

**Supplementary Table S1: Frequency of different classes of reported DA.**

|  | Rheumatology patients (N=2541) |     |     |       |     | Controls (N=3540) |     |
|--|--------------------------------|-----|-----|-------|-----|-------------------|-----|
|  | RA                             | SLE | SpA | Total | %   | Total             | %   |
| Any antibiotics  | 113                            | 129 | 64  | 306   | 12  | 247               | 7   |
| - Beta-lactam antibiotics                                | 69                             | 82  | 43  | 194   | 7.6 | 170               | 4.8 |
| Non-steroidal anti-inflammatory drugs                    | 73                             | 30  | 27  | 130   | 5.1 | 78                | 2.2 |
| Disease-modifying antirheumatic drugs/immunosuppressants | 79                             | 19  | 15  | 113   | 4.4 | 0                 | 0   |
| Cardiovascular drugs                                     | 42                             | 19  | 4   | 65    | 2.6 | 59                | 1.7 |
| Intravenous contrast                                     | 14                             | 11  | 8   | 33    | 1.3 | 41                | 1.2 |
| Other analgesics   | 16                             | 6   | 8   | 30    | 1.2 | 12                | 0.3 |
| Allopurinol  | 3                              | 4   | 1   | 8     | 0.3 | 17                | 0.5 |
| Anti-fungal  | 4                              | 2   | 2   | 8     | 0.3 | 4                 | 0.1 |
| Anti-virals  | 3                              | 4   | 0   | 7     | 0.3 | 3                 | 0.1 |

**Supplementary Table S2: Allergy histories and investigation results of patients who completed beta-lactam allergy testing.**

| Age | Sex | Diagnosis | DMARDs/IST | Reported DA                                   | Other DA                      | Index Reactions                               | Allergy investigation results  |
|-----|-----|-----------|------------|---|-------------------------------|---|--|
| 1   | 74  | F         | RA         | Nil   | "Penicillins" (unknown index) | Aspirin<br>Betahistine<br>Cinnarizine         | Shortness of breath, syncope<br>Negative skin tests to PPL, MDM, BP and amoxicillin.<br>Negative DPT to amoxicillin                    |
| 2   | 45  | F         | RA         | Methotrexate 15mg weekly, sulfasalazine 1g BD | Amoxicillin<br>Cloxacillin    | Mefenamic acid                                | Angioedema<br>Negative skin tests to PPL, MDM, BP and amoxicillin.<br>Positive skin test to cloxacillin<br>Negative DPT to amoxicillin |
| 3   | 79  | M         | RA         | Tofacitinib 5mg BD                            | Amoxicillin<br>Meropenem      | Nitrofurantoin<br>Vancomycin<br>Penicillamine | Unknown<br>Negative skin tests to PPL, MDM, BP, amoxicillin and meropenem.<br>Negative DPT to amoxicillin and meropenem                |
| 4   | 75  | M         | SpA        | Nil   | Amoxicillin                   | Phensedyl                                     | Rash<br>Negative skin tests to PPL, MDM, BP and amoxicillin.<br>Negative DPT to amoxicillin  |
| 5   | 64  | M         | SLE        | Nil   | "Penicillins" (unknown index) | Nil   | Rash<br>Negative skin tests to PPL, MDM, BP and amoxicillin.<br>Negative DPT to amoxicillin  |

