Sex- and Age-Based Achievement of Type II Diabetes Clinical and Treatment Targets in Canadian Primary Care (2015-2020): A Multi-Provincial Serial Cross-Sectional Study

Brief Title: Achievement of Type 2 Diabetes Targets in Canada (2015-2020)

SUPPLEMENT

SUPPLEMENTAL METHODS
SUPPLEMNTAL RESULTS

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Appendix 1, as submitted by the authors. Appendix to: Nandiwada S, Manca DP, Yeung RO, et al. Achievement of treatment targets among patients with type 2 diabetes in 2015 and 2020 in Canadian primary care. *CMAJ* 2023. doi: 10.1503/cmaj.220673.

Supplementary Methods

More details regarding CPCSSN

CPCSSN, the largest and only pan-Canadian primary care EMR database, is comprised of provincial primary care practice-based research networks, themselves comprised of multiple full-service, primary care clinics in academic (19%) and non-academic (81%) settings.[1,2] Participating practices contribute de-identified data to CPCSSN on all of their patients, except in Quebec, where consent for participation is obtained from each patient. The available EMR data includes demographics, health conditions, physical parameters, encounter data, medications, lab data, smoking status, and billing codes.[3] These data have been used in previous research.[4,5] The NDR abstract contains data from > 140,000 adults with diabetes from 7 practice-based research networks across Canada (2 from Alberta, 1 from Manitoba, 1 from Newfoundland, 2 from Ontario, and 1 from Quebec), using a validated case definition for diabetes.[6]

Inspection-Driven Cut-Offs for Outlier Values of Physical Parameters

SBP < 0.1^{th} or > 99.9^{th} percentile (<82mmHg or >203mmHg)

DBP < 0.1^{th} or > 99.9^{th} percentile (<43mmHg or >115mmHg)

BMI < 0.2^{th} or > 99.6^{th} percentile (<16.5kg/m^2 or >100kg/m^2)

Height < 0.3^{th} or > 99.9^{th} percentile (<72cm or >198cm)

Weight < 0.1^{th} or > 99.9^{th} percentile (<36kg or >230kg)

Outliers on inspection were highly likely to represent data entry errors (e.g.: missing digits, height of 70cm entered instead of 170cm) – These were changed to "missing".

ATC codes for ascertainment of medication use

Medication Class	Abbreviation	ATC Code (as a Regular Expression)*
Metformin	MET	A10B(A|D(0[123578]|1[013-8]|2[0235]))
Sulfonylurea	SU	A10B(B|(D0[1246]))
Alpha-glucosidase Inhibitor	AGI	A10B(F|D17)
Thiazolidinediones	TZD	A10B(G|D(0[34569]|12))
Dipeptidyl peptidase-4 inhibitor	DPP4	A10B(H|D(0[789]|1[012389]|2[1245]))
Glucagon-like peptide-1 receptor agonist	GLP1	A10(BJ|AE5[46])
Sodium-glucose cotransporter-2 inhibitor	SGLT2	A10B(K|D(1[569]|2[01345])|X(09|1[12]))
Meglitinides	MEG	A10B(X0[238]|D14)
Pramlintide	PRAM	A10BX05
Basal Insulin	BASAL	A10A[ECD]
Bolus Insulin	BOLUS	A10A[BD]
ACE inhibitor or angiotensin receptor blocker	ACEi/ARB	C09 C10BX0[467]|C10BX1{012345678]|A10BH51|A10BH52 Not: C09(DX04|BX0[467][BX1[0-7])
Statin	Statin	^C10AA|^C10BX

* Provided in the form of a regular expression for use with STATA's regexm() or SAS's PRXPARSE() functions.

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Case Definitions for Relevant Comorbidities and Diabetes Complications

Our approach to comorbidities and diabetes complications is as follows.

First, if there was a validated EMR-based case definition (diabetes, hypertension, heart failure), we used it. EMR case definitions are typically based on ICD-9 billing or health condition codes, which (depending on the definition) can be abstracted directly from the EMR or abstracted from free text analysis looking for certain key words. They are validated against manual (human) chart abstraction from the EMR. Manual chart abstraction is considered the criterion standard for the presence or absence of a condition. Well-accepted administrative data case definitions are typically validated against manual chart abstraction as well.

Second, coronary artery disease (CAD), stroke, hypoglycemia did not have validated EMR-based case definitions, but there were validated administrative data-based case definitions. Administrative database definitions typically take the form of "1 hospital discharge diagnosis or 2 or more outpatient physician billings with a certain diagnosis". This could be translated into "1 health conditions table entry or 2 or more physician billings with a certain diagnosis" for use with CPCSSN data. We recognize that the performance of an administrative data-based case definition will not be the same as the performance of the same case definition in the EMR. However, for coronary artery disease, we had both an administrative data-based definition, and an EMR-based case definition validated in a single Ontario practice-based research network (UTOPIAN, Toronto). We performed a mini-validation of the administrative data-based

definition using the EMR-based definition as the gold standard in UTOPIAN NDR data, and found good performance characteristics[7,8]:

		UTOPIAN definition of IHD		
		NEG	**POS**	**ROW total**
Admin data-based CAD definition	**NEG**	43296	923	44219
	POS	1298	6344	7642
	COL total	44594	7267	51861

The performance characteristics were as follows: sensitivity 87%, specificity 97%, positive predictive value 83%, negative predictive value 98%. Based on these findings, our importation of administrative data-based definitions for use with CPCSSN data is reasonable – imperfect, but "fit for purpose", so to speak.

Third, diabetes complications had neither clearly validated EMR-based case definitions, nor administrative data-based case definitions. In their development of coding algorithms for the Charlson and Elixhauser comorbidity scores, Quan et al. distinguished uncomplicated and complicated diabetes. The codes that make up complicated diabetes may be considered validated in that the complicated diabetes category contributed independently to the estimation of in-hospital mortality. These codes were pulled out to populate diabetic retinopathy and neuropathy, with some manual inspection of ICD-9 codes and adjustments. Notably, the prevalence of these conditions was rare.

It is important to recognize the importance of diabetes and coronary artery disease to this study. The former defines the study sample, while the latter is the most common and most

important indication for ACEi / statin / LDLc-lowering outside of age >= 40. Chronic kidney disease, another common and important ACEi indication, was estimated from laboratory values, so did not require a diagnostic code-based case definition. All the other conditions were helpful in describing the study sample, but contributed little to the numerators or denominators for the proportion of adults achieving treatment targets (LDLc/statin/ACEi), and were irrelevant to HbA1c and BP achievement proportions.

Specific definitions and sources

Diabetes: Two billings or one entry in the health conditions table with ICD-9 code 250.

Reference: Williamson T, Green ME, Birtwhistle R, Khan S, Garies S, Wong ST, Natarajan N, Manca D, Drummond N. Validating the 8 CPCSSN case definitions for chronic disease surveillance in a primary care database of electronic health records. Ann Fam Med. 2014;12(4):367-372.

Heart failure: Two billings or one entry in the health conditions table with ICD-9 codes 428.x or 425.x; or current use of ACEi/ARB *and* beta-blocker *and* diuretic (spironolactone, eplerenone, furosemide, or indapamide).

Reference: Vijh, Rohit et al. Identifying heart failure in patients with chronic obstructive lung disease through the Canadian Primary Care Sentinel Surveillance Network in British Columbia: a case derivation study. CMAJ Open. 2021;9(2):E376-E383.

Hypertension: Two billings or one entry in the health conditions table with ICD-9 codes 401, 402, 403, 404, 405.

Reference: Garies, S., McBrien, K., Quan, H. et al. A data quality assessment to inform hypertension surveillance using primary care electronic medical record data from Alberta, Canada. BMC Public Health. 2021;21:264.

Coronary artery disease: Two billings or one entry in the health conditions table with ICD-9 codes 410, 412, or 413. ICD-9 code 414.x (except 414.1) was added after it improved performance characteristics (improved positive and negative predictive values) for coronary artery disease according to the UTOPIAN case definition, in the subset of UTOPIAN patients.

Reference: Tu K, Mitiku T, Lee DS, Guo H, Tu JV. Validation of physician billing and hospitalization data to identify patients with ischemic heart disease using data from the Electronic Medical Record Administrative data Linked Database (EMRALD). Can J Cardiol. 2010;26(7):e225-e228.

Stroke: Two billings or one entry in the health conditions table with ICD-9 codes 430-438.

References:

- McCormick N, Bhole V, Lacaille D, Avina-Zubieta JA."Validity of Diagnostic Codes for Acute Stroke in Administrative Databases: A Systematic Review." PloS One. 2015;10(8):e0135834.
- Tu K, Wang M, Young J, Green D, Ivers NM, Butt D, Jaakkimainen L, Kapral MK. Validity of administrative data for identifying patients who have had a stroke or transient ischemic attack using EMRALD as a reference standard. Can J Cardiol. 2013;29(11):1388-1394.

Hypoglycemia: Two billings or one entry in the health conditions table with ICD-9 codes meeting the following algorithm:

(ICD-9 codes 251.0, 251.1, 251.2, 270.3, 775.0, 775.6, or 962.3)

OR

(ICD-9 code 250.8 *without any concomitant instance of* 259.8, 272.7, 681.xx, 682.xx, 686.9x, 707.1-707.9, 709.3, 730.0-730.2, 731.8)

Reference: Ginde AA, Blanc PG, Lieberman RM, Camargo CA Jr. Validation of ICD-9-CM coding algorithm for improved identification of hypoglycemia visits. BMC Endocr Disord. 2008;8:4.

Diabetic ophthalmopathy: Two billings or one entry in the health conditions table with ICD-9 codes 366, 362.0-3. 362.8-9, 250.5.

Reference: Quan H, Sundararajan V, Halfon P, Fong A, Burnand B, Luthi JC, Saunders LD, Beck CA, Feasby TE, Ghali WA. Coding algorithms for defining comorbidities in ICD-9-CM and ICD-10 administrative data. Med Care. 2005 Nov;43(11):1130-9.

Diabetic neuropathy: Two billings or one entry in the health conditions table with ICD-9 codes 354-357, 337.1, 337.9, 337.00, 249.x6, 250.x6.

Reference: Quan H, Sundararajan V, Halfon P, Fong A, Burnand B, Luthi JC, Saunders LD, Beck CA, Feasby TE, Ghali WA. Coding algorithms for defining comorbidities in ICD-9-CM and ICD-10 administrative data. Med Care. 2005 Nov;43(11):1130-9.

Adjusted Logistic Regression Model

$$
\begin{aligned}
logit[Y_i] = \ & \alpha + \beta_{female}X_{female} + \beta_{age<40}X_{age<40} + \beta_{age40-64}X_{age40-64} + \beta_{2020}X_{2020} \\
& + \beta_{female*age<40}X_{female}X_{age<40} + \beta_{female*age40-64}X_{female}X_{age40-64} \\
& + \beta_{2020*age<40}X_{2020}X_{age<40} + \beta_{2020*age40-64}X_{2020}X_{age40-64} + \beta_{CAD}X_{CAD} \\
& + \beta_{stroke}X_{stroke} + \beta_{HF}X_{HF} + \beta_{CKD1}X_{CKD1} + \beta_{CKD2}X_{CKD2} + \beta_{CKD3}X_{CKD3} \\
& + \beta_{CKD4}X_{CKD4} + \beta_{CKD5}X_{CKD5} + \beta_{documented\ hypo}X_{documented\ hypo}
\end{aligned}
$$

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Supplement References

See **Specific Definitions and Sources** for references for case definitions.

1. Queenan JA, Williamson T, Khan S, et al. Representativeness of patients and providers in the Canadian Primary Care Sentinel Surveillance Network: a cross-sectional study. *CMAJ Open.* 2016;4:E28-32.
2. Garies S, Birtwhistle R, Drummond N, Queenan J, Williamson T. Data Resource Profile: National electronic medical record data from the Canadian Primary Care Sentinel Surveillance Network (CPCSSN). *Int J Epidemiol.* 2017;46:1091-2f.
3. National Diabetes Repository. *Data Dictionary*. Toronto, ON: Diabetes Action Canada; 2021. https://repository.diabetesaction.ca/wp-content/uploads/2021/09/vimo.htm. Last accessed September 30, 2022.
4. Greiver M, Williamson T, Barber D, et al. Prevalence and epidemiology of diabetes in Canadian primary care practices: a report from the Canadian Primary Care Sentinel Surveillance Network. *Can J Diabetes.* 2014;38:179-85.
5. Coons MJ, Greiver M, Aliarzadeh B, et al. Is glycemia control in Canadians with diabetes individualized? A cross-sectional observational study. *BMJ Open Diabetes Res Care.* 2017;5:e000316.
6. Williamson T, Green ME, Birtwhistle R, et al. Validating the 8 CPCSSN case definitions for chronic disease surveillance in a primary care database of electronic health records. *Ann Fam Med.* 2014;12:367-72.
7. Ivers N, Pylypenko B, Tu K. Identifying patients with ischemic heart disease in an electronic medical record. *J Prim Care Community Health.* 2011;2:49-53.
8. Bodoarca R, Yeung RO, Lau D. New Diabetes Guidelines: Impact on Eligibility for Sodium-glucose Cotransporter-2 Inhibitors and Glucagon-like Peptide-1 Receptor Agonists in Canada. *Can J Diabetes.* 2022.

Supplemental Results

Figure S1: Inclusion / Exclusion of Adults with Diabetes in 2015

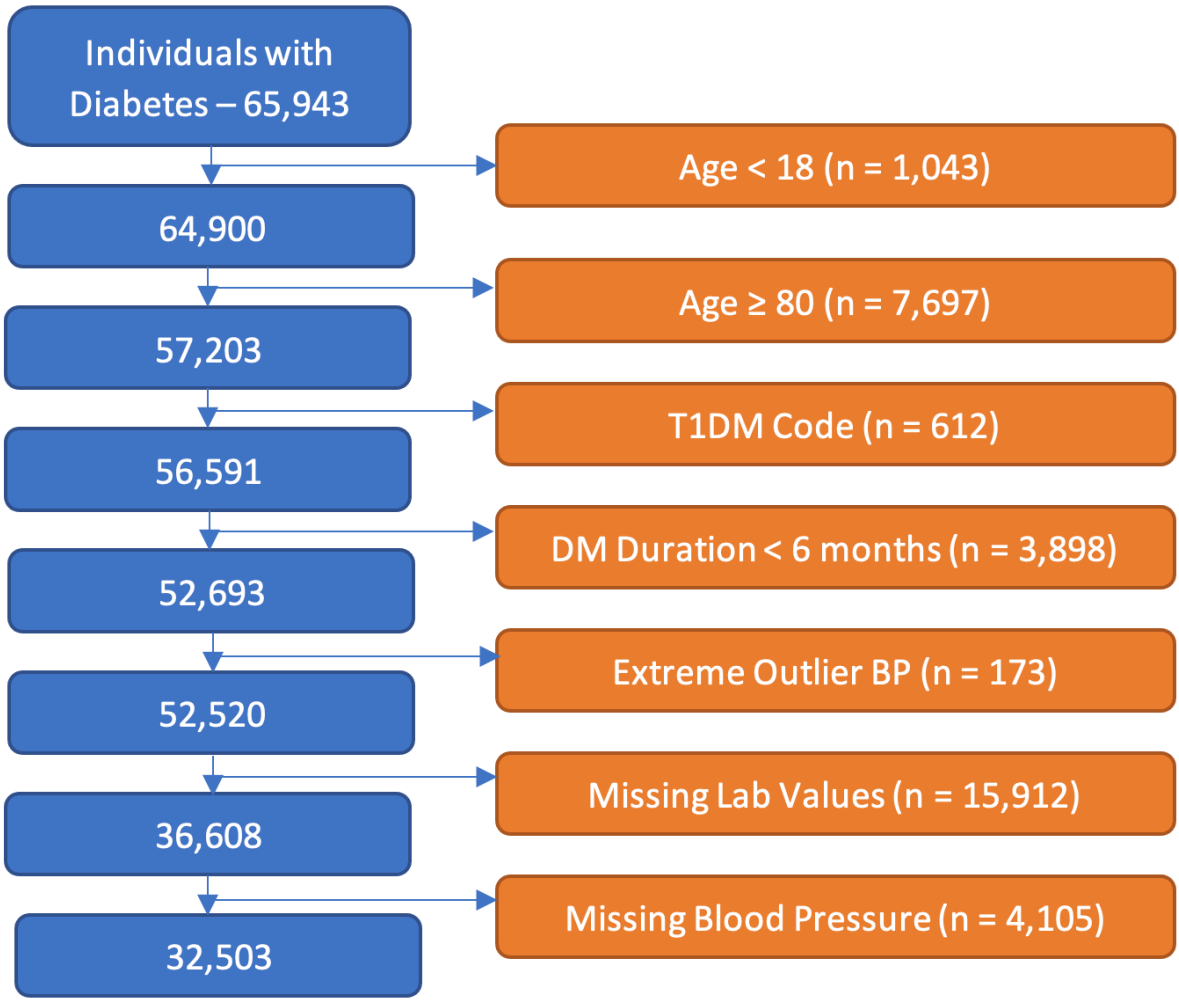
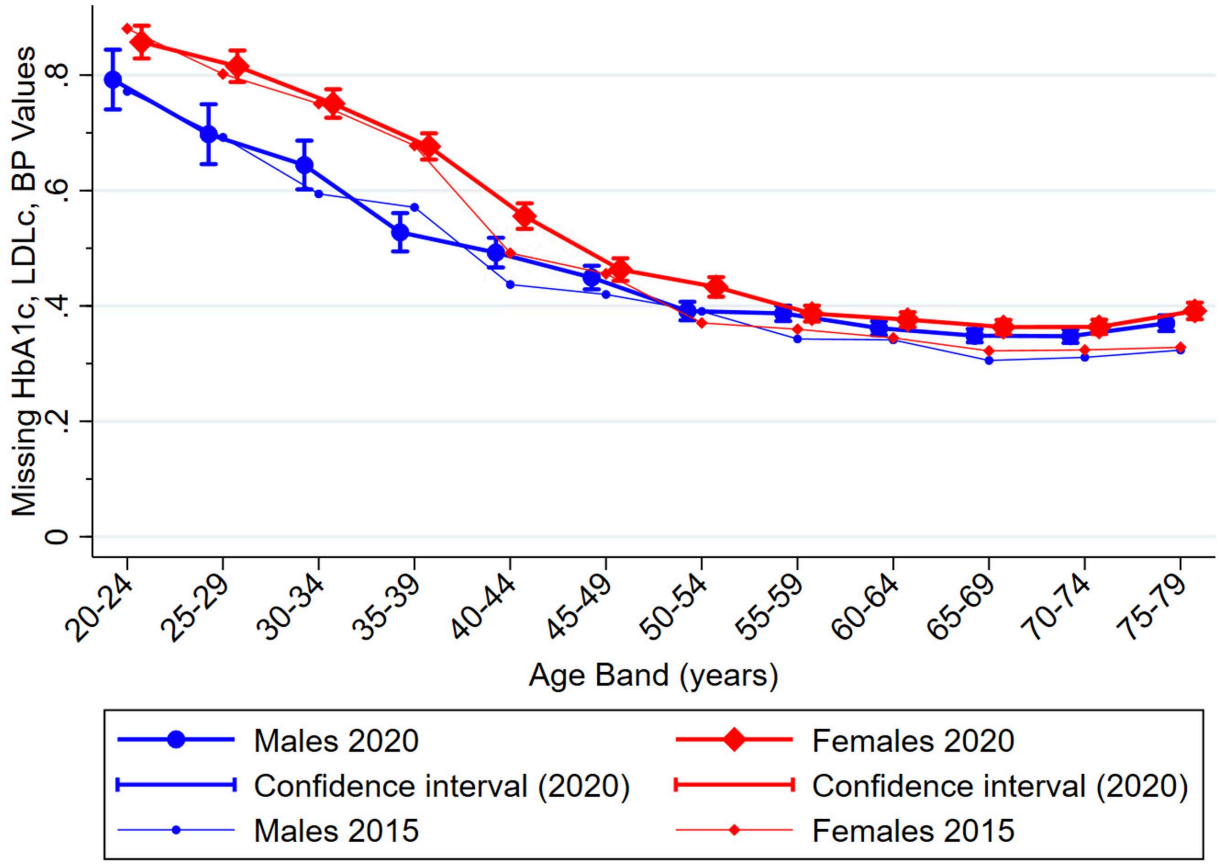


Figure S2: Frequency of Missing Measurements by Age and Sex – 2020 vs 2015



Missing measurements defined as no measurement within the previous two years on one or more of HbA1c, BP, LDLc, or serum creatinine. Unlike the similar-appearing Figure 2 in the main manuscript, this figure documents the frequency of an undesirable outcome.

Table S1: Frequency of Non-Missing Measurements by Age and Sex Groups – 2020 vs 2015

		Male				Female			
Variable	**Age**	**2015**	**2020**	**Difference**	**P-value**	**2015**	**2020**	**Difference**	**P-value**
Non-Missing Measurements	All	64.0%	61.2%	-2.8% (-2.0%, -3.5%)	<0.001	59.7%	56.2%	-3.5% (-2.7%, -4.3%)	<0.001
	<40	37.0%	37.2%	0.2% (-3.0%, 3.4%)	0.897	24.0%	24.8%	0.9% (-1.1%, 2.9%)	0.399
	40-64	63.0%	60.5%	-2.5% (-1.5%, -3.6%)	<0.001	61.6%	57.9%	-3.7% (-2.6%, -4.9%)	<0.001
	65-79	68.8%	64.6%	-4.2% (-3.1%, -5.3%)	<0.001	67.6%	62.9%	-4.7% (-3.5%, -5.9%)	<0.001

Missing measurements defined as no measurement within the previous two years on one or more of HbA1c, BP, LDLc, or serum creatinine. Unlike the similar-appearing Table 3 in the main manuscript, this table documents the frequency of an undesirable outcome.

Table S2: Comparison of Included Adults and Adults Excluded for Missing Measurements (2020)

Characteristics		Excluded – Missing Measurements	Included
Number (n)		31571	44930
Demographics (n(%) unless otherwise specified)			
Province	AB	7285 (23%)	9723 (22%)
	ON	15787 (50%)	27687 (62%)
	QC	1577 (5%)	816 (2%)
	NL	70 (0%)	222 (0%)
	MN	6852 (22%)	6482 (14%)
Age (mean(sd))		57.7 (14.7)	62.3 (11.2)
Sex	Male	14908 (47%)	23522 (52%)
	Female	16663 (53%)	21408 (48%)
Diabetes duration (mean(sd))		6.0 (4.9)	6.5 (5.3)
Current smoker		2111 (26%)	1807 (20%)
BMI (mean(sd))		32.3 (7.4)	32.3 (7.1)
Comorbidities (n(%))			
CAD		3032 (10%)	5613 (12%)
CHF		1468 (5%)	2223 (5%)
Stroke		1172 (4%)	1565 (3%)
PAD		112 (0%)	161 (0%)
Complications (n(%) unless otherwise specified)			
Neuropathy		1039 (3%)	1395 (3%)
Retinopathy		784 (2%)	1139 (3%)
Hypoglycemia		208 (1%)	233 (1%)
eGFR (mean(sd))		86.3 (45.9)[a]	83.2 (39.1)
Proteinurea	None	6328 (63%)	19449 (68%)
	MOD	2794 (28%)	7226 (25%)
	SEV	732 (7%)	1497 (5%)
	NEPH	177 (2%)	284 (1%)
Medications (n(%))			
AHA intensity	None	19302 (61%)	19547 (44%)
	Oral only	9310 (29%)	20523 (46%)
	Any insulin	2959 (9%)	4860 (11%)
GLP-1RA		1150 (4%)	2396 (5%)
SGLT2i		2617 (8%)	6757 (15%)
Metformin		8970 (28%)	20073 (45%)
Sulfonylurea		2817 (9%)	5566 (12%)
AGI		25 (0%)	34 (0%)
TZD		51 (0%)	62 (0%)
DPP4i		2805 (9%)	8016 (18%)

Meglitinide		226 (1%)	256 (1%)
Insulin	Basal only	1575 (5%)	2699 (6%)
	Prandial (any)	1384 (4%)	2161 (5%)
Utilization (mean (sd))			
Encounters (previous year)		7.2 (10.0)	9.1 (9.9)
Diabetes Clinical Parameters (mean (sd))			
HbA1c		7.2 (1.6)[b]	7.1 (1.4)
LDLc		2.3 (1.0)[c]	2.1 (1.0)
sBP		130.1 (16.3)[d]	130.6 (15.7)
dBP		77.2 (9.9)[e]	77.0 (9.6)

Missing measurements defined as completely missing data within the previous two years on one or more of HbA1c, BP, LDLc, or serum creatinine.

[a] Missing in 11,225. [b] Missing in 11,213. [c] Missing in 24,225. [d] Missing in 9,713. [e] Missing in 9,723.

See table legend (Table 2) in main text for abbreviations.

Table S3: Characteristics of Included Adults in 2015

Characteristics		Overall	M < 40	M 40-64	M 65-80	F < 40	F 40-64	F 65-80
Number (n)		32503	560	8841	7719	696	7831	6856
Demographics (n(%) unless otherwise specified)								
Province	AB	8787 (27%)	131 (23%)	2498 (28%)	2265 (29%)	145 (21%)	2013 (26%)	1735 (25%)
	ON	20401 (63%)	358 (64%)	5332 (60%)	4768 (62%)	441 (63%)	4971 (63%)	4531 (66%)
	QC	72 (0%)	1 (0%)	22 (0%)	16 (0%)	0 (0%)	17 (0%)	16 (0%)
	NL	186 (1%)	10 (2%)	45 (1%)	39 (1%)	1 (0%)	55 (1%)	36 (1%)
	MN	3057 (9%)	60 (11%)	944 (11%)	631 (8%)	109 (16%)	775 (10%)	538 (8%)
Age (mean(sd))		61.5 (11.1)	33.0 (5.4)	55.4 (6.3)	71.1 (4.1)	32.9 (5.1)	55.2 (6.4)	71.3 (4.2)
Sex	Male	17120 (53%)	560 (100%)	8841 (100%)	7719 (100%)	0 (0%)	0 (0%)	0 (0%)
	Female	15383 (47%)	0 (0%)	0 (0%)	0 (0%)	696 (100%)	7831 (100%)	6856 (100%)
Diabetes duration (mean(sd))		3.8 (4.8)	3.0 (2.3)	3.6 (3.6)	4.3 (6.3)	3.1 (2.8)	3.7 (4.5)	4.0 (4.6)
Current smoker		1326 (22%)	23 (23%)	430 (28%)	235 (17%)	48 (32%)	417 (27%)	173 (14%)
BMI (mean(sd))		32.2 (7.3)	33.0 (8.7)	32.4 (6.9)	30.9 (5.9)	35.0 (8.9)	33.7 (8.3)	31.4 (7.1)
Comorbidities (n(%))								
CAD		3440 (11%)	10 (2%)	906 (10%)	1485 (19%)	5 (1%)	370 (5%)	664 (10%)
CHF		1489 (5%)	4 (1%)	298 (3%)	580 (8%)	6 (1%)	198 (3%)	403 (6%)
Stroke		925 (3%)	8 (1%)	186 (2%)	339 (4%)	12 (2%)	149 (2%)	231 (3%)
PAD		123 (0%)	0 (0%)	27 (0%)	66 (1%)	0 (0%)	13 (0%)	17 (0%)
Complications (n(%) unless otherwise specified)								
Neuropathy		711 (2%)	8 (1%)	167 (2%)	166 (2%)	13 (2%)	214 (3%)	143 (2%)
Retinopathy		629 (2%)	7 (1%)	123 (1%)	216 (3%)	6 (1%)	98 (1%)	179 (3%)
Hypoglycemia		180 (1%)	2 (0%)	69 (1%)	31 (0%)	3 (0%)	48 (1%)	27 (0%)
eGFR (mean(sd))		82.1 (27.2)	104.6 (43.3)	88.4 (25.9)	74.7 (23.4)	104.0 (35.8)	87.5 (26.5)	72.2 (24.9)
Proteinurea	None	14586 (70%)	246 (76%)	4161 (70%)	3372 (64%)	259 (71%)	3485 (75%)	3063 (71%)
	MOD	4995 (24%)	65 (20%)	1404 (24%)	1499 (29%)	87 (24%)	914 (20%)	1026 (24%)
	SEV	1067 (5%)	11 (3%)	328 (5%)	330 (6%)	17 (5%)	207 (4%)	174 (4%)
	NEPH	204 (1%)	3 (1%)	74 (1%)	56 (1%)	4 (1%)	34 (1%)	33 (1%)
Medications (n(%))								
GLP-1RA		470 (1%)	6 (1%)	147 (2%)	61 (1%)	20 (3%)	189 (2%)	47 (1%)
SGLT2i		799 (2%)	8 (1%)	305 (3%)	126 (2%)	15 (2%)	244 (3%)	101 (1%)
Metformin		14878 (46%)	217 (39%)	4368 (49%)	3570 (46%)	258 (37%)	3490 (45%)	2975 (43%)
Sulfonylurea		5514 (17%)	85 (15%)	1655 (19%)	1431 (19%)	74 (11%)	1212 (15%)	1057 (15%)
AGI		73 (0%)	0 (0%)	18 (0%)	22 (0%)	0 (0%)	11 (0%)	22 (0%)
TZD		258 (1%)	2 (0%)	69 (1%)	96 (1%)	2 (0%)	37 (0%)	52 (1%)
DPP4i		4722 (15%)	58 (10%)	1462 (17%)	1141 (15%)	58 (8%)	1084 (14%)	919 (13%)
Meglitinide		477 (1%)	2 (0%)	129 (1%)	134 (2%)	6 (1%)	110 (1%)	96 (1%)
Insulin	Basal only	1962 (6%)	27 (5%)	624 (7%)	442 (6%)	42 (6%)	488 (6%)	339 (5%)
	Prandial (any)	2165 (7%)	65 (12%)	586 (7%)	479 (6%)	80 (11%)	570 (7%)	385 (6%)
Utilization (mean (sd))								
Encounters (previous year)		9.6 (9.7)	8.4 (17.6)	8.4 (8.7)	9.6 (9.2)	10.0 (9.2)	10.2 (10.1)	10.5 (9.7)
Diabetes Clinical Parameters (mean (sd))								

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HbA1c	7.1 (1.4)	7.6 (1.8)	7.3 (1.5)	7.0 (1.2)	7.3 (1.8)	7.2 (1.6)	6.9 (1.1)
LDLc	2.2 (0.9)	2.5 (0.9)	2.2 (0.9)	1.9 (0.8)	2.5 (0.8)	2.4 (0.9)	2.2 (0.9)
sBP	129.0 (16.1)	125.2 (14.1)	129.1 (15.6)	129.8 (16.1)	121.3 (14.8)	127.2 (15.7)	131.0 (16.8)
dBP	76.0 (9.8)	79.0 (9.7)	78.8 (9.5)	73.7 (9.6)	77.6 (10.0)	77.2 (9.5)	73.2 (9.6)

Table S4: Crude(-ish) Age and Sex Group Odds Ratios for Target Achievement

Target	Age	Adjusted Odds Ratio (aOR) of target achievement		
		Females	Males	Period Effect
HbA1c	<40	1.06 (0.95, 1.17), p = 0.298	0.62 (0.55, 0.69), p < 0.001	0.98 (0.95, 1.00), p = 0.061
	40-64	0.98 (0.93, 1.02), p = 0.265	0.80 (0.77, 0.83), p < 0.001	
	65-79	1.20 (1.14, 1.25), p < 0.001	REF	
BP	<40	1.29 (1.17, 1.42), p < 0.001	0.89 (0.79, 1.00), p = 0.043	0.84 (0.82, 0.86), p < 0.001
	40-64	1.01 (0.96, 1.05), p = 0.784	0.80 (0.77, 0.83), p < 0.001	
	65-79	0.94 (0.90, 0.99), p = 0.009	REF	
LDLc	<40	0.19 (0.17, 0.21), p < 0.001	0.24 (0.21, 0.27), p < 0.001	1.24 (1.21, 1.28), p < 0.001
	40-64	0.31 (0.29, 0.32), p < 0.001	0.51 (0.48, 0.53), p < 0.001	
	65-79	0.57 (0.55, 0.60), p < 0.001	REF	
All 3 clinical targets	<40	0.42 (0.36, 0.49), p < 0.001	0.30 (0.25, 0.37), p < 0.001	1.03 (0.99, 1.07), p = 0.167
	40-64	0.47 (0.44, 0.49), p < 0.001	0.57 (0.54, 0.60), p < 0.001	
	65-79	0.76 (0.71, 0.80), p < 0.001	REF	
Statin use	<40	0.09 (0.07, 0.11), p < 0.001	0.21 (0.17, 0.24), p < 0.001	0.99 (0.97, 1.02), p = 0.684
	40-64	0.48 (0.46, 0.50), p < 0.001	0.72 (0.69, 0.75), p < 0.001	
	65-79	0.82 (0.79, 0.86), p < 0.001	REF	
ACEi/ARB use	<40	0.16 (0.14, 0.18), p < 0.001	0.32 (0.28, 0.38), p < 0.001	0.97 (0.94, 0.99), p = 0.007
	40-64	0.58 (0.55, 0.60), p < 0.001	0.76 (0.73, 0.80), p < 0.001	
	65-79	0.93 (0.89, 0.97), p = 0.001	REF	

These odds ratios are produced by logistic regression models contain dummy variables for age and sex groups and the period (2020 vs 2015 [REF]) main effect only, without the period*age interaction.