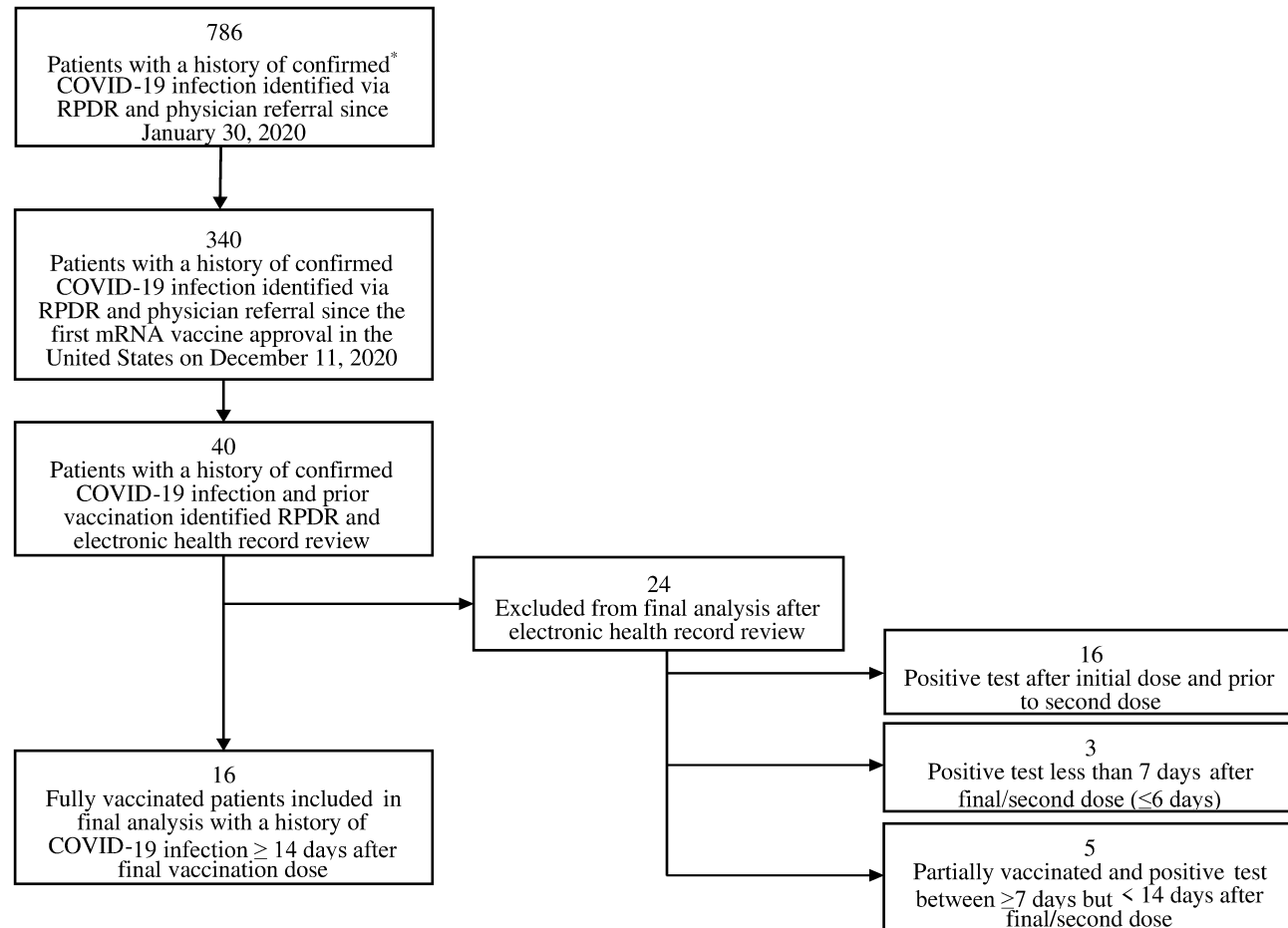


**Supplemental Figure 1.** Identification of COVID-19 breakthrough infections among vaccinated patients with systemic autoimmune rheumatic diseases



RPDR, Research Patient Data Registry

\*Confirmed with positive SARS-CoV-2 polymerase chain reaction or antigen test

**Supplementary Table 1.** Descriptions of COVID-19 breakthrough infections  $\geq 14$  days after second/final vaccine dose among patients with systemic rheumatic diseases (n=16)

Case	Age range	Rheumatic Disease	Vaccine Type	Time from final vaccine to diagnosis (days)	Rheumatic disease treatment at the time of first vaccine dose	Rheumatic disease treatment at the time of second vaccine dose (if different/new from first)	Time from last B cell depletion before vaccination to first vaccine dose (days)	Asymptomatic infection	COVID-19 treatment	Hospitalization	Supplemental oxygen/mechanical ventilation	Deceased
1	45-64	Dermatomyositis	Moderna	16	Azathioprine, Rituximab		99	No	Remdesivir, azithromycin, glucocorticoids	Yes	Supplemental oxygen	No
2	45-64	Systemic lupus erythematosus	Pfizer-BioNTech	24	Mycophenolate Moferil, Tacrolimus, Prednisone (5mg/d)			No	Remdesivir, Neutralizing monoclonal antibody	Yes	Supplemental oxygen	No
3	>85	Rheumatoid arthritis	Pfizer-BioNTech	26	Prednisone (10mg/d)	Methotrexate*		No	None	No	No	No
4	45-64	Hypocomplementemic urticarial vasculitis, Mixed connective tissue disease	Pfizer-BioNTech	29	Hydroxy-chloroquine, Methotrexate			No	None	No	No	No
5	25-44	Systemic lupus erythematosus	Moderna	30	Mycophenolic Acid, Belimumab			No	Remdesivir	Yes <sup>†</sup>	No	No
6	45-64	Rheumatoid arthritis	Janssen/Johnson & Johnson	33	None			Yes <sup>‡</sup>	None	No	No	No
7	65-84	Rheumatoid arthritis	Janssen/Johnson & Johnson	40	Rituximab		190	No	Remdesivir, glucocorticoids	Yes	Supplemental oxygen	No

8	45-64	Systemic lupus erythematosus	Pfizer-BioNTech	50	Mycophenolic acid, Tacrolimus			No	Neutralizing monoclonal antibody	No	No	No
9	65-84	Ankylosing spondylitis, Dermatomyositis with interstitial lung disease	Pfizer-BioNTech	57	Rituximab, prednisone (20mg/d)		25	No	Remdesivir, glucocorticoids, Convalescent plasma, Enrolled in clinical trial <sup>§</sup>	Yes	Supplemental oxygen and high-flow oxygen device	Yes
10	25-44	Dermatomyositis	Moderna	61	IVIg, Mycophenolate mofetil, Rituximab		111	No	None	No	No	No
11	25-44	Rheumatoid arthritis	Pfizer-BioNTech	70	Methotrexate			No	None	No	No	No
12	65-84	Rheumatoid arthritis-associated interstitial lung disease	Moderna	78	Rituximab		35	No	Remdesivir, azithromycin, glucocorticoids	Yes	Mechanical ventilation	Yes
13	25-44	IgG4-related disease	Moderna	82	Prednisone (10mg/d) <sup>¶</sup>			No	None	No	No	No
14	18-24	Rheumatoid arthritis	Pfizer-BioNTech	96	Methotrexate, Tocilizumab			No	Neutralizing monoclonal antibody	No	No	No
15	25-44	Ankylosing spondylitis	Janssen/Johnson & Johnson	111	Adalimumab, Sulfasalazine			No	None	No	No	No
16	25-44	Psoriatic arthritis	Janssen/Johnson & Johnson	132	Ustekinumab, prednisone (10mg/day)			No	Neutralizing monoclonal antibody	No	No	No

IVIg, Intravenous immunoglobulin

\* Initiated methotrexate between dose one and two

† Hospitalization unrelated to COVID-19 diagnosis

‡ Diagnosed via pre-procedure PCR test, no reported symptoms in electronic health record

§ NCT04501978; Phase 3 randomized, blinded, trial assessing treatments for hospitalized patients with COVID-19. Intervention arms: investigational drug + standard of care (Remdesivir) or placebo + standard of care (Remdesivir)

¶ Initiated rituximab between the second dose and infection

