

Mental Health and Diabetes: Results from a Population-Based Surveillance System

Larry W Svenson^{1,2,3} Robert L Campbell⁴ Donald P Schopflocher^{1,2,3}

¹ Public Health Surveillance and Environmental Health, Public Health Division

² School of Public Health, University of Alberta

³ Community Health Sciences, University of Calgary

⁴ Concordia University College of Alberta

Background and Purpose

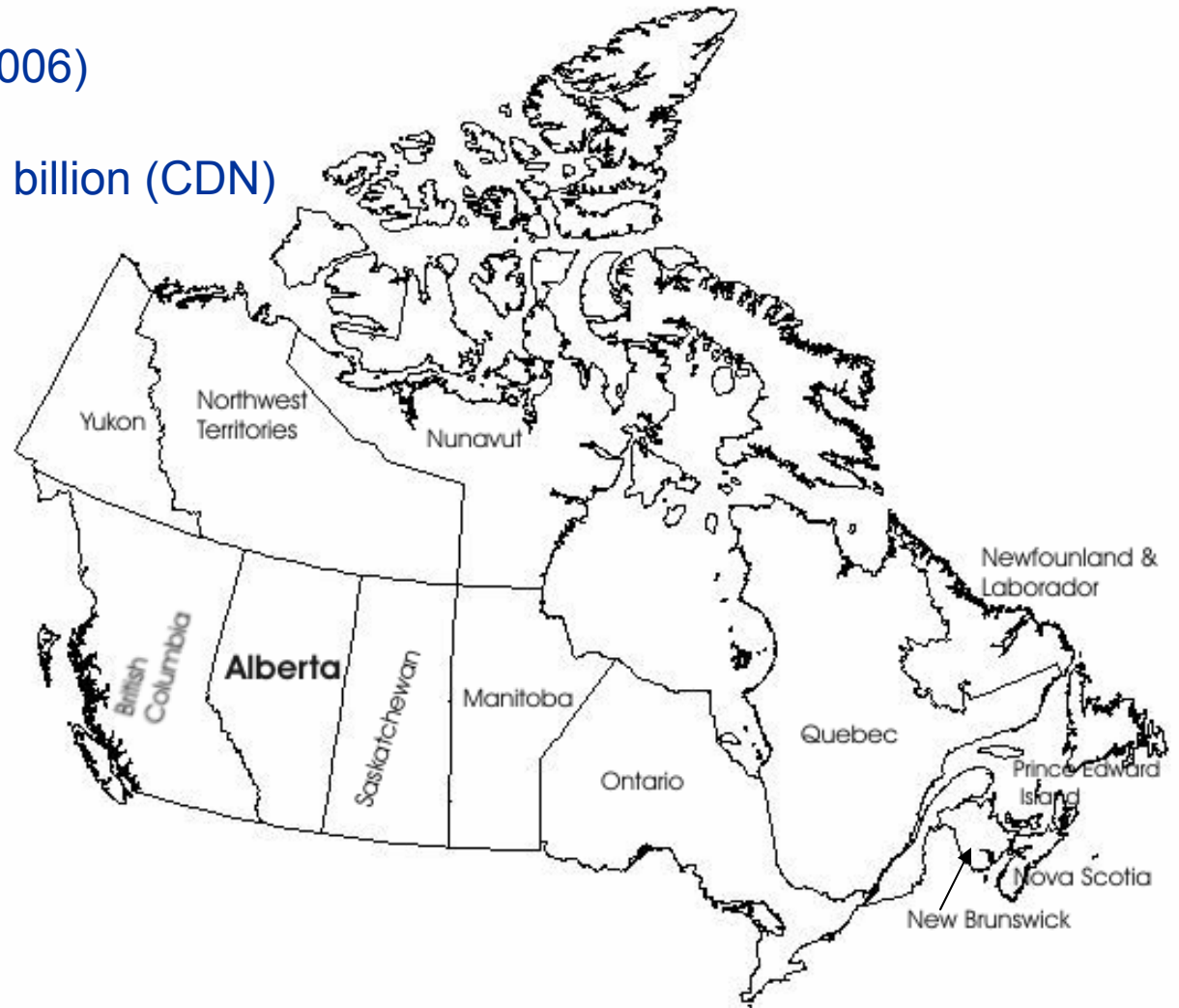
- **National Diabetes Surveillance System (NDSS)** was established in 1996 to address gaps in information related to diabetes and its complications
- The NDSS was built on population-based administrative health data allowing for a comparison of those with and without diabetes
- The purpose of the present analysis was to examine the risk of being diagnosed with mental health problems among those with and without diabetes

Context

Population: 3,298,028 (2006)

Area: 661,185 km²

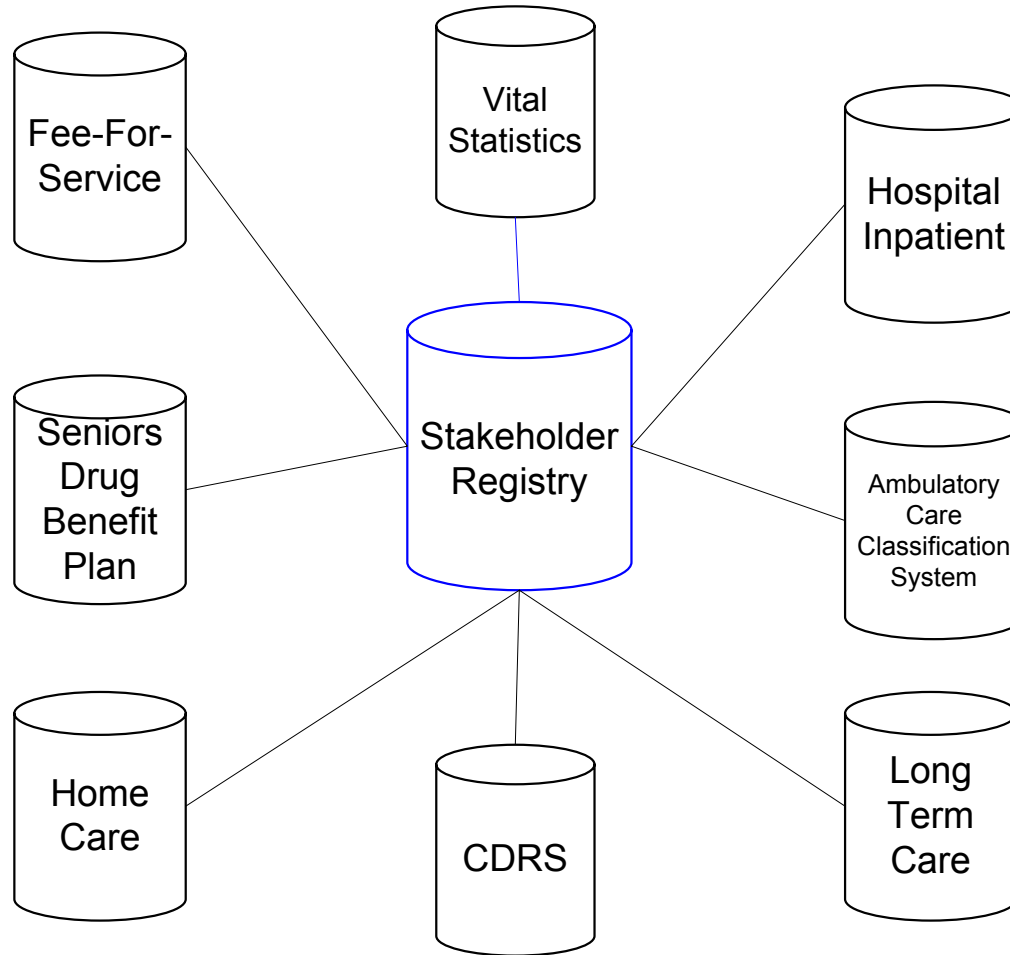
Health Care Budget: \$12 billion (CDN)



Methods

- Alberta maintains a publicly funded and universally available health care system
- All residents of the province must register with the Alberta Health Care Insurance Plan
- Most physicians are reimbursed on a fee-for-service basis and those on alternative payment arrangements are required to “shadow bill”
- Data were extracted from administrative sources to assess diabetes status and services related to mental health problems.

Administrative Health Databases



Methods – Diagnostic Codes

Diagnosis	ICD-9-CM	Description
Affective Disorders	296.X	Affective psychoses
	300.4	Neurotic depression
	301.1	Affective personality disorder
	309.0	Brief depressive reaction
	309.1	Prolonged depressive reaction
	311	Depressive disorder

M ethods – D iagnostic Codes

Diagnosis	ICD-9-CM	Description
Anxiety Disorders	300.X	Neurotic disorders (excl. 300.4)
	308.X	Acute reaction to stress
Substance Abuse	291.X	Alcoholic psychoses
	292.X	Drug psychoses
	303.X	Alcohol dependence syndrome
	305.2 – 305.9	Non-dependent abuse of drugs

Surveillance Case Definition

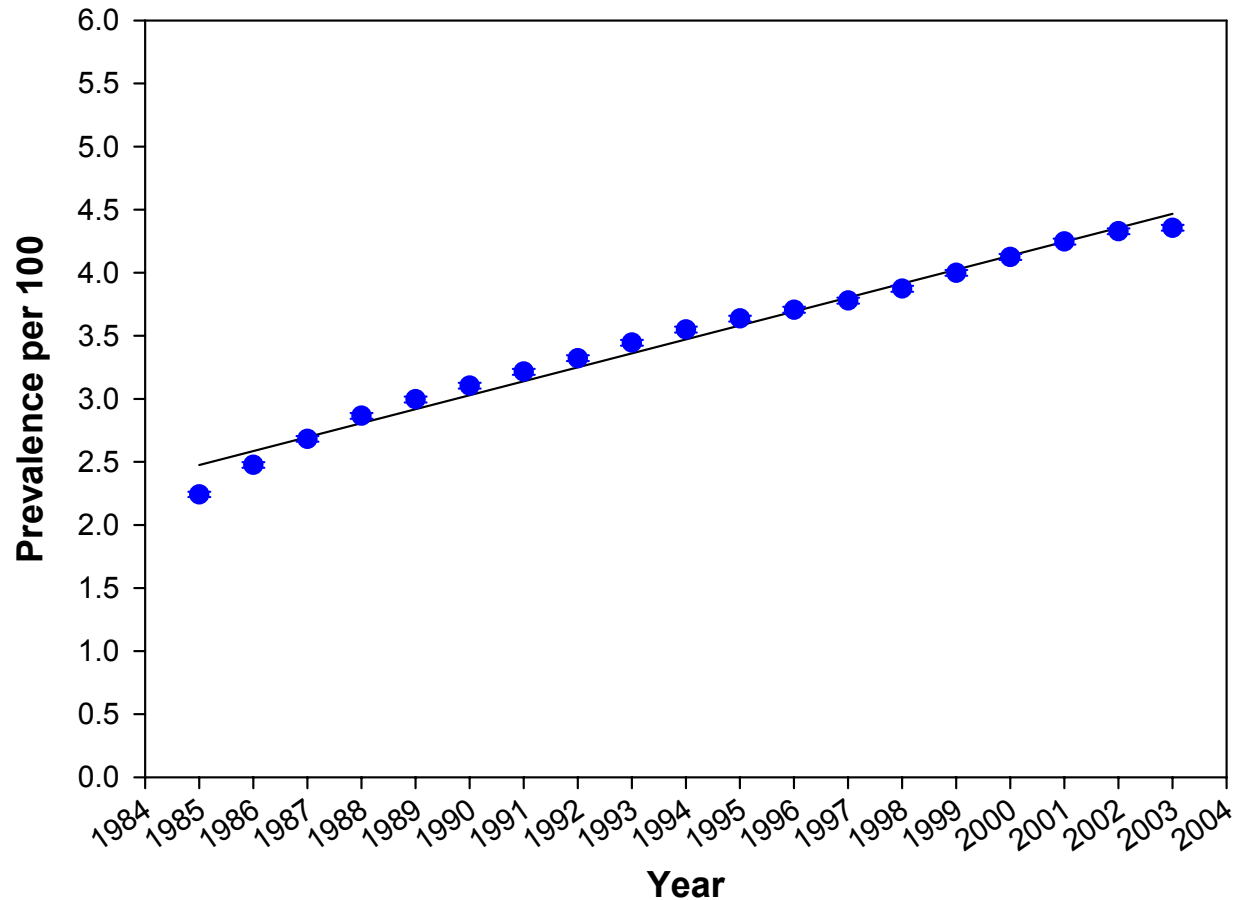
- **Diabetes**

- Two or more physician services or one or more hospitalizations with diabetes coded

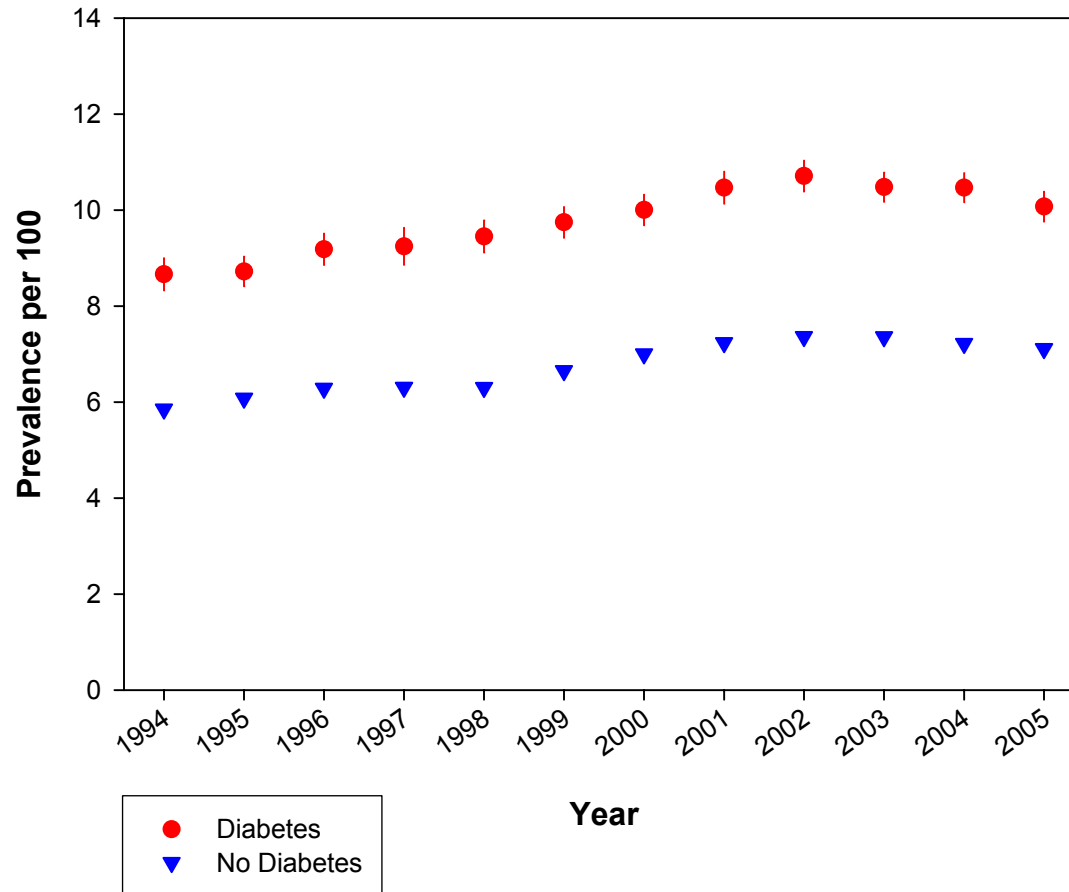
- **Mental Health Conditions**

- One or more physician services within a one year period
- Individual needed to “re-qualify” each year

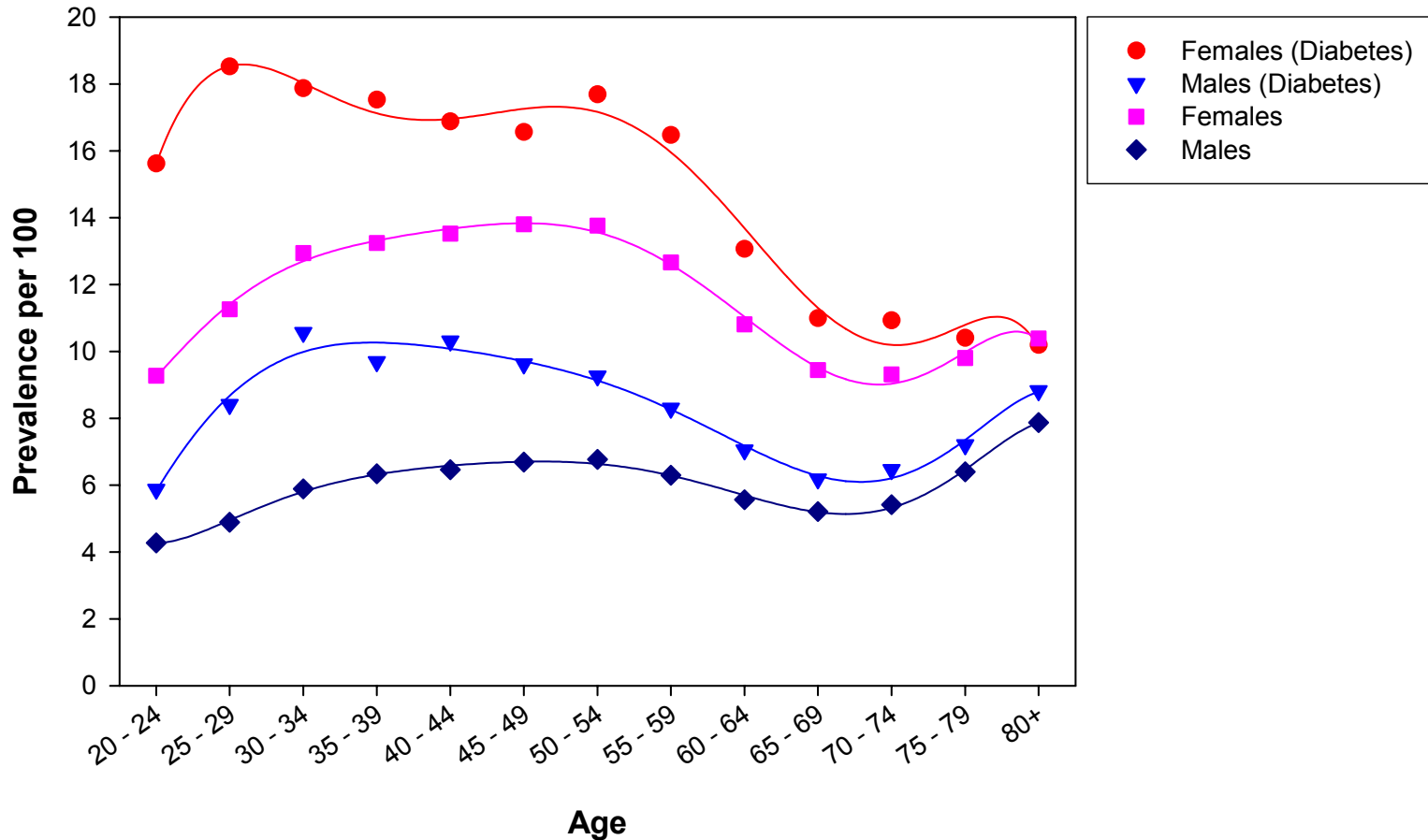
Age-Standardized Prevalence of Diabetes in Alberta



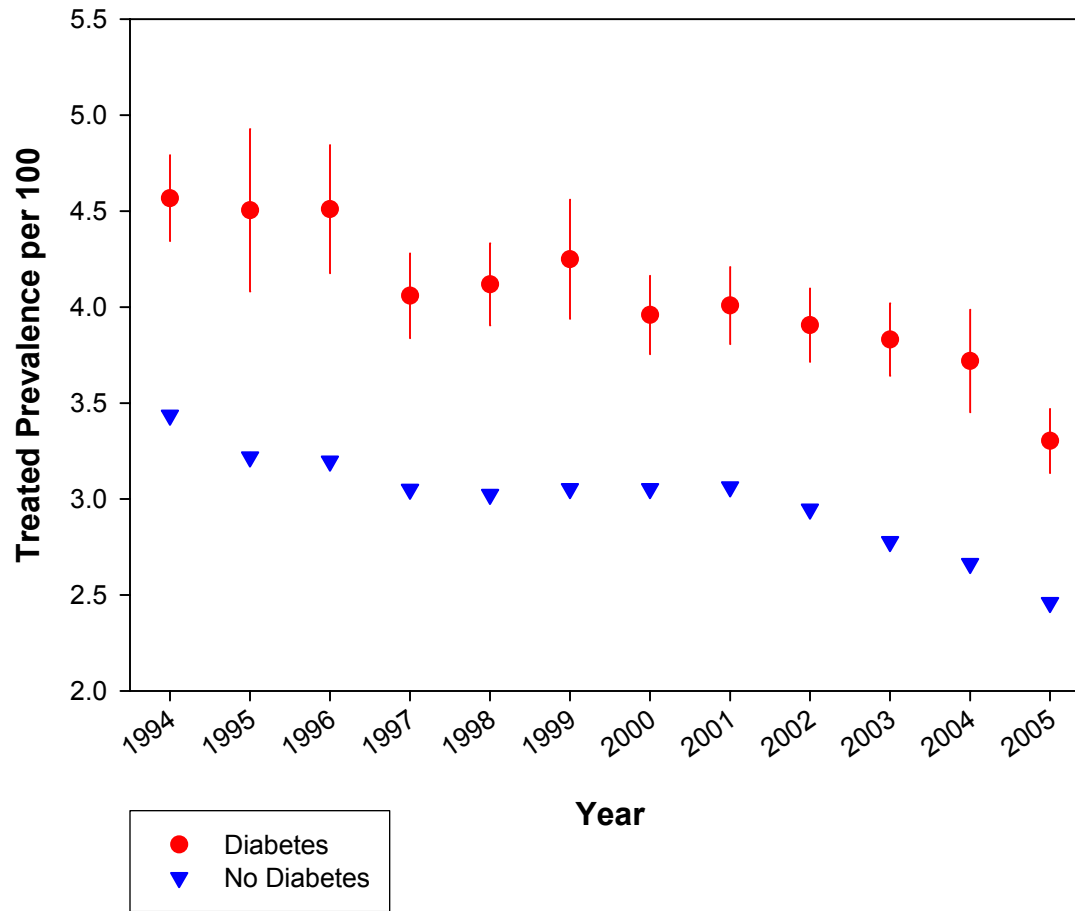
Age-Standardized Prevalence of Affective Disorders by Diabetes Status



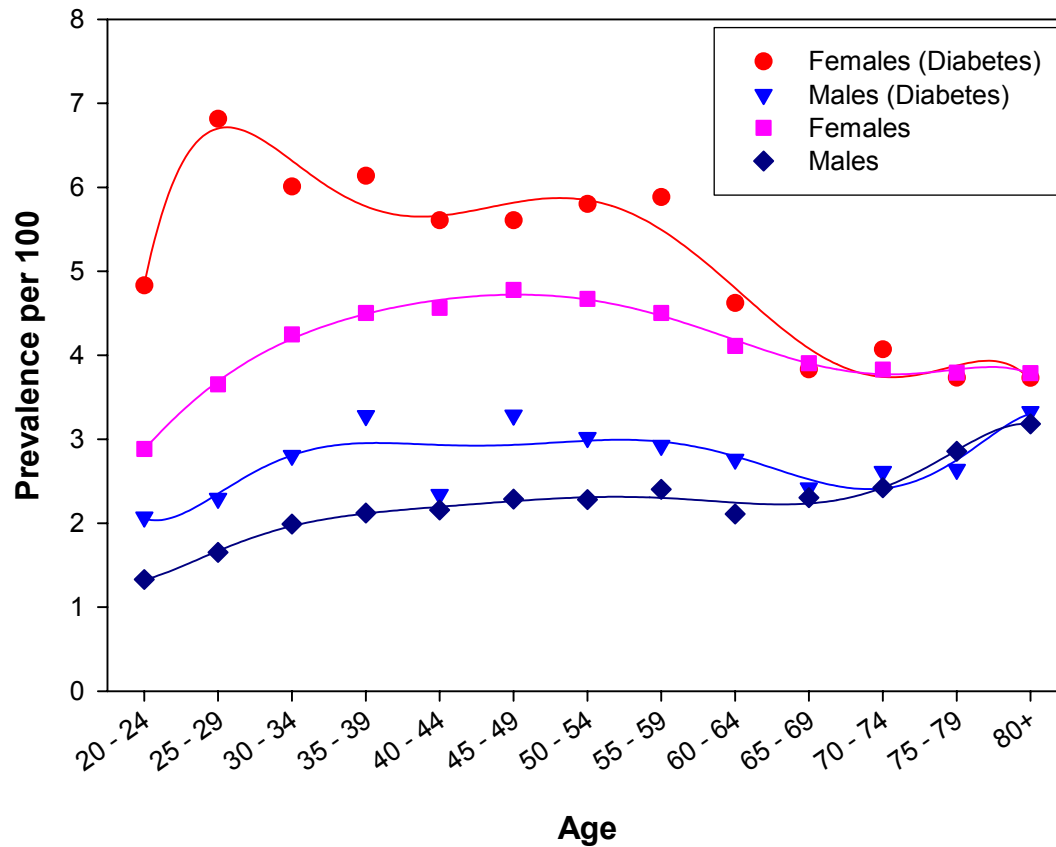
Age-Specific Prevalence of Affective Disorders by Diabetes Status and Sex, 2005



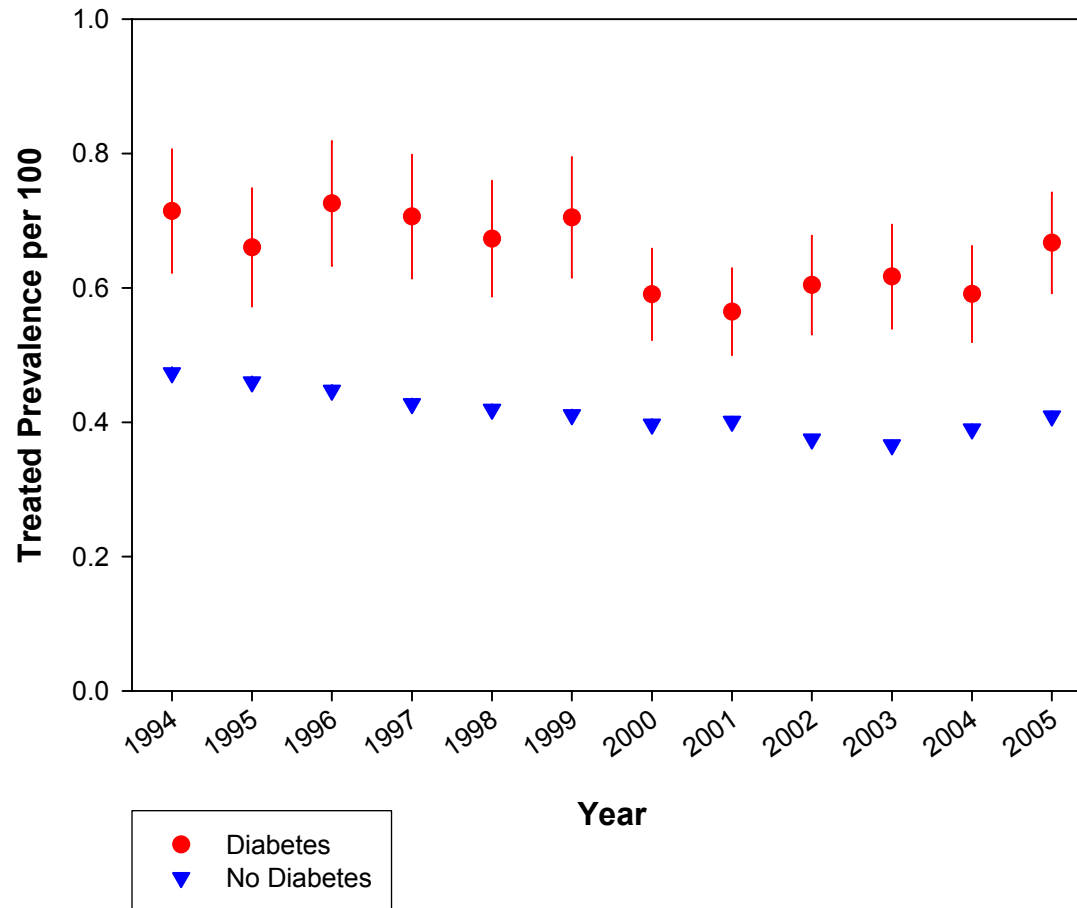
Age-Standardized Prevalence of Anxiety Disorders by Diabetes Status, 1994-2005



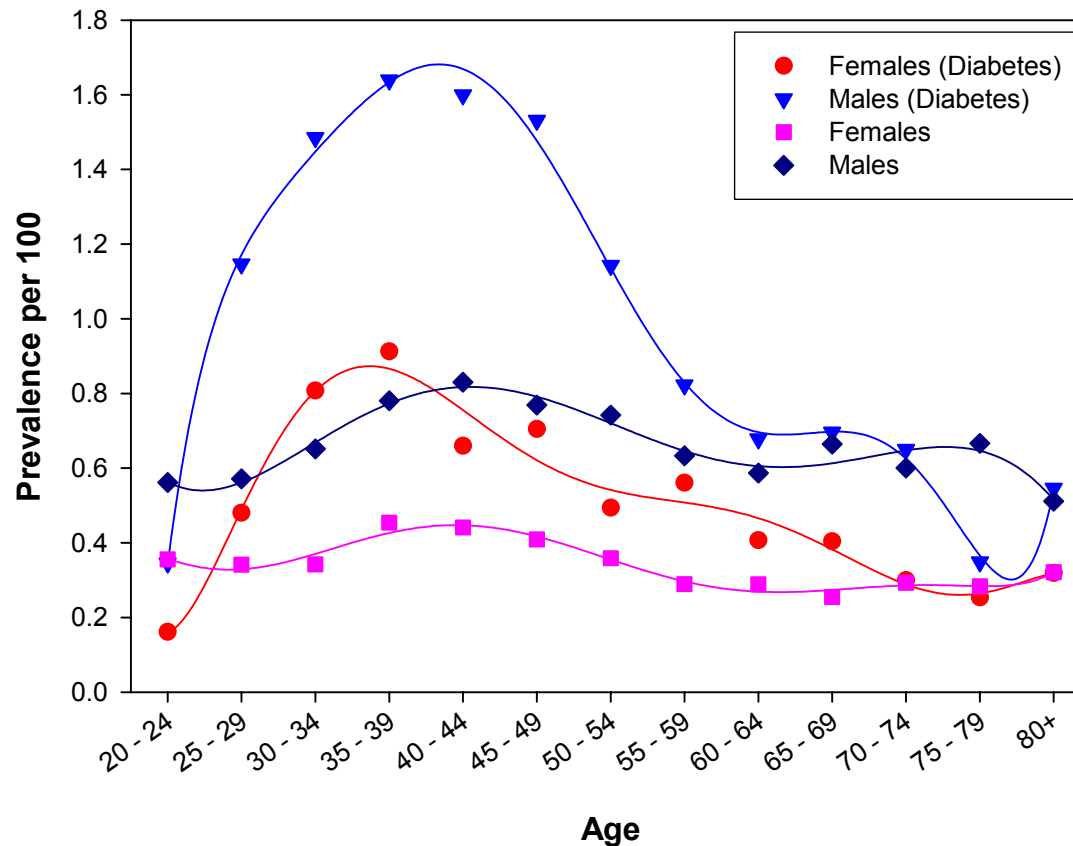
Age-Specific Prevalence of Anxiety Disorders by Diabetes Status and Sex, 2005



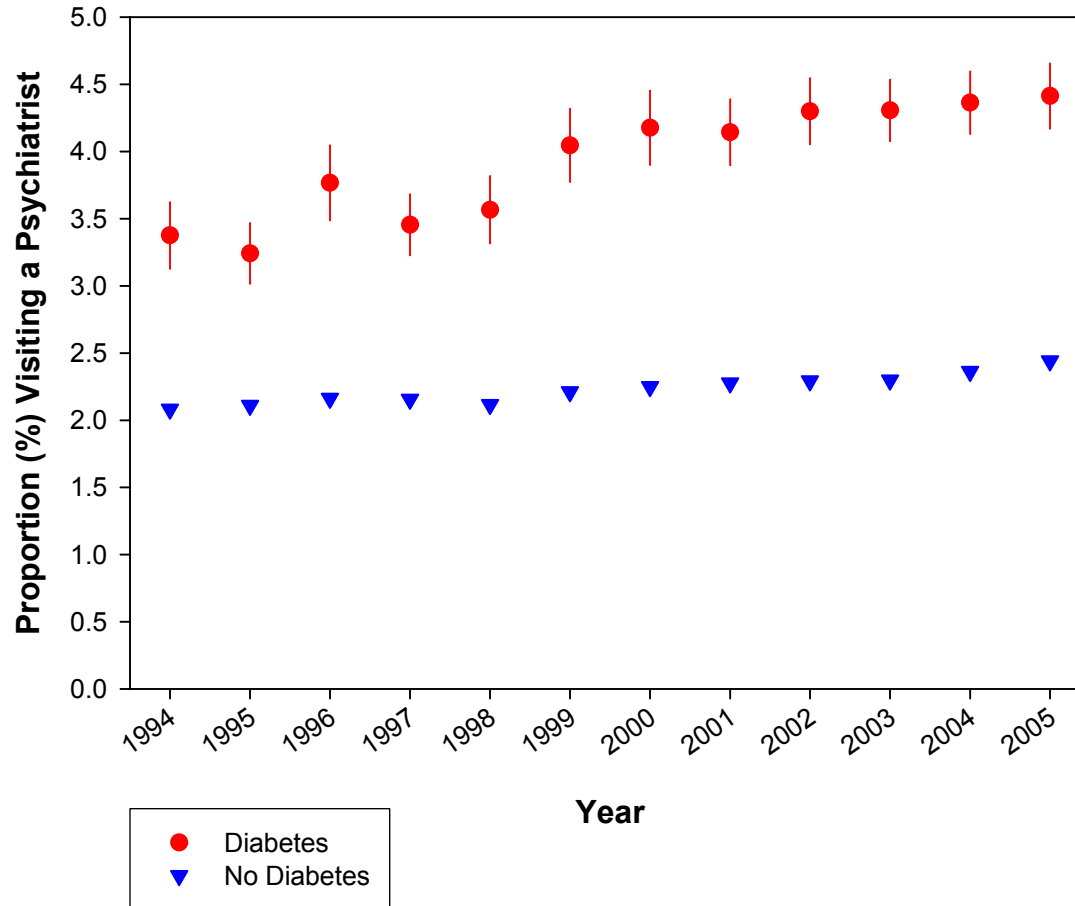
Age-Standardized Prevalence of Substance Abuse Disorders by Diabetes Status, 1994-2005



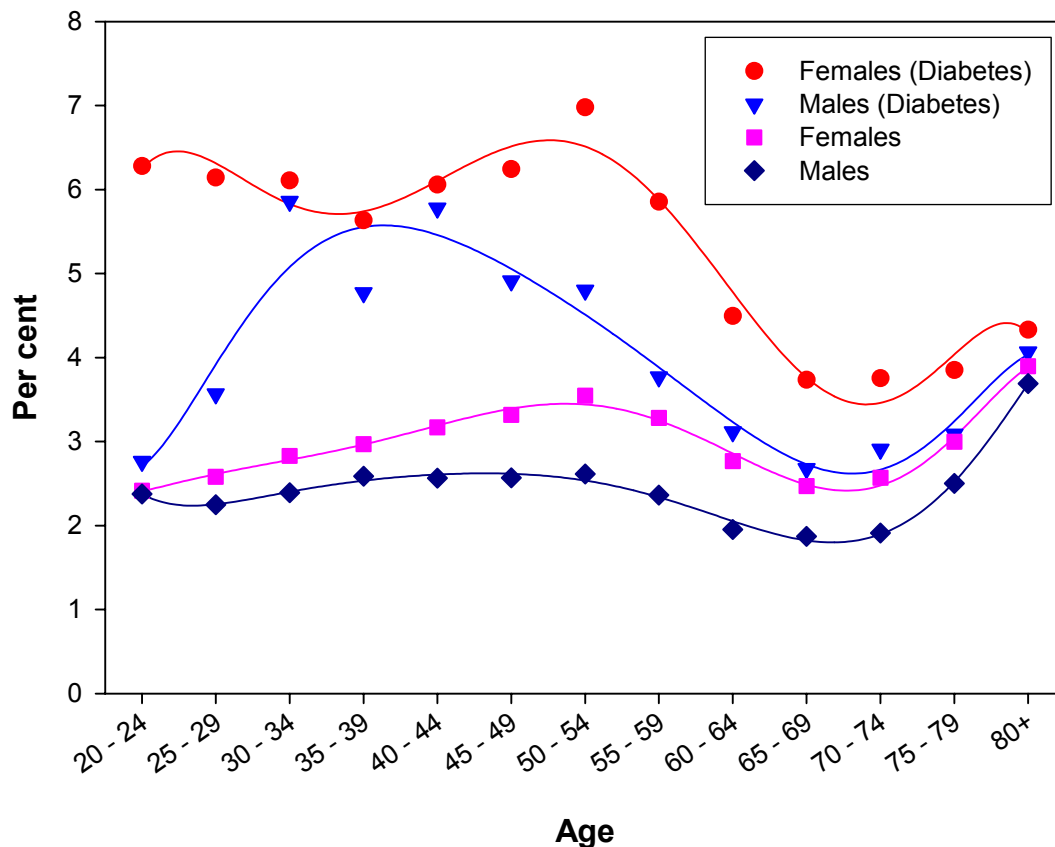
Age-Specific Prevalence of Substance Abuse Disorders by Diabetes Status and Sex, 2005



Proportion of the Population Having at Least One Visit with a Psychiatrist by Diabetes Status



Proportion of the Population Visiting a Psychiatrist by Age, Sex and Diabetes Status, 2005



Odds Ratios

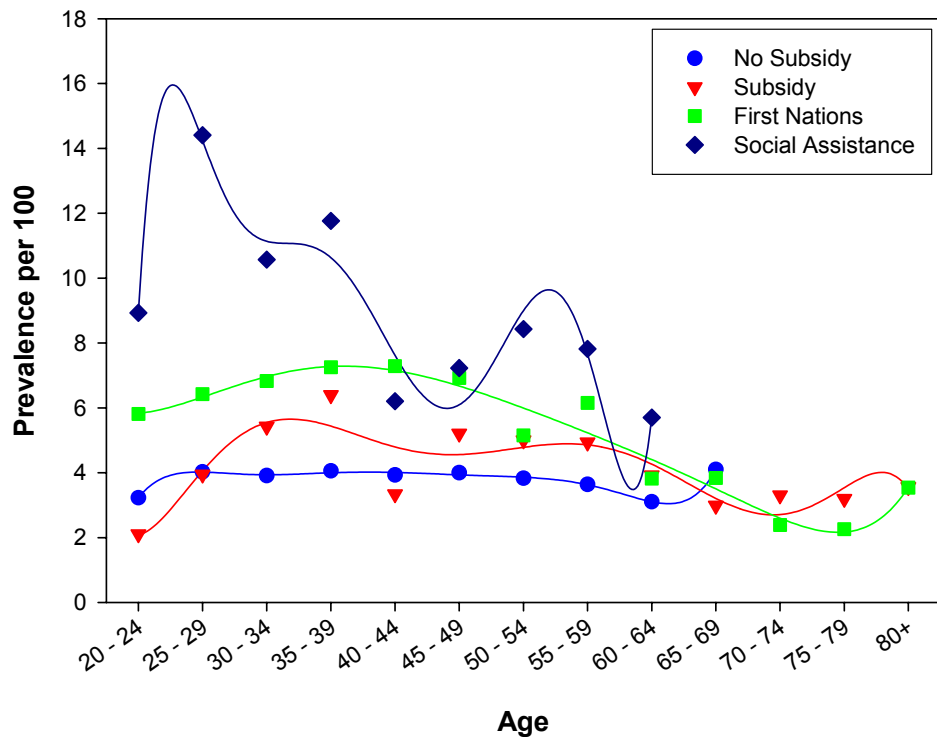
	Odds Ratio	95% CI
Affective Disorders	1.59	1.57, 1.62
Anxiety	1.58	1.53, 1.62
Substance Abuse	1.66	1.55, 1.78
Psychiatrist Visit	1.83	1.79, 1.89

Health Insurance Subsidy Level

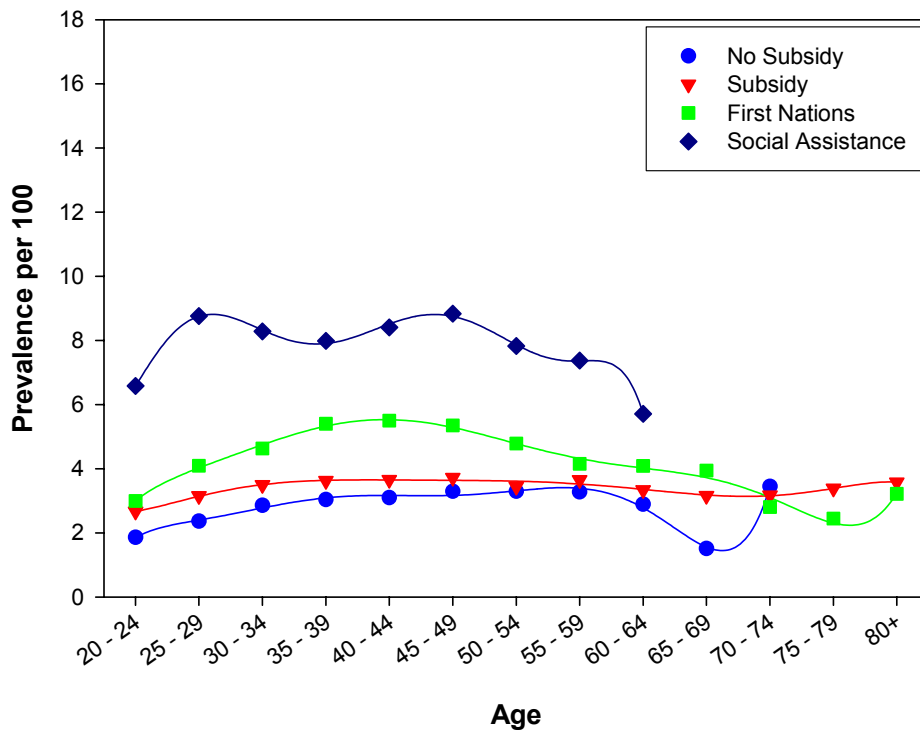
Health Care Insurance Plan Subsidy Levels

Subsidy Group	Description
No Subsidy	Responsible for full payment of health insurance premiums
Subsidy	Received a subsidy or waiver of premiums ranging from 20% to 100%
First Nations	Health Canada responsible for the payment of premiums
Social Assistance	Receiving Supports for Independence or child welfare

Anxiety Disorders – Health Insurance Subsidy Level

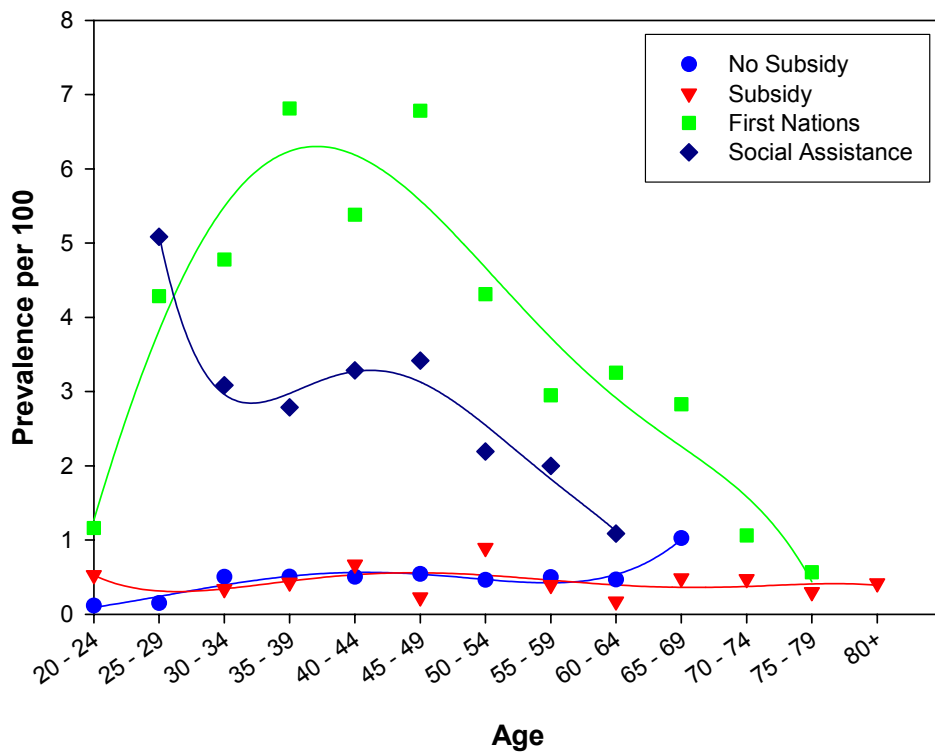


Diabetes

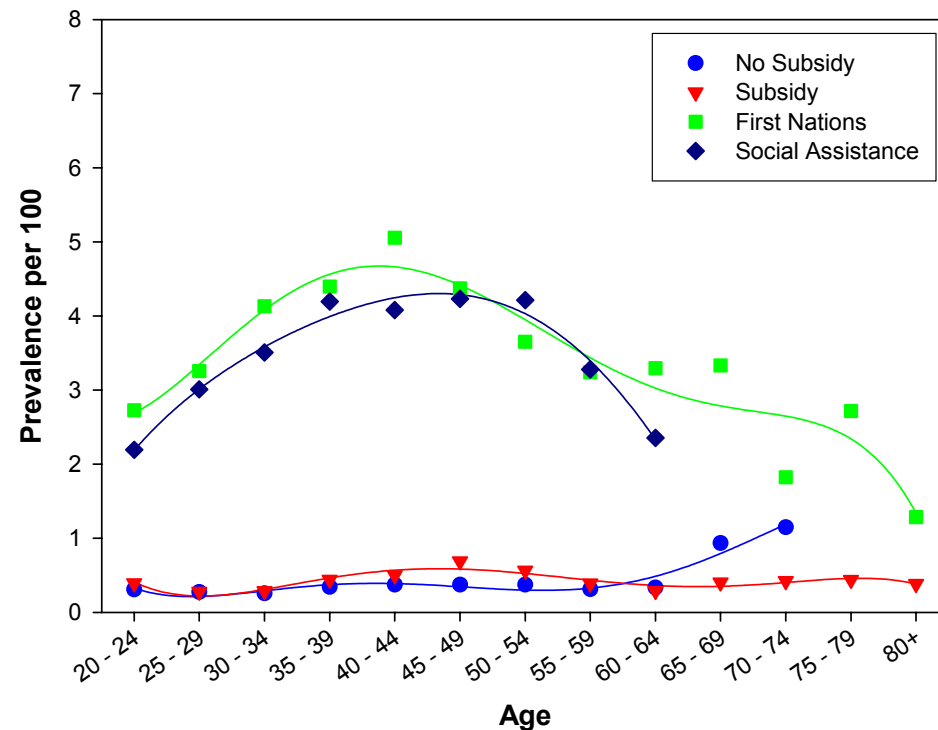


No Diabetes

Substance Abuse Disorders – health insurance subsidy level



Diabetes



No Diabetes

Affective Disorders

Effect	Odds Ratio	95% CI
Diabetes	1.20	1.18, 1.23
Age 25-44 (ref: 20-24)	1.42	1.40, 1.45
Age 45-64 (ref: 20-24)	1.49	1.47, 1.52
Age 65+ (ref: 20-24)	1.14	1.11, 1.17
Female	2.16	2.14, 2.18
First Nations (ref: No Subsidy)	1.37	1.33, 1.40
Social Assistance (ref: No Subsidy)	4.44	4.36, 4.53
Subsidy (ref: No Subsidy)	1.10	1.08, 1.12

Anxiety Disorders

Effect	Odds Ratio	95% CI
Diabetes	1.13	1.10, 1.17
Age 25-44 (ref: 20-24)	1.50	1.46, 1.55
Age 45-64 (ref: 20-24)	1.67	1.62, 1.72
Age 65+ (ref: 20-24)	1.49	1.43, 1.55
Female	2.00	1.97, 2.03
First Nations (ref: No Subsidy)	1.61	1.55, 1.67
Social Assistance (ref: No Subsidy)	2.72	2.63, 2.81
Subsidy (ref: No Subsidy)	1.08	1.05, 1.11

Substance Abuse Disorders

Effect	Odds Ratio	95% CI
Diabetes	1.05	0.98, 1.13
Age 25-44 (ref: 20-24)	1.23	1.15, 1.32
Age 45-64 (ref: 20-24)	1.29	1.20, 1.38
Age 65+ (ref: 20-24)	1.07	0.97, 1.18
Female	0.51	0.49, 0.53
First Nations (ref: No Subsidy)	12.35	11.78, 12.95
Social Assistance (ref: No Subsidy)	11.05	10.48, 11.62
Subsidy (ref: No Subsidy)	1.43	1.33, 1.54

Psychiatrist Visits

Effect	Odds Ratio	95% CI
Diabetes	1.42	1.387, 1.46
Age 25-44 (ref: 20-24)	1.10	1.07, 1.14
Age 45-64 (ref: 20-24)	1.16	1.13, 1.20
Age 65+ (ref: 20-24)	0.97	0.93, 1.01
Female	1.20	1.19, 1.22
First Nations (ref: No Subsidy)	1.53	1.46, 1.60
Social Assistance (ref: No Subsidy)	12.33	12.05, 12.62
Subsidy (ref: No Subsidy)	1.46	1.42, 1.50

Conclusions

- Affective disorders, anxiety disorders, and substance abuse disorders are higher in the diabetes population compared to non-diabetes population
- Affective and anxiety disorders most common in younger adults with diabetes
- Individuals receiving Social Assistance as well as First Nations are at a greater risk of being diagnosed with a mental health problem
- Mental health represents a significant burden, particularly for those with diabetes

Contact Information

Larry Svenson

Public Health Surveillance and Environmental Health

Public Health Division

Alberta Health and Wellness

P O Box 1360 Station Main

Edmonton, AB T5J 2N3

CANADA

Telephone: 1.780.422.4767

Facsimile: 1.780.427.1470

E-mail: larry.svenson@gov.ab.ca