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Understanding Family Physician Usage of Electronic Health Records in Canada: Results From the 2004 National Physician Survey

Introduction

As part of Canada's move to increase the use of technology to aid in the provision of health services, considerable funding and project initiatives have been announced both nationally and across provinces and territories. Nationally, Canada spent more per capita on healthcare information technology in 2005 than the United States, Australia, Germany, and Norway.¹ Since 2001, Canada Health Infoway has invested \$702 million in initiatives designed primarily to support the adoption of the electronic health record in Canada.²

The focus of several technological initiatives has been the development of an electronic health record (EHR). This has been defined as a private lifetime record of a patient's health history, which can be accessed in real-time by authorized health professionals situated at different geographic locations.³ The EHR brings multiple benefits, including immediate access to integrated patient information and diagnostic and laboratory results, reduced drug interaction and prescription errors, and reduced physician and patient travel time and costs.³

Many EHR-related initiatives have been announced in Canada; the following examples represent a few that have been announced in the past year. In May 2006, the government of British Columbia announced spending of \$150 million towards the creation of online computerized medical records for doctors.⁴ In April 2006, the government of Quebec announced an investment of \$547 million to digitize medical records so that a doctor anywhere in the province may view a patient's medical file on a computer screen.⁵ Also in 2006, the government of Newfoundland and Labrador announced a combined investment with Canada Health Infoway of \$14.5 million towards a computer system that allows diagnostic images to be viewed and transmitted electronically, enabling referring clinicians to review patient images in different cities.⁶

Analysis in Brief

Taking health information further

When Canadians turn to their health care system, their first point of contact is often a family physician. According to Statistics Canada's 2003 Canadian Community Health Survey, 23 million people, an estimated 86% of Canadians aged 12 and older, had a regular family doctor.⁷ Given the benefits and investments made in the EHR in Canada and the level of contact Canadians have with their family doctors, it is important to hear what family physicians are saying about their use of the EHR. What percentage of family physicians report using the EHR in delivering healthcare services to Canadians? Is the proportion the same or different across provinces and territories? Do greater numbers of family physicians in remote rural areas use the EHR to share patient information? Given that established physicians may not have used the EHR throughout many years of previous clinical practice, are older family physicians less likely to use the EHR?

This *Analysis in Brief* presents data on the percentages of family physicians that reported using EHR, offering a pan-Canadian perspective based on a national survey of physicians carried out in 2004. This report also looks at differences in the proportions of family physicians using EHR by age, sex, jurisdiction, across urban and rural locations, and patient-care settings.

Data Sources

2004 National Physician Survey (NPS). The NPS Database contains information provided by the 21,296 physicians who replied to the 2004 National Physician Survey. All family/general practitioners and specialist physicians in Canada were contacted. The College of Family Physicians of Canada, the Canadian Medical Association, and the Royal College of Physicians and Surgeons of Canada carried out the NPS. Detailed survey information, including methodology, questionnaires, and results, is available on the NPS website at www.nps-snm.ca.

Methodology

The 2004 National Physician Survey asked family physicians to indicate their usage of the EHR, as well as their usage of electronic interface systems to external pharmacy, hospital, and/or laboratory systems for the purposes of sharing patient information. We have used these questions to explore use and non-use of EHR and electronic interfaces.

Questionnaire items. Analysis evaluating the use of EHR is based on the 2004 questionnaire, which asked physicians to indicate their use of "electronic patient health records". Those indicating that they "use it" or "have it on a PDA (personal digital assistant)" were categorized as "users" of EHR.

Analysis evaluating the use of electronic interfaces is based on the following three questions asking about the use of “electronic interfaces to external (1) pharmacy/ pharmacist, (2) laboratory/ diagnostic imaging, (3) other systems (e.g. hospitals, other clinics) for accessing or sharing patient information”. Those reporting that they “use it” or “have it on a PDA” for any of the three questions were categorized as “users” of electronic interfaces.

Analyses revealed that most respondents viewed the response categories as a hierarchy and therefore responses were forced in the “use it” category if “have it on a PDA” was indicated, necessitating only an examination of the “use it” response category. Results are self-reported; therefore interpretation of the questionnaire items may have varied by respondent.

Non-response. In total 11,041 family/general practitioners replied to the 2004 National Physician Survey. In analyzing the data, 26.0% of family/general practitioners did not complete the questions on EHR and electronic interfaces. To determine the impact of including or excluding non-responders from our analysis, the demographic profiles of non-respondents was compared to “users” and “non-users” of EHR and electronic interfaces. This analysis indicated that non-respondents tended to follow a normal distribution and did not resemble the profile of either “users” or “non-users”, thus no inferences could be made as to whether or not non-respondents use or do not use EHR. To this end, non-response data was removed from the analysis, as they did not provide any additional value to the profiling of “users” and “non-users” of EHR and electronic interfaces. More information on the impacts of non-response rates can be found in CIHI’s Analysis in Brief released in May 2005: *“2004 National Physician Survey Response Rates and Comparability of Physician Demographic Distributions with those of the Physician Population.”*

Table 1. Family Physician (FP) Use of EHR Including and Excluding Non-Respondents

Non-response included						Non-response removed				
Jurisdiction	FP respondents using EHR	FP respondents not using EHR	FP respondents: EHR use not indicated	Total number of FP respondents	Percent of FPs using EHR	Jurisdiction	FP respondents using EHR	FP respondents not using EHR	Total number of FP respondents	Percent of FPs using EHR
N.L.	53	123	53	229	23.1%	N.L.	53	123	176	30.1%
P.E.I.	4	33	21	58	6.9%	P.E.I.	4	33	37	10.8%
N.S.	66	247	103	416	15.9%	N.S.	66	247	313	21.1%
N.B.	45	188	80	313	14.4%	N.B.	45	188	233	19.3%
Que.	199	1,378	696	2,273	8.8%	Que.	199	1,378	1,577	12.6%
Ont.	726	2,318	1,110	4,154	17.5%	Ont.	726	2,318	3,044	23.9%
Man.	93	214	91	398	23.4%	Man.	93	214	307	30.3%
Sask.	38	232	80	350	10.9%	Sask.	38	232	270	14.1%
Alta.	319	598	257	1,174	27.2%	Alta.	319	598	917	34.8%
B.C.	258	999	374	1,631	15.8%	B.C.	258	999	1,257	20.5%
Y.T./N.W.T./Nun.	8	32	5	45	17.8%	Y.T./N.W.T./Nun.	8	32	40	20.0%
Canada	1,809	6,362	2,870	11,041	16.4%	Canada	1,809	6,362	8,171	22.1%

Notes:

Discrepancies in calculated percentages are due to rounding.
Source: 2004 National Physician Survey.

Family Physician Usage of EHR and Electronic Interface Systems in 2004

Jurisdictional breakdown. The results presented in Table 2 indicate that 22% of family physicians across Canada report using EHR. This is consistent with a 2006 study, which reported that approximately 20% of Canadian general practitioners use electronic medical records or other technology in clinical care⁸. Some variation in reported use of EHR exists jurisdictionally, with family physicians living in Alberta, Manitoba, and Newfoundland and Labrador being the most likely to say they use EHR (35%, 30%, and 30% respectively).

Table 2. Family Physician (FP) EHR Usage by Province/Territory, 2004

Jurisdiction	FP respondents using EHR	FP respondents not using EHR	Total number of FP respondents	Percent of FPs using EHR
N.L.	53	123	176	30.1%
P.E.I.	4	33	37	10.8%
N.S.	66	247	313	21.1%
N.B.	45	188	233	19.3%
Que.	199	1,378	1,577	12.6%
Ont.	726	2,318	3,044	23.9%
Man.	93	214	307	30.3%
Sask.	38	232	270	14.1%
Alta.	319	598	917	34.8%
B.C.	258	999	1,257	20.5%
Y.T./N.W.T./Nun.	8	32	40	20.0%
Canada	1,809	6,362	8,171	22.1%

Notes:

Discrepancies in calculated percentages are due to rounding.

Counts and percentages presented are only based on those responding to the questions about use of EHR and electronic interfaces.

Source: 2004 National Physician Survey.

Analysis in Brief

Taking health information further

Nationally, 34% of family physicians report using electronic interfaces to external pharmacy/pharmacist, laboratory/diagnostic imaging, or other systems (e.g. hospitals, other clinics), for accessing or sharing patient information. Again, reported use does vary by jurisdiction, with Newfoundland and Labrador, New Brunswick, and British Columbia family physicians being most likely to say that they are “users” of electronic interfaces (53%, 51%, and 45% respectively).

Table 3. Family Physician (FP) Electronic Interface Usage by Province/Territory, 2004

Jurisdiction	FP respondents using electronic interfaces	FP respondents not using electronic interfaces	Total number of FP respondents	Percent of FPs using electronic interfaces
N.L.	94	82	176	53.4%
P.E.I.	13	24	37	35.1%
N.S.	72	241	313	23.0%
N.B.	119	114	233	51.1%
Que.	491	1,086	1,577	31.1%
Ont.	1,024	2,020	3,044	33.6%
Man.	67	240	307	21.8%
Sask.	44	226	270	16.3%
Alta.	298	619	917	32.5%
B.C.	562	695	1,257	44.7%
Y.T./N.W.T./Nun.	10	30	40	25.0%
Canada	2,794	5,377	8,171	34.2%

Notes:

Discrepancies in calculated percentages are due to rounding.

Counts and percentages presented are only based on those responding to the questions about use of EHR and electronic interfaces.

Source: 2004 National Physician Survey.

Urban versus rural location.ⁱ Table 4 results suggest that EHR and electronic interface usage patterns of urban versus rural family physicians are similar across Canada as a whole, and strong similarities also exist by region.

Table 4. Family Physician (FP) EHR and Electronic Interface Usage by Urban/Rural Location, 2004

Use of EHR						Use of Electronic Interfaces					
Region	Urban/Rural	FP respondents using EHR	FP respondents not using EHR	Total number of FP respondents	Percent of FPs using EHR	Region	Urban/Rural	FP respondents using electronic interfaces	FP respondents not using electronic interfaces	Total number of FP respondents	Percent of FPs using electronic interfaces
Atlantic	Urban	121	419	540	22.4%	Atlantic	Urban	212	328	540	39.3%
	Rural	32	124	156	20.5%		Rural	66	90	156	42.3%
Quebec	Urban	148	1,048	1,196	12.4%	Quebec	Urban	400	796	1,196	33.4%
	Rural	27	213	240	11.3%		Rural	59	181	240	24.6%
Ontario	Urban	602	1,940	2,542	23.7%	Ontario	Urban	848	1,694	2,542	33.4%
	Rural	77	230	307	25.1%		Rural	120	187	307	39.1%
Prairies	Urban	335	809	1,144	29.3%	Prairies	Urban	317	827	1,144	27.7%
	Rural	69	132	201	34.3%		Rural	50	151	201	24.9%
B.C. and Territories	Urban	210	827	1,037	20.3%	B.C. and Territories	Urban	485	552	1,037	46.8%
	Rural	26	151	177	14.7%		Rural	60	117	177	33.9%
Canada	Urban	1,416	5,043	6,459	21.9%	Canada	Urban	2,262	4,197	6,459	35.0%
	Rural	231	850	1,081	21.4%		Rural	355	726	1,081	32.8%
	Other	118	284	402	29.4%		Other	125	277	402	31.1%
	Unknown	44	185	229	N/A		Unknown	52	177	229	N/A
	Total	1,809	6,362	8,171	22.1%		Total	2,794	5,377	8,171	34.2%

Notes:

Discrepancies in calculated percentages are due to rounding.

Counts and percentages presented are only based on those responding to the questions about use of EHR and electronic interfaces.

N/A = not applicable.

Source: 2004 National Physician Survey.

The greatest difference in reported percentages of urban and rural family physicians using EHR by region was a difference of 5 percentage points in British Columbia and the Territories: 15% of rural family physicians use EHR versus 20% of urban family physicians. In the case of electronic interfaces, compared to the other regions, British Columbia and the Territories family physicians again reported a higher difference across urban and rural settings, as well Quebec family physicians. In both of these cases, greater numbers of physicians reported using electronic interfaces in urban centres: 47% of urban versus 34% of rural family physicians in British Columbia and the territories, and 33% of urban versus 25% of rural family physicians in Quebec.

i. Location is based on physicians' self-reported primary practice population. *Rural* includes physicians who responded "rural" or "geographically remote/isolated". *Urban* includes physicians who responded "inner city", "urban/suburban" or "small town". *Other* includes physicians who responded that their primary practice population was "other" or who indicated more than one primary practice population.

Hospital versus office main patient-care setting.ⁱⁱ As indicated in Table 5, family physicians reporting that their main patient-care setting is in the hospital are considerably more likely to say they are “users” of EHR and electronic interfaces.

Table 5. Family Physician (FP) EHR and Electronic Interface Usage by Main Patient-Care Setting, 2004

Use of EHR					Use of Electronic Interfaces				
Main patient-care setting	FP respondents using EHR	FP respondents not using EHR	Total number of FP respondents	Percent of FPs using EHR	Main patient-care setting	FP respondents using electronic interfaces	FP respondents not using electronic interfaces	Total number of FP respondents	Percent of FPs using electronic interfaces
Office-based	1,145	4,629	5,774	19.8%	Office-based	1,797	3,977	5,774	31.1%
Hospital-based	516	1,223	1,739	29.7%	Hospital-based	833	906	1,739	47.9%
Other	116	387	503	23.1%	Other	124	379	503	24.7%
Unknown	32	123	155	N/A	Unknown	40	115	155	N/A
Total	1,809	6,362	8,171	22.1%	Total	2,794	5,377	8,171	34.2%

Notes:

Discrepancies in calculated percentages are due to rounding.

Counts and percentages presented are only based on those responding to the questions about use of EHR and electronic interfaces.

N/A = not applicable.

Source: 2004 National Physician Survey.

Across Canada, 30% of hospital-based family physicians reported using EHR compared to 20% of office-based family physicians. Similarly across Canada, 48% of hospital-based family physicians report using electronic interfaces compared to 31% of office-based family physicians. These results are not surprising, given that the EHR-related initiatives have been frequently announced in provincial hospitals.^{5, 6}

ii. Please note that hospital-based setting includes those indicating that their main patient-care setting is an academic health sciences centre, community hospital, and emergency department (community hospital or academic health sciences centre). Office-based setting includes those indicating that their main patient-care setting is a private office/clinic, community clinic/community health centre, and free-standing walk-in clinic.

Family physicians working in office-based settings were further analyzed to determine if usage of EHR and electronic interfaces differed between those in solo practices and those in practice arrangements where services are shared with other family physicians, such as group practice or practice networks. As shown in Table 6, a lower proportion of office-based family physicians in solo practice reported usage of EHR (14% compared to 22% who reported not being in solo practice) and electronic interfaces (27% compared to 33% who reported not being in solo practice).

Table 6. Family Physician (FP) EHR and Electronic Interface Usage by Office-Based Patient-Care Settings, 2004

Use of EHR					Use of Electronic Interfaces				
Office-based patient-care settings	FP respondents using EHR	FP respondents not using EHR	Total number of FP respondents	Percent of FPs using EHR	Office-based patient-care settings	FP respondents using electronic interfaces	FP respondents not using electronic interfaces	Total number of FP respondents	Percent of FPs using electronic interfaces
Solo practice	208	1,250	1,458	14.3%	Solo practice	386	1,072	1,458	26.5%
Not solo practice	929	3,349	4,278	21.7%	Not solo practice	1,399	2,879	4,278	32.7%
Unknown	8	30	38	N/A	Unknown	12	26	38	N/A
Total	1,145	4,629	5,774	19.8%	Total	1,797	3,977	5,774	31.1%

Notes:

Discrepancies in calculated percentages are due to rounding.

Counts and percentages presented are only based on those responding to the questions about use of EHR and electronic interfaces.

N/A = not applicable.

Source: 2004 National Physician Survey.

Breakdown by age. The results presented in Table 7 indicate that a greater proportion of younger family physicians aged 34 or younger indicate that they use EHR and electronic interfaces than family physicians aged 65 or older.

Table 7. Family Physician (FP) EHR and Electronic Interface Usage by Age Group, 2004

Use of EHR					Use of Electronic Interfaces				
Age Group	FP respondents using EHR	FP respondents not using EHR	Total number of FP respondents	Percent of FPs using EHR	Age Group	FP respondents using electronic interfaces	FP respondents not using electronic interfaces	Total number of FP respondents	Percent of FPs using electronic interfaces
< 35	298	833	1,131	26.3%	< 35	467	664	1,131	41.3%
35-44	524	1,888	2,412	21.7%	35-44	830	1,582	2,412	34.4%
45-54	589	2,105	2,694	21.9%	45-54	898	1,796	2,694	33.3%
55-64	310	1,125	1,435	21.6%	55-64	459	976	1,435	32.0%
65 +	66	313	379	17.4%	65 +	106	273	379	28.0%
Unknown	22	98	120	N/A	Unknown	34	86	120	N/A
Total	1,809	6,362	8,171	22.1%	Total	2,794	5,377	8,171	34.2%

Notes:

Discrepancies in calculated percentages are due to rounding.

Counts and percentages presented are only based on those responding to the questions about use of EHR and electronic interfaces.

N/A = not applicable.

Source: 2004 National Physician Survey.

Across age groups, changes among reported use only exist at the end of the spectrums. Reported use is consistent among family physicians aged 35-64 years for EHR and electronic interfaces.

Breakdown by sex. A slightly higher proportion of male family physicians report using EHR and electronic interfaces.

Table 8. Family Physician (FP) EHR and Electronic Interface Usage by Sex, 2004

Use of EHR					Use of Electronic Interfaces				
Sex	FP respondents using EHR	FP respondents not using EHR	Total number of FP respondents	Percent of FPs using EHR	Sex	FP respondents using electronic interfaces	FP respondents not using electronic interfaces	Total number of FP respondents	Percent of FPs using electronic interfaces
Male	1,135	3,720	4,855	23.4%	Male	1,699	3,156	4,855	35.0%
Female	651	2,572	3,223	20.2%	Female	1,064	2,159	3,223	33.0%
Unknown	23	70	93	N/A	Unknown	31	62	93	N/A
Total	1,809	6,362	8,171	22.1%	Total	2,794	5,377	8,171	34.2%

Notes:

Discrepancies in calculated percentages are due to rounding.

Counts and percentages presented are only based on those responding to the questions about use of EHR and electronic interfaces.

N/A = not applicable.

Source: 2004 National Physician Survey.

Summary

The results presented in this *Analysis in Brief* indicate that 22% of family physicians across Canada report using EHR in 2004, and 34% of family physicians report using electronic interfaces to external pharmacy/pharmacist, laboratory/diagnostic imaging, or other systems (e.g. hospitals, other clinics), for accessing or sharing patient information in 2004. Additional results were presented as follows:

- Use of EHR and electronic interfaces by family doctors was variable across province and the territories.
- Very similar proportions of urban and rural family physicians report using EHR and electronic interfaces across Canada. Strong similarities also exist by region.
- Family physicians identifying the hospital as their main patient-care setting are more likely to say that they use EHR and electronic interfaces than family physicians working in office-based settings. Furthermore, within office-based settings, family physicians in solo practices are the least likely to say they use EHR and electronic interfaces.
- Higher percentages of younger family physicians reported using EHR and electronic interfaces, compared with older family physicians.

A number of questions still remain when considering physician usage of the EHR. To what extent are physicians using other aspects of EHR, such as electronic reminder systems for recommended patient care, warning systems for adverse prescribing and drug interactions, electronic decision aids, and telemedicine? Given that the interest and resources being directed into EHR-related initiatives in Canada is increasing, will EHR use by physicians increase in the near future? Further research is needed to answer these questions.

Looking forward with the data already collected by the NPS survey, a future analysis could be conducted to profile the use of EHR and electronic interfaces among specialists.

Next year, the College of Family Physicians of Canada, the Canadian Medical Association, and the Royal College of Physicians and Surgeons of Canada will be conducting the 2007 National Physician Survey. The 2007 questionnaire will provide an invaluable source of information to better understand physician usage patterns of the EHR, as well as to better understand many other issues related to physician practice patterns and their patients' health needs.

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