Figure S1. Pooled analysis of the incidence of Bell's palsy as an adverse event of mRNA vaccines against coronavirus disease 2019.
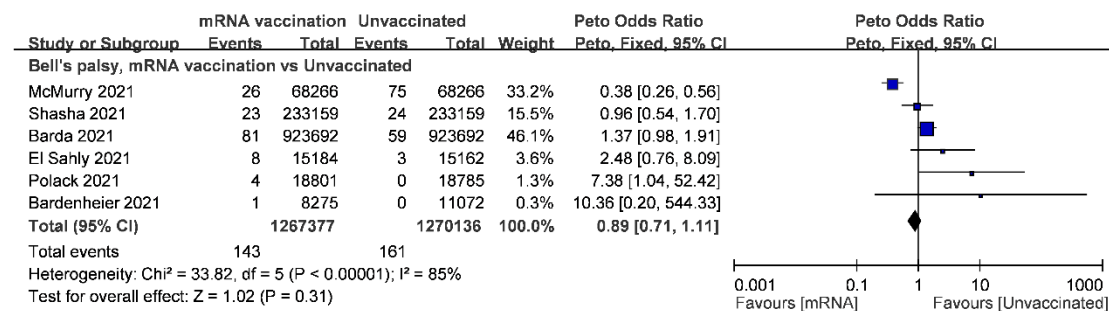
Study or Subgroup	mRNA vaccination Events	Total	Unvaccinated Events	Total	Weight	Peto Odds Ratio Peto, Fixed, 95% CI	Peto Odds Ratio Peto, Fixed, 95% CI
Bell's palsy, mRNA vaccination vs Unvaccinated							
McMurry 2021	26	68266	75	68266	33.2%	0.38 [0.26, 0.56]	
Shasha 2021	23	233159	24	233159	15.5%	0.96 [0.54, 1.70]	
Barda 2021	81	923692	59	923692	46.1%	1.37 [0.98, 1.91]	
El Sahly 2021	8	15184	3	15162	3.6%	2.48 [0.76, 8.09]	
Polack 2021	4	18801	0	18785	1.3%	7.38 [1.04, 52.42]	
Bardenheier 2021	1	8275	0	11072	0.3%	10.36 [0.20, 544.33]	
Total (95% CI)		1267377		1270136	100.0%	0.89 [0.71, 1.11]	
Total events	143		161				

Heterogeneity: Chi² = 33.82, df = 5 (P < 0.00001); I² = 85%
Test for overall effect: Z = 1.02 (P = 0.31)

Favours [mRNA]   Favours [Unvaccinated]

Figure S2. Forest plot analysis of the incidence of Bell's palsy in the mRNA vaccination and control groups including McMurry et al.'s study.
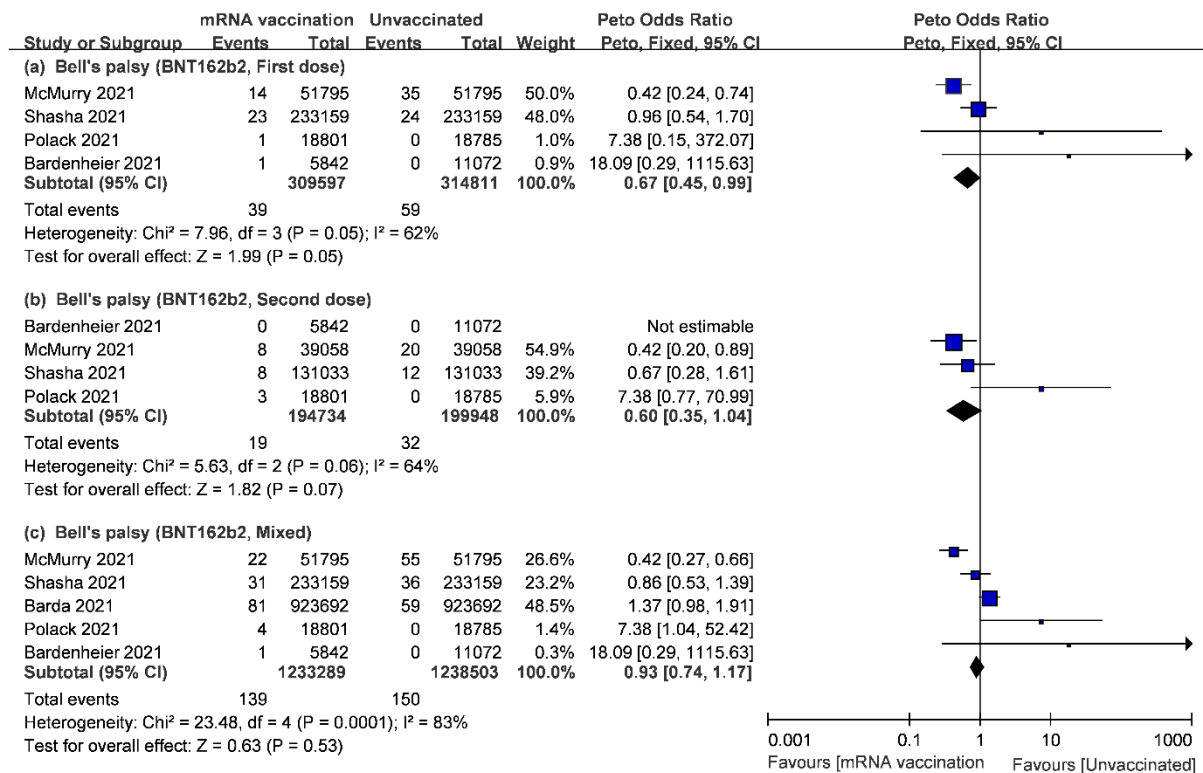
Study or Subgroup	mRNA vaccination Events	Total	Unvaccinated Events	Total	Weight	Peto Odds Ratio Peto, Fixed, 95% CI
(a) Bell's palsy (BNT162b2, First dose)						
McMurry 2021	14	51795	35	51795	50.0%	0.42 [0.24, 0.74]
Shasha 2021	23	233159	24	233159	48.0%	0.96 [0.54, 1.70]
Polack 2021	1	18801	0	18785	1.0%	7.38 [0.15, 372.07]
Bardenheier 2021	1	5842	0	11072	0.9%	18.09 [0.29, 1115.63]
Subtotal (95% CI)		309597		314811	100.0%	0.67 [0.45, 0.99]
Total events	39		59			

Heterogeneity: Chi² = 7.96, df = 3 (P = 0.05); I² = 62%
Test for overall effect: Z = 1.99 (P = 0.05)

(b) Bell's palsy (BNT162b2, Second dose)						
Bardenheier 2021	0	5842	0	11072		Not estimable
McMurry 2021	8	39058	20	39058	54.9%	0.42 [0.20, 0.89]
Shasha 2021	8	131033	12	131033	39.2%	0.67 [0.28, 1.61]
Polack 2021	3	18801	0	18785	5.9%	7.38 [0.77, 70.99]
Subtotal (95% CI)		194734		199948	100.0%	0.60 [0.35, 1.04]
Total events	19		32			

Heterogeneity: Chi² = 5.63, df = 2 (P = 0.06); I² = 64%
Test for overall effect: Z = 1.82 (P = 0.07)

(c) Bell's palsy (BNT162b2, Mixed)						
McMurry 2021	22	51795	55	51795	26.6%	0.42 [0.27, 0.66]
Shasha 2021	31	233159	36	233159	23.2%	0.86 [0.53, 1.39]
Barda 2021	81	923692	59	923692	48.5%	1.37 [0.98, 1.91]
Polack 2021	4	18801	0	18785	1.4%	7.38 [1.04, 52.42]
Bardenheier 2021	1	5842	0	11072	0.3%	18.09 [0.29, 1115.63]
Subtotal (95% CI)		1233289		1238503	100.0%	0.93 [0.74, 1.17]
Total events	139		150			

Heterogeneity: Chi² = 23.48, df = 4 (P = 0.0001); I² = 83%
Test for overall effect: Z = 0.63 (P = 0.53)

Figure S3. Forest plot analysis of the incidence of Bell's palsy after the first dose of BNT162b2 versus unvaccinated group (a), the second dose of BNT162b2 versus unvaccinated group (b), dose-unspecified BNT162b2 versus unvaccinated group (c), and BNT162b2 versus mRNA-1273 including McMurry et al.'s study.
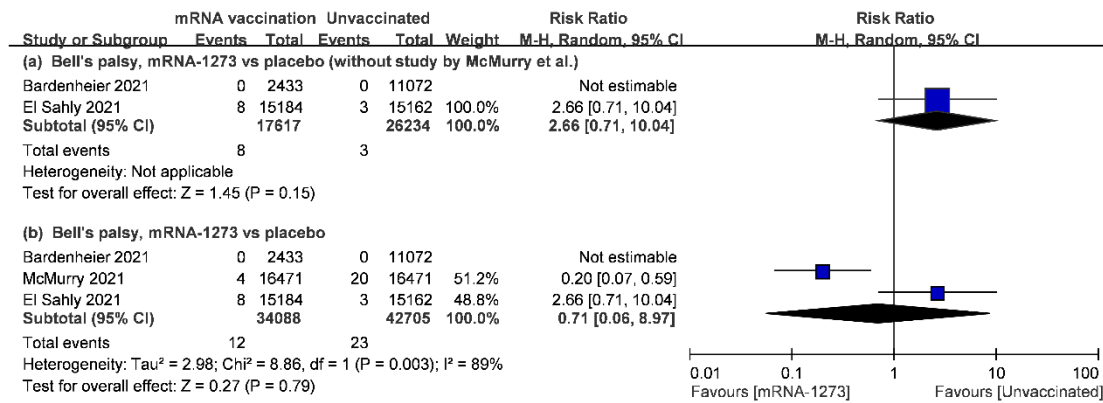
	mRNA vaccination		Unvaccinated			Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
(a) Bell's palsy, mRNA-1273 vs placebo (without study by McMurry et al.)							
Bardenheier 2021	0	2433	0	11072		Not estimable	
El Sahly 2021	8	15184	3	15162	100.0%	2.66 [0.71, 10.04]	
Subtotal (95% CI)		17617		26234	100.0%	2.66 [0.71, 10.04]	
Total events	8		3				
Heterogeneity: Not applicable							
Test for overall effect: Z = 1.45 (P = 0.15)							
(b) Bell's palsy, mRNA-1273 vs placebo							
Bardenheier 2021	0	2433	0	11072		Not estimable	
McMurry 2021	4	16471	20	16471	51.2%	0.20 [0.07, 0.59]	
El Sahly 2021	8	15184	3	15162	48.8%	2.66 [0.71, 10.04]	
Subtotal (95% CI)		34088		42705	100.0%	0.71 [0.06, 8.97]	
Total events	12		23				
Heterogeneity: Tau² = 2.98; Chi² = 8.86, df = 1 (P = 0.003); I² = 89%							
Test for overall effect: Z = 0.27 (P = 0.79)							

0.01   0.1   1   10   100
Favours [mRNA-1273]   Favours [Unvaccinated]

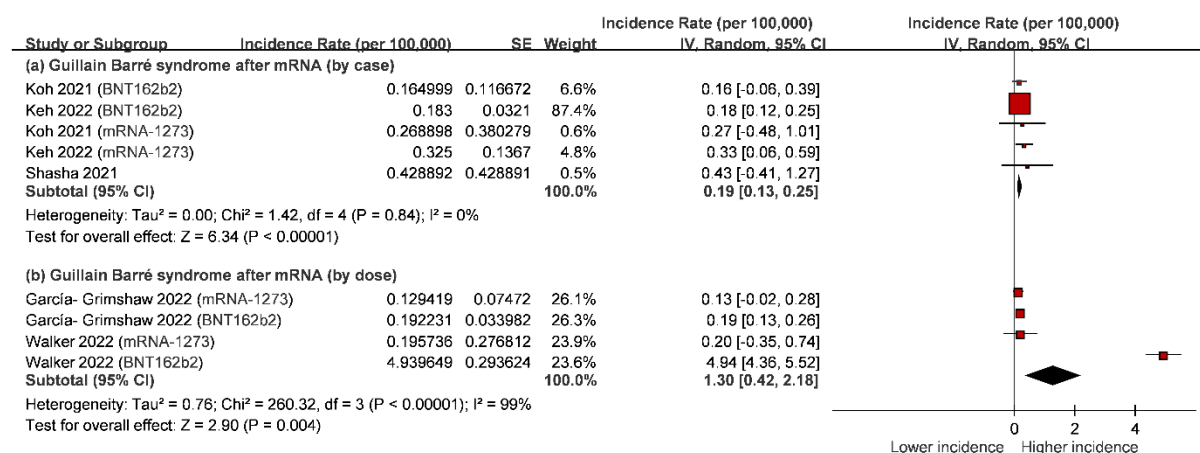**Figure S4.** Forest plot analysis with (a) and without (b) McMurry et al.'s study of the incidence of Bell's palsy after the administration of mRNA-1273 SARS-CoV-2 vaccine compared with the control group.

Study or Subgroup	mRNA vaccination Events	Total	Unvaccinated Events	Total	Weight	Peto Odds Ratio Peto, Fixed, 95% CI
Bell's palsy (BNT162b2 vs mRNA-1273)						
Li 2022	185	3142114	19	404462	11.6%	1.23 [0.80, 1.89]
McMurry 2021	22	51795	4	16471	2.7%	1.61 [0.66, 3.96]
Walker 2022	3609	5729152	78	255446	84.9%	1.69 [1.44, 1.99]
Koh 2021	11	1212130	0	185944	0.7%	3.17 [0.56, 18.06]
Bardenheier 2021	1	5842	0	2433	0.1%	4.12 [0.06, 304.42]
Subtotal (95% CI)		**10141033**		**864756**	**100.0%**	**1.64 [1.41, 1.90]**
Total events	3828		101			
Heterogeneity: Chi² = 2.59, df = 4 (P = 0.63); I² = 0%						
Test for overall effect: Z = 6.58 (P < 0.00001)						

Favours [BNT162b2]   Favours [Comparison]

Figure S5. Forest plot analysis with (a) and without (b) McMurry et al.'s study on the incidence of Bell's palsy after BNT162b2 and mRNA-1273 vaccines.

Study or Subgroup	Incidence Rate (per 100,000)	SE	Weight	IV, Random, 95% CI
(a) Guillain Barré syndrome after mRNA (by case)				
Koh 2021 (BNT162b2)	0.164999	0.116672	6.6%	0.16 [-0.06, 0.39]
Keh 2022 (BNT162b2)	0.183	0.0321	87.4%	0.18 [0.12, 0.25]
Koh 2021 (mRNA-1273)	0.268898	0.380279	0.6%	0.27 [-0.48, 1.01]
Keh 2022 (mRNA-1273)	0.325	0.1367	4.8%	0.33 [0.06, 0.59]
Shasha 2021	0.428892	0.428891	0.5%	0.43 [-0.41, 1.27]
Subtotal (95% CI)			100.0%	**0.19 [0.13, 0.25]**
Heterogeneity: Tau² = 0.00; Chi² = 1.42, df = 4 (P = 0.84); I² = 0%				
Test for overall effect: Z = 6.34 (P < 0.00001)				
(b) Guillain Barré syndrome after mRNA (by dose)				
García- Grimshaw 2022 (mRNA-1273)	0.129419	0.07472	26.1%	0.13 [-0.02, 0.28]
García- Grimshaw 2022 (BNT162b2)	0.192231	0.033982	26.3%	0.19 [0.13, 0.26]
Walker 2022 (mRNA-1273)	0.195736	0.276812	23.9%	0.20 [-0.35, 0.74]
Walker 2022 (BNT162b2)	4.939649	0.293624	23.6%	4.94 [4.36, 5.52]
Subtotal (95% CI)			100.0%	**1.30 [0.42, 2.18]**
Heterogeneity: Tau² = 0.76; Chi² = 260.32, df = 3 (P < 0.00001); I² = 99%				
Test for overall effect: Z = 2.90 (P = 0.004)				

Figure S6. Forest plot analysis of the incidence of Guillain–Barré syndrome after the administration of mRNA vaccines.

Table S1. The Newcastle–Ottawa Scale (NOS) was used to evaluate the quality of the included cohort studies.

Study	Selection				Comparability		Outcome		
	1	2	3	4	5a	5b	6	7	8
Barda et al.	★	★	★	★	★	★	★	★	★
Bardenheier et al.		★	★	★	★	★	★		★
Garcia-Grimshaw et al.	★	★	★				★	★	★
Hanson et al.	★	★	★				★	★	★
Keh et al.	★	★	★				★	★	★
Koh et al.		★	★	★	★		★	★	★
Li (Xintong) et al.	★	★	★	★	★	★	★	★	★
McMurry et al.		★	★		★	★	★	★	★
Renoud et al.	★	★	★				★	★	★
Rosenblum et al.	★	★	★		★	★	★	★	★
Sato et al.	★	★	★				★	★	★
Shasha et al.	★	★	★	★	★	★	★		★
Walker et al.	★	★	★				★	★	★

1, Representativeness of the exposed cohort. 2, Selection of the non-exposed cohort. 3, Ascertainment of exposure. 4, Demonstration that the outcome of interest was not present at the start of the study. 5, Comparability of cohorts based on the design or analysis. 6, Assessment of outcome. 7, Was follow-up long enough for outcomes to occur? 8, Adequacy of follow-up of the cohorts.

The number of stars ranged from zero to nine (7–9 stars, high-quality; 4–6 stars, medium-quality; <4 stars, poor-quality).

Table S2. The Cochrane Risk-of-Bias Tool was used to evaluate the quality of the included randomized controlled trials.

Trial	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7
NCT04470427 (Baden, El Sahly)	Low	Low	Low	Low	Low	Low	High
NCT04368728 (Polack, Stephen)	Low	Low	Low	Low	Low	Low	High

1, Randomization; 2, Concealment. 3, Blinding (participants and professionals). 4, Blinding the assessor. 5, Lost to follow-up. 6, Selective reporting. 7, Other bias.

Each domain was categorized as "low," "high," or "unclear" risk of bias.