Supplemental Online Content

Niesen MJM, Pawlowski C, O'Horo JC, et al. Surveillance of safety of 3 doses of COVID-19 mRNA vaccination using electronic health records. *JAMA Netw Open.* 2022;5(4):e227038. doi:10.1001/jamanetworkopen.2022.7038

This supplemental material has been provided by the authors to give readers additional information about their work.

eAppendix. Race and Ethnicity Database Options

Race:
These are the race options as they appeared in the EHR database, grouped as was done in Table 1:

Table 1 category: [list of options]

Asian: ['Asian', 'Asian Cambodian', 'Asian Chinese', 'Asian Filipino', 'Asian Indian', 'Asian Japanese', 'Asian Korean', 'Asian Laotian', 'Asian Other', 'Asian Pakistani', 'Asian Taiwanese', 'Asian Thai', 'Asian Vietnamese']

Black or African American: ['African', 'African American', 'American born African', 'Black or African American', 'Black or African American Other', 'Caribbean Black']

American Indian: ['American Indian/Alaskan Native', 'American Indian/Alaskan Native Alaska region native', 'American Indian/Alaskan Native Eastern region', 'American Indian/Alaskan Native Northern Plains region native', 'American Indian/Alaskan Native Pacific Coast region native', 'American Indian/Alaskan Native South West region native', 'American Indian/Alaskan Native Southern Plains region native']

Native Hawaiian or Pacific Islander: ['Guamanian or Chamorro', 'Native Hawaii/Pacific Islander', 'Native Hawaiian', 'Other Pacific Islander', 'Samoan']

White or Caucasian: ['White']

Other: ['Other', 'Unable to Provide']

Unknown: ['Choose Not to Disclose', 'Unknown', none]

Ethnicity:

These are the ethnicity options as they appeared in the EHR database, grouped as done in Table 1:

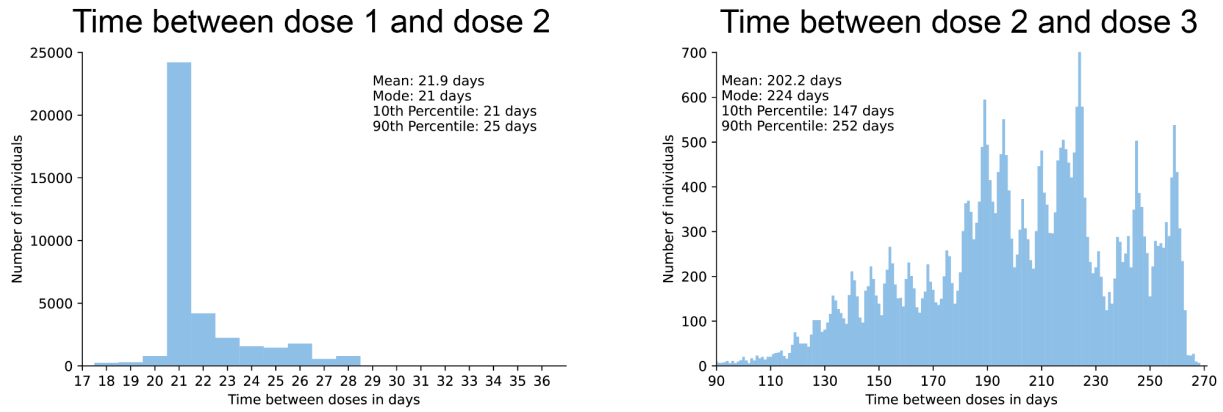
Table 1 category: [list of options]

Hispanic or Latino: ['Central American', 'Cuban', 'Hispanic or Latino', 'Mexican', 'Other Spanish culture of origin regardless of race (except Spain)', 'Puerto Rican', 'South American']

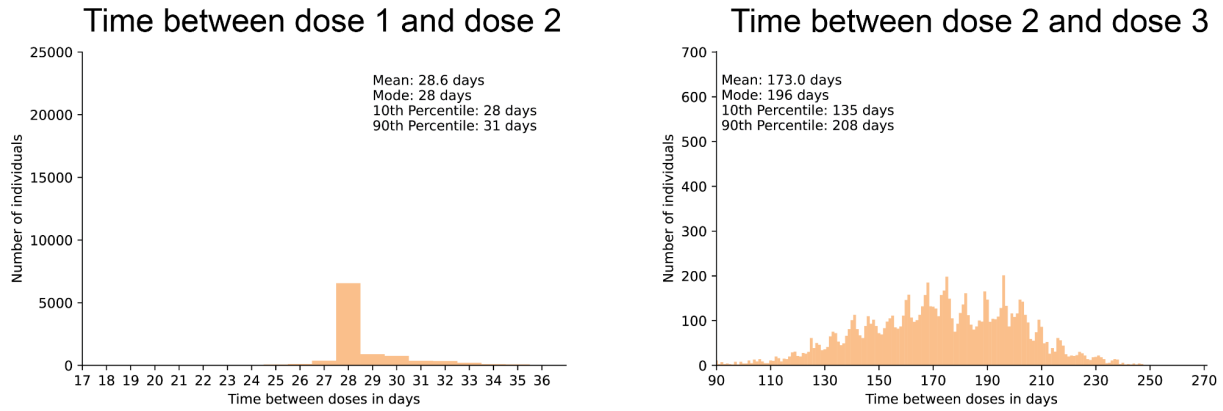
Not hispanic or Latino: ['Not Hispanic or Latino']

Unknown: ['Choose Not to Disclose', 'Unable to Provide', 'Unknown', None]

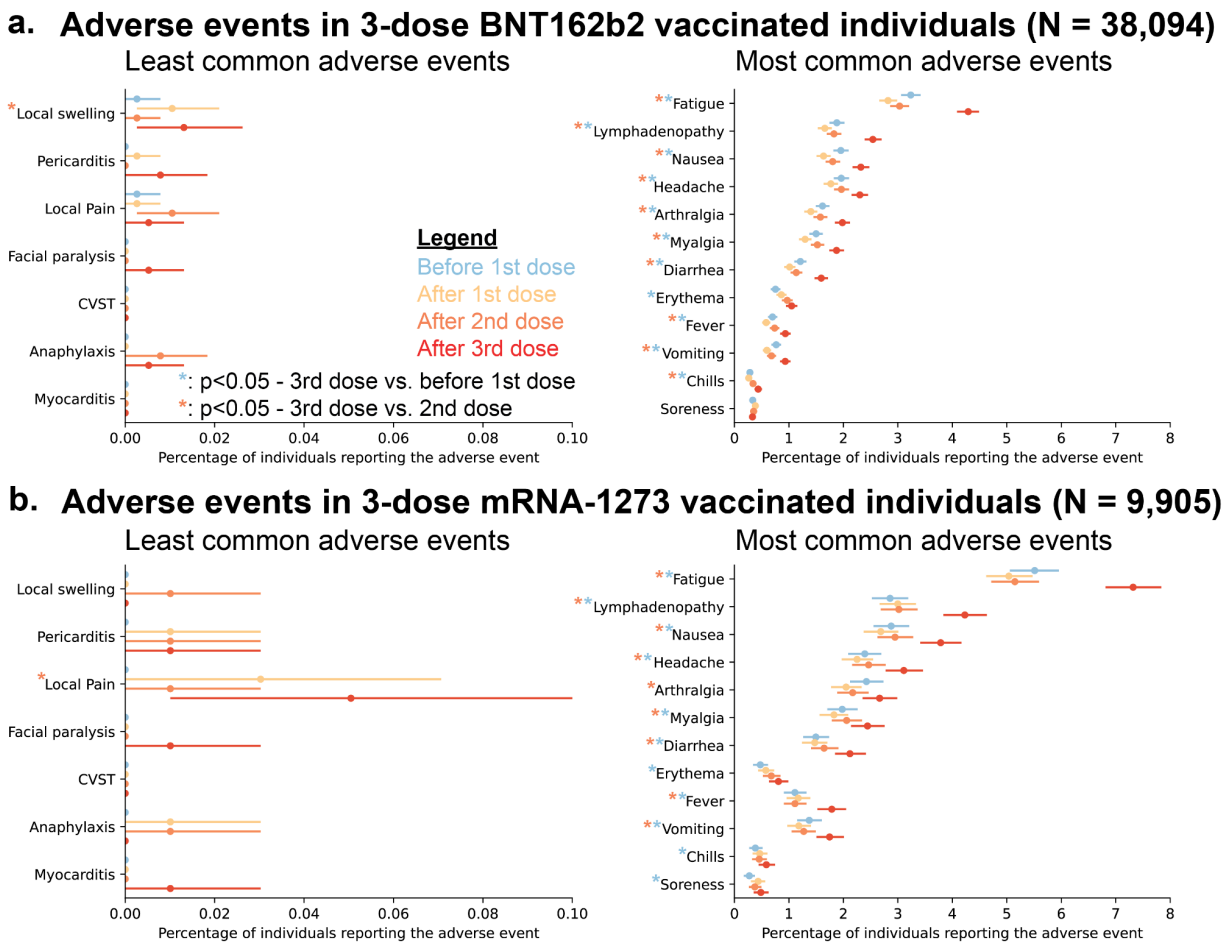
a. Time between vaccine doses for 3-dose BNT162b2 recipients (N = 38,094)



b. Time between vaccine doses for 3-dose mRNA-1273 recipients (N = 9,905)

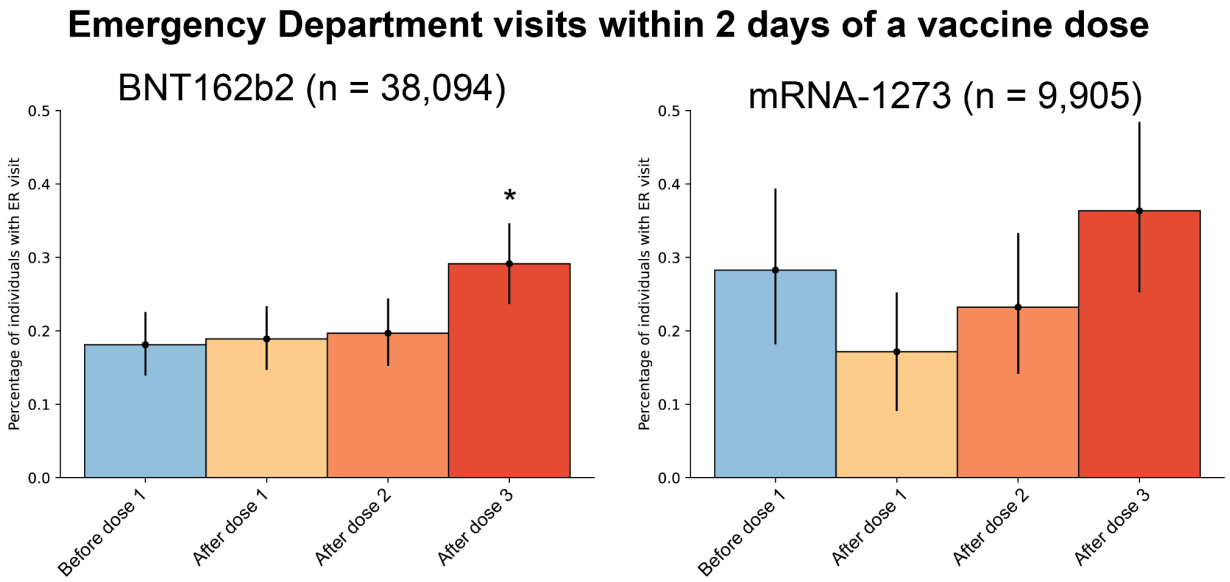


eFigure 1. Distribution of Time Between Vaccine Doses

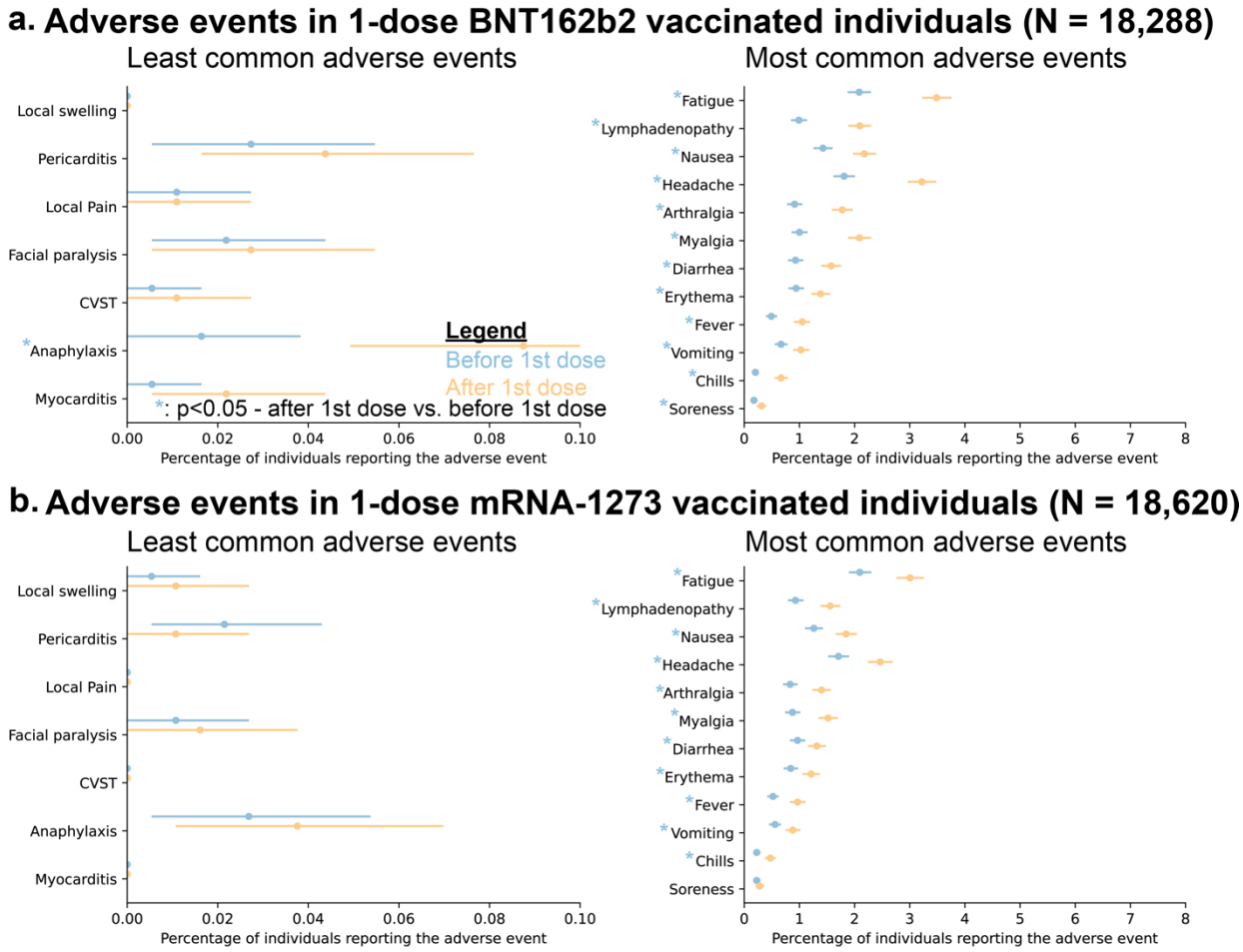


eFigure 2. Prevalence of Vaccine-Associated Adverse Events During 14-Day Periods Before and After Vaccination With 3 Doses

(**a**) Adverse events reported in individuals that received three doses of BNT162b2, before 1st dose (blue), after 1st dose (yellow), after 2nd dose (orange), and after 3rd dose (red). (**b**) Adverse events reported in individuals that received three doses of mRNA-1273, before 1st dose (blue), after 1st dose (yellow), after 2nd dose (orange), and after 3rd dose (red). Error bars indicate 95% confidence intervals, and asterisks indicate adverse events with significant (paired t-test p-value < 0.05) difference in prevalence after the 3rd dose, compared with before the 1st dose (blue asterisk) or after the 2nd dose (orange asterisk). CVST, cerebral venous sinus thrombosis.



eFigure 3. Emergency Department Visits Within 2 Days of Vaccine Dose
The percentage of 3-dose mRNA vaccine recipients that visited the emergency department within 2 days after the 1st dose (yellow), 2nd dose (orange), or 3rd dose (red), compared with a 2-day period, starting 14-days before their 1st dose (blue). Error bars indicate 95% confidence intervals, and asterisks indicate a significant (two-tailed p-value < 0.05) difference in emergency department visits after vaccination compared with before.



eFigure 4. Prevalence of Vaccine-Associated Adverse Events During 14-Day Periods Before and After Vaccination With 1 Dose

(**a**) Adverse events reported in individuals that received only one dose of BNT162b2, before (blue) and after (yellow) 1st dose. (**b**) Adverse events reported in individuals that received only one dose of mRNA-1273, before (blue) and after (yellow) 1st dose. Error bars indicate 95% confidence intervals, and asterisks indicate adverse events with significant (two-tailed p-value < 0.05) difference in prevalence after vaccination compared with before (blue asterisk). CVST, cerebral venous sinus thrombosis.

Adverse event	#reports after 1st dose of BNT162b2	Median days between 1st dose and report	#reports after 2nd dose of BNT162b2	Median days between 2nd dose and report	#reports after 3rd dose of BNT162b2	Median days between 3rd dose and report	#reports before 1st dose of BNT162b2
Anaphylaxis	0	not reported	3	9	2	3.5	0
Arthralgia	534	6	601	7	755	4	616
CVST	0	not reported	0	not reported	0	not reported	0
Chills	100	8	130	6	166	6	108
Diarrhea	386	7	432	6	607	5	461
Erythema	328	7	369	6	400	6	287
Facial paralysis	0	not reported	0	not reported	2	6.5	0
Fatigue	1,074	7	1,155	7	1635	4	1233
Fever	222	7.5	281	7	356	6	266
Headache	674	7	748	6	877	5	747
Local pain	1	8	4	4	2	3.5	1
Local swelling	4	4	1	2	5	4	1
Lymphadenopathy	632	7	696	7	968	3	716
Myalgia	494	6	580	7	714	4	571
Myocarditis	0	not reported	0	not reported	0	not reported	0
Nausea	623	7	687	7	884	6	744
Pericarditis	0	7	0		3	4	0
Soreness	146	7	134	7	126	5	128
Vomiting	227	7	259	7	355	5	292

eTable 1. Tracked Adverse Events by Time Window for 3-Dose BNT162b2 Cohort
CVST, cerebral venous sinus thrombosis.

	#reports after 1st dose of mRNA-1273	Median days between 1st dose and report	#reports after 2nd dose of mRNA-1273	Median days between 2nd dose and report	#reports after 3rd dose of mRNA-1273	Median days between 3rd dose and report	#reports before 1st dose of mRNA-1273
Anaphylaxis	1	10	1	10	0	not reported	0
Arthralgia	203	7	215	7	264	4	240
CVST	0	not reported	0	not reported	0	not reported	0
Chills	46	7.5	45	6	58	5	38
Diarrhea	146	6	163	7	210	4.5	148
Erythema	57	6	67	7	80	5	47
Facial paralysis	0	not reported	0	not reported	1	10	0
Fatigue	499	6	510	7	725	5	546
Fever	116	7	110	7	177	3	110
Headache	223	7	244	7	308	5	237
Local pain	3	14	1	11	5	5	0
Local swelling	0	not reported	1	4	0	not reported	0
Lymphadenopathy	297	8	299	7	419	3	283
Myalgia	181	8	204	7	242	3	196
Myocarditis	0	not reported	0	not reported	1	1	0
Nausea	266	7	292	7	375	4	285
Pericarditis	1	12	1	10	1	11	0
Soreness	43	7	37	7	48	4	27
Vomiting	117	6	126	7	173	4	136

eTable 2. Tracked Adverse Events by Time Window for 3-Dose mRNA-1273 Cohort
CVST, cerebral venous sinus thrombosis.