

**Supplementary Table 1. Disease code and category**

| <b>Trait</b>                                                                                                 | <b>ICD10</b>   | <b>Category</b>                              |
|--------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------|
| Diabetic hypoglycemia                                                                                        | E11            | Endocrine                                    |
| Asthma                                                                                                       | J45            | Respiratory                                  |
| Type 1 diabetes with coma                                                                                    | E10            | Endocrine                                    |
| Diabetes, several complications                                                                              | E11            | Endocrine                                    |
| Other diabetic retinopathy                                                                                   | E11            | Endocrine                                    |
| Multiple sclerosis                                                                                           | G35            | Mental and Nervous                           |
| Multiple sclerosis                                                                                           | G35            | Mental and Nervous                           |
| Diabetes mellitus                                                                                            | E08.9          | Endocrine                                    |
| Primary biliary cholangitis                                                                                  | K74.3          | Digestive                                    |
| excluded)                                                                                                    | E11            | Endocrine                                    |
| Celiac disease                                                                                               | K90.0          | Digestive                                    |
| Blood clot DVT bronchitis emphysema asthma rhinitis eczema<br>allergy diagnosed by doctor: None of the above | Not applicable | Skin                                         |
| Systemic lupus erythematosus                                                                                 | M32.9          | Musculoskeletal system and connective tissue |
| Asthma-related infections                                                                                    | Not applicable | Respiratory                                  |
| Atopic dermatitis                                                                                            | L20.9          | Skin                                         |
| Type 1 diabetes without complications                                                                        | E10            | Endocrine                                    |
| Type 1 diabetes                                                                                              | E10            | Endocrine                                    |
| Celiac disease                                                                                               | K90.0          | Digestive                                    |
| Type 1 diabetes, strict definition                                                                           | E10            | Endocrine                                    |
| Type 1 diabetes, wide definition, subgroup 1                                                                 | E10            | Endocrine                                    |
| Celiac disease                                                                                               | K90.0          | Digestive                                    |
| Multiple sclerosis                                                                                           | G35            | Mental and Nervous                           |
| Primary biliary cirrhosis                                                                                    | K74.3          | Digestive                                    |
| Type 1 diabetes                                                                                              | E10            | Endocrine                                    |

|                                                                                                                                 |                |                                              |
|---------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------|
| Diabetes diagnosed by doctor                                                                                                    | Not applicable | Endocrine                                    |
| Ankylosing spondylitis                                                                                                          | M45            | Musculoskeletal system and connective tissue |
| Rheumatoid arthritis                                                                                                            | M06.9          | Musculoskeletal system and connective tissue |
| Type 1 diabetes                                                                                                                 | E10            | Endocrine                                    |
| Allergic disease (asthma, hay fever or eczema)                                                                                  | Not applicable | Respiratory                                  |
| Diagnoses - secondary ICD10: J45.9 Asthma, unspecified                                                                          | J45.9          | Respiratory                                  |
| Hypothyroidism, drug reimbursement                                                                                              | E03.2          | Endocrine                                    |
| Type 1 diabetes                                                                                                                 | E10            | Endocrine                                    |
| Psoriasis vulgaris                                                                                                              | L40.0          | Skin                                         |
| Coronary artery disease                                                                                                         | I25.10         | Blood and circulatory                        |
| Vascular/heart problems diagnosed by doctor: High blood pressure                                                                | Not applicable | Blood and circulatory                        |
| Asthma (childhood onset)                                                                                                        | J45            | Respiratory                                  |
| Systemic lupus erythematosus                                                                                                    | M32.9          | Musculoskeletal system and connective tissue |
| Rheumatoid Arthritis                                                                                                            | M06.9          | Musculoskeletal system and connective tissue |
| Blood clot DVT bronchitis emphysema asthma rhinitis eczema<br>allergy diagnosed by doctor: Hayfever allergic rhinitis or eczema | Not applicable | Skin                                         |
| Disorders of the thyroid gland                                                                                                  | E07.9          | Endocrine                                    |
| Hypothyroidism (congenital or acquired)                                                                                         | E03.2          | Endocrine                                    |
| Diagnoses - main ICD10: D22 Melanocytic naevi                                                                                   | D22            | Neoplasms                                    |
| Celiac disease                                                                                                                  | K90.0          | Digestive                                    |
| Celiac disease                                                                                                                  | K90.0          | Digestive                                    |
| Thyrotoxicosis with diffuse goitre                                                                                              | E05.0          | Endocrine                                    |
| Hypothyroidism, levothyroxin purchases                                                                                          | E03.2          | Endocrine                                    |
| Asthma                                                                                                                          | J45            | Respiratory                                  |
| Myocardial infarction                                                                                                           | I21            | Blood and circulatory                        |
| Gastroesophageal reflux disease                                                                                                 | K21            | Digestive                                    |
| Coronary atherosclerosis                                                                                                        | I25            | Blood and circulatory                        |
| Diabetes, varying definitions                                                                                                   | Not applicable | Endocrine                                    |

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|--------------------------------------------------------------------|----------------|----------------------------------------------|
| Autoimmune diseases                                                | D89.9          | Blood and circulatory                        |
| Coronary atherosclerosis (no controls excluded)                    | I25            | Blood and circulatory                        |
| Type 2 diabetes, definitions combined, including avohilmo          | E11            | Endocrine                                    |
| Disorders of gallbladder, biliary tract and pancreas               | K87            | Digestive                                    |
| Vascular/heart problems diagnosed by doctor: None of the above     | Not applicable | Blood and circulatory                        |
| Diabetes, insuline treatment (Kela reimbursement)                  | Z79.4          | Endocrine                                    |
| Type 2 diabetes                                                    | E11            | Endocrine                                    |
| Ischaemic heart disease, wide definition                           | I20-I25        | Blood and circulatory                        |
| Major depression                                                   | F32.0–F33.3    | Mental and Nervous                           |
| Nasal polyp                                                        | J33.9          | Respiratory                                  |
| Rheumatoid arthritis                                               | M06.9          | Musculoskeletal system and connective tissue |
| Other diabetes, wide definition                                    | Not applicable | Endocrine                                    |
| Mouth/teeth dental problems: Mouth ulcers                          | K12.30         | Digestive                                    |
| Type 2 diabetes, strict (exclude DM1)                              | E11            | Endocrine                                    |
| Type 2 diabetes, definitions combined                              | E11            | Endocrine                                    |
| Pure hypercholesterolaemia                                         | E78.0          | Endocrine                                    |
| Celiac disease                                                     | K90.0          | Digestive                                    |
| Basal cell carcinoma                                               | C44.91         | Neoplasms                                    |
| and anal canal                                                     | D12            | Neoplasms                                    |
| Colorectal cancer                                                  | C18.9          | Digestive                                    |
| Diagnoses - secondary ICD10: E78.0 Pure hypercholesterolaemia      | E78.0          | Endocrine                                    |
| Diagnoses - secondary ICD10: E11.9 Without complications           | E11.9          | Endocrine                                    |
| Hypothyroidism, strict autoimmune, 3 medication purchases required | E03.2          | Endocrine                                    |
| Disorders of lipoprotein metabolism and other lipidaemias          | E78            | Endocrine                                    |
| Haemorrhoidal disease                                              | K64            | Digestive                                    |
| Myocardial infarction                                              | I21            | Blood and circulatory                        |
| Parkinson's disease                                                | G20            | Mental and Nervous                           |
| Coronary heart disease                                             | I25            | Blood and circulatory                        |

|                                                                                                   |                |                                              |
|---------------------------------------------------------------------------------------------------|----------------|----------------------------------------------|
| Prostate cancer                                                                                   | C61            | Neoplasms                                    |
| Rheumatoid arthritis                                                                              | M06.9          | Musculoskeletal system and connective tissue |
| Asthma (adult onset)                                                                              | J45            | Respiratory                                  |
| Cancer of skin                                                                                    | C44            | Neoplasms                                    |
| Type 2 diabetes                                                                                   | E11            | Endocrine                                    |
| Thyroid cancer                                                                                    | C73            | Endocrine                                    |
| Type 2 diabetes with other specified/multiple/unspecified complications                           | E11            | Endocrine                                    |
| Hypothyroidism, strict autoimmune                                                                 | E03.2          | Endocrine                                    |
| Type 2 diabetes                                                                                   | E11            | Endocrine                                    |
| Psoriasis                                                                                         | L40.0          | Skin                                         |
| Breast cancer                                                                                     | C50            | Neoplasms                                    |
| Multiple sclerosis                                                                                | G35.9          | Mental and Nervous                           |
| Bipolar disorder                                                                                  | F31            | Mental and Nervous                           |
| Narcolepsy                                                                                        | G47.4          | Mental and Nervous                           |
| Schizophrenia                                                                                     | F20            | Mental and Nervous                           |
| Hypothyroidism, other/unspecified                                                                 | E03.2          | Endocrine                                    |
| Rheumatoid arthritis                                                                              | M06.9          | Musculoskeletal system and connective tissue |
| Rheumatoid arthritis                                                                              | M06.9          | Musculoskeletal system and connective tissue |
| Type 2 diabetes                                                                                   | E11            | Endocrine                                    |
| Type 2 diabetes (adjusted for BMI)                                                                | E11            | Endocrine                                    |
| Type 2 diabetes                                                                                   | E11            | Endocrine                                    |
| Blood clot DVT bronchitis emphysema asthma rhinitis eczema<br>allergy diagnosed by doctor: Asthma | Not applicable | Respiratory                                  |
| Breast cancer                                                                                     | C50            | Neoplasms                                    |
| Doctor diagnosed asthma                                                                           | Not applicable | Respiratory                                  |
| Osteoarthritis of the hip or knee                                                                 | M16            | Musculoskeletal system and connective tissue |

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Supplementary Table 2. Disease-wide MR analysis results in forward direction

| Trait                                                                                                                        | Name                     | IBD                 |           | UC                |           | CD                  |           | Category                             | GWAS-ID                         |
|------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------|-----------|-------------------|-----------|---------------------|-----------|--------------------------------------|---------------------------------|
|                                                                                                                              |                          | OR [95%CI]          | pval      | OR [95%CI]        | pval      | OR [95%CI]          | pval      |                                      |                                 |
| Diabetic hypoglycemia                                                                                                        | Diabetic hypoglycemia    | 0.78 [0.75, 0.81]   | 1.480E-38 | 0.68 [0.64, 0.71] | 1.723E-42 | 0.85 [0.82, 0.89]   | 1.310E-13 | Endocrine, nutritional and metabolic | finn-b-DM_HYPOGLYC              |
| Asthma                                                                                                                       | Asthma_UKB               | 2.12 [1.88, 2.40]   | 8.880E-34 | 2.11 [1.80, 2.47] | 3.385E-20 | 1.81 [1.58, 2.08]   | 1.857E-17 | Respiratory                          | ebi-a-GCST90014325              |
| Type 1 diabetes with coma                                                                                                    | T1D_COMA                 | 0.90 [0.88, 0.92]   | 3.090E-33 | 1.08 [1.04, 1.13] | 4.706E-04 | 0.95 [0.93, 0.97]   | 8.012E-08 | Endocrine, nutritional and metabolic | finn-b-E4_DM1COMA               |
| Diabetes, several complications                                                                                              | DM_SEVERAL_COMPLICATIONS | 0.75 [0.71, 0.78]   | 2.000E-31 | 1.25 [1.12, 1.39] | 8.204E-05 | 0.86 [0.82, 0.91]   | 6.053E-08 | Endocrine, nutritional and metabolic | finn-b-DM_SEVERAL_COMPLICATIONS |
| Other diabetic retinopathy                                                                                                   | RETINOPATHYDIAB_NAS      | 0.88 [0.86, 0.90]   | 4.620E-31 | 0.81 [0.78, 0.83] | 1.192E-38 | 0.93 [0.91, 0.96]   | 2.069E-07 | Endocrine, nutritional and metabolic | finn-b-H7_RETINOPATHYDIAB_NAS   |
| Multiple sclerosis                                                                                                           | MS_S1                    | 1.15 [1.12, 1.17]   | 4.150E-30 | 0.97 [0.94, 1.00] | 7.516E-02 | 1.01 [0.98, 1.04]   | 6.343E-01 | Mental and Nervous                   | ieu-a-1025                      |
| Multiple sclerosis                                                                                                           | MS_S2                    | 1.12 [1.10, 1.14]   | 8.690E-28 | 1.16 [1.12, 1.19] | 2.750E-20 | 1.01 [0.98, 1.04]   | 4.505E-01 | Mental and Nervous                   | ebi-a-GCST005531                |
| Diabetes mellitus                                                                                                            | DM                       | 0.69 [0.65, 0.74]   | 2.000E-24 | 0.90 [0.79, 1.03] | 1.170E-01 | 0.85 [0.79, 0.93]   | 1.579E-04 | Endocrine, nutritional and metabolic | finn-b-E4_DIABETES              |
| Primary biliary cholangitis                                                                                                  | PBC_S1                   | 1.15 [1.12, 1.19]   | 2.360E-22 | 1.15 [1.11, 1.19] | 1.853E-15 | 1.11 [1.08, 1.14]   | 8.809E-13 | Digestive                            | ebi-a-GCST003129                |
| Diabetes, insulin treatment (Kela reimbursement) (more controls excluded)                                                    | KELA_DIAB_INSUL_EXMORE   | 0.76 [0.71, 0.80]   | 3.590E-22 | 0.87 [0.79, 0.97] | 8.067E-03 | 0.90 [0.84, 0.96]   | 1.496E-03 | Endocrine, nutritional and metabolic | finn-b-KELA_DIAB_INSUL_EXMORE   |
| Celiac disease                                                                                                               | CeD_S3                   | 0.96 [0.95, 0.96]   | 1.280E-21 | 0.98 [0.97, 0.99] | 2.658E-03 | 0.92 [0.91, 0.93]   | 2.231E-41 | Digestive                            | ieu-a-1058                      |
| Blood clot DVT bronchitis emphysema asthma rhinitis eczema allergy diagnosed by doctor: None of                              | Diagnosis_3              | 0.05 [0.03, 0.10]   | 1.610E-19 | 0.19 [0.10, 0.37] | 1.063E-06 | 0.00 [0.00, 0.01]   | 1.737E-55 | Skin                                 | ukb-a-442                       |
| Systemic lupus erythematosus                                                                                                 | SLE_S1                   | 0.91 [0.89, 0.93]   | 3.090E-17 | 0.89 [0.87, 0.92] | 7.077E-15 | 0.96 [0.94, 0.99]   | 1.938E-03 | Musculoskeletal                      | ebi-a-GCST003156                |
| Asthma-related infections                                                                                                    | Asthma_INFECTIONS        | 0.40 [0.32, 0.50]   | 1.110E-15 | 0.44 [0.35, 0.56] | 5.270E-12 | 0.39 [0.31, 0.50]   | 8.805E-14 | Respiratory                          | finn-b-ASTHMA_INFECTIONS        |
| Atopic dermatitis                                                                                                            | Atopic dermatitis        | 1.52 [1.37, 1.70]   | 2.490E-14 | 1.26 [1.13, 1.41] | 4.936E-05 | 1.81 [1.57, 2.08]   | 2.148E-16 | Skin                                 | finn-b-L12_ATOPIC               |
| Type 1 diabetes without complications                                                                                        | T1DNOCOMP                | 0.91 [0.88, 0.93]   | 4.890E-14 | 1.01 [0.98, 1.04] | 4.701E-01 | 0.89 [0.86, 0.92]   | 2.090E-12 | Endocrine, nutritional and metabolic | finn-b-E4_DM1NOCOMP             |
| Type 1 diabetes                                                                                                              | T1D_S3                   | 0.94 [0.92, 0.95]   | 1.410E-13 | 1.02 [0.99, 1.05] | 1.334E-01 | 0.92 [0.89, 0.95]   | 3.142E-07 | Endocrine, nutritional and metabolic | ebi-a-GCST90000529              |
| Celiac disease                                                                                                               | CeD_S5                   | 1.18 [1.12, 1.23]   | 1.120E-12 | 1.12 [1.06, 1.19] | 5.594E-05 | 1.14 [1.08, 1.20]   | 1.683E-06 | Digestive                            | ieu-a-1060                      |
| Type 1 diabetes, strict definition                                                                                           | T1D_STRICT               | 0.93 [0.91, 0.95]   | 1.830E-11 | 0.99 [0.96, 1.03] | 6.223E-01 | 0.93 [0.91, 0.96]   | 5.966E-08 | Endocrine, nutritional and metabolic | finn-b-T1D_STRICT               |
| Type 1 diabetes, wide definition, subgroup 1                                                                                 | T1D_wide                 | 0.91 [0.89, 0.94]   | 3.060E-11 | 1.00 [0.98, 1.03] | 7.818E-01 | 0.96 [0.94, 0.99]   | 1.741E-03 | Endocrine, nutritional and metabolic | finn-b-T1D_WIDE1                |
| Celiac disease                                                                                                               | CeD_S2                   | 1.06 [1.04, 1.08]   | 3.560E-11 | 1.08 [1.06, 1.10] | 6.591E-18 | 1.03 [1.02, 1.05]   | 6.649E-06 | Digestive                            | ebi-a-GCST005523                |
| Multiple sclerosis                                                                                                           | MS_S3                    | 1.09 [1.06, 1.11]   | 1.320E-10 | 0.98 [0.94, 1.02] | 2.444E-01 | 0.94 [0.91, 0.97]   | 7.688E-05 | Mental and Nervous                   | ieu-a-1024                      |
| Primary biliary cirrhosis                                                                                                    | PBC_S2                   | 1.08 [1.06, 1.11]   | 1.710E-10 | 1.04 [1.02, 1.07] | 1.995E-03 | 1.08 [1.05, 1.11]   | 3.024E-08 | Digestive                            | ebi-a-GCST005581                |
| Type 1 diabetes                                                                                                              | T1D_S2                   | 0.92 [0.90, 0.95]   | 6.990E-10 | 0.99 [0.97, 1.01] | 4.482E-01 | 0.93 [0.90, 0.95]   | 1.718E-10 | Endocrine, nutritional and metabolic | ebi-a-GCST010681                |
| Diabetes diagnosed by doctor                                                                                                 | Diabetes_diagnosed       | 0.00 [0.00, 0.01]   | 1.320E-09 | 0.01 [0.00, 0.17] | 7.673E-04 | 0.00 [0.00, 0.00]   | 3.207E-15 | Endocrine, nutritional and metabolic | ukb-a-306                       |
| Ankylosing spondylitis                                                                                                       | AS                       | 1.41 [1.25, 1.59]   | 1.680E-08 | 1.38 [1.22, 1.56] | 2.934E-07 | 1.04 [0.90, 1.19]   | 5.986E-01 | Musculoskeletal                      | ebi-a-GCST005529                |
| Rheumatoid arthritis                                                                                                         | RA_S4                    | 1.13 [1.08, 1.18]   | 4.610E-08 | 1.10 [1.06, 1.15] | 2.381E-06 | 1.13 [1.07, 1.18]   | 2.536E-06 | Musculoskeletal                      | ieu-a-832                       |
| Type 1 diabetes                                                                                                              | T1D_S4                   | 0.95 [0.93, 0.97]   | 4.130E-07 | 1.01 [0.98, 1.04] | 4.630E-01 | 0.95 [0.92, 0.97]   | 6.276E-05 | Endocrine, nutritional and metabolic | finn-b-E4_DM1                   |
| Allergic disease (asthma, hay fever or eczema)                                                                               | Allergic disease         | 1.79 [1.41, 2.26]   | 1.350E-06 | 2.10 [1.63, 2.71] | 8.663E-09 | 3.21 [2.54, 4.05]   | 1.215E-22 | Respiratory                          | ebi-a-GCST005038                |
| Diagnoses - secondary ICD10: J45.9 Asthma,                                                                                   | Asthma_unspecified       | 0.00 [0.00, 0.00]   | 1.390E-06 | 0.00 [0.00, 0.00] | 2.278E-05 | 0.00 [0.00, 0.01]   | 2.630E-05 | Respiratory                          | ukb-b-17219                     |
| Hypothyroidism, drug reimbursement                                                                                           | HYPOTHY_REIMB            | 0.89 [0.85, 0.94]   | 8.360E-06 | 1.05 [0.95, 1.16] | 3.485E-01 | 0.73 [0.69, 0.78]   | 5.473E-20 | Endocrine, nutritional and metabolic | finn-b-HYPOTHY_REIMB            |
| Type 1 diabetes                                                                                                              | T1D_S1                   | 1.05 [1.03, 1.07]   | 2.440E-05 | 1.04 [1.01, 1.06] | 7.211E-03 | 1.14 [1.10, 1.19]   | 4.324E-13 | Endocrine, nutritional and metabolic | ebi-a-GCST005536                |
| Psoriasis vulgaris                                                                                                           | Psori_vulg               | 1.07 [1.04, 1.11]   | 2.620E-05 | 1.32 [1.22, 1.44] | 1.938E-11 | 1.09 [1.05, 1.13]   | 1.854E-05 | Skin                                 | finn-b-L12_PSORI_VULG           |
| Coronary artery disease                                                                                                      | CAD                      | 1.40 [1.19, 1.64]   | 3.930E-05 | 1.42 [1.17, 1.73] | 4.036E-04 | 1.41 [1.16, 1.71]   | 4.767E-04 | Blood and circulatory                | ebi-a-GCST003116                |
| Vascular/heart problems diagnosed by doctor: High blood pressure                                                             | Hypertension             | 0.10 [0.03, 0.31]   | 4.370E-05 | 0.19 [0.06, 0.59] | 4.125E-03 | 0.91 [0.31, 2.65]   | 8.618E-01 | Blood and circulatory                | ukb-b-14177                     |
| Asthma (childhood onset)                                                                                                     | Asthma (childhood onset) | 0.98 [0.98, 0.99]   | 5.430E-05 | 0.95 [0.95, 0.96] | 7.357E-40 | 0.95 [0.94, 0.96]   | 4.197E-39 | Respiratory                          | ebi-a-GCST007800                |
| Systemic lupus erythematosus                                                                                                 | SLE_S2                   | 0.92 [0.88, 0.96]   | 8.870E-05 | 0.93 [0.89, 0.98] | 5.418E-03 | 0.91 [0.87, 0.96]   | 1.625E-04 | Musculoskeletal                      | ieu-a-815                       |
| Rheumatoid Arthritis                                                                                                         | RA_S6                    | 1.07 [1.03, 1.11]   | 3.974E-04 | 1.09 [1.05, 1.13] | 8.742E-06 | 0.89 [0.85, 0.92]   | 7.546E-09 | Musculoskeletal                      | bbj-a-73                        |
| Blood clot DVT bronchitis emphysema asthma rhinitis eczema allergy diagnosed by doctor: Hayfever allergic rhinitis or eczema | Diagnosis_2              | 12.53 [4.05, 38.71] | 7.293E-04 | 3.65 [1.75, 7.61] | 5.396E-04 | 14.54 [3.93, 53.79] | 2.052E-03 | Skin                                 | ukb-a-447                       |
| Disorders of the thyroid gland                                                                                               | Disorders_2              | 0.86 [0.79, 0.94]   | 1.050E-03 | 1.17 [1.05, 1.31] | 5.434E-03 | 0.65 [0.59, 0.73]   | 3.180E-14 | Endocrine, nutritional and metabolic | finn-b-E4_THYROID               |
| Hypothyroidism (congenital or acquired)                                                                                      | HYPOTHY                  | 0.89 [0.83, 0.96]   | 1.696E-03 | 1.14 [1.04, 1.24] | 5.351E-03 | 0.70 [0.64, 0.77]   | 3.098E-14 | Endocrine, nutritional and metabolic | finn-b-HYPOTHYROIDISM           |
| Diagnoses - main ICD10: D22 Melanocytic naevi                                                                                | Melanocytic naevi        | 0.00 [0.00, 0.00]   | 1.828E-03 | 0.00 [0.00, 0.00] | 1.678E-04 | 0.00 [0.00, 0.09]   | 1.872E-02 | Neoplasms                            | ukb-d-D22                       |
| Celiac disease                                                                                                               | CeD_S1                   | 1.07 [1.03, 1.12]   | 2.026E-03 | 1.22 [1.15, 1.29] | 3.949E-11 | 1.14 [1.07, 1.20]   | 7.445E-06 | Digestive                            | ebi-a-GCST000612                |
| Celiac disease                                                                                                               | CeD_S6                   | 1.07 [1.03, 1.12]   | 2.030E-03 | 1.05 [1.00, 1.10] | 5.366E-02 | 1.14 [1.07, 1.20]   | 7.615E-06 | Digestive                            | ieu-a-276                       |
| Thyrototoxicosis with diffuse goitre                                                                                         | THYTOXGOITDIF            | 0.95 [0.92, 0.98]   | 2.384E-03 | 1.02 [0.98, 1.07] | 3.112E-01 | 0.91 [0.87, 0.96]   | 1.561E-04 | Endocrine, nutritional and metabolic | finn-b-E4_THYTOXGOITDIF         |

|                                                                                   |                       |                    |           |                      |           |                       |           |                                      |                                 |
|-----------------------------------------------------------------------------------|-----------------------|--------------------|-----------|----------------------|-----------|-----------------------|-----------|--------------------------------------|---------------------------------|
| Hypothyroidism, levothyroxin purchases                                            | HYPOTHY_LEVOTHY       | 0.90 [0.84, 0.96]  | 3.108E-03 | 1.14 [1.04, 1.24]    | 5.351E-03 | 0.73 [0.67, 0.80]     | 1.539E-11 | Endocrine, nutritional and metabolic | finn-b-HYPOTHY_LEVOTHY          |
| Asthma                                                                            | Asthma_meta           | 0.87 [0.79, 0.96]  | 5.191E-03 | 0.85 [0.75, 0.95]    | 6.427E-03 | 0.86 [0.77, 0.97]     | 1.524E-02 | Respiratory                          | ebi-a-GCST006862                |
| Myocardial infarction                                                             | Asthma_unspecified    | 1.23 [1.06, 1.44]  | 6.569E-03 | 1.41 [1.20, 1.67]    | 4.487E-05 | 1.21 [1.01, 1.46]     | 3.804E-02 | Blood and circulatory                | ebi-a-GCST011365                |
| Gastroesophageal reflux disease                                                   | GERD                  | 0.69 [0.52, 0.90]  | 7.075E-03 | 0.93 [0.69, 1.27]    | 6.585E-01 | 0.53 [0.41, 0.69]     | 1.751E-06 | Digestive                            | ebi-a-GCST90000514              |
| Coronary atherosclerosis                                                          | CORATHER              | 1.28 [1.07, 1.53]  | 7.604E-03 | 1.28 [1.03, 1.59]    | 2.578E-02 | 1.01 [0.77, 1.32]     | 9.565E-01 | Blood and circulatory                | finn-b-I9_CORATHER              |
| Diabetes, varying definitions                                                     | Diabetes_FG           | 0.88 [0.79, 0.97]  | 1.094E-02 | 0.90 [0.79, 1.02]    | 1.068E-01 | 0.81 [0.74, 0.88]     | 7.667E-07 | Endocrine, nutritional and metabolic | finn-b-DIABETES_FG              |
| Autoimmune diseases                                                               | Autoimmune diseases   | 1.10 [1.02, 1.18]  | 1.222E-02 | 1.21 [1.11, 1.31]    | 9.127E-06 | 0.68 [0.63, 0.74]     | 5.498E-19 | Blood and circulatory                | finn-b-AUTOIMMUNE               |
| Coronary atherosclerosis (no controls excluded)                                   | CORATHER_EXNONE       | 1.29 [1.06, 1.57]  | 1.228E-02 | 1.30 [1.03, 1.66]    | 3.027E-02 | 1.01 [0.75, 1.35]     | 9.720E-01 | Blood and circulatory                | finn-b-I9_CORATHER_EXNONE       |
| Type 2 diabetes, definitions combined, including                                  | T2D_INCLAVO           | 0.86 [0.76, 0.97]  | 1.241E-02 | 0.93 [0.80, 1.08]    | 3.323E-01 | 0.82 [0.71, 0.95]     | 9.433E-03 | Endocrine, nutritional and metabolic | finn-b-T2D_INCLAVO              |
| Disorders of gallbladder, biliary tract and pancreas                              | Disorders_3           | 0.00 [0.00, 0.27]  | 1.420E-02 | 0.00 [0.00, 0.00]    | 5.688E-05 | 0.11 [0.00, 44.41]    | 4.685E-01 | Digestive                            | ukb-d-K11_GALLBLIPANC           |
| Vascular/heart problems diagnosed by doctor: None of the above                    | Diagnosis_1           | 2.79 [1.21, 6.42]  | 1.612E-02 | 2.00 [0.74, 5.42]    | 1.721E-01 | 1.15 [0.44, 3.03]     | 7.785E-01 | Blood and circulatory                | ukb-b-13352                     |
| Diabetes, insuline treatment (Kela reimbursement)                                 | KELA_DIAB_INSUL       | 0.91 [0.84, 0.98]  | 1.679E-02 | 0.85 [0.77, 0.94]    | 1.438E-03 | 0.88 [0.83, 0.94]     | 2.733E-04 | Endocrine, nutritional and metabolic | finn-b-KELA_DIAB_INSUL          |
| Type 2 diabetes                                                                   | T2D_S3                | 0.88 [0.79, 0.98]  | 1.804E-02 | 0.88 [0.79, 0.98]    | 1.716E-02 | 0.94 [0.83, 1.06]     | 3.211E-01 | Endocrine, nutritional and metabolic | ebi-a-GCST007517                |
| Ischaemic heart disease, wide definition                                          | IHD                   | 1.22 [1.03, 1.45]  | 2.221E-02 | 1.21 [0.98, 1.49]    | 8.089E-02 | 1.38 [1.15, 1.67]     | 7.501E-04 | Blood and circulatory                | finn-b-I9_IHD                   |
| Major depression                                                                  | Major depression      | 0.61 [0.40, 0.93]  | 2.270E-02 | 1.42 [0.94, 2.12]    | 9.278E-02 | 0.58 [0.35, 0.95]     | 2.903E-02 | Mental and Nervous                   | ieu-b-102                       |
| Nasal polyp                                                                       | Nasal polyp           | 0.90 [0.83, 0.99]  | 2.393E-02 | 0.97 [0.87, 1.07]    | 5.141E-01 | 0.81 [0.73, 0.91]     | 2.951E-04 | Respiratory                          | finn-b-J10_NASALPOLYP           |
| Rheumatoid arthritis                                                              | RA_S2                 | 0.97 [0.93, 1.00]  | 3.740E-02 | 1.09 [1.04, 1.13]    | 3.777E-05 | 0.85 [0.82, 0.89]     | 1.090E-13 | Musculoskeletal                      | ebi-a-GCST002318                |
| Other diabetes, wide definition                                                   | Diabetes_wide         | 0.90 [0.82, 1.00]  | 3.924E-02 | 0.93 [0.83, 1.05]    | 2.570E-01 | 0.88 [0.82, 0.96]     | 2.368E-03 | Endocrine, nutritional and metabolic | finn-b-DM_OTHER_WIDE            |
| Mouth/teeth dental problems: Mouth ulcers                                         | Asthma_diagnosed      | 2.52 [1.05, 6.05]  | 3.934E-02 | 6.61 [2.21, 19.74]   | 7.273E-04 | 0.65 [0.22, 1.90]     | 4.292E-01 | Digestive                            | ukb-a-427                       |
| Type 2 diabetes, strict (exclude DM1)                                             | T2D_STRICT            | 0.87 [0.76, 1.00]  | 4.219E-02 | 0.87 [0.75, 1.02]    | 7.903E-02 | 0.85 [0.73, 1.00]     | 5.268E-02 | Endocrine, nutritional and metabolic | finn-b-E4_DM2_STRICT            |
| Type 2 diabetes, definitions combined                                             | T2D_S5                | 0.87 [0.76, 1.00]  | 4.245E-02 | 0.93 [0.79, 1.10]    | 3.972E-01 | 0.85 [0.73, 1.00]     | 5.334E-02 | Endocrine, nutritional and metabolic | finn-b-T2D                      |
| Pure hypercholesterolaemia                                                        | FH_Finn               | 1.08 [1.00, 1.17]  | 5.580E-02 | 1.09 [0.98, 1.21]    | 9.749E-02 | 1.08 [0.98, 1.19]     | 1.224E-01 | Endocrine, nutritional and metabolic | finn-b-E4_HYPERCHOL             |
| Celiac disease                                                                    | CeD_S4                | 1.04 [1.00, 1.09]  | 6.244E-02 | 1.03 [0.98, 1.08]    | 3.110E-01 | 1.10 [1.04, 1.17]     | 8.547E-04 | Digestive                            | ieu-a-1059                      |
| Basal cell carcinoma                                                              | BCC                   | 1.09 [0.99, 1.20]  | 7.574E-02 | 1.04 [0.94, 1.16]    | 4.488E-01 | 1.11 [0.99, 1.25]     | 7.136E-02 | Neoplasms                            | ebi-a-GCST90013410              |
| Diagnoses - main ICD10: D12 Benign neoplasm of colon, rectum, anus and anal canal | Digestive Neoplasms   | 0.03 [0.00, 1.66]  | 8.687E-02 | 0.06 [0.00, 8.59]    | 2.664E-01 | 0.14 [0.00, 16.43]    | 4.139E-01 | Neoplasms                            | ukb-d-D12                       |
| Colorectal cancer                                                                 | Colorectal cancer     | 0.01 [0.00, 2.09]  | 9.296E-02 | 0.02 [0.00, 9.48]    | 2.028E-01 | 0.06 [0.00, 28.22]    | 3.656E-01 | Digestive                            | ieu-b-4965                      |
| Diagnoses - secondary ICD10: E78.0 Pure hypercholesterolaemia                     | FH_UKB                | 6.44 [0.72, 58.07] | 9.667E-02 | 31.32 [2.38, 412.08] | 8.803E-03 | 4.49 [0.32, 63.37]    | 2.659E-01 | Endocrine, nutritional and metabolic | ukb-b-12651                     |
| Diagnoses - secondary ICD10: E11.9 Without purchases required                     | T2D_nocom             | 0.08 [0.00, 1.67]  | 1.029E-01 | 0.00 [0.00, 0.14]    | 2.597E-03 | 1.03 [0.03, 40.91]    | 9.855E-01 | Endocrine, nutritional and metabolic | ukb-b-970                       |
| Hypothyroidism, strict autoimmune, 3 medication purchases required                | HYTHY_AI_STRICT_PURCH | 1.07 [0.99, 1.16]  | 1.077E-01 | 1.14 [1.04, 1.24]    | 3.594E-03 | 0.77 [0.69, 0.86]     | 2.701E-06 | Endocrine, nutritional and metabolic | finn-b-E4_HYTHY_AI_STRICT_PURCH |
| Disorders of lipoprotein metabolism and other                                     | Disorders_1           | 1.07 [0.98, 1.16]  | 1.124E-01 | 1.07 [0.96, 1.19]    | 1.956E-01 | 1.06 [0.96, 1.18]     | 2.236E-01 | Endocrine, nutritional and metabolic | finn-b-E4_LIPOPROT              |
| Haemorrhoidal disease                                                             | HD                    | 1.26 [0.94, 1.68]  | 1.200E-01 | 2.64 [1.93, 3.63]    | 1.742E-09 | 0.72 [0.51, 1.02]     | 6.729E-02 | Digestive                            | ebi-a-GCST90014033              |
| Myocardial infarction                                                             | Allergic disease      | 1.15 [0.96, 1.38]  | 1.275E-01 | 1.41 [1.16, 1.71]    | 4.520E-04 | 1.08 [0.87, 1.34]     | 5.032E-01 | Blood and circulatory                | ebi-a-GCST011364                |
| Parkinson's disease                                                               | PD                    | 1.08 [0.98, 1.20]  | 1.321E-01 | 1.13 [0.99, 1.29]    | 6.057E-02 | 1.04 [0.92, 1.18]     | 5.293E-01 | Mental and Nervous                   | ieu-b-7                         |
| Coronary heart disease                                                            | CHD                   | 1.10 [0.97, 1.25]  | 1.383E-01 | 1.13 [0.96, 1.32]    | 1.423E-01 | 1.04 [0.89, 1.21]     | 6.084E-01 | Blood and circulatory                | ieu-a-8                         |
| Prostate cancer                                                                   | Prostate cancer       | 0.94 [0.86, 1.02]  | 1.460E-01 | 0.95 [0.86, 1.04]    | 2.769E-01 | 0.97 [0.88, 1.08]     | 6.216E-01 | Neoplasms                            | ebi-a-GCST006085                |
| Rheumatoid arthritis                                                              | RA_S1                 | 0.98 [0.96, 1.01]  | 1.955E-01 | 1.17 [1.13, 1.21]    | 1.835E-18 | 0.83 [0.80, 0.85]     | 6.117E-34 | Musculoskeletal                      | ebi-a-GCST000679                |
| Asthma (adult onset)                                                              | Asthma (adult onset)  | 0.99 [0.98, 1.00]  | 1.957E-01 | 1.03 [1.02, 1.05]    | 3.643E-06 | 0.92 [0.91, 0.93]     | 4.765E-33 | Respiratory                          | ebi-a-GCST007799                |
| Cancer of skin                                                                    | Cancer of skin        | 6.90 [0.95, 49.88] | 1.958E-01 | 2.54 [0.15, 41.86]   | 5.143E-01 | 40.15 [1.20, 1342.63] | 1.753E-01 | Neoplasms                            | ukb-d-C_SKIN                    |
| Type 2 diabetes                                                                   | T2D_S4                | 0.93 [0.82, 1.04]  | 1.983E-01 | 0.88 [0.77, 1.01]    | 6.841E-02 | 0.81 [0.69, 0.95]     | 9.598E-03 | Endocrine, nutritional and metabolic | finn-b-E4_DM2                   |
| Thyroid cancer                                                                    | Thyroid cancer        | 1.00 [1.00, 1.01]  | 2.108E-01 | 1.00 [1.00, 1.01]    | 1.418E-01 | 1.00 [1.00, 1.01]     | 1.756E-01 | Endocrine, nutritional and metabolic | ieu-a-1082                      |
| Type 2 diabetes with other specified/multiple/unspecified complications           | T2D_NASCOMP           | 0.91 [0.78, 1.06]  | 2.144E-01 | 0.93 [0.79, 1.10]    | 3.997E-01 | 0.83 [0.72, 0.97]     | 1.536E-02 | Endocrine, nutritional and metabolic | finn-b-E4_DM2NASCOMP            |
| Hypothyroidism, strict autoimmune                                                 | HYTHY_AI_STRICT       | 1.05 [0.97, 1.14]  | 2.403E-01 | 1.12 [1.03, 1.21]    | 1.011E-02 | 0.81 [0.73, 0.89]     | 2.161E-05 | Endocrine, nutritional and metabolic | finn-b-E4_HYTHY_AI_STRICT       |
| Type 2 diabetes                                                                   | T2D_S1                | 0.95 [0.86, 1.04]  | 2.634E-01 | 0.95 [0.85, 1.06]    | 3.469E-01 | 0.96 [0.86, 1.07]     | 4.690E-01 | Endocrine, nutritional and metabolic | ebi-a-GCST005047                |
| Psoriasis                                                                         | Psoriasis             | 1.01 [0.99, 1.02]  | 2.720E-01 | 0.98 [0.97, 1.00]    | 6.202E-02 | 1.09 [1.07, 1.11]     | 6.365E-22 | Skin                                 | ebi-a-GCST005527                |
| Breast cancer                                                                     | Breast cancer_S1      | 0.91 [0.76, 1.10]  | 3.324E-01 | 1.06 [0.87, 1.31]    | 5.485E-01 | 1.62 [1.26, 2.08]     | 1.592E-04 | Neoplasms                            | ebi-a-GCST004988                |
| multiple sclerosis                                                                | MS_S4                 | 0.99 [0.96, 1.01]  | 3.577E-01 | 1.17 [1.13, 1.21]    | 4.169E-18 | 1.00 [0.97, 1.04]     | 9.345E-01 | Mental and Nervous                   | ieu-b-18                        |
| Bipolar disorder                                                                  | Bipolar disorder      | 0.96 [0.88, 1.05]  | 3.745E-01 | 1.00 [0.90, 1.11]    | 9.933E-01 | 0.93 [0.84, 1.03]     | 1.523E-01 | Mental and Nervous                   | ieu-a-800                       |
| Narcolepsy                                                                        | Narcolepsy            | 1.03 [0.97, 1.09]  | 3.802E-01 | 1.00 [0.93, 1.08]    | 9.376E-01 | 1.05 [0.97, 1.13]     | 2.279E-01 | Mental and Nervous                   | ebi-a-GCST005522                |
| schizophrenia                                                                     | Schizophrenia         | 1.05 [0.94, 1.16]  | 3.901E-01 | 1.04 [0.92, 1.18]    | 5.482E-01 | 1.06 [0.94, 1.20]     | 3.679E-01 | Mental and Nervous                   | ieu-b-42                        |

|                                                                                                   |                  |                   |           |                    |           |                   |           |                                      |                    |
|---------------------------------------------------------------------------------------------------|------------------|-------------------|-----------|--------------------|-----------|-------------------|-----------|--------------------------------------|--------------------|
| Hypothyroidism, other/unspecified                                                                 | HYTHYNAS         | 1.03 [0.95, 1.12] | 4.753E-01 | 1.14 [1.05, 1.24]  | 1.684E-03 | 0.79 [0.71, 0.88] | 1.838E-05 | Endocrine, nutritional and metabolic | finn-b-E4_HYTHYNAS |
| Rheumatoid arthritis                                                                              | RA_S3            | 1.00 [0.97, 1.02] | 7.660E-01 | 1.08 [1.05, 1.11]  | 4.573E-07 | 0.85 [0.82, 0.89] | 6.439E-17 | Musculoskeletal                      | ebi-a-GCST005569   |
| Rheumatoid arthritis                                                                              | RA_S5            | 1.00 [0.98, 1.02] | 8.795E-01 | 1.17 [1.13, 1.21]  | 1.959E-18 | 0.83 [0.80, 0.86] | 2.957E-30 | Musculoskeletal                      | ieu-a-834          |
| Type 2 diabetes                                                                                   | T2D_S2           | 1.00 [0.94, 1.08] | 8.869E-01 | 0.89 [0.83, 0.97]  | 6.933E-03 | 0.90 [0.81, 0.99] | 2.503E-02 | Endocrine, nutritional and metabolic | ebi-a-GCST006867   |
| Type 2 diabetes (adjusted for BMI)                                                                | T2D_adjusted     | 1.00 [0.93, 1.08] | 9.259E-01 | 0.98 [0.91, 1.07]  | 7.196E-01 | 1.13 [1.04, 1.23] | 3.311E-03 | Endocrine, nutritional and metabolic | ebi-a-GCST007518   |
| Type 2 diabetes                                                                                   | T2D_S6           | 1.00 [0.93, 1.08] | 9.263E-01 | 0.97 [0.89, 1.06]  | 4.608E-01 | 1.10 [1.01, 1.20] | 2.898E-02 | Endocrine, nutritional and metabolic | ebi-a-GCST007515   |
| Blood clot DVT bronchitis emphysema asthma<br>rhinitis eczema allergy diagnosed by doctor: Asthma | Diagnosis_1      | 0.98 [0.34, 2.81] | 9.640E-01 | 3.96 [1.36, 11.48] | 1.135E-02 | 0.38 [0.10, 1.49] | 1.653E-01 | Respiratory                          | ukb-a-446          |
| Breast cancer                                                                                     | Breast cancer_S2 | 1.00 [0.99, 1.01] | 9.716E-01 | 1.00 [0.99, 1.01]  | 6.417E-01 | 1.00 [0.99, 1.01] | 9.749E-01 | Neoplasms                            | ebi-a-GCST007236   |
| Doctor diagnosed asthma                                                                           | Asthma_diagnosed | 1.01 [0.37, 2.82] | 9.778E-01 | 0.99 [0.27, 3.60]  | 9.937E-01 | 0.62 [0.18, 2.15] | 4.521E-01 | Respiratory                          | ukb-a-255          |
| Osteoarthritis of the hip or knee                                                                 | OA of hip/knee   | 1.00 [0.77, 1.30] | 9.943E-01 | 1.06 [0.76, 1.46]  | 7.462E-01 | 0.99 [0.72, 1.36] | 0.9487527 | Musculoskeletal                      | ebi-a-GCST007092   |

Supplementary Table 3. Disease-wide MR analysis results in reverse direction

| Trait                                                                                                                              | Name                     | IBD               |           | UC                |            | CD                 |            | Category                             | GWAS-ID                         |
|------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------|-----------|-------------------|------------|--------------------|------------|--------------------------------------|---------------------------------|
|                                                                                                                                    |                          | OR [95%CI]        | pval      | OR [95%CI]        | pval       | OR [95%CI]         | pval       |                                      |                                 |
| Diabetic hypoglycemia                                                                                                              | Diabetic hypoglycemia    | 0.98 [0.94, 1.03] | 4.179E-01 | 1.00 [0.96, 1.05] | 9.952E-01  | 1.00 [0.96, 1.04]  | 8.908E-01  | Endocrine, nutritional and metabolic | finn-b-DM_HYPOGLYC              |
| Asthma                                                                                                                             | Asthma_UKB               | 1.00 [0.99, 1.01] | 8.595E-01 | 1.01 [1.00, 1.03] | 4.714E-02  | 1.03 [1.01, 1.04]  | 4.371E-06  | Respiratory                          | ebi-a-GCST90014325              |
| Type 1 diabetes with coma                                                                                                          | T1D_COMA                 | 0.97 [0.90, 1.05] | 4.741E-01 | 1.00 [0.92, 1.08] | 9.523E-01  | 1.00 [0.94, 1.07]  | 9.631E-01  | Endocrine, nutritional and metabolic | finn-b-E4_DM1COMA               |
| Diabetes, several complications                                                                                                    | DM_SEVERAL_COMPLICATIONS | 1.00 [0.96, 1.03] | 8.090E-01 | 0.99 [0.95, 1.03] | 5.695E-01  | 1.01 [0.98, 1.04]  | 6.760E-01  | Endocrine, nutritional and metabolic | finn-b-DM_SEVERAL_COMPLICATIONS |
| Other diabetic retinopathy                                                                                                         | RETINOPATHYDIAB_NAS      | 0.95 [0.88, 1.03] | 2.274E-01 | 0.93 [0.85, 1.01] | 8.512E-02  | 0.98 [0.91, 1.05]  | 5.885E-01  | Endocrine, nutritional and metabolic | finn-b-H7_RETINOPATHYDIAB_NAS   |
| Multiple sclerosis                                                                                                                 | MS_S1                    | 1.09 [1.06, 1.12] | 7.906E-08 | 1.07 [1.03, 1.10] | 1.810E-04  | 1.10 [1.07, 1.13]  | 8.476E-11  | Mental and Nervous                   | ieu-a-1025                      |
| Multiple sclerosis                                                                                                                 | MS_S2                    | 1.09 [1.05, 1.12] | 1.697E-07 | 1.07 [1.03, 1.10] | 1.908E-04  | 1.10 [1.07, 1.13]  | 1.251E-10  | Mental and Nervous                   | ebi-a-GCST005531                |
| Diabetes mellitus                                                                                                                  | DM                       | 0.99 [0.97, 1.01] | 2.900E-01 | 0.99 [0.97, 1.00] | 1.420E-01  | 1.01 [0.99, 1.02]  | 2.983E-01  | Endocrine, nutritional and metabolic | finn-b-E4_DIABETES              |
| Primary biliary cholangitis                                                                                                        | PBC_S1                   | 1.24 [1.14, 1.35] | 6.449E-07 | 1.09 [0.99, 1.19] | 6.979E-02  | 1.12 [1.05, 1.20]  | 6.510E-04  | Digestive                            | ebi-a-GCST003129                |
| Diabetes, insuline treatment (Kela reimbursement)<br>(more controls excluded)                                                      | KELA_DIAB_INSUL_EXMORE   | 0.99 [0.98, 1.01] | 5.013E-01 | 0.98 [0.96, 1.00] | 8.896E-02  | 1.01 [0.99, 1.03]  | 2.836E-01  | Endocrine, nutritional and metabolic | finn-b-KELA_DIAB_INSUL_EXMORE   |
| Celiac disease                                                                                                                     | CeD_S3                   | 1.20 [1.09, 1.32] | 2.128E-04 | 1.07 [0.98, 1.17] | 1.109E-01  | 1.26 [1.16, 1.37]  | 9.187E-08  | Digestive                            | ieu-a-1058                      |
| Blood clot DVT bronchitis emphysema asthma<br>rhinitis eczema allergy diagnosed by doctor: None of                                 | Diagnosis_3              | 1.00 [0.99, 1.00] | 5.958E-04 | 1.00 [1.00, 1.00] | 1.857E-01  | 0.99 [0.99, 0.99]  | 2.522E-14  | Skin                                 | ukb-a-442                       |
| Systemic lupus erythematosus                                                                                                       | SLE_S1                   | 1.07 [1.01, 1.13] | 1.431E-02 | 1.06 [1.00, 1.12] | 4.213E-02  | 0.98 [0.93, 1.02]  | 2.998E-01  | Musculoskeletal                      | ebi-a-GCST003156                |
| Asthma-related infections                                                                                                          | Asthma_INFECTIONS        | 1.03 [1.00, 1.06] | 4.213E-02 | 1.01 [0.98, 1.04] | 3.828E-01  | 1.03 [1.01, 1.06]  | 8.727E-03  | Respiratory                          | finn-b-ASTHMA_INFECTIONS        |
| Atopic dermatitis                                                                                                                  | Atopic dermatitis        | 1.05 [1.02, 1.08] | 1.883E-03 | 1.02 [0.99, 1.05] | 2.422E-01  | 1.04 [1.01, 1.07]  | 1.174E-02  | Skin                                 | finn-b-L12_ATOPIC               |
| Type 1 diabetes without complications                                                                                              | T1DNOCOMP                | 1.01 [0.97, 1.06] | 5.284E-01 | 1.02 [0.97, 1.06] | 5.028E-01  | 1.01 [0.98, 1.05]  | 5.425E-01  | Endocrine, nutritional and metabolic | finn-b-E4_DM1NOCOMP             |
| Type 1 diabetes                                                                                                                    | T1D_S3                   | 1.07 [1.03, 1.12] | 4.825E-04 | 1.04 [1.00, 1.09] | 6.163E-02  | 1.01 [0.98, 1.05]  | 5.345E-01  | Endocrine, nutritional and metabolic | ebi-a-GCST90000529              |
| Celiac disease                                                                                                                     | CeD_S5                   | 1.42 [1.18, 1.69] | 1.496E-04 | 1.40 [1.18, 1.67] | 1.283E-04  | 1.11 [0.93, 1.33]  | 2.275E-01  | Digestive                            | ieu-a-1060                      |
| Type 1 diabetes, strict definition                                                                                                 | T1D_STRICT               | 0.99 [0.94, 1.05] | 8.037E-01 | 1.01 [0.95, 1.07] | 6.982E-01  | 1.00 [0.95, 1.05]  | 8.620E-01  | Endocrine, nutritional and metabolic | finn-b-T1D_STRICT               |
| Type 1 diabetes, wide definition, subgroup 1                                                                                       | T1D_wide                 | 1.00 [0.96, 1.04] | 8.879E-01 | 1.00 [0.96, 1.05] | 9.237E-01  | 1.02 [0.98, 1.05]  | 3.746E-01  | Endocrine, nutritional and metabolic | finn-b-T1D_WIDE1                |
| Celiac disease                                                                                                                     | CeD_S2                   | NA                | NA        | NA                | NA         | NA                 | NA         | Digestive                            | ebi-a-GCST005523                |
| Multiple sclerosis                                                                                                                 | MS_S3                    | 1.12 [1.05, 1.20] | 1.279E-03 | 1.13 [1.06, 1.20] | 1.671E-04  | 1.04 [0.99, 1.09]  | 1.546E-01  | Mental and Nervous                   | ieu-a-1024                      |
| Primary biliary cirrhosis                                                                                                          | PBC_S2                   | NA                | NA        | NA                | NA         | NA                 | NA         | Digestive                            | ebi-a-GCST005581                |
| Type 1 diabetes                                                                                                                    | T1D_S2                   | 1.02 [0.98, 1.07] | 3.343E-01 | 1.02 [0.98, 1.07] | 3.559E-01  | 0.99 [0.95, 1.02]  | 4.303E-01  | Endocrine, nutritional and metabolic | ebi-a-GCST010681                |
| Diabetes diagnosed by doctor                                                                                                       | Diabetes_diagnosed       | 1.00 [1.00, 1.00] | 3.743E-01 | 1.00 [1.00, 1.00] | 4.277E-01  | 1.00 [1.00, 1.00]  | 1.965E-02  | Endocrine, nutritional and metabolic | ukb-a-306                       |
| Ankylosing spondylitis                                                                                                             | AS                       | NA                | NA        | NA                | NA         | NA                 | NA         | Musculoskeletal                      | ebi-a-GCST005529                |
| Rheumatoid arthritis                                                                                                               | RA_S4                    | 1.01 [0.98, 1.04] | 4.259E-01 | 1.03 [1.00, 1.07] | 2.944E-02  | 0.97 [0.94, 0.99]  | 1.435E-02  | Musculoskeletal                      | ieu-a-832                       |
| Type 1 diabetes                                                                                                                    | T1D_S4                   | 0.99 [0.96, 1.03] | 6.570E-01 | 1.01 [0.97, 1.05] | 6.427E-01  | 1.01 [0.97, 1.04]  | 6.779E-01  | Endocrine, nutritional and metabolic | finn-b-E4_DM1                   |
| Allergic disease (asthma, hay fever or eczema)                                                                                     | Allergic disease         | 1.01 [1.00, 1.02] | 8.263E-02 | 1.00 [0.99, 1.01] | 6.658E-01  | 1.02 [1.01, 1.03]  | 7.000E-05  | Respiratory                          | ebi-a-GCST005038                |
| Diagnoses - secondary ICD10: J45.9 Asthma,                                                                                         | Asthma_unspecified       | 1.00 [1.00, 1.00] | 3.964E-01 | 1.00 [1.00, 1.00] | 4.786E-02  | 1.00 [1.00, 1.00]  | 1.069E-02  | Respiratory                          | ukb-b-17219                     |
| Hypothyroidism, drug reimbursement                                                                                                 | HYPOTHY_REIMB            | 1.04 [1.00, 1.08] | 4.087E-02 | 1.04 [1.00, 1.09] | 3.059E-02  | 1.01 [0.98, 1.05]  | 4.418E-01  | Endocrine, nutritional and metabolic | finn-b-HYPOTHY_REIMB            |
| Type 1 diabetes                                                                                                                    | T1D_S1                   | NA                | NA        | NA                | NA         | NA                 | NA         | Endocrine, nutritional and metabolic | ebi-a-GCST005536                |
| Psoriasis vulgaris                                                                                                                 | Psori_vulg               | 1.14 [1.08, 1.19] | 3.964E-07 | 1.12 [1.06, 1.18] | 2.771E-05  | 1.08 [1.03, 1.13]  | 5.278E-04  | Skin                                 | finn-b-L12_PSORI_VULG           |
| Coronary artery disease                                                                                                            | CAD                      | 1.01 [0.99, 1.02] | 5.266E-01 | 1.00 [0.98, 1.01] | 6.805E-01  | 1.00 [0.98, 1.01]  | 6.979E-01  | Blood and circulatory                | ebi-a-GCST003116                |
| Vascular/heart problems diagnosed by doctor: High<br>blood pressure                                                                | Hypertension             | 1.00 [1.00, 1.00] | 1.970E-03 | 1.00 [1.00, 1.00] | 4.333E-02  | 1.00 [1.00, 1.00]  | 2.473E-04  | Blood and circulatory                | ukb-b-14177                     |
| Asthma (childhood onset)                                                                                                           | Asthma (childhood onset) | NA                | NA        | 0.01 [0.01, 0.02] | 4.073E-196 | 3.62 [19.24, 29.0] | 1.246E-200 | Respiratory                          | ebi-a-GCST007800                |
| Systemic lupus erythematosus                                                                                                       | SLE_S2                   | 0.76 [0.65, 0.89] | 9.211E-04 | 1.08 [0.92, 1.27] | 3.246E-01  | 0.98 [0.87, 1.10]  | 6.950E-01  | Musculoskeletal                      | ieu-a-815                       |
| Rheumatoid Arthritis                                                                                                               | RA_S6                    | 1.03 [1.00, 1.06] | 6.655E-02 | 1.03 [1.00, 1.06] | 4.570E-02  | 0.97 [0.95, 1.00]  | 4.456E-02  | Musculoskeletal                      | bbj-a-73                        |
| Blood clot DVT bronchitis emphysema asthma<br>rhinitis eczema allergy diagnosed by doctor: Hayfever<br>allergic rhinitis or eczema | Diagnosis_2              | 1.01 [1.00, 1.01] | 5.119E-08 | 1.00 [1.00, 1.01] | 9.143E-04  | 1.01 [1.01, 1.01]  | 3.644E-15  | Skin                                 | ukb-a-447                       |
| Disorders of the thyroid gland                                                                                                     | Disorders_2              | 1.01 [0.99, 1.03] | 2.590E-01 | 1.02 [1.00, 1.04] | 8.075E-02  | 0.99 [0.98, 1.01]  | 5.084E-01  | Endocrine, nutritional and metabolic | finn-b-E4_THYROID               |
| Hypothyroidism (congenital or acquired)                                                                                            | HYPOTHY                  | 1.04 [1.02, 1.07] | 1.182E-03 | 1.04 [1.02, 1.07] | 8.470E-04  | 1.02 [0.99, 1.04]  | 1.439E-01  | Endocrine, nutritional and metabolic | finn-b-HYPOTHYROIDISM           |
| Diagnoses - main ICD10: D22 Melanocytic naevi                                                                                      | Melanocytic naevi        | 1.00 [1.00, 1.00] | 5.060E-01 | 1.00 [1.00, 1.00] | 5.752E-01  | 1.00 [1.00, 1.00]  | 9.634E-01  | Neoplasms                            | ukb-d-D22                       |
| Celiac disease                                                                                                                     | CeD_S1                   | 1.27 [1.15, 1.39] | 7.474E-07 | 1.17 [1.07, 1.28] | 3.281E-04  | 1.02 [0.96, 1.09]  | 5.249E-01  | Digestive                            | ebi-a-GCST000612                |

|                                                                                   |                       |                   |           |                   |            |                     |            |                                      |                                 |
|-----------------------------------------------------------------------------------|-----------------------|-------------------|-----------|-------------------|------------|---------------------|------------|--------------------------------------|---------------------------------|
| Celiac disease                                                                    | CeD_S6                | 1.27 [1.16, 1.40] | 5.439E-07 | 1.17 [1.07, 1.28] | 3.354E-04  | 1.02 [0.96, 1.09]   | 5.305E-01  | Digestive                            | ieu-a-276                       |
| Thyrototoxicosis with diffuse goitre                                              | THYTOXGOITDIF         | 0.99 [0.94, 1.04] | 6.019E-01 | 0.99 [0.94, 1.05] | 7.511E-01  | 1.00 [0.95, 1.04]   | 8.944E-01  | Endocrine, nutritional and metabolic | finn-b-E4_THYTOXGOITDIF         |
| Hypothyroidism, levothyroxin purchases                                            | HYPOTHY_LEVOTHY       | 1.04 [1.01, 1.07] | 1.689E-03 | 1.04 [1.02, 1.07] | 1.067E-03  | 1.01 [0.99, 1.04]   | 1.885E-01  | Endocrine, nutritional and metabolic | finn-b-HYPOTHY_LEVOTHY          |
| Asthma                                                                            | Asthma_meta           | 0.98 [0.95, 1.00] | 1.050E-01 | 0.98 [0.95, 1.01] | 1.050E-01  | 1.02 [1.00, 1.05]   | 5.833E-02  | Respiratory                          | ebi-a-GCST006862                |
| Myocardial infarction                                                             | Asthma_unspecified    | 1.02 [1.01, 1.03] | 1.185E-03 | 1.01 [0.99, 1.02] | 4.281E-01  | 1.01 [1.00, 1.02]   | 1.128E-01  | Blood and circulatory                | ebi-a-GCST011365                |
| Gastroesophageal reflux disease                                                   | GERD                  | 1.01 [1.00, 1.02] | 7.164E-02 | 1.01 [1.00, 1.02] | 7.097E-02  | 1.01 [1.00, 1.02]   | 1.600E-01  | Digestive                            | ebi-a-GCST90000514              |
| Coronary atherosclerosis                                                          | CORATHER              | 1.00 [0.98, 1.03] | 6.692E-01 | 1.01 [0.98, 1.03] | 5.655E-01  | 1.01 [0.99, 1.03]   | 3.687E-01  | Blood and circulatory                | finn-b-I9_CORATHER              |
| Diabetes, varying definitions                                                     | Diabetes_FG           | 0.99 [0.98, 1.01] | 3.978E-01 | 0.98 [0.97, 1.00] | 8.616E-02  | 1.01 [1.00, 1.03]   | 1.085E-01  | Endocrine, nutritional and metabolic | finn-b-DIABETES_FG              |
| Autoimmune diseases                                                               | Autoimmune diseases   | 1.03 [1.01, 1.05] | 2.601E-04 | 1.02 [1.01, 1.04] | 4.889E-03  | 1.00 [0.99, 1.02]   | 5.875E-01  | Blood and circulatory                | finn-b-AUTOIMMUNE               |
| Coronary atherosclerosis (no controls excluded)                                   | CORATHER_EXNONE       | 1.00 [0.98, 1.02] | 8.322E-01 | 1.00 [0.98, 1.02] | 9.984E-01  | 1.01 [0.99, 1.03]   | 2.738E-01  | Blood and circulatory                | finn-b-I9_CORATHER_EXNONE       |
| Type 2 diabetes, definitions combined, including                                  | T2D_INCLAVO           | 0.98 [0.97, 1.00] | 8.151E-02 | 0.98 [0.96, 1.00] | 2.835E-02  | 1.00 [0.99, 1.02]   | 7.614E-01  | Endocrine, nutritional and metabolic | finn-b-T2D_INCLAVO              |
| Disorders of gallbladder, biliary tract and pancreas                              | Disorders_3           | 1.00 [1.00, 1.00] | 3.615E-01 | 1.00 [1.00, 1.00] | 8.600E-01  | 1.00 [1.00, 1.00]   | 6.179E-01  | Digestive                            | ukb-d-K11_GALLBILPANC           |
| Vascular/heart problems diagnosed by doctor: None of the above                    | Diagnosis_1           | 1.00 [0.99, 1.00] | 6.445E-07 | 1.00 [1.00, 1.00] | 1.607E-02  | 1.00 [1.00, 1.00]   | 9.607E-02  | Blood and circulatory                | ukb-b-13352                     |
| Diabetes, insuline treatment (Kela reimbursement)                                 | KELA_DIAB_INSUL       | 0.99 [0.98, 1.01] | 5.253E-01 | 0.98 [0.96, 1.00] | 8.440E-02  | 1.01 [0.99, 1.02]   | 4.752E-01  | Endocrine, nutritional and metabolic | finn-b-KELA_DIAB_INSUL          |
| Type 2 diabetes                                                                   | T2D_S3                | 1.01 [0.98, 1.04] | 5.922E-01 | 1.00 [0.97, 1.03] | 8.522E-01  | 0.99 [0.96, 1.01]   | 2.630E-01  | Endocrine, nutritional and metabolic | ebi-a-GCST007517                |
| Ischaemic heart disease, wide definition                                          | IHD                   | 0.99 [0.98, 1.01] | 5.752E-01 | 1.00 [0.98, 1.02] | 6.626E-01  | 1.00 [0.98, 1.02]   | 8.705E-01  | Blood and circulatory                | finn-b-I9_IHD                   |
| Major depression                                                                  | Major depression      | 1.00 [0.99, 1.01] | 8.052E-01 | 1.00 [1.00, 1.01] | 2.690E-01  | 1.00 [1.00, 1.01]   | 3.649E-01  | Mental and Nervous                   | ieu-b-102                       |
| Nasal polyp                                                                       | Nasal polyp           | 1.04 [0.99, 1.09] | 9.799E-02 | 0.99 [0.94, 1.03] | 5.668E-01  | 1.03 [0.98, 1.07]   | 2.348E-01  | Respiratory                          | finn-b-J10_NASALPOLYP           |
| Rheumatoid arthritis                                                              | RA_S2                 | 1.01 [0.99, 1.04] | 3.607E-01 | 1.02 [0.99, 1.04] | 2.667E-01  | 0.99 [0.96, 1.01]   | 1.686E-01  | Musculoskeletal                      | ebi-a-GCST002318                |
| Other diabetes, wide definition                                                   | Diabetes_wide         | 0.99 [0.98, 1.01] | 5.236E-01 | 0.98 [0.96, 1.00] | 2.734E-02  | 1.01 [0.99, 1.02]   | 3.752E-01  | Endocrine, nutritional and metabolic | finn-b-DM_OTHER_WIDE            |
| Mouth/teeth dental problems: Mouth ulcers                                         | Asthma_diagnosed      | 1.00 [1.00, 1.00] | 6.367E-02 | 1.00 [1.00, 1.00] | 1.467E-01  | 1.00 [1.00, 1.00]   | 1.286E-02  | Digestive                            | ukb-a-427                       |
| Type 2 diabetes, strict (exclude DM1)                                             | T2D_STRICT            | 0.98 [0.96, 1.00] | 1.794E-02 | 0.98 [0.96, 1.00] | 2.902E-02  | 1.00 [0.99, 1.02]   | 6.918E-01  | Endocrine, nutritional and metabolic | finn-b-E4_DM2_STRICT            |
| Type 2 diabetes, definitions combined                                             | T2D_S5                | 0.98 [0.97, 1.00] | 8.814E-02 | 0.98 [0.96, 1.00] | 3.339E-02  | 1.00 [0.99, 1.02]   | 6.651E-01  | Endocrine, nutritional and metabolic | finn-b-T2D                      |
| Pure hypercholesterolaemia                                                        | FH_Finn               | 1.01 [0.98, 1.04] | 3.819E-01 | 1.00 [0.97, 1.03] | 9.422E-01  | 0.99 [0.97, 1.01]   | 4.624E-01  | Endocrine, nutritional and metabolic | finn-b-E4_HYPERCHOL             |
| Celiac disease                                                                    | CeD_S4                | 1.12 [1.01, 1.25] | 3.463E-02 | 1.10 [1.00, 1.22] | 5.197E-02  | 1.00 [0.93, 1.07]   | 9.247E-01  | Digestive                            | ieu-a-1059                      |
| Basal cell carcinoma                                                              | BCC                   | 1.02 [1.00, 1.04] | 7.276E-02 | 1.03 [1.01, 1.05] | 6.061E-03  | 1.02 [1.00, 1.04]   | 1.696E-02  | Neoplasms                            | ebi-a-GCST90013410              |
| Diagnoses - main ICD10: D12 Benign neoplasm of colon, rectum, anus and anal canal | Digestive Neoplasms   | 1.00 [1.00, 1.00] | 9.260E-02 | 1.00 [1.00, 1.00] | 3.828E-01  | 1.00 [1.00, 1.00]   | 1.883E-01  | Neoplasms                            | ukb-d-D12                       |
| Colorectal cancer                                                                 | Colorectal cancer     | 1.00 [1.00, 1.00] | 2.475E-01 | 1.00 [1.00, 1.00] | 4.442E-01  | 1.00 [1.00, 1.00]   | 1.547E-01  | Digestive                            | ieu-b-4965                      |
| Diagnoses - secondary ICD10: E78.0 Pure hypercholesterolaemia                     | FH_UKB                | 1.00 [1.00, 1.00] | 6.387E-01 | 1.00 [1.00, 1.00] | 5.951E-01  | 1.00 [1.00, 1.00]   | 1.400E-01  | Endocrine, nutritional and metabolic | ukb-b-12651                     |
| Diagnoses - secondary ICD10: E11.9 Without purchases required                     | T2D_nocom             | 1.00 [1.00, 1.00] | 4.996E-02 | 1.00 [1.00, 1.00] | 6.285E-02  | 1.00 [1.00, 1.00]   | 4.938E-01  | Endocrine, nutritional and metabolic | ukb-b-970                       |
| Hypothyroidism, strict autoimmune, 3 medication purchases required                | HYTHY_AI_STRICT_PURCH | 1.01 [0.99, 1.03] | 3.070E-01 | 1.01 [0.99, 1.03] | 3.330E-01  | 0.99 [0.97, 1.01]   | 2.715E-01  | Endocrine, nutritional and metabolic | finn-b-E4_HYTHY_AI_STRICT_PURCH |
| Disorders of lipoprotein metabolism and other                                     | Disorders_1           | 1.00 [0.97, 1.02] | 7.180E-01 | 1.00 [0.98, 1.02] | 9.763E-01  | 0.99 [0.97, 1.01]   | 2.906E-01  | Endocrine, nutritional and metabolic | finn-b-E4_LIPOPROT              |
| Haemorrhoidal disease                                                             | HD                    | 1.02 [1.02, 1.03] | 5.069E-11 | 1.01 [1.01, 1.02] | 5.086E-05  | 1.02 [1.02, 1.03]   | 1.544E-13  | Digestive                            | ebi-a-GCST90014033              |
| Myocardial infarction                                                             | Allergic disease      | 1.01 [0.99, 1.03] | 2.645E-01 | 1.00 [0.98, 1.02] | 9.489E-01  | 1.01 [1.00, 1.03]   | 1.447E-01  | Blood and circulatory                | ebi-a-GCST011364                |
| Parkinson's disease                                                               | PD                    | NA                | NA        | NA                | NA         | 0.99 [0.96, 1.02]   | 5.377E-01  | Mental and Nervous                   | ieu-b-7                         |
| Coronary heart disease                                                            | CHD                   | 1.02 [0.99, 1.05] | 1.370E-01 | 1.02 [0.98, 1.05] | 3.719E-01  | 1.02 [0.99, 1.04]   | 1.428E-01  | Blood and circulatory                | ieu-a-8                         |
| Prostate cancer                                                                   | Prostate cancer       | 0.98 [0.97, 1.00] | 1.621E-02 | 1.00 [0.98, 1.01] | 7.249E-01  | 0.99 [0.98, 1.01]   | 3.879E-01  | Neoplasms                            | ebi-a-GCST006085                |
| Rheumatoid arthritis                                                              | RA_S1                 | 0.95 [0.90, 1.00] | 6.539E-02 | 1.01 [0.95, 1.07] | 7.874E-01  | 0.95 [0.90, 0.99]   | 1.684E-02  | Musculoskeletal                      | ebi-a-GCST000679                |
| Asthma (adult onset)                                                              | NA                    | NA                | NA        | 0.01 [0.01, 0.02] | 1.144E-179 | 2.85 [18.73, 27.85] | 1.320E-208 | Respiratory                          | ebi-a-GCST007799                |
| Cancer of skin                                                                    | Cancer of skin        | 1.00 [1.00, 1.00] | 1.408E-01 | 1.00 [1.00, 1.00] | 7.436E-03  | 1.00 [1.00, 1.00]   | 1.619E-01  | Neoplasms                            | ukb-d-C_SKIN                    |
| Type 2 diabetes                                                                   | T2D_S4                | 0.98 [0.96, 1.00] | 5.218E-02 | 0.98 [0.97, 1.00] | 1.116E-01  | 1.01 [1.00, 1.03]   | 1.535E-01  | Endocrine, nutritional and metabolic | finn-b-E4_DM2                   |
| Thyroid cancer                                                                    | Thyroid cancer        | 1.17 [0.90, 1.51] | 2.335E-01 | 1.09 [0.85, 1.39] | 4.943E-01  | 1.11 [0.92, 1.33]   | 2.964E-01  | Endocrine, nutritional and metabolic | ieu-a-1082                      |
| Type 2 diabetes with other specified/multiple/unspecified complications           | T2D_NASCOMP           | 0.98 [0.96, 1.00] | 4.448E-02 | 0.98 [0.96, 1.00] | 3.733E-02  | 1.00 [0.98, 1.01]   | 6.333E-01  | Endocrine, nutritional and metabolic | finn-b-E4_DM2NASCOMP            |
| Hypothyroidism, strict autoimmune                                                 | HYTHY_AI_STRICT       | 1.01 [0.99, 1.03] | 2.765E-01 | 1.02 [1.00, 1.04] | 5.048E-02  | 0.99 [0.97, 1.01]   | 1.897E-01  | Endocrine, nutritional and metabolic | finn-b-E4_HYTHY_AI_STRICT       |
| Type 2 diabetes                                                                   | T2D_S1                | 1.00 [0.97, 1.02] | 7.573E-01 | 1.00 [0.97, 1.02] | 8.856E-01  | 1.01 [0.99, 1.03]   | 5.809E-01  | Endocrine, nutritional and metabolic | ebi-a-GCST005047                |
| Psoriasis                                                                         | Psoriasis             | NA                | NA        | NA                | NA         | NA                  | NA         | Skin                                 | ebi-a-GCST005527                |
| Breast cancer                                                                     | Breast cancer_S1      | 1.02 [1.01, 1.03] | 3.374E-05 | 1.02 [1.01, 1.03] | 2.792E-03  | 1.01 [1.00, 1.02]   | 6.935E-02  | Neoplasms                            | ebi-a-GCST004988                |

|                                                                                                   |                  |                   |           |                      |            |                   |            |                                      |                    |
|---------------------------------------------------------------------------------------------------|------------------|-------------------|-----------|----------------------|------------|-------------------|------------|--------------------------------------|--------------------|
| multiple sclerosis                                                                                | MS_S4            | 1.01 [0.98, 1.05] | 4.121E-01 | 1.00 [0.96, 1.03]    | 8.784E-01  | 1.01 [0.98, 1.04] | 4.399E-01  | Mental and Nervous                   | ieu-b-18           |
| Bipolar disorder                                                                                  | Bipolar disorder | 1.23 [0.98, 1.56] | 7.773E-02 | 1.08 [0.81, 1.42]    | 6.043E-01  | 0.97 [0.77, 1.21] | 7.775E-01  | Mental and Nervous                   | ieu-a-800          |
| Narcolepsy                                                                                        | Narcolepsy       | NA                | NA        | NA                   | NA         | NA                | NA         | Mental and Nervous                   | ebi-a-GCST005522   |
| schizophrenia                                                                                     | Schizophrenia    | 1.00 [0.99, 1.02] | 6.394E-01 | 1.01 [0.98, 1.03]    | 6.179E-01  | 1.01 [0.99, 1.03] | 3.802E-01  | Mental and Nervous                   | ieu-b-42           |
| Hypothyroidism, other/unspecified                                                                 | HYTHYNAS         | 1.01 [0.99, 1.03] | 3.545E-01 | 1.02 [1.00, 1.04]    | 2.962E-02  | 0.99 [0.98, 1.01] | 3.681E-01  | Endocrine, nutritional and metabolic | finn-b-E4_HYTHYNAS |
| Rheumatoid arthritis                                                                              | RA_S3            | 1.03 [1.00, 1.07] | 7.811E-02 | 1.05 [1.01, 1.09]    | 9.466E-03  | 1.00 [0.97, 1.03] | 7.694E-01  | Musculoskeletal                      | ebi-a-GCST005569   |
| Rheumatoid arthritis                                                                              | RA_S5            | 0.96 [0.91, 1.02] | 1.568E-01 | 1.01 [0.95, 1.07]    | 8.607E-01  | 0.95 [0.91, 0.99] | 2.328E-02  | Musculoskeletal                      | ieu-a-834          |
| Type 2 diabetes                                                                                   | T2D_S2           | 1.02 [1.00, 1.03] | 1.755E-02 | 1.02 [1.00, 1.03]    | 5.685E-02  | 1.01 [1.00, 1.02] | 1.906E-01  | Endocrine, nutritional and metabolic | ebi-a-GCST006867   |
| Type 2 diabetes (adjusted for BMI)                                                                | T2D_adjusted     | 1.00 [0.97, 1.03] | 9.112E-01 | 1.00 [0.97, 1.02]    | 7.456E-01  | 0.98 [0.95, 1.00] | 2.735E-02  | Endocrine, nutritional and metabolic | ebi-a-GCST007518   |
| Type 2 diabetes                                                                                   | T2D_S6           | 0.99 [0.97, 1.02] | 5.930E-01 | 1.00 [0.97, 1.02]    | 8.315E-01  | 0.99 [0.97, 1.01] | 2.277E-01  | Endocrine, nutritional and metabolic | ebi-a-GCST007515   |
| Blood clot DVT bronchitis emphysema asthma<br>rhinitis eczema allergy diagnosed by doctor: Asthma | Diagnosis_1      | 1.00 [1.00, 1.00] | 4.533E-01 | 1.00 [1.00, 1.00]    | 8.392E-01  | 1.00 [1.00, 1.00] | 1.471E-05  | Respiratory                          | ukb-a-446          |
| Breast cancer                                                                                     | Breast cancer_S2 | NA                | NA        | 51.97 [41.98, 64.34] | 4.656E-288 | 0.05 [0.04, 0.06] | 1.544E-286 | Neoplasms                            | ebi-a-GCST007236   |
| Doctor diagnosed asthma                                                                           | Asthma_diagnosed | 1.00 [1.00, 1.01] | 7.044E-02 | 1.00 [1.00, 1.00]    | 2.855E-01  | 1.01 [1.00, 1.01] | 5.934E-05  | Respiratory                          | ukb-a-255          |
| Osteoarthritis of the hip or knee                                                                 | OA of hip/knee   | 0.99 [0.98, 1.00] | 5.200E-02 | 0.99 [0.98, 1.01]    | 3.665E-01  | 0.98 [0.97, 0.99] | 2.760E-04  | Musculoskeletal                      | ebi-a-GCST007092   |

Supplementary Table 4. SMR analysis in lung tissue

| probeID            | ProbeChr | Gene           | Probe bp  | topSNP     | topSNP chr | topSNP bp | b SMR | se SMR | p SMR    | p HEIDI  | nsnp | HEIDI |
|--------------------|----------|----------------|-----------|------------|------------|-----------|-------|--------|----------|----------|------|-------|
| ENSG00000138031.10 | 2        | ADCY3          | 25092373  | rs13407913 | 2          | 25097644  | -0.35 | 0.07   | 1.43E-06 | NA       | NA   |       |
| ENSG00000169220.13 | 5        | RGS14          | 176792220 | rs35716097 | 5          | 176806636 | 0.30  | 0.06   | 3.07E-06 | 3.82E-01 | 5    |       |
| ENSG00000122873.7  | 10       | CISD1          | 60039082  | rs2440858  | 10         | 59965710  | -0.27 | 0.05   | 6.30E-07 | 1.10E-02 | 13   |       |
| ENSG00000165688.7  | 9        | PMPCA          | 139311661 | rs35873563 | 9          | 139324029 | -0.64 | 0.13   | 1.58E-06 | 9.31E-05 | 20   |       |
| ENSG00000161180.6  | 22       | CCDC116        | 21989310  | rs2266963  | 22         | 21947467  | 0.16  | 0.03   | 3.51E-08 | 7.05E-05 | 5    |       |
| ENSG00000182179.6  | 3        | UBA7           | 49847009  | rs2247036  | 3          | 49882349  | -0.72 | 0.15   | 1.17E-06 | 4.11E-05 | 10   |       |
| ENSG00000187796.9  | 9        | CARD9          | 139263270 | rs10781499 | 9          | 139266405 | -0.99 | 0.18   | 6.07E-08 | 3.92E-05 | 20   |       |
| ENSG00000161395.8  | 17       | PGAP3          | 37840212  | rs2934956  | 17         | 37830447  | -0.37 | 0.07   | 6.81E-08 | 2.10E-05 | 20   |       |
| ENSG00000026297.11 | 6        | RNASET2        | 167356832 | rs2149093  | 6          | 167373045 | 0.20  | 0.03   | 4.85E-10 | 3.23E-06 | 20   |       |
| ENSG00000138092.6  | 2        | CENPO          | 25030748  | rs13407913 | 2          | 25097644  | -0.30 | 0.05   | 3.49E-08 | 3.22E-06 | 3    |       |
| ENSG00000068745.10 | 3        | IP6K2          | 48751611  | rs17595772 | 3          | 49409704  | 0.46  | 0.09   | 9.04E-07 | 2.43E-06 | 7    |       |
| ENSG00000113522.9  | 5        | RAD50          | 131936012 | rs2070722  | 5          | 131824486 | 0.38  | 0.07   | 6.19E-08 | 1.66E-06 | 9    |       |
| ENSG00000251417.1  | 16       | RP11-1348G14.4 | 28821623  | rs62036622 | 16         | 28837203  | 0.20  | 0.04   | 2.44E-08 | 9.55E-07 | 20   |       |
| ENSG00000169682.13 | 16       | SPNS1          | 28990705  | rs62036622 | 16         | 28837203  | -0.42 | 0.08   | 7.07E-07 | 8.34E-07 | 18   |       |
| ENSG00000135926.8  | 2        | TMBIM1         | 219148112 | rs736731   | 2          | 219120588 | -0.44 | 0.09   | 8.62E-07 | 6.38E-08 | 11   |       |
| ENSG00000244731.3  | 6        | C4A            | 31960129  | rs2105902  | 6          | 32395698  | -0.13 | 0.02   | 2.64E-08 | 1.96E-08 | 20   |       |
| ENSG00000233006.2  | 5        | AC034220.3     | 131676159 | rs272894   | 5          | 131662460 | 0.17  | 0.03   | 3.21E-07 | 1.45E-08 | 17   |       |
| ENSG00000160766.10 | 1        | GBAP1          | 155190415 | rs2990245  | 1          | 155197462 | 0.16  | 0.03   | 2.41E-08 | 1.22E-08 | 20   |       |
| ENSG00000204351.7  | 6        | SKIV2L         | 31932210  | rs389883   | 6          | 31947460  | -0.30 | 0.06   | 4.23E-06 | 8.83E-09 | 20   |       |
| ENSG00000008838.13 | 17       | MED24          | 38196409  | rs3935280  | 17         | 38189055  | 0.24  | 0.05   | 6.10E-06 | 2.98E-09 | 9    |       |
| ENSG00000101216.6  | 20       | GMEB2          | 62238674  | rs13043255 | 20         | 62218916  | 0.33  | 0.07   | 3.37E-06 | 1.99E-09 | 12   |       |
| ENSG00000196502.7  | 16       | SULT1A1        | 28625924  | rs3020803  | 16         | 28618914  | 0.21  | 0.04   | 4.03E-09 | 7.76E-10 | 18   |       |
| ENSG00000115604.6  | 2        | IL18R1         | 102993803 | rs7568913  | 2          | 102920037 | 0.30  | 0.05   | 5.88E-09 | 2.96E-10 | 20   |       |
| ENSG00000203963.7  | 1        | Clorf141       | 67627692  | rs12060309 | 1          | 67604219  | -0.47 | 0.06   | 6.22E-15 | 1.05E-10 | 12   |       |
| ENSG00000164068.11 | 3        | RNF123         | 49740422  | rs9855505  | 3          | 49792158  | -0.38 | 0.06   | 1.39E-09 | 3.82E-11 | 20   |       |
| ENSG00000145020.10 | 3        | AMT            | 49457198  | rs6446275  | 3          | 49466871  | -0.13 | 0.03   | 7.08E-07 | 3.00E-11 | 20   |       |
| ENSG00000073605.14 | 17       | GSDMB          | 38067875  | rs1008723  | 17         | 38066267  | -0.47 | 0.07   | 1.88E-10 | 1.92E-11 | 20   |       |
| ENSG00000101017.9  | 20       | CD40           | 44752706  | rs4239702  | 20         | 44749251  | -0.22 | 0.05   | 2.75E-06 | 6.33E-12 | 20   |       |
| ENSG00000176998.3  | 6        | HCG4           | 29759514  | rs1632995  | 6          | 29769621  | -0.07 | 0.01   | 6.32E-08 | 3.98E-12 | 20   |       |
| ENSG00000198502.5  | 6        | HLA-DRB5       | 32491592  | rs9271255  | 6          | 32580357  | 0.14  | 0.02   | 6.31E-18 | 8.70E-13 | 20   |       |
| ENSG00000169231.9  | 1        | THBS3          | 155171543 | rs914615   | 1          | 155175892 | 0.25  | 0.05   | 7.46E-07 | 4.21E-13 | 20   |       |
| ENSG00000260302.1  | 18       | RP11-973H7.1   | 12775286  | rs2542148  | 18         | 12777573  | 0.23  | 0.04   | 2.31E-09 | 2.76E-13 | 11   |       |
| ENSG00000054219.9  | 2        | LY75           | 160710563 | rs4664304  | 2          | 160794008 | -0.09 | 0.02   | 1.49E-07 | 1.82E-13 | 7    |       |
| ENSG00000172057.5  | 17       | ORMDL3         | 38080574  | rs7224129  | 17         | 38075426  | 0.43  | 0.07   | 3.75E-10 | 1.31E-13 | 20   |       |
| ENSG00000138111.10 | 10       | TMEM180        | 104228975 | rs2274351  | 10         | 104264107 | -0.22 | 0.04   | 8.16E-07 | 3.34E-14 | 7    |       |
| ENSG00000197146.2  | 6        | AL133458.1     | 167359002 | rs434093   | 6          | 167382449 | -0.25 | 0.04   | 8.16E-09 | 3.14E-14 | 20   |       |
| ENSG00000163466.11 | 2        | ARPC2          | 219100448 | rs12694432 | 2          | 219082330 | -0.41 | 0.07   | 3.96E-08 | 1.99E-14 | 17   |       |
| ENSG00000197083.7  | 5        | ZNF300P1       | 150318029 | rs59980321 | 5          | 150241813 | -0.13 | 0.02   | 7.98E-19 | 3.69E-15 | 4    |       |
| ENSG00000178952.4  | 16       | TUFM           | 28855730  | rs7187776  | 16         | 28857645  | -0.38 | 0.06   | 4.25E-12 | 3.59E-15 | 20   |       |
| ENSG00000197375.8  | 5        | SLC22A5        | 131718375 | rs2631360  | 5          | 131707429 | -0.25 | 0.04   | 3.11E-12 | 7.70E-16 | 20   |       |
| ENSG00000196301.3  | 6        | HLA-DRB9       | 32434437  | rs9271255  | 6          | 32580357  | -0.17 | 0.02   | 5.16E-16 | 3.78E-19 | 20   |       |
| ENSG00000241106.2  | 6        | HLA-DOB        | 32782682  | rs2621326  | 6          | 32783896  | 0.09  | 0.02   | 2.15E-08 | 4.68E-20 | 20   |       |
| ENSG00000004534.10 | 3        | RBM6           | 50046061  | rs9866695  | 3          | 50069452  | -0.17 | 0.03   | 1.35E-11 | 4.47E-20 | 20   |       |
| ENSG00000259982.1  | 16       | CDC37P1        | 28712238  | rs62036620 | 16         | 28833097  | -0.12 | 0.02   | 1.10E-13 | 1.36E-20 | 20   |       |
| ENSG00000237541.3  | 6        | HLA-DQA2       | 32712055  | rs9268835  | 6          | 32428115  | 0.12  | 0.01   | 2.48E-19 | 1.51E-23 | 20   |       |
| ENSG00000261338.1  | 2        | RP11-378A13.1  | 219121064 | rs736730   | 2          | 219120255 | -0.12 | 0.02   | 1.28E-11 | 4.71E-31 | 20   |       |
| ENSG00000173209.18 | 2        | AHSA2          | 61411445  | rs2167565  | 2          | 61476458  | -0.16 | 0.03   | 2.47E-08 | 3.91E-31 | 20   |       |
| ENSG00000167914.6  | 17       | GSDMA          | 38126622  | rs3859191  | 17         | 38128714  | -0.10 | 0.01   | 1.57E-12 | 2.50E-32 | 20   |       |
| ENSG00000115602.12 | 2        | IL1RL1         | 102948229 | rs1420102  | 2          | 102948819 | 0.17  | 0.02   | 1.35E-13 | 7.78E-33 | 20   |       |
| ENSG00000229391.3  | 6        | HLA-DRB6       | 32524144  | rs9268838  | 6          | 32428715  | 0.14  | 0.02   | 2.20E-18 | 1.93E-34 | 20   |       |
| ENSG00000164308.12 | 5        | ERAP2          | 96233531  | rs2910686  | 5          | 96252589  | -0.06 | 0.01   | 5.33E-12 | 8.57E-60 | 20   |       |

**Supplementary Table 5. SMR analysis in whole blood**

| probeID            | ProbeChr | Gene          | Probe_bp  | topSNP     | topSNP_chr | topSNP_bp | b_SMR | se_SMR | p_SMR    | p_HEIDI  | nsnp | HEIDI |
|--------------------|----------|---------------|-----------|------------|------------|-----------|-------|--------|----------|----------|------|-------|
| ENSG00000187796.9  | 9        | CARD9         | 139263270 | rs4078099  | 9          | 139267533 | 0.51  | 0.06   | 6.51E-19 | 1.61E-01 | 20   |       |
| ENSG00000026297.11 | 6        | RNASET2       | 167356832 | rs434093   | 6          | 167382449 | -0.17 | 0.02   | 9.26E-13 | 6.90E-02 | 20   |       |
| ENSG00000197146.2  | 6        | AL133458.1    | 167359002 | rs444210   | 6          | 167390242 | -0.18 | 0.03   | 3.34E-12 | 1.50E-01 | 20   |       |
| ENSG00000073605.14 | 17       | GSDMB         | 38067875  | rs8067378  | 17         | 38051348  | -0.34 | 0.04   | 6.39E-18 | 5.20E-04 | 20   |       |
| ENSG00000229391.3  | 6        | HLA-DRB6      | 32524144  | rs9268838  | 6          | 32428715  | -0.17 | 0.02   | 9.18E-18 | 9.67E-04 | 20   |       |
| ENSG00000148396.14 | 9        | SEC16A        | 139353345 | rs11145760 | 9          | 139382594 | -0.36 | 0.04   | 3.71E-17 | 2.74E-04 | 20   |       |
| ENSG00000197165.6  | 16       | SULT1A2       | 28605847  | rs180744   | 16         | 28508048  | 0.10  | 0.01   | 1.58E-16 | 9.35E-03 | 20   |       |
| ENSG00000178952.4  | 16       | TUFM          | 28855730  | rs7187776  | 16         | 28857645  | 0.17  | 0.02   | 3.91E-16 | 9.78E-04 | 20   |       |
| ENSG00000164308.12 | 5        | ERAP2         | 96233531  | rs2910686  | 5          | 96252589  | 0.07  | 0.01   | 6.96E-12 | 1.12E-01 | 20   |       |
| ENSG00000261338.1  | 2        | RP11-378A13.1 | 219121064 | rs11677953 | 2          | 219121663 | -0.22 | 0.03   | 1.14E-10 | 2.51E-01 | 20   |       |
| ENSG00000177628.11 | 1        | GBA           | 155209366 | rs1045253  | 1          | 155201235 | 0.22  | 0.05   | 1.61E-06 | 2.03E-02 | 20   |       |
| ENSG00000172057.5  | 17       | ORMDL3        | 38080574  | rs7224129  | 17         | 38075426  | -0.26 | 0.03   | 1.23E-14 | 5.05E-05 | 20   |       |
| ENSG00000197375.8  | 5        | SLC22A5       | 131718375 | rs2631360  | 5          | 131707429 | -0.22 | 0.03   | 7.14E-14 | 4.94E-04 | 20   |       |
| ENSG00000182179.6  | 3        | UBA7          | 49847009  | rs7372725  | 3          | 49790544  | 0.32  | 0.04   | 2.45E-13 | 5.06E-09 | 20   |       |
| ENSG00000198502.5  | 6        | HLA-DRB5      | 32491592  | rs9270986  | 6          | 32574060  | 0.12  | 0.02   | 2.54E-12 | 1.30E-06 | 20   |       |
| ENSG00000225851.1  | 6        | HLA-S         | 31349958  | rs9264942  | 6          | 31274380  | 0.12  | 0.02   | 4.39E-12 | 5.94E-10 | 20   |       |
| ENSG00000138092.6  | 2        | CENPO         | 25030748  | rs13407913 | 2          | 25097644  | 0.15  | 0.02   | 5.15E-13 | 4.22E-02 | 4    |       |
| ENSG00000138031.10 | 2        | ADCY3         | 25092373  | rs13407913 | 2          | 25097644  | 0.11  | 0.01   | 6.84E-16 | 1.17E-02 | 5    |       |
| ENSG00000115137.7  | 2        | DNAJC27       | 25180734  | rs13407913 | 2          | 25097644  | 0.23  | 0.04   | 1.93E-10 | 2.86E-02 | 4    |       |
| ENSG00000235888.1  | 21       | AF064858.8    | 40369356  | rs9977672  | 21         | 40463283  | 0.64  | 0.10   | 5.04E-10 | 7.30E-02 | 7    |       |
| ENSG00000196301.3  | 6        | HLA-DRB9      | 32434437  | rs9271255  | 6          | 32580357  | -0.24 | 0.03   | 7.99E-12 | 4.15E-03 | 20   |       |
| ENSG00000004534.10 | 3        | RBM6          | 50046061  | rs7621352  | 3          | 50070763  | 0.13  | 0.02   | 1.82E-11 | 2.64E-08 | 20   |       |
| ENSG00000100321.10 | 22       | SYNGR1        | 39763761  | rs61616683 | 22         | 39755773  | 0.20  | 0.03   | 1.93E-09 | 1.56E-07 | 20   |       |
| ENSG00000165689.12 | 9        | SDCCAG3       | 139300719 | rs10747043 | 9          | 139318310 | -0.33 | 0.06   | 3.88E-09 | 7.56E-06 | 20   |       |
| ENSG00000237721.1  | 21       | AF064858.11   | 40380914  | rs9977672  | 21         | 40463283  | 0.62  | 0.10   | 7.41E-10 | 6.80E-02 | 6    |       |
| ENSG00000115607.5  | 2        | IL18RAP       | 103052087 | rs2272128  | 2          | 103039929 | -0.25 | 0.04   | 5.53E-09 | 7.62E-12 | 20   |       |
| ENSG00000122873.7  | 10       | CISD1         | 60039082  | rs2790167  | 10         | 60024470  | 0.13  | 0.02   | 3.76E-09 | 5.01E-01 | 20   |       |
| ENSG00000169231.9  | 1        | THBS3         | 155171543 | rs4072037  | 1          | 155162067 | 0.19  | 0.03   | 1.72E-08 | 6.82E-01 | 20   |       |
| ENSG00000173209.18 | 2        | AHSA2         | 61411445  | rs2167565  | 2          | 61476458  | -0.14 | 0.03   | 3.80E-08 | 5.81E-01 | 20   |       |
| ENSG00000233232.2  | 16       | NPIP7         | 28474780  | rs240702   | 16         | 28531353  | -0.22 | 0.04   | 6.78E-09 | 9.87E-03 | 20   |       |

|                    |    |              |           |            |    |           |       |      |          |          |    |
|--------------------|----|--------------|-----------|------------|----|-----------|-------|------|----------|----------|----|
| ENSG00000169682.13 | 16 | SPNS1        | 28990705  | rs7140     | 16 | 28995757  | 0.23  | 0.04 | 8.51E-09 | 2.45E-05 | 20 |
| ENSG00000176476.4  | 16 | CCDC101      | 28584179  | rs480400   | 16 | 28574615  | -0.37 | 0.06 | 8.66E-09 | 1.20E-03 | 20 |
| ENSG00000196126.6  | 6  | HLA-DRB1     | 32552085  | rs9268614  | 6  | 32402778  | 0.42  | 0.07 | 1.57E-08 | 1.49E-07 | 20 |
| ENSG00000255389.1  | 6  | C6orf3       | 111922288 | rs33980500 | 6  | 111913262 | -0.19 | 0.03 | 7.08E-08 | 6.45E-03 | 20 |
| ENSG00000204528.3  | 6  | PSORS1C3     | 31143594  | rs1052989  | 6  | 31146403  | -0.12 | 0.02 | 8.53E-08 | 1.44E-04 | 20 |
| ENSG00000223534.1  | 6  | HLA-DQB1-AS1 | 32628319  | rs9270986  | 6  | 32574060  | 0.27  | 0.05 | 1.68E-07 | 7.37E-05 | 20 |
| ENSG00000196502.7  | 16 | SULT1A1      | 28625924  | rs75301646 | 16 | 28617885  | -0.23 | 0.04 | 1.88E-07 | 4.68E-04 | 18 |
| ENSG00000236525.1  | 2  | AC007278.2   | 103051108 | rs1420106  | 2  | 103035044 | -0.33 | 0.06 | 2.63E-07 | 1.96E-06 | 20 |
| ENSG00000231852.2  | 6  | CYP21A2      | 32007744  | rs2856674  | 6  | 32659645  | -0.17 | 0.04 | 1.34E-06 | 5.65E-04 | 20 |
| ENSG00000234745.5  | 6  | HLA-B        | 31322934  | rs13218306 | 6  | 31240932  | 0.25  | 0.05 | 1.56E-06 | 3.03E-06 | 20 |
| ENSG00000236935.1  | 11 | AP003774.1   | 64094749  | rs694739   | 11 | 64097233  | -0.07 | 0.02 | 2.05E-06 | 7.37E-04 | 5  |
| ENSG00000213066.7  | 6  | FGFR1OP      | 167439435 | rs7760495  | 6  | 167506795 | 0.33  | 0.07 | 2.32E-06 | 4.12E-03 | 14 |
| ENSG00000237669.1  | 6  | HCG4P3       | 29974395  | rs2523971  | 6  | 29938258  | -0.11 | 0.02 | 2.70E-06 | 3.78E-08 | 20 |
| ENSG00000081985.6  | 1  | IL12RB2      | 67817815  | rs17129794 | 1  | 67794918  | -0.21 | 0.04 | 2.88E-06 | 5.79E-03 | 20 |
| ENSG00000206341.6  | 6  | HLA-H        | 29857251  | rs2523962  | 6  | 29939544  | -0.13 | 0.03 | 5.46E-06 | 6.76E-04 | 20 |
| ENSG00000127838.9  | 2  | PNKD         | 219173315 | rs10932766 | 2  | 219122090 | -0.29 | 0.05 | 5.14E-08 | 1.49E-01 | 19 |
| ENSG00000267654.1  | 18 | RP11-973H7.4 | 12744454  | rs2542157  | 18 | 12787247  | 0.10  | 0.02 | 5.65E-06 | 8.73E-12 | 16 |
| ENSG00000234290.2  | 5  | AC116366.6   | 131806658 | rs2070729  | 5  | 131819921 | 0.43  | 0.07 | 7.34E-11 | 1.30E-02 | 20 |
| ENSG00000204531.11 | 6  | POU5F1       | 31140313  | rs1052989  | 6  | 31146403  | -0.22 | 0.05 | 4.53E-06 | 2.43E-02 | 20 |
| ENSG00000204267.9  | 6  | TAP2         | 32798083  | rs241449   | 6  | 32796653  | 0.23  | 0.05 | 4.57E-06 | 3.98E-02 | 20 |
| ENSG00000197457.5  | 20 | STMN3        | 62277920  | rs3787088  | 20 | 62316634  | 0.47  | 0.09 | 7.28E-08 | 1.00E-01 | 20 |
| ENSG00000116288.8  | 1  | PARK7        | 8029958   | rs3766606  | 1  | 8022197   | -0.58 | 0.11 | 1.01E-07 | 1.86E-01 | 19 |
| ENSG00000185651.10 | 22 | UBE2L3       | 21950079  | rs2070512  | 22 | 21949411  | 0.53  | 0.10 | 3.74E-07 | 4.92E-01 | 4  |
| ENSG00000054219.9  | 2  | LY75         | 160710563 | rs4664304  | 2  | 160794008 | -0.13 | 0.02 | 3.85E-07 | 1.22E-01 | 4  |
| ENSG00000132823.6  | 20 | OSER1        | 42832283  | rs2143606  | 20 | 42838550  | -0.24 | 0.05 | 5.76E-07 | 5.27E-01 | 4  |
| ENSG00000121281.8  | 16 | ADCY7        | 50313497  | rs7184802  | 16 | 50355996  | -0.45 | 0.08 | 2.83E-09 | NA       | NA |
| ENSG00000166164.11 | 16 | BRD7         | 50375121  | rs7184802  | 16 | 50355996  | -0.16 | 0.02 | 1.36E-12 | NA       | NA |
| ENSG00000011485.10 | 19 | PPP5C        | 46873244  | rs4802307  | 19 | 46849806  | 0.14  | 0.03 | 2.01E-07 | NA       | NA |
| ENSG00000160766.10 | 1  | GBAP1        | 155190415 | rs2075570  | 1  | 155182164 | -0.14 | 0.03 | 8.39E-07 | 2.70E-01 | 20 |
| ENSG00000151151.5  | 10 | IPMK         | 59989486  | rs2590322  | 10 | 59999931  | 0.51  | 0.10 | 9.12E-07 | 6.47E-01 | 20 |
| ENSG00000157557.7  | 21 | ETS2         | 40187055  | rs2836882  | 21 | 40466570  | 1.10  | 0.21 | 1.82E-07 | 3.62E-02 | 5  |
| ENSG00000180871.3  | 2  | CXCR2        | 218995994 | rs4674259  | 2  | 218991005 | -0.69 | 0.14 | 2.08E-06 | 8.19E-02 | 8  |
| ENSG00000176022.3  | 1  | B3GALT6      | 1169025   | rs6697886  | 1  | 1173611   | -0.45 | 0.10 | 3.02E-06 | 8.40E-01 | 5  |

|                   |    |          |          |           |    |          |       |      |          |          |   |
|-------------------|----|----------|----------|-----------|----|----------|-------|------|----------|----------|---|
| ENSG00000186891.9 | 1  | TNFRSF18 | 1140479  | rs6697886 | 1  | 1173611  | -0.33 | 0.07 | 3.97E-06 | 3.75E-01 | 4 |
| ENSG00000025708.8 | 22 | TYMP     | 50966333 | rs470119  | 22 | 50966914 | -0.22 | 0.05 | 4.32E-06 | 3.56E-01 | 5 |

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**Supplementary Table 6. SMR analysis in muscle skeletal tissue**

| probeID            | ProbeChr | Gene           | Probe bp  | topSNP     | topSNP chr | topSNP bp | b SMR | se SMR | p SMR    | p HEIDI  | nsnp | HEIDI |
|--------------------|----------|----------------|-----------|------------|------------|-----------|-------|--------|----------|----------|------|-------|
| ENSG00000197083.7  | 5        | ZNF300P1       | 150318029 | rs12659118 | 5          | 150324622 | 0.12  | 0.01   | 9.43E-24 | 3.67E-05 | 13   |       |
| ENSG00000237541.3  | 6        | HLA-DQA2       | 32712055  | rs9268835  | 6          | 32428115  | -0.13 | 0.01   | 3.56E-21 | 7.82E-10 | 20   |       |
| ENSG00000229391.3  | 6        | HLA-DRB6       | 32524144  | rs9268838  | 6          | 32428715  | -0.14 | 0.02   | 2.74E-20 | 2.06E-06 | 20   |       |
| ENSG00000185614.4  | 3        | FAM212A        | 49841575  | rs9836291  | 3          | 49697459  | -0.48 | 0.06   | 3.51E-17 | 1.11E-02 | 20   |       |
| ENSG00000196126.6  | 6        | HLA-DRB1       | 32552085  | rs9271255  | 6          | 32580357  | 0.29  | 0.04   | 3.67E-15 | 3.48E-03 | 20   |       |
| ENSG00000197165.6  | 16       | SULT1A2        | 28605847  | rs62034319 | 16         | 28532188  | 0.13  | 0.02   | 2.27E-14 | 4.49E-03 | 20   |       |
| ENSG00000198502.5  | 6        | HLA-DRB5       | 32491592  | rs9270986  | 6          | 32574060  | 0.08  | 0.01   | 2.73E-13 | 2.84E-07 | 20   |       |
| ENSG00000260442.1  | 16       | RP11-22P6.3    | 28891073  | rs8062405  | 16         | 28837906  | -0.22 | 0.03   | 5.51E-13 | 3.13E-02 | 20   |       |
| ENSG00000181915.3  | 10       | ADO            | 64566377  | rs224090   | 10         | 64541319  | 0.37  | 0.05   | 4.22E-12 | 3.72E-05 | 20   |       |
| ENSG00000164308.12 | 5        | ERAP2          | 96233531  | rs2910686  | 5          | 96252589  | 0.07  | 0.01   | 4.46E-12 | 6.16E-02 | 20   |       |
| ENSG00000261338.1  | 2        | RP11-378A13.1  | 219121064 | rs736730   | 2          | 219120255 | -0.10 | 0.01   | 6.18E-12 | 8.20E-02 | 20   |       |
| ENSG00000189067.8  | 16       | LITAF          | 11686045  | rs11641184 | 16         | 11704651  | -0.13 | 0.02   | 2.39E-11 | 1.85E-01 | 6    |       |
| ENSG00000131507.9  | 5        | NDFIP1         | 141511037 | rs449454   | 5          | 141533062 | 0.16  | 0.02   | 4.05E-11 | 9.42E-02 | 20   |       |
| ENSG00000234132.1  | 1        | RP11-168O16.2  | 201008212 | rs11807626 | 1          | 201000354 | 0.31  | 0.05   | 5.79E-11 | 3.72E-08 | 20   |       |
| ENSG00000232629.4  | 6        | HLA-DQB2       | 32727593  | rs3891175  | 6          | 32634467  | -0.10 | 0.02   | 1.16E-10 | 4.34E-09 | 20   |       |
| ENSG00000225697.6  | 3        | SLC26A6        | 48668041  | rs9868809  | 3          | 48681053  | 0.33  | 0.05   | 1.44E-10 | 1.97E-02 | 20   |       |
| ENSG00000004534.10 | 3        | RBM6           | 50046061  | rs4688755  | 3          | 50064424  | 0.20  | 0.03   | 2.04E-10 | 3.04E-05 | 20   |       |
| ENSG00000163466.11 | 2        | ARPC2          | 219100448 | rs6752254  | 2          | 219058743 | -0.22 | 0.04   | 3.19E-10 | 2.61E-02 | 20   |       |
| ENSG00000233006.2  | 5        | AC034220.3     | 131676159 | rs272886   | 5          | 131665840 | 0.14  | 0.02   | 4.21E-10 | 2.40E-10 | 20   |       |
| ENSG00000168610.10 | 17       | STAT3          | 40502964  | rs7211777  | 17         | 40534075  | 0.41  | 0.07   | 5.30E-10 | 1.85E-03 | 20   |       |
| ENSG00000175643.7  | 16       | RMI2           | 11394562  | rs9936459  | 16         | 11437779  | -0.14 | 0.02   | 6.26E-10 | 7.52E-03 | 20   |       |
| ENSG00000255389.1  | 6        | C6orf3         | 111922288 | rs33980500 | 6          | 111913262 | -0.17 | 0.03   | 1.81E-09 | 1.19E-02 | 20   |       |
| ENSG00000135926.8  | 2        | TMBIM1         | 219148112 | rs7559416  | 2          | 219150211 | -0.26 | 0.05   | 1.08E-08 | 4.42E-02 | 15   |       |
| ENSG00000167914.6  | 17       | GSDMA          | 38126622  | rs4458030  | 17         | 38121706  | 0.15  | 0.03   | 1.20E-08 | 3.36E-03 | 20   |       |
| ENSG00000204528.3  | 6        | PSORS1C3       | 31143594  | rs2074488  | 6          | 31240431  | -0.09 | 0.02   | 1.70E-08 | 4.25E-06 | 20   |       |
| ENSG00000169220.13 | 5        | RGS14          | 176792220 | rs4976646  | 5          | 176788570 | -0.22 | 0.04   | 1.89E-08 | 4.79E-01 | 6    |       |
| ENSG00000176476.4  | 16       | CCDC101        | 28584179  | rs480400   | 16         | 28574615  | -0.54 | 0.10   | 2.07E-08 | 6.61E-03 | 20   |       |
| ENSG00000161395.8  | 17       | PGAP3          | 37840212  | rs903502   | 17         | 37829604  | -0.35 | 0.06   | 2.16E-08 | 5.65E-03 | 20   |       |
| ENSG00000197208.5  | 5        | SLC22A4        | 131655017 | rs10463891 | 5          | 131597392 | -0.35 | 0.06   | 2.98E-08 | 2.14E-04 | 20   |       |
| ENSG00000251417.1  | 16       | RP11-1348G14.4 | 28821623  | rs153106   | 16         | 28526897  | -0.26 | 0.05   | 3.59E-08 | 1.44E-01 | 20   |       |
| ENSG00000204257.10 | 6        | HLA-DMA        | 32926630  | rs9276931  | 6          | 32928984  | -0.16 | 0.03   | 4.80E-08 | 6.77E-03 | 20   |       |
| ENSG00000241106.2  | 6        | HLA-DOB        | 32782682  | rs2621326  | 6          | 32783896  | -0.11 | 0.02   | 7.45E-08 | 2.02E-02 | 20   |       |
| ENSG00000196502.7  | 16       | SULT1A1        | 28625924  | rs3743963  | 16         | 28604686  | -0.27 | 0.05   | 9.19E-08 | 3.67E-02 | 20   |       |
| ENSG00000164078.8  | 3        | MST1R          | 49932856  | rs9821675  | 3          | 49902544  | -0.29 | 0.06   | 1.77E-07 | 1.65E-03 | 20   |       |

|                    |    |               |           |            |    |           |       |      |          |          |    |
|--------------------|----|---------------|-----------|------------|----|-----------|-------|------|----------|----------|----|
| ENSG00000173209.18 | 2  | AHSA2         | 61411445  | rs2167565  | 2  | 61476458  | -0.23 | 0.04 | 1.80E-07 | 1.41E-01 | 20 |
| ENSG00000132357.9  | 5  | CARD6         | 40850780  | rs1070444  | 5  | 40839644  | -0.27 | 0.05 | 2.21E-07 | 6.36E-04 | 12 |
| ENSG00000228078.1  | 6  | HLA-U         | 29901970  | rs2844806  | 6  | 29933439  | -0.11 | 0.02 | 4.42E-07 | 8.28E-05 | 20 |
| ENSG00000185651.10 | 22 | UBE2L3        | 21950079  | rs738129   | 22 | 21971041  | 0.39  | 0.08 | 4.49E-07 | 1.68E-01 | 6  |
| ENSG00000187796.9  | 9  | CARD9         | 139263270 | rs11145988 | 9  | 139321545 | -0.26 | 0.05 | 5.11E-07 | 6.41E-02 | 11 |
| ENSG00000204338.4  | 6  | CYP21A1P      | 31974821  | rs3129716  | 6  | 32657436  | 0.22  | 0.04 | 5.24E-07 | 8.73E-05 | 20 |
| ENSG00000054219.9  | 2  | LY75          | 160710563 | rs4664304  | 2  | 160794008 | -0.12 | 0.02 | 8.36E-07 | 8.36E-03 | 5  |
| ENSG00000116288.8  | 1  | PARK7         | 8029958   | rs172811   | 1  | 8039949   | -0.18 | 0.04 | 8.86E-07 | 9.74E-04 | 20 |
| ENSG00000145020.10 | 3  | AMT           | 49457198  | rs6446275  | 3  | 49466871  | 0.19  | 0.04 | 1.09E-06 | 4.32E-14 | 20 |
| ENSG00000115234.6  | 2  | SNX17         | 27596692  | rs715326   | 2  | 27725761  | 0.11  | 0.02 | 1.32E-06 | 6.23E-04 | 9  |
| ENSG00000270820.1  | 2  | RP11-355B11.2 | 61704794  | rs811372   | 2  | 61429568  | -0.24 | 0.05 | 2.39E-06 | 1.03E-01 | 20 |
| ENSG00000160360.7  | 9  | GPSM1         | 139237931 | rs28635228 | 9  | 139245901 | -0.36 | 0.08 | 3.68E-06 | 7.17E-04 | 18 |
| ENSG00000108443.9  | 17 | RPS6KB1       | 57999186  | rs1292035  | 17 | 57989557  | 0.39  | 0.08 | 3.80E-06 | 5.87E-02 | 4  |
| ENSG00000159128.10 | 21 | IFNGR2        | 34813428  | rs2284553  | 21 | 34776695  | 0.24  | 0.05 | 4.41E-06 | 1.26E-01 | 3  |
| ENSG00000169885.5  | 1  | CALML6        | 1847499   | rs9660180  | 1  | 1723031   | -0.15 | 0.03 | 5.06E-06 | 6.38E-01 | 7  |
| ENSG00000244731.3  | 6  | C4A           | 31960129  | rs6901158  | 6  | 32205942  | 0.11  | 0.02 | 5.71E-06 | 7.31E-03 | 20 |
| ENSG00000149485.12 | 11 | FADS1         | 61581944  | rs174550   | 11 | 61571478  | -0.25 | 0.06 | 6.13E-06 | 4.25E-01 | 3  |
| ENSG00000264968.1  | 17 | RP11-387H17.4 | 38089924  | rs4795402  | 17 | 38085385  | 0.10  | 0.02 | 6.61E-06 | 3.34E-06 | 20 |
| ENSG00000204301.5  | 6  | NOTCH4        | 32177232  | rs434841   | 6  | 32191041  | 0.15  | 0.03 | 6.95E-06 | 3.74E-02 | 20 |
| ENSG00000212978.5  | 2  | AC016747.3    | 61370418  | rs1177274  | 2  | 61368532  | -0.26 | 0.06 | 7.50E-06 | 4.21E-01 | 20 |

**Supplementary Table 7. SMR analysis in thyroid tissue**

| probeID            | ProbeChr | Gene           | Probe_bp  | topSNP     | topSNP_chr | topSNP_bp | b_SMR | se_SMR | p_SMR    | p_HEIDI  | snp_HEIDI |
|--------------------|----------|----------------|-----------|------------|------------|-----------|-------|--------|----------|----------|-----------|
| ENSG00000148384.11 | 9        | INPP5E         | 139328672 | rs7628     | 9          | 139318071 | -0.23 | 0.02   | 2.00E-22 | 2.97E-06 | 20        |
| ENSG00000197083.7  | 5        | ZNF300P1       | 150318029 | rs12659118 | 5          | 150324622 | 0.12  | 0.01   | 3.45E-21 | 7.95E-08 | 16        |
| ENSG00000072682.14 | 5        | P4HA2          | 131579269 | rs7701414  | 5          | 131585958 | 0.23  | 0.03   | 1.29E-18 | 2.48E-06 | 20        |
| ENSG00000259982.1  | 16       | CDC37P1        | 28712238  | rs62034323 | 16         | 28536473  | 0.11  | 0.01   | 1.39E-14 | 2.99E-04 | 20        |
| ENSG00000119919.9  | 10       | NKX2-3         | 101294484 | rs10748781 | 10         | 101283330 | 0.35  | 0.05   | 6.26E-14 | 1.79E-02 | 13        |
| ENSG00000196126.6  | 6        | HLA-DRB1       | 32552085  | rs9271255  | 6          | 32580357  | 0.28  | 0.04   | 9.42E-14 | 2.36E-04 | 20        |
| ENSG00000229391.3  | 6        | HLA-DRB6       | 32524144  | rs9271640  | 6          | 32592200  | -0.12 | 0.02   | 3.26E-13 | 1.37E-03 | 20        |
| ENSG00000198502.5  | 6        | HLA-DRB5       | 32491592  | rs9270986  | 6          | 32574060  | 0.07  | 0.01   | 3.75E-13 | 2.64E-06 | 20        |
| ENSG00000178952.4  | 16       | TUFM           | 28855730  | rs7187776  | 16         | 28857645  | 0.33  | 0.05   | 9.25E-13 | 5.52E-03 | 20        |
| ENSG00000271623.1  | 16       | RP11-435I10.5  | 28376337  | rs151174   | 16         | 28508069  | -0.14 | 0.02   | 2.63E-12 | 4.33E-03 | 20        |
| ENSG00000196301.3  | 6        | HLA-DRB9       | 32434437  | rs9271255  | 6          | 32580357  | -0.20 | 0.03   | 3.03E-12 | 2.13E-03 | 20        |
| ENSG00000164308.12 | 5        | ERAP2          | 96233531  | rs2910686  | 5          | 96252589  | 0.07  | 0.01   | 5.03E-12 | 8.29E-02 | 20        |
| ENSG00000261338.1  | 2        | RP11-378A13.1  | 219121064 | rs736730   | 2          | 219120255 | -0.08 | 0.01   | 5.58E-12 | 2.12E-02 | 20        |
| ENSG00000004534.10 | 3        | RBM6           | 50046061  | rs4688755  | 3          | 50064424  | 0.14  | 0.02   | 6.84E-12 | 4.19E-09 | 20        |
| ENSG00000225851.1  | 6        | HLA-S          | 31349958  | rs9264942  | 6          | 31274380  | 0.15  | 0.02   | 2.43E-11 | 4.08E-10 | 20        |
| ENSG00000166949.11 | 15       | SMAD3          | 67421817  | rs72743461 | 15         | 67441750  | -0.22 | 0.03   | 3.94E-11 | 1.31E-01 | 16        |
| ENSG00000255389.1  | 6        | C6orf3         | 111922288 | rs33980500 | 6          | 111913262 | -0.15 | 0.02   | 4.28E-11 | 5.59E-03 | 20        |
| ENSG00000173531.11 | 3        | MST1           | 49724164  | rs11130213 | 3          | 49712297  | 0.53  | 0.08   | 8.31E-11 | 1.79E-03 | 18        |
| ENSG00000167914.6  | 17       | GSDMA          | 38126622  | rs56326707 | 17         | 38130139  | 0.14  | 0.02   | 1.34E-10 | 4.96E-03 | 20        |
| ENSG00000197375.8  | 5        | SLC22A5        | 131718375 | rs11950562 | 5          | 131652529 | -0.47 | 0.07   | 1.85E-10 | 3.83E-03 | 20        |
| ENSG00000165689.12 | 9        | SDCCAG3        | 139300719 | rs10747043 | 9          | 139318310 | -0.31 | 0.05   | 2.75E-10 | 9.86E-07 | 20        |
| ENSG00000270424.1  | 16       | RP11-1348G14.6 | 28761598  | rs4787458  | 16         | 28531287  | 0.16  | 0.03   | 5.13E-10 | 9.25E-02 | 20        |
| ENSG00000251417.1  | 16       | RP11-1348G14.4 | 28821623  | rs12325113 | 16         | 28848668  | -0.22 | 0.03   | 6.37E-10 | 6.50E-03 | 20        |
| ENSG00000233006.2  | 5        | AC034220.3     | 131676159 | rs270601   | 5          | 131656997 | 0.11  | 0.02   | 1.47E-09 | 1.09E-09 | 20        |
| ENSG00000204338.4  | 6        | CYP21A1P       | 31974821  | rs2856674  | 6          | 32659645  | 0.17  | 0.03   | 2.07E-09 | 6.80E-09 | 20        |
| ENSG00000161395.8  | 17       | PGAP3          | 37840212  | rs407307   | 17         | 37827163  | -0.21 | 0.04   | 2.21E-09 | 7.14E-06 | 20        |
| ENSG00000244731.3  | 6        | C4A            | 31960129  | rs3135353  | 6          | 32392877  | 0.15  | 0.02   | 2.86E-09 | 2.14E-04 | 20        |
| ENSG00000196502.7  | 16       | SULT1A1        | 28625924  | rs75301646 | 16         | 28617885  | -0.13 | 0.02   | 3.48E-09 | 5.77E-06 | 20        |
| ENSG00000225697.6  | 3        | SLC26A6        | 48668041  | rs3821876  | 3          | 48668394  | 0.33  | 0.06   | 3.81E-09 | 7.71E-03 | 20        |

|                    |    |              |           |            |    |           |       |      |          |          |    |
|--------------------|----|--------------|-----------|------------|----|-----------|-------|------|----------|----------|----|
| ENSG00000175643.7  | 16 | RMI2         | 11394562  | rs243327   | 16 | 11353304  | -0.09 | 0.02 | 5.63E-09 | 1.20E-07 | 20 |
| ENSG00000142233.7  | 19 | NTN5         | 49170501  | rs516246   | 19 | 49206172  | 0.23  | 0.04 | 6.63E-09 | 5.52E-05 | 20 |
| ENSG00000234936.1  | 2  | AC010883.5   | 43458622  | rs13419550 | 2  | 43468636  | 0.22  | 0.04 | 9.25E-09 | 1.59E-02 | 20 |
| ENSG00000164068.11 | 3  | RNF123       | 49740422  | rs2247036  | 3  | 49882349  | -0.36 | 0.06 | 9.79E-09 | 8.19E-03 | 20 |
| ENSG00000213066.7  | 6  | FGFR1OP      | 167439435 | rs720325   | 6  | 167467349 | 0.30  | 0.05 | 1.03E-08 | 3.99E-02 | 20 |
| ENSG00000231852.2  | 6  | CYP21A2      | 32007744  | rs1048709  | 6  | 31914935  | -0.26 | 0.04 | 1.05E-08 | 2.99E-05 | 20 |
| ENSG00000131435.8  | 5  | PDLIM4       | 131601255 | rs10076701 | 5  | 131596419 | -0.34 | 0.06 | 1.24E-08 | 9.34E-05 | 20 |
| ENSG00000026297.11 | 6  | RNASET2      | 167356832 | rs398278   | 6  | 167388169 | -0.37 | 0.07 | 1.28E-08 | 2.36E-01 | 20 |
| ENSG00000204528.3  | 6  | PSORS1C3     | 31143594  | rs2074488  | 6  | 31240431  | -0.08 | 0.01 | 1.48E-08 | 9.00E-06 | 20 |
| ENSG00000224431.1  | 5  | AC063976.7   | 131537164 | rs72793278 | 5  | 131561372 | 0.37  | 0.07 | 1.55E-08 | 2.19E-03 | 20 |
| ENSG00000173209.18 | 2  | AHSA2        | 61411445  | rs2167565  | 2  | 61476458  | -0.13 | 0.02 | 2.44E-08 | 1.02E-02 | 20 |
| ENSG00000085978.17 | 2  | ATG16L1      | 234161508 | rs56049444 | 2  | 234157688 | 0.70  | 0.13 | 2.82E-08 | 2.15E-02 | 20 |
| ENSG00000204257.10 | 6  | HLA-DMA      | 32926630  | rs9276931  | 6  | 32928984  | -0.12 | 0.02 | 2.85E-08 | 6.61E-02 | 20 |
| ENSG00000127838.9  | 2  | PNKD         | 219173315 | rs4672884  | 2  | 219182481 | -0.25 | 0.04 | 3.04E-08 | 8.86E-02 | 20 |
| ENSG00000260302.1  | 18 | RP11-973H7.1 | 12775286  | rs2542151  | 18 | 12779947  | 0.26  | 0.05 | 3.15E-08 | 3.45E-01 | 16 |
| ENSG00000233232.2  | 16 | NPIP7        | 28474780  | rs151174   | 16 | 28508069  | -0.23 | 0.04 | 3.66E-08 | 6.66E-02 | 20 |
| ENSG00000176998.3  | 6  | HCG4         | 29759514  | rs1362070  | 6  | 29742299  | 0.07  | 0.01 | 3.81E-08 | 1.83E-02 | 20 |
| ENSG00000160766.10 | 1  | GBAP1        | 155190415 | rs2974929  | 1  | 155197268 | -0.15 | 0.03 | 4.09E-08 | 1.93E-01 | 20 |
| ENSG00000169231.9  | 1  | THBS3        | 155171543 | rs4072037  | 1  | 155162067 | 0.26  | 0.05 | 6.00E-08 | 8.38E-01 | 20 |
| ENSG00000169220.13 | 5  | RGS14        | 176792220 | rs4976646  | 5  | 176788570 | -0.27 | 0.05 | 6.48E-08 | 5.62E-01 | 6  |
| ENSG00000163466.11 | 2  | ARPC2        | 219100448 | rs10169718 | 2  | 219103580 | -0.36 | 0.07 | 8.55E-08 | 8.10E-02 | 20 |
| ENSG00000223534.1  | 6  | HLA-DQB1-AS1 | 32628319  | rs9270986  | 6  | 32574060  | 0.25  | 0.05 | 1.15E-07 | 3.81E-07 | 20 |
| ENSG00000115226.5  | 2  | FNDC4        | 27716431  | rs780094   | 2  | 27741237  | -0.27 | 0.05 | 1.27E-07 | 1.52E-01 | 3  |
| ENSG00000125520.9  | 20 | SLC2A4RG     | 62373036  | rs2427532  | 20 | 62363817  | 0.44  | 0.08 | 1.60E-07 | 1.31E-02 | 20 |
| ENSG00000197146.2  | 6  | AL133458.1   | 167359002 | rs7760495  | 6  | 167506795 | -0.27 | 0.05 | 1.60E-07 | 1.27E-02 | 20 |
| ENSG00000008838.13 | 17 | MED24        | 38196409  | rs11078934 | 17 | 38189793  | 0.16  | 0.03 | 2.22E-07 | 9.38E-07 | 20 |
| ENSG00000160360.7  | 9  | GPSM1        | 139237931 | rs10870202 | 9  | 139257411 | -0.54 | 0.11 | 2.53E-07 | 1.90E-02 | 20 |
| ENSG00000137312.10 | 6  | FLOT1        | 30702998  | rs1264372  | 6  | 30769726  | -0.18 | 0.04 | 2.61E-07 | 5.16E-03 | 20 |
| ENSG00000204929.7  | 2  | AC074391.1   | 65987809  | rs11692813 | 2  | 65662306  | 0.07  | 0.01 | 3.38E-07 | 5.45E-04 | 20 |
| ENSG00000138111.10 | 10 | TMEM180      | 104228975 | rs3740415  | 10 | 104232716 | -0.07 | 0.01 | 3.48E-07 | 2.59E-02 | 9  |
| ENSG00000241106.2  | 6  | HLA-DOB      | 32782682  | rs2621326  | 6  | 32783896  | -0.16 | 0.03 | 4.36E-07 | 1.45E-02 | 20 |
| ENSG00000232871.4  | 19 | SEC1P        | 49162931  | rs516246   | 19 | 49206172  | 0.20  | 0.04 | 4.58E-07 | 4.11E-04 | 20 |

|                    |    |               |           |            |    |           |       |      |          |          |    |
|--------------------|----|---------------|-----------|------------|----|-----------|-------|------|----------|----------|----|
| ENSG00000054219.9  | 2  | LY75          | 160710563 | rs4664304  | 2  | 160794008 | -0.10 | 0.02 | 4.64E-07 | 2.01E-03 | 6  |
| ENSG00000145020.10 | 3  | AMT           | 49457198  | rs6446275  | 3  | 49466871  | 0.11  | 0.02 | 4.97E-07 | 6.30E-19 | 20 |
| ENSG00000091140.8  | 7  | DLD           | 107551795 | rs6965674  | 7  | 107528102 | -0.58 | 0.12 | 5.22E-07 | 1.35E-04 | 20 |
| ENSG00000101246.15 | 20 | ARFRP1        | 62334707  | rs2315008  | 20 | 62343956  | 0.54  | 0.11 | 6.41E-07 | 1.70E-01 | 11 |
| ENSG00000145721.7  | 5  | LIX1          | 96453075  | rs38030    | 5  | 96353684  | -0.30 | 0.06 | 7.38E-07 | 1.08E-01 | 11 |
| ENSG00000204616.6  | 6  | TRIM31        | 30075778  | rs9261394  | 6  | 30064562  | 0.15  | 0.03 | 7.42E-07 | 2.05E-03 | 20 |
| ENSG00000145029.7  | 3  | NICN1         | 49463859  | rs6446275  | 3  | 49466871  | 0.12  | 0.02 | 9.13E-07 | 1.81E-14 | 20 |
| ENSG00000270210.1  | 2  | RP11-373D23.3 | 28649199  | rs6547850  | 2  | 28629343  | 0.21  | 0.04 | 1.05E-06 | 1.54E-01 | 4  |
| ENSG00000271889.1  | 2  | RP11-493E12.1 | 61383904  | rs3889717  | 2  | 61390791  | 0.14  | 0.03 | 1.34E-06 | 4.67E-01 | 20 |
| ENSG00000204301.5  | 6  | NOTCH4        | 32177232  | rs2071287  | 6  | 32170433  | 0.19  | 0.04 | 1.57E-06 | 3.97E-03 | 20 |
| ENSG00000164078.8  | 3  | MST1R         | 49932856  | rs7372725  | 3  | 49790544  | -0.38 | 0.08 | 1.93E-06 | 6.45E-08 | 20 |
| ENSG00000235908.1  | 3  | RHOA-IT1      | 49403508  | rs7621003  | 3  | 49411404  | 0.31  | 0.07 | 2.35E-06 | 6.22E-05 | 17 |
| ENSG00000263080.1  | 16 | RP11-485G7.5  | 11437367  | rs243330   | 16 | 11350991  | -0.18 | 0.04 | 2.45E-06 | 5.15E-05 | 20 |
| ENSG00000230795.2  | 6  | HLA-K         | 29895982  | rs12193110 | 6  | 29937104  | 0.06  | 0.01 | 3.20E-06 | 2.28E-03 | 20 |
| ENSG00000270820.1  | 2  | RP11-355B11.2 | 61704794  | rs778140   | 2  | 61682976  | 0.27  | 0.06 | 3.66E-06 | 6.25E-02 | 20 |
| ENSG00000204625.6  | 6  | HCG9          | 29944536  | rs3823376  | 6  | 29944184  | -0.17 | 0.04 | 3.85E-06 | 1.07E-04 | 20 |
| ENSG00000161180.6  | 22 | CCDC116       | 21989310  | rs7444     | 22 | 21976934  | -0.20 | 0.04 | 3.95E-06 | 2.18E-01 | 4  |
| ENSG00000112977.11 | 5  | DAP           | 10720363  | rs267949   | 5  | 10743929  | -0.23 | 0.05 | 5.06E-06 | 5.49E-02 | 8  |
| ENSG00000160752.10 | 1  | FDPS          | 155284066 | rs2297480  | 1  | 155279482 | 0.17  | 0.04 | 5.31E-06 | 1.31E-01 | 20 |
| ENSG00000220201.3  | 19 | ZGLP1         | 10418017  | rs73510898 | 19 | 10416444  | -0.52 | 0.11 | 5.39E-06 | 2.60E-06 | 7  |
| ENSG00000176022.3  | 1  | B3GALT6       | 1169025   | rs6697886  | 1  | 1173611   | -0.44 | 0.10 | 6.65E-06 | NA       | NA |
| ENSG00000213760.6  | 6  | ATP6V1G2      | 31513432  | rs2239705  | 6  | 31513402  | -0.09 | 0.02 | 6.67E-06 | 3.33E-05 | 20 |

**Supplementary Table 8. SMR analysis in lymphoblastoid cell lines**

| probeID            | ProbeChr | Gene            | Probe_bp  | topSNP    | rsSNP_ch | topSNP_bp | b_SMR | se_SMR | p_SMR    | p_HEIDI  | snp_HEIDI |
|--------------------|----------|-----------------|-----------|-----------|----------|-----------|-------|--------|----------|----------|-----------|
| ENSG00000237541.3  | 6        | HLA-DQA2        | 32709119  | rs660895  | 6        | 32577380  | -0.14 | 0.02   | 2.96E-18 | 3.25E-07 | 20        |
| ENSG00000187796.9  | 9        | CARD9           | 139268133 | rs1087016 | 9        | 139316601 | -0.24 | 0.04   | 8.88E-11 | 1.47E-01 | 20        |
| ENSG00000184110.9  | 16       | EIF3C           | 28699879  | rs6203665 | 16       | 28850371  | 0.14  | 0.02   | 1.83E-10 | 7.18E-02 | 20        |
| ENSG00000212978.4  | 2        | ENSG00000212978 | 61372104  | rs1729662 | 2        | 61391305  | -0.09 | 0.02   | 1.94E-08 | 6.11E-02 | 20        |
| ENSG00000095794.14 | 10       | CREM            | 35415719  | rs1758300 | 10       | 35320915  | -0.21 | 0.04   | 3.71E-08 | 5.28E-01 | 18        |
| ENSG00000172057.4  | 17       | ORMDL3          | 38083854  | rs8067378 | 17       | 38051348  | -0.14 | 0.02   | 1.75E-17 | 2.65E-04 | 20        |
| ENSG00000196735.6  | 6        | HLA-DQA1        | 32595956  | rs9271100 | 6        | 32576478  | 0.17  | 0.02   | 2.08E-13 | 3.17E-08 | 20        |
| ENSG00000146535.8  | 7        | GNA12           | 2883958   | rs1182188 | 7        | 2869985   | -0.09 | 0.02   | 1.78E-07 | 2.26E-01 | 4         |
| ENSG00000164308.12 | 5        | ERAP2           | 96211643  | rs2910686 | 5        | 96252589  | 0.06  | 0.01   | 8.71E-12 | 1.85E-04 | 20        |
| ENSG00000148384.11 | 9        | INPP5E          | 139334274 | rs1329073 | 9        | 139330701 | -0.24 | 0.05   | 8.31E-07 | 8.16E-02 | 20        |
| ENSG00000135926.6  | 2        | TMBIM1          | 219157309 | rs2168704 | 2        | 219142492 | -0.16 | 0.03   | 2.85E-06 | 2.90E-01 | 20        |
| ENSG00000112977.11 | 5        | DAP             | 10761384  | rs267949  | 5        | 10743929  | -0.09 | 0.02   | 3.89E-06 | 9.88E-02 | 8         |
| ENSG00000131435.8  | 5        | PDLIM4          | 131593364 | rs1979981 | 5        | 131601720 | -0.11 | 0.02   | 6.60E-11 | 3.33E-07 | 20        |
| ENSG00000232629.4  | 6        | HLA-DQB2        | 32731311  | rs9271100 | 6        | 32576478  | -0.21 | 0.03   | 1.79E-10 | 8.24E-06 | 20        |
| ENSG00000179344.11 | 6        | HLA-DQB1        | 32636160  | rs3891175 | 6        | 32634467  | 0.08  | 0.01   | 3.39E-10 | 7.89E-06 | 20        |
| ENSG00000175643.7  | 16       | RMI2            | 11343476  | rs9936459 | 16       | 11437779  | 0.09  | 0.01   | 5.14E-10 | 1.45E-06 | 20        |
| ENSG00000204267.8  | 6        | TAP2            | 32806557  | rs2621323 | 6        | 32788707  | 0.10  | 0.02   | 6.65E-09 | 6.60E-04 | 20        |
| ENSG00000169914.5  | 1        | OTUD3           | 20209006  | rs7541059 | 1        | 20211670  | 0.14  | 0.03   | 1.24E-08 | 2.62E-10 | 15        |
| ENSG00000237651.2  | 2        | C2orf74         | 61372243  | rs1729673 | 2        | 61389799  | 0.08  | 0.01   | 2.80E-08 | 3.25E-03 | 20        |
| ENSG00000162929.9  | 2        | KIAA1841        | 61293006  | rs1729653 | 2        | 61377008  | 0.09  | 0.02   | 6.47E-08 | 3.53E-03 | 20        |
| ENSG00000196126.6  | 6        | HLA-DRB1        | 32557625  | rs532098  | 6        | 32578052  | 0.11  | 0.02   | 1.73E-07 | 1.91E-12 | 15        |
| ENSG00000100311.12 | 22       | PDGFB           | 39640756  | rs968451  | 22       | 39670851  | -0.21 | 0.04   | 3.10E-07 | 5.80E-04 | 19        |
| ENSG00000171522.5  | 5        | PTGER4          | 40679600  | rs1044063 | 5        | 40490790  | 0.31  | 0.05   | 1.94E-09 | 2.87E-02 | 20        |
| ENSG00000108771.6  | 17       | DHX58           | 40264751  | rs730086  | 17       | 40271757  | 0.12  | 0.03   | 2.25E-06 | 2.21E-03 | 8         |
| ENSG00000173214.5  | 6        | KIAA1919        | 111580551 | rs7156228 | 6        | 111555571 | 0.14  | 0.03   | 2.41E-06 | 3.18E-03 | 20        |
| ENSG00000100321.10 | 22       | SYNGR1          | 39745930  | rs2069235 | 22       | 39747780  | 0.05  | 0.01   | 3.15E-06 | 1.83E-12 | 20        |
| ENSG00000137310.7  | 6        | TCF19           | 31126319  | rs1966    | 6        | 31107733  | 0.12  | 0.03   | 5.37E-06 | 2.11E-03 | 15        |
| ENSG00000204531.9  | 6        | POU5F1          | 31148508  | rs1966    | 6        | 31107733  | 0.12  | 0.03   | 5.40E-06 | 7.96E-04 | 15        |

|                   |    |        |          |           |    |          |       |      |          |          |    |
|-------------------|----|--------|----------|-----------|----|----------|-------|------|----------|----------|----|
| ENSG00000204536.8 | 6  | CCHCR1 | 31126015 | rs1966    | 6  | 31107733 | 0.12  | 0.03 | 6.10E-06 | 3.23E-03 | 7  |
| ENSG00000205609.7 | 16 | EIF3CL | 28415200 | s5618613' | 16 | 28825953 | 0.13  | 0.02 | 5.23E-12 | 3.86E-02 | 20 |
| ENSG00000065989.9 | 19 | PDE4A  | 10527449 | s1297810: | 19 | 10520514 | -0.14 | 0.03 | 7.51E-06 | 1.91E-02 | 13 |

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**Supplementantary Table 9. Meta-analysis of MR esti**

| <b>direction</b> | <b>disease_group</b> | <b>IBD type</b> |
|------------------|----------------------|-----------------|
| Forward          | Breast cancer        | CD              |
| Forward          | Breast cancer        | IBD             |
| Forward          | Breast cancer        | UC              |
| Forward          | CeD                  | CD              |
| Forward          | CeD                  | IBD             |
| Forward          | CeD                  | UC              |
| Forward          | MS                   | CD              |
| Forward          | MS                   | IBD             |
| Forward          | MS                   | UC              |
| Forward          | PBC                  | CD              |
| Forward          | PBC                  | IBD             |
| Forward          | PBC                  | UC              |
| Forward          | RA                   | CD              |
| Forward          | RA                   | IBD             |
| Forward          | RA                   | UC              |
| Forward          | SLE                  | CD              |
| Forward          | SLE                  | IBD             |
| Forward          | SLE                  | UC              |
| Forward          | T1D                  | CD              |
| Forward          | T1D                  | IBD             |
| Forward          | T1D                  | UC              |
| Forward          | T2D                  | CD              |
| Forward          | T2D                  | IBD             |
| Forward          | T2D                  | UC              |
| Inverse          | Breast cancer        | CD              |
| Inverse          | Breast cancer        | UC              |
| Inverse          | CeD                  | CD              |
| Inverse          | CeD                  | IBD             |
| Inverse          | CeD                  | UC              |
| Inverse          | MS                   | CD              |
| Inverse          | MS                   | IBD             |
| Inverse          | MS                   | UC              |
| Inverse          | RA                   | CD              |
| Inverse          | RA                   | IBD             |
| Inverse          | RA                   | UC              |
| Inverse          | SLE                  | CD              |
| Inverse          | SLE                  | IBD             |
| Inverse          | SLE                  | UC              |
| Inverse          | T1D                  | CD              |
| Inverse          | T1D                  | IBD             |
| Inverse          | T1D                  | UC              |
| Inverse          | T2D                  | CD              |
| Inverse          | T2D                  | IBD             |
| Inverse          | T2D                  | UC              |

## imates across data source in both directions

| included_traits                                |
|------------------------------------------------|
| Breast_cancer_S1; Breast_cancer_S2             |
| Breast_cancer_S1; Breast_cancer_S2             |
| Breast_cancer_S1; Breast_cancer_S2             |
| CeD_S3; CeD_S5; CeD_S2; CeD_S1; CeD_S6; CeD_S4 |
| CeD_S3; CeD_S5; CeD_S2; CeD_S1; CeD_S6; CeD_S4 |
| CeD_S3; CeD_S5; CeD_S2; CeD_S1; CeD_S6; CeD_S4 |
| MS_S1; MS_S2; MS_S3; MS_S4                     |
| MS_S1; MS_S2; MS_S3; MS_S4                     |
| MS_S1; MS_S2; MS_S3; MS_S4                     |
| PBC_S1; PBC_S2                                 |
| PBC_S1; PBC_S2                                 |
| PBC_S1; PBC_S2                                 |
| RA_S4; RA_S6; RA_S2; RA_S1; RA_S3; RA_S5       |
| RA_S4; RA_S6; RA_S2; RA_S1; RA_S3; RA_S5       |
| RA_S4; RA_S6; RA_S2; RA_S1; RA_S3; RA_S5       |
| SLE_S1; SLE_S2                                 |
| SLE_S1; SLE_S2                                 |
| SLE_S1; SLE_S2                                 |
| T1D_S3; T1D_S2; T1D_S4; T1D_S1                 |
| T1D_S3; T1D_S2; T1D_S4; T1D_S1                 |
| T1D_S3; T1D_S2; T1D_S4; T1D_S1                 |
| T2D_S3; T2D_S5; T2D_S4; T2D_S1; T2D_S2; T2D_S6 |
| T2D_S3; T2D_S5; T2D_S4; T2D_S1; T2D_S2; T2D_S6 |
| T2D_S3; T2D_S5; T2D_S4; T2D_S1; T2D_S2; T2D_S6 |
| Breast_cancer_S1; Breast_cancer_S2             |
| Breast_cancer_S1; Breast_cancer_S2             |
| CeD_S3; CeD_S5; CeD_S1; CeD_S6; CeD_S4         |
| CeD_S3; CeD_S5; CeD_S1; CeD_S6; CeD_S4         |
| CeD_S3; CeD_S5; CeD_S1; CeD_S6; CeD_S4         |
| MS_S1; MS_S2; MS_S3; MS_S4                     |
| MS_S1; MS_S2; MS_S3; MS_S4                     |
| MS_S1; MS_S2; MS_S3; MS_S4                     |
| RA_S4; RA_S6; RA_S2; RA_S1; RA_S3; RA_S5       |
| RA_S4; RA_S6; RA_S2; RA_S1; RA_S3; RA_S5       |
| RA_S4; RA_S6; RA_S2; RA_S1; RA_S3; RA_S5       |
| SLE_S1; SLE_S2                                 |
| SLE_S1; SLE_S2                                 |
| SLE_S1; SLE_S2                                 |
| T1D_S3; T1D_S2; T1D_S4                         |
| T1D_S3; T1D_S2; T1D_S4                         |
| T1D_S3; T1D_S2; T1D_S4                         |
| T2D_S3; T2D_S5; T2D_S4; T2D_S1; T2D_S2; T2D_S6 |
| T2D_S3; T2D_S5; T2D_S4; T2D_S1; T2D_S2; T2D_S6 |
| T2D_S3; T2D_S5; T2D_S4; T2D_S1; T2D_S2; T2D_S6 |

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**included\_gwas\_ids**

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ebi-a-GCST004988; ebi-a-GCST007236  
ebi-a-GCST004988; ebi-a-GCST007236  
ebi-a-GCST004988; ebi-a-GCST007236  
ieu-a-1058; ieu-a-1060; ebi-a-GCST005523; ebi-a-GCST000612; ieu-a-276; ieu-a-1059  
ieu-a-1058; ieu-a-1060; ebi-a-GCST005523; ebi-a-GCST000612; ieu-a-276; ieu-a-1059  
ieu-a-1058; ieu-a-1060; ebi-a-GCST005523; ebi-a-GCST000612; ieu-a-276; ieu-a-1059  
ieu-a-1025; ebi-a-GCST005531; ieu-a-1024; ieu-b-18  
ieu-a-1025; ebi-a-GCST005531; ieu-a-1024; ieu-b-18  
ieu-a-1025; ebi-a-GCST005531; ieu-a-1024; ieu-b-18  
ebi-a-GCST003129; ebi-a-GCST005581  
ebi-a-GCST003129; ebi-a-GCST005581  
ebi-a-GCST003129; ebi-a-GCST005581  
ieu-a-832; bbj-a-73; ebi-a-GCST002318; ebi-a-GCST000679; ebi-a-GCST005569; ieu-a-834  
ieu-a-832; bbj-a-73; ebi-a-GCST002318; ebi-a-GCST000679; ebi-a-GCST005569; ieu-a-834  
ieu-a-832; bbj-a-73; ebi-a-GCST002318; ebi-a-GCST000679; ebi-a-GCST005569; ieu-a-834  
ebi-a-GCST003156; ieu-a-815  
ebi-a-GCST003156; ieu-a-815  
ebi-a-GCST003156; ieu-a-815  
ebi-a-GCST90000529; ebi-a-GCST010681; finn-b-E4\_DM1; ebi-a-GCST005536  
ebi-a-GCST90000529; ebi-a-GCST010681; finn-b-E4\_DM1; ebi-a-GCST005536  
ebi-a-GCST90000529; ebi-a-GCST010681; finn-b-E4\_DM1; ebi-a-GCST005536  
ebi-a-GCST007517; finn-b-T2D; finn-b-E4\_DM2; ebi-a-GCST005047; ebi-a-GCST006867; ebi-a-G  
ebi-a-GCST007517; finn-b-T2D; finn-b-E4\_DM2; ebi-a-GCST005047; ebi-a-GCST006867; ebi-a-G  
ebi-a-GCST007517; finn-b-T2D; finn-b-E4\_DM2; ebi-a-GCST005047; ebi-a-GCST006867; ebi-a-G  
ebi-a-GCST004988; ebi-a-GCST007236  
ebi-a-GCST004988; ebi-a-GCST007236  
ieu-a-1058; ieu-a-1060; ebi-a-GCST000612; ieu-a-276; ieu-a-1059  
ieu-a-1058; ieu-a-1060; ebi-a-GCST000612; ieu-a-276; ieu-a-1059  
ieu-a-1058; ieu-a-1060; ebi-a-GCST000612; ieu-a-276; ieu-a-1059  
ieu-a-1025; ebi-a-GCST005531; ieu-a-1024; ieu-b-18  
ieu-a-1025; ebi-a-GCST005531; ieu-a-1024; ieu-b-18  
ieu-a-1025; ebi-a-GCST005531; ieu-a-1024; ieu-b-18  
ieu-a-832; bbj-a-73; ebi-a-GCST002318; ebi-a-GCST000679; ebi-a-GCST005569; ieu-a-834  
ieu-a-832; bbj-a-73; ebi-a-GCST002318; ebi-a-GCST000679; ebi-a-GCST005569; ieu-a-834  
ieu-a-832; bbj-a-73; ebi-a-GCST002318; ebi-a-GCST000679; ebi-a-GCST005569; ieu-a-834  
ebi-a-GCST003156; ieu-a-815  
ebi-a-GCST003156; ieu-a-815  
ebi-a-GCST003156; ieu-a-815  
ebi-a-GCST90000529; ebi-a-GCST010681; finn-b-E4\_DM1  
ebi-a-GCST90000529; ebi-a-GCST010681; finn-b-E4\_DM1  
ebi-a-GCST90000529; ebi-a-GCST010681; finn-b-E4\_DM1  
ebi-a-GCST007517; finn-b-T2D; finn-b-E4\_DM2; ebi-a-GCST005047; ebi-a-GCST006867; ebi-a-G  
ebi-a-GCST007517; finn-b-T2D; finn-b-E4\_DM2; ebi-a-GCST005047; ebi-a-GCST006867; ebi-a-G  
ebi-a-GCST007517; finn-b-T2D; finn-b-E4\_DM2; ebi-a-GCST005047; ebi-a-GCST006867; ebi-a-G

| category            | n_dataset | pooled_logOR        | pooled_SE         | pooled_OR         |
|---------------------|-----------|---------------------|-------------------|-------------------|
| Neoplasms           | 2         | 0.224293302565066   | 0.240618928353951 | 2.5143801558527   |
| Neoplasms           | 2         | -0.000275151        | 0.005094762611320 | 0.999724886571578 |
| Neoplasms           | 2         | 0.00013881276383787 | 0.005096129827181 | 0.00013882239878  |
| Digestive           | 6         | 0.0695437961713526  | 0.039331380927581 | 0.7201901050494   |
| Digestive           | 6         | 0.0580811962743033  | 0.032798337841681 | 0.05980104411312  |
| Digestive           | 6         | 0.0717688753539396  | 0.030898600871681 | 0.7440699342886   |
| Mental and Nervous  | 4         | -0.010289346        | 0.017284310571820 | 0.989763408617786 |
| Mental and Nervous  | 4         | 0.0826732269921136  | 0.029765835814811 | 0.08618681401774  |
| Mental and Nervous  | 4         | 0.0639469485137318  | 0.051965944002011 | 0.06603584247546  |
| Digestive           | 2         | 0.0908561751519577  | 0.013698089973501 | 0.09511148968782  |
| Digestive           | 2         | 0.107557908125072   | 0.031390166492981 | 0.11355534278157  |
| Digestive           | 2         | 0.0886650821397949  | 0.050263824083821 | 0.09271462539045  |
| Musculoskeletal     | 6         | -0.116404373        | 0.040918064895080 | 0.890115212036749 |
| Musculoskeletal     | 6         | 0.0205008564282223  | 0.018370605431021 | 0.02071244240976  |
| Musculoskeletal     | 6         | 0.110024784706938   | 0.015895874298301 | 0.11630573742657  |
| Musculoskeletal     | 2         | -0.063305255        | 0.026402708795280 | 0.938656900564467 |
| Musculoskeletal     | 2         | -0.092088056        | 0.010009936762120 | 0.912024836988181 |
| Musculoskeletal     | 2         | -0.099109291        | 0.021504010657650 | 0.905643723943931 |
| Endocrine, nutritio | 4         | -0.019989509        | 0.041834558488190 | 0.980208956494008 |
| Endocrine, nutritio | 4         | -0.036656999        | 0.029671781337960 | 0.964006733827335 |
| Endocrine, nutritio | 4         | 0.0141199169835799  | 0.011724708576571 | 0.01422007385844  |
| Endocrine, nutritio | 6         | -0.069731295        | 0.046365894949010 | 0.932644392202941 |
| Endocrine, nutritio | 6         | -0.048653211        | 0.023902902004070 | 0.952511392449185 |
| Endocrine, nutritio | 6         | -0.086530166        | 0.021665549569650 | 0.917107882685002 |
| Neoplasms           | 2         | -1.491115455        | 1.502840253370930 | 0.225121402550058 |
| Neoplasms           | 2         | 1.9837286288818     | 1.965431423881027 | 2.6979889521696   |
| Digestive           | 5         | 0.069392839332911   | 0.043103800440461 | 0.07185719411832  |
| Digestive           | 5         | 0.211038428227768   | 0.031447080544031 | 0.23495981146647  |
| Digestive           | 5         | 0.142678787826774   | 0.033837484612961 | 0.15335926912207  |
| Mental and Nervous  | 4         | 0.0611255420870077  | 0.022670471308781 | 0.06303236111159  |
| Mental and Nervous  | 4         | 0.0707384450067261  | 0.021351331114831 | 0.07330046205724  |
| Mental and Nervous  | 4         | 0.0602653752861186  | 0.021977472341101 | 0.06211836911543  |
| Musculoskeletal     | 6         | -0.024631766        | 0.007552346284890 | 0.975669120089483 |
| Musculoskeletal     | 6         | 0.0057564605803004  | 0.010899199526481 | 0.00577306083713  |
| Musculoskeletal     | 6         | 0.026748041156863   | 0.007249242315621 | 0.02710898096802  |
| Musculoskeletal     | 2         | -0.020202707        | 0.02192580385128  | 0.98              |
| Musculoskeletal     | 2         | -0.095195051        | 0.170851366299560 | 0.90919557772531  |
| Musculoskeletal     | 2         | 0.0603245833975455  | 0.027274373456851 | 0.06218125699989  |
| Endocrine, nutritio | 3         | 0.00350463547356767 | 0.010296064958871 | 0.00351078388902  |
| Endocrine, nutritio | 3         | 0.0248294569445906  | 0.023336521102081 | 0.02514027506078  |
| Endocrine, nutritio | 3         | 0.0222728909649704  | 0.012397402367991 | 0.02252278362966  |
| Endocrine, nutritio | 6         | 0.00474769425740205 | 0.003426181144691 | 0.00475898241495  |
| Endocrine, nutritio | 6         | -0.003728065        | 0.008103338074450 | 0.996278875397489 |
| Endocrine, nutritio | 6         | -0.003522152        | 0.007901273196640 | 0.99648404303712  |

| <b>lower_CI</b> | <b>upper_CI</b>   | <b>p_value</b> | <b>I2</b> | <b>heterogeneity_p</b> |
|-----------------|-------------------|----------------|-----------|------------------------|
| 0.780890927     | 2.00552606346857  | 0.351          | 92.96     | 0.000163               |
| 0.989791577     | 1.00975788413632  | 0.957          | 0         | 0.318                  |
| 0.9901987467    | 1.01017868113922  | 0.978          | 0         | 0.577                  |
| 0.992482686     | 1.15792927573333  | 0.077          | 98.16     | 1.5e-56                |
| 0.993815656     | 1.13016759789088  | 0.0766         | 97.71     | 3.42e-45               |
| 1.011270658     | 1.14148509904156  | 0.0202         | 96.45     | 1.25e-28               |
| 0.956794547     | 1.0238682980013   | 0.552          | 78.44     | 0.00302                |
| 1.024630632     | 1.15144107339231  | 0.00548        | 96.52     | 1.45e-18               |
| 0.962803149     | 1.18033724531388  | 0.218          | 97.27     | 1.2e-23                |
| 1.066100840     | 1.12491157379948  | 3.29e-11       | 47.89     | 0.166                  |
| 1.047109155     | 1.18421799208491  | 0.000611       | 90.43     | 0.00123                |
| 0.990196359     | 1.20584694303442  | 0.0777         | 95.41     | 3.07e-06               |
| 0.821516069     | 0.964442595558877 | 0.00444        | 96.13     | 3.59e-26               |
| 0.984614061     | 1.05813427891633  | 0.264          | 88.98     | 1.21e-08               |
| 1.082062423     | 1.15163272729685  | 4.47e-12       | 78.56     | 0.000293               |
| 0.891317508     | 0.988510568066095 | 0.0165         | 71.85     | 0.0595                 |
| 0.894305775     | 0.930094970077926 | 3.59e-20       | 0         | 0.66                   |
| 0.868266006     | 0.944630502996706 | 4.05e-06       | 58.24     | 0.122                  |
| 0.903042877     | 1.06396896844969  | 0.633          | 96.5      | 1.86e-18               |
| 0.909542375     | 1.02173247597527  | 0.217          | 96.98     | 1.99e-21               |
| 0.991178626     | 1.0377971541925   | 0.228          | 69.2      | 0.0209                 |
| 0.851625460     | 1.02137101675915  | 0.133          | 72.09     | 0.00306                |
| 0.908915726     | 0.998198101823067 | 0.0418         | 31.28     | 0.201                  |
| 0.878978673     | 0.956891098123946 | 6.5e-05        | 0         | 0.625                  |
| 0.011835138     | 0.28213381903183  | 0.321          | 99.88     | 3.27e-185              |
| 0.154352402     | 0.342.39814262919 | 0.313          | 99.92     | 1.4e-284               |
| 0.985022683     | 1.16634658701272  | 0.107          | 82        | 0.000181               |
| 1.161139848     | 1.31347291059049  | 1.93e-11       | 39.02     | 0.161                  |
| 1.079348175     | 1.23244531609215  | 2.48e-05       | 52.74     | 0.076                  |
| 1.016831498     | 1.11133241114013  | 0.00701        | 87.35     | 2.86e-05               |
| 1.029311195     | 1.11916968086036  | 0.000923       | 80.69     | 0.00141                |
| 1.017338119     | 1.10886971424507  | 0.0061         | 80.02     | 0.0018                 |
| 0.961333048     | 0.990218980754763 | 0.00111        | 28.27     | 0.223                  |
| 0.984515171     | 1.02748995548031  | 0.597          | 55.6      | 0.0465                 |
| 1.012618475     | 1.04180684440526  | 0.000224       | 0         | 0.811                  |
| 0.938777029     | 1.02303312656685  | 0.357          | 0         | 1                      |
| 0.650467639     | 1.27083431663802  | 0.577          | 93.81     | 5.85e-05               |
| 1.006890442     | 1.12050822574857  | 0.027          | 0         | 0.83                   |
| 0.983462617     | 1.02396763819524  | 0.734          | 0         | 0.662                  |
| 0.979306976     | 1.0731186531659   | 0.287          | 74.22     | 0.0207                 |
| 0.997976033     | 1.04767329889846  | 0.0724         | 0         | 0.613                  |
| 0.998034313     | 1.0115289613542   | 0.166          | 9.79      | 0.353                  |
| 0.980580429     | 1.01222864325438  | 0.645          | 72        | 0.00313                |
| 0.981170877     | 1.01203620204736  | 0.656          | 70.45     | 0.00465                |

| <b>pooled_OR_CI</b> |                  |
|---------------------|------------------|
| 1.251               | [0.781, 2.006]   |
| 1.000               | [0.990, 1.010]   |
| 1.000               | [0.990, 1.010]   |
| 1.072               | [0.992, 1.158]   |
| 1.060               | [0.994, 1.130]   |
| 1.074               | [1.011, 1.141]   |
| 0.990               | [0.957, 1.024]   |
| 1.086               | [1.025, 1.151]   |
| 1.066               | [0.963, 1.180]   |
| 1.095               | [1.066, 1.125]   |
| 1.114               | [1.047, 1.184]   |
| 1.093               | [0.990, 1.206]   |
| 0.890               | [0.822, 0.964]   |
| 1.021               | [0.985, 1.058]   |
| 1.116               | [1.082, 1.152]   |
| 0.939               | [0.891, 0.989]   |
| 0.912               | [0.894, 0.930]   |
| 0.906               | [0.868, 0.945]   |
| 0.980               | [0.903, 1.064]   |
| 0.964               | [0.910, 1.022]   |
| 1.014               | [0.991, 1.038]   |
| 0.933               | [0.852, 1.021]   |
| 0.953               | [0.909, 0.998]   |
| 0.917               | [0.879, 0.957]   |
| 0.225               | [0.012, 4.282]   |
| 7.270               | [0.154, 342.398] |
| 1.072               | [0.985, 1.166]   |
| 1.235               | [1.161, 1.313]   |
| 1.153               | [1.079, 1.232]   |
| 1.063               | [1.017, 1.111]   |
| 1.073               | [1.029, 1.119]   |
| 1.062               | [1.017, 1.109]   |
| 0.976               | [0.961, 0.990]   |
| 1.006               | [0.985, 1.027]   |
| 1.027               | [1.013, 1.042]   |
| 0.980               | [0.939, 1.023]   |
| 0.909               | [0.650, 1.271]   |
| 1.062               | [1.007, 1.121]   |
| 1.004               | [0.983, 1.024]   |
| 1.025               | [0.979, 1.073]   |
| 1.023               | [0.998, 1.048]   |
| 1.005               | [0.998, 1.012]   |
| 0.996               | [0.981, 1.012]   |
| 0.996               | [0.981, 1.012]   |

**mentary Table 10. Forward direction MR analysis F-st**

| <b>Outcome</b> | <b>SNP</b> | <b>F statistic</b> |
|----------------|------------|--------------------|
| IBD            | rs2261033  | 1309.70595         |
| IBD            | rs34521355 | 619.4259078        |
| IBD            | rs3891175  | 340.6548467        |
| IBD            | rs17312661 | 329.0355684        |
| IBD            | rs2074475  | 251.7351789        |
| IBD            | rs27529    | 208.270196         |
| IBD            | rs4672505  | 207.3744313        |
| IBD            | rs9380120  | 202.8458428        |
| IBD            | rs7453920  | 187.3840192        |
| IBD            | rs2523443  | 163.8322774        |
| IBD            | rs7746199  | 153.3312682        |
| IBD            | rs17194627 | 146.3295001        |
| IBD            | rs3857546  | 143.5570397        |
| IBD            | rs7771335  | 111.647554         |
| IBD            | rs362521   | 104.9229818        |
| IBD            | rs9262222  | 90.92558971        |
| IBD            | rs2836883  | 69.83216632        |
| IBD            | rs9393646  | 68.78743718        |
| IBD            | rs41299637 | 63.25861617        |
| IBD            | rs6600247  | 62.56710603        |
| IBD            | rs9901869  | 60.88986422        |
| IBD            | rs2239842  | 59.29114202        |
| IBD            | rs11190133 | 56.79210306        |
| IBD            | rs4129267  | 53.00824023        |
| IBD            | rs11624293 | 41.03960526        |
| IBD            | rs1041926  | 40.96172978        |
| IBD            | rs1860545  | 39.82087767        |
| IBD            | rs35164067 | 39.41475927        |
| IBD            | rs2927613  | 38.00117864        |
| IBD            | rs12615545 | 37.26600201        |
| IBD            | rs1801274  | 36.74091877        |
| IBD            | rs1250550  | 36.5824539         |
| IBD            | rs7191548  | 34.00021582        |
| IBD            | rs7282490  | 33.76681929        |
| IBD            | rs1128905  | 33.54905971        |
| IBD            | rs6915101  | 33.53582202        |
| IBD            | rs4676410  | 32.86114726        |
| IBD            | rs11065898 | 29.83296349        |
| IBD            | rs6881706  | 122.0334473        |
| IBD            | rs56375023 | 115.5625           |
| IBD            | rs7224129  | 88.09633733        |
| IBD            | rs848      | 67.78025896        |
| IBD            | rs12365699 | 57.60420776        |
| IBD            | rs2228145  | 41.35820452        |
| IBD            | rs6011033  | 40.11111111        |
| IBD            | rs249677   | 38.48204539        |
| IBD            | rs45613035 | 37.73469388        |

|     |            |             |
|-----|------------|-------------|
| IBD | rs4845604  | 34.16680839 |
| IBD | rs17664743 | 33.34655822 |
| IBD | rs12740374 | 74.62841521 |
| IBD | rs10774625 | 55.96924896 |
| IBD | rs11591147 | 42.23149781 |
| IBD | rs943689   | 15331.36608 |
| IBD | rs174535   | 14925.55714 |
| IBD | rs11742240 | 13095.58337 |
| IBD | rs6866614  | 12003.57035 |
| IBD | rs4771332  | 10973.31764 |
| IBD | rs72743461 | 8550.412667 |
| IBD | rs17454584 | 8543.773292 |
| IBD | rs17668708 | 6537.486118 |
| IBD | rs57585717 | 5200.061381 |
| IBD | rs62626322 | 4884.227913 |
| IBD | rs4795399  | 12651.68545 |
| IBD | rs11065979 | 8666.64348  |
| IBD | rs7100984  | 7384.392732 |
| IBD | rs9391997  | 6447.57544  |
| IBD | rs912425   | 6359.282939 |
| IBD | rs10786050 | 6096.274685 |
| IBD | rs449454   | 6010.474415 |
| IBD | rs705700   | 5925.1174   |
| IBD | rs10995245 | 5865.850642 |
| IBD | rs35570272 | 5785.519507 |
| IBD | rs3997849  | 5673.511839 |
| IBD | rs12365699 | 5421.749137 |
| IBD | rs4917131  | 5333.142509 |
| IBD | rs11236797 | 5009.390268 |
| IBD | rs4845604  | 4729.476999 |
| IBD | rs55743914 | 4442.172618 |
| IBD | rs2738783  | 4177.728664 |
| IBD | rs72743461 | 3725.129751 |
| IBD | rs9275602  | 3457.002739 |
| IBD | rs17611877 | 2190.374927 |
| IBD | rs4705869  | 2030.281908 |
| IBD | rs45613035 | 1816.028893 |
| IBD | rs10118244 | 1220.032642 |
| IBD | rs4065275  | 60.0625     |
| IBD | rs4851582  | 37.83680368 |
| IBD | rs17228058 | 31.19476369 |
| IBD | rs56375023 | 180.8381491 |
| IBD | rs848      | 129.3111611 |
| IBD | rs943689   | 105.8320661 |
| IBD | rs35570272 | 57.79741471 |
| IBD | rs17454584 | 57.42021622 |
| IBD | rs2229094  | 46.45601899 |
| IBD | rs2296618  | 41.30204088 |
| IBD | rs11742240 | 37.99541679 |
| IBD | rs6922431  | 37.29855251 |
| IBD | rs12365699 | 37.04297066 |

|     |            |             |
|-----|------------|-------------|
| IBD | rs3130196  | 36.07438813 |
| IBD | rs1800797  | 35.8317146  |
| IBD | rs2255088  | 35.22255884 |
| IBD | rs11042902 | 33.78044012 |
| IBD | rs7219483  | 33.40236018 |
| IBD | rs2275806  | 30.53114472 |
| IBD | rs10912564 | 30.48300256 |
| IBD | rs4787426  | 30.05105399 |
| IBD | rs11679146 | 75.00572944 |
| IBD | rs12949100 | 70.13310017 |
| IBD | rs10900809 | 45.65419851 |
| IBD | rs72743461 | 40.34409125 |
| IBD | rs34972832 | 34.07344531 |
| IBD | rs3781094  | 32.19627276 |
| IBD | rs76830965 | 751.4926184 |
| IBD | rs2523554  | 95.59110318 |
| IBD | rs17552787 | 73.16962599 |
| IBD | rs17282175 | 62.12034288 |
| IBD | rs913678   | 56.484542   |
| IBD | rs9261425  | 48.62943421 |
| IBD | rs436857   | 42.88770149 |
| IBD | rs10513548 | 32.5228789  |
| IBD | rs2305479  | 187.7155729 |
| IBD | rs3771180  | 86.39709541 |
| IBD | rs17293632 | 64.6798294  |
| IBD | rs2155219  | 62.33605557 |
| IBD | rs20541    | 59.28971257 |
| IBD | rs2596464  | 54.22461405 |
| IBD | rs2325291  | 51.14465884 |
| IBD | rs2855812  | 39.80707175 |
| IBD | rs7705042  | 37.63508136 |
| IBD | rs2523716  | 32.21965276 |
| IBD | rs241429   | 30.72053745 |
| IBD | rs12740374 | 137.8754864 |
| IBD | rs10774625 | 99.02658713 |
| IBD | rs11591147 | 67.90742618 |
| IBD | rs2681472  | 50.46833153 |
| IBD | rs72743461 | 43.38995462 |
| IBD | rs17115100 | 37.29062542 |
| IBD | rs13402621 | 37.12083809 |
| IBD | rs748431   | 30.2782117  |
| IBD | rs2160203  | 101.5586578 |
| IBD | rs20541    | 52.13554725 |
| IBD | rs879606   | 36.57155192 |
| IBD | rs10806425 | 34.9088659  |
| IBD | rs62322662 | 33.49912916 |
| IBD | rs6010620  | 63.17508918 |
| IBD | rs17513531 | 34.8043543  |
| IBD | rs61839660 | 33.13625904 |
| IBD | rs2476601  | 695.271424  |
| IBD | rs3184504  | 255.6445679 |

|     |            |             |
|-----|------------|-------------|
| IBD | rs11066320 | 212.835679  |
| IBD | rs2596503  | 156.4693752 |
| IBD | rs11571297 | 145.3073015 |
| IBD | rs9277557  | 128.376993  |
| IBD | rs28780083 | 77.82161548 |
| IBD | rs10905669 | 66.97251145 |
| IBD | rs1990760  | 56.08345679 |
| IBD | rs229541   | 54.76       |
| IBD | rs13203715 | 50.30862245 |
| IBD | rs4073285  | 39.33471172 |
| IBD | rs75438091 | 37.34567901 |
| IBD | rs2293158  | 33.0625     |
| IBD | rs7205474  | 30.53515161 |
| IBD | rs9392026  | 100.500894  |
| IBD | rs3778607  | 81.22837799 |
| IBD | rs3087243  | 76.72820712 |
| IBD | rs72928038 | 71.13282576 |
| IBD | rs162298   | 54.06345131 |
| IBD | rs2049218  | 46.42533891 |
| IBD | rs2476601  | 39.76934144 |
| IBD | rs4682103  | 32.62425174 |
| IBD | rs10994397 | 38.50900594 |
| IBD | rs7296288  | 32.95192315 |
| IBD | rs12576775 | 30.86928367 |
| IBD | rs7258465  | 120.6668962 |
| IBD | rs7017073  | 58.16604444 |
| IBD | rs9952980  | 54.07905325 |
| IBD | rs4971059  | 43.890625   |
| IBD | rs3749971  | 33.78515625 |
| IBD | rs61744064 | 32.92125773 |
| IBD | rs17426269 | 32.06719849 |
| IBD | rs666930   | 30.33736458 |
| IBD | rs414851   | 10679.99029 |
| IBD | rs17076598 | 8944.242115 |
| IBD | rs3759333  | 7956.728479 |
| IBD | rs26433    | 7862.218435 |
| IBD | rs3800393  | 6135.983387 |
| IBD | rs12606193 | 4627.748927 |
| IBD | rs11864719 | 4513.373015 |
| IBD | rs17450969 | 4142.522261 |
| IBD | rs592719   | 3790.1959   |
| IBD | rs6880335  | 2343.940734 |
| IBD | rs2109897  | 2066.055573 |
| IBD | rs12650313 | 1930.49442  |
| IBD | rs10519288 | 1613.473299 |
| IBD | rs16839999 | 578.9153819 |
| IBD | rs17238590 | 527.3553142 |
| IBD | rs16941631 | 341.6692449 |
| IBD | rs72905734 | 32.99332008 |
| IBD | rs4468572  | 65.71142838 |
| IBD | rs2681472  | 42.76643653 |

|     |            |             |
|-----|------------|-------------|
| IBD | rs11065979 | 40.54015268 |
| IBD | rs11191416 | 34.33208586 |
| IBD | rs515135   | 30.64899745 |
| IBD | rs599839   | 39.75093937 |
| IBD | rs1122608  | 37.37777487 |
| IBD | rs2306374  | 30.49755064 |
| IBD | rs11591147 | 45.84997549 |
| IBD | rs653178   | 45.11184822 |
| IBD | rs12705390 | 42.67808621 |
| IBD | rs11591147 | 42.77237626 |
| IBD | rs653178   | 37.6372512  |
| IBD | rs12705390 | 35.29240055 |
| IBD | rs9392026  | 108.0394805 |
| IBD | rs3778607  | 84.45035746 |
| IBD | rs72928038 | 53.06870018 |
| IBD | rs3087243  | 52.44553257 |
| IBD | rs204295   | 42.22106729 |
| IBD | rs2476601  | 33.29128367 |
| IBD | rs9851967  | 95.52135384 |
| IBD | rs17810546 | 75.06089693 |
| IBD | rs13151961 | 74.42239571 |
| IBD | rs653178   | 56.36192249 |
| IBD | rs2816316  | 50.11751    |
| IBD | rs13098911 | 44.51210622 |
| IBD | rs11221335 | 43.53962169 |
| IBD | rs1018326  | 34.73256097 |
| IBD | rs1738074  | 30.61653045 |
| IBD | rs13003464 | 29.74740267 |
| IBD | rs416352   | 1479.738185 |
| IBD | rs1265099  | 1479.736498 |
| IBD | rs1264622  | 1479.735003 |
| IBD | rs3117326  | 1479.733708 |
| IBD | rs521977   | 1479.72934  |
| IBD | rs9366717  | 1290.54482  |
| IBD | rs2523534  | 1240.027985 |
| IBD | rs1264344  | 1172.828436 |
| IBD | rs13219354 | 1156.538829 |
| IBD | rs2523693  | 1137.865427 |
| IBD | rs13198474 | 920.7933941 |
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| IBD | rs16869648 | 647.6503087 |
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| IBD | rs9296068  | 324.1139529 |
| IBD | rs2030519  | 217.6129001 |
| IBD | rs13132308 | 168.1506364 |
| IBD | rs2235982  | 165.2298147 |
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| IBD | rs76830965 | 117.2233821 |

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| IBD | rs4148881  | 102.2553076 |
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| IBD | rs2296748  | 83.2303368  |
| IBD | rs6934794  | 83.09811547 |
| IBD | rs499384   | 81.213784   |
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| IBD | rs990171   | 68.56934627 |
| IBD | rs12530421 | 66.9080154  |
| IBD | rs1018326  | 66.76226128 |
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| IBD | rs182429   | 64.75391564 |
| IBD | rs1980422  | 63.72965887 |
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| IBD | rs16894128 | 49.55212246 |
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| IBD | rs10892258 | 45.25034448 |
| IBD | rs7104791  | 45.08247447 |
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| IBD | rs1570760  | 40.35551091 |
| IBD | rs1050976  | 36.13798535 |
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| IBD | rs2523504  | 82.30249168 |
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| IBD | rs11591147  | 118.0998178 |
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| IBD | rs9277557   | 47.87360086 |
| IBD | rs2111485   | 33.52242176 |
| IBD | rs10974437  | 31.90387634 |
| IBD | rs7599564   | 31.55092802 |
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| IBD | rs35633336 | 36.17134696 |
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| IBD | rs9266629  | 238.0532385 |
| IBD | rs722788   | 129.5756482 |
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| IBD | rs2104286  | 95.65667554 |
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| IBD | rs1920296  | 59.88255844 |
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| IBD | rs74796499 | 41.9955859  |
| IBD | rs6498184  | 39.62359077 |
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| IBD | rs11154801 | 36.20743486 |
| IBD | rs4410871  | 36.14245546 |
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| IBD | rs842639   | 35.61351815 |
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| IBD | rs67297943 | 29.52202688 |
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| IBD | rs1800693  | 65.15622698 |
| IBD | rs41286801 | 64.88992935 |
| IBD | rs212407   | 62.57878754 |
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| IBD | rs1335532  | 35.95597677 |
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| IBD | rs243325   | 48.73339793 |
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| IBD | rs3998159   | 38.752453   |
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| IBD | rs3893538   | 140.3479735 |
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| IBD | rs34695944  | 100.9924468 |
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| IBD | rs11574914 | 40.06789519 |
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| IBD | rs1893217  | 64          |
| IBD | rs11203203 | 62.32704479 |
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| IBD | rs9275601   | 199.7820048 |
| IBD | rs9276943   | 189.7241355 |
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| CD | rs2523534  | 1240.027985 |
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| CD | rs2296748  | 83.2303368  |
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| CD | rs55743914 | 77.79128697 |
| CD | rs1250552  | 69.41738357 |
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| UC | rs11191416 | 34.33208586 |
| UC | rs515135   | 30.64899745 |
| UC | rs599839   | 39.75093937 |
| UC | rs1122608  | 37.37777487 |
| UC | rs2306374  | 30.49755064 |
| UC | rs11591147 | 45.84997549 |
| UC | rs653178   | 45.11184822 |
| UC | rs12705390 | 42.67808621 |
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| UC | rs653178   | 37.6372512  |
| UC | rs12705390 | 35.29240055 |
| UC | rs9392026  | 108.0394805 |
| UC | rs3778607  | 84.45035746 |
| UC | rs72928038 | 53.06870018 |
| UC | rs3087243  | 52.44553257 |
| UC | rs204295   | 42.22106729 |
| UC | rs2476601  | 33.29128367 |
| UC | rs9851967  | 95.52135384 |
| UC | rs17810546 | 75.06089693 |
| UC | rs13151961 | 74.42239571 |
| UC | rs653178   | 56.36192249 |
| UC | rs2816316  | 50.11751    |
| UC | rs13098911 | 44.51210622 |
| UC | rs11221335 | 43.53962169 |
| UC | rs1018326  | 34.73256097 |
| UC | rs1738074  | 30.61653045 |
| UC | rs13003464 | 29.74740267 |
| UC | rs416352   | 1479.738185 |
| UC | rs1265099  | 1479.736498 |
| UC | rs1264622  | 1479.735003 |
| UC | rs3117326  | 1479.733708 |
| UC | rs521977   | 1479.72934  |
| UC | rs9366717  | 1290.54482  |
| UC | rs2523534  | 1240.027985 |
| UC | rs1264344  | 1172.828436 |
| UC | rs13219354 | 1156.538829 |
| UC | rs2523693  | 1137.865427 |
| UC | rs13198474 | 920.7933941 |
| UC | rs3130357  | 843.5232897 |
| UC | rs23544    | 841.2168935 |
| UC | rs16869648 | 647.6503087 |
| UC | rs1383265  | 557.4883494 |
| UC | rs9296068  | 324.1139529 |

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| UC | rs2030519  | 217.6129001 |
| UC | rs13132308 | 168.1506364 |
| UC | rs2235982  | 165.2298147 |
| UC | rs4947332  | 154.9639815 |
| UC | rs2017525  | 143.4783783 |
| UC | rs17264332 | 129.6121552 |
| UC | rs76830965 | 117.2233821 |
| UC | rs1323292  | 107.0991357 |
| UC | rs4148881  | 102.2553076 |
| UC | rs3184504  | 88.37382666 |
| UC | rs2097282  | 86.92046105 |
| UC | rs2296748  | 83.2303368  |
| UC | rs6934794  | 83.09811547 |
| UC | rs499384   | 81.213784   |
| UC | rs55743914 | 77.79128697 |
| UC | rs1250552  | 69.41738357 |
| UC | rs990171   | 68.56934627 |
| UC | rs12530421 | 66.9080154  |
| UC | rs1018326  | 66.76226128 |
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| UC | rs11066320 | 55.09582463 |
| UC | rs17404424 | 53.86812827 |
| UC | rs61907765 | 52.94579441 |
| UC | rs4947256  | 52.88211844 |
| UC | rs1929848  | 52.16257946 |
| UC | rs16894128 | 49.55212246 |
| UC | rs4445406  | 47.52775009 |
| UC | rs10892258 | 45.25034448 |
| UC | rs7104791  | 45.08247447 |
| UC | rs4821124  | 42.9125254  |
| UC | rs2267632  | 41.90765533 |
| UC | rs12068671 | 41.16791264 |
| UC | rs11875687 | 40.54953979 |
| UC | rs1570760  | 40.35551091 |
| UC | rs1050976  | 36.13798535 |
| UC | rs6933319  | 35.44836417 |
| UC | rs1893592  | 35.20800313 |
| UC | rs7616215  | 33.45953222 |
| UC | rs1378938  | 33.32651768 |
| UC | rs1107943  | 33.28780669 |
| UC | rs6715106  | 33.18500134 |
| UC | rs61579022 | 32.85683346 |
| UC | rs16894722 | 31.86578322 |
| UC | rs11801183 | 31.82516941 |
| UC | rs79758729 | 31.38524655 |
| UC | rs10800746 | 31.00741953 |
| UC | rs744254   | 30.68406801 |
| UC | rs10513548 | 30.03920125 |

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| UC | rs3130380  | 2488.026097 |
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| UC | rs9469220  | 1626.502217 |
| UC | rs9268368  | 1390.544471 |
| UC | rs9276612  | 1193.007016 |
| UC | rs13219354 | 1156.678473 |
| UC | rs4540292  | 1067.331181 |
| UC | rs13198474 | 920.515888  |
| UC | rs16869648 | 647.6977466 |
| UC | rs2395296  | 549.4338273 |
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| UC | rs2229092  | 230.1286855 |
| UC | rs11753326 | 209.9604293 |
| UC | rs3097657  | 171.3483583 |
| UC | rs13205699 | 137.8277567 |
| UC | rs9258557  | 131.7905808 |
| UC | rs9380294  | 129.0496726 |
| UC | rs9501234  | 118.5916253 |
| UC | rs17351888 | 100         |
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| UC | rs6934794  | 83.10086982 |
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| UC | rs12527282 | 54.34636206 |
| UC | rs16894128 | 49.54785641 |
| UC | rs9658119  | 49.18193628 |
| UC | rs10892258 | 45.25278712 |
| UC | rs7104791  | 45.07798795 |
| UC | rs12665489 | 44.715982   |
| UC | rs2267632  | 41.91254141 |
| UC | rs7761745  | 38.36563639 |
| UC | rs1611697  | 36.36086417 |
| UC | rs10752747 | 34.17580435 |
| UC | rs7162232  | 33.28148309 |
| UC | rs16894722 | 31.86599681 |
| UC | rs2441467  | 31.80993363 |
| UC | rs11757750 | 31.25940326 |
| UC | rs13030124 | 31.13618677 |
| UC | rs11979905 | 31.0695865  |
| UC | rs9851967  | 95.32510474 |
| UC | rs17810546 | 74.65691017 |
| UC | rs13151961 | 73.67023001 |
| UC | rs653178   | 56.0625039  |
| UC | rs2816316  | 49.85991365 |
| UC | rs13098911 | 44.23540633 |
| UC | rs1018326  | 34.4837366  |
| UC | rs1738074  | 30.77181067 |
| UC | rs13003464 | 29.37484965 |
| UC | rs13091753 | 66.34364786 |
| UC | rs6933404  | 51.49762868 |

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| UC | rs1468791  | 45.04994231 |
| UC | rs11221335 | 43.39365361 |
| UC | rs9819226  | 38.95214004 |
| UC | rs1323292  | 34.38686922 |
| UC | rs9851967  | 95.32510474 |
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| UC | rs653178   | 56.0625039  |
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| UC | rs6983267  | 91.83428037 |
| UC | rs4939827  | 70.97770955 |
| UC | rs16892766 | 35.04778755 |
| UC | rs3957146  | 670.2345679 |
| UC | rs2523504  | 82.30249168 |
| UC | rs2237897  | 76.41833716 |
| UC | rs2476601  | 66.35707816 |
| UC | rs11558471 | 45.99794138 |
| UC | rs10938397 | 43.04966681 |
| UC | rs17187735 | 38.90640625 |
| UC | rs76177300 | 36.51612245 |
| UC | rs10974438 | 36.23801588 |
| UC | rs34337125 | 32.2624     |
| UC | rs9765960  | 30.15685148 |
| UC | rs5215     | 30.13785923 |
| UC | rs3957146  | 537.1139442 |
| UC | rs2476601  | 77.30128082 |
| UC | rs34171662 | 69.12311447 |
| UC | rs17187735 | 44.72780591 |
| UC | rs2296329  | 34.84133448 |
| UC | rs878898   | 33.08058423 |
| UC | rs3957146  | 659.0029432 |
| UC | rs2523504  | 80.02994887 |
| UC | rs2237897  | 77.04938272 |
| UC | rs2476601  | 64.58958694 |
| UC | rs11558471 | 46.1041     |
| UC | rs10938397 | 45.21876302 |
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| UC | rs76177300 | 35.31430141 |
| UC | rs56258397 | 32.76333321 |
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| UC | rs5215     | 29.58027905 |
| UC | rs9273363  | 219.6369847 |
| UC | rs1421085  | 95.67277557 |

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| UC | rs1260326  | 51.3808817  |
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| UC | rs2476601  | 30.65820455 |
| UC | rs646123   | 29.81313658 |
| UC | rs3957146  | 609.261834  |
| UC | rs2237897  | 81.56643184 |
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| UC | rs4402960  | 54.57349241 |
| UC | rs10938397 | 47.24893958 |
| UC | rs11558471 | 42.25       |
| UC | rs76177300 | 36.1630802  |
| UC | rs17187735 | 34.8239935  |
| UC | rs853974   | 34.56629013 |
| UC | rs5215     | 31.49062117 |
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| UC | rs3957146  | 446.3578212 |
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| UC | rs34018127 | 64.05307899 |
| UC | rs3873444  | 58.75570162 |
| UC | rs2107202  | 35.36190334 |
| UC | rs17187735 | 33.03913015 |
| UC | rs4795399  | 213.1525795 |
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| UC | rs72743461 | 164.0231007 |
| UC | rs1321859  | 104.035551  |
| UC | rs2621322  | 76.05759964 |
| UC | rs1117490  | 66.23317075 |
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| UC | rs2338819  | 37.18354855 |
| UC | rs429916   | 36.72699383 |
| UC | rs7771953  | 36.00951948 |
| UC | rs13208164 | 35.02525737 |
| UC | rs41284471 | 34.87325903 |
| UC | rs805287   | 34.14574701 |
| UC | rs2296618  | 33.32483733 |
| UC | rs3781094  | 32.70625219 |
| UC | rs6729966  | 31.35010616 |
| UC | rs12365699 | 29.98577268 |
| UC | rs9375459  | 159.8205842 |
| UC | rs11072508 | 124.9436252 |
| UC | rs1052486  | 89.3645148  |
| UC | rs7838131  | 58.06523158 |

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| UC | rs11864054 | 45.13135868 |
| UC | rs169080   | 44.7912553  |
| UC | rs2246490  | 39.93143088 |
| UC | rs11229555 | 37.49582107 |
| UC | rs27433    | 37.12780233 |
| UC | rs35633336 | 37.00116955 |
| UC | rs57786342 | 32.27754701 |
| UC | rs10072700 | 32.14303234 |
| UC | rs6905288  | 31.8339008  |
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| UC | rs16858573 | 46.35375184 |
| UC | rs5029949  | 36.47550325 |
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| UC | rs4939489  | 34.84480371 |
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| UC | rs647397   | 31.11630209 |
| UC | rs2422254  | 30.01641747 |
| UC | rs34463936 | 177.358569  |
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| UC | rs962993   | 121.0171896 |
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| UC | rs4845604  | 79.72036465 |
| UC | rs905670   | 77.67955622 |
| UC | rs849335   | 68.72827897 |
| UC | rs45613035 | 66.44838124 |
| UC | rs10903115 | 58.32674249 |
| UC | rs2228145  | 56.70650655 |
| UC | rs6025     | 51.33053693 |
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| UC | rs249677   | 44.6207053  |
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| UC | rs4410871   | 39.48207075 |
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| UC | rs11256311  | 33.1705323  |
| UC | rs1177289   | 31.81903734 |
| UC | rs28360011  | 31.51135145 |
| UC | rs72799426  | 31.00951592 |
| UC | rs114420077 | 30.05833404 |
| UC | rs17538393  | 29.7510625  |
| UC | rs4939827   | 89.14101097 |
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| UC | rs646776    | 82.44194362 |
| UC | rs499883    | 68.2473268  |
| UC | rs1367117   | 65.30387144 |
| UC | rs4953023   | 48.02547037 |
| UC | rs12916     | 36.36180677 |
| UC | rs2476601   | 401.7161224 |
| UC | rs11571297  | 97.87548308 |
| UC | rs115084931 | 50.83753946 |
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| UC | rs11964080  | 33.75907955 |
| UC | rs11102634  | 32.18297214 |
| UC | rs4409785   | 30.37418735 |
| UC | rs1800961   | 47.48195767 |
| UC | rs1260326   | 37.88932141 |
| UC | rs1169286   | 34.98169542 |
| UC | rs11591147  | 81.82562262 |
| UC | rs646776    | 54.243225   |
| UC | rs1367117   | 46.10485028 |
| UC | rs499883    | 45.39801457 |
| UC | rs688       | 32.57346817 |
| UC | rs12916     | 31.60633551 |
| UC | rs646776    | 188.9443931 |
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| UC | rs1260326   | 68.65754422 |
| UC | rs11591147  | 60.64810791 |
| UC | rs4245791   | 58.01732088 |
| UC | rs12916     | 36.35360002 |
| UC | rs2244608   | 31.25966387 |
| UC | rs2240326   | 96.02888374 |
| UC | rs773109    | 55.63788661 |
| UC | rs2232423   | 45.70598484 |
| UC | rs1716171   | 42.30125524 |
| UC | rs6722661   | 41.55473241 |
| UC | rs205262    | 41.19322308 |

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| UC | rs3172494   | 33.61569586 |
| UC | rs9615905   | 32.46700519 |
| UC | rs2164300   | 30.0858308  |
| UC | rs17293632  | 139.3426276 |
| UC | rs9847710   | 99.500625   |
| UC | rs72707023  | 53.31755073 |
| UC | rs3072      | 42.40868531 |
| UC | rs1262776   | 41.24493827 |
| UC | rs10460504  | 38.9138322  |
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| UC | rs3087243   | 80.62801427 |
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| UC | rs10974437  | 31.90387634 |
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| UC | rs3087243   | 82.113389   |
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| UC | rs11066320  | 85.7971076  |
| UC | rs11571297  | 65.74141709 |
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| UC | rs229541    | 61.12396694 |
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| UC | rs877636   | 41.09138725 |
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| UC | rs210179   | 32.49974432 |
| UC | rs11102634 | 30.82967382 |
| UC | rs12567136 | 174.6834486 |
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| UC | rs35633336 | 36.17134696 |
| UC | rs736801   | 34.30657189 |
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| UC | rs696      | 31.46061655 |
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| UC | rs11591147 | 57.5872865  |
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| UC | rs34337125 | 31.75901825 |
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| UC | rs34337125 | 33.16906722 |
| UC | rs853974   | 31.17361111 |
| UC | rs7100984  | 30.8025     |
| UC | rs9271100  | 1153.78976  |
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| UC | rs9469220  | 808.7316572 |
| UC | rs9266629  | 238.0532385 |
| UC | rs722788   | 129.5756482 |
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| UC | rs13194491 | 79.16415234 |
| UC | rs1813375  | 74.64878281 |
| UC | rs2394423  | 72.05492404 |
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| UC | rs1800693  | 64.71669962 |
| UC | rs8070345  | 64.71669962 |
| UC | rs1920296  | 59.88255844 |
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| UC | rs1077667  | 53.28033723 |
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| UC | rs12087340 | 47.25406297 |
| UC | rs11172342 | 46.2049889  |
| UC | rs2071292  | 46.07892099 |
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| UC | rs4410871  | 36.14245546 |
| UC | rs55838263 | 36.0921596  |
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| UC | rs71624119 | 35.10542979 |
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| UC | rs6881706  | 34.0714384  |
| UC | rs6880778  | 32.36681908 |
| UC | rs9380294  | 32.22777182 |
| UC | rs917116   | 31.70531526 |
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| UC | rs6933319  | 30.42722174 |
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| UC | rs67297943 | 29.52202688 |
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| UC | rs71624119 | 35.38911173 |
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| UC | rs7923837  | 34.36020519 |
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| UC | rs16896742 | 229.2913396 |
| UC | rs404860   | 163.5528652 |
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| UC | rs1738074  | 43.06640625 |
| UC | rs396090   | 42.91176937 |
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| UC | rs2546890  | 50.76912939 |
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| UC | rs631204   | 47.18824872 |
| UC | rs17124032 | 47.00466038 |
| UC | rs1860545  | 46.81876026 |
| UC | rs1738074  | 46.34664316 |
| UC | rs701006   | 45.74151198 |
| UC | rs13327021 | 45.25801287 |
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| UC | rs7592560  | 39.75841812 |
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| UC | rs2568958  | 75.37396694 |
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| UC | rs10995245 | 29.79195949 |
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| UC | rs17027258 | 39.09494618 |
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| UC | rs10758594 | 32.0620678  |
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| UC | rs2069235  | 44.75387889 |
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| UC | rs522127   | 94.11121064 |
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| UC | rs9295947  | 65.38650962 |
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| UC | rs13201757 | 1019.640594 |
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| UC | rs28780084 | 205.7241026 |
| UC | rs2199874  | 103.7710131 |
| UC | rs7741091  | 87.83161454 |
| UC | rs926070   | 66.26200654 |
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| UC | rs17728338  | 60.48454624 |
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| UC | rs2074488   | 178.4507845 |
| UC | rs4711211   | 144.0976519 |
| UC | rs106287    | 115.8059851 |
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| UC | rs6920220   | 49.05173894 |
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| UC | rs3130379   | 272.8979258 |
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| UC | rs3893538   | 140.3479735 |
| UC | rs6456964   | 133.7007259 |
| UC | rs8026898   | 129.8023912 |
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| UC | rs34695944  | 100.9924468 |
| UC | rs4239702   | 100.9924468 |
| UC | rs29243     | 76.07991245 |
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| UC | rs3087243  | 64.82443647 |
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| UC | rs11066320 | 50.67509336 |
| UC | rs705702   | 45.1584     |
| UC | rs11571297 | 32.42802122 |
| UC | rs3957146  | 721.0693728 |
| UC | rs2071463  | 80.77267157 |
| UC | rs2476601  | 75.94293215 |
| UC | rs2256539  | 59.24542041 |
| UC | rs6905949  | 52.83961648 |
| UC | rs3842727  | 892.1879561 |
| UC | rs6679677  | 554.8636935 |
| UC | rs3184504  | 196.000884  |
| UC | rs61839660 | 171.9010403 |
| UC | rs1701704  | 137.7539958 |
| UC | rs11066320 | 120.9991893 |
| UC | rs12927355 | 94.09039781 |
| UC | rs3087243  | 87.76771775 |
| UC | rs8056814  | 80.41995498 |
| UC | rs2111485  | 75.41625824 |
| UC | rs1893217  | 64          |
| UC | rs11203203 | 62.32704479 |
| UC | rs12416116 | 61.73474733 |
| UC | rs516246   | 56.64517909 |
| UC | rs72928038 | 56.24953121 |
| UC | rs34593439 | 55.57010009 |
| UC | rs4820830  | 50.48474486 |
| UC | rs6827756  | 47.53720135 |
| UC | rs56994090 | 46.09686261 |
| UC | rs7239671  | 45.18840856 |
| UC | rs2611215  | 45.15835268 |
| UC | rs2304256  | 43.81151828 |
| UC | rs151233   | 43.25597164 |
| UC | rs6043409  | 39.6899937  |
| UC | rs72727394 | 39.34692084 |
| UC | rs2045258  | 37.91982455 |
| UC | rs1574285  | 36.63460047 |
| UC | rs41295121 | 33.99306255 |

|    |             |             |
|----|-------------|-------------|
| UC | rs7893467   | 33.23180199 |
| UC | rs12150079  | 32.49014245 |
| UC | rs229533    | 31.71466584 |
| UC | rs60918750  | 31.59219765 |
| UC | rs62447205  | 31.0406647  |
| UC | rs9585056   | 30.5125418  |
| UC | rs4849135   | 29.98855034 |
| UC | rs113010081 | 29.88453674 |
| UC | rs402072    | 29.82858008 |
| UC | rs2596560   | 687.9581449 |
| UC | rs6679677   | 355.8566023 |
| UC | rs3129809   | 273.9222027 |
| UC | rs6913635   | 214.3114623 |
| UC | rs9275601   | 199.7820048 |
| UC | rs9276943   | 189.7241355 |
| UC | rs9267536   | 117.9153838 |
| UC | rs9467704   | 117.0559971 |
| UC | rs11571297  | 68.67304029 |
| UC | rs741172    | 62.15305571 |
| UC | rs2394392   | 61.12668492 |
| UC | rs12722495  | 59.41840278 |
| UC | rs3094138   | 41.00227505 |
| UC | rs8056814   | 40.49865583 |
| UC | rs2111485   | 40.43523998 |
| UC | rs202520    | 37.75526428 |
| UC | rs194749    | 33.9793569  |
| UC | rs2596560   | 1498.833347 |
| UC | rs1894406   | 838.3230436 |
| UC | rs387608    | 465.5808626 |
| UC | rs2535319   | 391.6576889 |
| UC | rs2071463   | 366.3098416 |
| UC | rs2476601   | 331.0880737 |
| UC | rs149943    | 288.6743954 |
| UC | rs3871466   | 150.5002563 |
| UC | rs4759229   | 104.2639664 |
| UC | rs12722496  | 103.4254097 |
| UC | rs12927355  | 72.04860879 |
| UC | rs80054410  | 53.56278678 |
| UC | rs2111485   | 45.43818071 |
| UC | rs12982646  | 43.70844043 |
| UC | rs151233    | 43.61333085 |
| UC | rs7122407   | 43.17035171 |
| UC | rs13415465  | 39.54962553 |
| UC | rs4238595   | 36.37755316 |
| UC | rs34725611  | 35.43176379 |
| UC | rs2281808   | 30.63143581 |
| UC | rs9911533   | 30.57604133 |
| UC | rs3024505   | 30.00770331 |
| UC | rs9268145   | 949.1737935 |
| UC | rs485502    | 392.5124358 |
| UC | rs2476601   | 233.2373085 |

|    |            |             |
|----|------------|-------------|
| UC | rs2071463  | 197.2503956 |
| UC | rs1419675  | 99.79392071 |
| UC | rs3184504  | 60.28203987 |
| UC | rs11066320 | 44.06965108 |
| UC | rs705699   | 42.94820984 |
| UC | rs9277932  | 40.11111111 |
| UC | rs34337125 | 30.32751438 |
| UC | rs10484565 | 461.6877968 |
| UC | rs34171662 | 190.7876263 |
| UC | rs2476601  | 190.1168939 |
| UC | rs3135333  | 131.6059263 |
| UC | rs2256539  | 107.9631666 |
| UC | rs3025643  | 86.4151886  |
| UC | rs9268145  | 978.2427824 |
| UC | rs485502   | 404.8277578 |
| UC | rs2476601  | 241.5913733 |
| UC | rs2071463  | 205.091692  |
| UC | rs2256539  | 122.6913534 |
| UC | rs3184504  | 57.63071073 |
| UC | rs11066320 | 44.08734918 |
| UC | rs11571297 | 36.55441957 |
| UC | rs41176    | 33.42431445 |
| UC | rs2237897  | 97.08044983 |
| UC | rs11558471 | 53.82105098 |
| UC | rs10938397 | 48.61892562 |
| UC | rs80134320 | 32.86787202 |
| UC | rs5215     | 32.59371901 |
| UC | rs10974438 | 32.47991229 |
| UC | rs28624681 | 54.80590109 |
| UC | rs10938397 | 50.32507853 |
| UC | rs11558471 | 49.11577078 |
| UC | rs76177300 | 42.17234647 |
| UC | rs498475   | 32.4526337  |
| UC | rs1053924  | 31.09893974 |
| UC | rs2383208  | 199.2238757 |
| UC | rs13266634 | 92.73731617 |
| UC | rs11708067 | 45.64088074 |
| UC | rs864745   | 45.64088074 |
| UC | rs5215     | 36.62845648 |
| UC | rs7756992  | 276.4972058 |
| UC | rs10811661 | 256.3266347 |
| UC | rs849135   | 192.515625  |
| UC | rs11708067 | 125.9092753 |
| UC | rs17334919 | 119.2873535 |
| UC | rs780094   | 87.4477721  |
| UC | rs5215     | 86.26083693 |
| UC | rs7729395  | 73.63785156 |
| UC | rs340874   | 73.5364984  |
| UC | rs17168486 | 62.30918968 |
| UC | rs10974438 | 62.0944     |
| UC | rs6795735  | 58.42822293 |

|    |            |             |
|----|------------|-------------|
| UC | rs2857605  | 55.75111111 |
| UC | rs12970134 | 48.12890625 |
| UC | rs10401969 | 47.95302165 |
| UC | rs853974   | 46.64269112 |
| UC | rs2071479  | 42.48040175 |
| UC | rs67232546 | 38.54340278 |
| UC | rs2237892  | 37.38894073 |
| UC | rs1265099  | 37.30898466 |
| UC | rs9940149  | 37.27423823 |
| UC | rs940904   | 36.14472347 |
| UC | rs17405722 | 35.50853819 |
| UC | rs16988333 | 32.84171598 |
| UC | rs7561798  | 30.86419753 |
| UC | rs7756992  | 164.8529188 |
| UC | rs13266634 | 107.9001563 |
| UC | rs864745   | 72.94083272 |
| UC | rs11708067 | 72.90532544 |
| UC | rs5215     | 65.69529086 |
| UC | rs2943641  | 58.51256536 |
| UC | rs60980157 | 55.99747507 |
| UC | rs1260326  | 54.60634171 |
| UC | rs2191349  | 50.52520088 |
| UC | rs7202877  | 46.97263534 |
| UC | rs340874   | 44.44444444 |
| UC | rs1077394  | 43.32639    |
| UC | rs35658696 | 40.86371257 |
| UC | rs35720761 | 37.52849375 |
| UC | rs4607517  | 33.4084     |
| UC | rs10146997 | 32.87111111 |
| UC | rs17782313 | 32.15405475 |
| UC | rs6795735  | 30.39490997 |
| UC | rs10758593 | 29.73884444 |
| UC | rs1727307  | 24.51457466 |
| UC | rs2237897  | 86.14160156 |
| UC | rs3129871  | 55.65424074 |
| UC | rs11558471 | 49.52476199 |
| UC | rs10938397 | 43.0033284  |
| UC | rs76177300 | 40.2824649  |
| UC | rs2256594  | 38.14080425 |
| UC | rs498475   | 33.48979767 |
| UC | rs5215     | 31.74889053 |
| UC | rs10974438 | 29.78915189 |
| UC | rs2237897  | 96.74337269 |
| UC | rs11558471 | 54.04236669 |
| UC | rs10938397 | 47.07484568 |
| UC | rs76177300 | 35.02394842 |
| UC | rs5215     | 32.53223594 |
| UC | rs7901695  | 952.6896859 |
| UC | rs7756992  | 248.6686391 |
| UC | rs13266634 | 176.733564  |
| UC | rs864745   | 136.232666  |

|    |            |             |
|----|------------|-------------|
| UC | rs7501939  | 95.85041623 |
| UC | rs1260326  | 93.44444444 |
| UC | rs11708067 | 91.25277008 |
| UC | rs2943641  | 77.02027178 |
| UC | rs2191349  | 66.15111111 |
| UC | rs10758593 | 61.6611126  |
| UC | rs60980157 | 60.0625     |
| UC | rs35658696 | 56.79347511 |
| UC | rs340874   | 55.39263639 |
| UC | rs35720761 | 52.67022841 |
| UC | rs2395163  | 46.63452216 |
| UC | rs7202877  | 43.53278776 |
| UC | rs17782313 | 39.87020408 |
| UC | rs10146997 | 36.30834977 |
| UC | rs730497   | 34.5337601  |
| UC | rs1727307  | 34.17751479 |
| UC | rs4607103  | 31.58123388 |
| UC | rs9388489  | 26.88023669 |
| UC | rs1065461  | 26.69444444 |
| UC | rs665268   | 26.01       |
| UC | rs1800961  | 23.73854938 |
| UC | rs2237897  | 97.23333581 |
| UC | rs11558471 | 52.82174745 |
| UC | rs10938397 | 47.20198903 |
| UC | rs76177300 | 35.69032402 |
| UC | rs5215     | 32.84987997 |
| UC | rs7901695  | 979.3217993 |
| UC | rs7756992  | 256.4778347 |
| UC | rs4402960  | 193.8845271 |
| UC | rs13266634 | 174.0071367 |
| UC | rs864745   | 116.307929  |
| UC | rs11708067 | 115.7003616 |
| UC | rs7501939  | 94.45410156 |
| UC | rs2943641  | 76.37240076 |
| UC | rs1260326  | 69.78674556 |
| UC | rs60980157 | 60.60326871 |
| UC | rs340874   | 59.51020408 |
| UC | rs7202877  | 53.77777778 |
| UC | rs35658696 | 48.76029388 |
| UC | rs35720761 | 48.06222263 |
| UC | rs10758593 | 40.17924037 |
| UC | rs2395163  | 39.1426693  |
| UC | rs6905288  | 38.05940828 |
| UC | rs4607103  | 36.17412308 |
| UC | rs1727307  | 32.84829583 |
| UC | rs7961581  | 31.29510607 |
| UC | rs1065461  | 27.49159971 |
| UC | rs9388489  | 26.51481399 |
| UC | rs1800961  | 25.43430241 |
| UC | rs730497   | 24.17361111 |
| UC | rs1421085  | 72.49375232 |

|    |             |             |
|----|-------------|-------------|
| UC | rs13266634  | 64.67040509 |
| UC | rs2383208   | 51.83339471 |
| UC | rs11708067  | 46.60171771 |
| UC | rs115505614 | 41.62012014 |
| UC | rs72802342  | 37.12698404 |
| UC | rs2014830   | 31.99926034 |
| UC | rs12912777  | 31.52083868 |
| UC | rs515071    | 30.72245884 |
| UC | rs1635852   | 30.60674781 |
| UC | rs179252    | 124.0609175 |
| UC | rs2476601   | 93.1268274  |
| UC | rs3094067   | 84.34972299 |
| UC | rs11571297  | 52.87566475 |
| UC | rs2855426   | 44.11338828 |
| UC | rs7516666   | 443.202828  |
| UC | rs9869760   | 373.559354  |
| UC | rs2836836   | 368.6366667 |
| UC | rs12428112  | 72.89417023 |
| UC | rs12421579  | 53.9085254  |
| UC | rs12151689  | 50.28327229 |
| UC | rs6516819   | 46.83519595 |
| UC | rs2001823   | 46.74806385 |
| UC | rs965513    | 46.40110627 |
| UC | rs6060124   | 44.50478237 |
| UC | rs4149570   | 44.15782176 |
| UC | rs869987    | 43.57851929 |
| UC | rs3809983   | 41.5960671  |
| UC | rs10801825  | 41.44580956 |
| UC | rs932311    | 40.65684167 |
| UC | rs9290550   | 39.40310821 |
| UC | rs241449    | 39.16755826 |
| UC | rs2526401   | 38.62141278 |
| UC | rs1868534   | 38.11722773 |
| UC | rs12782349  | 37.66344954 |
| UC | rs3828193   | 36.26520651 |
| UC | rs2516677   | 34.65804705 |
| UC | rs8049383   | 33.47773309 |
| UC | rs9355255   | 32.72510609 |
| UC | rs950910    | 30.34197834 |
| UC | rs406113    | 30.18413893 |

**Supplementary Table 11. Forward direction MR analysis F**

| Exposure | SNP        | F_statistic |
|----------|------------|-------------|
| IBD      | rs7547569  | 774.768     |
| IBD      | rs6111031  | 320.323     |
| IBD      | rs7711427  | 294.734     |
| IBD      | rs10748781 | 282.372     |
| IBD      | rs9273363  | 258.696     |
| IBD      | rs11793497 | 241.661     |
| IBD      | rs10761659 | 234.947     |
| IBD      | rs9836291  | 233.634     |
| IBD      | rs272882   | 232.792     |
| IBD      | rs11236797 | 229.110     |
| IBD      | rs4151651  | 228.735     |
| IBD      | rs3024493  | 223.391     |
| IBD      | rs56167332 | 220.464     |
| IBD      | rs2836883  | 212.792     |
| IBD      | rs10758669 | 212.135     |
| IBD      | rs59655222 | 196.166     |
| IBD      | rs4795397  | 192.672     |
| IBD      | rs6708373  | 182.434     |
| IBD      | rs2143178  | 166.282     |
| IBD      | rs10800309 | 161.210     |
| IBD      | rs7194886  | 158.398     |
| IBD      | rs7608910  | 158.346     |
| IBD      | rs7523442  | 158.224     |
| IBD      | rs7848647  | 153.383     |
| IBD      | rs6062496  | 145.038     |
| IBD      | rs17800987 | 136.352     |
| IBD      | rs11745587 | 131.557     |
| IBD      | rs1297258  | 129.460     |
| IBD      | rs8127691  | 128.442     |
| IBD      | rs2847278  | 119.455     |
| IBD      | rs12318183 | 118.074     |
| IBD      | rs34779708 | 108.514     |
| IBD      | rs6556417  | 105.170     |
| IBD      | rs11743851 | 99.941      |
| IBD      | rs11152949 | 96.913      |
| IBD      | rs744166   | 96.007      |
| IBD      | rs62037363 | 92.612      |
| IBD      | rs1388585  | 92.465      |
| IBD      | rs3806308  | 91.558      |
| IBD      | rs7738430  | 89.940      |
| IBD      | rs9889296  | 86.563      |
| IBD      | rs74346889 | 86.438      |
| IBD      | rs13407913 | 86.126      |
| IBD      | rs1420098  | 85.972      |
| IBD      | rs395157   | 85.583      |
| IBD      | rs35164067 | 85.230      |
| IBD      | rs17293632 | 85.191      |
| IBD      | rs1250566  | 84.072      |

|     |            |        |
|-----|------------|--------|
| IBD | rs4643314  | 82.546 |
| IBD | rs72634258 | 82.173 |
| IBD | rs2024092  | 77.828 |
| IBD | rs10055349 | 77.816 |
| IBD | rs2488401  | 77.355 |
| IBD | rs9878063  | 76.594 |
| IBD | rs9457247  | 76.265 |
| IBD | rs4676410  | 75.119 |
| IBD | rs2179070  | 73.825 |
| IBD | rs4845604  | 73.141 |
| IBD | rs367569   | 72.218 |
| IBD | rs6561151  | 71.021 |
| IBD | rs1567009  | 70.828 |
| IBD | rs11117431 | 68.955 |
| IBD | rs6588248  | 68.327 |
| IBD | rs1551399  | 67.059 |
| IBD | rs12720356 | 66.173 |
| IBD | rs4845140  | 66.079 |
| IBD | rs740287   | 65.779 |
| IBD | rs1990623  | 64.315 |
| IBD | rs7097656  | 63.965 |
| IBD | rs77059113 | 63.782 |
| IBD | rs11677953 | 62.318 |
| IBD | rs2279990  | 62.210 |
| IBD | rs1003342  | 62.080 |
| IBD | rs780094   | 61.758 |
| IBD | rs181826   | 61.674 |
| IBD | rs1363907  | 61.314 |
| IBD | rs6933404  | 60.955 |
| IBD | rs1419632  | 60.462 |
| IBD | rs2395022  | 60.271 |
| IBD | rs4917129  | 60.001 |
| IBD | rs11641184 | 59.731 |
| IBD | rs17694108 | 59.521 |
| IBD | rs11230563 | 58.845 |
| IBD | rs3776414  | 57.978 |
| IBD | rs12718244 | 57.516 |
| IBD | rs1517352  | 57.236 |
| IBD | rs516246   | 55.095 |
| IBD | rs2328546  | 54.855 |
| IBD | rs7657746  | 54.174 |
| IBD | rs3806157  | 53.032 |
| IBD | rs559928   | 53.006 |
| IBD | rs9557207  | 52.896 |
| IBD | rs35256947 | 52.706 |
| IBD | rs2283789  | 52.229 |
| IBD | rs2393904  | 51.845 |
| IBD | rs941823   | 51.786 |
| IBD | rs974801   | 51.524 |
| IBD | rs1265100  | 51.289 |
| IBD | rs1292053  | 50.866 |

|     |            |        |
|-----|------------|--------|
| IBD | rs2006788  | 50.345 |
| IBD | rs2621323  | 48.875 |
| IBD | rs4976646  | 48.541 |
| IBD | rs12722515 | 47.864 |
| IBD | rs11229555 | 47.601 |
| IBD | rs6740462  | 47.468 |
| IBD | rs259964   | 47.047 |
| IBD | rs2974935  | 46.564 |
| IBD | rs2108225  | 45.854 |
| IBD | rs2153283  | 45.488 |
| IBD | rs55693740 | 45.488 |
| IBD | rs13107612 | 45.384 |
| IBD | rs2050392  | 45.100 |
| IBD | rs2297559  | 45.087 |
| IBD | rs17119    | 44.799 |
| IBD | rs2538470  | 44.177 |
| IBD | rs17780256 | 44.054 |
| IBD | rs12103    | 44.002 |
| IBD | rs11713774 | 43.654 |
| IBD | rs2270395  | 43.111 |
| IBD | rs12585310 | 43.082 |
| IBD | rs913678   | 43.046 |
| IBD | rs4703855  | 42.476 |
| IBD | rs11691685 | 42.445 |
| IBD | rs61959439 | 42.222 |
| IBD | rs6456426  | 42.214 |
| IBD | rs6074022  | 42.180 |
| IBD | rs7240004  | 41.794 |
| IBD | rs2497318  | 41.223 |
| IBD | rs34920465 | 41.044 |
| IBD | rs8055876  | 40.444 |
| IBD | rs4973341  | 40.439 |
| IBD | rs2688608  | 39.841 |
| IBD | rs752508   | 39.757 |
| IBD | rs1990760  | 39.339 |
| IBD | rs2816958  | 39.296 |
| IBD | rs314313   | 39.154 |
| IBD | rs2517689  | 38.546 |
| IBD | rs13204742 | 38.529 |
| IBD | rs470079   | 38.386 |
| IBD | rs67643815 | 38.190 |
| IBD | rs1847472  | 38.127 |
| IBD | rs254562   | 38.110 |
| IBD | rs3853824  | 37.834 |
| IBD | rs6651252  | 37.513 |
| IBD | rs1182188  | 37.176 |
| IBD | rs648541   | 36.941 |
| IBD | rs17668708 | 36.834 |
| IBD | rs3184504  | 36.828 |
| IBD | rs3749946  | 36.592 |
| IBD | rs3801835  | 36.573 |

|     |             |         |
|-----|-------------|---------|
| IBD | rs1535      | 35.329  |
| IBD | rs1569328   | 35.052  |
| IBD | rs72978783  | 34.788  |
| IBD | rs4743820   | 34.725  |
| IBD | rs2769267   | 34.575  |
| IBD | rs56163845  | 34.304  |
| IBD | rs2284553   | 34.259  |
| IBD | rs10878386  | 34.001  |
| IBD | rs7773324   | 33.888  |
| IBD | rs12411259  | 33.779  |
| IBD | rs17679361  | 33.777  |
| IBD | rs2274351   | 33.554  |
| IBD | rs34856868  | 32.881  |
| IBD | rs453779    | 32.697  |
| IBD | rs10142466  | 32.685  |
| IBD | rs4692386   | 32.468  |
| IBD | rs12928665  | 32.345  |
| IBD | rs2143606   | 32.211  |
| IBD | rs4767956   | 32.138  |
| IBD | rs72924296  | 32.127  |
| IBD | rs7236492   | 32.113  |
| IBD | rs907611    | 31.939  |
| IBD | rs4802307   | 31.787  |
| IBD | rs7011507   | 31.464  |
| IBD | rs1528602   | 31.317  |
| IBD | rs4664304   | 30.977  |
| IBD | rs6058869   | 30.959  |
| IBD | rs2945412   | 30.862  |
| IBD | rs17651741  | 30.835  |
| IBD | rs7015630   | 30.775  |
| IBD | rs7404095   | 30.644  |
| IBD | rs12599586  | 30.368  |
| IBD | rs34804116  | 30.341  |
| IBD | rs11190087  | 30.051  |
| IBD | rs113010081 | 30.050  |
| IBD | rs12796489  | 309.453 |
| IBD | rs55808324  | 70.284  |
| IBD | rs6025      | 31.051  |
| CD  | rs7517847   | 724.541 |
| CD  | rs7711427   | 395.535 |
| CD  | rs6738490   | 349.989 |
| CD  | rs7194886   | 347.591 |
| CD  | rs17622378  | 247.976 |
| CD  | rs6111031   | 242.807 |
| CD  | rs12766391  | 233.639 |
| CD  | rs10748781  | 228.071 |
| CD  | rs11236797  | 224.699 |
| CD  | rs1896707   | 199.098 |
| CD  | rs11793497  | 192.341 |
| CD  | rs56167332  | 181.491 |
| CD  | rs1990623   | 166.402 |

|    |            |         |
|----|------------|---------|
| CD | rs2413583  | 156.184 |
| CD | rs10758669 | 148.249 |
| CD | rs3197999  | 145.090 |
| CD | rs9264942  | 138.144 |
| CD | rs11743851 | 136.708 |
| CD | rs4795397  | 120.992 |
| CD | rs10055349 | 120.582 |
| CD | rs7848647  | 118.225 |
| CD | rs12131796 | 118.023 |
| CD | rs34779708 | 117.821 |
| CD | rs76906269 | 113.419 |
| CD | rs1250573  | 111.019 |
| CD | rs2847278  | 110.825 |
| CD | rs4643314  | 110.114 |
| CD | rs1297258  | 108.484 |
| CD | rs11152949 | 108.415 |
| CD | rs9889296  | 107.812 |
| CD | rs3024505  | 107.239 |
| CD | rs6561151  | 106.903 |
| CD | rs2024092  | 106.069 |
| CD | rs8127691  | 102.427 |
| CD | rs9457247  | 99.385  |
| CD | rs7608910  | 98.693  |
| CD | rs26528    | 95.765  |
| CD | rs12411259 | 95.569  |
| CD | rs13001325 | 95.251  |
| CD | rs6062496  | 93.624  |
| CD | rs780094   | 93.272  |
| CD | rs13407913 | 91.791  |
| CD | rs921720   | 91.489  |
| CD | rs516246   | 86.601  |
| CD | rs35164067 | 84.869  |
| CD | rs438475   | 84.733  |
| CD | rs17293632 | 84.575  |
| CD | rs2945412  | 84.185  |
| CD | rs11117431 | 82.437  |
| CD | rs6556417  | 81.193  |
| CD | rs12041056 | 80.126  |
| CD | rs1946410  | 77.070  |
| CD | rs4655709  | 76.328  |
| CD | rs7097656  | 75.378  |
| CD | rs7775228  | 73.904  |
| CD | rs2270395  | 73.737  |
| CD | rs1567009  | 73.669  |
| CD | rs1528602  | 72.444  |
| CD | rs12949918 | 71.056  |
| CD | rs9491892  | 70.878  |
| CD | rs2476601  | 70.862  |
| CD | rs2284553  | 70.104  |
| CD | rs1646019  | 69.262  |
| CD | rs4151651  | 69.012  |

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| CD | rs925255   | 68.832 |
| CD | rs6456426  | 68.353 |
| CD | rs212388   | 67.816 |
| CD | rs2488401  | 67.530 |
| CD | rs77981966 | 67.421 |
| CD | rs395157   | 67.277 |
| CD | rs34787213 | 66.901 |
| CD | rs6651252  | 66.307 |
| CD | rs1363907  | 66.291 |
| CD | rs181826   | 61.453 |
| CD | rs2836878  | 61.421 |
| CD | rs2058813  | 60.770 |
| CD | rs752508   | 60.347 |
| CD | rs13109404 | 60.203 |
| CD | rs11713774 | 59.729 |
| CD | rs1292053  | 58.798 |
| CD | rs4917129  | 58.452 |
| CD | rs68191    | 56.581 |
| CD | rs3801810  | 56.174 |
| CD | rs11159833 | 55.908 |
| CD | rs34804116 | 54.895 |
| CD | rs9257828  | 54.441 |
| CD | rs61839660 | 53.086 |
| CD | rs714027   | 52.899 |
| CD | rs102275   | 52.654 |
| CD | rs2227551  | 52.316 |
| CD | rs2283789  | 52.191 |
| CD | rs3776414  | 52.188 |
| CD | rs10800309 | 51.168 |
| CD | rs6740462  | 49.761 |
| CD | rs2153283  | 49.131 |
| CD | rs6074022  | 48.898 |
| CD | rs6908425  | 47.764 |
| CD | rs72727394 | 47.580 |
| CD | rs4802307  | 46.526 |
| CD | rs56163845 | 46.450 |
| CD | rs2006788  | 46.022 |
| CD | rs28999107 | 45.825 |
| CD | rs11691685 | 45.738 |
| CD | rs12107418 | 45.258 |
| CD | rs7195296  | 44.486 |
| CD | rs2230365  | 44.169 |
| CD | rs12720356 | 43.940 |
| CD | rs7438704  | 43.920 |
| CD | rs11679753 | 43.354 |
| CD | rs12718244 | 43.333 |
| CD | rs11175963 | 43.245 |
| CD | rs2188958  | 42.941 |
| CD | rs1569328  | 42.672 |
| CD | rs9554587  | 42.188 |
| CD | rs41295117 | 42.050 |

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| CD | rs6738394  | 42.033 |
| CD | rs1847472  | 41.653 |
| CD | rs76181804 | 41.585 |
| CD | rs3853824  | 41.509 |
| CD | rs1517352  | 41.288 |
| CD | rs11264426 | 41.030 |
| CD | rs61959448 | 41.029 |
| CD | rs2621323  | 40.948 |
| CD | rs36016881 | 40.899 |
| CD | rs727563   | 40.585 |
| CD | rs6738825  | 39.765 |
| CD | rs2395022  | 39.589 |
| CD | rs6827756  | 39.506 |
| CD | rs559928   | 39.241 |
| CD | rs9494844  | 39.027 |
| CD | rs4767956  | 38.978 |
| CD | rs367254   | 38.391 |
| CD | rs71624119 | 38.143 |
| CD | rs10276381 | 38.091 |
| CD | rs2735076  | 37.983 |
| CD | rs2143606  | 37.673 |
| CD | rs303429   | 37.671 |
| CD | rs7015630  | 37.530 |
| CD | rs2641348  | 37.394 |
| CD | rs35320439 | 37.346 |
| CD | rs7969592  | 37.256 |
| CD | rs2538470  | 37.237 |
| CD | rs7773324  | 37.209 |
| CD | rs640466   | 36.803 |
| CD | rs259964   | 35.895 |
| CD | rs1990684  | 35.561 |
| CD | rs17391694 | 35.449 |
| CD | rs3130186  | 35.063 |
| CD | rs17694108 | 35.004 |
| CD | rs10798069 | 34.507 |
| CD | rs76606004 | 33.904 |
| CD | rs7758080  | 33.460 |
| CD | rs7236492  | 33.026 |
| CD | rs1267501  | 32.902 |
| CD | rs76546301 | 32.882 |
| CD | rs974801   | 32.379 |
| CD | rs16870166 | 32.239 |
| CD | rs3184504  | 31.799 |
| CD | rs568617   | 31.755 |
| CD | rs224140   | 31.314 |
| CD | rs1486418  | 31.290 |
| CD | rs915286   | 30.995 |
| CD | rs13204048 | 30.779 |
| CD | rs314313   | 30.776 |
| CD | rs3812609  | 30.737 |
| CD | rs4703855  | 30.688 |

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| CD | rs4976646  | 30.428  |
| CD | rs12194548 | 29.876  |
| CD | rs12796489 | 225.783 |
| CD | rs16917597 | 32.477  |
| UC | rs9271255  | 425.836 |
| UC | rs6426833  | 341.048 |
| UC | rs7547569  | 288.883 |
| UC | rs2836883  | 237.370 |
| UC | rs3024493  | 191.603 |
| UC | rs6111031  | 187.151 |
| UC | rs1801274  | 182.422 |
| UC | rs3806308  | 170.568 |
| UC | rs10748783 | 169.913 |
| UC | rs9836291  | 165.217 |
| UC | rs12318183 | 164.093 |
| UC | rs59655222 | 134.716 |
| UC | rs3095301  | 128.384 |
| UC | rs4795397  | 123.648 |
| UC | rs10758669 | 123.587 |
| UC | rs7738430  | 116.602 |
| UC | rs56167332 | 115.156 |
| UC | rs11793497 | 113.426 |
| UC | rs272882   | 110.764 |
| UC | rs4380874  | 106.273 |
| UC | rs7608910  | 100.392 |
| UC | rs9272105  | 100.094 |
| UC | rs61893460 | 93.253  |
| UC | rs6920220  | 93.178  |
| UC | rs10761659 | 86.363  |
| UC | rs661054   | 84.873  |
| UC | rs2108225  | 82.636  |
| UC | rs4676410  | 81.388  |
| UC | rs10799838 | 80.528  |
| UC | rs4366152  | 78.551  |
| UC | rs6062496  | 78.237  |
| UC | rs2816958  | 77.806  |
| UC | rs4845604  | 77.707  |
| UC | rs1431403  | 71.835  |
| UC | rs34659678 | 69.993  |
| UC | rs1359946  | 69.042  |
| UC | rs4812833  | 67.735  |
| UC | rs7282490  | 67.549  |
| UC | rs35223180 | 64.355  |
| UC | rs1297256  | 62.973  |
| UC | rs9611131  | 61.779  |
| UC | rs1182188  | 61.249  |
| UC | rs2394250  | 61.235  |
| UC | rs10185424 | 59.133  |
| UC | rs4728142  | 58.614  |
| UC | rs9941524  | 58.387  |
| UC | rs3774937  | 56.890  |

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| UC | rs7633840   | 54.942 |
| UC | rs941823    | 54.718 |
| UC | rs34920465  | 53.893 |
| UC | rs8096327   | 53.780 |
| UC | rs17780256  | 51.805 |
| UC | rs4845140   | 51.767 |
| UC | rs7711427   | 48.291 |
| UC | rs17694108  | 47.275 |
| UC | rs395157    | 46.586 |
| UC | rs10910092  | 45.638 |
| UC | rs12720356  | 45.321 |
| UC | rs9891119   | 45.262 |
| UC | rs10010325  | 44.806 |
| UC | rs6556417   | 44.179 |
| UC | rs2070729   | 43.346 |
| UC | rs9368696   | 42.107 |
| UC | rs76546301  | 41.728 |
| UC | rs1990760   | 40.693 |
| UC | rs13136827  | 40.155 |
| UC | rs7240004   | 40.032 |
| UC | rs254562    | 39.799 |
| UC | rs2395022   | 39.755 |
| UC | rs483905    | 39.574 |
| UC | rs11150589  | 39.498 |
| UC | rs11641184  | 38.999 |
| UC | rs1405108   | 38.369 |
| UC | rs12142199  | 38.100 |
| UC | rs17679361  | 38.077 |
| UC | rs113010081 | 37.527 |
| UC | rs2488401   | 37.108 |
| UC | rs2240064   | 36.052 |
| UC | rs11676348  | 35.900 |
| UC | rs1517352   | 35.879 |
| UC | rs4946717   | 35.658 |
| UC | rs11578752  | 35.631 |
| UC | rs4976646   | 35.526 |
| UC | rs76904798  | 35.332 |
| UC | rs6088747   | 34.715 |
| UC | rs4743820   | 34.601 |
| UC | rs17552904  | 34.504 |
| UC | rs1076137   | 34.119 |
| UC | rs1077773   | 33.846 |
| UC | rs9911533   | 33.444 |
| UC | rs17800987  | 33.278 |
| UC | rs4747886   | 32.924 |
| UC | rs907611    | 32.838 |
| UC | rs151723    | 32.683 |
| UC | rs2497318   | 32.576 |
| UC | rs11229555  | 32.463 |
| UC | rs913678    | 32.440 |
| UC | rs13430791  | 32.195 |

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| UC | rs12718244 | 32.171  |
| UC | rs79045992 | 32.142  |
| UC | rs59418206 | 32.119  |
| UC | rs79823250 | 32.027  |
| UC | rs7404095  | 32.022  |
| UC | rs10460566 | 31.932  |
| UC | rs10494343 | 31.833  |
| UC | rs11230563 | 31.591  |
| UC | rs4712520  | 31.302  |
| UC | rs4973341  | 31.263  |
| UC | rs6700241  | 31.221  |
| UC | rs12661782 | 31.070  |
| UC | rs1646019  | 30.974  |
| UC | rs11083840 | 30.459  |
| UC | rs16939788 | 30.429  |
| UC | rs13255292 | 30.241  |
| UC | rs3776414  | 30.100  |
| UC | rs17736589 | 29.991  |
| UC | rs17771967 | 29.921  |
| UC | rs2274351  | 29.758  |
| UC | rs12796489 | 146.127 |
| UC | rs411326   | 114.410 |
| UC | rs55808324 | 36.572  |