### Supplemental Table 1. Multivariable Logistic Regression Analysis of Treatments and Other Factors, Including Geographic Region, Associated With Medication Adherence

<table>
<thead>
<tr>
<th>Parameter (Retained Based on Backward Selection)</th>
<th>Component Being Rated</th>
<th>RA Population OR (95% CI)b</th>
<th>PsA Population OR (95% CI)b</th>
<th>AS Population OR (95% CI)b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>csDMARD-TNFi combination</td>
<td>TNFi</td>
<td>5.43 (3.35–8.78)c</td>
<td>1.15 (0.51–2.60)</td>
<td>21.64 (5.96–78.56)c</td>
</tr>
<tr>
<td>NSAID-TNFi combination</td>
<td>TNFi</td>
<td>NA</td>
<td>NA</td>
<td>6.08 (1.77–20.94)c</td>
</tr>
<tr>
<td>TNFi monotherapy</td>
<td>TNFi</td>
<td>3.50 (1.66–7.38)c</td>
<td>1.08 (0.49–2.43)</td>
<td>12.60 (4.10–38.73)c</td>
</tr>
<tr>
<td>csDMARD monotherapy</td>
<td>csDMARD</td>
<td>Reference</td>
<td>Reference</td>
<td>1.24 (0.19–7.95)</td>
</tr>
<tr>
<td>csDMARD-TNFi combination</td>
<td>csDMARD</td>
<td>2.04 (1.32–3.15)c</td>
<td>0.47 (0.21–1.04)</td>
<td>3.08 (0.92–10.27)</td>
</tr>
<tr>
<td>NSAID-csDMARD combination</td>
<td>csDMARD</td>
<td>NA</td>
<td>NA</td>
<td>1.20 (0.28–5.12)</td>
</tr>
<tr>
<td>csDMARD-TNFi combination</td>
<td>NSAID</td>
<td>NA</td>
<td>NA</td>
<td>1.63 (0.36–7.34)</td>
</tr>
<tr>
<td>NSAID-TNFi combination</td>
<td>NSAID</td>
<td>NA</td>
<td>NA</td>
<td>1.13 (0.32–3.94)</td>
</tr>
<tr>
<td>NSAID-csDMARD combination</td>
<td>NSAID</td>
<td>NA</td>
<td>NA</td>
<td>0.98 (0.23–4.23)</td>
</tr>
<tr>
<td>Sociodemographic factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, y</td>
<td></td>
<td>1.05 (1.03–1.06)c</td>
<td>1.07 (1.04–1.11)c</td>
<td>1.03 (1.01–1.06)c</td>
</tr>
<tr>
<td>Race (white vs other)</td>
<td></td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Sex (female vs male)</td>
<td></td>
<td>—</td>
<td>—</td>
<td>1.71 (0.94–3.11)</td>
</tr>
<tr>
<td>Illness perception</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIPQ item 1–Consequences</td>
<td></td>
<td>—</td>
<td>—</td>
<td>1.10 (0.99–1.23)</td>
</tr>
<tr>
<td>BIPQ item 8–Emotional Representation</td>
<td></td>
<td>—</td>
<td>—</td>
<td>0.87 (0.78–0.97)</td>
</tr>
<tr>
<td>Disease-/medication-related factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disease duration, y</td>
<td></td>
<td>0.97 (0.95–0.99)c</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Number of pretreatments (&gt;3 vs ≤3)</td>
<td></td>
<td>—</td>
<td>—</td>
<td>0.34 (0.16–0.73)c</td>
</tr>
<tr>
<td>Duration of current treatment, y</td>
<td></td>
<td>—</td>
<td>0.90 (0.84–0.97)c</td>
<td>—</td>
</tr>
<tr>
<td>Treatment response (complete vs non-complete)d</td>
<td></td>
<td>—</td>
<td>2.03 (1.09–3.79)c</td>
<td>—</td>
</tr>
<tr>
<td>Beliefs factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMQ-Specific Necessity</td>
<td>1.12 (1.07–1.18)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.13 (1.04–1.23)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.20 (1.10–1.30)&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>BMQ-Specific Concerns</td>
<td>0.92 (0.87–0.96)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>—</td>
<td>0.95 (0.88–1.02)</td>
<td></td>
</tr>
<tr>
<td>BMQ-General Harm</td>
<td>0.88 (0.82–0.94)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.85 (0.77–0.94)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

Geographic region (vs Western Europe and Canada)

| Region | 0.62 (0.39–0.98)<sup>c</sup> | 0.55 (0.24–1.25) | 0.74 (0.35–1.56) |
| Eastern Europe and Middle East | 0.30 (0.18–0.49)<sup>c</sup> | 0.45 (0.16–1.29) | 0.26 (0.08–0.85)<sup>c</sup> |
| Latin America | 0.19 (0.10–0.35) | 0.38 (0.11–1.29) | 0.34 (0.17–0.70)<sup>c</sup> |
| Asia Pacific | 0.35<sup>c</sup> | 1.29 | 0.70<sup>c</sup> |

<sup>a</sup>=eliminated from model; NA=not applicable (NSAIDs were only taken by patients with AS; therefore, there are no data for NSAID-containing regimens for patients with RA and PsA).

<sup>b</sup>Adherence was defined as a binary variable: highly adherent (MMAS-4© score = 4) or not highly adherent (MMAS-4© score <4).

<sup>c</sup>Except where noted, ORs represent the impact of treatment vs reference (csDMARD in csDMARD monotherapy for RA and PsA; NSAID monotherapy for AS) or the impact of a 1-unit or 1-year increase (other factors); empty cells denote that a variable was not selected in the regression model for the respective indication.

<sup>d</sup>P<0.05 vs OR of 1.

<sup>e</sup>Determined by treating physician; treatment response was categorized as “complete response,” “partial response,” “no response,” or “not evaluable.”
### Supplemental Table 2. Comparison of Predictive Post Hoc Adherence Models

<table>
<thead>
<tr>
<th>Parameter</th>
<th>RA Population</th>
<th>PsA Population</th>
<th>AS Population</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full model</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of treatment</td>
<td>Categorical</td>
<td>Categorical</td>
<td>Categorical</td>
</tr>
<tr>
<td>Age</td>
<td>D (&lt;58 vs ≥58 years)</td>
<td>D (&lt;51 vs ≥51 years)</td>
<td>D (&lt;44 vs ≥44 years)</td>
</tr>
<tr>
<td>Race</td>
<td>D (white vs non-white)</td>
<td>—</td>
<td>D (white vs non-white)</td>
</tr>
<tr>
<td>BMQ-Specific <em>Necessity</em></td>
<td>D (&lt;20 vs ≥20)</td>
<td>D (&lt;18 vs ≥18)</td>
<td>D (&lt;19 vs ≥19)</td>
</tr>
<tr>
<td>BMQ-Specific <em>Concerns</em></td>
<td>Continuous</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>BMQ-General <em>Harm</em></td>
<td>Continuous</td>
<td>Continuous</td>
<td>—</td>
</tr>
<tr>
<td>BIPQ item 2–Timeline</td>
<td>Continuous</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>BIPQ item 7–Coherence</td>
<td>—</td>
<td>—</td>
<td>D (&lt;9 vs ≥9)</td>
</tr>
<tr>
<td>Duration of disease</td>
<td>Continuous</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Duration of current treatment</td>
<td>—</td>
<td>D (&lt;3 vs ≥3 years)</td>
<td>—</td>
</tr>
<tr>
<td>Response to current treatment</td>
<td>—</td>
<td>D (complete vs non-complete)</td>
<td>—</td>
</tr>
<tr>
<td>No. of prior treatments</td>
<td>—</td>
<td>—</td>
<td>D (≤3 vs &gt;3)</td>
</tr>
<tr>
<td>AUROC</td>
<td>0.6802</td>
<td>0.6807</td>
<td>0.7406</td>
</tr>
<tr>
<td><strong>Simplified model</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of treatment</td>
<td>Categorical</td>
<td>Categorical</td>
<td>Categorical</td>
</tr>
<tr>
<td>Age</td>
<td>D (&lt;58 vs ≥58 years)</td>
<td>D (&lt;51 vs ≥51 years)</td>
<td>D (&lt;44 vs ≥44 years)</td>
</tr>
<tr>
<td>Race</td>
<td>D (white vs non-white)</td>
<td>—</td>
<td>D (white vs non-white)</td>
</tr>
<tr>
<td>BMQ-Specific <em>Concerns</em></td>
<td>—</td>
<td>—</td>
<td>D (&lt;14 vs ≥14)</td>
</tr>
<tr>
<td>BMQ-General <em>Harm</em></td>
<td>D (&lt;11 vs ≥11)</td>
<td>D (&lt;12 vs ≥12)</td>
<td>—</td>
</tr>
<tr>
<td>Duration of disease</td>
<td>—</td>
<td>D (&lt;9 vs ≥9 years)</td>
<td>—</td>
</tr>
<tr>
<td>AUROC</td>
<td>0.6374</td>
<td>0.6415</td>
<td>0.7241</td>
</tr>
</tbody>
</table>

— = eliminated from model; D = parameter treated as dichotomous variable obtained from receiver operating characteristic curve analysis.
Supplemental Figure 1. Classification of patients into attitudinal groups toward systemic medication by BMQ-Specific Necessity and Concerns results.

Mean Necessity and Concerns subscale scores were categorized as low (<15) or high (≥15); the possible range was 5–25.
Supplemental Figure 2. Multivariable regression analyses for adherence as measured by the MMAS-4: full models before variable selection.

Adherence was defined as a binary variable with levels highly adherent (MMAS-4 score = 4) and not highly adherent (MMAS-4 score <4).

*Impact of a 1-unit increase.

AS=ankylosing spondyloarthritis; BIPQ=Brief Illness Perception Questionnaire; BMQ=Beliefs about Medicines Questionnaire; Combo=combination; CI=confidence interval; combo=combination; csDMARD=conventional synthetic disease-modifying antirheumatic drug; mono=monotherapy; MMAS-4=4-item Morisky Medication Adherence Scale; No=number; NSAID=non-steroidal anti-inflammatory drug; PHQ-2=Patient Health Questionnaire-2; RA=rheumatoid arthritis; PsA=psoriatic arthritis; TNFi=tumor necrosis factor inhibitor.
Supplemental Figure 2 continued.

PsA

- Age (y)*
- Female sex (vs male)
- White race (vs non-white)
- Residence (urban vs rural)
- Living with someone else (vs alone)
- Duration of formal education, y*
- Duration of disease (y)*
- Current disease severity (score)*
- Prior disease severity (score)*
- No. of comorbidities*
- Maximal treatment duration (y)*
- No. of pretreatments (>3 vs ≤3)
- Complete response (vs non-complete)
- TNFi mono (vs csDMARD mono)
- TNFi in csDMARD-TNFi combo (vs csDMARD mono)
- csDMARD in csDMARD-TNFi combo (vs csDMARD mono)
- BMO-Specific Necessity (score)*
- BMO-Specific Concerns (score)*
- BMO-General Harm (score)*
- BMO-General Overuse (score)*
- BIPQ 1: Consequences (score)*
- BIPQ 2: Timeline (score)*
- BIPQ 3: Personal control (score)*
- BIPQ 4: Treatment control (score)*
- BIPQ 5: Identity (score)*
- BIPQ 6: Illness concern (score)*
- BIPQ 7: Coherence (score)*
- BIPQ 8: Emotional representation (score)*
- PHQ-2 (score)*

Estimate (95% CI)
Supplemental Figure 2 continued.

**AS**
- Age (y)*
- Female sex (vs male)
- White race (vs non-white)
- Residence (urban vs rural)
- Living with someone else (vs alone)
- Duration of formal education, y*
- Duration of disease (y)*
- Current disease severity (score)*
- Prior disease severity (score)*
- No. of comorbidities*
- Maximal treatment duration (y)*
- No. of pretreatments (>3 vs ≤3)
- Complete response (vs non-complete)
- TNFi mono (vs NSAID mono)
- TNFi in csDMARD-TNFi combo (vs NSAID mono)
- csDMARD in csDMARD-TNFi combo (vs NSAID mono)
- NSAID in csDMARD-TNFi combo (vs NSAID mono)
- TNFi in NSAID-TNFi combo (vs NSAID mono)
- NSAID in NSAID-TNFi combo (vs NSAID mono)
- csDMARD in NSAID-csDMARD combo (vs NSAID mono)
- NSAID in NSAID-csDMARD combo (vs NSAID mono)
- BMQ-Specific Necessity (score)*
- BMQ-Specific Concerns (score)*
- BMQ-General Harm (score)*
- BMQ-General Overuse (score)*
- BIPQ 1: Consequences (score)*
- BIPQ 2: Timeline (score)*
- BIPQ 3: Personal control (score)*
- BIPQ 4: Treatment control (score)*
- BIPQ 5: Identity (score)*
- BIPQ 6: Illness concern (score)*
- BIPQ 7: Coherence (score)*
- BIPQ 8: Emotional representation (score)*
- PHQ-2 (score)**

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**Estimate (95% CI)**
Supplemental Figure 3. Multivariable regression analyses for adherence as measured by the MMAS-4, including variables for geographic region: full models before variable selection. Adherence was defined as a binary variable with levels highly adherent (MMAS-4 score = 4) and not highly adherent (MMAS-4 score <4). *Impact of a 1-unit increase.

AS=ankylosing spondyloarthritis; BIPQ=Brief Illness Perception Questionnaire; BMQ=Beliefs about Medicines Questionnaire; Combo=combination; CI=confidence interval; combo=combination; csDMARD=conventional synthetic disease-modifying antirheumatic drug; mono=monotherapy; EEMEA=Eastern Europe and Middle East; MMAS-4=4-item Morisky Medication Adherence Scale; No=number; NSAID=non-steroidal anti-inflammatory drug; PHQ-2=Patient Health Questionnaire-2; RA=rheumatoid arthritis; PsA=psoriatic arthritis; TNFi=tumor necrosis factor inhibitor; WEC=Western Europe and Canada.
Supplemental Figure 3 continued.

PsA

Factors:
- Age (y)*
- Female sex (vs male)
- White race (vs non-white)
- Residence (urban vs rural)
- Living with someone else (vs alone)
- Duration of formal education, y*
- Duration of disease (y)*
- Current disease severity (score)*
- Prior disease severity (score)*
- No. of comorbidities*
- Maximal treatment duration (y)*
- No. of pretreatments (>3 vs ≤3)
- Complete response (vs non-complete)
- TNFi mono (vs csDMARD mono)
- TNFi in csDMARD-TNFi combo (vs csDMARD mono)
- csDMARD in csDMARD-TNFi (vs csDMARD mono)
- BMQ-Specific Necessity (score)*
- BMQ-Specific Concerns (score)*
- BMQ-General Harm (score)*
- BMQ-General Overuse (score)*
- BIPQ 1: Consequences (score)*
- BIPQ 2: Timeline (score)*
- BIPQ 3: Personal control (score)*
- BIPQ 4: Treatment control (score)*
- BIPQ 5: Identity (score)*
- BIPQ 6: Illness concern (score)*
- BIPQ 7: Coherence (score)*
- BIPQ 8: Emotional representation (score)*
- PHQ-2 (score)*
- EEMEA region (vs WEC)
- Latin America region (vs WEC)
- Asia Pacific region (vs WEC)

Estimate (95% CI)
Supplemental Figure 3 continued.

AS

- Female sex (vs male)
- White race (vs non-white)
- Residence (urban vs rural)
- Living with someone else (vs alone)
- Duration of formal education, y*
- Duration of disease (y)*
- Current disease severity (score)*
- Prior disease severity (score)*
- No. of comorbidities*
- Maximal treatment duration (y)*
- No. of pretreatments (>3 vs ≤3)
- Complete response (vs non-complete)
- TNFi mono (vs NSAID mono)
- TNFi in csDMARD-TNFi combo (vs NSAID mono)
- csDMARD in csDMARD-TNFi (vs NSAID mono)
- NSAID in csDMARD-TNFi combo (vs NSAID mono)
- TNFi in NSAID-TNFi combo (vs NSAID mono)
- NSAID in NSAID-TNFi combo (vs NSAID mono)
- csDMARD in NSAID-csDMARD combo (vs NSAID mono)
- NSAID in NSAID-csDMARD combo (vs NSAID mono)
- BMQ-Specific Necessity (score)*
- BMQ-Specific Concerns (score)*
- BMQ-General Harm (score)*
- BMQ-General Overuse (score)*
- BIPQ 1: Consequences (score)*
- BIPQ 2: Timeline (score)*
- BIPQ 3: Personal control (score)*
- BIPQ 4: Treatment control (score)*
- BIPQ 5: Identity (score)*
- BIPQ 6: Illness concern (score)*
- BIPQ 7: Coherence (score)*
- BIPQ 8: Emotional representation (score)*
- PHQ-2 (score)*
- EEMEA region (vs WEC)
- Latin America region (vs WEC)
- Asia Pacific region (vs WEC)