APPENDIX

Supplementary Table 1. ICPC and ICD-10-AM diagnostic codes used in diabetes case definitions

	ICPC	ICD-10-AM
Any diabetes	T89* T90*	E10*-E14* O24.0-O24.3 O24.5 O24.9
Type 1 diabetes	T89002	E10* O24.0
Other diabetes	T90017	E13*
Gestational diabetes	W85*	O24.4

** indicates truncation. ICPC: International Classification of Primary Care; ICD-10-AM: International Classification of Diseases, Tenth Revision, Australian Modification.*

Validation study results

Manual review of individual electronic health records was undertaken to inform our study definition of diabetes. Three specific potential issues were targeted including: (i) whether or not prescription of metformin indicates a diagnosis of diabetes, (ii) whether cases of gestational diabetes mellitus (GDM) were adequately excluded, and (iii) the accuracy of determination of diabetes type, especially in young-onset diabetes. This work was undertaken by a single research assistant with a clinical background under the supervision of an endocrinologist, who personally reviewed all records where there was any doubt about the patient's diabetes diagnosis.

Metformin prescription was removed from the study definition of diabetes following manual review of a sample (n=62) of people prescribed metformin but with no other glucose-lowering medication, no coding for a diabetes diagnosis and no biochemical data to support a diabetes diagnosis. Of these people, 52 (81%) did not have diabetes. The most common indication for metformin in this subgroup was diabetes prevention in high-risk individuals (including pre-diabetes, evidence of insulin resistance and antipsychotic use), followed by GDM and polycystic ovarian syndrome.

To avoid including diagnoses of GDM, we excluded all medication and biochemistry data in the nine months preceding and three months following the allocation of a GDM diagnostic code in either the primary care or hospital datasets. In order to assess this approach, we investigated the health records of a random sample of women (n=40) of childbearing age (born between 1st July 1968 and 1st July 1998) who had been defined as having diabetes. Once metformin had been removed from the study definition of diabetes, 39 (98%) of these women were confirmed as having established diabetes. Therefore, we deemed that the approach to excluding GDM was adequate.

With regard to determining diabetes type, we were concerned about two non-specific ICPC codes (T89001 – "Insulin dependent" and T89003 – "Juvenile onset") intended to report type 1 diabetes in the ICPC classification system. Insulin is frequently used for type 2 diabetes and there is a high burden of youth-onset type 2 diabetes among Aboriginal people in the Northern Territory. In a random sample (n=28), only 4 (14%) of people coded as T89001 had type 1 diabetes, therefore we did not include this code in our type 1 diabetes definition. Only two people were assigned the

T89003 code. One of these had type 2 diabetes, the other had pre-diabetes. This code was also removed from the type 1 diabetes definition.

To further assess the accuracy of identification of diabetes type in young people, we took a random sample (n=40) of people with diabetes born on or after 1st July 1988. Only one of these people had type 1 diabetes and it had been coded appropriately in the study dataset.

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