Supplemental Material

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Table 1. RECORD checklist of recommendations for the reporting of studies conducted using routinely collected health data

	Item No	Recommendation	Reported
Title and abstract	1	1.1 The type of data used should be specified in the title or abstract. When possible, the name of the databases should be included.	Abstract
		1.2 If applicable, the geographic region and time frame within which the study took place should be reported in the title or abstract.	Abstract
		1.3 If linkage between databases was conducted for the study, this should be clearly stated in the title or abstract	Abstract
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	Introduction
Objectives	3	State specific objectives, including any pre-specified hypotheses	Introduction
Methods			
Study design	4	Present key elements of study design early in the paper	Methods
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Methods
Participants	6	6.1 The methods of study population selection should be listed in detail. If this is not possible, an explanation should be provided.	Methods
		6.2 Any validation studies of the codes or algorithms used to select the population should be referenced. If validation was conducted for this study and not published elsewhere, detailed methods and results should be provided.	Methods
		6.3 If the study involved linkage of databases, consider use of a flow diagram or other graphical display to demonstrate the linkage process, including the number of individuals with linked data at each stage.	Supplemental Material Figure 1
Variables	7	A complete list of codes and algorithms used to classify exposures, outcomes, confounders, and effect modifiers should be provided. If these cannot be reported, an explanation should be provided.	Supplemental Material Table 2

Data sources/ measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Methods, Supplemental Material Table 2 and 3
Bias	9	Describe any efforts to address potential sources of bias	Methods
Study size	10	Explain how the study size was arrived at	Methods, Supplemental Material Figure 1
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Tables 1-4
Statistical methods	12	12.1 Describe all statistical methods, including those used to control for confounding	Methods
		12.2 Describe any methods used to examine subgroups and interactions	Methods
		12.3 Explain how missing data were addressed	Methods, Table 1 and Table 3
		12.4 If applicable, explain how loss to follow-up was addressed	Methods
		12.5 Describe any sensitivity analyses	Not applicable
Data access and cleaning methods		12.6 Authors should describe the extent to which the investigators had access to the database population used to create the study population.	Methods
		12.7 Authors should provide information on the data cleaning methods used in the study	Methods, Supplemental Materials Figure 1
Linkage		12.8 State whether the study included person-level, institutional-level, or other data linkage across two or more databases. The methods of linkage and methods of linkage quality evaluation should be provided.	Methods, Supplemental Materials Figure 1
Results			
Participants	13	13.1 Describe in detail the selection of the persons included in the study (i.e. study population selection), including filtering based on data quality, data availability, and linkage. The selection of included persons can be described in the text and/or by means of the study flow diagram.	Results, Supplemental Materials Figure 1
Descriptive data	14	14.1 Give characteristics of study participants (e.g. demographic, clinical, social) and information on exposures and potential confounders	Results, Tables 1-4

		14.2 Indicate number of participants with missing data for each variable of interest	Table 1 and Table 3
		14.3 Summarize follow-up time (e.g. average and total amount)	Results
Outcome data	15	Report numbers of outcome events or summary measures over time	Results, Table 2
Main results	16	16.1 Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g. 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Results, Table 2-4
		16.2 Report category boundaries when continuous variables were categorized	Tables 1-4
		16.3 If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	Not applicable
Other analyses	17	Report other analyses done—e.g. analyses of subgroups and interactions, and sensitivity analyses	Results, Table 3, Figure 1
Discussion			
Key results	18	Summarize key results with reference to study objectives	Discussion
Limitations	19	Discuss the implications of using data that were not created or collected to answer the specific research question(s). Include discussion of misclassification bias, unmeasured confounding, missing data and changing eligibility over time, as they pertain to the study being reported.	Discussion
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Discussion
Generalizability	21	Discuss the generalizability (external validity) of the study results	Discussion
Other information			
Funding	22	22.1 Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Acknowledgments
Accessibility of protocol, raw data and programming code		22.2 Authors should provide information on how to access any supplemental information such as the study protocol, raw data, or programming code.	The dataset from this study is held securely in coded form at ICES. While data sharing agreements prohibit ICES from making the

			dataset publicly available, access may be granted to those who meet pre-specified criteria for confidential access, available at www.ices.on.ca/DAS. The full dataset creation plan and underlying analytic code are available from the authors upon request, understanding that the programs may rely upon coding templates or macros that are unique to ICES.

Table 2. List of variables and data sources

Variables	Data source	Administrative codes
Age	RPDB	NA
Sex	RPDB	NA
Race	ORRS	NA
Rostered to family physician	CAPE	NA
Income quintile	RPDB	NA
CKD/dialysis program	ORRS	
Distance to dialysis facility (km)	RPDB	NA
Marginalization index	ON-MARG	NA
Long-term care	ODB	NA
Rural location	RPDB	NA
Duration of diabetes	ODD	NA
Duration of first ESKD prior to index date	ORRS CORR	NA
CAD	CIHI-DAD NACRS OHIP	ICD10: I20, I21, I22, I23, I24, I25, Z955, Z958, Z959, R931, T822 CCI: 1IJ26, 1IJ27, 1IJ50, 1IJ54, 1IJ57 ,1IJ76

		OHIP Fee: R741, R742, R743, G298, E646, E651, E652, E654, E655, G262, Z434 ,Z448 OHIP Dx: 410 ,412 ,413
Stroke/TIA	CIHI-DAD NACRS	ICD10: I62 ,I630 ,I631 ,I632, I633, I634, I635, I638, I639 ,I64, H341 ,I600 ,I601, I602 ,I603, I604, I605 ,I606, I607, I609, I61, G450 ,G451, G452, G453, G458, G459, H340
CHF	CHF	Diagnosis in CHF database as of the index date
Foot Ulcer	CIHI-DAD	ICD10: E1070, E1071, E1170, E1171, E1370, E1371, E1470, E1471
Amputation	CIHI-DAD	CCI: 1VA93, 1VC93, 1VG93, IVQ93, 1WA93, 1WE93, 1WI93, 1WJ93, 1WK93, 1WL93, 1WM93, 1WN93, 1SN93, 1SQ93, 1TA93, 1TK93, 1TM93, 1TV93, 1UB93, 1UE93, 1UF93, 1UG93, 1UH93, 1UI93, 1UJ93, 1UK93, 1UM93
Depression or anxiety	CIHI-DAD	ICD10: F063, F064, F313, F314, F315, F316, F320, F321, F322, F323, F328, F329, F330, F331, F332, F333, F338, F339, F340, F341, F348, F349, F380, F381, F388, F39, F410, F411, F412, F413, F418, F419, F204, F318, F319
Hypoglycemia	CIHI-DAD	ICD10: E15, E160, E161, E162, E1063, E1163, E1363, E1463
Hyperglycemia	CIHI-DAD	ICD10: E1101, E131, E141, R739
Hypertension		ICD10: I10, I11, I12, I13, I15 OHIP Dx: 401, 402, 403

Retinopathy	CIHI-DAD	ICD 10: H350, H352, H360, E10300, E10301, E10302, E10303, E10304, E10309, E1031, E10310, E10311, E10312, E10313, E10314, E10319,E10320, E10321, E10322, E10323, E10324, E10329, E1033, E10330, E10331, E10332, E10333, E10334, E10339, E10340, E10341, E10342, E10343, E10344, E10349, E1036, E1038, E10380, E10381, E10382, E10383, E10384, E10389, E10390, E10391, E10392, E10393, E10394, E10399, E1130, E11300, E11301, E11302, E11303, E11304, E11309, E1131, E11310, E11311, E11313, E11314, E11319, E1132, E11320, E11321, E11322, E11323, E11324, E11329, E1133, E11330, E11331, E11332, E11333, E11334, E11339, E11340, E11341, E11342, E11343, E11344, E11349, E1136, E1138, E11381, E11382, E11383, E11384, E11389, E11390, E11391, E11392, E11393, E11394, E11399
Major cancer	CIHI-DAD OHIP	IDC10: 971, 980, 982, 984, 985, 986, 987, 988, 989, 990, 991, 993, C15, C18, C19, C20, C22, C25, C34, C50, C56, C61, C82, C83, C85, C91, C92, C93, C94, C95, D00, D05, D010, D011, D012, D022, D075 OHIP Dx: 203, 204, 205, 206, 207, 208, 150, 154, 155, 157, 162, 174, 175, 183, 185
COPD	COPD	Diagnosis in COPD database as of the index date
Chronic liver disease	CIHI-DAD OHIP	ICD 10: B16, B17, B18, B19, I85, R17, R18, R160, R162, B942, Z225, E831, E830, K70, K713, K714, K715, K717, K721, K729, K73, K74, K753, K754, K758, K759, K76, K77 OHIP Dx: 571, 573, 070 OHIP Fee: Z551, Z554
Dementia	DEMENTIA	Diagnosis in DEMENTIA database as of the index date
Charlson comorbidity index	CIHI-DAD	NA
Specialist visits in the 2 year prior	OHIP	NA

Primary care visits in the 2 years prior	OHIP	NA
Diabetes visit in the 2 years prior	OHIP	Diagnostic code for diabetes (code 250) during an outpatient visit
Physician SPECs who provided diabetes care in 2 years prior	OHIP	Specialty of physician who administered code 250 during outpatient visit
Number of unique physicians in the 2 years prior	OHIP	NA
Number of ED visits in the 2 year prior	NACRS	NA
Number of hospitalizations in the 2 year prior	CIHI-DAD	NA
HbA1c value	OLIS	OLIS observation codes: 17855-8, 17856-6, 41995-2, 4548-4, 59261-8, 71875-9
Diabetes medication prescriber	ODB CPDB	Prescriber of last diabetes medication

Abbreviations: CAD, Coronary artery disease; CAPE, Client Agency Program Enrolment; CCI, Canadian Classification of Health Interventions; CHF, Congestive heart failure; CIHI-DAD, Canadian Institute for Health Information's Discharge Abstract Database; COPD, Chronic Obstructive Pulmonary Disease; CORR, Canadian Organ Replacement Registry; CPDB, Corporate Provider Database; Dx, Diagnostic; ICD, International Classification of Diseases; NACRS, National Ambulatory Care Reporting System Database; ODB, Ontario Drug Benefit; ODD, Ontario Diabetes Database; OHIP, Ontario Health Insurance Plan; ONMARG, Ontario Marginalization Index; OLIS, Ontario Laboratories Information System; ORRS, Ontario Renal Reporting System; TIA, transient ischemic attack, RPDB, Registered Persons Database

Table 3. Diabetes Care Gaps

Indicator 1	**At least annual HbA1c**	**Gap score**
Data Sources	OLIS	
Numerator	2 year lookback prior to Jan 1 2018 to determine the number of people with at least one HbA1c test per year Note: 'Annual' is defined as at least 2 tests separated by at least 365 days	
Measures	N(%) with: No evidence of annual A1c test At least annual A1c test	 1 0
Indicator 2	**Number of HbA1c tests**	
Data Sources	OLIS Note: Restrict to 1 lab test per person per day	
Numerator	2 year lookback prior to Jan 1 2018 to determine the number of people with more than eight HbA1c tests	
Measures	N(%) with: >8 A1c tests ≤8 A1c tests	 1 0
Indicator 3	**Diabetes eye exam**	
Data sources	OHIP Optometrist SPEC=56 Ophthalmologist SPEC= 23 Restricted to only 1 relevant code per person per day.	
Numerator	2 year lookback prior to Jan 1 2018 to determine the number of people with evidence of at least one screening eye exam.	

Measures	N (%) with at least one vision exam over the 2 years N (%) with no vision exam over 2 years	0 1
Indicator 4	**Cardiac screening**	
Data sources	OHIP	
Numerator	2 year lookback prior to Jan 1 2018 to determine the number of people with evidence of at least one EKG or cardiac stress test	
Measures	N (%) with at least one EKG or stress test N (%) with no EKG or stress test	0 1
Indicator 5	**Hospital encounter for hyperglycemia**	
Data Sources	CIHI-DAD (main diagnoses) NACRS (main diagnoses)	
Numerator	Look back from Jan 1 2018 to determine the number of patients with at least one hospital encounter for hyperglycemia	
Measures	N(%) with hospital encounter N(%) with no encounter	1 0
Indicator 6	**Hospital encounter for hypoglycemia**	
Data Sources	CIHI-DAD (main diagnoses) NACRS (main diagnoses)	
Numerator	2 year lookback prior to Jan 1 to determine the number of patients with at least one hospital encounter for hypoglycemia	
Measures	N(%) with hospital encounter N(%) with no encounter	1 0
Indicator 7	**Hospital encounter for hypertension**	
Data Sources	CIHI-DAD (main diagnoses)	

	NACRS (main diagnoses)	
Numerator	2 year lookback prior to Jan 1 2018 to determine the number of patients with at least one hospital encounter for hypertension	
Measures	N(%) with hospital encounter N(%) with no encounter	1 0

Abbreviations: CIHI-DAD, Canadian Institute of Health Information's Discharge Abstract Database; EKG, electrocardiogram; NACRS, National Ambulatory Care Reporting System Database; OHIP, Ontario Health Insurance Plan; OLIS, Ontario Laboratories Information System; SPEC, specialist code

Figure 1. Flow chart participant inclusion