Prevalence and predictors for being unscreened for diabetic retinopathy: A population-based study over a decade

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Background

- The global prevalence of diabetic retinopathy (DR) is estimated to be 22% among those with diabetes.[1]
- Screening for DR for early identification and treatment may prevent severe and irreversible vision loss.[2]
- Large cross-sectional studies have suggested that 25-50% of those with type-2 diabetes have not visited any eye care provider based on the recommended guidelines.[3]

Purpose

To determine the population-level predictors for being unscreened for DR amongst individuals with diabetes in Ontario, Canada.

Methods

Data collection
Databases used: The Institute for Clinical Evaluative Sciences (ICES), Registered Person, Discharge Abstract, Ontario Mental Health Reporting System (OMHRS), Ontario Health Insurance Plan (OHIP) Claims, Ontario Drug Benefit, Immigration, Refugees, and Citizenship Canada Permanent Resident.
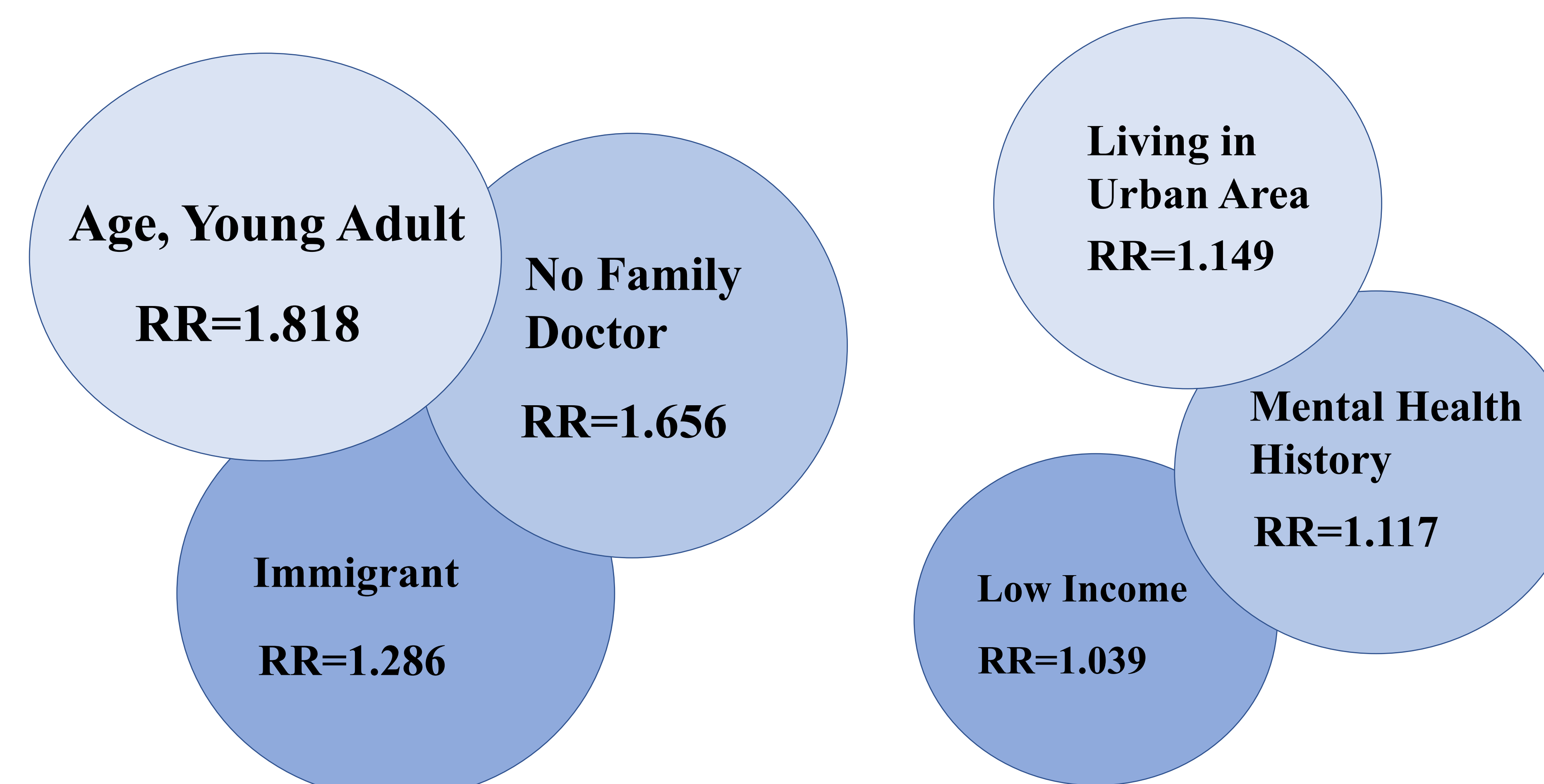
Study population
All individuals in Ontario with diabetes aged ≥20 years were identified in 2011-2013 and 2017-2019 time periods.

Statistical analysis
- Prevalence of screened and unscreened individuals calculated for 2011-2013 and to 2017-2019 time periods.
- Comparison of proportions, chi-square analysis conducted and reported as relative risk (RR) and 95% confidence intervals (CI).
- Mantel-Haenszel test used for calculation of RR comparison of subcategories within each of the two time points.
- For each variable of interest, potential time interaction tested using the Breslow-Day test for homogeneity of RR.
- Independent samples t-test was used for aggregate data.

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	2011-2013		2017-2019	
	Screened	Unscreened	Screened	Unscreened
	n=739,678	n=405,967	n=891,551	n=455,027
Age Group, n (row %)				
20 to 39 years	26,547 (38.0)	43,317 (62.0)	29,923 (41.8%)	41,716 (58.2%)
40 to 64 years	312,454 (56.9)	236,626 (43.1)	341,838 (58.0%)	247,710 (42.0%)
65 and above	400,677 (76.1)	126,024 (23.9)	519,790 (75.8%)	165,601 (24.2%)
Income Quintile, n (row %)				
1 - Lowest	158,246 (63.1)	92,483 (36.9)	205,793 (64.2%)	114,989 (35.8%)
2	158,911 (64.8)	86,263 (35.2)	195,826 (66.4%)	98,884 (33.6%)
3	149,511 (64.9)	80,969 (35.1)	183,109 (66.8%)	90,867 (33.2%)
4	144,512 (65.1)	77,398 (34.9)	161,449 (66.9%)	79,933 (33.1%)
5 - Highest	124,930 (65.6)	65,425 (34.4)	144,035 (67.7%)	68,614 (32.3%)
Missing	3,568 (51.0)	3,429 (49.0)	1,339 (43.5%)	1,740 (56.5%)
Immigrant, n (row %)				
Yes	51,946 (55.5)	41,631 (44.5)	59,015 (57.5%)	43,675 (42.5%)
No	687,732 (65.4)	364,336 (34.6)	832,536 (66.9%)	411,352 (33.1%)
Rurality, n (row%)				
Large cities	516,885 (63.2)	300,796 (36.8)	632,577 (65.1%)	338,575 (34.9%)
Small cities	151,315 (68.2)	70,524 (31.8)	178,176 (69.5%)	78,093 (30.5%)
Rural Areas	62,798 (68.6)	28,781 (31.4)	70,022 (69.1%)	31,380 (30.9%)
Missing	8,680 (59.7)	5,866 (40.3)	10,776 (60.7%)	6,979 (39.3%)
Mental Health Issues, n (row %)				
None	612,328 (65.2)	327,446 (34.8)	753,072 (67.0%)	371,532 (33.0%)
Severe	13,995 (55.7)	11,146 (44.3)	16,729 (55.2%)	13,580 (44.8%)
Non-severe	113,355 (62.7)	67,375 (37.3)	121,750 (63.5%)	69,915 (36.5%)
Access to Family Doctor				
No primary care	9,588 (39.9)	14,465 (60.1)	16,547 (46.5%)	19,025 (53.5%)

Age, Young Adult RR=1.818

No Family Doctor RR=1.656

Immigrant RR=1.286

Living in Urban Area RR=1.149

Mental Health History RR=1.117

Low Income RR=1.039

Results

- Proportion of unscreened patients decreased from 35% (405,967) in 2011-2013 to 34% (455,027) of the population with diabetes in 2017-2019 (RR = 0.967; 95% CI=0.964-0.9693; p<0.001).
- Having more comorbidities associated with higher screening rates.
- Even amongst highest healthcare users, only 67% were screened in both time points.

Risk factors for being unscreened
- **Age:** Young adults aged 20-39 years old had the highest proportion of unscreened patients (62% and 58% in 2011-2013 and 2017-2019 respectively).
- **Income:** Having a lower income quintile (RR=1.039; 95% CI=1.036-1.044; p<0.001)
- **Recent immigrant:** (RR= 1.286; 95% CI=1.280-1.293; p<0.001)
- **Live in urban area:** (RR=1.149; 95% CI=1.145-1.154; p<0.001)
- **Mental health history** (RR=1.117; 95% CI=1.112-1.122; p<0.001)
- **No family doctor:** (RR=1.656; 95% CI=1.644-1.668; p<0.001)

Conclusion

- Approximately a third of patients with diabetes in Ontario, Canada have not been screened for DR.
- Of all patients with diabetes, young adults, those with a low-income status, immigrants, residents in a large city, those with a prior history of mental illness, and no access to primary care are at the highest risk of not being screened for DR.

References

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