating SMDs for differences in characteristics across COVID-19 vaccination status, investigators calculated SMD as the average of the three absolute values of the SMD for unvaccinated versus each vaccination status category individually (unvaccinated versus 2 doses 14-149 days earlier, unvaccinated versus 2-dose ≥150 days earlier, and unvaccinated versus 3 mRNA doses ≥7 days earlier). All SMDs are reported as the absolute SMD. Additionally, the average SMD calculation comparing Negative SARS-CoV-2 Test Result and Positive SARS-CoV-2 Test Result was generated by directly calculating the SMD for Negative SARS-CoV-2 Test Result and Positive SARS-CoV-2 Test Result.

Vaccination was defined as having received the listed number of doses of COVID-19 Pfizer-BioNTech BNT162b2 or Moderna mRNA-1273 vaccine ≥14 days (for 2 doses) or ≥7 days (for 3 doses) before the medical event index date, which was the date of respiratory specimen collection associated with the most recent positive or negative SARS-CoV-2 test result before medical event or the admission date if testing only occurred after the admission.

Unknown race/ethnicity includes Asian, Native Hawaiian or other Pacific islander, American Indian or Alaska Native, other not listed, and multiple races.

Chronic respiratory condition was defined as the presence of discharge code for asthma, COPD, or other lung disease using diagnosis codes from the ICD-9 and ICD-10.

Chronic non-respiratory condition was defined as the presence of discharge code for heart failure, ischemic heart disease, hypertension, other heart disease, stroke, other cerebrovascular disease, diabetes type I or II, other diabetes, metabolic disease, clinical obesity, clinically underweight, renal disease, liver disease, blood disorder, immunosuppression, organ transplant, cancer, neurological disorder, musculoskeletal disorder, Down Syndrome, and dementia.
### eTable 8. Characteristics of Hospitalizations Among Pregnant People With COVID-19–Like Illnessa Who Did Not Have a Prior Positive SARS-CoV-2 Infection by COVID-19 mRNA Vaccination Status, VISION Network, 10 states, June 1, 2021–June 2, 2022b

| Characteristic                              | Total, No. (Column %) | No. (Row %) mRNA COVID-19 Vaccination Status | No. (Row %) Positive SARS-CoV-2 Test Result | SMD** | SMD** |
|---------------------------------------------|-----------------------|---------------------------------------------|-------------------------------------------|-------|-------|
|                                             |                       | Unvaccinated                                | 2 doses (14-149 days earlier)             | 2 doses (≥150 days earlier) | 3 doses* (7-119 days earlier) | 3 doses* (≥120 days earlier) |                       |       |       |
| All Hospitalizations                        | 888                   | 612                                         | 110                                        | 70    | 74    | 22    | 329                       |       |       |
| Pregnancy trimester of CLI event            |                       |                                             |                                            |       |       |       |                           |       |       |
| 1st                                         | 28 (3.2)              | 27 (96.4)                                   | 0 ( 0.0)                                  | 0 ( 0.0) | 1 ( 3.6) | 0 ( 0.0) | 17 (60.7)                   | 0.50  | 0.31  |
| 2nd                                         | 150 (16.9)            | 127 (84.7)                                  | 11 ( 7.3)                                 | 5 ( 3.3) | 6 ( 4.0) | 1 ( 0.7) | 74 (49.3)                   |       |       |
| 3rd                                         | 710 (80)              | 458 (64.5)                                  | 99 (13.9)                                 | 65 (9.2) | 67 (9.4) | 21 (3.0) | 238 (33.5)                  |       |       |
| CLI event associated with delivery          |                       |                                             |                                            |       |       |       |                           |       |       |
| No                                          | 306 (34.5)            | 243 (79.4)                                  | 27 ( 8.8)                                 | 10 ( 3.3) | 16 ( 5.2) | 10 ( 3.3) | 168 (54.9)                  | 0.36  | 0.57  |
| Yes                                         | 582 (65.5)            | 369 (63.4)                                  | 83 (14.3)                                 | 60 (10.3) | 58 (10.0) | 12 ( 2.1) | 161 (27.7)                  |       |       |
| Variant predominance period                 |                       |                                             |                                            |       |       |       |                           |       |       |
| B.1.617.2 (Delta)                           | 638 (71.8)            | 469 (73.5)                                  | 94 (14.7)                                 | 54 ( 8.5) | 21 ( 3.3) | 0 ( 0.0) | 255 (40.0)                  | 0.98  | 0.20  |
| B.1.1.529 (Omicron)                        | 250 (28.2)            | 143 (57.2)                                  | 16 ( 6.4)                                 | 16 ( 6.4) | 53 (21.2) | 22 ( 8.8) | 74 (29.6)                   |       |       |
| Sites                                       |                       |                                             |                                            |       |       |       |                           |       |       |
| Baylor Scott & White Health                 | 32 (3.6)              | 25 (78.1)                                   | 5 (15.6)                                  | 1 ( 3.1) | 1 ( 3.1) | 0 ( 0.0) | 8 (25.0)                    |       |       |
| Columbia University                         | 78 (8.8)              | 48 (61.5)                                   | 13 (16.7)                                 | 12 (15.4) | 4 ( 5.1) | 1 ( 1.3) | 16 (20.5)                   |       |       |
| HealthPartners                              | 16 (1.8)              | 10 (62.5)                                   | 1 ( 6.2)                                  | 2 (12.5) | 2 (12.5) | 1 ( 6.2) | 3 (18.8)                    |       |       |
| Intermountain Healthcare                   | 89 (10)               | 71 (79.8)                                   | 7 ( 8.2)                                  | 5 ( 5.6) | 5 ( 5.6) | 1 ( 1.1) | 27 (30.3)                   |       |       |
| Kaiser Permanente Northern California      | 312 (35.1)            | 180 (57.7)                                  | 48 (15.4)                                 | 32 (10.3) | 42 (13.5) | 10 ( 3.2) | 129 (41.3)                  | 0.72  | 0.46  |
| Kaiser Permanente Northwest                | 63 (7.1)              | 36 (57.1)                                   | 8 (12.7)                                  | 5 ( 7.9) | 9 (14.3) | 5 ( 7.9) | 20 (31.7)                   |       |       |
| Regenstrief Institute                      | 153 (17.2)            | 131 (85.6)                                  | 12 ( 7.8)                                 | 1 ( 0.7) | 6 ( 3.9) | 3 ( 2.0) | 83 (54.2)                   |       |       |
| University of Colorado                     | 145 (16.3)            | 111 (76.6)                                  | 16 (11.0)                                 | 12 ( 8.3) | 5 ( 3.4) | 1 ( 0.7) | 43 (29.7)                   |       |       |
| Age (yrs)                                  |                       |                                             |                                            |       |       |       |                           |       |       |
| 18-24                                      | 149 (16.8)            | 126 (84.6)                                  | 15 (10.1)                                 | 5 ( 3.4) | 3 ( 2.0) | 0 ( 0.0) | 51 (34.2)                   | 0.63  | 0.11  |
| 25-34                                      | 480 (54.1)            | 349 (72.7)                                  | 55 (11.5)                                 | 32 ( 6.7) | 32 ( 6.7) | 12 ( 2.5) | 189 (39.4)                  |       |       |
| 35-45                                      | 259 (29.2)            | 137 (52.9)                                  | 40 (15.4)                                 | 33 (12.7) | 39 (15.1) | 10 ( 3.9) | 89 (34.4)                   |       |       |

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| Category                              | No       | Yes        | Total vaccinated | p-value | 95% CI Lower | 95% CI Upper |
|---------------------------------------|----------|------------|------------------|---------|--------------|--------------|
| **Hispanic**                          | 218 (45.9)| 156 (71.6) | 276              | 0.47    | 62 (11.9)    | 74 (15.9)    |
| Non-Hispanic Black                    | 109 (12.3)| 91 (83.5)  | 10 (2.1)         | 0.43    | 125 (27.1)   | 204 (47.8)   |
| Non-Hispanic Other                    | 131 (14.8)| 72 (55.0)  | 203              | 0.27    | 76 (34.4)    | 137 (34.4)   |
| Non-Hispanic White                    | 398 (44.8)| 275 (69.1)| 673              | 0.24    | 125 (31.0)   | 204 (42.1)   |
| Unknown                               | 32 (3.6) | 18 (56.2)  | 21 (3.8)         | 0.11    | 321 (37.5)   | 8 (24.2)     |
| **Chronic respiratory condition**     | No       | Yes        | Total vaccinated | p-value | 95% CI Lower | 95% CI Upper |
|                                       | 461 (51.9)| 427 (48.1) | 888              | 0.34    | 125 (27.1)   | 204 (47.8)   |
|                                       | 285 (61.8)| 327 (76.6) | 612              | 0.43    | 76 (34.4)    | 137 (34.4)   |
| **Chronic non respiratory condition** | No       | Yes        | Total vaccinated | p-value | 95% CI Lower | 95% CI Upper |
|                                       | 403 (45.4)| 485 (54.6) | 888              | 0.09    | 125 (31.0)   | 204 (42.1)   |
|                                       | 281 (69.7)| 331 (68.2) | 612              | 0.24    | 76 (34.4)    | 137 (34.4)   |
| **ICU**                               | No       | Yes        | Total vaccinated | p-value | 95% CI Lower | 95% CI Upper |
|                                       | 773 (87) | 115 (13)   | 888              | 0.27    | 271 (35.1)   | 58 (50.4)    |
|                                       | 522 (67.5)| 90 (78.3)  | 612              | 0.22    | 76 (34.4)    | 137 (34.4)   |
| **Immunocompromised status**          | No       | Yes        | Total vaccinated | p-value | 95% CI Lower | 95% CI Upper |
|                                       | 855 (96.3)| 33 (3.7)   | 888              | 0.11    | 321 (37.5)   | 8 (24.2)     |
|                                       | 591 (69.1)| 21 (63.6)  | 612              | 0.11    | 76 (34.4)    | 137 (34.4)   |
| **History of SARS-CoV-2 infection**   | No       | Yes        | Total vaccinated | p-value | 95% CI Lower | 95% CI Upper |
|                                       | 888 (100)| 0 (0)      | 888              | NA      | 329 (37.0)   | NA           |
|                                       | 612 (68.9)| 0 (0)      | 612              | NA      | 70 (7.9)     | NA           |
| **Vaccine product**                   | Combination of mRNA products | 6 (2.2) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 276 | 0 | 110 | 70 | 74 | 22 | 20 | 0 |
|                                       | Moderna | 100 (36.2)| 0 (0) | 40 (40.0) | 30 (30.0) | 22 (22.0) | 8 (8.0) | 5 (5.0) | 14 (8.2) | NA | 14 (8.2) | 0.30 |
|                                       | Pfizer-BioNTech | 170 (61.6)| 0 (0) | 70 (41.2) | 40 (23.5) | 47 (27.6) | 13 (7.6) | 1 (16.7) | 1 (16.7) | NA | 1 | 0.30 |
| **Timing of first dose**              | before current pregnancy | 106 (38.4)| 0 (0) | 2 (1.9) | 20 (18.9) | 62 (58.5) | 22 (20.8) | 10 (9.4) | 7 (9.1) | 0.59 |
|                                       | 1st trimester | 77 (27.9) | 0 (0) | 20 (26.0) | 45 (58.4) | 12 (15.6) | 0 (0) | 3 (3.8) | 0.59 |
|                                       | 2nd trimester | 78 (28.3) | 0 (0) | 73 (93.6) | 5 (6.4) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0.59 |
|                                       | 3rd trimester | 15 (5.4) | 0 (0) | 15 (100.0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0.59 |
| **Timing of second dose**             | before current pregnancy | 75 (27.2)| 0 (0) | 0 (0) | 0 (0) | 53 (70.7) | 22 (20.8) | 7 (9.3) | 8 (9.9) | 0.60 |
|                                       | 1st trimester | 81 (29.3) | 0 (0) | 8 (9.9) | 52 (64.2) | 21 (25.9) | 0 (0) | 8 (9.9) | 0.60 |
### Timing of Third Dose

| Timing of Third Dose | 2nd trimester | 3rd trimester | 1st trimester | 2nd trimester | 3rd trimester |
|----------------------|---------------|---------------|---------------|---------------|---------------|
|                       | 89 (32.2)     | 0 (0.0)       | 71 (79.8)     | 18 (20.2)     | 0 (0.0)       |
|                       | 31 (11.2)     | 0 (0.0)       | 31 (100.0)    | 0 (0.0)       | 0 (0.0)       |
|                       | 5 (5.6)       | 0 (0.0)       | 0 (0.0)       | 0 (0.0)       | 0 (0.0)       |

### 2 Doses

#### 2 Doses During Current Pregnancy

| Timing of First Dose | Timing of 2nd Dose | Timing of 3rd Dose |
|----------------------|---------------------|--------------------|
| before current pregnancy | before current pregnancy | 1st trimester |
| before current pregnancy | before current pregnancy | 2nd trimester |
| 1st trimester | before current pregnancy | 2nd trimester |
| 1st trimester | before current pregnancy | 3rd trimester |
| 2nd trimester | before current pregnancy | 2nd trimester |
| 2nd trimester | before current pregnancy | 3rd trimester |
| 3rd trimester | before current pregnancy | 3rd trimester |

### 3 Doses

#### 3 Doses During Current Pregnancy

| Timing of First Dose | Timing of 2nd Dose | Timing of 3rd Dose |
|----------------------|---------------------|--------------------|
| before current pregnancy | before current pregnancy | 1st trimester |
| before current pregnancy | before current pregnancy | 2nd trimester |
| before current pregnancy | before current pregnancy | 3rd trimester |
| 1st trimester | before current pregnancy | 2nd trimester |
| 1st trimester | before current pregnancy | 3rd trimester |
| 1st trimester | 1st trimester |

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Abbreviations: ICD-9 = International Classification of Diseases, Ninth Revision; ICD-10 = International Classification of Diseases, Tenth Revision; SMD = standardized mean or proportion difference.

Medical events with an encounter or discharge code consistent with COVID-19–like illness were included, using ICD-9 and ICD-10. Four categories of codes were considered: 1) acute respiratory illness, including respiratory failure, viral or bacterial pneumonia, asthma exacerbation, influenza, and viral illness not otherwise specified; 2) non-respiratory COVID-19–like illness diagnoses including cause-unspecified gastroenteritis, thrombosis, and acute myocarditis; 3) respiratory signs and symptoms consistent with COVID-19–like illness, including hemoptysis, cough, dyspnea, painful respiration, or hypoxemia; 4) signs and symptoms of acute febrile illness. One code in any of the four categories was sufficient for inclusion. Clinician-ordered molecular assays (e.g., real-time reverse transcription–polymerase chain reaction) for SARS-CoV-2 occurring ≤14 days before to <72 hours after the encounter date were included.

Partners contributing data on medical events were in California (estimated start date of Delta predominance June 23, estimated start date of Omicron predominance: December 21), Colorado (estimated start date of Delta predominance June 3, estimated start date of Omicron predominance December 19), Indiana (estimated start date of Delta predominance July 3, estimated start date of Omicron predominance December 26), Minnesota and Wisconsin (estimated start date of Delta predominance July 1, estimated start date of Omicron predominance December 25), New York (estimated start date of Delta predominance June 30, estimated start date of Omicron predominance December 18), Oregon (estimated start date of Delta predominance June 30, estimated start date of Omicron predominance December 24), Texas (estimated start date of Delta predominance September 11, estimated start date of Omicron predominance December 16), Utah (estimated start date of Delta predominance June 1, estimated start date of Omicron predominance December 24), and Washington (estimated start date Delta predominance June 30, estimated start date of Omicron predominance December 24). The study period began in September 2021 for partners located in Texas.

An absolute standardized mean or proportion difference (SMD) ≥0.20 indicates a non-negligible difference in the distribution of characteristics for vaccinated categories versus unvaccinated patients and for positive versus negative test results. When calculating SMDs for differences in characteristics across COVID-19 vaccination status, investigators calculated SMD as the average of the three absolute values of the SMD for unvaccinated versus each vaccination status category individually (unvaccinated versus 2 doses 14-149 days earlier, unvaccinated versus 2-dose ≥150 days earlier, and unvaccinated versus 3 mRNA doses ≥7 days earlier). All SMDs are reported as the absolute SMD. Additionally, the average SMD calculation comparing Negative SARS-CoV-2 Test Result and Positive SARS-CoV-2 Test Result was generated by directly calculating the SMD for Negative SARS-CoV-2 Test Result and Positive SARS-CoV-2 Test Result.

Vaccination was defined as having received the listed number of doses of COVID-19 Pfizer-BioNTech BNT162b2 or Moderna mRNA-1273 vaccine ≥14 days (for 2 doses) or ≥7 days (for 3 doses) before the medical event index date, which was the date of respiratory specimen collection associated with the most recent positive or negative SARS-CoV-2 test result before medical event or the admission date if testing only occurred after the admission.

Unknown race/ethnicity includes Asian, Native Hawaiian or other Pacific islander, American Indian or Alaska Native, other not listed, and multiple races.

Chronic respiratory condition was defined as the presence of discharge code for asthma, COPD, or other lung disease using diagnosis codes from the ICD-9 and ICD-10

Chronic non-respiratory condition was defined as the presence of discharge code for heart failure, ischemic heart disease, hypertension, other heart disease, stroke, other cerebrovascular disease, diabetes type I or II, other diabetes, metabolic disease, clinical obesity, clinically underweight, renal disease, liver disease, blood disorder, immunosuppression, organ transplant, cancer, neurological disorder, musculoskeletal disorder, Down Syndrome, and dementia.

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eTable 9. Characteristics of Emergency Department and Urgent Care Encounters Among Pregnant People With COVID-19–Like Illnessa Who Did Not Have a Prior Positive SARS-CoV-2 Infection by COVID-19 mRNA Vaccination Status, VISION Network, 10 States, June 1, 2021 to June 2, 2022b

| Characteristic                                      | Total, No. (Column %) | No. (Row %) | mRNA COVID-19 Vaccination Status | SMD** | Positive SARS-CoV-2 Test Result | SMD** |
|----------------------------------------------------|-----------------------|-------------|----------------------------------|-------|--------------------------------|-------|
|                                                   |                       |             | Unvaccinated | 2 doses (14-149 days earlier) | 2 doses (≥150 days earlier) | 3 doses (7-119 days earlier) | 3 doses (≥120 days earlier) |       |                       |       |
| All ED/UC CLI encounters                           | 3934                  | 2940        | 457          | 175                           | 305               | 57                        | 828          |       |                       |       |
| Pregnancy trimester of CLI event                   |                       |             |              |                               |                   |                           |                           | 0.82  |                       | 0.07  |
| 1st                                                | 1048 (26.6)            | 940 (89.7)  | 57 (5.4)     | 0 (0.0)                      | 51 (4.9)          | 0 (0.0)                   | 204 (19.5)   |       |                       |       |
| 2nd                                                | 1434 (36.5)            | 1061 (74.0) | 198 (13.8)   | 27 (1.9)                     | 129 (9.0)         | 19 (1.3)                  | 320 (22.3)   |       |                       |       |
| 3rd                                                | 1452 (36.9)            | 939 (64.7)  | 202 (13.9)   | 148 (10.2)                   | 125 (8.6)         | 38 (2.6)                  | 304 (20.9)   |       |                       |       |
| CLI event associated with delivery                 |                       |             |              |                               |                   |                           |                           | 0.09  |                       | 0.02  |
| No                                                 | 3626 (92.2)            | 2694 (74.3) | 433 (11.9)   | 159 (4.4)                    | 286 (7.9)         | 54 (1.5)                  | 759 (20.9)   |       |                       |       |
| Yes                                                | 308 (7.8)              | 246 (79.9)  | 24 (7.8)     | 16 (5.2)                     | 19 (6.2)          | 3 (1.0)                   | 69 (22.4)    |       |                       |       |
| Variant predominance period                        |                       |             |              |                               |                   |                           |                           | 0.89  |                       | 0.28  |
| B.1.617.2 (Delta)                                  | 2582 (65.6)            | 2059 (79.7) | 337 (13.1)   | 112 (4.3)                    | 72 (2.8)          | 2 (0.1)                   | 455 (17.6)   |       |                       |       |
| B.1.1.529 (Omicron)                                | 1352 (34.4)            | 881 (65.2)  | 120 (8.9)    | 63 (4.7)                     | 233 (17.2)        | 55 (4.1)                  | 373 (27.6)   |       |                       |       |
| Sites                                              |                       |             |              |                               |                   |                           |                           |       |                       |       |
| Baylor Scott & White Health                        | 81 (2.1)               | 65 (80.2)   | 13 (16.0)    | 1 (1.2)                      | 1 (1.2)           | 1 (1.2)                   | 32 (39.5)    | 0.57  |                       | 0.35  |
| Columbia University                                | 261 (6.6)              | 185 (70.9)  | 47 (18.0)    | 16 (6.1)                     | 12 (4.6)          | 1 (0.4)                   | 33 (12.6)    |       |                       |       |
| HealthPartners                                     | 267 (6.8)              | 161 (60.3)  | 37 (13.9)    | 16 (6.0)                     | 38 (14.2)         | 15 (5.6)                  | 65 (24.3)    |       |                       |       |
| Intermountain Healthcare                           | 1383 (35.2)            | 1051 (76.0) | 160 (11.6)   | 58 (4.2)                     | 95 (6.9)          | 19 (1.4)                  | 220 (15.9)   |       |                       |       |
| Kaiser Permanente Northern California              | 816 (20.7)             | 538 (65.9)  | 128 (15.7)   | 45 (5.5)                     | 94 (11.5)         | 11 (1.3)                  | 181 (22.2)   |       |                       |       |
| Kaiser Permanente Northwest                        | 284 (7.2)              | 202 (71.1)  | 27 (9.5)     | 11 (3.9)                     | 38 (13.4)         | 6 (2.1)                   | 92 (32.4)    |       |                       |       |
| Regenstrief Institute                              | 502 (12.8)             | 451 (89.8)  | 26 (5.2)     | 12 (2.4)                     | 11 (2.2)          | 2 (0.4)                   | 123 (24.5)   |       |                       |       |
| University of Colorado                              | 340 (8.6)              | 287 (84.4)  | 19 (5.6)     | 16 (4.7)                     | 16 (4.7)          | 2 (0.6)                   | 82 (24.1)    |       |                       |       |
| Age (yrs)                                          |                       |             |              |                               |                   |                           |                           |       |                       |       |
| 18-24                                              | 1136 (28.9)            | 982 (86.4)  | 95 (8.4)     | 32 (2.8)                     | 22 (1.9)          | 5 (0.4)                   | 228 (20.1)   | 0.54  |                       | 0.04  |
| 25-34                                              | 2201 (55.9)            | 1602 (72.8) | 260 (11.8)   | 112 (5.1)                    | 192 (8.7)         | 35 (1.6)                  | 476 (21.6)   |       |                       |       |

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| Race/ethnicity                      | Hispanic | Non-Hispanic Black | Non-Hispanic Other | Non-Hispanic White | Unknown |
|------------------------------------|----------|--------------------|--------------------|--------------------|---------|
| 35-45                              | 597 (15.2) | 356 (59.6) | 102 (17.1) | 91 (15.2) | 17 (2.8) |
| Hispanic                           | 1023 (26) | 761 (74.4) | 146 (14.3) | 48 (4.7) | 62 (6.1) |
| Non-Hispanic Black                 | 463 (11.8) | 403 (87.0) | 36 (7.8) | 7 (1.5) | 15 (3.2) |
| Non-Hispanic Other§§               | 311 (7.9) | 182 (58.5) | 46 (14.8) | 25 (8.0) | 48 (15.4) |
| Non-Hispanic White                 | 2009 (51.1) | 1482 (73.8) | 222 (11.1) | 92 (4.6) | 174 (8.7) |
| Unknown                            | 128 (3.3) | 112 (87.5) | 7 (5.5) | 3 (2.3) | 6 (4.7) |

| Chronic respiratory condition¶¶  | No        | Yes       | 0.49 | 212 (20.7) | 0.13 | 126 (27.2) | 64 (20.6) | 401 (20.0) | 25 (19.5) |
|----------------------------------|-----------|-----------|------|-------------|------|-------------|-----------|-------------|-----------|
| 35-45                            | 3651 (92.8) | 2720 (74.5) | 429 (11.8) | 164 (4.5) | 284 (7.8) | 54 (1.5) |
| Hispanic                         | 283 (7.2) | 220 (77.7) | 28 (9.9) | 11 (3.9) | 21 (7.4) | 3 (1.1) |
| Non-Hispanic Black               | 3622 (92.1) | 2700 (74.5) | 426 (11.8) | 162 (4.5) | 283 (7.8) | 51 (1.4) |
| Non-Hispanic Other               | 312 (7.9) | 240 (76.9) | 31 (9.9) | 13 (4.2) | 22 (7.1) | 6 (1.9) |

| Chronic non respiratory condition*** | No         | Yes       | 0.05 | 759 (20.8) | 0.05 | 69 (24.4) |
|-----------------------------------|------------|-----------|------|-------------|------|-----------|
| 35-45                             | 3622 (92.8) | 2700 (74.5) | 426 (11.8) | 162 (4.5) | 283 (7.8) | 51 (1.4) |
| Hispanic                          | 283 (7.2) | 220 (77.7) | 28 (9.9) | 11 (3.9) | 21 (7.4) | 3 (1.1) |
| Non-Hispanic Black                | 3613 (92.1) | 2700 (74.5) | 426 (11.8) | 162 (4.5) | 283 (7.8) | 51 (1.4) |
| Non-Hispanic Other§§              | 312 (7.9) | 240 (76.9) | 31 (9.9) | 13 (4.2) | 22 (7.1) | 6 (1.9) |

| ICU                               | No         | Yes       | 0.05 | 759 (20.8) | 0.05 | 69 (24.4) |
|-----------------------------------|------------|-----------|------|-------------|------|-----------|
| 35-45                             | 3613 (92.1) | 2700 (74.5) | 426 (11.8) | 162 (4.5) | 283 (7.8) | 51 (1.4) |
| Hispanic                          | 283 (7.2) | 220 (77.7) | 28 (9.9) | 11 (3.9) | 21 (7.4) | 3 (1.1) |
| Non-Hispanic Black                | 3622 (92.1) | 2700 (74.5) | 426 (11.8) | 162 (4.5) | 283 (7.8) | 51 (1.4) |
| Non-Hispanic Other§§              | 312 (7.9) | 240 (76.9) | 31 (9.9) | 13 (4.2) | 22 (7.1) | 6 (1.9) |

| Imunocompromised status           | No         | Yes       | 0.02 | 759 (20.8) | 0.02 | 69 (24.4) |
|-----------------------------------|------------|-----------|------|-------------|------|-----------|
| 35-45                             | 3613 (92.1) | 2700 (74.5) | 426 (11.8) | 162 (4.5) | 283 (7.8) | 51 (1.4) |
| Hispanic                          | 283 (7.2) | 220 (77.7) | 28 (9.9) | 11 (3.9) | 21 (7.4) | 3 (1.1) |
| Non-Hispanic Black                | 3622 (92.1) | 2700 (74.5) | 426 (11.8) | 162 (4.5) | 283 (7.8) | 51 (1.4) |
| Non-Hispanic Other§§              | 312 (7.9) | 240 (76.9) | 31 (9.9) | 13 (4.2) | 22 (7.1) | 6 (1.9) |

| History of SARS-CoV-2 infection   | No         | Yes       | NA   | 828 (21.0) | NA   | 8 (33.3) |
|-----------------------------------|------------|-----------|------|-------------|------|-----------|
| 35-45                             | 3934 (100) | 2940 (74.7) | 457 (11.6) | 174 (4.4) | 305 (7.8) | 57 (1.4) |
| Hispanic                          | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Non-Hispanic Black                | 3916 (99.5) | 2926 (74.5) | 455 (11.6) | 174 (4.4) | 304 (7.8) | 57 (1.5) |
| Non-Hispanic Other§§              | 18 (0.5) | 14 (47.7) | 2 (11.1) | 1 (5.6) | 1 (5.6) | 0 (0) |

| Total vaccinated                  | 994        | 0         | 457   | 175   | 305   | 57   |
|-----------------------------------|------------|-----------|-------|-------|-------|------|
| Vaccine product                   | NA         | 0         | 0     | 0     | 0     | 0    |
| Combination of mRNA products     | 42 (4.2)   | 0 (0)     | 0 (0) | 0 (0) | 33 (7.8) | 9 (21.4) |
| Moderna                           | 286 (28.8) | 0 (0)     | 125 (43.7) | 53 (18.5) | 89 (31.1) | 19 (6.6) |
| Pfizer-BioNTech                   | 666 (67)   | 0 (0)     | 332 (49.8) | 122 (18.3) | 183 (27.5) | 29 (4.4) |

| Timing of first dose              | 994        | 0         | 457   | 175   | 305   | 57   |
|-----------------------------------|------------|-----------|-------|-------|-------|------|
| before current pregnancy          | 520 (52.3) | 0 (0)     | 86 (16.5) | 80 (15.4) | 297 (57.1) | 57 (11.0) |
| 1st trimester                     | 289 (29.1) | 0 (0)     | 191 (66.1) | 90 (31.1) | 8 (2.8) | 0 (0) |
| 2nd trimester                     | 171 (17.2) | 0 (0)     | 166 (97.1) | 5 (2.9) | 0 (0) | 0 (0) |
| 3rd trimester                     | 14 (1.4)   | 0 (0)     | 14 (100.0) | 0 (0) | 0 (0) | 0 (0) |

| Timing of second dose             | 994        | 0         | 457   | 175   | 305   | 57   |
|-----------------------------------|------------|-----------|-------|-------|-------|------|
| 0 (0)                             | 0 (0)     | 0 (0)     | 0 (0) | 0 (0) | 0 (0) | 0 (0) |

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| Timing of first dose | Timing of 2nd dose | Timing of 3rd dose | No | Yes | Timing of 3rd dose | No | Yes | Timing of 3rd dose |
|---------------------|-------------------|-------------------|----|-----|-------------------|----|-----|-------------------|
| before current pregnancy | 1st trimester | 85 | 80 | | 1st trimester | 115 | 40 | |
| before current pregnancy | 2nd trimester | 1 | 0 | | 2nd trimester | 147 | 17 | |
| before current pregnancy | 3rd trimester | 24 | 0 | | 3rd trimester | 29 | 0 | |
| before current pregnancy | 3rd trimester | 14 | 0 | | 3rd trimester | 16 | NA | |
| 3 Doses | | | | | | | | |
| before current pregnancy | 1st trimester | 1 | 0 | | 1st trimester | 8 | NA | |
| before current pregnancy | 2nd trimester | 12 | 5 | | 2nd trimester | 14 | 1 | |
| before current pregnancy | 3rd trimester | 0 | 0 | | 3rd trimester | 14 | NA | |
| 3 Doses | | | | | | | | |
| before current pregnancy | before current pregnancy | 1st trimester | 115 | 40 | | before current pregnancy | 1st trimester | 115 | 40 | |
| before current pregnancy | before current pregnancy | 2nd trimester | 147 | 17 | | before current pregnancy | 2nd trimester | 147 | 17 | |
| before current pregnancy | before current pregnancy | 3rd trimester | 29 | 0 | | before current pregnancy | 3rd trimester | 29 | 0 | |

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Abbreviations: ICD-9 = International Classification of Diseases, Ninth Revision; ICD-10 = International Classification of Diseases, Tenth Revision; SMD = standardized mean or proportion difference.

Medical events with an encounter or discharge code consistent with COVID-19–like illness were included, using ICD-9 and ICD-10. Four categories of codes were considered: 1) acute respiratory illness, including respiratory failure, viral or bacterial pneumonia, asthma exacerbation, influenza, and viral illness not otherwise specified; 2) non-respiratory COVID-19–like illness diagnoses including cause-unspecified gastroenteritis, thrombosis, and acute myocarditis; 3) respiratory signs and symptoms consistent with COVID-19–like illness, including hemoptysis, cough, dyspnea, painful respiration, or hypoxemia; 4) signs and symptoms of acute febrile illness. One code in any of the four categories was sufficient for inclusion. Clinician-ordered molecular assays (e.g., real-time reverse transcription–polymerase chain reaction) for SARS-CoV-2 occurring ≤14 days before to <72 hours after the encounter date were included.

Partners contributing data on medical events were in California (estimated start date of Delta predominance June 23, estimated start date of Omicron predominance December 21), Colorado (estimated start date of Delta predominance June 3, estimated start date of Omicron predominance December 19), Indiana (estimated start date of Delta predominance July 3, estimated start date of Omicron predominance December 26), Minnesota and Wisconsin (estimated start date of Delta predominance July 1, estimated start date of Omicron predominance December 25), New York (estimated start date of Delta predominance June 30, estimated start date of Omicron predominance December 18), Oregon (estimated start date of Delta predominance June 30, estimated start date of Omicron predominance December 24), Texas (estimated start date of Delta predominance September 11, estimated start date of Omicron predominance December 16), Utah (estimated start date of Delta predominance June 1, estimated start date of Omicron predominance December 24), and Washington (estimated start date Delta predominance June 30, estimated start date of Omicron predominance December 24). The study period began in September 2021 for partners located in Texas.

An absolute standardized mean or proportion difference (SMD) ≥0.20 indicates a non-negligible difference in the distribution of characteristics for vaccinated categories versus unvaccinated patients and for positive versus negative test results. When calculating SMDs for differences in characteristics across COVID-19 vaccination status, investigators calculated SMD as the average of the three absolute values of the SMD for unvaccinated versus each vaccination status category individually (unvaccinated versus 2 doses 14–149 days earlier, unvaccinated versus 2-dose ≥150 days earlier, and unvaccinated versus 3 mRNA doses ≥7 days earlier). All SMDs are reported as the absolute SMD. Additionally, the average SMD calculation comparing Negative SARS-CoV-2 Test Result and Positive SARS-CoV-2 Test Result was generated by directly calculating the SMD for Negative SARS-CoV-2 Test Result and Positive SARS-CoV-2 Test Result.

Vaccination was defined as having received the listed number of doses of COVID-19 Pfizer-BioNTech BNT162b2 or Moderna mRNA-1273 vaccine ≥14 days (for 2 doses) or ≥7 days (for 3 doses) before the medical event index date, which was the date of respiratory specimen collection associated with the most recent positive or negative SARS-CoV-2 test result before medical event or the admission date if testing only occurred after the admission.

Unknown race/ethnicity includes Asian, Native Hawaiian or other Pacific islander, American Indian or Alaska Native, other not listed, and multiple races.

Chronic respiratory condition was defined as the presence of discharge code for asthma, COPD, or other lung disease using diagnosis codes from the ICD-9 and ICD-10.

Chronic non-respiratory condition was defined as the presence of discharge code for heart failure, ischemic heart disease, hypertension, other heart disease, stroke, other cerebrovascular disease, diabetes type 1 or II, other diabetes, metabolic disease, clinical obesity, clinically underweight, renal disease, liver disease, blood disorder, immunosuppression, organ transplant, cancer, neurological disorder, musculoskeletal disorder, Down Syndrome, and dementia.
eFigure 1. Flow Figure for Hospitalizations and ED/UC Visits Among Pregnant People (Unvaccinated or With 1 Vaccine Dose Received During Pregnancy) a

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**eFigure 2. mRNA COVID-19 Vaccine Effectiveness Against Laboratory-Confirmed COVID-19–Associated Emergency Department and Urgent Care Encounter Among Pregnant People Regardless of Pregnancy Status at Time of Vaccination, VISION Network, 10 States, June 1, 2021, to June 2, 2022**

| Vaccination Status                                      | Cases  | Controls | Total  | (SARS CoV-2 + %) | VE % (CI) |
|----------------------------------------------------------|--------|----------|--------|------------------|-----------|
| **Omicron Time Period**                                  |        |          |        |                  |           |
| Unvaccinated (Referent)                                 | 325    | 773      | 1098   | (29.6)           |           |
| 2-dose mRNA vaccinated >=14 days prior                   | 262    | 707      | 969    | (27)             | 20 (-1 to 37) |
| 2-dose mRNA vaccinated 14-149 days prior                 | 70     | 169      | 239    | (29.3)           | 39 (13 to 58) |
| 2-dose mRNA vaccinated >= 150 days prior                 | 192    | 530      | 730    | (26.3)           | 11 (-16 to 32) |
| 3-dose mRNA vaccinated >= 7 days prior                   | 51     | 443      | 494    | (10.3)           | 65 (48 to 77) |
| 3-dose mRNA vaccinated 7-119 days prior                  | 26     | 316      | 342    | (7.6)            | 81 (68 to 89) |
| 3-dose mRNA vaccinated >= 120 days prior                 | 25     | 127      | 152    | (16.4)           | -26 (-123 to 29) |
| **Delta Time Period**                                   |        |          |        |                  |           |
| Unvaccinated (Referent)                                 | 443    | 1839     | 2282   | (19.4)           |           |
| 2-dose mRNA vaccinated >=14 days prior                   | 55     | 1204     | 1259   | (4.4)            | 83 (75 to 88) |
| 2-dose mRNA vaccinated 14-149 days prior                 | 22     | 601      | 623    | (3.5)            | 87 (78 to 92) |
| 2-dose mRNA vaccinated >= 150 days prior                 | 33     | 603      | 936    | (5.2)            | 76 (64 to 87) |
| 3-dose mRNA vaccinated >= 7 days prior                   | 5      | 89       | 94     | (5.3)            | 83 (57 to 94) |
| 3-dose mRNA vaccinated 7-119 days prior                  | 5      | 86       | 91     | (5.5)            | 82 (53 to 93) |
| 3-dose mRNA vaccinated >= 120 days prior                 | 0      | 3        | 3      | (0)              |           |

VE could not be calculated for Delta Period, 3-dose mRNA vaccinated ≥120 days because the stratum included fewer than 20 encounters with prior vaccination.
eFigure 3. mRNA COVID-19 Vaccine Effectiveness Against Laboratory-Confirmed COVID-19–Associated Hospitalizations Among Pregnant People Regardless of Pregnancy Status at Time of Vaccination, VISION Network, 10 states, June 1, 2021, to June 2, 2022

| Vaccination Status                                         | Cases (Col %) | Controls (Col%) | Total (SARS CoV-2 + %) | VE % (CI) |
|------------------------------------------------------------|---------------|-----------------|------------------------|-----------|
| Vaccination Either Before or During Pregnancy              |               |                 |                        |           |
| Omicron Time Period                                        |               |                 |                        |           |
| Unvaccinated (Referent)                                    | 60 (64.5)     | 112 (40.9)      | 172 (34.9)             |           |
| 2-dose mRNA vaccinated >=14 days prior                     | 24 (25.8)     | 83 (30.3)       | 107 (22.4)             | 58 (12 to 80) |
| 2-dose mRNA vaccinated 14-149 days prior                   | 4 (4.3)       | 17 (6.2)        | 21 (19)                | 82 (41 to 95) |
| 2-dose mRNA vaccinated >= 150 days prior                   | 20 (21.5)     | 66 (24.1)       | 86 (23.3)              | 40 (-44 to 75) |
| 3-dose mRNA vaccinated >=7 days prior                      | 9 (9.7)       | 79 (28.8)       | 88 (10.2)              | 85 (53 to 95) |
| 3-dose mRNA vaccinated 7-119 days prior                    | 4 (4.3)       | 57 (20.8)       | 61 (6.6)               | 94 (66 to 99) |
| 3-dose mRNA vaccinated >= 120 days prior                   | 5 (5.4)       | 22 (8.0)        | 27 (18.5)              | -61 (-601 to 63) |

Delta Time Period

| Vaccination Status                                         | Cases (Col %) | Controls (Col%) | Total (SARS CoV-2 + %) | VE % (CI) |
|------------------------------------------------------------|---------------|-----------------|------------------------|-----------|
| Unvaccinated (Referent)                                    | 253 (98.1)    | 245 (54.7)      | 498 (50.8)             |           |
| 2-dose mRNA vaccinated >=14 days prior                     | 4 (1.6)       | 181 (40.4)      | 185 (2.2)              | 99 (97 to 100) |
| 2-dose mRNA vaccinated 14-149 days prior                   | 1 (0.4)       | 101 (22.5)      | 102 (1)                | 99 (96 to 100) |
| 2-dose mRNA vaccinated >= 150 days prior                   | 3 (1.2)       | 80 (17.9)       | 83 (3.0)               | 98 (92 to 99) |
| 3-dose mRNA vaccinated >=7 days prior                      | 1 (0.4)       | 22 (4.9)        | 23 (4.3)               | 98 (80 to 100) |
| 3-dose mRNA vaccinated 7-119 days prior                    | 1 (0.4)       | 22 (4.9)        | 23 (4.3)               | 98 (80 to 100) |
| 3-dose mRNA vaccinated >= 120 days prior                   | 0 (0.0)       | 0 (0.0)         | 0 (0)                  |           |

VE could not be calculated for Delta Period, 3-dose mRNA vaccinated ≥120 days because the stratum included fewer than 20 encounters with prior vaccination.

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eFigure 4. mRNA COVID-19 Vaccine Effectiveness Against Laboratory-Confirmed COVID-19–Associated Emergency Department and Urgent Care Encounter Among Pregnant People Who Did Not Have a Prior Positive SARS-CoV-2 Infection, VISION Network, 10 States, June 1, 2021, to June 2, 2022

| Vaccination Status                        | Cases (Col %) | Controls (Col %) | Total (SARS CoV-2 + %) | VE % (CI) |
|------------------------------------------|---------------|------------------|------------------------|----------|
| No History of Prior SARS CoV 2 Infection|               |                  |                        |          |
| Omicron Time Period                      |               |                  |                        |          |
| Unvaccinated (Referent)                  | 285 (76.4)    | 596 (60.9)       | 881 (32.3)             |          |
| 2-dose mRNA vaccinated >=14 days prior   | 58 (15.5)     | 125 (12.8)       | 183 (31.7)             | 15 (-26 to 43) |
| 2-dose mRNA vaccinated 14-149 days prior| 44 (11.8)     | 76 (7.8)         | 120 (36.7)             | -7 (-69 to 33) |
| 2-dose mRNA vaccinated >= 150 days prior | 14 (3.8)      | 49 (5.0)         | 63 (22.2)              | 54 (7 to 77) |
| 3-dose mRNA vaccinated >= 7 days prior   | 30 (8.0)      | 258 (26.4)       | 288 (10.4)             | 67 (43 to 80) |
| 3-dose mRNA vaccinated 7-119 days prior  | 21 (5.6)      | 212 (21.7)       | 233 (9)                | 79 (60 to 89) |
| 3-dose mRNA vaccinated >= 120 days prior | 9 (2.4)       | 46 (4.7)         | 55 (16.4)              | -163 (-540 to -8) |
| Delta Time Period                        |               |                  |                        |          |
| Unvaccinated (Referent)                  | 435 (95.6)    | 1624 (76.4)      | 2059 (21.1)            |          |
| 2-dose mRNA vaccinated >=14 days prior   | 16 (3.5)      | 433 (20.4)       | 449 (3.6)              | 84 (69 to 91) |
| 2-dose mRNA vaccinated 14-149 days prior | 12 (2.6)      | 325 (15.3)       | 337 (3.6)              | 86 (71 to 93) |
| 2-dose mRNA vaccinated >= 150 days prior | 4 (0.9)       | 108 (5.1)        | 112 (3.6)              | 74 (4 to 93) |
| 3-dose mRNA vaccinated >= 7 days prior   | 4 (0.9)       | 70 (3.3)         | 74 (5.4)               | 81 (35 to 95) |
| 3-dose mRNA vaccinated 7-119 days prior  | 4 (0.9)       | 68 (3.2)         | 72 (5.6)               | 81 (33 to 94) |
| 3-dose mRNA vaccinated >= 120 days prior | 0 (0.0)       | 2 (0.1)          | 2 (0)                  |          |

VE could not be calculated for Delta Period, 3-dose mRNA vaccinated ≥120 days because the stratum included fewer than 20 encounters with prior vaccination.
eFigure 5. mRNA COVID-19 Vaccine Effectiveness Against Laboratory-Confirmed COVID-19–Associated Hospitalizations Among Pregnant People Who Did Not Have a Prior Positive SARS-CoV-2 Infection, VISION Network, 10 States, June 1, 2021, to June 2, 2022

| Vaccination Status                                      | Cases (Col %) | Controls (Col %) | Total | SARS CoV-2 + % | VE % (CI) |
|---------------------------------------------------------|---------------|-----------------|-------|---------------|-----------|
| No History of Prior SARS CoV 2 Infection                |               |                 |       |               |           |
| Unvaccinated (Referent)                                 | 59 (79.7)     | 84 (47.7)       | 143   | (41.3)        |           |
| 2-dose mRNA vaccinated >=14 days prior                   | 8 (10.8)      | 24 (13.6)       | 32    | (25)          | 75 (7 to 93) |
| 2-dose mRNA vaccinated 14-149 days prior                 | 4 (5.4)       | 12 (6.8)        | 16    | (25)          | 80 (5 to 96) |
| 2-dose mRNA vaccinated >= 150 days prior                 | 4 (5.4)       | 12 (6.8)        | 16    | (25)          | 69 (-142 to 90) |
| 3-dose mRNA vaccinated >= 7 days prior                   | 7 (9.5)       | 68 (38.6)       | 75    | (9.3)         | 82 (45 to 94) |
| 3-dose mRNA vaccinated 7-119 days prior                  | 4 (5.4)       | 49 (27.8)       | 53    | (7.5)         | 90 (61 to 97) |
| 3-dose mRNA vaccinated >= 120 days prior                 | 3 (4.1)       | 19 (10.8)       | 22    | (13.6)        | -65 (-1817 to 86) |
| Delta Time Period                                        |               |                 |       |               |           |
| Unvaccinated (Referent)                                 | 250 (98.0)    | 219 (57.2)      | 469   | (53.3)        |           |
| 2-dose mRNA vaccinated >=14 days prior                   | 4 (1.6)       | 144 (37.6)      | 148   | (2.7)         | 98 (96 to 99) |
| 2-dose mRNA vaccinated 14-149 days prior                 | 1 (0.4)       | 93 (24.3)       | 94    | (1.1)         | 99 (96 to 100) |
| 2-dose mRNA vaccinated >= 150 days prior                 | 3 (1.2)       | 51 (13.3)       | 54    | (5.0)         | 90 (87 to 99) |
| 3-dose mRNA vaccinated >= 7 days prior                   | 1 (0.4)       | 20 (5.2)        | 21    | (4.8)         | 97 (74 to 100) |
| 3-dose mRNA vaccinated 7-119 days prior                  | 1 (0.4)       | 20 (5.2)        | 21    | (4.8)         | 97 (74 to 100) |
| 3-dose mRNA vaccinated >= 120 days prior                 | 0 (0.0)       | 0 (0.0)         | 0     | (0)           |           |

VE could not be calculated for Delta Period, 3-dose mRNA vaccinated ≥120 days because the stratum included fewer than 20 encounters with prior vaccination.