

Multiple medication use among seniors

Wayne J. Millar

Abstract

Objectives

This article examines the prevalence of medication use among Canadian seniors. Indicators of patient-physician and patient-pharmacist communication were also investigated.

Data source

Health Canada-sponsored supplementary questions to the 1994/95 National Population Health Survey (NPHS) were used in this analysis.

Analytical techniques

All estimates were weighted to represent the Canadian population on the date of the survey. Summary rates by sex were age-standardized to the estimated survey population for both sexes. Respondents who reported taking five or more drugs in the two days before their NPHS interview were considered to be multiple-medication users.

Main results

In 1994/95, 10% of Canadians aged 65 to 74, and 13% of those aged 75 and older were multiple-medication users. For certain drug-related information, there was a decline with advancing age in the percent of the population who reported that they received this information from their physician and from their pharmacist.

Key words

professional-patient relations, chronic disease, drug interactions, drug utilization, drug monitoring

Author

Wayne J. Millar (613-951-1631) is with the Health Statistics Division at Statistics Canada, Ottawa, K1A 0T6.

Although medications are intended to be salutary, they can be dangerous, particularly for the elderly. Elderly people are prone to drug-related problems such as inappropriate prescribing, adverse drug reactions and non-compliance with prescribed medications.¹⁻⁵ An estimated 10% to 30% of elderly hospital patients are admitted because of medication toxicity.⁶⁻⁷

Medication use by the elderly is an important quality-of-care issue related to preventable illness and death.⁸⁻⁹ One aspect of this issue is the simultaneous use of several medications. In 1994/95, 10% of Canadians aged 65 to 74, and 13% of those aged 75 and older were multiple-medication users; that is, they reported that they had taken five or more drugs during the two days before their interview for the National Population Health Survey (NPHS) (see *Methods*).

Methods

Data source

The National Population Health Survey (NPHS) is a longitudinal survey designed to collect information related to the health of the Canadian population over time. In 1994/95, it surveyed household residents in all provinces and territories, except persons living on Indian reserves, Canadian Forces bases, and in some remote areas. An institutional component of the survey, not included in this analysis, covered long-term residents of hospitals and residential care facilities. A more detailed description of the survey design, sample and interview procedures is found in published reports.¹⁰

The 1994/95 NPHS non-institutional sample for the provinces consisted of 27,263 households, of which 88.7% agreed to participate. After the application of a screening rule, 20,725 households remained in scope.

One knowledgeable person in every participating household provided general socio-demographic and health information about each household member. In total, data pertaining to 58,439 individuals were collected. (The data base containing these data is called the General file.)

In addition, one randomly selected person in each of the 20,725 participating households was chosen to provide in-depth information about their own health. In 18,342 of these households, the selected person was aged 12 or older. Their response rate to these in-depth health questions was 96.1%, or 17,626 respondents. (The data base containing in-depth health information as well as data from the General file pertaining to these respondents is called the Health file.) In the remaining 2,383 participating households, the randomly selected respondent was younger than age 12. In-depth health information was collected for these individuals as part of the 1994/95 National Longitudinal Survey of Children and Youth.

Of the 17,626 randomly selected respondents aged 12 or older, 14,786 were eligible members of the NPHS longitudinal panel. These respondents were also eligible for the Health Canada supplement. The response rate to these Health Canada-sponsored questions was 90.6%. (The data base containing information from the Health Canada supplement as well as data from the General and Health files pertaining to these respondents is called the Supplement file.)

Of the 17,626 randomly selected respondents aged 12 or older, the remaining 2,840 were sponsored by provincial governments that elected to enlarge the sample size in their province. These respondents will not be followed-up and were not eligible for the Health Canada supplement.

This article analyses data for the 10 provinces from the supplemental Health Canada-sponsored questions. The sample size of the supplement was 13,400 respondents. The sample analyzed in this article was 12,010 respondents aged 20 and older, 2,412 of whom were aged 65 and older.

Analytical techniques

All estimates were weighted to represent the national population on the date of the survey. Summary rates by sex were age-standardized to the estimated survey population for both sexes.

NPHS respondents were asked about their use of specific medications in the month before the survey. The list included: pain relievers; tranquilizers; diet pills; anti-depressants; codeine, Demerol or morphine; allergy medicine; asthma medications; cough or cold remedies; penicillin or other antibiotics; medicine for the heart; medicine for blood pressure; diuretics or water pills; steroids; insulin; pills to control diabetes; sleeping pills; stomach remedies; laxatives; hormones for menopause or aging symptoms; birth control pills; any other medication; or none of the above. Those who reported having taken any medication in the past month were asked to report the number of medications they took in the previous two days. In this article, having taken five or more different medications in those two days is considered multiple medication use. Those who reported not having taken any medication in the past month were not asked the question about medication use in the previous two days. In this analysis, these respondents were assumed to have not taken any medication in the two days before their interview.

Limitations

Self-reports of medication use require accurate recall. Some older respondents may have trouble remembering. This difficulty may be related to the lack of formal employment or regular events that help structure memory. Recall may also be affected by disease, use of alcohol, or the actual use of medications. It has been estimated that older people may under-report the number of drugs they take daily by 20% to 30%.^{11,12}

Even light or moderate drinking can place older adults at clinical risk, especially when they are also taking prescription and over-the-counter medications.¹³ However, the risk associated with combining medication and alcohol depends on the context, the amount consumed during a drinking episode, and the timing of medication use.

Medication use higher among women

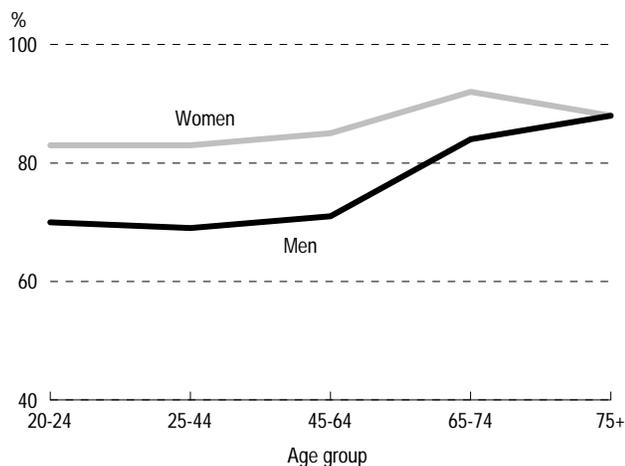
For both sexes, the proportion who reported taking medication in the month before their NPHS interview generally increased with age. The gradient was more pronounced among men than among women (Chart 1). However, in most age groups, a higher proportion of women reported taking medication. Among women, rates rose from 83% to 88% between ages 20 to 24 and age 75 and older. Among men, the corresponding rise was from 70% to 88%.

Previous studies also indicate that women generally use more medications than men,^{14,15} and that some of this difference may be attributed to the fact that women visit doctors more often than do men.¹⁶ Moreover, physicians are somewhat more likely to prescribe drugs to women.^{17,18}

Pain relievers—number one

The five drugs most commonly taken by people aged 65 and older were pain relievers, blood pressure medications, heart medications, diuretics, stomach remedies, and laxatives (Table 1). Although a higher proportion of senior women took medications in general, there were two exceptions. Heart medications and diabetes pills were used by a larger share of senior men than women.

Chart 1
Percentage who took medication, by sex and age group, provinces, 1994/95



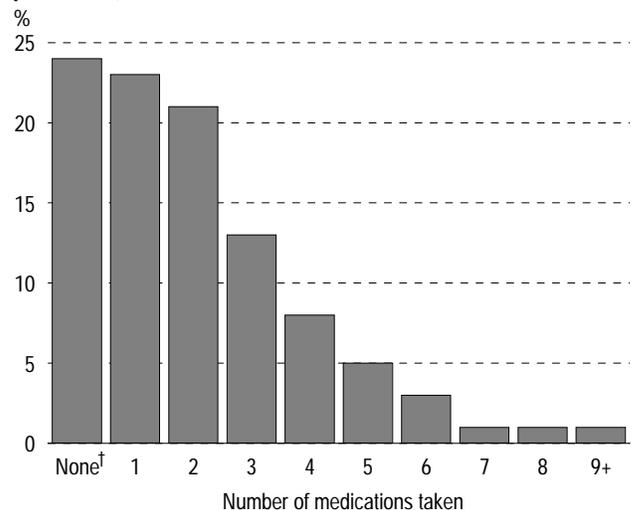
Data source: 1994/95 National Population Health Survey, Supplement file
Note: Data pertain to the month before the respondents' interview.

Table 1
Percentage who took medication, by sex and type of medication, population aged 65 and older, provinces, 1994/95

Type of medication	Both sexes	Men	Women
		%	
Pain relievers	60	56	62
Blood pressure	30	24	35
Heart medications	22	24	20
Diuretics	11	7	14
Stomach remedies	11	12	11
Laxatives	10	6	13
Cold/cough	8	8	8
Antibiotic	8	7	9
Sleeping pills	8	6	9
Diabetes pills	7	9	6
Tranquilizers	5	4	6
Asthma	5	6	5
Allergy	4	4	5
Anti-depressants	3	2	4
Codeine/Demerol/morphine	3	2	3
Insulin	3	3	3
Steroids	2	2	2
Hormones	7
Diet pills	--	--	--
Any other medication	15	13	18

Data source: 1994/95 National Population Health Survey, Supplement file
Note: Data pertain to the month before the respondents' interview. Data are age-standardized to the 1994/95 Canadian population (both sexes).
-- Amount too small to be expressed
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Chart 2
Number of medications taken, population aged 65 and older, provinces, 1994/95



Data source: 1994/95 National Population Health Survey, Supplement file
Note: Data pertain to the two days before the respondents' interview. Excludes respondents who did not state number of medications taken.

† Those who reported not having taken any medication in the past month were not asked about medication use in the previous two days. These respondents were assumed to have not taken any medication in the two days before their interview. These responses were coded "zero" and were assigned to the "none" category.

Older people are more sensitive to drugs that affect the central nervous system.^{19,20} Even a single dose of a psychotropic drug has been found to impair psychomotor function in the elderly to a much greater extent than in the young. Consequently, the use of psychotropic drugs has been associated with an increased risk of falls and hip fractures among the elderly.^{21,22} According to the 1994/95 NPHS, the percentage of seniors who used tranquilizers in the two days before their interview (6% of women and 4% of men) is relatively small and similar to the rate reported in the 1989 National Alcohol and Drug Survey.²³

Chronic disease and medication use

Nearly a quarter of all seniors reported taking no medication during the two days before their NPHS interview (Chart 2). However a considerable proportion of seniors were multiple-medication users: 10% of Canadians aged 65 to 74 and 13% of those aged 75 and older took five or more medications in the two days before their interview (Table 2).

Table 2
Number of medications taken, by sex and age group, provinces, 1994/95

	Popu- lation	Number of medications taken				
		None†	1	2	3-4	5+
	'000	%				
Both sexes	20,517	54	24	12	8	3
20-44	11,321	65	24	7	3	1
45-64	5,953	48	24	15	10	3
65-74	2,066	26	24	22	19	10
75+	1,178	21	22	20	24	13
Men	10,004	64	20	8	6	2
20-44	5,639	75	18	5	2	1
45-64	2,966	59	22	11	7	1
65-74	934	32	23	18	18	9
75+	465	24	25	15	23	12
Women	10,514	44	28	15	9	4
20-44	5,682	56	31	9	3	1
45-64	2,987	38	26	19	13	5
65-74	1,132	21	25	25	20	10
75+	713	18	21	23	24	14

Data source: 1994/95 National Population Health Survey, Supplement file
Note: Row percentages may not sum to 100% because of rounding. Data pertain to the two days before the respondents' interview. Excludes respondents who did not state number of medications taken.
 † Those who reported not having taken any medication in the past month were not asked about medication use in the previous two days. These respondents were assumed to have not taken any medication in the two days before their interview and were assigned to the "none" category.

Moreover, 20% of seniors who are multiple medication users were also daily drinkers. Alcohol has the potential to interact with at least half of the most commonly prescribed drugs and can exacerbate problems caused by multiple medication use.²⁴⁻²⁷

The presence of chronic diseases implies the use of medications to treat the conditions and the consequent risk of drug interactions.^{6,20} As expected, substantial proportions of elderly multiple medication users had been diagnosed with a chronic disease. Among men with a diagnosed chronic

Table 3
Number of medications taken, by sex and diagnosed disease, population aged 65 and older, provinces, 1994/95

	Popu- lation	Number of medications taken			
		None†	1-2	3-4	5+
	'000	%			
Both sexes with:					
Heart disease	559	4	26	37	33
Diabetes	372	7	30	32	31
Asthma	164	11	33	33	23
Hypertension	946	5	43	31	21
Chronic bronchitis	230	15	33	34	19
Arthritis	1,311	14	45	26	16
Back problem	586	18	43	25	14
No chronic disease	591	56	39	5	--
Men with:					
Heart disease	264	5	27	36	32
Diabetes	193	9	32	29	30
Asthma	74	14	24	34	28
Chronic bronchitis	120	14	38	25	23
Hypertension	347	8	41	30	21
Arthritis	480	20	39	26	15
Back problem	253	29	37	23	10
No chronic disease	289	61	35	4	--
Women with:					
Heart disease	295	4	25	38	34
Diabetes	180	4	29	34	32
Hypertension	599	3	44	33	21
Asthma	89	7	40	32	21
Back problem	333	10	49	26	16
Arthritis	832	11	49	25	16
Chronic bronchitis	110	16	29	41	14
No chronic disease	302	50	43	6	--

Data source: 1994/95 National Population Health Survey, Supplement file
Note: Row percentage may not sum to 100% because of rounding. Data pertain to the two days before the respondents' interview. Data are age-standardized to the 1994/95 Canadian population (both sexes). Excludes respondents who did not state number of medications taken.
 † Those who reported not having taken any medication in the past month were not asked about medication use in the previous two days. These respondents were assumed to have not taken any medication in the two days before their interview and were assigned to the "none" category.
 -- Amount too small to be expressed

condition, the highest prevalence of multiple medication use was among those with heart disease, diabetes, and asthma (Table 3). For women, hypertension and asthma both ranked third.

Seniors tend to receive less information

Good communication about drugs between patients and their physicians and pharmacists is an important component in reducing the negative consequences of medication use. The continuity of these relationships is particularly important. Recent research has shown that the risk of inappropriate drug combinations increases with the number of physicians prescribing medications. The practise of visiting a single primary care physician and a single pharmacy may prevent inappropriate drug combinations.²⁸

Table 5
Selected indicators of patient-physician communication about medication, by age group and sex, provinces, 1994/95

Physician explained...	Both sexes	Men	Women
	%		
what medication was for	93	93	93
20-44	93	93	93
45-64	93	93	93
65-74	92	92	91
75+	91	93	89
how much and when to take	82	83	82
20-44	83	84	82
45-64	84	85	84
65-74	78	78	77
75+	73	70	75
what medication should do	81	84	79
20-44	83	86	80
45-64	82	86	79
65-74	77	82	73
75+	74	74	74
possible side effects	55	56	54
20-44	56	57	55
45-64	57	58	56
65-74	52	55	50
75+	50	47	51
what not to eat or drink	55	58	52
20-44	55	59	53
45-64	57	60	54
65-74	51	54	48
75+	45	47	43
what activities to avoid	41	45	38
20-44	44	48	42
45-64	41	45	38
65-74	32	35	30
75+	28	32	26

Data source: 1994/95 National Population Health Survey, Supplement file
Note: Based on respondents who reported being prescribed medication in the 12 months before their interview.

Table 4
Percentage who always take a list of their prescription drugs to their physician or pharmacist, by age group and sex, provinces, 1994/95

	Both sexes	Men	Women
	%		
Always take list to physician	14	12	17
20-44	10	9	11
45-64	15	10	19
65-74	21	19	22
75+	29	26	31
Always take list to pharmacist	10	8	11
20-44	7	7	7
45-64	9	6	11
65-74	15	11	18
75+	20	17	22

Data source: 1994/95 National Population Health Survey, Supplement file
Note: Based on respondents who reported being prescribed medication in the 12 months before their interview.

Table 6
Selected indicators of patient-pharmacist communication about medication, by age group and sex, provinces, 1994/95

Pharmacist explained...	Both sexes	Men	Women
	%		
what medication was for	63	63	63
20-44	62	62	62
45-64	64	64	64
65-74	65	67	63
75+	61	57	64
how much and when to take	72	73	71
20-44	75	76	75
45-64	71	73	69
65-74	67	67	66
75+	61	58	62
what medication should do	57	57	56
20-44	57	57	57
45-64	57	58	55
65-74	57	58	56
75+	54	52	56
possible side effects	58	56	59
20-44	59	56	61
45-64	58	56	60
65-74	57	58	56
75+	49	45	52
what not to eat or drink	61	59	62
20-44	64	62	66
45-64	61	60	61
65-74	55	54	56
75+	52	50	54
what activities to avoid	44	44	44
20-44	48	47	49
45-64	43	44	42
65-74	36	39	34
75+	33	33	33

Data source: 1994/95 National Population Health Survey, Supplement file
Note: Based on respondents who reported being prescribed medication in the 12 months before their interview.

According to the NPHS, the vast majority of seniors maintain ongoing relationships with one physician and one pharmacy. Over 90% of people aged 65 and older reported always visiting the same doctor. Similarly, 90% of seniors reported always using the same pharmacy.

The NPHS asked respondents who had been prescribed a drug in the 12 months before their interview whether they took a list of currently used prescription drugs to the physician or pharmacist. Among people aged 65 to 74, 21% reported that they always take a list to their physician (Table 4). For those aged 75 and older, 29% said that they did so. By comparison, fewer reported always taking a list to their pharmacist: 15% and 20% for people aged 65 to 74 and 75 and older, respectively. In both cases, women were more likely than men to report that they always take a list.

The vast majority (93%) of adults who were prescribed a drug stated that the physician explained what the medication was for (Table 5). This was the case for both men and women in all age groups. However, for other drug-related information—how much and when to take the medication, what the medication should do, possible side effects, what not to eat or drink with the drug, and what activities to avoid when using the medication—there was a decline with advancing age in the percent of the population who reported that they received this information from their physician. A similar pattern was found for the information received from pharmacists. However, the percentages were lower for some items of information (Table 6). This differential has been noted in other research.²⁹

Physicians and pharmacists presumably exercise their judgement as to when drug-related information should be mentioned. Some people are prescribed a drug for many years and may be well aware of side effects and use recommendations. This may partly explain the decline in information provided about medication use as age increases. As well, respondent recall may be less accurate with advancing age.

Concluding remarks

Developments in information technology may help overcome some of the dangers in multiple medication use. An information system that contains the drugs currently taken by an individual, their drug allergies, and other relevant health information could alert physicians and pharmacists to potential problems.³⁰ However, a number of logistic and administrative difficulties are associated with the development of such a system.³¹ A prescription drug monitoring system implies a central data base that would have to be maintained on an ongoing basis, be quickly responsive to the needs of physicians and pharmacists, and respect the confidentiality of patients.²⁸

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