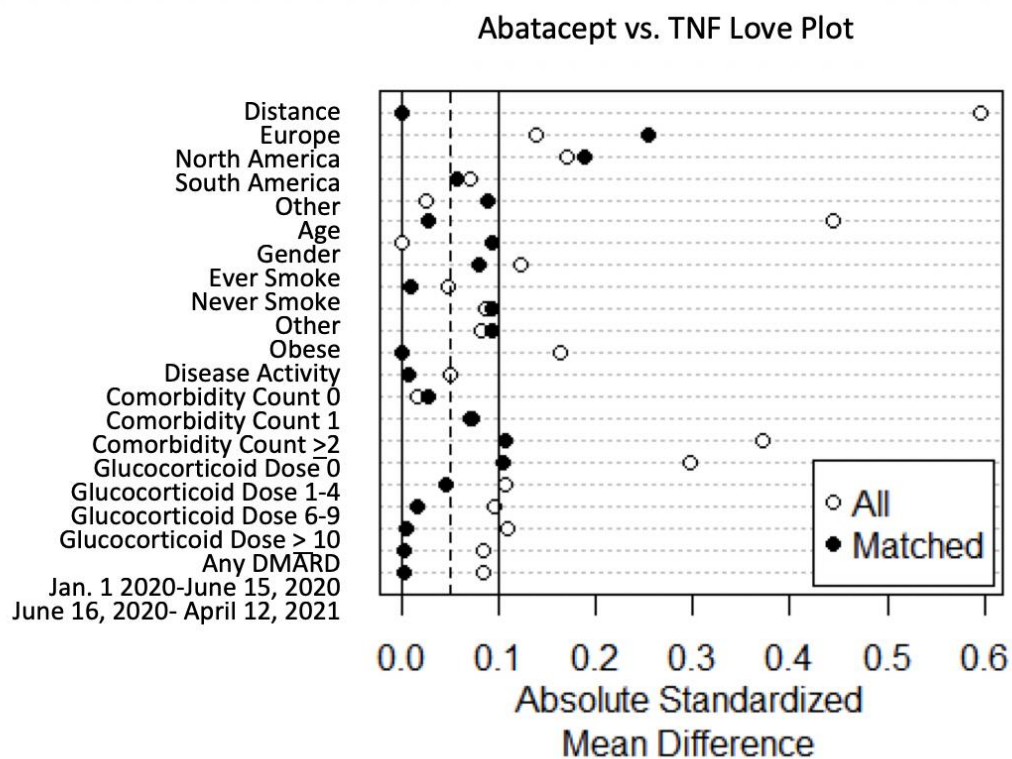
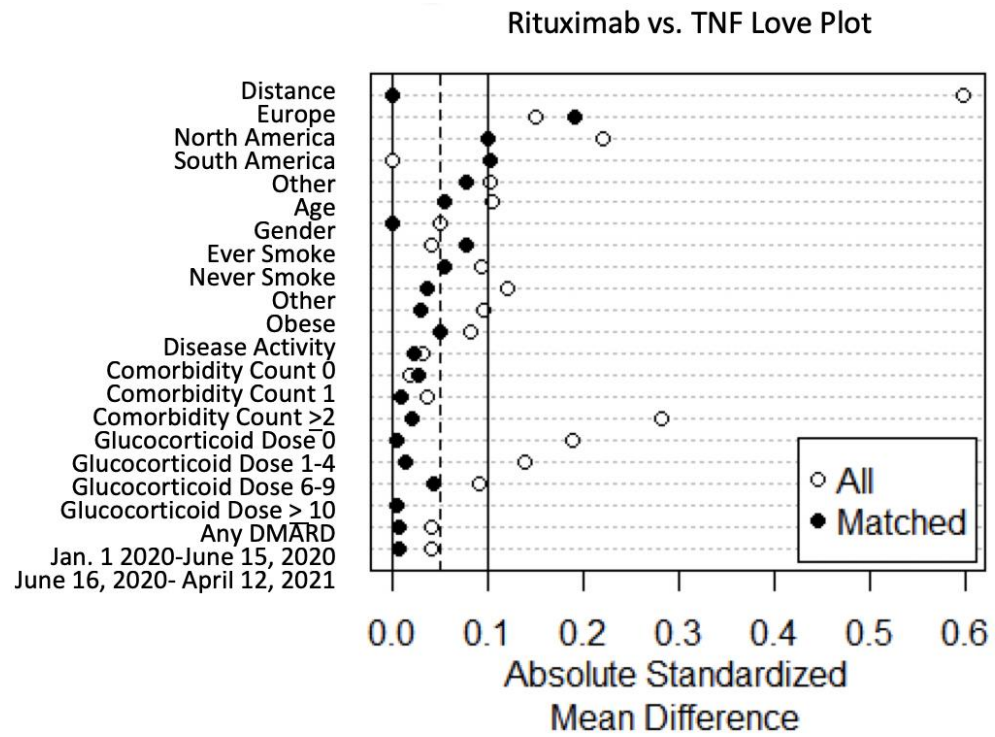


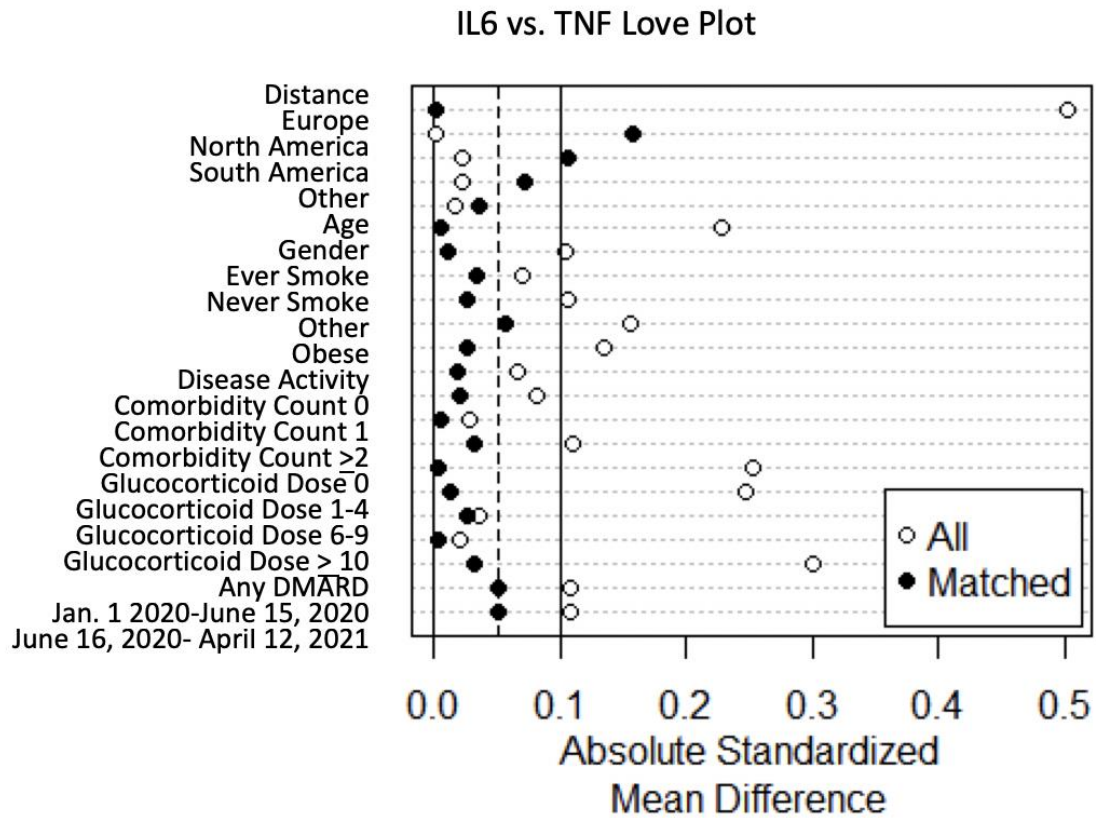
Supplementary Material for “Associations of baseline use of biologic or targeted synthetic DMARDs with COVID-19 severity in rheumatoid arthritis: Results from the COVID-19 Global Rheumatology Alliance Physician Registry” by Sparks JA, Wallace ZS, et al.

Supplementary Figure 1: Love plot for abatacept vs. TNF inhibitors.

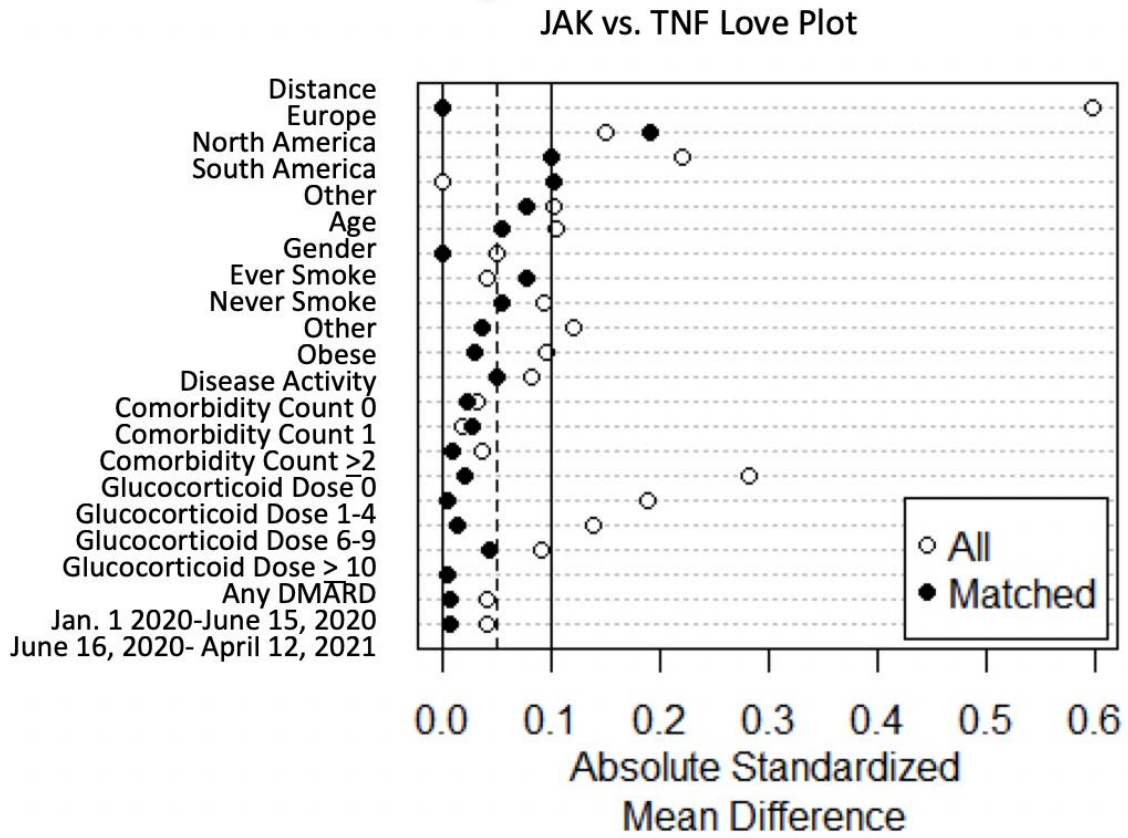


Supplementary Figure 2: Love plot for rituximab vs. TNF inhibitors.

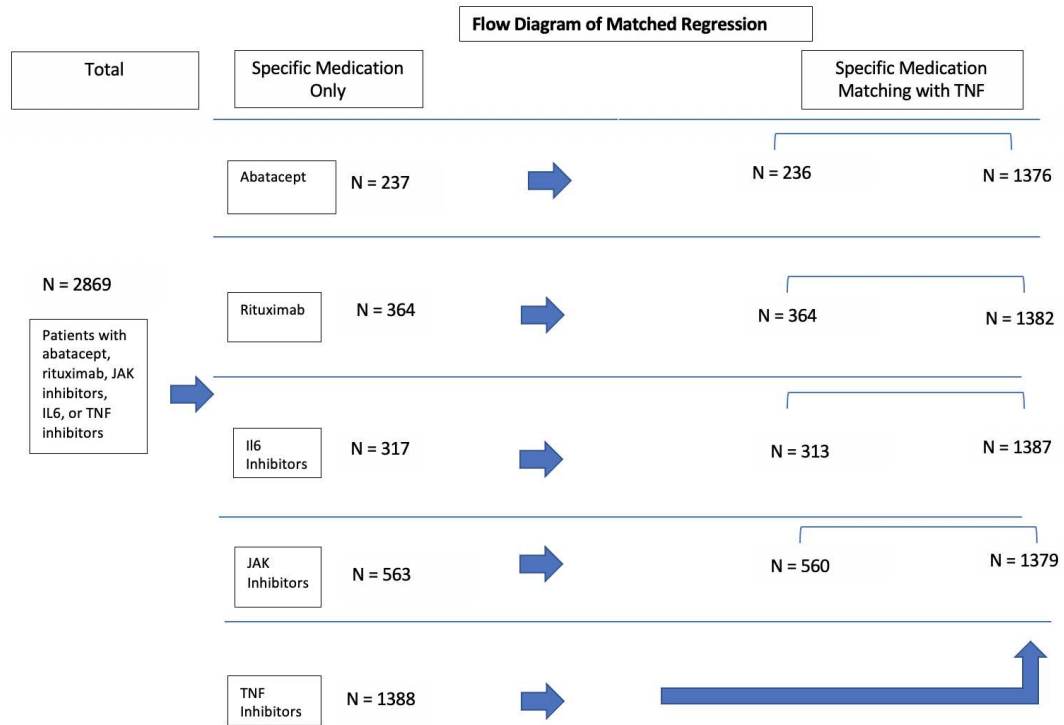
Supplementary Figure 3: Love plot for IL-6 inhibitors vs. TNF inhibitors.



Supplementary Figure 4: Love plot for JAK inhibitors vs. TNF inhibitors.



Supplementary Figure 5: Flow diagram illustrating analyzed sample for propensity score matching analyses.



Supplementary Table 1. Sensitivity analysis restricting to study period before or after June 16, 2021 and by North America or Europe.

| | Abatacept | | Rituximab | | IL-6 inhibitors | | JAK inhibitors | | TNF inhibitors |
|--|-------------------|---------|--------------------|---------|-------------------|---------|-------------------|---------|----------------|
| | OR (95% CI) | p-value | OR (95% CI) | p-value | OR (95% CI) | p-value | OR (95% CI) | p-value | Ref |
| Restricted to North America* (January 1, 2020 to June 15, 2020) | 0.94 (0.40, 2.21) | 0.89 | 3.95 (1.93, 8.06) | <0.01 | 0.59 (0.18, 1.93) | 0.38 | 1.90 (1.06, 3.40) | 0.03 | Ref |
| Restricted to Europe (January 1, 2020 to June 15, 2020) | 1.11 (0.55, 2.23) | 0.77 | 5.01 (3.10, 8.09) | <0.01 | 1.00 (0.52, 1.92) | 0.99 | 1.72 (1.01, 2.94) | 0.05 | Ref |
| Restricted to Europe (June 16, 2020-April 12, 2021) | 1.45 (0.50, 4.23) | 0.50 | 7.34 (3.94, 13.65) | <0.01 | 0.28 (0.08, 1.02) | 0.05 | 2.61 (1.41, 4.82) | <0.01 | Ref |

Adjusted for age, sex, region, obesity, smoking, concomitant csDMARD use, glucocorticoid use/dose, comorbidity count, hypertension/cardiovascular disease, interstitial lung disease, cancer, and rheumatoid arthritis disease activity except as otherwise indicated.

*There were too few cases to analyze North America June 16, 2020-April 12, 2021.

Supplementary Table 2. Frequencies and proportions of outcomes using a revised ordinal COVID-19 severity scale according to baseline use of biologic or targeted synthetic disease-modifying antirheumatic drug for patients with rheumatoid arthritis at time of COVID-19 onset (n=2,869).

| COVID-19 severity scale | Overall n=2,869 | Abatacept n=237 | Rituximab n=364 | IL-6 inhibitors n=317 | JAK inhibitors n=563 | TNF inhibitors n=1388 |
|---|----------------------------|----------------------------|----------------------------|--------------------------------------|-------------------------------------|--------------------------------------|
| 1) Not hospitalized | 2256 (78.6%) | 181 (76.4%) | 210 (57.7%) | 271 (85.5%) | 409 (72.6%) | 1185 (85.4%) |
| 2) Hospitalized with or without oxygenation (but no mechanical ventilation) | 428 (14.9%) | 36 (11.0%) | 91 (25.0%) | 36 (11.4%) | 108 (19.2%) | 157 (11.3%) |
| 3) Hospitalized with mechanical ventilation | 28 (1.0%) | 2 (0.8%) | 9 (2.5%) | 1 (0.32%) | 6 (1.1%) | 10 (0.7%) |
| 4) Death | 157 (5.5%) | 18 (7.6%) | 54 (14.8%) | 9 (2.8%) | 40 (7.1%) | 36 (2.6%) |

Supplementary Table 3. Associations of b/tsDMARD use with COVID-19 severity using a revised ordinal outcome scale.

| | Abatacept | | Rituximab | | IL-6 inhibitors | | JAK inhibitors | | TNF inhibitors |
|---|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------|
| | OR (95% CI) | p-value | OR (95% CI) | p-value | OR (95% CI) | p-value | OR (95% CI) | p-value | Ref |
| Using different ordinal outcome scale as supplemental analysis | | | | | | | | | |
| Unadjusted | 1.87 (1.34, 2.61) | 0.25 | 4.50 (3.50, 5.79) | <0.01 | 0.99 (0.70, 1.40) | 0.96 | 2.23 (1.76, 2.82) | <0.01 | |
| Multivariable Adjusted | 1.24 (0.78, 2.19) | 0.36 | 3.60 (3.40, 3.80) | <0.01 | 0.83 (0.50, 1.37) | 0.46 | 1.59 (1.11, 2.28) | 0.01 | |

Adjusted for age, sex, region, calendar time, obesity, smoking, concomitant csDMARD use, glucocorticoid use/dose, comorbidity count, hypertension/cardiovascular disease, interstitial lung disease, cancer, and rheumatoid arthritis disease activity except as otherwise indicated.

Supplementary Table 4. Associations of b/tsDMARD use with COVID-19 severity using a revised ordinal outcome scale.

| | Abatacept | | Rituximab | | IL-6 inhibitors | | JAK inhibitors | | TNF inhibitors |
|--|-------------------|---------|-------------------|---------|-------------------|---------|-------------------|---------|----------------|
| | OR (95% CI) | p-value | OR (95% CI) | p-value | OR (95% CI) | p-value | OR (95% CI) | p-value | Ref |
| Multivariable adjusted (primary analysis) | 1.24 (0.78, 2.19) | 0.36 | 3.60 (3.40, 3.80) | <0.01 | 0.83 (0.50, 1.37) | 0.46 | 1.59 (1.11, 2.28) | 0.01 | Ref |
| Excluding patients with ILD or cancer* | 1.24 (0.78, 1.96) | 0.36 | 4.15 (2.95, 5.84) | <0.01 | 0.66 (0.40, 1.07) | 0.09 | 1.76 (1.25, 2.47) | <0.01 | Ref |
| Restricted to US and additionally adjusted for race** | 1.00 (0.48, 2.12) | 0.99 | 3.82 (2.72, 5.37) | <0.01 | 0.66 (0.40, 1.07) | 0.09 | 1.67 (1.19, 2.35) | <0.01 | Ref |
| Propensity score matched*** | 1.72 (0.99, 2.98) | 0.051 | 3.36 (2.11, 5.34) | <0.01 | 0.68 (0.35, 1.32) | 0.25 | 1.56 (1.01, 2.42) | 0.049 | Ref |

Adjusted for age, sex, region, calendar time, obesity, smoking, concomitant csDMARD use, glucocorticoid use/dose, comorbidity count, hypertension/cardiovascular disease, interstitial lung disease, cancer, and rheumatoid arthritis disease activity except as otherwise indicated.

*n= 2,704 1,563 in the analysis excluding ILD and cancer.

**n=622 868 in the US-only analysis.

***n for each pair of propensity-score matched analyses: ABA: 236 TNF: 1376; RTX: 364 TNFi: 1382; IL6i: 313 TNFi: 1387; JAKi: 560 TNFi: 1379

CI, confidence interval; COVID-19, Coronavirus Disease 2019; IL-6, interleukin-6; ILD, interstitial lung disease; JAK, Janus kinase; OR, odds ratio; TNFi, tumor necrosis factor inhibitors.