Supplemental Table 1: Study Participant characteristics for variables with missing data (n = 19,622). Data can be missing because a participant was not asked a demographic question or because they were asked and did not supply an answer; categories in bold. Data are n (%).

Characteristic	Unvaccinated (n =4,686)	Vaccinated (n =14,936)	Overall (n =19,622)
Race/Ethnicity			
Asian	20 (0.43)	130 (0.87)	150 (0.76)
Black	170 (3.63)	346 (2.32)	516 (2.63)
Hispanic	76 (1.62)	235 (1.57)	311 (1.58)
Middle-Eastern/North African	15 (0.32)	41 (0.27)	56 (0.29)
Native Hawaiian/Pacific Islander	4 (0.09)	19 (0.13)	23 (0.12)
White	1,513 (32.29)	5,306 (35.52)	6,819 (34.75)
Not asked question	**1,759 (37.54)**	**6,283 (42.07)**	**8,042 (40.98)**
No response	**1,129 (24.09)**	**2,576 (17.25)**	**3,705 (18.88)**
Parity			
Nulliparous	3,192 (68.12)	11,509 (77.06)	14,701 (74.92)
Parous	757 (16.15)	1,885 (12.62)	2,642 (13.46)
Not asked question	**136 (2.90)**	**76 (0.51)**	**212 (1.08)**
No response	**601 (12.83)**	**1,466 (9.82)**	**2,067 (10.53)**
BMI			
Underweight	144 (3.07)	428 (2.87)	572 (2.92)
Normal weight	2,057 (43.90)	7,274 (48.70)	9,331 (47.55)
Overweight	564 (12.04)	1,924 (12.88)	2,488 (12.68)
Obese	233 (4.97)	852 (5.70)	1,085 (5.53)
No response	**1,688 (36.02)**	**4,458 (29.85)**	**6,146 (31.32)**
Education level			
Less than 4-year college	1,215 (25.93)	2,205 (14.76)	3,420 (17.43)
College degree or more	2,496 (53.27)	10,540 (70.57)	13,036 (66.44)
Not asked question	**51 (1.09)**	**31 (0.21)**	**82 (0.42)**
No response	**924 (19.72)**	**2,160 (14.46)**	**3,084 (15.72)**

Relationship status			
Not in relationship	631 (13.47)	1,928 (12.91)	2,559 (13.04)
In relationship	3,002 (64.06)	10,553 (70.65)	13,555 (69.08)
Not asked question	**523 (11.16)**	**1,063 (7.12)**	**1,586 (8.08)**
No response	**530 (11.31)**	**1,392 (9.32)**	**1,922 (9.80)**

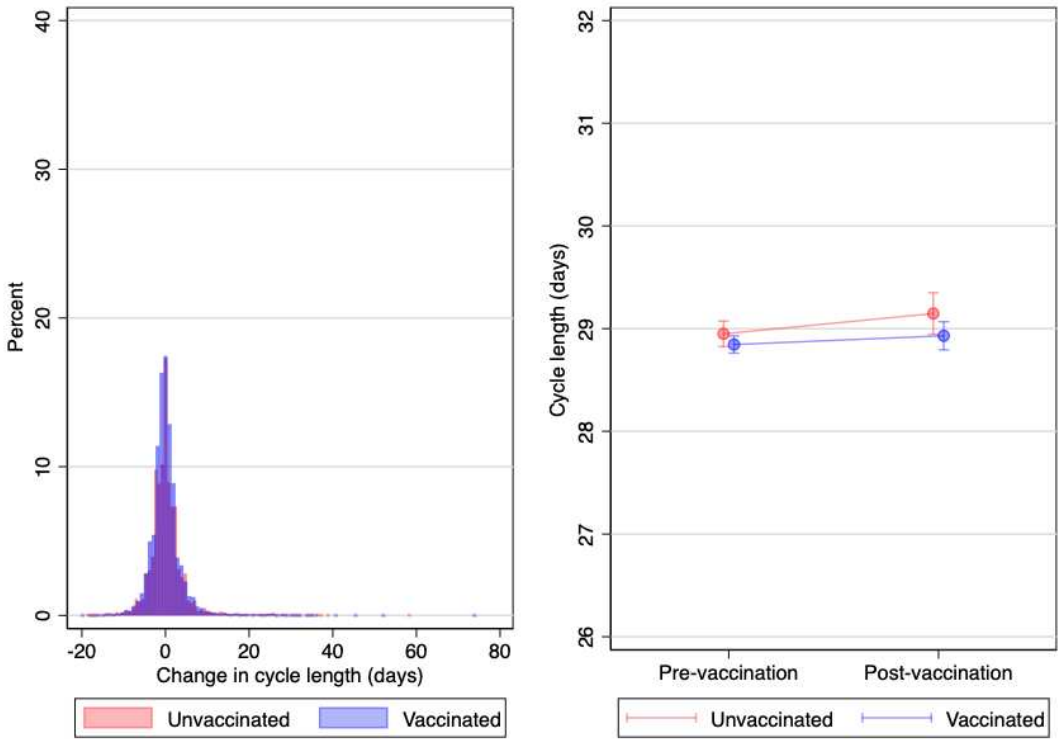
Supplemental Table 2: Detailed country list, by study region (n = 19,622).

Australia/ New Zealand	Europe		Other		UK/Channel Islands	United States/ Canada
n = 767	n = 6,584		n = 439		n = 6,222	n = 5,610
Australia (698; 91%)	Aland Island	Italy	Argentina	Malawi	Guernsey	Canada (1,037; 18%)
New Zealand (69; 9%)	Andorra	Latvia	Bermuda	Malaysia	Isle of Man	US (4,573; 82%)
	Austria	Lithuania	Brazil (273; 62%)	Martinique	Jersey	
	Belgium	Luxembourg	Cambodia	Mauritius	United Kingdom	
	Bosnia Herzegovina	Macedonia	Chile	Mexico		
	Bulgaria	Malta	Colombia	Namibia		
	Croatia	Monaco	Costa Rica	Panama		
	Cyprus	Netherlands	Dominican Republic	Peru		
	Czech Republic	Norway	Ecuador	Philippines		
	Denmark	Poland	El Salvador	Saint Lucia		
	Estonia	Portugal	Ethiopia	Saudi Arabia		
	Faroe Islands	Romania	French Polynesia	Seychelles		
	Finland	Russia	Guatemala	Singapore		
	France	Slovakia	Hong Kong	South Africa		
	Germany	Slovenia	India	Sri Lanka		
	Greece	Spain	Indonesia	Taiwan		
	Hungary	Sweden (3,664; 56%)	Israel	Thailand		
	Iceland	Switzerland	Japan	Turkey		
	Ireland	Ukraine	Jordan	United Arab Emirates		
			Korea	US Minor Islands		
			Kuwait	Virgin Islands		
			Liberia			

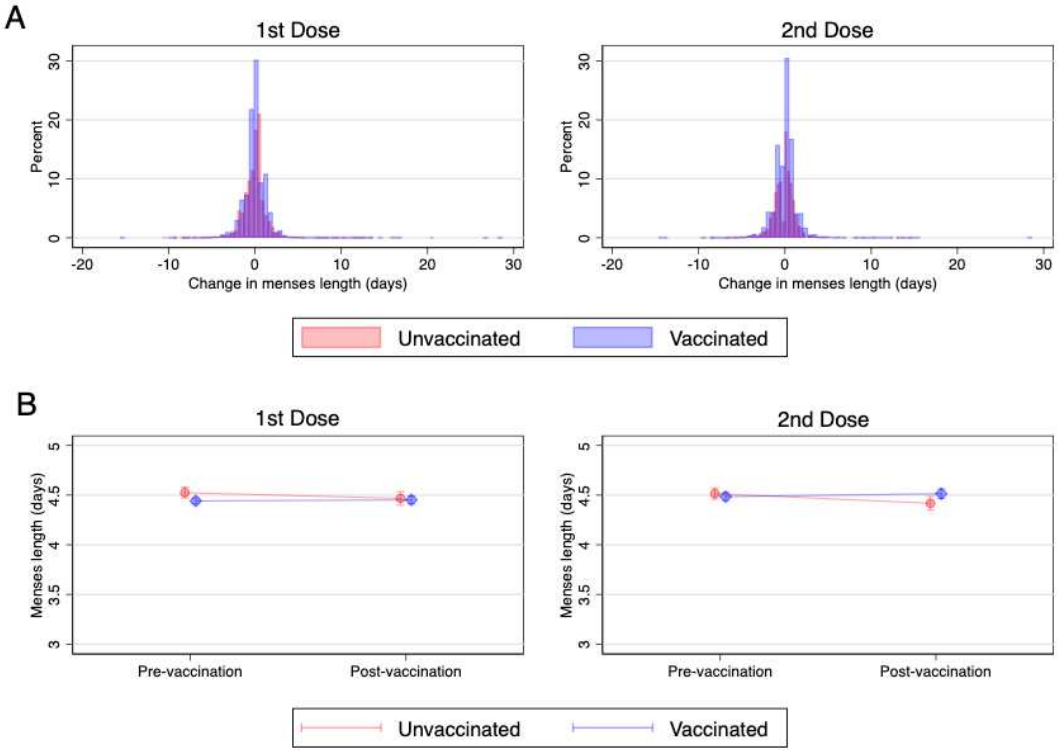
If shown, individual country data are (n; %); if no data are shown, data are suppressed due to small sample sizes

Supplemental Table 3: Characteristics of study participants, by vaccination status and experience of a clinically significant change in menstrual cycle length (≥ eight days) during first COVID-19 vaccine dose cycle (n = 19,622). Data are n (%) or mean ± standard deviation.

Characteristic	Unvaccinated (n =4,686)			Vaccinated (n =14,936)		
	< 8-day change	≥ 8-day change	p-value	< 8-day change	≥ 8-day change	p-value
n	4,450	236		14,007	929	
Age (y)			0.048			0.009
18-24	855 (19.21)	52 (22.03)		1,341 (9.57)	120 (12.92)	
25-29	1,521 (34.18)	103 (43.64)		4,839 (34.55)	340 (36.60)	
30-34	1,263 (28.38)	48 (20.34)		4,929 (35.19)	302 (32.51)	
35-39	591 (13.28)	24 (10.17)		2,133 (15.23)	114 (12.27)	
40-45	220 (4.94)	9 (3.81)		765 (5.46)	53 (5.71)	
Cycle 1 length (d)	29.1 ± 4.1	32.2 ± 8.0	< 0.001	28.8 ± 3.7	31.0 ± 6.4	< 0.001
Cycle 2 length (d)	29.0 ± 3.9	31.2 ± 6.7	< 0.001	28.7 ± 3.6	31.2 ± 6.1	< 0.001
Cycle 3 length (d)	28.8 ± 3.6	31.0 ± 7.2	< 0.001	28.7 ± 3.7	31.5 ± 6.7	< 0.001
Pre-vax average length (d)	28.9 ± 2.9	31.5 ± 3.9	< 0.001	28.7 ± 2.8	31.2 ± 3.7	< 0.001



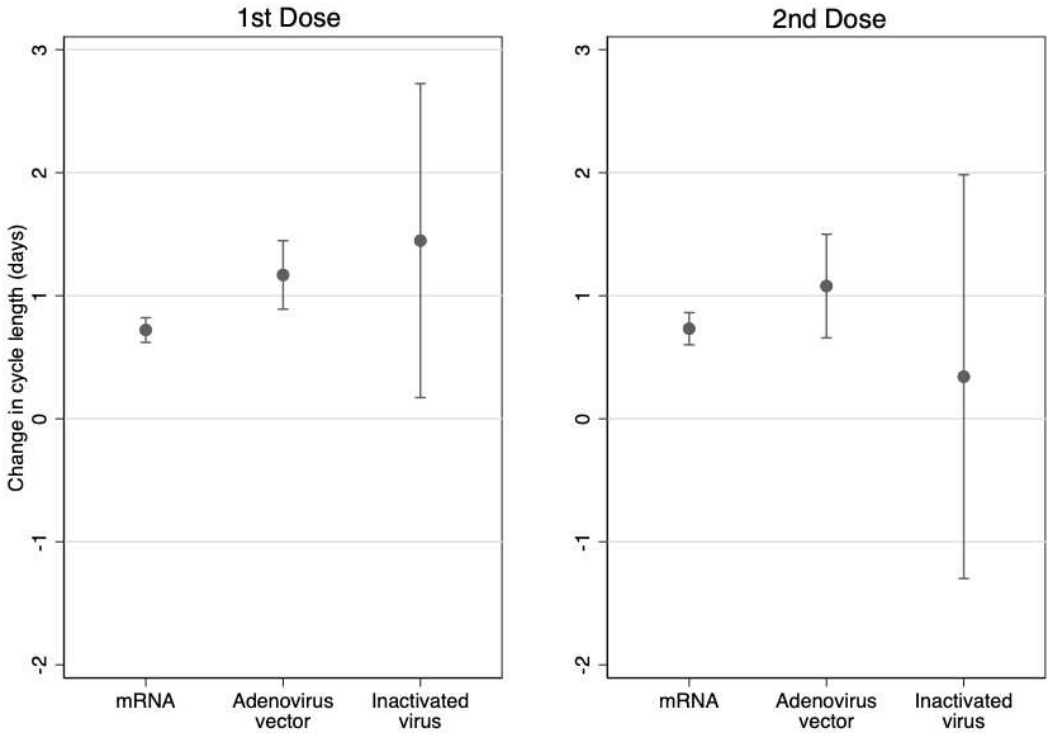
Supplemental Figure 1: Left) Overlayed histogram of the change in cycle length (days) between the 3-pre vaccination cycle average and the 'post-vaccine' cycle following the second dose vaccination cycle. Histograms for unvaccinated individuals are shown in red, vaccinated individuals are shown in blue, overlapping distributions appear as purple. Right) Adjusted marginal means for cycle length (days) for the 3 pre-vaccination cycle average and the 'post-vaccine' cycle following the second dose vaccination cycle). Estimates are from a mixed effects model with random intercepts and random slopes at the individual level, an interaction between vaccination status and pre/post-vaccination timing, and adjusted for age, body mass index, educational attainment, parity, relationship status, and global region. Unvaccinated individuals are shown in red, vaccinated individuals are shown in blue, error bars represent 99.3% confidence intervals.



Supplemental Figure 2: A) Overlayed histograms of the change in menses length (days) between the 3-pre vaccination cycle average and the vaccination cycle for first dose (left) or second dose (right). Histograms for unvaccinated individuals are shown in red, vaccinated individuals are shown in blue, overlapping distributions appear as purple. B) Adjusted marginal means for menses length (days) for the 3 pre-vaccination cycle average and the vaccination cycle for first dose (left) or second dose (right). Estimates are from mixed effects models with random intercepts and random slopes at the individual level, an interaction between vaccination status and pre/post-vaccination timing, and adjusted for age, body mass index, educational attainment, parity, relationship status, and global region. Unvaccinated individuals are shown in red, vaccinated individuals are shown in blue, error bars represent 99.3% confidence intervals.

Supplemental Table 4: Sensitivity analysis incorporating 500 iterations of imputation, covariate balancing propensity score (CBPS) weighting, and bootstrapped standard errors. CBPS weights balanced assignment to treatment group, and balanced on age group, race/ethnicity, parity, body mass index, education level, relationship status, and global region.

Outcome	Cycle	Unvaccinated		Vaccinated		Adjusted difference in change
		n	Change from pre-vaccination average	n	Change from pre-vaccination average	
Cycle length	First Dose	4,686	0.06 (-0.12, 0.23)	14,936	0.75 (0.53, 0.98)	0.70 (0.18, 1.23)
	Second Dose	4,423	0.23 (0.01, 0.44)	9,600	0.55 (0.27, 0.83)	0.90 (0.34, 1.47)
	Cycle after second dose	4,134	0.19 (-0.02, 0.41)	8,871	-0.10 (-0.35, 0.14)	-0.32 (-0.81, 0.17)
Menses length	First Dose	4,686	-0.04 (-0.10, 0.02)	14,936	0.02 (-0.05, 0.10)	0.04 (-0.13, 0.21)
	Second Dose	4,423	-0.09 (-0.15, -0.04)	9,600	0.10 (0.03, 0.17)	0.16 (0.00, 0.32)



Supplemental Figure 3: Change in cycle length (days) between the 3-pre vaccination cycle average and the vaccination cycle for first dose (left, n = 14,257) or second dose (right, n = 9,216), among vaccinated individuals with known vaccine brands, adjusted for five-year age groups.