

## Appendix

### Appendix 1. Description of baseline characteristics described for Cohort 1 and 2.

Baseline characteristics included sociodemographic and socioeconomic factors: sex, age (45-60, 61-70 and 71-85 years), immigration status (yes/no), ethnic/racial background (White, Black, South Asian, Chinese and Other), marital status (widowed, divorced or separated), language most spoken at home (French, English and other), household income (Can\$, <20,000; 20,000-50,000; 50,000-100,000 and >100,000), employment status (employed, unemployed and completely or partly retired), education (post-secondary, secondary, <secondary), province (Ontario, British Columbia, Quebec, and other provinces [Alberta, Manitoba, Nova Scotia, Prince Edward Island, Newfoundland and Labrador, Saskatchewan]), and place of residence (urban or rural based on postal code areas with rural having <10,000 people) (1, 2); common medical conditions: living with pain, history of cancer, arthritis, bowel disorders (Crohn's disease, ulcerative colitis or irritable bowel syndrome), myocardial infarction, heart disease, and hypertension; perceived health ("poor", "fair", "good", "very good" or "excellent"), sleep satisfaction (satisfied/very satisfied, neutral, dissatisfied/very dissatisfied); personal health choices: alcohol consumption (no, occasional or regular) in the past year, smoking status (current, former and never); anthropomorphic measurements: World Health Organization (WHO) classification for adults aged  $\geq 18$  years of body mass index (BMI) (3) and of waist circumference (WC) risk status (high risk, men:  $\geq 102$  cm women:  $\geq 88$ cm) (4); Nutritional risk scored using AB SCREEN<sup>TM</sup> II (high and low risk) (5); and weight change ("Compared with 6 months ago, have you gained weight, lost weight, or stayed about the same?"); laboratory test results: vitamin D deficiency (<30 nmol/L), iron deficiency (Ferritin  $\geq 30$   $\mu$ g/L), high triglycerides ( $\geq 1.7$  mmol/L), high low density lipoprotein (LDL,  $\geq 5$  mmol/L), high non high density lipoprotein (nHDL,  $\geq 4.3$  nmol/L); DEXA-measured [total lean mass (without bone, kg/m<sup>2</sup>) and total fat mass (kg/m<sup>2</sup>)].

**Table 1: Baseline characteristics of Cohort 1 study individuals with and without baseline diabetes by immigration status**

	Immigrant (N=3,766)			Non-immigrant (N=16,957)		
	Diabetes ( N= 616) N (%)	No Diabetes ( N= 3,150) N (%)	OR (95% CI)* (N= 3,766)	Diabetes ( N= 2,639) N (%)	No Diabetes ( N= 14,318) N (%)	OR (95% CI)* * (N= 16,957)
Age, years						
45-60	141 (22.9)	1,173 (37.2)	1	893 (33.8)	7,050 (49.2)	1
61-70	236 (38.3)	1,050 (33.3)	1.30 (0.88 - 1.92)	969 (36.7)	4,224 (29.5)	1.06 (0.91 -1.25)
71-85	239 (38.8)	927 (29.4)	1.24 (0.79 - 1.96)	777 (29.4)	3,044 (21.3)	0.91 (0.75 - 1.11)
Sex						
Male	408 (66.2)	1,743 (55.3)	1	1,551 (58.8)	7,167 (50.1)	1
Female	208 (33.8)	1,407 (44.7)	0.70 (0.53 - 0.92)	1,088 (41.2)	7,151 (49.9)	0.74 (0.65 - 0.84)
Marital status						
Single	27 (4.4)	149 (4.7)		234 (8.9)	1,176 (8.2)	
Married	455 (73.9)	2,405 (76.3)	-	1,834 (69.5)	10,407 (72.7)	-
Widowed/divorced/separated	134 (21.8)	595 (18.9)	-	571 (21.6)	2,731 (19.1)	-
Language most spoken at home						
French	31 (5.0)	205 (6.5)		541 (20.5)	3,171 (22.1)	
English	492 (79.9)	2,597 (82.4)	-	2,092 (79.3)	11,114 (77.6)	-
Other	55 (8.9)	254 (8.1)		3 (0.1)	17 (0.1)	
Years since arrival to Canada						
<20	42 (3.4)	396 (12.6)	-	-	-	-
20-40	162 (26.2)	781 (20.7)	-	-	-	-
>40	412 (66.9)	1,973 (61.6)	-	-	-	-

Appendix 1, as supplied by the authors. Appendix to: Farid D, Li P, Da Costa D, et al. Depression, diabetes and immigration status: a retrospective cohort study using the Canadian Longitudinal Study on Aging. *CMAJ Open* 2022. DOI:10.9778/cmajo.20210019. Copyright © 2022 The Author(s) or their employer(s). To receive this resource in an accessible format, please contact us at [cmajgroup@cmaj.ca](mailto:cmajgroup@cmaj.ca).

Ethnic/racial background						
White	464 (75.3)	2,640 (83.8)	1	2,596 (98.4)	14,166 (98.9)	
Black	36 (5.8)	89 (2.8)	1.82 (0.91 - 3.62)	8 (0.3)	19 (0.1)	-
South Asian	50 (8.1)	122 (3.9)	2.31 (1.33 - 4.03)	0 (0.0)	6 (0.0)	-
Chinese	24 (3.9)	107 (3.4)	1.53 (0.82 - 2.84)	8 (0.3)	37 (0.3)	-
Other	42 (6.8)	188 (6.0)	1.22 (0.69 - 2.17)	25 (0.9)	80 (0.6)	-
Total household income (CAD\$)						
<20,000	29 (4.7)	82 (2.6)		140 (5.3)	432 (3.0)	1
20,000-50,000	141 (22.9)	589 (18.7)	-	641 (24.3)	2,435 (17.0)	0.94 (0.69 - 1.29)
50,000-100,000	245 (39.8)	1,076 (34.2)	-	927 (35.1)	4,786 (33.4)	0.75 (0.55 - 1.02)
>100,000	163 (26.5)	1,180 (37.5)	-	779 (29.5)	5,855 (40.9)	0.65 (0.47 - 0.89)
Working status						
Employed	158 (25.6)	1,333 (42.3)	1	826 (31.3)	6,368 (44.5)	1
Unemployed	29 (4.7)	111 (3.5)	2.65 (1.38 - 5.09)	72 (2.7)	468 (3.3)	0.76 (0.52 - 1.10)
Retired	429 (69.6)	1,699 (53.9)	1.45 (1.01 - 2.09)	1,732 (65.6)	7,453 (52.1)	1.17 (1.00 - 1.37)
Education level						
< Secondary school	20 (3.2)	77 (2.4)		188 (7.1)	590 (4.1)	
Secondary school	51 (8.3)	195 (6.2)	-	316 (12.0)	1,275 (8.9)	-
Post-secondary degree/diploma	541 (87.8)	2,870 (91.1)	-	2,134 (80.9)	12,436 (86.9)	-
Place of residence***						
Rural	58 (9.4)	310 (9.8)		365 (13.8)	1,849 (12.9)	1
Urban	551 (89.4)	2,799 (88.9)	-	2,239 (84.8)	12,303 (85.9)	0.75 (0.63 - 0.90)
Province						
Quebec	65 (10.6)	365 (11.6)	1	536 (20.3)	3,199 (22.3)	1
British Columbia	189 (30.7)	996 (31.6)	1.24 (0.78 - 1.97)	538 (20.4)	2,736 (19.1)	1.81 (1.48 - 2.21)
Ontario	169 (27.4)	869 (27.6)	0.80 (0.50 - 1.29)	551 (20.9)	2,920 (20.4)	1.34 (1.10 - 1.62)
Other****	193 (31.3)	920 (29.2)	0.84 (0.52 - 1.34)	1,014 (38.4)	5,463 (38.2)	1.21 (1.02 - 1.44)
Perceived health						
Poor	13 (2.1)	16 (0.5)		31 (1.2)	39 (0.3)	
Fair	54 (8.8)	106 (3.4)	-	264 (10.0)	518 (3.6)	-

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Good	253 (41.1)	806 (25.6)	-	1,075 (40.7)	3,321 (23.2)	-
Very good	211 (34.3)	1,384 (43.9)	-	972 (36.8)	6,708 (46.9)	-
Excellent	84 (13.6)	836 (26.5)	-	295 (11.2)	3,724 (26.0)	-
Medical conditions						
Living with pain	226 (36.7)	944 (30.0)	-	1,055 (40.0)	4,260 (29.8)	1.20 (1.06 - 1.37)
Bowel disorders	41 (6.7)	227 (7.2)	-	224 (8.5)	1,135 (7.9)	-
Arthritis	16 (2.6)	83 (2.6)	-	109 (4.1)	355 (2.5)	-
Heart disease	370 (60.1)	1,007 (32.0)	1.93 (1.39 - 2.67)	1,552 (58.8)	4,353 (30.4)	1.85 (1.59 - 2.14)
Kidney disease	36 (5.8)	66 (2.1)	-	111 (4.2)	292 (2.0)	-
Stroke	11 (1.8)	36 (1.1)	-	65 (2.5)	157 (1.1)	-
Cancer	95 (15.4)	475 (15.1)	-	465 (17.6)	2,005 (14.0)	-
Hypertension	355 (57.6)	1,081 (34.3)	1.56 (1.13 - 2.15)	1,530 (58.0)	4,851 (33.9)	1.96 (1.68 - 2.28)
Anxiety disorder	17 (2.8)	109 (3.5)	-	137 (5.2)	606 (4.2)	-
Alcohol consumption						
Never	92 (14.9)	309 (9.8)	1	340 (12.9)	1,209 (8.4)	1
About once a month	141 (22.9)	514 (16.3)	0.93 ( 0.62 - 1.38)	608 (23.0)	2,255 (15.7)	0.98 (0.79 - 1.23)
2-4 times a month	115 (18.7)	576 (18.3)	0.66 (0.42 - 1.05)	588 (22.3)	3,160 (22.1)	0.77 (0.62 - 0.95)
>2 times a week	239 (38.8)	1,641 (52.1)	0.52 (0.35 - 0.77)	1,031 (39.1)	7,433 (51.9)	0.60 (0.49 - 0.73)
Smoking status						
Non smoker	297 (48.2)	1,691 (53.7)		1,088 (41.2)	7,184 (50.2)	
Former smoker	275 (44.6)	1,291 (41.0)	-	1,348 (51.1)	6,029 (42.1)	-
Smoker	44 (7.1)	168 (5.3)	-	203 (7.7)	1,105 (7.7)	-
Sleep quality						
Satisfied or very satisfied	373 (60.6)	2,014 (63.9)		1,615 (61.2)	9,114 (63.7)	
Neutral	116 (18.8)	513 (16.3)	-	388 (14.7)	2,158 (15.1)	-
Dissatisfied or very dissatisfied	127 (20.6)	617 (19.6)	-	635 (24.1)	3,038 (21.2)	-
Nutritional risk status						
Low risk	394 (64.0)	2,256 (71.6)		1,577 (59.8)	10,128 (70.7)	1
High risk	201 (32.6)	796 (25.3)	-	1,008 (38.2)	3,919 (27.4)	1.20 (1.04 - 1.38)
Waist circumference risk status						

Low risk	263 (42.7)	2,128 (67.6)	1	908 (34.4)	8,966 (62.6)	1
High risk	353 (57.3)	1,022 (32.4)	1.66 (1.18 - 2.34)	1,731 (65.6)	5,352 (37.4)	2.19 (1.92 - 2.50)
Weight classification †						
Normal weight	112 (18.2)	1,193 (37.9)	1	383 (14.5)	4,827 (33.7)	
Overweight	248 (40.3)	1,312 (41.7)	1.50 (1.04 – 2.16)	967 (36.6)	6,086 (42.5)	-
Obese	253 (41.1)	638 (20.3)	2.10 (1.33 - 3.32)	1,277 (48.4)	3,365 (23.5)	-
Weight change ‡						
Same weight	401 (65.1)	2,152 (68.3)		1,574 (59.6)	9,693 (67.7)	1
Gained weight	69 (11.2)	447 (14.2)	-	385 (14.6)	2,012 (14.1)	1.18 (0.98 - 1.41)
Lost weight	132 (21.4)	494 (15.7)	-	646 (24.5)	2,439 (17.0)	1.32 (1.13 - 1.55)
Laboratory tests						
Vitamin D deficiency						
≥ 30 nmol/L	522 (84.7)	2,719 (86.3)		2,314 (87.7)	12,807 (89.4)	1
<30 nmol/L	30 (4.9)	91 (2.9)	-	81 (3.1)	247 (1.7)	1.55 (1.08 – 1.22)
Iron deficiency						
No	492 (79.9)	2,607 (82.8)		2,180 (82.6)	11,978 (83.7)	
Yes	46 (7.5)	159 (5.0)	-	147 (5.6)	878 (6.1)	-
Triglycerides						
<1.7 mmol/L	281 (45.6)	1,808 (57.4)	1	1,107 (41.9)	8,090 (56.5)	1
≥1.7 mmol/L	271 (44.0)	1,004 (31.9)	1.55 (1.17 - 2.04)	1,288 (48.8)	4,965 (34.7)	1.52 (1.34 - 1.73)
Low density lipoprotein						
<5 mmol/L	518 (84.1)	2,715 (86.2)		2,271 (86.1)	12,621 (88.1)	
≥5 mmol/L	8 (1.3)	61 (1.9)	-	16 (0.6)	219 (1.5)	-
Non high density lipoprotein						
< 4.3 nmol/L	448 (72.7)	2,026 (64.3)	1	1,891 (71.7)	9,529 (66.6)	1
≥ 4.3 nmol/L	78 (12.7)	750 (23.8)	0.49 (0.35 - 0.69)	396 (15.0)	3,311 (23.1)	0.61 (0.52 - 0.72)
	Mean (SD)			Mean (SD)		
Total lean mass (kg/m <sup>2</sup> )	18.7 (2.7)	17.3 (2.6)	-	18.9 (2.9)	17.7 (2.8)	-
Total fat mass (kg/m <sup>2</sup> )	10.2 (3.7)	8.7 (3.1)	-	11.0 (4.0)	9.3 (3.5)	-

SD=Standard Deviation

Diabetes at baseline was assessed with Hb1Ac  $\geq 7\%$  and/or a positive answer to “Has a doctor ever told you that you have diabetes, borderline diabetes or that your blood sugar is higher?”

\* Odds ratio derived from a multivariable logistic regression model comparing baseline characteristics of immigrant with diabetes versus immigrants without diabetes.

\*\* Odds ratio derived from a multivariable logistic regression model comparing baseline characteristics of non-immigrant with diabetes versus non-immigrants without diabetes.

\*\*\* The place of residence classification (urban or rural) was derived by CLSA based on Statistics Canada's Postal Code Conversion File where rural areas were those with a total population of less than 10,000.

\*\*\*\*Other provinces are Alberta, Manitoba, Nova Scotia, Prince Edward Island, Labrador and Saskatchewan

† Based on Body Mass Index international classification for adults  $\geq 18$  years of age.

‡ Weight change was defined by the question "Compared with 6 months ago, have you gained weight, lost weight, or stayed about the same?"

**Table 2: Sensitivity analysis of the association between baseline self-reported diabetes and depression at three years: Multivariable logistic regression models**

	Cohort 1: Depression incidence N=20,695
	Adjusted OR (95% CI)
Diabetes* (Yes vs. no)	1.26 (1.09 - 1.46)
<b>Interaction effect of immigrant status and diabetes at baseline</b>	
Immigrant with diabetes versus immigrant without diabetes	1.14 (0.82 - 1.60)
Immigrant with diabetes versus non-immigrant with diabetes	1.03 (0.74 - 1.44)
Immigrant without diabetes versus non-immigrant without diabetes	1.16 (0.98 - 1.36)
Non-immigrant with diabetes versus non-immigrant without diabetes	1.28 (1.09 - 1.51)
Sex	
Male	1
Female	1.65 (1.47 - 1.85)
Age, years,	
45 - 60	1
61 - 70	0.94 (0.82 - 1.07)
71 - 85	1.30 (1.13 - 1.48)

Province	
Quebec	1
British Columbia	0.68 (0.58 - 0.81)
Ontario	0.65 (0.55 - 0.77)
Other	0.78 (0.67 – 0.90)
Medical conditions (Yes vs. no)	
Living with pain	1.54 (1.56 – 1.97)
Bowel disorders	1.75 (1.56 – 1.97)
Smoking status	
Smoker	1
Former smoker	0.51 (0.42 - 0.62)
Non-smoker	0.46 (0.38 - 0.55)
Weight change †	
Same weight	1
Gained weight	1.31 (1.12 - 1.52)
Lost weight	1.30 (1.12 - 1.51)
Sleep quality	
Satisfied or very satisfied	1
Neutral	1.28 (1.10 - 1.50)
Dissatisfied or very dissatisfied	1.86 (1.63 – 2.11)

OR=Odds Ratio; CI=Confidence Interval;

\* The model adjusted for all the variables included in Table 1. Sex, age and immigration status were forced in the model. The variables that were not significant (p-value > 0.5), which inclusion did not affect the Bayesian Information Criterion and did not modify the effect of the main exposure variable by more than 10% were removed. Diabetes at baseline is assessed with a positive answer to “Has a doctor ever told you that you have diabetes, borderline diabetes or that your blood sugar is higher?” At 3-year follow-up, depression is defined using CES-D-10 score  $\geq 10$  or currently taking medication for depression for cohort1.

† Weight change is defined by the question "Compared with 6 months ago, have you gained weight, lost weight, or stayed about the same?"

**Table 3: Association between baseline diabetes and three-year depression incidence (Cohort 1) and between baseline depression and three-year diabetes incidence (Cohort 2)\*: Multivariable logistic regression models**

	Cohort 1: Depression incidence N=20,723	Cohort 2: Diabetes incidence N=22,041
	Adjusted OR (95% CI)	
Diabetes* (Yes vs. no)	1.18 (1.01 - 1.37)	NA
Depression* (Yes vs. no)	NA	1.43 (1.21 - 1.68)
<b>Interaction effect of immigrant status and diabetes at baseline</b>		
Immigrant with Diabetes versus immigrant with No Diabetes	1.12 (0.80 - 1.56)	-
Immigrant with Diabetes versus non-immigrant with Diabetes	1.01 (0.72 - 1.41)	-
Immigrant with No Diabetes versus non-immigrant with No Diabetes	1.15 (0.98 - 1.35)	-
Non-immigrant with Diabetes versus non-immigrant with No Diabetes	1.27 (1.08 - 1.49)	-
<b>Interaction effect of immigrant status and depression at baseline</b>		
Immigrant with Depression versus immigrant with No Depression	-	1.60 (1.08 - 2.37)
Immigrant with Depression versus non-immigrant with Depression	-	1.10 (0.76 - 1.58)
Immigrant with No Depression versus non-immigrant with No Depression	-	0.96 (0.76 - 1.21)
Non-immigrant with Depression versus non-immigrant with No Depression	-	1.39 (1.16 - 1.68)
Sex		
Male	1	1
Female	1.55 (1.38 - 1.75)	0.81 (0.70 - 0.94)
Age, years,		
45 - 60	1	1
61 - 70	0.86 (0.75 - 0.98)	0.93 (0.79 - 1.10)
71 - 85	1.08 (0.93 - 1.26)	0.76 (0.62 - 0.94)
Province		
Quebec	1	1
British Columbia	0.75 (0.63 - 0.90)	1.09 (0.88 - 1.37)
Ontario	0.73 (0.61 - 0.87)	0.85 (0.68 - 1.05)
Other	0.86 (0.74 - 1.01)	0.68 (0.56 - 0.84)
Medical conditions (Yes vs. no)		
Hypertension	-	1.34 (1.12 - 1.60)
Living with pain	1.74 (1.54 - 1.96)	-
Heart disease	-	1.40 (1.17 - 1.68)

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Smoking status		
Smoker	1	
Former smoker	0.53 (0.44 - 0.65)	-
Non-smoker	0.49 (0.40 - 0.60)	-
Waist circumference risk (Yes vs. no)	-	2.50 (2.13 - 2.92)
Weight change†		
Same weight	1	1
Gained weight	1.30 (1.11 - 1.53)	1.22 (1.01 - 1.49)
Lost weight	1.30 (1.12 - 1.51)	1.34 (1.11 - 1.61)
Sleep quality		
Satisfied or very satisfied	1	
Neutral	1.31 (1.11 - 1.54)	-
Dissatisfied or very dissatisfied	1.90 (1.66 - 2.18)	-

OR=Odds Ratio; CI=Confidence Interval;

\* The model included all the variables listed in Table 1. Sex, age and immigration status were forced in the model. The variables that were not significant ( $p$ -value  $> 0.5$ ), which inclusion did not affect the Bayesian Information Criterion and did not modify the effect of the main exposure variable by more than 10% were removed. Depression was assessed with Center for Epidemiological Studies Depression 10 Scale, CESD  $\geq 10$  and/or currently undergoing treatment for depression. Diabetes at baseline was assessed with Hb1Ac  $\geq 7\%$  and/or positive answer to “Has a doctor ever told you that you have diabetes, borderline diabetes or that your blood sugar is higher?” At 3-year follow-up, depression was defined using CES-D-10 score  $\geq 10$  and/or currently taking medication for depression for Cohort 1. For Cohort 2, 3-year incident diabetes is defined using self-reported diabetes diagnosis.

† Weight change was defined by the question "Compared with 6 months ago, have you gained weight, lost weight, or stayed about the same?"

**Table 4: Baseline characteristics of Cohort 2 study individuals with and without depression by immigration status**

	Immigrant (N=3,913)			Non-immigrant (N=18,141)		
	Depression ( N= 762) N (%)	No Depression ( N= 3,151) N (%)	OR (95% CI)* (N= 3,913)	Depression ( N= 3,797) N (%)	No Depression ( N= 14,344) N (%)	OR (95% CI)** (N= 18,141)
Age, y						
45-60	325 (42.7)	1,173 (37.2)	1	1,941 (51.1)	7,053 (49.2)	1
61-70	235 (30.8)	1,048 (33.3)	0.62 (0.46 – 0.84)	1,087 (28.6)	4,228 (29.5)	0.79 (0.70 - 0.90)
71-85	202 (26.5)	930 (29.5)	0.46 (0.32 - 0.66)	769 (20.3)	3,063 (21.4)	0.63 (0.54 - 0.74)
Sex						
Male	266 (34.9)	1,741 (55.3)	1	1,351 (35.6)	7,175 (50.0)	1
Female	496 (65.1)	1,410 (44.7)	1.87 (1.50 - 2.33)	2,446 (64.4)	7,169 (50.0)	1.53 (1.39 - 1.69)
Marital status						
Single	68 (8.9)	149 (4.7)	1	485 (12.8)	1,178 (8.2)	1
Married	465 (61.0)	2,403 (76.3)	0.60 (0.41 - 0.88)	2,223 (58.5)	10,417 (72.6)	0.81 (0.69 - 0.95)
Widowed/divorced/separated	227 (29.8)	598 (19.0)	0.79 (0.52 - 1.18)	1,088 (28.7)	2,745 (19.1)	1.01 (0.86 - 1.19)
Language most spoken at home						
French	65 (8.5)	205 (6.5)		925 (24.4)	3,174 (22.1)	
English	597 (78.3)	2,598 (82.5)	-	2,861 (75.3)	11,137 (77.6)	-
Other	58 (7.6)	254 (8.1)		7 (0.2)	17 (0.1)	
Years since arrival to Canada						
<20	112 (14.7)	395 (12.5)	-	-	-	-
20-40	190 (24.9)	783 (24.8)	-	-	-	-
>40	460 (60.4)	1,973 (62.6)	-	-	-	-
Ethnic/racial background						
White	629 (82.5)	2,641 (83.8)		3,758 (99.0)	14,191 (98.9)	

Black	24 (3.1)	89 (2.8)	-	8 (0.2)	19 (0.1)	-
South Asian	36 (4.7)	122 (3.9)	-	2 (0.1)	6 (0.0)	-
Chinese	17 (2.2)	107 (3.4)	-	7 (0.2)	37 (0.3)	-
Other	53 (7.0)	188 (6.0)	-	20 (0.5)	81 (0.6)	-
Total household income (CAD\$)						
<20,000	57 (7.5)	82 (2.6)	1	332 (8.7)	436 (3.0)	1
20,000-50,000	208 (27.3)	591 (18.8)	0.59 (0.34 - 1.01)	923 (24.3)	2,443 (17.0)	0.74 (0.60 - 0.90)
50,000-100,000	246 (32.3)	1,075 (34.1)	0.45 (0.26 - 0.79)	1,217 (32.1)	4,794 (33.4)	0.60 (0.49 - 0.74)
>100,000	194 (25.5)	1,180 (37.4)	0.37 (0.21 - 0.66)	1,088 (28.7)	5,854 (40.8)	0.52 (0.41 - 0.65)
Working status						
Employed	297 (39.0)	1,332 (42.3)	1	1,510 (39.8)	6,373 (44.4)	1
Unemployed	71 (9.3)	111 (3.5)	2.22 (1.49 - 3.31)	313 (8.2)	468 (3.3)	1.83 (1.50 - 1.24)
Retired	393 (51.6)	1,701 (54.0)	1.26 (0.92 - 1.71)	1,964 (51.7)	7,474 (52.1)	1.10 (0.97 - 1.24)
Education level						
< Secondary school	30 (3.9)	76 (2.4)		260 (6.8)	595 (4.1)	
Secondary school	64 (8.4)	196 (6.2)	-	367 (9.7)	1,278 (8.9)	-
Post-secondary degree/diploma	664 (87.1)	2,871 (91.1)	-	3,166 (83.4)	12,454 (86.8)	-
Place of residence ***						
Rural	75 (9.8)	310 (9.8)		453 (11.9)	1,850 (12.9)	1
Urban	674 (88.5)	2,800 (88.9)	-	3,293 (86.7)	12,328 (85.9)	0.75 (0.63 - 0.90)
Province						
Quebec	111 (14.6)	365 (11.6)	1	922 (24.3)	3,204 (22.3)	1
British Columbia	227 (29.8)	995 (31.6)	0.84 (0.61 - 1.16)	665 (17.5)	2,735 (19.1)	0.90 (0.78 - 1.05)
Ontario	223 (29.3)	872 (27.7)	1.11 (0.80 - 1.54)	855 (22.5)	2,921 (20.4)	1.15 (1.00 - 1.31)
Other****	201 (26.4)	919 (29.2)	0.93 (0.67 - 1.30)	1,355 (35.7)	5,484 (38.2)	0.92 (0.81 - 1.04)
Perceived health						
Poor	25 (3.3)	16 (0.5)		125 (3.3)	39 (0.3)	
Fair	115 (15.1)	108 (3.4)	-	480 (12.6)	518 (3.6)	-
Good	280 (36.7)	807 (25.6)	-	1,389 (36.6)	3,331 (23.2)	-
Very good	251 (32.9)	1,383 (43.9)	-	1,371 (36.1)	6,714 (46.8)	-
Excellent	90 (11.8)	835 (26.5)	-	431 (11.4)	3,734 (26.0)	-

Medical conditions						
Living with pain	366 (48.0)	945 (30.0)	1.69 (1.37 - 2.08)	1,904 (50.1)	4,267 (29.7)	1.71 (1.55 - 1.88)
Bowel disorders	105 (13.8)	227 (7.2)	1.52 (1.07 - 2.17)	582 (15.3)	1,136 (7.9)	1.61 (1.40 - 1.85)
Arthritis	28 (3.7)	83 (2.6)	-	160 (4.2)	354 (2.5)	-
Stroke	15 (2.0)	37 (1.2)	-	67 (1.8)	157 (1.1)	-
Cancer	117 (15.4)	474 (15.0)	-	573 (15.1)	2,012 (14.0)	-
Hypertension	283 (37.1)	1,080 (34.3)	-	1,457 (38.4)	4,870 (34.0)	-
Anxiety disorder	119 (15.6)	109 (3.5)	-	919 (24.2)	611 (4.3)	-
Alcohol consumption						
Never	101 (13.3)	310 (9.8)		528 (13.9)	1,218 (8.5)	1
About once a month	171 (22.4)	512 (16.2)	-	756 (19.9)	2,259 (15.7)	0.71 (0.60 - 0.84)
2-4 times a month	150 (19.7)	574 (18.2)	-	827 (21.8)	3,166 (22.1)	0.71 (0.60 - 0.83)
>2 times a week	310 (40.7)	1,645 (52.2)	-	1,625 (42.8)	7,436 (51.8)	0.67 (0.58 - 0.78)
Smoking status						
Non smoker	377 (49.5)	1,690 (53.6)		1,644 (43.3)	7,200 (50.2)	
Former smoker	315 (41.3)	1,293 (41.0)	-	1,690 (44.5)	6,040 (42.1)	-
Smoker	70 (9.2)	168 (5.3)	-	463 (12.2)	1,104 (7.7)	-
Sleep quality						
Satisfied or very satisfied	339 (44.5)	2,014 (63.9)	1	1,692 (44.6)	9,133 (63.7)	1
Neutral	132 (17.3)	513 (16.3)	1.42 (1.06 - 1.89)	588 (15.5)	2,162 (15.1)	1.39 (1.22 - 1.59)
Dissatisfied or very dissatisfied	291 (38.2)	618 (19.6)	2.57 (2.04 - 3.24)	1,512 (39.8)	3,041 (21.2)	2.04 (1.84 - 2.26)
Nutritional risk status						
Low risk	381 (50.0)	2,256 (71.6)	1	1,772 (46.7)	10,147 (70.7)	1
High risk	356 (46.7)	797 (25.3)	1.74 (1.41 - 2.15)	1,941 (51.1)	3,924 (27.4)	2.07 (1.88 - 2.28)
Waist circumference risk status						
Low risk	475 (62.3)	2,129 (67.6)		2,030 (53.5)	8,983 (62.6)	1
High risk	287 (37.7)	1,022 (32.4)	-	1,767 (46.5)	5,361 (37.4)	1.09 (0.99 - 1.20)
Weight classification †						
Normal weight	264 (34.6)	1,194 (37.9)		1,205 (31.7)	4,838 (33.7)	
Overweight	310 (40.7)	1,313 (41.7)	-	1,423 (37.5)	6,094 (42.5)	-
Obese	184 (24.1)	637 (20.2)	-	1,144 (30.1)	3,372 (23.5)	-

Weight change ‡						
Same weight	442 (58.0)	2,150 (68.2)		2,204 (58.0)	9,707 (67.7)	
Gained weight	157 (20.6)	449 (14.2)	-	810 (21.3)	2,020 (14.1)	-
Lost weight	149 (19.6)	495 (15.7)	-	725 (19.1)	2,442 (17.0)	-
Laboratory tests						
Vitamin D deficiency						
≥ 30 nmol/L	633 (83.1)	2,721 (86.4)		3,309 (87.1)	12,827 (89.4)	-
<30 nmol/L	25 (3.3)	90 (2.9)	-	89 (2.3)	247 (1.7)	-
Triglycerides						
<1.7 mmol/L	402 (52.8)	1,807 (57.3)		1,951 (51.4)	8,101 (56.5)	
≥1.7 mmol/L	256 (33.6)	1,006 (31.9)	-	1,448 (38.1)	4,974 (34.7)	-
Low density lipoprotein						
<5 mmol/L	632 (82.9)	2,715 (86.2)		3,253 (85.7)	12,641 (88.1)	
≥5 mmol/L	17 (2.2)	62 (2.0)	-	75 (2.0)	219 (1.5)	-
Non high density lipoprotein						
< 4.3 nmol/L	474 (62.2)	2,026 (64.3)		2,377 (62.6)	9,550 (66.6)	
≥ 4.3 nmol/L	175 (23.0)	751 (23.8)	-	951 (25.0)	3,310 (23.1)	-
	Mean (SD)			Mean (SD)		
Total lean mass (kg/m <sup>2</sup> )	16.9 (2.8)	17.3 (2.6)	-	17.1 (2.9)	17.4 (2.8)	-
Total fat mass (kg/m <sup>2</sup> )	9.8 (3.6)	8.7 (3.1)	-	10.4 (4.0)	9.3 (3.5)	-

SD=Standard Deviation

Depression was assessed with Center for Epidemiological Studies Depression 10 Scale, CESD ≥ 10 and/or currently undergoing treatment for depression.

\* Odds ratio derived from a multivariable logistic regression model comparing baseline characteristics of immigrant with depression versus immigrants without depression.

\*\* Odds ratio derived from a multivariable logistic regression model comparing baseline characteristics of non-immigrant with depression versus non-immigrants without depression.

\*\*\* The place of residence classification (urban or rural) was derived by CLSA based on Statistics Canada's Postal Code Conversion File where rural areas were those with a total population of less than 10,000.

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\*\*\*\* Other provinces are Alberta, Manitoba, Nova Scotia, Prince Edward Island, Labrador and Saskatchewan

† Based on Body Mass Index international classification for adults  $\geq 18$  years of age.

‡ Weight change is defined by the question "Compared with 6 months ago, have you gained weight, lost weight, or stayed about the same?"

**Table 5: Sensitivity analysis of the association between baseline diabetes and depression at three years: missing baseline data were imputed using multiple imputation**

	Cohort 1: Depression incidence N=20,723
	Adjusted OR (95% CI)
Diabetes* (Yes vs. no)	1.22 (1.05 – 1.41)
Immigrant (Yes vs. no)	1.13 (0.97 – 1.30)
Sex	
Male	1
Female	1.65 (1.47 - 1.85)
Age, years,	
71 - 85	1
61 - 70	0.80 (0.70 - 0.92)
45 - 60	1.01 (0.86 - 1.17)
Province	
Quebec	1
British Columbia	0.68 (0.58 - 0.81)
Ontario	0.64 (0.54 - 0.76)
Other	0.78 (0.68 – 0.90)
Medical conditions (Yes vs. no)	
Living with pain	1.75 (1.96 – 1.56)
Bowel disorders	1.42 (1.19 – 1.68)
Smoking status	
Smoker	1
Former smoker	0.45 (0.38 - 0.55)
Non-smoker	0.50 (0.42 - 0.61)
Weight change †	
Same weight	1
Gained weight	1.33 (1.14 - 1.55)
Lost weight	1.31 (1.13 - 1.51)
Sleep quality	

Appendix 1, as supplied by the authors. Appendix to: Farid D, Li P, Da Costa D, et al. Depression, diabetes and immigration status: a retrospective cohort study using the Canadian Longitudinal Study on Aging. *CMAJ Open* 2022. DOI:10.9778/cmajo.20210019. Copyright © 2022 The Author(s) or their employer(s). To receive this resource in an accessible format, please contact us at [cmajgroup@cmaj.ca](mailto:cmajgroup@cmaj.ca).

Satisfied or very satisfied	1
Neutral	1.30 (1.12 - 1.52)
Dissatisfied or very dissatisfied	1.87 (1.65 - 2.13)

OR=Odds Ratio; CI=Confidence Interval;

\* The multiple imputation model adjusted for all the variables included in Table 1.

Diabetes at baseline is assessed with a positive answer to “Has a doctor ever told you that you have diabetes, borderline diabetes or that your blood sugar is higher?” At 3-year follow-up, depression is defined using CES-D-10 score  $\geq 10$  or currently taking medication for depression for cohort1.

† Weight change is defined by the question "Compared with 6 months ago, have you gained weight, lost weight, or stayed about the same?"



**Table 6: Sensitivity analysis of the association between baseline depression and diabetes at three years: missing baseline data were imputed using multiple imputation**

	Cohort 2: Diabetes incidence N=22,041
	Adjusted OR (95% CI)
Depression* (Yes vs. no)	1.31 (1.12 - 1.54)
Immigrant (Yes vs. no)	0.96 (0.80 - 1.15)
Sex	
Male	1
Female	1.21 (1.05 - 1.40)
Age, years,	
45 - 60	1
61 - 70	0.95 (0.82– 1.27)
71 - 85	0.73 (0.60 – 0.89)
Province	
Quebec	1
British Columbia	1.13 (0.92 – 1.39)
Ontario	0.99 (0.81 – 1.21)
Other	0.75 (0.62 – 0.90)
Medical conditions (Yes vs. no)	
Hypertension	1.25 (1.05 – 1.49)
Heart disease	1.43 (1.20 – 1.69)
Waist circumference risk (Yes vs. no)	2.21 (1.91- 2.56)
Weight change †	
Same weight	1
Gained weight	0.99 (1.12 - 1.43)
Lost weight	1.25 (1.06 - 1.49)

OR=Odds Ratio; CI=Confidence Interval;

\* The multiple imputation model adjusted for all the variables included in Table 1.

Depression is assessed with Center for Epidemiological Studies Depression 10 Scale, CESD  $\geq 10$  or currently taking medication for depression or following any other treatments for depression. 3-year incident diabetes is defined using self-reported diabetes diagnosis.

† Weight change is defined by the question "Compared with 6 months ago, have you gained weight, lost weight, or stayed about the same?"

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