

**Supplemental Table S1.** Distribution of immunomodulatory medications prior to propensity score overlap weighting among patients with SARDs who received either BNT162b2 or mRNA-1273 vaccine

	<b>Overall (N=10531)</b>	<b>BNT162b2 recipients (N=6010)</b>	<b>mRNA-1273 recipients (N=4521)</b>	<b>Standardized mean difference</b>
<b>Immunomodulatory medications</b>				
<i>Biologic DMARDs</i>				
Anti-CD20 monoclonal antibody	264 (3)	152 (3)	112 (2)	0.0011
TNF inhibitor	2865 (27)	1628 (27)	1237 (27)	0.0091
IL-6 receptor inhibitor	418 (4)	239 (4)	179 (4)	0.0089
B-cell activating factor inhibitor	83 (1)	52 (1)	31 (1)	0.0197
IL-23 inhibitor	37 (0)	24 (0)	13 (0)	0.0046
IL-17 inhibitor	408 (4)	225 (4)	183 (4)	0.0124
IL-12/IL-23 inhibitor	97 (1)	58 (1)	39 (1)	0.0073
IL-1 inhibitor	29 (0)	16 (0)	13 (0)	0.0076
CTLA-4 immunoglobulin	343 (3)	189 (3)	154 (3)	0.0183
IL-5 inhibitor	17 (0)	8 (0)	9 (0)	0.0250
C5 inhibitor	4 (0)	3 (0)	1 (0)	0.0159
<i>Targeted synthetic DMARD</i>				
JAK inhibitor	636 (6)	339 (6)	297 (7)	0.0419
<i>Conventional synthetic DMARDs</i>				
Hydroxychloroquine	3460 (33)	1970 (33)	1490 (33)	0.0051
Hydroxychloroquine monotherapy	2278 (22)	1297 (22)	981 (22)	0.0022
Chloroquine	11 (0)	10 (0)	1 (0)	0.0421
Methotrexate	3726 (35)	2115 (35)	1611 (36)	0.0035
Mycophenolate mofetil	487 (5)	299 (5)	188 (4)	0.0413
Mycophenolic acid	48 (0)	37 (1)	11 (0)	0.0616
Leflunomide	566 (5)	294 (5)	272 (6)	0.0568
Azathioprine	265 (3)	153 (3)	112 (2)	0.0036
Sulfasalazine	499 (5)	291 (5)	208 (5)	0.0173
Apremilast	212 (2)	122 (2)	90 (2)	0.0026
Cyclophosphamide	64 (1)	41 (1)	23 (1)	0.0199
Cyclosporine	29 (0)	20 (0)	9 (0)	0.0310
Tacrolimus	127 (1)	97 (2)	30 (1)	0.0914
Oral glucocorticoid	1125 (11)	692 (12)	433 (10)	0.0621

**Supplemental Table S2. Immunomodulatory medications used to identify patients with systemic rheumatic disease**

Category and generic name	Brand name(s)	Mechanism of action (for targeted therapy)	Route	CPT code if intravenous
<b>Glucocorticoids</b>				
Prednisone (minimum of 30 pills)	Deltasone		Oral	
	Prednicot			
	Prednisone Intensol			
	Rayos			
	Sterapred			
Methylprednisolone (minimum of 30 pills)	Sterapred DS		Oral	
	Medrol			
<b>Conventional Synthetic DMARDs</b>				
Azathioprine	Imuran		Oral	
	Azasan			
Methotrexate	Otrexup		Oral or subQ	
	Rasuvo			
	Rheumatrex			
	Trexall			
Leflunomide	Arava		Oral	
Mycophenolic acid	CellCept		Oral	
Mycophenolate mofetil	Myfortic		Oral	
Sulfasalazine	Azulfidine		Oral	
Hydroxychloroquine	Plaquenil		Oral	
Chloroquine	Aralen		Oral	
<b>Targeted Synthetic DMARDs</b>				
Tofacitinib	Xeljanz	JAK inhibitor	Oral	
Baricitinib	Olumiant	JAK inhibitor	Oral	
Upadacitinib	Rinvoq	JAK inhibitor	Oral	
<b>Biologic DMARDs</b>				
Rituximab	Rituxan	Anti-CD20 monoclonal antibody	IV	J9310
	Truxima			Q5115
	Ruxience			Q5119
Ocrelizumab	Ocrevus	Anti-CD20 monoclonal antibody	IV	J2350
Abatacept	Orencia	CTLA-4 Ig	subQ or IV	J0129
	Infliximab	Remicade	TNF inhibitor	IV
Infliximab	Inflectra			Q5103
	Renflexis			Q5104
	Avsola			Q5121
	Etanercept	Enbrel	TNF inhibitor	subQ
Adalimumab	Humira	TNF inhibitor	subQ	
Certolizumab	Cimzia	TNF inhibitor	subQ or IV	J0717
Golimumab	Simponi	TNF inhibitor	subQ or IV	J1602
Anakinra	Kineret	IL-1 inhibitor	subQ or IV	n/a (coded under "other biologic" J3490 or J3590 but doesn't seem to have its own)

Canakinumab	Ilaris	IL-1 inhibitor	subQ or IV	J0638
Mepolizumab	Nucala	IL-5 inhibitor	subQ or IV	J2182
Benralizumab	Fasenra	IL-5 inhibitor	subQ or IV	J0517
Tocilizumab	Actemra	IL-6 inhibitor	subQ or IV	J3262
Sarilumab	Kevzara	IL-6 inhibitor	subQ	
Secukinumab	Cosentyx	IL-17A inhibitor	subQ	
Ixekizumab	Taltz	IL-17A inhibitor	subQ	
Ustekinumab	Stelara	IL-12/23 inhibitor	subQ or IV	J3358
Guselkumab	Tremfya	IL-23 inhibitor	subQ	
Belimumab	Benlysta	BLyS inhibitor	subQ or IV	J0490
Eculizumab	Soliris	C5 inhibitor	IV	J1300
<b>Other</b>				
Tacrolimus	Prograf		Oral or IV	J7525
	Envarsus			
	Astagraf			
	Hecoria			
Cyclosporine	Gengraf		Oral or IV	J7516
	Neoral			
	Sandimmune			
Apremilast	Otezla	PDE4 inhibitor	Oral	
Cyclophosphamide	Cytoxan		Oral or IV	J9070

**Supplemental Table S3.** Distribution of vaccine type and breakthrough across time blocks included in analysis

Time block	Vaccine type (n, %)			Breakthrough infection (n, %)
	Pfizer	Moderna	Total	
0	113 (2)	266 (6)	379 (4)	50 (6)
1	264 (5)	306 (7)	570 (6)	55 (7)
2	768 (14)	509 (16)	1277 (13)	98 (13)
3	772 (14)	709 (16)	1481 (15)	86 (11)
4	722 (13)	1150 (27)	1872 (19)	143 (18)
5	863 (16)	556 (13)	1419 (14)	113 (15)
6	958 (17)	361 (8)	1319 (13)	107 (14)
7	656 (12)	240 (6)	896 (9)	70 (9)
8	293 (5)	162 (4)	455 (5)	35 (5)
9	107 (2)	63 (1)	170 (2)	18 (2)
Total	5516 (56)	4322 (44)	9838	775 (8)

**Supplemental Table S4.** Days between most recent prescription date and index date

	Pfizer Arm	Moderna Arm	Overall
N	5516	4322	9838
Mean, SD	75.8 (81.3)	76.5 (79.7)	76.1 (80.6)
Median, IQR	44 (15, 110)	47 (17, 110)	45 (16, 110)