### Supplemental digital contents

Supplemental digital content 1. Search strategy for Ovid MEDLINE® and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions® (1946-present)

|   | Search Terms                                                                 |
|---|-------------------------------------------------------------------------------|
| 1 | diabetes mellitus/ or exp diabetes mellitus, experimental/ or exp diabetes mellitus, type 1/ or exp diabetes mellitus, type 2/ or exp diabetic ketoacidosis/ or exp donohue syndrome/ or exp latent autoimmune diabetes in adults/ |
| 2 | (DKA or IDDM).mp. or DM1.ab.                                                  |
| 3 | (MODY or DM2 or NIDDM).mp. or IIIDM.ti,ab.                                  |
| 4 | (((impaired glucose tolerance or glucose intoleran$ or insulin$ resist$) and (DM or DM2)).ti,ab. |
| 5 | ("typ$ 1"^ or typ$ I) adj6 DM).ti,ab.                                       |
| 6 | ("typ$ 2" or typ$ II) adj6 DM).ti,ab.                                       |
| 7 | ((juvenil$ or child$ or keto$ or labil$ or britt$ or earl$ onset) adj6 (DM or DM1)).ti,ab. |
| 8 | ((keto$ prone or autoimmun$ or auto immun$ or sudden onset) adj6 (DM or DM1)).ti,ab. |
| 9 | ((keto$ resist$ or nonketo$ or non keto$ or adult$ onset or matur$ onset or late$ onset or slow onset or stabl$) adj6 (DM or DM2)).ti,ab. |
| 10 | (insulin$ defic$ adj6 (absolut$ or relativ$)).ti,ab.                       |
| 11 | metabolic$ syndrom$).ti,ab.                                                |
| 12 | T2DM.ab,ti.                                                                 |
| 13 | T2D.ab,ti.                                                                  |
| 14 | T1DM.ab,ti.                                                                 |
| 15 | T1D.ab,ti.                                                                  |
| 16 | exp arthritis, rheumatoid/                                                  |
| 17 | (arthritis adj2 rheumat$).tw.                                              |
| 18 | (felty$ adj2 syndrome).tw.                                                 |
| 19 | (caplan$ adj2 syndrome).tw.                                                |
| 20 | rheumatoid nodule.tw.                                                       |
| 21 | rheumatoid vasculitis.tw.                                                   |
| 22 | (sjogren$ adj2 syndrome).tw.                                               |
| 23 | still$ disease.tw.                                                          |
| 24 | exp animals/ not (exp humans/ and exp animals/)                             |
| 25 | "review"/ or consensus development conference/ or consensus development conference, nih/ or letter/ |
| 26 | exp Cohort Studies/                                                         |
| 27 | cohort*.ab,ti.                                                              |
| 28 | cohort analy$.ab,ti.                                                        |
| 29 | follow up.ab,ti.                                                            |
| 30 | longitudinal.ab,ti.                                                        |
| 31 | retrospective$.ab,ti.                                                       |
| 32 | prospective$.ab,ti.                                                         |
| 33 | nest* case*.ab,ti.                                                          |
| 34 | or/1-15                                                                     |
| 35 | or/16-23                                                                    |
| 36 | or/26-33                                                                    |
| 37 | 36 not 25                                                                   |
| 38 | (34 and 35 and 37) not 24                                                   |
| 39 | limit 38 to english language                                                |
Supplemental digital content 2. Search strategy for Embase (1974- present)

|   |   |
|---|---|
| 46 | limit 45 to english language |
| 45 | (37 and 38 and 44) not 24 |
| 44 | 39 not 43 |
| 43 | 25 or 40 or 41 or 42 |
| 42 | exp note/ |
| 41 | exp erratum/ |
| 40 | exp editorial/ |
| 39 | or/26-36 |
| 38 | or/16-23 |
| 37 | or/1-15 |
| 36 | nest* case*.ab,ti. |
| 35 | prospective$.ab,ti. |
| 34 | retrospective$.ab,ti. |
| 33 | longitudinal.ab,ti. |
| 32 | follow up.ab,ti. |
| 31 | cohort*.ab,ti. |
| 30 | prospective study/ |
| 29 | retrospective study/ |
| 28 | longitudinal study/ |
| 27 | follow up/ |
| 26 | cohort analysis/ |
| 25 | exp review/ or exp consensus development/ or letter/ |
| 24 | (exp animal/ or animal.hw. or nonhuman/) not (exp human/ or human cell/ or (human or humans).ti.) |
| 23 | still$ disease.tw. |
| 22 | (sjogren$ adj2 syndrome).tw. |
| 21 | rheumatoid vasculitis.tw. |
| 20 | rheumatoid nodule.tw. |
| 19 | (caplan$ adj2 syndrome).tw. |
| 18 | (felty$ adj2 syndrome).tw. |
| 17 | (arthritis adj2 rheumat$).tw. |
| 16 | exp arthritis, rheumatoid/ |
| 15 | T1D.ab,ti. |
| 14 | T1DM.ab,ti. |
| 13 | T2D.ab,ti. |
| 12 | T2DM.ab,ti. |
| 11 | metabolic$ syndrom$.ti,ab. |
| 10 | (insulin$ defic$ adj6 (absolut$ or relativ$)).ti,ab. |
| 9 | ((keto$ resist$ or nonketo$ or non keto$ or adult$ onset or matu$ onset or late$ onset or slow onset or stabl$) adj6 (DM or DM2)).ti,ab. |
| 8 | ((keto$ prone or autoimmun$ or auto immun$ or sudden onset) adj6 (DM or DM1)).ti,ab. |
| 7 | ((juvenil$ or child$ or keto$ or labi$ or britti$ or earl$ onset) adj6 (DM or DM1)).ti,ab. |
| 6 | ("typ$ 2" or "typ$ II") adj6 DM).ti,ab. |
| 5 | ("typ$ 1" or "typ$ I") adj6 DM).ti,ab. |
| 4 | ((impair$ glucose tolerance or glucose intoleran$ or insulin$ resist$) and (DM or DM2)).ti,ab. |
| 3 | (MODY or DM2 or NIDDM).mp. or lIDM.ti,ab. |
| 2 | (DKA or IIDD).mp. or DMI.ab,ti. |
| 1 | diabetes mellitus/ or exp diabetic complication/ or exp diabetic obesity/ or exp experimental diabetes mellitus/ or exp impaired glucose tolerance/ or exp insulin dependent diabetes mellitus/ or exp lipoatrophic diabetes mellitus/ or exp "maternally inherited diabetes and deafness"/ or exp non insulin dependent diabetes mellitus/ or exp wolfram syndrome/ |
Supplemental digital content 3. Search strategy for Web of Science Core Collection (1900-present)

6 (4 not5) and language: (English)
5 ti=(review or meta-analy*)
4 1 and 2 and 3
3 TS=("cohort analy*" OR "Cohort Stud*" OR cohort* OR longitud* OR retrospect* OR prospect* or follow-up OR (nest* case*))
2 TS=(rheumat* NEAR/2 arthritis or caplan* NEAR/2 syndrome or felty* NEAR/2 syndrome or "rheumatoid nodule*" or "rheumatoid vasculitis" or sjogren* NEAR/2 syndrome or "still* disease")
1 TS=diabet*

Supplemental digital content 4. The Newcastle-Ottawa Scale (NOS) for assessing the quality of eligible studies

| Subhead                  | Components                                                                 | Solomon | Schmidt | Su | Jafri | Wilson | Gonzalez | Mathew |
|--------------------------|-----------------------------------------------------------------------------|---------|---------|----|-------|--------|----------|--------|
| Selection                | Representativeness of the exposed cohort                                    | 1       | 1       | 1  | 1     | 1      | 1        | 1      |
|                          | Selection of the non exposed cohort                                         | 1       | 1       | 1  | 1     | 1      | 1        | 1      |
|                          | Ascertainment of exposure                                                   | 1       | 1       | 1  | 1     | 1      | 1        | 1      |
|                          | Demonstration that outcome of interest was not present at start of study    | 1       | 1       | 1  | 1     | 1      | 1        | 1      |
| Comparability            | Comparability of cohorts on the basis of the design or analysis             | 1       | 1       | 0  | 1     | 1      | 1        | 1      |
| Outcome                  | Assessment of outcome                                                       | 1       | 1       | 1  | 1     | 1      | 1        | 1      |
|                          | Was follow-up long enough for outcomes to occur/ 5 years                    | 1       | 1       | 1  | 1     | 1      | 1        | 1      |
|                          | Adequacy of follow up of cohorts                                            | 0       | 0       | 0  | 0     | 0      | 0        | 0      |
| Total number of stars    |                                                                             | 7       | 7       | 7  | 7     | 7      | 7        | 8      |

Supplemental digital content 5. Subgroup Analyses of the incidence of diabetes in people with rheumatoid arthritis compared with controls

| Subgroups               | No of studies | RR (95% CI)          | \( P^\text{H} \) |
|-------------------------|---------------|----------------------|-----------------|
| Country/ region         |               |                      |                 |
| USA                     | 2             | 0.92 (0.52, 1.63)    | 0.02            |
| Canada                  | 2             | 1.53 (1.31, 1.78)    |                 |
| UK                      | 2             | 1.21 (1.17, 1.25)    |                 |
| Taiwan                  | 1             | 1.18 (1.08, 1.28)    |                 |
| Study design            |               |                      | 0.30            |
| Age and gender-matched  | 4             | 1.14 (0.96, 1.36)    |                 |
| Not matched             | 3             | 1.33 (1.06, 1.67)    |                 |

RR: risk ratio; \( P^\text{H} \): For heterogeneity among subgroups
| Section/topic | Checklist item | Reported on page # |
|---------------|----------------|-------------------|
| **TITLE**     |                |                   |
| Title         | 1 Identify the report as a systematic review, meta-analysis, or both. | 1 |
| **ABSTRACT**  |                |                   |
| Structured summary | 2 Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number. | 2 |
| **INTRODUCTION** |                |                   |
| Rationale  | 3 Describe the rationale for the review in the context of what is already known. | 3 |
| Objectives  | 4 Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS). | 4 |
| **METHODS**   |                |                   |
| Protocol and registration | 5 Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number. | 3 |
| Eligibility criteria | 6 Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale. | 4 |
| Information sources | 7 Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched. | 3 |
| Search | 8 Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated. | Supplemen
tary Data S1 |
| Study selection | 9 State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis). | 5 |
| Data collection process | 10 Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators. | 5 |
| Data items | 11 List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made. | 4-5 |
| Risk of bias in individual studies | 12 Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis. | N/A |
| Summary measures | 13 State the principal summary measures (e.g., risk ratio, difference in means). | 5-6 |
| Synthesis of results | 14 Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I²) for each meta-analysis. | 5-6 |
| Risk of bias across studies | 15 | Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies). | 5-6 |
|----------------------------|----|--------------------------------------------------------------------------------------------------------------------------------|------|
| Additional analyses        | 16 | Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified. | 5-6 |

## RESULTS

| Study selection            | 17 | Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram. | 6   |
| Study characteristics      | 18 | For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations. | 6-7 |
| Risk of bias within studies| 19 | Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12). | N/A |
| Results of individual studies | 20 | For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot. | 8-9 |
| Synthesis of results       | 21 | Present results of each meta-analysis done, including confidence intervals and measures of consistency. | 8-9 |
| Risk of bias across studies| 22 | Present results of any assessment of risk of bias across studies (see Item 15). | 9   |
| Additional analysis        | 23 | Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]). | 8-9 |

## DISCUSSION

| Summary of evidence        | 24 | Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers). | 9-11 |
| Limitations                | 25 | Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias). | 11   |
| Conclusions                | 26 | Provide a general interpretation of the results in the context of other evidence, and implications for future research. | 11-12 |

## FUNDING

| Funding                    | 27 | Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review. | The authors have declared no conflicts of interest. |