Internal Migration of Canada’s Health Care Workforce: Summary Report—Update to 2006
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Established in 1994, CIHI is an independent, not-for-profit corporation that provides essential information on Canada’s health system and the health of Canadians. Funded by federal, provincial and territorial governments, we are guided by a Board of Directors made up of health leaders across the country.

Our Vision
CIHI’s vision is to help improve Canada’s health system and the well-being of Canadians by being a leading source of unbiased, credible and comparable information that will enable health leaders to make better-informed decisions.
Internal Migration of
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The analyses of the distribution and internal migration patterns of physicians are based on data from Scott’s Medical Database (SMDB).

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Introduction

Health care is a complex enterprise, relying heavily on the skills and efforts of many individuals. More than one million Canadians work directly in health occupations, which include a wide variety of both regulated and non-regulated health professions.¹

While the health human resources (HHR) workforce is relatively large in Canada, it is not evenly distributed geographically, relative to the distribution of the general population. As well, the distribution of health care providers is constantly changing and is influenced by both internal and external (international) migration. In 2007, recognizing that few studies had been undertaken to examine the geographical distribution or mobility of a wide variety of health care providers in Canada, the Canadian Institute for Health Information (CIHI) produced a series of publications on the distribution and internal migration of 15 groups of health care workers based on the occupational classification system² used by Statistics Canada. The results of these analyses, along with a summary report, may be downloaded from the CIHI website (www.cihi.ca).

The 2007 publications focused on internal migration—the movement of health care workers within provinces or territories and from one province or territory to another, using census data from 1991, 1996 and 2001, as well as annual data from Scott’s Medical Database (SMDB) for the years 1986 through 2004. It is important to note that the census occupational data employed in this report, and in the previous reports in the Distribution and Internal Migration series of publications, refers to the kind of work people were doing during the census reference week (that is, from Sunday to Saturday prior to the census enumeration dates) as well as to the work of those who were unemployed during the reference week but employed at some point between January 1 of the respective census year and the reference week. As a result, total numbers of health care providers in each occupational group reported were larger than what would be enumerated for the active labour force (that is, those people who worked specifically during the census reference week).

The present publication provides an update to the migration component of the 2007 work by incorporating data from the 2006 census and information from the SMDB for the period 2005 to 2007. A total of 25 health care occupational groups are included in the analyses. The data reported in the previous study was updated. The numbers representing migratory trends of physicians and the combined health care workforce during the previous migration periods (for figures 3, 5 and 6 as well as tables 1 and 2) reflect more current data from the SMDB.

The report provides

- Overviews of HHR internal (interprovincial and intraprovincial) mobility patterns, along with general population or workforce comparisons; and
The health professionals featured in this report are

- Registered nurses (including registered psychiatric nurses, head nurses and supervisors);
- Licensed practical nurses;
- Medical laboratory technologists and pathologists’ assistants;
- Medical laboratory technicians;
- Respiratory therapists, clinical perfusionists and cardio-pulmonary technologists;
- Medical radiation technologists;
- Medical sonographers;
- Audiologists and speech-language pathologists;
- Physiotherapists;
- Occupational therapists;
- Dentists;
- Dental hygienists and dental therapists;
- Dental assistants;
- Pharmacists; and
- Physicians (specialist physicians and family medicine physicians).

In addition, mobility counts and rates in aggregated and occupation-specific form were derived for the following:

- Nurse aides, orderlies and patient service associates;
- Cardiology technologists;
- Electroencephalographic and other diagnostic technologists;
- Denturists;
- Dental technologists, technicians and laboratory bench workers;
- Optometrists;
- Opticians;
- Chiropractors;
- Dietitians and nutritionists; and
- Ambulance attendants and other paramedical occupations.

The principal tables and figures that make up this update are in this summary report. Supplementary tables may be found in an online appendix at www.cihi.ca.
Agreement on Internal Trade

Over the past few years, the premiers of Canada, through the Council of the Federation (www.councilofthefederation.ca) and the Forum of Labour Market Ministers (http://flmm-lmi.org/), have sought to strengthen Chapter 7 (Labour Mobility) of the Agreement on Internal Trade (AIT) to achieve full labour mobility within Canada. On January 16, 2009, the first ministers endorsed an amendment to Article 701 of the AIT that “will enable any worker certified for an occupation by a regulatory authority of one Party to be recognized as qualified to practise that occupation by all other Parties.” The stated objective of the premiers was to reach full compliance with the existing labour mobility obligations of the AIT by April 1, 2009, with subsequent inter-jurisdictional agreements to follow.

It is far too early to measure the impact the amended AIT will have on interprovincial mobility rates or directions of flow for health care providers in Canada. However, the analyses and observations included in the present CIHI series of publications on HHR internal migration may be used as baseline information that may help monitor the impacts of the agreement on the future mobility and subsequent geographical distribution of health care professionals in Canada.
Highlights

Internal Migration

- Most health care provider workforces were more mobile than the general workforce during the migration periods under study; the majority of movements were from one community to another within the same province or territory (intraprovincial migration).

Interprovincial Migration Rates

- Overall, Canadian interprovincial health care workforce migration rates decreased; rates for health care workforces tended to be higher than those of the general Canadian workforce. Most provinces and territories experienced net losses of health care workers, but continuous losses (or gains) did not occur for any provinces for all occupational groups for all migration periods.

- For many health care provider groups, and especially for physicians, workforce proportions moving from one province or territory to another declined to some of the lowest levels in the past two decades.

Interprovincial Migration Destinations

- The principal destinations of interprovincial migrants tended to be larger magnet provinces (Alberta, British Columbia and, at one point, Ontario) and neighbouring provinces.

- Of the magnet provinces, Alberta superseded B.C. as the prime destination for the majority of interprovincial migrants in general, as well as for Canada’s health care workforces, from 1996 to 2001. Alberta continued to be the prime destination for interprovincial health care provider migrants from 2001 to 2006.

- Regarding neighbouring provinces, significant interchanges of health care workers continued to be experienced between, for example, Ontario and Quebec, Alberta and Saskatchewan, and Nova Scotia and all other eastern provinces.

Urban–Rural Migration

- For the general population, net rural in-migration occurred during the migration period 1991 to 1996. Out-migration was more the norm during the migration periods 1986 to 1991 and 1996 to 2001. During the migration period 2001 to 2006, the rates of rural in- and out-migration were nearly equal. Urban–rural migration patterns for the health care occupational groups were much more complex than those of the general population or the general Canadian workforce. Health care providers who began their migration journeys in an urban area in highly urbanized provinces (especially Quebec, Ontario and B.C.) were most likely to relocate to another urban area of the same province (intraprovincial migrants). For less urbanized (more rural) provinces, health care providers originating in rural areas often relocated to another rural area, either within the same province or in a different province. Even so, most migratory movements were from rural to urban areas of the country.
Internal Migration Patterns

Internal migration is the mobility pattern of Canada’s health care workforce; this is the focus of the reports in CIHI’s Internal Migration series. It includes movement from one community to another within the same province or territory (intraprovincial migration) and movement from one province or territory to another (interprovincial migration). Analyses in this study also pertain to movements of health care workers to and from rural and urban areas of the country.

The majority of the mobility patterns examined are based on the census long-form questionnaire, a 20% sample of Canadian households, which asked where all individuals in a selected household, age 15 and older, lived five years ago. As four censuses were used, the study included analyses of four five-year mobility or migration periods: 1986 to 1991; 1991 to 1996; 1996 to 2001; and 2001 to 2006. In addition to these five-year migration periods, one-year migration characteristics were assessed for physicians using information for 1986 to 2007 from Scott’s Medical Database.

Migration Composition

Migration composition identifies, for any point in time, the number or proportion of people in an area who can be classified as

- Non-movers/non-migrants: lived at the same address five years before or, if they did move, lived in the same community five years before;
- Intraprovincial migrants: lived in the same province/territory but in a different community five years before;
- Interprovincial migrants: lived in a different province/territory five years before; and
- International migrants: lived in another country five years before.

Supplementary Table A provides national and provincial/territorial migration composition percentages for both individual and groups of health care occupational workforces. As a summary, the national percentages for selected health occupational groups are illustrated for 1996 (Figure 1) and 2006 (Figure 2). These figures (resulting from migration activity for the migration periods 1991 to 1996 and 2001 to 2006) show the internal migrant (interprovincial and intraprovincial) percentages as proportions of the total numbers in the respective workforces. For ease of comparison, the value axes (percentage of the workforces) of the two figures have been set to a common value.

Some of the principal features of these figures are noted below:

- The general Canadian workforce was more mobile than the overall total population in both years shown.
- Most health care provider workforces were more mobile than the general Canadian workforce, especially as reported in the 2006 census, which identified movement patterns from 2001 to 2006.

i. Statistics Canada labels this category “external” migrants.
Of the individual groups shown in Figure 1, members of six health occupations were less mobile than the general Canadian workforce in 1996 (registered nurses and psychiatric nurses, licensed practical nurses, medical laboratory technologists, medical laboratory technicians, dentists and physicians). By 2006, only five of these were less mobile than the general Canadian workforce (registered nurses and psychiatric nurses, licensed practical nurses, medical laboratory technologists, dentists and physicians).

Intraprovincial migration involves movements from one community to another within the same province or territory. As indicated in both Figure 1 and Figure 2, this form of internal migration was the most common mode of mobility. In 2006, for example, intraprovincial movement rates of individual health care occupational groups ranged from approximately 12% to 19%, compared with a range of 2% to 7% for interprovincial migration.

As described elsewhere, for the general population up to 1996, as well as more recent work based on the 2006 census, the proportions of both intraprovincial and interprovincial migrants have decreased. Similar patterns can be seen for health care providers by comparing migration compositions over time (see Supplementary Table A; see also Figure 3, which compares one-year interprovincial mobility percentages for the general population and physicians).

In terms of interprovincial migrant compositions at the national level, most of the 2006 percentages (Figure 2) were lower or nearly identical to the percentages reported in 1996 (Figure 1). Slight increases (of less than one percentage point) were experienced for licensed practical nurses, medical radiation technologists, medical sonographers, occupational therapists and pharmacists. Additional national and provincial variations may be seen in Supplementary Table A.

Similarly, the proportions for intraprovincial movers decreased from 1996 to 2006 for the overall population and essentially for all of the workforces shown. Again, additional intraprovincial migrant composition patterns may be seen by examining Supplementary Table A.
Figure 1  Migrants as a Percentage of Total Population or Workforce (Based on Place of Residence Five Years Ago) for the Total Population, General Canadian Workforce and Selected Health Care Occupational Groups, Canada, 1996

Sources
Scott’s Medical Database, Canadian Institute for Health Information; Census of Population, 1996, Statistics Canada.
Figure 2  Migrants as a Percentage of Total Population or Workforce (Based on Place of Residence Five Years Ago) for the Total Population, General Canadian Workforce and Selected Health Care Occupational Groups, Canada, 2006

Sources
Scott’s Medical Database, Canadian Institute for Health Information; Census of Population, 2006, Statistics Canada.

Interprovincial Migration

Comparisons between the migration compositions for the migration periods 1991 to 1996 (Figure 1) and 2001 to 2006 (Figure 2) reveal that interprovincial migration in the general Canadian population decreased. The decreasing proportions of the general population who moved interprovincially are further illustrated in Figure 3. These proportions are based on one-year migration periods from 1986–1987 to 2005–2006.6

Figure 3 also includes the annual proportions of physicians who moved from one province or territory to another. These figures are consistent with the observation that “each year between 1 and 2% of active civilian physicians in Canada (excluding residents) migrate to another province or territory.”7 As seen in Figure 3, the provincial physician migration pattern differed from that of the general population. The interprovincial migration rates for physicians were relatively high during the 1980s and decreased until the mid-1990s. Unlike the general population, the proportions of interprovincial physician migrants rose again in the late 1990s and early 2000s. Figure 3 further illustrates that the proportion of physicians moving from one province or territory to another has declined to some of the lowest levels in the past two decades.
Figure 3  Percentages of the General Canadian Population and Physicians Who Were Interprovincial Migrants by One-Year Migration Periods, Canada, 1986–1987 to 2005–2006

Notes
Value axis does not start at zero.
The 2005–2006 percent of interprovincial migrants in the general population is an estimate made by Statistics Canada. Actual numbers are not yet available.

Sources
Physician data: Scott’s Medical Database, Canadian Institute for Health Information; general population data: Annual Demographic Statistics, 2005, Statistics Canada.

The difference between the number of persons who move into a region and the number of persons who move out of that same region is referred to as “net migration.” Many provinces experienced negative net migration of health care providers as more moved away from rather than to those provinces. Figure 4 provides a summary of the provincial net migration rates for the aggregate health care workforce during the migration periods 1991 to 1996, 1996 to 2001 and 2001 to 2006.

Overall losses (negative net migration) of health care providers associated with interprovincial migration in all three of those mobility periods are highlighted for the provinces of Newfoundland and Labrador, Quebec, Manitoba and Saskatchewan. With the exception of Saskatchewan, which had a higher rate, the negative net migration rates slowed during the migration period 2001 to 2006. New Brunswick might also be considered in this group of provinces, as its net migration rate went from zero to negative values during these time periods.
Overall gains (positive net migration) in all three of these time periods were only experienced in British Columbia. However, although more health care workers moved to rather than from B.C., its positive net migration rates decreased in magnitude. Positive or neutral net migration rates for the aggregate health care workforce were also experienced throughout this time period in Prince Edward Island.

The notable decrease in the magnitude of the positive net migration rate that B.C. experienced in the migration periods 1991 to 1996 and 1996 to 2001 occurred as net migration rates changed significantly for Alberta. Over these periods, net migration for Alberta switched from being a negative to a significantly high positive rate. In particular, Alberta became the principal destination for a large proportion of the individuals in the health care workforces who were interprovincial migrants in the 1996-to-2001 and subsequent migration periods. The importance of Alberta as a principal destination for interprovincial migrant health care providers is highlighted again in Table 1.

**Figure 4** All Health Care Occupational Groups: Net Interprovincial Migration Rates (Percent) by Province for the Migration Periods 1991 to 1996, 1996 to 2001 and 2001 to 2006

*Note*
Data from the territories has been suppressed due to small cell sizes.

*Sources*
Census of Population, Statistics Canada; Scott’s Medical Database, Canadian Institute for Health Information (physician data only).
In general, interprovincial migrants tended to relocate to larger magnet provinces (Ontario, Alberta and B.C.) or, secondly, to neighbouring provinces. The three most important provincial or territorial destinations for interprovincial migrants are identified in Table 1 for the three most recent migration periods examined in this study. The principal destinations were identified based on the magnitude of net interprovincial migration counts.

The dentist workforce is used to illustrate how that table was constructed. For the migration period 1991 to 1996, B.C. was the province or territory with the largest net gain (number of in-migrants from other provinces and territories minus the out-migrants from B.C.) of dentists. The provinces with the second- and third-largest net interprovincial migration counts during that same time frame were, in order, Ontario and Newfoundland and Labrador. During the migration period 1996 to 2001, the order was almost reversed, but with Alberta replacing Newfoundland and Labrador as a primary destination. Then, Alberta had the largest net gain of interprovincial migrant dentists. B.C. was still an important destination but, from 1996 to 2001, it had only the third-highest net gain of dentists through interprovincial migration.

In a Statistics Canada analysis of the mobility status of Canadians, based on the 2001 census, a heading proclaimed “we’re still heading west, but stopping at the Rockies.” Over the migration period 1996 to 2001, Alberta replaced B.C. as the destination of choice for many of Canada’s interprovincial migrants. This continued to be the case from 2001 to 2006.

The majority of health care workforces followed this pattern; however, a number of exceptions can be identified (Table 1). For instance, during the migration period 1991 to 1996, B.C. ranked as the most important destination for medical laboratory technologists, but by 2001, it was not one of the three most important destinations for members of this occupational group. Instead, Alberta was the prime destination, followed by Nova Scotia in the migration period 1996 to 2001. This order switched in the migration period 2001 to 2006, when Nova Scotia became the prime destination for interprovincial migrant medical laboratory technologists, followed by Alberta.

Much more detailed information about principal interprovincial destinations may be found in Supplementary Table B. That table identifies the provincial/territorial destinations with the three highest percentages of interprovincial migrants for each province for each health care provider group. Changes in the primary destinations may be observed in that table, as it highlights the interprovincial five-year flows for the migration periods 1986 to 1991, 1991 to 1996, 1996 to 2001 and 2001 to 2006.
Table 1  Provinces With Highest Positive Net Interprovincial Migration Counts for the

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<th>Province Count</th>
<th>Province Count</th>
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<td>General Population</td>
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<td>Alta. 103,030</td>
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<td>B.C. 77,755</td>
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<td>Al. 76,220</td>
<td>B.C. 11,605</td>
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<td>Occupational Therapists</td>
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<td>Ont. 95</td>
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<td></td>
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<td>Alta. 100</td>
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<tr>
<td>Dental Hygienists and Therapists</td>
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<td>Alta. 55</td>
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<td>Dental Assistants</td>
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<td>— The next province had a net interprovincial migration value less than zero.</td>
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<td>* Same migration count as for the top destination.</td>
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<td>† Same migration count as for the second top destination.</td>
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<td>‡ There are more provinces with same migration count.</td>
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<td>Sources</td>
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<td>Census of Population, Statistics Canada; Scott’s Medical Database, Canadian Institute for Health Information (physician data only).</td>
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</table>
The other side of the interprovincial migration story, net losses, is summarized in Table 2. There, for the general population and selected workforces, provinces were identified based on the magnitude of negative net interprovincial migration counts.

Quebec, Manitoba and Saskatchewan most commonly appear throughout Table 2 as the provinces with the greatest net losses of health care providers through interprovincial migration. The Atlantic provinces are also included, especially Newfoundland and Labrador in the later years of the study period. However, it must be noted that for some migration periods, larger provinces also experienced net losses. For example, in the migration period 2001 to 2006, Ontario was the province with the largest net loss of dental hygienists and respiratory therapists.

Table 2  Provinces With Highest Negative Net Interprovincial Migration Counts for the Migration Periods 1991 to 1996, 1996 to 2001 and 2001 to 2006

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Province Count</td>
<td>Province Count</td>
<td>Province Count</td>
</tr>
<tr>
<td>General Canadian Workforce</td>
<td>Ont. -37,790 Que. -21,390 N.L. -19,905</td>
<td>Que. -36,670 N.L. -27,330 B.C. -21,235</td>
<td>Ont. -20,625 Sask. -20,220 Man. -14,050</td>
</tr>
<tr>
<td>Licensed Practical Nurses</td>
<td>Alta. -65 Ont. -55 Que. -15</td>
<td>Ont. -190 Que. -70 Man. -40</td>
<td>Man. -105 N.B. -85 Ont. -50</td>
</tr>
<tr>
<td>Medical Laboratory Technologists</td>
<td>Alta. -55 N.S. -30 Que. -25</td>
<td>Que. -40 N.L. -20 N.B. -20</td>
<td>N.L. -55 Que. -35 Ont. -35</td>
</tr>
<tr>
<td>Medical Laboratory Technicians</td>
<td>Alta. -100 Sask. -50 N.S. -35</td>
<td>N.S. -30 N.L. -20 Man. -20</td>
<td>B.C. -90 Ont. -60 N.S. -20</td>
</tr>
<tr>
<td>Medical Radiation Technologists</td>
<td>Alta. -60 Man. -40 Que. -20</td>
<td>Man. -95 N.L. -50 Que. -50</td>
<td>Que. -45 Ont. -35 Man. -30</td>
</tr>
</tbody>
</table>
Table 2 Provinces With Highest Negative Net Interprovincial Migration Counts for the Migration Periods 1991 to 1996, 1996 to 2001 and 2001 to 2006 (cont’d)

<table>
<thead>
<tr>
<th>Province</th>
<th>County</th>
<th>Province</th>
<th>County</th>
<th>Province</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiotherapists</td>
<td>Que. -60</td>
<td>Man. -40</td>
<td>Ont. -40</td>
<td>N.S. -55</td>
<td>Que. -40</td>
</tr>
<tr>
<td>Occupational Therapists</td>
<td>Que. -75</td>
<td>Sask. -30</td>
<td>Man. -25</td>
<td>N.S. -90</td>
<td>N.B. -40</td>
</tr>
<tr>
<td>Dentists</td>
<td>N.S. -95</td>
<td>Que. -85</td>
<td>Sask. -70</td>
<td>Que. -145</td>
<td>Sask. -80</td>
</tr>
<tr>
<td>Dental Hygienists and Therapists</td>
<td>Ont. -200</td>
<td>Sask. -50</td>
<td>Que. -45</td>
<td>Sask. -55</td>
<td>Man. -45</td>
</tr>
</tbody>
</table>

Notes
* Same migration count as for the top donor province.
† Same migration count as for the second top donor province.
‡ There are more provinces with same migration count.

Sources
Census of Population, Statistics Canada; Scott’s Medical Database, Canadian Institute for Health Information (physician data only).

Rural–Urban Migration
In most intercensal periods since 1976, the population of rural and small-town Canada grew in absolute terms. However, that growth was at a slower rate than urban Canada’s. Part of the reason why rural areas of the country did not increase at a greater rate is that they often experienced negative net migration rates (Table 3).

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-Movers (Counts)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td></td>
<td>4,078,820</td>
<td>4,328,740</td>
<td>4,309,005</td>
<td>4,268,700</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td>15,203,385</td>
<td>16,485,095</td>
<td>17,724,720</td>
<td>19,380,625</td>
</tr>
<tr>
<td><strong>Internal Migrants (Counts)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural to Urban</td>
<td></td>
<td>554,515</td>
<td>469,990</td>
<td>545,435</td>
<td>512,580</td>
</tr>
<tr>
<td>Urban to Rural</td>
<td></td>
<td>552,465</td>
<td>545,675</td>
<td>498,540</td>
<td>512,655</td>
</tr>
<tr>
<td><strong>Total Net Migration to Rural</strong></td>
<td></td>
<td>-2,050</td>
<td>75,685</td>
<td>-46,895</td>
<td>75</td>
</tr>
<tr>
<td><strong>Migration Rates (Percent)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-Migration Rate</td>
<td></td>
<td>11.9</td>
<td>11.4</td>
<td>10.3</td>
<td>10.7</td>
</tr>
<tr>
<td>Out-Migration Rate</td>
<td></td>
<td>12.0</td>
<td>9.8</td>
<td>11.2</td>
<td>10.7</td>
</tr>
<tr>
<td>Net Migration Rate</td>
<td></td>
<td>-0.0</td>
<td>1.6</td>
<td>-1.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-Migration Rate</td>
<td></td>
<td>3.5</td>
<td>2.8</td>
<td>3.0</td>
<td>2.6</td>
</tr>
<tr>
<td>Out-Migration Rate</td>
<td></td>
<td>3.5</td>
<td>3.2</td>
<td>2.7</td>
<td>2.6</td>
</tr>
<tr>
<td>Net Migration Rate</td>
<td></td>
<td>0.0</td>
<td>-0.4</td>
<td>0.3</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Notes**

The in-migration rate is defined as the proportion of in-migrants from another statistical area type to the combined count of stayers, migrants between same type of statistical area and out-migrants from the specified statistical area type (that is, total number of dwellers in the specified statistical area type at the start of a migration period); the out-migration rate is defined as the proportion of out-migrants to the same combined count.

The difference between in-migration and out-migration rates (that is, net migration) may not be exactly as displayed due to rounding.

**Source**

Census of Population, Statistics Canada.

On the other hand, rates of rural out-migration were not constant. During the migration period 1986 to 1991, rural Canada had a net loss of only about 2,000 people age 15 and older. Rural—urban migration flow swung in the opposite direction from 1991 to 1996, with positive rural net growth (just fewer than 76,000 people) due to migration only, to return to a negative migration state from 1996 to 2001. During the migration period 2001 to 2006, almost an equal number of people moved from rural to urban and urban to rural areas of the country.
Studies that examine the detailed movements of Canadians to and from urban or rural areas of the country have been limited to date. This is especially the case for health care workforces. The information gap for the general Canadian population was filled, to some extent, by recent work of Statistics Canada analysts;\textsuperscript{10, 11} Table 3 was prepared using a modification of their methodology.\textsuperscript{iii} Similar computations were completed for the 25 individual health care occupational groups that are the subject of the analyses undertaken in CIHI’s \textit{Distribution and Internal Migration} project. Only one health care occupational group had a pattern of rural net migration rates that was identical to that of the general Canadian population. To show some of the variations in rural–urban migration patterns, rural net migration rates were plotted (Figure 5) for a selected number of health care occupational groups for the most recent five-year mobility periods. Supplementary Table C lists these rural and small-town net migration rates for all 25 health care occupational groups for all four of the migration periods under study.

Table 3 indicates that there was a negative–positive–negative–positive pattern of rural net migration rates (that is, net losses–net gains–net losses–net gains for rural Canada) for the general population for the migration periods 1986 to 1991, 1991 to 1996, 1996 to 2001 and 2001 to 2006, respectively. In summary, of all of the health care occupational groups reported on in the study

- Only medical radiation technologists had a rural net migration rate pattern that was similar to the general Canadian population.
- For members of four groups (physicians, dental assistants, opticians and nurse aides/orderlies), rural areas of the country experienced losses (negative net migration rates) in all four of the migration periods examined in this study.
- For members of four health care occupational groups (pharmacists, dentists, denturists and ambulance attendants/other paramedical occupations), rural Canada experienced net gains in all four migration periods.
- The remaining health care occupational groups had rural net migration rate patterns (in terms of net gains or net losses) that varied from one migration period to another. However, in general, they fell into one of two groups:
  - For the first of these remaining health care occupational groups, rural areas of the country experienced net losses in three of the four migration periods. This group included licensed practical nurses, occupational therapists, medical laboratory technologists, medical laboratory technicians, respiratory therapists, cardiology technologists, electroencephalographic technologists and dental technologists.
  - For the second of these groups, rural areas experienced net gains in three of the four migration periods for the following health care providers: registered nurses (including registered psychiatric nurses), audiologists/speech-language pathologists, physiotherapists, dental hygienists/therapists, optometrists, dietitians/nutritionists and chiropractors.

\textsuperscript{iii} An error was detected in the Statistics Canada methodology that was corrected here. Results from Table 3 should be used in place of the equivalent table previously published in the summary report of CIHI’s \textit{Distribution and Internal Migration} series of publications.
In enumerating the different patterns here, the emphasis is on the fact that rural and urban net migration rates for health care providers did not automatically follow those of the general population. As well, it is important to note that the direction of flow was not always simply from rural to urban areas of the country. Supplementary Table D provides details of these flows for all of the health care occupational groups for all four migration periods included in the present analysis. The notes below provide a summary of the principal themes that may be observed in Table D:

- Health care providers who migrated and originated from urban locations of highly urbanized (80% or more urban population) provinces (especially Quebec, Ontario and B.C., with Alberta increasingly showing the same trend as it became more urbanized) tended to move from one urban community to another urban community within the same province. If they did become interprovincial migrants, they tended to move to an urban community in the receiving province.

- Alberta is also highly urbanized and, overall, tended to follow the internal migration patterns described above. However, urban health care providers from this province were more likely to become interprovincial migrants (compared with the migrants from the three provinces listed above) and relocate to urban areas of a receiving province.
• Urban health care providers who migrated from less urbanized (more rural) provinces most often relocated in urban areas of other provinces rather than either urban or rural areas within their own province.

• Internal migrants from rural areas of the country also tended to move to urban areas, either within their own province or in a different province. However, those rural migrants from less urbanized provinces were more likely to relocate to another rural area (either within their own province or in another province) than the rural health care provider migrants originating from more urbanized provinces.

• Significant rural-to-rural migration occurred within Canada, although not in sufficient numbers to create positive rural net migration rates based solely on within-province movements. Rural-to-rural migration from one province to another was insufficient to compensate for overall rural-to-urban movements in a receiving province, which resulted in negative rural net migration.

• Migrant health care providers originating in the territories, whether from urban or rural areas, most often became interprovincial migrants and generally relocated in some provincial urban area, usually within a neighbouring province.

Previous summaries focused on the rural net migration rates and urban–rural flows that were observed using five-year migration periods. Analyses of the rural net migration rates for physicians were also undertaken using one-year migration periods from 1986–1987 through to 2006–2007.

Although Figure 5 and Supplementary Table C indicate that relatively high negative rural net migration rates were observed for physicians, the five-year migration periods mask the annual fluctuations in these rates. These one-year migration rates are shown in Figure 6.

Considering 12-month periods, the largest proportional loss of physicians from rural Canada occurred in 1986–1987, when the rural net migration rate was -4.9%. Relatively high but declining losses due to rural-to-urban migration of physicians continued until the mid-1990s. At that time, an almost equal number of physicians moved from rural areas as moved to rural areas in Canada. From the mid-1990s until the early 2000s, rural net losses of physicians increased. The rates of net losses seem to have stabilized in the last two years. For urban areas of the country, the inverse of these trends was observed, although the magnitude of the net migration rates was dampened because of the larger numbers of urban physicians who were non-migrants.
Figure 6  Net Migration Rates for Large Urban Centres and Rural and Small-Town Areas for Active Physicians for One-Year Migration Periods, Canada, 1986–1987 to 2006–2007

Sources
Census of Population, Statistics Canada; Scott’s Medical Database, Canadian Institute for Health Information (physician data only).
Methodological Notes

The principal analyses undertaken in this study are outlined here. More detailed descriptions of the methods employed may be found in the individual reports in the Distribution and Internal Migration series of documents published in 2007.

Data Sources

The geographical distribution and migration patterns of Canada’s health care providers were examined using custom tabulations from the Census of Population prepared by Statistics Canada. These data sets, from 1991, 1996, 2001 and 2006, were derived from the long-form questionnaires completed by one out of every five households in each of those census years.

With respect to occupations, the custom tabulations were received from Statistics Canada in Beyond 20/20 format. The following note was embedded in the 2006 data set: *Detailed definition: Refers to the kind of work persons were doing during the reference week, as determined by their kind of work and the description of the main activities in their job. If the person did not have a job during the week (Sunday to Saturday) prior to enumeration (May 16, 2006), the data relate to the job of longest duration since January 1, 2005. Persons with two or more jobs were to report the information for the job at which they worked the most hours.* Similar statements were included in the 1991, 1996 and 2001 data sets. As a result, total numbers of health care providers in each of the occupational groups reported here are often larger than what would be enumerated for the active labour force (that is, those persons who worked specifically during the census reference week). Therefore, the numbers in the analyses presented here include persons either employed or unemployed (during the respective census reference week) but who identified their occupations as one of the health care provider groups.

In addition, the analyses of physicians were based on information from Scott’s Medical Database (SMDB). Scott’s Directories ([www.MDSelect.com](http://www.MDSelect.com)) maintains a database on physicians to produce the Canadian Medical Directory and mailing lists for commercial purposes. CIHI acquires a copy of this database annually to update one of the physician databases—Scott’s Medical Database. For the purposes of enhancing data quality, CIHI also uses data from the Royal College of Physicians and Surgeons of Canada (RCPSC), the College of Family Physicians of Canada (CFPC) and the Collège des médecins du Québec (CMQ) to identify non-certified specialists and to rectify missing or erroneous data in the SMDB. For a more detailed description of the SMDB’s methodology, including data collection, inclusion/exclusion criteria, historical changes to the methodology and any data limitations, see the Methodological Notes of the latest Supply, Distribution and Migration of Canadian Physicians report available online at [www.cihi.ca](http://www.cihi.ca). The study included data from each of the individual years of that database from 1986–1987 to 2006–2007.

Results based on the data sets outlined above for health care workforces were compared with the distribution and mobility patterns of the general population. For these patterns, census data was also used, as were annual population estimates published by Statistics Canada.
Geographical Units of Analysis

Counts, percentages and health care provider-to-population ratios are reported in this study for the country as a whole, as well as for provinces and territories.

To illustrate some of the subprovincial and subterritorial variations, rural–urban comparisons for both geographical distribution and internal mobility characteristics were based on where the health care providers lived in terms of large urban centres and rural and small-town areas.

**Large urban centre (LUC) areas**
- Census metropolitan areas (CMAs) are very large urban areas with core populations of at least 100,000 people.
- Census agglomerations (CAs) are large urban areas with core populations that range from 10,000 to just less than 100,000 people.

**Rural and small-town (RST) areas**
- All communities located outside the boundaries of CMAs and CAs.

For all groups in the study (with the exception of physicians), LUC or RST attributions of addresses were provided by Statistics Canada. For physicians, geographic attribution of a specific postal code (existing in the SMDB data set) to an LUC or RST area was made using the Statistics Canada Postal Code Conversion File (PCCF), which enables the establishment of linkages in specific time periods. For the newest migration period, 2006 postal codes were linked to two PCCFs (dated March 2006 and March 2007), instead of one. This was done to include postal codes that were created between March 2006 and May 16 (2006 population census day) as well as postal codes that were deleted after this date.

Internal Migration

In census years that this study is based on, the long-form questionnaires included a question that asked where all individuals in a household, age 15 and older, lived five years ago. Based on results of this question, the five-year mobility status of Canadians can be determined and identified as follows:

Non-Mover and Non-Migrant
a) Non-mover: lived at the same address five years ago.
b) Non-migrant: lived at a different address but within the same community five years ago.

Migrant
a) Intraprovincial (internal) migrant: lived in a different community within the same province/territory five years ago.
b) Interprovincial (internal) migrant: lived in a different province/territory five years ago.
c) International or external migrant: lived outside of Canada five years ago.
The counts for each of these mobility status categories were provided by Statistics Canada for each of the geographical units previously described and for each health occupational group. Similar mobility categories for five-year and one-year migration periods were derived for physicians using the SMDB. For each of the health occupational groups included in the study, interprovincial, intraprovincial and rural–urban counts or rates were computed for the following migration characteristics:

- Migration composition: non-movers/non-migrants and migrants by migration category, expressed by counts or as a proportion of the total population of the relevant occupational group in specified geographical areas.

- Migration flows: counts and rates of the numbers of individuals moving from one province or territory to another (interprovincial migration); or from one community to another within the same province/territory (intraprovincial migration); or moving to and from RST and LUC locations (rural–urban migration).

- Migration destination: with a focus on interprovincial migration, the identification of the principal provincial or territorial destinations by provincial/territorial origins. Migration destination analyses also included measurements of the proportions of migrants who began their migration journeys from urban or rural areas of each province and relocated in urban or rural areas of the same province/territory (intraprovincial migrants) or urban or rural areas of a different province/territory (interprovincial migrants).

- Net migration: in-migration, out-migration and net migration counts and rates by province/territory and by RST/LUC areas of the country.
References


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