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Research

Income-related disparities in private prescription drug coverage in Canada

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Abstract

Background: Canada does not have universal public coverage for prescription drugs, which leaves an important role for private insurance plans. However, we do not have recent data on the characteristics of Canadians who report holding such coverage, particularly differences based on household income. We performed a study to examine the relation between household income and private drug insurance coverage in Canada.

Methods: We used data from the 2015–2016 cycle of the Canadian Community Health Survey to investigate the relation between household income and holding private drug insurance. We constructed modified multivariate Poisson regression models with robust error variances, including several potential confounders.

Results: Overall, 59.4% of respondents reported having private drug insurance. We found a strong dose–response relation between household income level and private drug insurance coverage: 19.8% of those with a household income less than $20 000 reported private coverage, compared to 76.2% of those with a household income of $80 000 or more.

Interpretation: Higher-income households are much more likely to hold private drug insurance coverage in Canada. This likely contributes to differential access to medicines and health outcomes by different income groups.

Canada has a universal health insurance plan that covers medically necessary physician services and hospital stays. However, expenses for prescription drugs are not included in the universal plan and are instead covered by a patchwork of public and private drug insurance plans and out-of-pocket payments by patients.[1] Private insurance companies accounted for $12.1 billion in spending on prescription drugs in 2017, representing 36% of total spending on prescription medicines.[2] Despite the importance of private insurance in the financing of prescription drugs, there is a growing concern that the ability to access private insurance benefits outside of the universal health care system is related to socioeconomic status in Canada, leaving more vulnerable groups without coverage.[3]

In countries where health care services are predominantly covered through private insurance policies, there is an income- and health-related gradient whereby people with higher income and better health are more likely to purchase private health coverage.[4–6] In the Canadian setting, the relation between income and private insurance coverage has been studied for dental and vision care coverage.[7,8] These studies have shown significant associations between having a higher income and holding private insurance coverage. For example, Locker and colleagues[7] found that only 17% of respondents with low household income reported having private dental insurance, compared to 80% of those with high household incomes. Similarly, Ngo and colleagues[8] reported that the number of people with vision coverage in low- to moderate-income groups was half that in middle- and high-income groups. As a result, the "working poor" are thought to be a key group lacking effective drug coverage.[3]

With respect to prescription drugs, previous research has tended to focus on the impact of private drug insurance on inequities in overall use and on medication use for chronic conditions among older people.[3,4,9,10] Overall, these studies have shown that people with private drug insurance were more likely to visit physicians and fill prescription medications than those without insurance. However, to our knowledge, no recent studies have reported the relation between private drug insurance coverage and household income in Canada. Increased household share of spending on private insurance in

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general,[11] increased inequality and subsequent increase in the demand for private insurance,[12] and evidence of cost-related nonadherence to prescription drugs[13–15] provide a rationale for updating our knowledge in this area. Therefore, we examined the relation between household income and private drug insurance coverage in Canada.

Methods

Study design

We used data from the 2015–2016 cycle of the Canadian Community Health Survey (CCHS), a cross-sectional survey that collects information from the community-dwelling Canadian population.[16] This CCHS cycle had 109 659 respondents aged 12 years or more who resided in private dwellings, with a response rate of 59.5%.[16] The sample was collected by means of multistage cluster sampling and is representative of 98% of the population.[16]

Analytical sample

Our sample included people aged 12 years or more with valid responses to the CCHS question asking about prescription drug insurance status, the type of drug coverage and all confounding variables (those who responded "don't know," "refused to answer" or "not stated" were excluded).

Study variables

We constructed a binary outcome variable for self-reported private drug insurance coverage through a series of questions. Respondents were classified as having private drug insurance if they 1) responded "Yes" to the question "Do you have insurance that covers all or part of your prescription medication?" and 2) responded that it was either "employer-sponsored" or "sponsored through an association/private plan." Those who reported holding a government-sponsored plan or having no coverage were considered not to have private drug coverage. We did not study the availability of public drug coverage in our study, as prior work showed significant underreporting among people known to be covered under existing public plans; therefore, we considered these responses unreliable.[17]

Our main explanatory variable for this analysis was self-reported household income based on 5 categories (< $20 000, $20 000–$39 999, $40 000–$59 999, $60 000–$79 999, ≥ $80 000). We also included a range of confounding variables, including age (grouped in 10-yr intervals), sex, province, number of chronic conditions (0, 1 or ≥ 2), self-reported ethnicity (white, visible minority), immigration status (landed immigrant or nonpermanent resident; Canadian born) and highest level of educational attainment (less than secondary school, secondary school graduate, some postsecondary education, postsecondary certificate).

Statistical analysis

As the prevalence of the outcome was high (> 10%), we used a modified Poisson model.[18] With this model, the unbiased prevalence ratio (PR) can be measured directly.[18–20] We conducted both unadjusted bivariate analyses to assess the relation between the outcome and exposure variables, and a multivariate adjusted model. All models used robust error variances, and we used survey weights for all statistical analyses to account for the survey sampling design.

Ethics approval

Ethics approval was not required for this study as it used a publicly available data set.

Results

Sample characteristics

Of the 109 659 survey respondents, 97 008 (88.5%) had valid and nonmissing responses to all study questions (Figure 1). The overall study sample was equally distributed between males and females and was well distributed across age groups, with a smaller number of respondents in the oldest and the youngest groups (Table 1). A total of 78.0% of respondents identified as white, and 60.6% had completed postsecondary education.

Overall, 59.4% of respondents self-reported as having private insurance that covered all or part of the cost of prescription medications. Nearly half of respondents (49.8%) reported an annual household income of $80 000 or more, compared to 6.6% in the lowest category (< $20 000). The proportion of respondents with private insurance increased with increasing annual household income: 19.8% of those in the lowest income band reported private drug insurance, compared to 49.0% in the $40 000–$59 999 income band and 76.2% in the highest income band (Table 1).

Model results

In both our unadjusted and multivariable modified Poisson regression models, the prevalence of private drug insurance was positively associated with annual household income. Compared to households with an annual income below $20 000, the PR of private drug insurance coverage versus no private insurance increased with each additional $20 000 of household income: $20 000–$39 999, 1.49 (95% confidence interval [CI] 1.36–1.64); $40 000–$59 999, 2.48 (95% CI 2.26–2.71); $60 000–$79 999, 3.05 (95% CI 2.79–3.34); and $80 000 or more, 3.85 (95% CI 3.53–4.20) (Table 2). Model adjustment for age, sex, ethnicity, education level, province, immigration status and number of chronic conditions attenuated these results only to a small degree (1.55 [95% CI 1.41–1.70] for income of $20 000–$39 999 to 3.22 [95% CI 2.95–3.51 for income of ≥ $80 000]) (Table 2).

We found a statistically significant association between all of the other variables and private drug insurance coverage. In particular, the prevalence of private insurance coverage was higher among white people than among visible minorities, among school-age groups than among all other age groups, among Canadian-born people than among landed immigrants/nonpermanent residents, and among people who had completed postsecondary education than among those with lower education levels. The number of

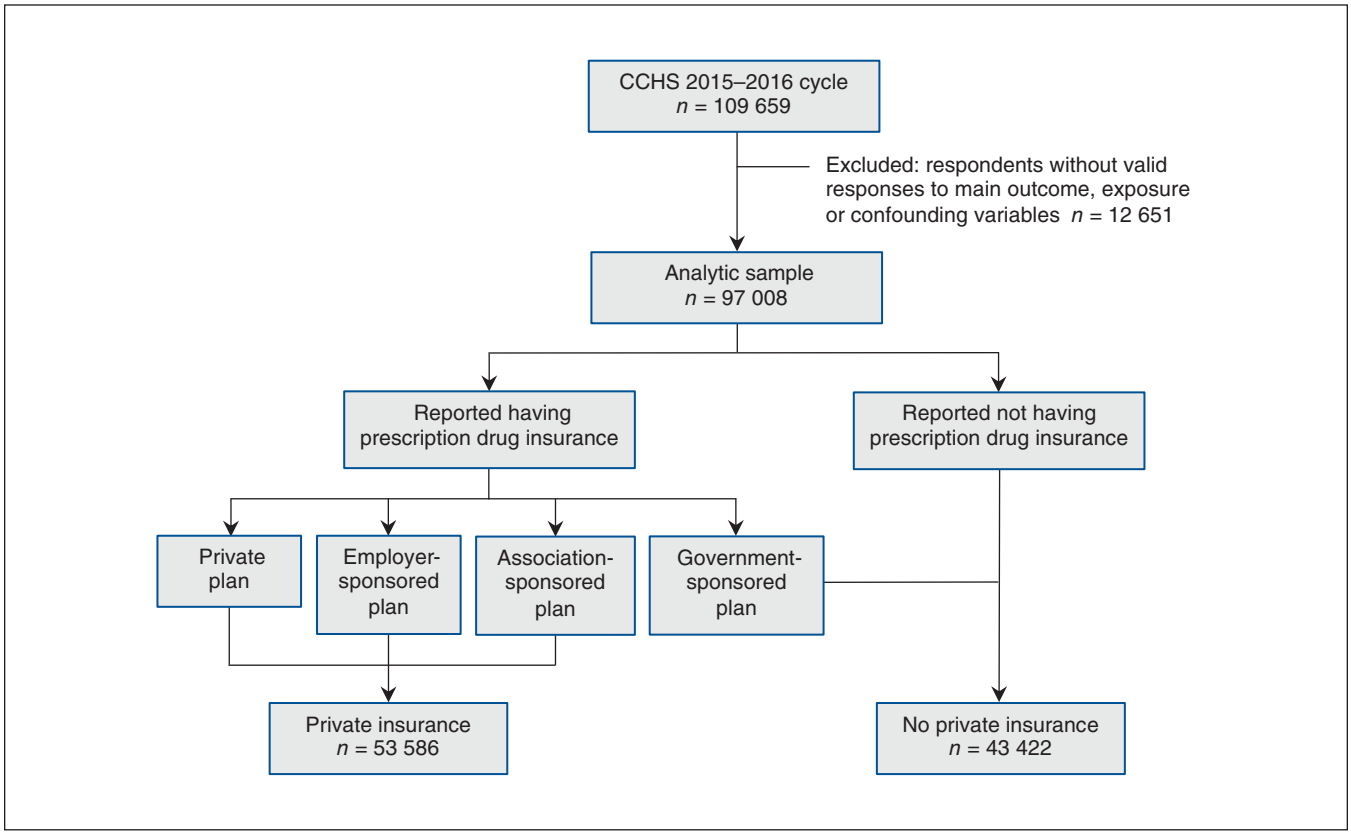

Figure 1: Selection of study sample from the Canadian Community Health Survey (CCHS) 2015–16.

chronic conditions was not significantly related to private insurance coverage in our final adjusted model.

Age-stratified analysis

In stratified analysis by age categories, the dose–response pattern of an increasing prevalence rate of employer and private insurance with increasing household income was strengthened for the working-age groups of 25–64 years (for income ≥ $80 000, PR 4.02, 95% CI 3.52–4.59) and for those aged 65 years or more (for income ≥ $80 000, PR 4.51, 95% CI 3.64–5.59) (Table 3). In contrast, the dose–response effect of increasing household income on the PR of employer and private insurance coverage was smaller in younger age groups.

Interpretation

We found that holding private prescription drug coverage was highly related to household income, with higher-income households being more than 3 times more likely to report holding such insurance than the lowest-income households. Our results are in line with those of previous studies conducted in Canada that also showed income-related disparities in holding private dental and vision coverage.[7,8] Our results are also similar to those of older studies showing that Canadians with higher incomes were more likely to have private drug insurance.[3] It is also notable that the characteristics we found to be associated with private drug insurance are similar to those of people who did not report cost-related nonadherence to prescription drugs and foregoing of other household spending to afford prescription medications.[13]

In the current study, people aged 18–24 years had slightly lower rates of insurance coverage than other age groups. This may have been due to the fact that people at this age become ineligible to be covered under their parent's employer-sponsored insurance coverage. Another plausible explanation is that people of this age group have not yet entered the workforce and therefore do not possess employment insurance or may be employed in industries with limited or no health coverage.[21] The very low estimates of private insurance coverage among respondents aged 65 years or more is likely due to their retirement and subsequent loss of their employer-sponsored insurance plan.

Limitations

Although we used high-quality data from the CCHS drawn from a representative sample of Canadians, our study has limitations worth noting. The cross-sectional nature of the study cannot, of course, establish causal relations owing to the potential for confounding from unmeasured variables. Another limitation arises from the self-reported nature of some of sensitive variables such as income. If this led some households to bias their responses toward a more socially desirable response, it may have biased our results. We also are unable to quantify any underreporting of private insurance by

Table 1: Sociodemographic characteristics and prevalence of private drug insurance coverage among respondents to the Canadian Community Health Survey

Characteristic	No. of respondents *n* = 97 008	Weighted proportion of total population, %	Weighted proportion with private drug insurance, %	Estimated proportion with private drug insurance, %
Annual household income, $				
< 20 000	8762	6.6	2.2	19.8
20 000–39 999	17 553	14.3	7.1	29.5
40 000–59 999	16 128	15.0	12.3	49.0
60 000–79 999	13 435	14.3	14.5	60.4
≥ 80 000	41 130	49.8	63.8	76.2
Sex				
Male	44 867	49.3	49.9	60.1
Female	52 141	50.7	50.1	58.8
Age, yr				
12–17	7522	7.1	8.4	71.0
18–24	6012	9.7	8.8	54.5
25–34	12 672	16.5	18.0	64.8
35–44	12 538	15.0	18.3	72.7
45–54	13 972	17.0	20.4	71.7
55–64	17 186	16.2	17.4	63.8
65–74	16 039	11.6	5.9	30.2
≥ 75	11 067	7.0	2.6	21.8
Ethnicity				
White	85 891	78.0	80.1	61.0
Nonwhite (Aboriginal/other visible minority)	11 117	22.0	19.9	53.8
Education				
Less than secondary school graduation	21 144	17.8	14.2	47.6
Secondary school graduation, no postsecondary education	20 784	21.7	19.8	54.3
Postsecondary certificate diploma/ university degree	55 080	60.6	66.0	64.7
Province				
British Columbia	12 741	13.1	12.5	56.8
Alberta	11 933	11.6	13.4	68.4
Saskatchewan	3988	2.9	3.1	63.9
Manitoba	4504	3.2	3.5	64.7
Ontario	29 513	38.7	38.2	58.7
Quebec	21 285	23.7	22.1	55.4
New Brunswick	3007	2.1	2.3	65.4
Nova Scotia	4347	2.7	2.9	62.6
Prince Edward Island	1695	0.4	0.4	61.1
Newfoundland and Labrador	2680	1.4	1.5	62.1
Yukon Territory	725	0.1	0.1	49.1
Northwest Territories	444	0.1	0.1	62.1
Nunavut	146	0.0	0.0	77.3
No. of chronic conditions				
0	41 234	49.1	53.9	65.3
1	24 892	25.3	25.7	60.4
≥ 2	30 882	25.6	20.3	47.2
Citizenship				
Landed immigrant/nonpermanent resident	15 913	26.0	22.9	52.3
Nonimmigrant (Canadian born)	81 095	74.0	77.1	62.0

Table 2: Unadjusted and multivariate parameter estimates from a modified Poisson model estimating the association of sociodemographic characteristics with private drug insurance coverage

Variable	Prevalence ratio (95% CI)	
	Unadjusted	Adjusted
Annual household income, $		
20 000–39 999	1.49 (1.36–1.64)	1.55 (1.41–1.70)
40 000–59 999	2.48 (2.26–2.71)	2.36 (2.16–2.58)
60 000–79 999	3.05 (2.79–3.34)	2.75 (2.52–3.00)
≥ 80 000	3.85 (3.53–4.20)	3.22 (2.95–3.51)
< 20 000	1	1
Sex		
Female	0.98 (0.96–0.99)	1.03 (1.01–1.04)
Male	1	1
Age, yr		
18–24	0.77 (0.73–0.80)	0.66 (0.63–0.70)
25–34	0.91 (0.88–0.94)	0.75 (0.71–0.78)
35–44	1.02 (0.99–1.06)	0.81 (0.77–0.84)
45–54	1.01 (0.98–1.04)	0.80 (0.76–0.83)
55–64	0.90 (0.87–0.93)	0.75 (0.72–0.78)
65–74	0.43 (0.41–0.44)	0.40 (0.38–0.43)
≥ 75	0.31 (0.29–0.33)	0.33 (0.31–0.36)
12–17	1	1
Ethnicity		
Nonwhite (Aboriginal/other visible minority)	0.88 (0.86–0.91)	0.90 (0.87–0.93)
White	1	1
Education		
Postsecondary certificate diploma/ university degree	1.36 (1.33–1.40)	1.29 (1.24–1.34)
Secondary school graduation, no postsecondary education	1.14 (1.11–1.18)	1.19 (1.14–1.24)
Less than secondary school graduation	1	1
Province		
British Columbia	0.97 (0.94–1.00)	0.99 (0.96–1.01)
Alberta	1.16 (1.14–1.19)	1.05 (1.03–1.08)
Saskatchewan	1.09 (1.05–1.13)	1.03 (0.99–1.06)
Manitoba	1.10 (1.06–1.14)	1.09 (1.05–1.13)
Quebec	0.94 (0.92–0.97)	0.96 (0.94–0.99)
New Brunswick	1.11 (1.07–1.16)	1.15 (1.11–1.20)
Nova Scotia	1.07 (1.03–1.11)	1.09 (1.06–1.13)
Prince Edward Island	1.04 (0.99–1.10)	1.08 (1.03–1.13)
Newfoundland and Labrador	1.06 (1.01–1.11)	1.08 (1.04–1.13)
Yukon Territory	0.84 (0.76–0.92)	0.74 (0.67–0.81)
Northwest Territories	1.06 (0.96–1.17)	0.82 (0.74–0.91)
Nunavut	1.32 (1.18–1.47)	0.98 (0.88–1.08)
Ontario	1	1
No. of chronic conditions		
1	0.92 (0.91–0.94)	1.00 (0.98–1.02)
≥ 2	0.72 (0.71–0.74)	0.96 (0.94–0.98)
0	1	1
Citizenship		
Nonimmigrant (Canadian born)	1.19 (1.15–1.22)	1.05 (1.02–1.09)
Landed immigrant/nonpermanent resident	1	1

Note: CI = confidence interval.

Table 3: Age-stratified adjusted prevalence ratio for holding private drug insurance

Annual household income, $	Age, yr; prevalence ratio (95% CI)			
	12–17	18–24	25–64	≥ 65
20 000–39 999	1.23 (0.94–1.61)	1.06 (0.88–1.28)	1.84 (1.60–2.12)	1.96 (1.59–2.43)
40 000–59 999	1.79 (1.41–2.29)	1.18 (0.99–1.41)	2.92 (2.55–3.34)	3.34 (2.70–4.13)
60 000–79 999	2.20 (1.73–2.79)	1.28 (1.07–1.52)	3.40 (2.97–3.89)	3.99 (3.21–4.96)
≥ 80 000	2.58 (2.05–3.24)	1.57 (1.36–1.81)	4.02 (3.52–4.59)	4.51 (3.64–5.59)
< 20 000	1	1	1	1

Note: CI = confidence interval.

people who were not aware that they had it through workplace coverage plans. However, we note that our estimates of the proportion of the Canadian population covered by private insurance is roughly similar to estimates produced by the private insurance industry.[22] We were also unable to assess the generosity of coverage and whether this varied between different groups. Finally, we did not study the factors associated with public insurance, as prior research has shown that people underreport this type of coverage significantly.[17]

Conclusion

We found significant income-related inequities in private drug insurance coverage in Canada. As insurance coverage has been shown to be associated with a greater ability to afford prescription medications, this may be contributing to differential access to medicines and health outcomes by different income groups.

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