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RESEARCH

Patterns and determinants of statin prescribing and discontinuation in individuals aged 80 and older: A 10-year population-based cohort study

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ABSTRACT

Background: Considering the limited knowledge regarding the benefits and risks of statins in people ≥80 years, population use patterns can provide valuable insights.
Objective: To describe prescribing and discontinuation patterns for statins, along with their determinants, in people ≥80 years in Québec, Canada.
Methods: Using the Quebec Integrated Chronic Disease Surveillance System, we built a population-based cohort of community-dwelling adults aged ≥80 years on January 4, 2018. We assessed statin use in the 5 years before and after cohort entry to calculate the proportion of prevalent, incident, and discontinued statin users. We used multivariable Cox models to identify factors associated with initiation and discontinuation, using hazard ratios (HRs) and 95% confidence intervals.
Results: A total of 317,027 individuals of mean age 85.2 years were included. At cohort entry, 51% were prevalent statin users. Within 5 years, 11% of nonusers initiated a statin. Among prevalent users, 22% discontinued their therapy during follow-up. Strongest factors associated with initiation included ages 80–84 (HRs ranging from 0.74 [95% confidence interval: 0.71–0.76] for 85–89 years to 0.26 [0.22–0.30] for 95+), previous statin use (1.99 [1.93–2.07]), and male sex (1.44 [1.39–1.49]). Older age (HRs ranging from 1.54 [1.51–1.58] for 85–89 years to 3.65 [3.42–3.89] for 95+), and Alzheimer's disease (1.77 [1.71–1.82]) were the most common factors for discontinuation. Previous cardiovascular disease was associated with both initiation (1.26 [1.07–1.49]) and reduced likelihood of discontinuation (0.69 [0.64–0.74]).
Conclusion: Statin use remains prevalent among the ≥80 years. A thorough evaluation of the risk/benefit balance of such use is needed.

Statins represent one of the most commonly prescribed therapies for the prevention and treatment of cardiovascular disease globally.[1] In 2021, more than half of people 65 years and over in Canada were prescribed statins.[2] However, data on the benefits and risks of statins in people of older age, such as those ≥80 years, remain scarce. For instance, Canadian guidelines advocate for individualized treatment based on lifetime risk and potential harms.[3] The 2018 U.S. lipid-lowering guidelines suggest that moderate-intensity statin therapy may be reasonable for individuals over 75 years of age with LDL-C levels between 1.7 and 4.8 mmol/L[4]. Conversely, discontinuation of statin therapy may be appropriate when the potential benefits are limited due to factors such as functional decline, multimorbidity, frailty, or reduced life expectancy.[4] European guidelines acknowledge that evidence for treatment in people older than 80 years is limited and that clinical judgment should prevail.[5] A recent joint expert consensus from the National Lipid Association and the American Geriatrics Society advocates for patient-centered approach to statin use for primary prevention in individuals over 75 years, indicating that available data suggest statin therapy may reduce cardiovascular events without substantially increasing potential risks, while deprescribing may be appropriate for selected patients with life-limiting diseases.[6] There is therefore a need to better distinguish appropriate from inappropriate statin therapies among older people, especially considering that occidental societies are increasingly aging. As deprescribing becomes

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Key Points

Background:

- Evidence on the benefits and risks of statin therapy in adults aged 80 and over remains limited.
- Despite widespread use, it is unclear to what extent statin prescribing and deprescribing practices align with clinical guidelines.
- Population-level data are needed to inform clinical decision-making and public health efforts related to statin use in this age group.

Findings:

- Nearly 1 in 2 community-dwelling adults aged 80 and over are prevalent statin users.
- Approximately 1 in 5 discontinue treatment within 5 years, while 1 in 10 initiate treatment during that period.
- Initiation is associated with younger age (80–84), prior statin use, and male sex, whereas discontinuation is associated with older age, Alzheimer's disease, and absence of cardiovascular disease.

progressively more prevalent,[7,8] establishing criteria that could help healthcare providers to determine if the initiation or continuation of a statin treatment is appropriate for this population is more than pertinent.

Previous studies already enlightened the matter. A Dutch study conducted among middle-aged patients concluded that there is often a gap between evidence-based recommendations and actual prescribing behavior for statins, especially among patients with low cardiovascular risk.[9] Similarly, discontinuation of statins in people aged 70 years and over was found to be mostly motivated by age and not by clinical evidence in a nation-wide register-based study.[10] Meanwhile, researchers emphasize the urgent need to develop clinical guidelines tailored to older populations, with a focus on prioritizing patient preferences, cognitive function, and life expectancy.[11]

To ensure that clear guidelines are issued and can have a tangible impact on clinical practice, it is essential to thoroughly understand the context of statin use among older individuals, particularly the increasingly prevalent ≥80 years population. However, there is a lack of population-level data on the prescription and discontinuation of statins in this age group, as well as the factors influencing these practices. In this context, our objective was to describe the pattern of statin use among people aged ≥80 in the province of Quebec, Canada. We aimed to estimate the proportion of prevalent, incident, and discontinued statin users, and identify factors associated with initiation and discontinuation.

Methods

Data source and study population

This population-based cohort study was conducted using data from the Quebec Integrated Chronic Disease Surveillance System (QICDSS), a system developed and managed by the *Institut national de santé publique du Québec* (INSPQ).[12] The QICDSS consists of 5 databases that are linked through citizens' health insurance number. It includes information regarding the health insurance registry, the hospital inpatient and day surgery database, the vital statistics death database, the physician claims database and the pharmaceutical services database, with which we gathered information related to statin use. More specifically, the pharmaceutical services database informs on medication claims (e.g., medication dispensed, date of dispensation, duration of treatment) for all medications listed on the public drug insurance plan. Since all individuals automatically become covered by the public drug insurance plan at 65 years of age, the QICDSS contains pharmaceutical data for over 90% of the older community-dwelling adults in the province.[12] Those who live in long-term care facilities and those who have private insurance through work are excluded from the analysis since they are not covered by the public drug insurance plan.

We created a population-based cohort of community-dwelling older adults. We included all older adults aged ≥80 on April 1, 2018. All individuals had to be covered by the public drug plan 5 years before their cohort entry, in order to assess statin use. We further assessed statin use in the 5 years after cohort entry, or until individuals died or were transferred to a long-term care facility, thereby ending their eligibility for the public drug plan. In supplementary analysis, we applied the same criteria for a 2013 cohort, where individuals had to be aged ≥80 on April 1, 2013. The inclusion of the 2013 cohort enabled an assessment of prescribing behaviors during an earlier period, providing insight into the consistency or evolution of prescribing practices in recent years – particularly in response to broader trends in cardiovascular risk management and deprescribing in the older population.

Variables

Statin use: Prevalence, incidence, and discontinuation

We used the Common Denomination Name,[13] which is equivalent to the fifth ATC level,[14] to identify the 6 statins commercialized in Canada during the study periods: atorvastatin, fluvastatin, lovastatin, pravastatin, rosuvastatin, and simvastatin, either alone or in combination with another medication (e.g., atorvastatin + amlodipine). The presence of a claim for such medications was considered as usage of a statin. We calculated the proportion of statin prevalent, incident, and discontinued users. Prevalent users were defined as individuals with current statin use at cohort entry, with current use corresponding to having at least one claim for a statin filled in the 6 months prior cohort entry. Incident use was defined as the first statin claim during the 5-year follow-up, provided there were no claims in the 6 months prior. Individuals who died or were transferred to long-term care were censored at the time of the event and not considered statin initiator if no claim occurred beforehand. Discontinuation was considered as the absence of any statin claims for at least 6 consecutive months and was calculated both in prevalent and incident users. For those who discontinued statin, the treatment period was calculated from the first statin claim up to discontinuation. Those who died or were transferred to a long-term care facility without discontinuing the statin were censored and therefore were not considered as having discontinued the statin.

Table 1
Characteristics of statin prevalent users and nonusers in community-based adults aged 80 and over in Québec on April 1, 2018

Characteristics	Statin users	Statin nonusers	Total
	n (%)	n (%)	n (%)
Frequency	n = 160,907	n = 156,120	n = 317,027
Demographics			
Mean age (SD) (y)	84.6 (3.8)	85.8 (4.6)	85.2 (4.3)
Median age (range) (y)	84 (80–107)	85 (80–115)	84 (80–115)
Age groups (y)			
80–84	89,326 (55.5%)	72,427 (46.4%)	161,753 (51.0%)
85–89	52,173 (32.4%)	50,831 (32.6%)	103,004 (32.5%)
90–94	16,770 (10.4%)	24,854 (15.9%)	41,624 (13.1%)
≥95	2638 (1.6%)	8008 (5.1%)	10,646 (3.4%)
Sex			
Females	87,101 (54.1%)	107,966 (69.2%)	195,067 (61.5%)
Males	73,806 (45.9%)	48,154 (30.8%)	121,960 (38.5%)
Residential area			
Rural	32,543 (20.2%)	29,581 (19.0%)	62,124 (19.6%)
Urban	127,864 (79.5%)	125,972 (80.7%)	253,836 (80.1%)
Unknown	500 (0.3%)	567 (0.4%)	1067 (0.3%)
Material deprivation index			
1 (least deprived)	22,177 (13.8%)	23,960 (15.4%)	46,137 (14.6%)
2	21,916 (13.6%)	20,719 (13.3%)	42,635 (13.5%)
3	25,819 (16.1%)	24,011 (15.4%)	49,830 (15.7%)
4	28,686 (17.8%)	25,728 (16.5%)	54,414 (17.2%)
5 (most deprived)	30,952 (19.2%)	27,941 (17.9%)	58,893 (18.6%)
Unknown	31,357 (19.5%)	33,761 (21.6%)	65,118 (20.5%)
Social deprivation index			
1 (least deprived)	20,064 (12.5%)	18,938 (12.1%)	39,002 (12.3%)
2	23,968 (14.9%)	22,061 (14.1%)	46,029 (14.5%)
3	25,864 (16.1%)	23,557 (15.1%)	49,421 (15.6%)
4	30,058 (18.7%)	28,416 (18.2%)	58,474 (18.4%)
5 (most deprived)	29,596 (18.4%)	29,387 (18.8%)	58,983 (18.6%)
Unknown	31,357 (19.5%)	33,761 (21.6%)	65,118 (20.5%)
Comorbidities			
Mean number (SD)	3.3 (2.9)	2.5 (2.6)	2.9 (2.8)
Chronic diseases			
Hypertension	138,579 (86.1%)	113,487 (72.7%)	252,066 (79.5%)
Coronary disease	29,845 (18.6%)	7938 (5.1%)	37,783 (11.9%)
Stroke	27,626 (17.2%)	14,050 (9.0%)	41,676 (13.2%)
Heart failure	28,900 (18.0%)	17,208 (11.0%)	46,108 (14.5%)
COPD	42,178 (26.2%)	34,749 (22.3%)	76,927 (24.3%)
Asthma	18,386 (11.4%)	17,208 (11.0%)	35,594 (11.2%)
Diabetes mellitus	60,060 (37.3%)	27,158 (17.4%)	87,218 (27.5%)
Osteoporosis	53,195 (33.1%)	64,274 (41.2%)	117,469 (37.1%)
Alzheimer	15,607 (9.7%)	19,809 (12.7%)	35,416 (11.2%)
Mental illnesses[a]	9178 (5.7%)	10,797 (6.9%)	19,975 (6.3%)
Personal history of cardiovascular disease	51,559 (32.0%)	20,439 (13.1%)	71,998 (22.7%)
Health care use			
Hospitalization in previous year			
Yes (≥1 hospitalization)	31,229 (19.4%)	26,173 (16.8%)	57,402 (18.1%)
No	129,678 (80.6%)	129,947 (83.2%)	259,625 (81.9%)
Visits to family physician in previous year			
0	14,811 (9.2%)	21,539 (13.8%)	36,350 (11.5%)
1–4	96,890 (60.2%)	91,104 (58.4%)	187,994 (59.3%)
5–9	38,085 (23.7%)	32,290 (20.7%)	70,375 (22.2%)
≥10	11,121 (6.9%)	11,187 (7.2%)	22,308 (7.0%)
Visits to specialists in previous year			
0	28,503 (17.7%)	40,507 (26.0%)	69,010 (21.8%)
1	21,510 (13.4%)	23,291 (14.9%)	44,801 (14.1%)
2–5	56,821 (35.3%)	51,989 (33.3%)	108,810 (34.3%)
≥6	54,073 (33.6%)	40,333 (25.8%)	94,406 (29.8%)
Emergency room visits in previous year			
0	103,624 (64.4%)	105,124 (67.3%)	208,748 (65.9%)
1	31,711 (19.7%)	28,888 (18.5%)	60,599 (19.1%)
2–5	23,861 (14.8%)	20,662 (13.2%)	44,523 (14.0%)
≥6	1711 (1.1%)	1446 (0.9%)	3157 (1.0%)

(*continued on next page*)

Table 1 (*continued*)

Characteristics	Statin users	Statin nonusers	Total
	n (%)	n (%)	n (%)
Number of medications in previous year			
Mean (SD)	11.6 (5.5)	8.3 (5.6)	10.0 (5.8)
0–4	9482 (5.9%)	41,740 (26.7%)	51,222 (16.2%)
5–9	55,191 (34.3%)	58,253 (37.3%)	113,444 (35.8%)
10–14	54,784 (34.1%)	35,123 (22.5%)	89,907 (28.4%)
15–19	27,271 (17.0%)	14,370 (9.2%)	41,641 (13.1%)
≥ 20	14,179 (8.8%)	6634 (4.3%)	20,813 (6.6%)

Abbreviations used: COPD, chronic obstructive pulmonary disease; SD, standard deviation.
[a] Mental illnesses: anxiety, depression, schizophrenia, bipolar disorder.

Factors associated with statin initiation and discontinuation

We studied sociodemographic factors, chronic diseases, and use of health services that may be associated with statin use patterns. Sociodemographic factors included age at cohort entry, sex, history of cardiovascular disease (coronary heart disease, stroke), living in a rural or urban area, and material and social deprivation indices. The material deprivation index includes data on education, income, and employment status while the social deprivation index deems information regarding marital status, single-parent families and lonely-living people.[15] Both indices are validated ecological proxies to socioeconomic status.[15] The first quintile regroups the least deprived for each index while the fifth quintile regroups the most deprived. We included chronic diseases with validated case definition that are used for chronic disease surveillance at the INSPQ[12]: Alzheimer's disease, asthma, chronic obstructive pulmonary disease, coronary disease, diabetes mellitus, heart failure, hypertension, mental illnesses (anxiety, bipolar disorder, depression, and schizophrenia), osteoporosis, and stroke. We also calculated the number of comorbidities for each individual using the list of diseases included in the combined comorbidity index of Charlson and Elixhauser, which gathers 31 conditions.[16] Use of health services was studied in the year before cohort entry and included the number of visits to a specialist, the number of family physician visits, the number of emergency room visits, and any hospitalization in the year before cohort entry. We also considered the number of medications used in the year prior to cohort entry by summing all different prescribed medications claimed at least once, using their common denomination names.

Statistical analyses

We calculated the proportion of statin prevalent, incident, and discontinued users for each cohort. We used multivariable Cox models to identify factors associated with initiation among nonprevalent users, and with discontinuation among prevalent users. The statistical significance was set at 0.05. All analyses were performed using SAS Enterprise 9.4 software (SAS Institute, Cary, NC).

Ethics approval

The use of the QICDSS for surveillance purposes has been approved by the government bodies and the Commission d'accès à l'information du Québec.

Results

The 2018 cohort was constituted of 317,027 participants with a mean age of 85.2 years and 62% of women (Table 1).

Half of the cohort (160,907 [50.8%]) were prevalent users of statin at cohort entry (Figure 1). Among these, 126,133 (78.4%) remained statin users either until the end of follow-up (n = 73,776 [58.5%]) or until censoring due to death (n = 37,248 [29.5%]) or transfer to long-term care facilities (n = 15,109 [12.0%]). Conversely, 34,774 (21.6%) individuals discontinued statin use during the follow-up period. The mean age at discontinuation was 87.5 years, and the mean duration of statin use was 3.5 years. Among those not using statin at cohort entry, 17,318 (11.1%) initiated statin treatment during follow-up, with a mean age at initiation of 86.1 years. Of these, 13,424 (77.5%) remained statin users until the end of follow-up (n = 9654 [71.9%]) or until censoring due to death (n = 2727 [20.3%]) or transfer to long-term care facilities (n = 1043 [7.8%]). The remaining (3895 [22.5%]) discontinued treatment before the end of follow-up. The average duration of use for incident users was 1.3 year.

Many factors were associated with the initiation of a statin treatment (Table 2). Notably, individuals aged 80–84 years had the higher likelihood of initiating treatment. Each subsequent age group showed approximately a 25% lower likelihood of statin initiation compared with the 80–84 years, with hazard ratios (HRs) decreasing from 0.74 (95% confidence intervals [CIs]: [0.71–0.76] for those aged 85–89 years to 0.26 [0.22–0.30] for individuals aged 95 years and over. Statin initiation was more common among men than women (1.44 [1.39–1.49]), and the 3 comorbidities most strongly associated with initiation included diabetes mellitus (1.29 [1.24–1.34]), coronary disease (1.19 [1.02–1.39]), and hypertension (1.18 [1.14–1.22]). Statins were more frequently prescribed for those with a history of cardiovascular disease (1.26 [1.07–1.49]) and among individuals with prior statin use (1.99 [1.93–2.07]). Conversely, Alzheimer's disease was associated with a lower likelihood of initiation (0.50 [0.47–0.54]). A higher number of visits to family physicians and to specialists, as well as a greater number of medications taken, were associated with increased likelihood of initiation.

Discontinuation of statin treatment, among prevalent users at cohort entry, was associated with factors similar to those associated with a lower likelihood of initiation (Table 2). Age emerged as the most significant determinant of discontinuation. Compared to individuals aged 80–84–years, the likelihood of discontinuing statins increased with age, from a HR of 1.54 (1.51–1.58) for those aged 85–89-years to 3.65

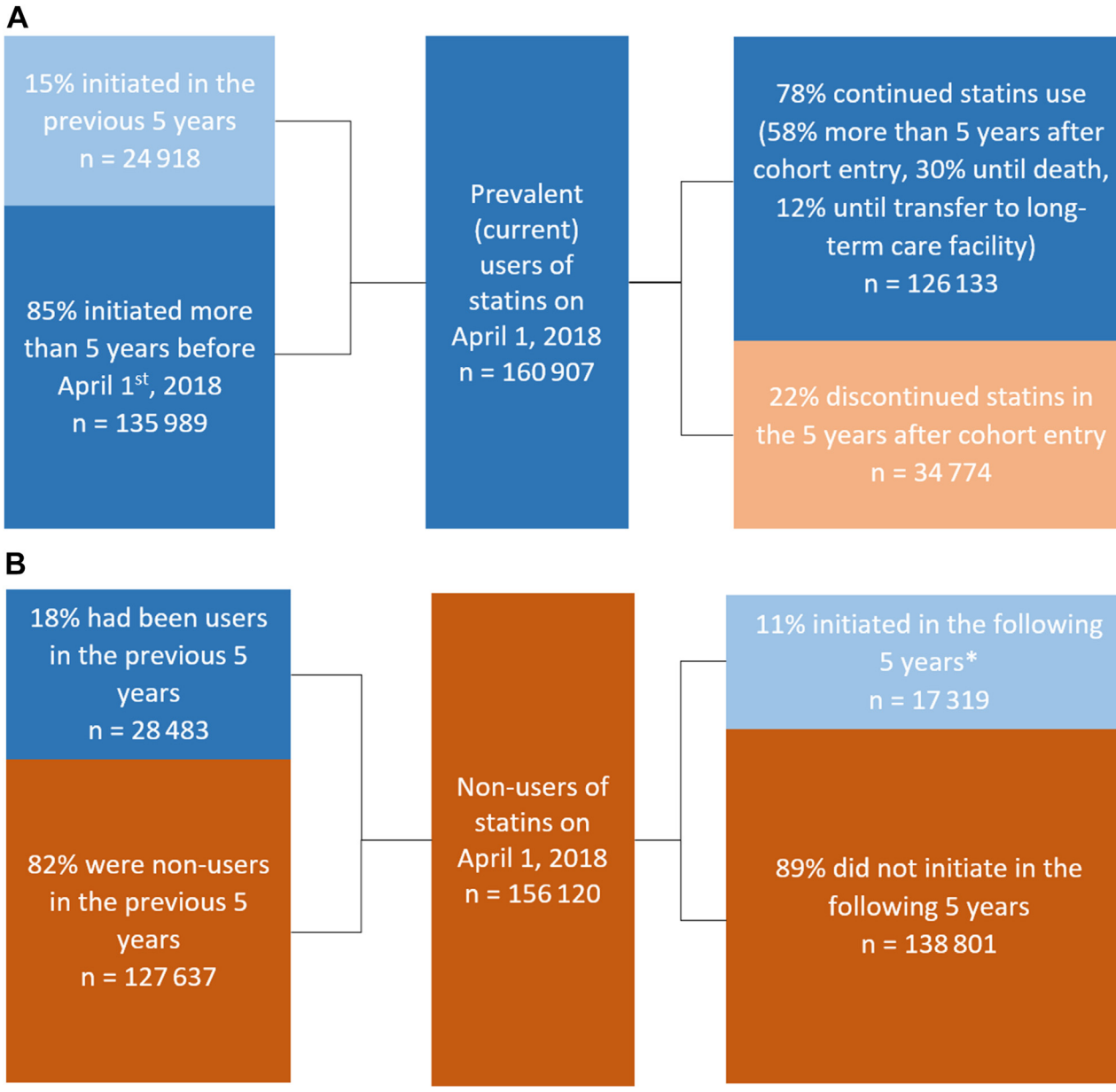

Figure 1. Patterns of statin use among the 2018 cohort, among prevalent users (A) and nonusers (B) on April 1, 2018. *Of these individuals, 78% continued statins until the end of follow-up. Among them, 72% remained users as of March 31, 2023 (n = 9654), 20% continued until death (n = 2727), and 8% until transfer to a long-term care facility (n = 1043). A proportion of 22% discontinued statins during follow-up, up to March 31, 2023 (n = 3895). Dark blue: prevalent use of statins; light blue: initiation of statins; dark brown: nonusers of statins; light brown: discontinuation of statins.

(3.42–3.89) for individuals aged 95 years or older. Men were less likely than women to discontinue their treatment (0.76 [0.74–0.78]). Conditions such as Alzheimer's disease (1.77 [1.71–1.82]) and mental illnesses (1.09 [1.05–1.14]) were associated with discontinuation. Conversely, patients with a history of cardiovascular disease were less compelled to cease treatment (0.69 [0.64–0.74]). However, those who experienced one or more emergency room admissions faced an increased likelihood of discontinuing statin therapy.

The supplemental analyses performed using the 2013 cohort yielded highly similar results (Supplemental Tables and Figures, Appendix 1).

Interpretation

The overall use of statins among individuals ≥80 years in Québec, Canada, has remained relatively stable over the past 15 years, with approximately half of this population using them. Age was the most significant factor associated with both initiation and discontinuation; older individuals were less likely to initiate statins and more likely to discontinue them. Likewise, men were more likely than women to initiate statins but less likely to discontinue them. Cardiovascular disease, coronary disease, and risk factors such as diabetes and hypertension, and prior statin use were strongly associated with

Table 2
Factors associated with the initiation or discontinuation of a statin treatment in the 2018 cohort

Factors	Initiation (n = 17,319)		Discontinuation (n = 34,774)	
	HR	95% CI	HR	95% CI
Demographics				
Age groups (y)				
80–84	1.00	–	1.00	–
85–89	0.74	[0.71;0.76]	1.54	[1.51;1.58]
90–94	0.49	[0.47;0.52]	2.32	[2.24;2.39]
≥95	0.26	[0.22;0.30]	3.65	[3.42;3.89]
Sex				
Females	1.00	ref	1.00	–
Males	1.44	[1.39;1.49]	0.76	[0.74;0.78]
Previous statin use				
No	1.00	ref	NA	
Yes	1.99	[1.93;2.07]	NA	
Residential area				
Urban	1.00	ref	1.00	ref
Rural	0.99	[0.95;1.03]	1.03	[1.00;1.06]
Unknown	0.88	[0.67;1.14]	1.25	[1.05;1.48]
Material deprivation index				
1 (least deprived)	1.00	ref	1.00	ref
2	1.00	[0.95;1.06]	0.97	[0.93;1.01]
3	1.03	[0.97;1.08]	0.99	[0.95;1.03]
4	1.04	[0.98;1.09]	0.96	[0.92;1.00]
5 (most deprived)	1.06	[1.01;1.12]	0.99	[0.95;1.03]
Unknown	0.92	[0.86;0.98]	1.06	[1.02;1.12]
Social deprivation index				
1 (least deprived)	1.00	ref	1.00	ref
2	0.97	[0.91;1.02]	1.04	[1.00;1.09]
3	0.96	[0.91;1.02]	0.99	[0.95;1.03]
4	0.99	[0.94;1.04]	0.99	[0.96;1.04]
5 (most deprived)	0.97	[0.92;1.03]	1.06	[1.02;1.11]
Comorbidities[a]				
Diabetes mellitus	1.29	[1.24;1.34]	0.97	[0.95;0.99]
Coronary disease	1.19	[1.02;1.39]	0.94	[0.88;1.01]
Hypertension	1.18	[1.14;1.22]	0.89	[0.86;0.92]
COPD	1.02	[0.98;1.06]	1.02	[1.00;1.05]
Stroke	1.02	[0.87;1.20]	1.11	[1.04;1.20]
Asthma	0.97	[0.92;1.02]	1.02	[0.98;1.05]
Mental illnesses	0.96	[0.90;1.02]	1.09	[1.05;1.14]
Osteoporosis	0.95	[0.92;0.98]	1.07	[1.04;1.09]
Heart failure	0.86	[0.82;0.92]	0.97	[0.94;1.00]
Alzheimer's disease	0.50	[0.47;0.54]	1.77	[1.71;1.82]
Personal history of cardiovascular disease	1.26	[1.07;1.49]	0.69	[0.64;0.74]
Health care use				
Hospitalization in previous year				
No	1.00	ref	1.00	ref
Yes (≥1)	0.89	[0.84;0.94]	1.07	[1.04;1.11]
Visits to family physician in previous year				
0	1.00	ref	1.00	ref
1–4	1.06	[1.01;1.11]	0.90	[0.87;0.94]
5–9	1.13	[1.07;1.20]	0.96	[0.92;1.00]
≥10	1.00	[0.921.08]	1.08	[1.031.14]
Visits to specialists in previous year				
0	1.00	ref	1.00	ref
1	1.09	[1.03;1.15]	0.91	[0.88;0.94]
2–5	1.21	[1.16;1.26]	0.85	[0.82;0.87]
≥6	1.24	[1.18;1.30]	0.85	[0.82;0.88]
Visits to emergency rooms in previous year				
0	1.00	ref	1.00	ref
1	1.06	[1.01;1.10]	1.09	[1.06;1.12]
2–5	1.06	[1.00;1.12]	1.24	[1.20;1.29]
≥6	1.07	[0.90;1.29]	1.53	[1.38;1.70]
Number of medications in previous year				
0–4	1.00	ref	1.00	ref
5–9	1.09	[1.05;1.13]	0.77	[0.73;0.80]
10–14	1.07	[1.02;1.13]	0.74	[0.71;0.77]

Table 2 (*continued*)

Factors	Initiation (n = 17,319)		Discontinuation (n = 34,774)	
	HR	95% CI	HR	95% CI
15–19	1.10	[1.03;1.18]	0.73	[0.70;0.77]
≥20	1.24	[1.13;1.36]	0.80	[0.75;0.85]

Abbreviations used: CI, confidence intervals; COPD, chronic obstructive pulmonary disease; HR, hazard ratio; NA, not applicable; ref, reference.

[a] Each comorbidity has its own reference, which is the absence of said comorbidity. For instance, the reference for hypertension would be no hypertension (HR: 1.00).

initiation, while Alzheimer's disease was a key factor linked to discontinuation.

The disproportionately lower utilization of statins with advancing age and in women reflects multifaceted factors that extend beyond clinical indications. Advancing age is often associated with increased multimorbidity, frailty, and concerns about polypharmacy, which may lead clinicians to adopt a more cautious approach to statin prescribing. However, this caution can contribute to undertreatment in selected older patients.[4] Similarly, lower statin use in women is well-documented and consistent with broader patterns of under-recognition and undertreatment of cardiovascular disease in female patients.[17,18] Addressing these disparities requires greater awareness of potential biases and a commitment to equitable, patient-centered care.

Our study is among the few to comprehensively explore the prescribing and discontinuation patterns of statins among individuals ≥80 years. A British study reported that while statin initiation remained limited in this population, overall statin use increased rapidly between 2001 and 2015.[19] It also revealed that men were more likely than women to be undergoing a statin treatment, a conclusion consistent with our findings, and that "frail" individuals were more prone to be prescribed statins.[19] Although our database lacks a frailty index, we observed that a higher number of medications and more visits to specialists in the previous year were associated with increased likelihood of statin initiation and reduced likelihood of discontinuation. While patients with more comorbidities are not necessarily frail, those who consult specialists or use multiple medications may represent a vulnerable subgroup, suggesting that our results align, at least partially, with the British study's findings.

Factors associated with statin discontinuation among older adults have been explored in a few studies. In a population of older Danish individuals (≥70 years), men were less likely to discontinue a statin treatment, and the older a patient was, the stronger the odds of discontinuation were.[10] These findings align with our own results. Given that men are at higher risk for coronary artery disease starting as early as age 45, prescribers may be more hesitant to discontinue statin treatment.[20] However, contrary to our findings and others,[21] dementia was associated with lower rates of discontinuation at all-time points in the Danish study.[10] While Alzheimer's disease may offer an opportunity to review and prioritize medications based on the patient's and family's goals, statin use has been shown to continue following a diagnosis of this condition.[22] To our knowledge, no study nor clinical guidelines specifically recommend discontinuing statins for patients with Alzheimer's disease. Therefore, clinicians may interpret the appropriateness of continuing treatment differently.

Given that the mean duration of statin use was 1.3 year for incident users, it is pertinent to question whether initial statin prescriptions as such an advanced age was justified. A recent meta-analysis suggested that 2.5 years of statin use are required to prevent one major adverse cardiovascular event per 100 adults aged 50 to 75 years in primary prevention.[23] This observation is of utmost importance, considering that statins represent a significant portion of health care expenditures and contribute to polypharmacy. Therefore, the cost-effectiveness of statin use in the older population, particularly for primary prevention, warrants further study. Additionally, approximately 30% of statin users either passed away or were admitted to long-term care facilities while still on statin therapy. In some of these cases, individuals may have exhibited characteristics—such as frailty, functional decline, or limited life expectancy—that would typically prompt a reassessment of statin use, suggesting potential missed opportunities for deprescribing.

Strengths and limits

This study provides a complete and up-to-date portrait of statin use among an older population. By including the entire community-dwelling population aged 80 years and older in the province of Québec, we minimized possible selection biases. Additionally, we took into consideration the death and transfer to a long-term care facility, allowing for a more nuanced understanding of statin usage patterns. However, lack of access to detailed clinical information in the administrative database remains a major limitation. Key variables such as LDL cholesterol levels, goal achievements, and adverse effects could not be assessed. As a result, the analysis reflects a population-level, public health perspective rather than a patient-centered clinical evaluation. Similarly, the specific reasons for statin prescription and discontinuation could not be assessed, as such information is not available in administrative databases. This limits the interpretation of prescription and cessation patterns, which may be influenced by a variety of clinical and nonclinical factors, including patient/family preference, life expectancy, or adverse effects. Complementary studies using prospective designs, patient or clinician surveys, or qualitative methods should explore these critical aspects. Finally, data on medication use in long-term care facilities were unavailable, precluding the possibility of studying statin use patterns in this setting.

Conclusion

Our study highlights that statin use remains prevalent among the population of 80 years and older, with little change

observed over the past 15 years. Initiation seemed to be mostly associated with younger age, male sex, and cardiovascular disease or associated comorbidities (hypertension, diabetes mellitus), whereas the determinants of discontinuation were mainly older age and Alzheimer's disease. The data raise important questions about whether prescribing and deprescribing criteria are being consistently applied. As the population ages and multimorbidity, frailty, and polypharmacy become increasingly common, further research is needed to clarify the benefits of statins and to inform public health initiatives. In the absence of robust clinical trial data for this age group, it appears essential to periodically reassess statin use based on individual patient characteristics and priorities, ensuring that treatment decisions are guided by a consistent and evidence-informed approach.

Disclosure

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Supplementary data

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