Supplementary Table 1. Description of variables*

| Variable Name                  | Variable Description                                                                 | Included (1/0) |
|--------------------------------|--------------------------------------------------------------------------------------|---------------|
| age_from_dob                   | Patient's age derived from date of birth                                              | 0             |
| alcoho_freq                    | Alcohol drink frequency per week                                                      | 0             |
| anti_ccp                       | Anti-cyclic citrullinated peptide (CCP) antibody                                       | 1             |
| anti_ccp_pos                   | Anti-CCP > 20                                                                         | 1             |
| any_allergy_comorb_active      | Indicator of patient having active allergy comorbidity                               | 1             |
| any_allergy_comorb_afterRA     | Indicator of patient ever having allergy comorbidity                                 | 1             |
| any_allergy_comorb_afterRA     | Indicator of patient ever having allergy comorbidity                                 | 1             |
| any_autoimu_comorb_active      | Indicator of patient having active autoimmune comorbidity                             | 1             |
| any_autoimu_comorb_afterRA     | Indicator of patient having autoimmune comorbidity after RA diagnosis                 | 1             |
| any_autoimu_comorb_afterRA     | Indicator of patient ever having autoimmune comorbidity                               | 1             |
| any_cardio_comorb_active       | Indicator of patient having active cardiovascular comorbidity                         | 1             |
| any_cardio_comorb_afterRA      | Indicator of patient having cardiovascular comorbidity after RA diagnosis             | 1             |
| any_cardio_comorb_afterRA      | Indicator of patient ever having cardiovascular comorbidity                           | 1             |
| any_endoc_comorb_active        | Indicator of patient having active endocrine comorbidity                               | 1             |
| any_endoc_comorb_afterRA       | Indicator of patient having endocrine comorbidity after RA diagnosis                  | 1             |
| any_endoc_comorb_afterRA       | Indicator of patient ever having endocrine comorbidity                                 | 1             |
| any_gi_comorb_active           | Indicator of patient having active GI comorbidity                                     | 1             |
| any_gi_comorb_afterRA          | Indicator of patient having GI comorbidity after RA diagnosis                         | 1             |
| any_gi_comorb_afterRA          | Indicator of patient ever having GI comorbidity                                       | 1             |
| any_hemat_comorb_active        | Indicator of patient having active hematologic comorbidity                             | 1             |
| any_hemat_comorb_afterRA       | Indicator of patient having hematologic comorbidity after RA diagnosis                | 1             |
| any_hemat_comorb_afterRA       | Indicator of patient ever having hematologic comorbidity                               | 1             |
| any_hepatic_comorb_afterRA     | Indicator of patient having hepatic comorbidity after RA diagnosis                    | 1             |
| any_hepatic_comorb_afterRA     | Indicator of patient ever having hepatic comorbidity                                  | 1             |
| any_infect_comorb_active       | Indicator of patient having active infectious comorbidity                              | 1             |
| any_infect_comorb_afterRA      | Indicator of patient having infectious comorbidity after RA diagnosis                  | 1             |
| any_infect_comorb_afterRA      | Indicator of patient ever having infectious comorbidity                                | 1             |
| any_infect_comorb_afterRA      | Indicator of patient ever having infectious comorbidity                                | 1             |
| orcomorb | Description                                                                 |
|---------|-----------------------------------------------------------------------------|
| any_metab_comorb_active | Indicator of patient having active metabolic comorbidity                |
| any_metab_comorb_afterRA | Indicator of patient having metabolic comorbidity after RA diagnosis  |
| any_metab_comorb_even | Indicator of patient ever having hepatic comorbidity                   |
| any_muscu_comorb_active | Indicator of patient having active musculoskeletal comorbidity          |
| any_muscu_comorb_afterRA | Indicator of patient having musculoskeletal comorbidity after RA diagnosis |
| any_muscu_comorb_even | Indicator of patient ever having hepatic comorbidity                   |
| any_neuro_comorb_active | Indicator of patient having active neurological comorbidity             |
| any_neuro_comorb_afterRA | Indicator of patient having neurological comorbidity after RA diagnosis |
| any_neuro_comorb_even | Indicator of patient ever having hepatic comorbidity                   |
| any_oncol_comorb_active | Indicator of patient having active oncology comorbidity                 |
| any_oncol_comorb_afterRA | Indicator of patient having oncology comorbidity after RA diagnosis     |
| any_oncol_comorb_even | Indicator of patient ever having hepatic comorbidity                   |
| any_ortho_comorb_afterRA | Indicator of patient having orthopedic trauma comorbidity after RA diagnosis |
| any_ortho_comorb_even | Indicator of patient ever having orthopedic trauma comorbidity          |
| any_osteoar_comorb_active | Indicator of patient having active osteoarthritis comorbidity          |
| any_osteoar_comorb_afterRA | Indicator of patient having osteoarthritis comorbidity after RA diagnosis |
| any_osteoar_comorb_even | Indicator of patient ever having osteoarthritis comorbidity             |
| any_other_comorb_active | Indicator of patient having active other comorbidity                    |
| any_other_comorb_afterRA | Indicator of patient having other comorbidity after RA diagnosis        |
| any_other_comorb_even | Indicator of patient ever having other comorbidity                      |
| any_psych_comorb_active | Indicator of patient having active psychiatric comorbidity              |
| any_psych_comorb_afterRA | Indicator of patient having psychiatric comorbidity after RA diagnosis  |
| any_psych_comorb_even | Indicator of patient ever having psychiatric comorbidity                 |
| any_pulmonary_comorb_active | Indicator of patient having active pulmonary comorbidity                |
| any_pulmonary_comorb_afterRA | Indicator of patient having pulmonary comorbidity after RA diagnosis     |
| any_pulmonary_comorb_even | Indicator of patient ever having pulmonary comorbidity                  |
| any_renal_comorb_afterRA | Indicator of patient having renal comorbidity after RA diagnosis        |
| any_renal_comorb_even | Indicator of patient ever having renal comorbidity                      |
| any_sicca_exoc_comorb_active | Indicator of patient having active sicca/exocrine comorbidity          |
| Variable                                      | Description                                                                 | Value |
|----------------------------------------------|-----------------------------------------------------------------------------|-------|
| any_sicca_exoc_comorb_afterRA               | Indicator of patient having sicca/exocrine comorbidity after RA diagnosis    | 1     |
| any_sicca_exoc_comorb_ever                  | Indicator of patient ever having sicca/exocrine comorbidity                  | 1     |
| any_supplement                              | Indicator of patient using any supplement                                    | 1     |
| any_urolog_comorb_active                    | Indicator of patient having active urological comorbidity                    | 1     |
| any_urolog_comorb_afterRA                   | Indicator of patient having urological comorbidity after RA diagnosis        | 1     |
| any_urolog_comorb_ever                      | Indicator of patient ever having urological comorbidity                      | 1     |
| arthritis_pain_today                        | How much arthritis pain do you feel today (0=no pain, 10=extreme pain)       | 0     |
| bmi_category                                 | Body mass index categorized                                                  | 1     |
| bp_category                                  | Blood pressure category                                                     | 1     |
| bp_diastolic                                 | Blood pressure: diastolic                                                   | 1     |
| bp_systolic                                  | Blood pressure: systolic                                                    | 1     |
| caffeine_freq                                | Caffeine drink frequency per day                                             | 0     |
| cdai_new                                     | Modified clinical disease activity index                                    | 1     |
| charlson_index                               | Co-morbidity scale. Modified Charlson Comorbidity index using variables available in BRASS. Higher scores indicate greater co-morbidity | 1     |
| community_groups                             | Total hours each week patient participates in any groups (eg. Social/work group, church-connected group, public service, or community group) | 1     |
| crp                                          | C-reactive protein (CRP) titer                                              | 0     |
| das28_new                                    | Modified disease activity score (28 joints) – CRP                           | 1     |
| days_exercise                                | Number of days patient exercise in an average week                          | 1     |
| dx_duration                                  | Years since RA diagnosis                                                    | 1     |
| earlyRA_patient1                             | Indicator of early RA (≤2 years) patient                                    | 1     |
| education                                    | Patient's highest level of education achieved                               | 1     |
| efficacy_score                               | Arthritis self-efficacy score – other symptoms                              | 1     |
| emotional_support_freq                       | How often can you count on anyone to provide you with emotional support     | 1     |
| emotional_support_num                        | Number of people who can provide with emotional support                     | 1     |
| emp_employed                                 | Current employment status indicator                                          | 0     |
| emp_hhincome                                 | Last year total household income                                            | 1     |
| exart                                        | Indicator for any extra-articular manifestations related to RA in the past year. | 1     |
| family_support                               | Family support                                                              | 1     |
| Variable             | Description                                                                 | Value |
|----------------------|-----------------------------------------------------------------------------|-------|
| flare_any            | Indicator of having a RA flare in the past 6 months                          | 1     |
| flare_number         | Number of flares during the past 6 months                                    | 1     |
| fsmhi5_score         | Mental health Index-5 score 1–25                                             | 1     |
| gender               | Gender                                                                      | 0     |
| height               | Height of patient                                                           | 0     |
| livewith_adult       | Indicator of living with an adult                                           | 0     |
| livewith_children    | Indicator of currently living with children                                  | 1     |
| manifest_other       | Other RA manifestation indicator                                            | 0     |
| manifest_sjogrens    | Indicator of having Sjögren manifestation in the past year                  | 1     |
| manifest_subcutaneous_nodules | Indicator of having subcutaneous RA manifestation in the past year  | 1     |
| marital_status       | Simplified patient's marital status at baseline. When marital_status = 1, patient lives with spouse/partner | 1     |
| mdhaq_score100       | Multi-dimensional health assessment questionnaire score - functions scaled to 100 | 1     |
| memory_score         | Memory score; the sum of neuroscreen_concentration, neuroscreen_memory, and neuroscreen_wordfind | 0     |
| nonra_surgery        | Indicator of ever having non-RA surgery                                      | 1     |
| num_active_manifest  | Number of currently active RA manifestation types                           | 1     |
| num_children         | Number of children                                                          | 1     |
| num_comorb_types_active | Number of comorbidity types currently active                                | 0     |
| num_comorb_types_afterra | Number of comorbidity types after RA diagnosis                             | 0     |
| num_comorb_types-ever | Number of comorbidity types ever                                           | 0     |
| num_curr_RAmem_types | Sum of current RA medicine types                                            | 1     |
| num_currRA_bDMARD_oth | Number of current RA unique bio DMARD -- non-TNF medicines (usage)         | 1     |
| num_currRA_bDMARD_TNF | Number of current RA unique bio DMARD -- TNF medicines (usage)             | 1     |
| num_currRA_csDMARD_nonMTX | Number of current RA unique non-MTX csDMARD medicines (usage)         | 1     |
| num_currRA_csDMARD_MTX | Number of current RA unique csDMARD medicines (usage)                     | 1     |
| num_currRA_NSAID     | Number of current RA unique NSAID medicines (usage)                         | 1     |
| num_currRA_pain_opioid | Number of current RA unique opioid medicines (usage)                        | 1     |
| num_currra_pain_other | Number of RA pain medicine types currently use                             | 0     |
| num_currRA_steroid   | Number of current RA unique steroid medicines (usage)                       | 1     |
| num_doctor_visit_types | Number of doctor visit types                                                 | 1     |
| num_exercise_types2  | Number of exercise types                                                    | 1     |
| Variable               | Description                                                                 | Value |
|-----------------------|-----------------------------------------------------------------------------|-------|
| num_FH_earlyMI        | Number of family members having early myocardial infarction in first-degree relatives | 1    |
| num_fjoint_amelbow    | Indicator of arm/elbow joint that was first affected by RA                   | 0    |
| num_fjoint_footankle  | Indicator of foot/ankle joint that was first affected by RA                  | 0    |
| num_fjoint_handwrist  | Indicator that the first joint affected by RA is hand or wrist                | 1    |
| num_fjoint_legknee    | Indicator that the first joint affected by RA is leg or knee                  | 1    |
| num_fjoint_other      | Indicator of other joints that was first affected by RA                      | 0    |
| num_fjoint_shoulder   | Indicator of shoulder joint that was first affected by RA                    | 0    |
| num_lw_pain_types     | Number of last week pain types                                               | 0    |
| num_nonRA_surgery_types | Number of non-RA surgery types                                              | 1    |
| num_other_visits      | Number of visits to other healthcare professionals                           | 1    |
| num_past_RAmed_types  | Sum of past RA medicine types                                                | 1    |
| num_pastRA_bDMARD_TNF | Number of past RA unique bioDMARD -- TNF medicines (usage)                   | 1    |
| num_pastRA_csDMARD    | Number of past RA unique csDMARD medicines (usage)                           | 1    |
| num_pastRA_csDMARD_MTX| Number of past RA unique csDMARD -- MTX medicines (usage)                    | 1    |
| num_pastra NSAID      | Number of different NSAID medicines used in the past 6 months                | 0    |
| num_pastra steroid     | Number of different steroid medicines used in the past 6 months              | 0    |
| num_pcp_visits2       | Number of PCP visits                                                         | 1    |
| num_RA_ankle_surgery  | Number of RA related ankle surgery                                           | 1    |
| num_RA_doctor_visits2 | Number or RA doctor visit                                                   | 1    |
| num_RA_elbow_surgery  | Number of RA related elbow surgery                                          | 1    |
| num_ra_foot_surgery    | Number of foot surgery ever due to RA                                        | 0    |
| num_RA_hand_surgery   | Number of RA related hand surgery                                           | 1    |
| num_RA_hip_surgery    | Number of RA related hip surgery                                            | 1    |
| num_RA_knee_surgery   | Number of RA related knee surgery                                           | 1    |
| num_RA_manifest        | Number of RA related manifestation types in the past year                    | 1    |
| num_RA_shoulder_surgery | Number of RA related shoulder surgery                                       | 1    |
| num_RA_surgery_types  | Sum of RA surgery types                                                      | 1    |
| num_RA_wrist_surgery  | Number of RA related wrist surgery                                          | 1    |
| num_siblings          | Number of siblings                                                           | 1    |
| num_support_freq4     | Number of support frequency from close friend/relatives per week             | 1    |
| Variable                          | Description                                                                 | Value |
|----------------------------------|------------------------------------------------------------------------------|-------|
| num_supporting_ppl4              | Number of supporting people (close friends/relatives) in the last 4 weeks    | 1     |
| num_therapist_visits             | Number of therapist visits in the past six months                            | 0     |
| num_types_herb_supp_nutra        | Sum of any_nutraceut, any_supplement and any_herbs                           | 1     |
| num_types_ppl_livewith           | Sum of live-with types                                                       | 1     |
| pack_years_20                    | Pack years of smoking, assuming 20 cigarettes in a pack                      | 1     |
| Painful_joints_total             | Total painful joints                                                         | 1     |
| ra_surgery_any                   | Indicator of ever having any RA surgery                                       | 1     |
| raceblack                        | Indicator of black race                                                       | 1     |
| racewhite                        | Indicator of white race                                                       | 1     |
| rf                               | Rheumatoid factor titer                                                      | 0     |
| rfp                              | RF positive                                                                  | 1     |
| sdai_new                         | Modified simplified disease activity index                                    | 1     |
| seropositive                     | Either RF positive or anti-CCP positive                                       | 1     |
| smoke_agegrp                     | Smoke started age group                                                      | 1     |
| smoke_status                     | Indicating of patient ever smoked, smoked in the past, or is a current smoker at visit. | 1     |
| smoke_still                      | Indicator of patient still smoking at baseline                                 | 1     |
| Swollen_joints_total             | Total swollen joints                                                         | 1     |
| total_curr_RA_meds               | Sum of current RA medicines                                                  | 1     |
| total_exercise_hrs2              | Total exercise hours per week                                                 | 1     |
| total_past_RA_meds               | Sum of past RA medicines                                                     | 1     |
| total_sharp_score                | Total sharp score                                                            | 1     |
| weight                           | Patient's bodyweight                                                         | 1     |

*Foodstuff (as a fortified food or a dietary supplement) that is held to provide health or medical benefits in addition to its basic nutritional value. *1=female, 0=male. * bioDMARD = biological DMARD; CCP = cyclic citrullinated peptide; CRP = C-reactive protein; csDMARD = conventional synthetic DMARD; DMARD = disease-modifying antirheumatic drug; GI = gastrointestinal; MTX = methotrexate; NSAID = non-steroidal anti-inflammatory drug; PCP = primary care physician; RA = rheumatoid arthritis; RF = rheumatoid factor; TNF = tumor necrosis factor.