

# Re-accreditation and the occupations of immigrant doctors and engineers

by Monica Boyd and Grant Schellenberg

**T**he immigration policies of many countries stress the importance of having highly educated workers able to perform well in their knowledge economies. As such, they favour the admission of professionally trained immigrants. Upon their arrival, however, internationally educated professionals often have difficulty finding employment in their chosen careers.

Canada is no different than many other destination countries in this respect, and for many of the same reasons. New immigrants tend to be unfamiliar with the structure of local and national labour markets; they may not have social networks that could support their job search; they often lack language fluency; and they do not possess Canadian work experience. Professionals often encounter a further obstacle to finding appropriate work in their field of expertise: If they wish to be employed in regulated occupations – such as certain trades, law, engineering, and health – they must be certified and/or licensed through professional associations, which generally operate under government statutes.

The purpose of accreditation is to assure public health and safety. Whereas professionals trained in Canada have followed recognized programs of study, have validated work experience and a high command of the language of employment, immigrant professionals may face difficulties in having their degrees, work experience and/or language proficiency recognized.<sup>1</sup> The collision of national immigration policies with professional accreditation thus creates a paradox: while highly educated immigrants are recruited on the basis of their potential professional contributions to Canadian society, the re-accreditation requirements they must meet often act as barriers to the full utilization of their skills.

In recent years, the media have highlighted the particular difficulty of foreign-trained physicians who are unable to practice medicine in Canada. Foreign-trained engineers are another professional group encountering similar difficulties in practicing their profession. Using data from the 2001 Census of Population, this article documents the extent to which foreign trained physicians and

engineers are not employed in the occupations for which they studied.

## **The study of medicine versus the practice of medicine**

People who seek to practice as physicians in Canada must be licensed by the appropriate regulatory bodies in the provinces. For those who are internationally educated, basic medical knowledge must be evaluated, which in most cases means that they must pass the Medical Council of Canada's Evaluating Examination (MCCEE). This exam assesses the candidate's general medical knowledge in comparison with graduates of Canadian medical schools. A candidate is eligible to write it only if he or she has a medical degree that is listed with the World Health Organization or the International Medical Education Directory.

Passing the MCCEE does not automatically mean that a person is eligible to practice medicine. In most provinces, graduates of foreign medical schools are required to have two years of postgraduate medical training at a Canadian university to practice family medicine and

# GST What you should know about this study

This study analyzes data from the 2001 Census of Population.<sup>1</sup> The study population is restricted to those individuals who were age 32 to 54 at the time of the Census (May, 2001), and living in private households. The age group is chosen because the period between age 32 and 54 is the core of their productive working life for most people, when they are typically well-established in their careers. The age restriction also removes people who may have retired early. In addition, individuals who were enrolled as students during the eight months preceding the 2001 Census were excluded. This restriction removes people who may not have completed their studies and hence may not yet be qualified to work in their intended profession.

Following procedures used in previous studies<sup>2</sup>, individuals in the study population were grouped into one of three mutually exclusive categories: (1) those born in Canada; (2) those foreign born who immigrated before 19 years of age; and (3) those foreign born who immigrated when they were 28 years of age or older *and* who arrived in Canada before 1997. Individuals in the first two groups are assumed to have received their highest degree in Canada while those in the third group are assumed to have received their highest degrees elsewhere and to have been resident in Canada for at least four years by December 2000. Data for those born abroad but immigrating as children are included in the tables and charts, but for the sake of clarity will not be discussed in the text. They account for 11% of the study population of physicians (3,800 individuals) and 9% of the study population for engineers (11,700 individuals).

**Canadian born:** Those members of the study population born in Canada and presumed to have received their highest degree from a Canadian institution.

**Internationally educated/Foreign trained:** Those members of the study population who immigrated as adults (age 28 or older) and are presumed to have received their highest degree from a foreign institution.

**Medical doctors/Medical training:** Persons who had completed at least six years of university (at least five years of university in Québec), who had completed a medical degree, and whose highest degree was in the field of medicine.

**Engineers/Engineering training:** Persons who had completed four or more years of university (at least three years of university in Québec), received a bachelor's degree or higher, and whose highest degree was in the field of engineering.

**N.B.** These criteria describe the minimal expectations and protocols that are applied in Canada to new labour market entrants – both Canadian- and foreign-born – for professional training in medicine and engineering. By omitting from the analysis those who have fewer years of schooling by Canadian standards, and who thus might have additional difficulty in having credentials recognized, we are conducting a conservative test of what happens to foreign-trained professionals in the Canadian labour market.

For the sake of convenience, this article refers to the study population as doctors or engineers, but this does not necessarily mean these individuals have been licensed or accredited to practice their profession in Canada.

**Doctors:** General Practitioners and family physicians, specialist physicians

**Other health occupations:** Dentists, veterinarians, optometrists, and other professions and technical occupations related to health care; includes senior managers and managers.

**Engineers:** Professional engineers, including mechanical, electrical, computer, chemical, civil, mining, aerospace engineers, and so on.

**Managerial occupations:** Seniors managers and managers. (Engineers are often promoted to management jobs that they obtain because of their engineering credentials; therefore, this occupational category is included as being analogous to working as an engineer.)

**Technical occupations:** Information systems analysts, computer programmers, engineering/chemical/biological/forestry/geological/ technologists and technicians, inspectors and regulatory officials, and so on.

**Unrelated/All other occupations:** For physicians, all occupations *not* medical doctor or other health occupations; for engineers, all occupations *not* engineering, managerial or technical occupations.

For a full list of occupations included in each category, please consult the relevant sections of the NOCS2001 classification system.

## The model

The central analytical question in this article asks the extent to which internationally educated physicians and engineers are not employed in their chosen profession, compared to those who trained in Canada. Since a variety of factors can have an impact on employment outcomes, we use multivariate

## GST What you should know about this study – continued

analyses to adjust for the effects of sex composition, age, place of residence, visible minority status, language spoken at home, type of degree and years of university, and field of study. The results are shown as predicted probabilities, which are hypothetical chances out of 100 that an individual would be employed in an occupation, given certain characteristics.

1. Data for 2001 are the most recent at the time of publication. Occupation data will be available from the 2006 Census of Population in March 2008.

2. Boyd, M. 2001. "Asian Engineers in Canada", in *The International Migration of the Highly Skilled: Demand, Supply, and Development Consequences*. W. A. Cornelius and T. J. Espenshade (eds.) La Jolla, California: Center for Comparative Immigration Studies. Boyd, M. and L. Kaida. 2005. "Foreign Trained and Female: The Double Negative at Work in Engineering Occupations." Paper presented at the annual meeting of the Canadian Sociology and Anthropology Association, Learned Societies, London, Ontario, May 30, 2005. Boyd, M. and D. Thomas. 2001. "Match or Mismatch? The Labour Market Performances of Foreign-Born Engineers." *Population Research & Policy Review* 20: 107-133. Boyd, M. and D. Thomas. 2002. "Skilled Immigrant Labour: Country of Origin and the Occupational Locations of Male Engineers." *Canadian Studies in Population* 29(1): 71-99.

four to five years' training for other specialties. In addition, they must pass the appropriate certification examinations of the College of Family Physicians of Canada or the Royal College of Physicians and Surgeons of Canada. Foreign trained immigrants who have studied medicine face barriers to becoming licensed in part because of the small number of residencies available to non-Canadians. Applications from graduates of medical schools outside Canada are processed according to the policies established by each medical institution, but the overall number of applicants who are accepted is small.<sup>2</sup>

### On average, internationally educated doctors have been in Canada about 11 years

According to 2001 census data, there are about 5,400 individuals living in Canada who studied medicine in a foreign institution, arrived at age 28 or older, and are between the ages of 32 and 54. They account for 16% of the potential physicians available that year, that is, the pool of persons who meet the minimal educational requirements to practice medicine in Canada (see "What you should know about this study" for a description of those requirements).

Internationally educated individuals with medical fields of study are about

2.5 years older than the Canadian born; their average age is 45.8 years. They are relatively recent immigrants, having been in Canada about 10.8 years. They are more likely to live in the magnet cities: about half live in Toronto, Montreal or Vancouver, compared with just over one-third of doctors born in Canada. Half are members of visible minority groups, fifteen times the rate for Canadian born doctors. Over one-third were born in Asia and another one-fifth in Africa. Given that they come from such diverse regions of the world, it is not surprising that only about half speak English and/or French most often at home (Table A.1).

The foreign trained who studied medicine have fewer years of university schooling; they averaged 8.3 years of university education in contrast to 9.1 years reported by the Canadian born. While 12% of the foreign trained were not working at the time of the 2001 Census, only 2% of the Canadian born did not have employment.

Nevertheless, the most dramatic differences between the two groups arise when examining the occupations in which they were employed. Fully 90% of the Canadian born who studied medicine are working as physicians. In contrast only 55% of the internationally educated work as doctors; furthermore, 33%

are employed in occupations that are completely unrelated to either medicine or health care in general (Chart 1).

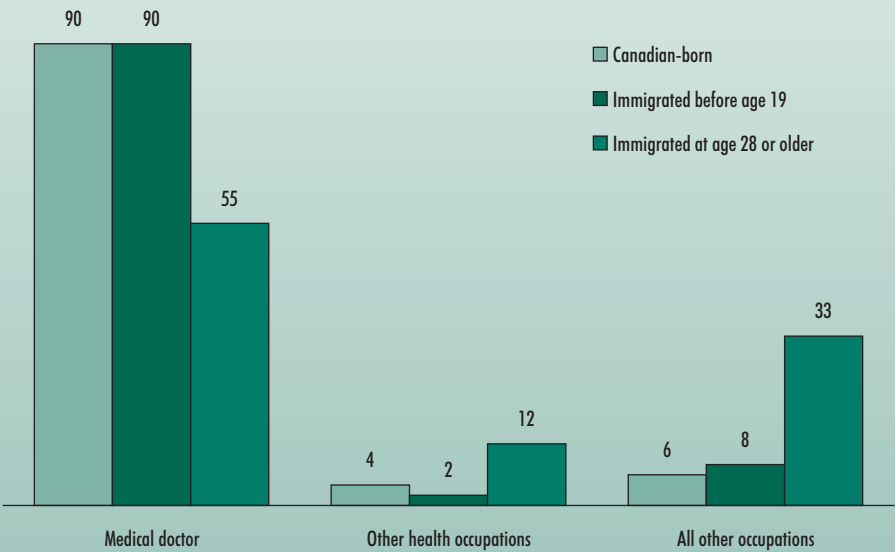
### Birthplace has most significant effect on chances of working as a doctor in Canada

As this brief profile clearly shows, internationally educated physicians constitute a highly heterogeneous group of individuals with widely varying characteristics. These characteristics can have a significant effect on the likelihood that a person will or will not find herself employed in her chosen profession.

Age is generally associated with higher status occupations because older workers usually have more labour market experience and this may increase the likelihood of working in one's chosen profession; on the other hand, age discrimination against older workers also may produce negative effects. Place of residence captures the effects of regional and local labour markets; large cities (CMAs) have more extensive knowledge based economies than smaller towns, and probably better employment opportunities. Language spoken at home is a proxy for fluency in Canada's official languages, since the ability to effectively use English or French not only enlarges employment opportunities but also

**Chart 1 Just over half of internationally educated doctors worked as physicians in 2001**

% of employed persons aged 32 to 54 with medical fields of study



Source: Statistics Canada, 2001 Census of Population.

employed as a medical doctor. The chances that a foreign trained doctor who arrived before 1980 would work as a physician were very similar to those of a Canadian born person who studied medicine, at 95% and 92%, respectively, when other factors are controlled for. However, the predicted probabilities of finding employment in their preferred profession decline for more recent arrivals. A foreign-trained physician who arrived in the early 1980s would have an 86% predicted probability of working as a doctor, but only a 70% probability if he or she had come in the early 1990s. In general, immigrants arriving in the 1990s and later have experienced greater labour market difficulties than those arriving in previous decades.

**Internationally educated engineers are older and better educated**

Canada’s emphasis on admitting high skilled workers can be seen in the number of foreign trained engineers who have been welcomed to this country. Approximately 34,100 engineers in the study population had immigrated as adults, and they accounted for over one-quarter of trained engineers aged 32 to 54 in Canada (Table A.2).

In order to be licensed as a professional engineer in Canada, a foreign trained person must formally apply to the appropriate provincial or territorial licensing body, pay the required fees, and meet all of its admission requirements. Among these requirements are the successful completion of a technical exam and a professional ethics exam; proof that the applicant has four years’ experience, including one year of Canadian work experience; and provision of references from Canadian professional engineers.

Internationally educated engineers are a little more mature than other engineers; with an average age of 44.5, they are almost 3 years older than their Canadian born counterparts. Almost one in five are women, twice the rate for the

is a requirement for medical re-certification in Canada.

Among those who immigrated as adults, one would expect that period of arrival and place of birth would be most important in determining whether or not they succeed in finding work as physicians. The reasons for this are easy to understand: Internationally educated doctors born in countries where English or French are spoken or taught intensively (for example, the US, the UK, North and West European countries) should have greater familiarity with Canada’s official languages. Similarly, doctors recently arrived in Canada may not yet be eligible to work as physicians because it takes time to complete exams and undertake any new training required for re-accreditation. Finally, the 1990s presented a less favorable labour market to all immigrants than earlier decades, and this may have affected the match between credentials and occupation.

Indeed, a multivariate regression shows that these personal characteristics are significantly associated with

the likelihood that a foreign trained person who studied medicine would actually practice medicine (see “What you should know about this study” for a more complete description of the technique). When all other variables in the model are controlled for, it is clear that those born in some regions have a better chance of finding employment as a physician.

A physician born in Canada, and assumed to have trained in a Canadian institution, would have a 92% predicted probability of working as a doctor. Taking all other variables into account, their internationally educated counterparts born in Africa or South Asia would also have very good chances, estimated at 85% and 87% respectively. In contrast, a foreign trained physician born in other regions of Asia or in Eastern Europe had the lowest hypothetical chances (less than 66 out of 100) of being employed in their chosen profession (Table 1).

The impact of period of arrival is not so markedly associated with the predicted probability of being

**Table 1 Foreign-trained doctors who are recent immigrants have much lower hypothetical chances of working as a physician**

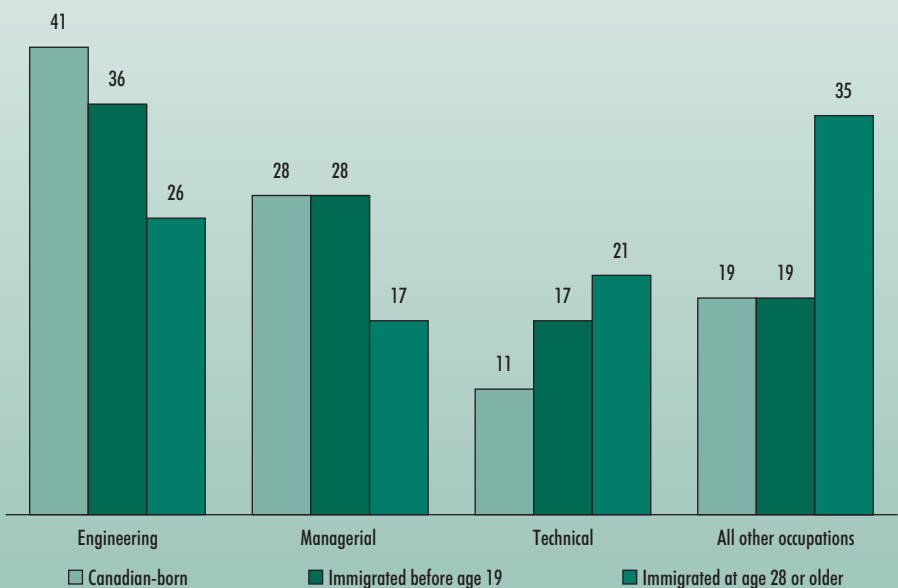
|   | Predicted probability of being employed in a health occupation <sup>1</sup> |                          |                       |
|---|---|--------------------------|-----------------------|
|   | Medical doctors   | Other health occupations | All other occupations |
| <b>Percent (distribution across)</b>      |   |                          |                       |
| Canadian-born                             | 92  | 4                        | 5                     |
| Immigrated before age 19                  | 92  | 2                        | 6                     |
| <b>Immigrated at age 28 or older</b>      |   |                          |                       |
| <i>Birthplace</i>                         |   |                          |                       |
| North America, Western Europe and Oceania | 79  | 8                        | 12                    |
| Eastern Europe                            | 65  | 18                       | 17                    |
| Caribbean, Central and South America      | 77  | 8                        | 15                    |
| Africa                                    | 85  | 4                        | 11                    |
| South Asia                                | 87  | 3                        | 10                    |
| South East Asia                           | 62  | 21                       | 17                    |
| East Asia                                 | 59  | 18                       | 23                    |
| West Asia                                 | 63  | 6                        | 31                    |
| <i>Immigration period</i>                 |   |                          |                       |
| Arrived before 1980                       | 95  | 1                        | 4                     |
| Arrived from 1980 to 1985                 | 86  | 8                        | 6                     |
| Arrived from 1986 to 1990                 | 76  | 7                        | 17                    |
| Arrived from 1991 to 1996                 | 70  | 11                       | 20                    |

1. Estimated chances out of 100 for persons aged 32 to 54 with highest level of schooling in medical fields of study when all other variables in the model are controlled for.

Source: Statistics Canada, 2001 Census of Population.

**Chart 2 More than half of foreign-trained engineers worked in technical occupations or jobs unrelated to engineering in 2001**

% of employed persons aged 32 to 54 with engineering fields of study



Source: Statistics Canada, 2001 Census of Population.

Canadian born, and over two-thirds of them live in Toronto, Vancouver or Montréal. Almost half are from Asian countries, and over one-quarter were born in Eastern Europe. Having emigrated from so many countries, foreign trained engineers represent a rich variety of cultures and it is no surprise that over two-thirds speak a language other than English or French in their homes. More than half are members of a visible minority group; in contrast, less than 3% of Canadian born engineers are visible minorities.

Many foreign trained engineers arrived in Canada during the 1990s; on average, they have been in the country for about 9 years. Unlike foreign trained physicians, engineers who studied abroad tend to be slightly more educated than the Canadian born, spending an average 5.4 years obtaining their credentials compared to 4.9 years.

Although internationally educated engineers are only marginally less likely to have been employed at the time of the 2001 Census, the occupations in which they worked are substantially different from those of the Canadian born. Only 26% of foreign-trained engineers hold jobs in engineering occupations, compared with 41% of Canadian-born engineers. And a far smaller proportion work in managerial occupations, at 17% and 28% respectively (Chart 2).

**Western-trained engineers more successful in matching education with occupation**

What underlies these differing occupational destinies of individuals who studied engineering? Personal characteristics play a role but, as with physicians, period of arrival in Canada and place of birth are key explanatory factors. Birthplace in particular is an important issue for engineers because the Canadian Council of Professional Engineers<sup>3</sup> has mutual agreements recognizing accredited engineering programs in some countries, including the US, the UK, France, Australia, New Zealand



and Hong Kong. These agreements should minimize the potential barriers to professional re-certification faced by individuals who received their education in those countries.

Indeed, the predicted probability that an internationally educated engineer born in North America, Europe or Oceania would be employed as an engineer is effectively the same as that of a Canadian born engineer – 39% compared to 40%. The chances are almost as high, all other factors being accounted for, for engineers born in South Asia or in the Caribbean or Latin America. On the other hand, the predicted probability is very low, at only 15%, for those born in South East Asia (Table 2).

Similarly, the hypothetical chances of being employed as an engineer are lower for those who arrived in Canada

more recently, once other factors are controlled for. An internationally educated engineer who arrived before the 1980s would have a substantially higher probability of working in his chosen field than one who arrived in the early 1980s (47% versus 35%); another ten years later, in the early 1990s, the predicted probability would have been only 31%.

### How being born in another country can influence job match in Canada

A professional's personal characteristics – level of education, field of study, language fluency, proximity to knowledge economy labour market, and so on – affect the likelihood of obtaining employment appropriate to his skills and training. But when he or she is an immigrant – and

especially if he or she has recently arrived – characteristics of the country of origin can also play a part in their success. Political or economic disruptions may mean a person cannot produce sufficient documentation for accreditation; for instance, during the 1990s, the number of immigrants accepted into Canada on humanitarian grounds increased.

Most importantly, though, for the professional seeking Canadian recertification are characteristics of the educational system in the source country: the length of schooling, the quality of education,<sup>4</sup> including the content of professional degrees and the requirements for specialized degrees, as well as the use of French or English in the educational system (or in major sectors of the economy).

The model in this study takes into account differences within the two study populations by controlling for individual characteristics and variations in group compositional structure. However, it is not possible to account for differences in source country characteristics that may affect an immigrant's training and work experience. Nevertheless, the findings do suggest that occupational differences between the Canadian born and the foreign born are related to certification requirements, which may not view programs of study in foreign schools as equivalent to those provided by Canadian schools.

### Summary

Census of Population data confirm that internationally educated physicians and engineers are less likely to find employment in occupations commensurate with their professional training. Underemployment is most common among foreign trained immigrants born in South East Asia and East Asia. Conversely, for those who received medical or engineering training outside Canada, the internationally educated born in European countries other than Eastern Europe or in South Asian



**Table 2 Birthplace has a significant impact on a person's hypothetical chances of working as an engineer**

|   | Predicted probability of being employed in an engineering occupation <sup>1</sup> |                        |                       |                       |
|---|---|------------------------|-----------------------|-----------------------|
|   | Engineering   | Managerial occupations | Technical occupations | All other occupations |
| <b>Percent (distribution across)</b>      |   |                        |                       |                       |
| Canadian-born                             | 40  | 28                     | 12                    | 21                    |
| Immigrated before age 19                  | 40  | 29                     | 13                    | 18                    |
| <b>Immigrated at age 28 or older</b>      |   |                        |                       |                       |
| <i>Birthplace</i>                         |   |                        |                       |                       |
| North America, Western Europe and Oceania | 39  | 20                     | 19                    | 23                    |
| Eastern Europe                            | 31  | 14                     | 24                    | 31                    |
| Caribbean, Central and South America      | 35  | 20                     | 14                    | 32                    |
| Africa                                    | 33  | 25                     | 14                    | 27                    |
| South Asia                                | 34  | 25                     | 12                    | 29                    |
| South East Asia                           | 15  | 11                     | 15                    | 58                    |
| East Asia                                 | 31  | 30                     | 17                    | 22                    |
| West Asia                                 | 27  | 35                     | 9                     | 29                    |
| <i>Immigration period</i>                 |   |                        |                       |                       |
| Arrived before 1980                       | 47  | 21                     | 11                    | 22                    |
| Arrived from 1980 to 1985                 | 35  | 26                     | 15                    | 24                    |
| Arrived from 1986 to 1990                 | 32  | 22                     | 16                    | 30                    |
| Arrived from 1991 to 1996                 | 31  | 17                     | 20                    | 32                    |

1. Estimated chances out of 100 for persons aged 32 to 54 with highest level of schooling in engineering fields of study when all other variables in the model are controlled for.

Source: Statistics Canada, Census of Population, 2001.

countries are the most likely to practice medicine or to work as engineers.<sup>5</sup> These findings are consistent with reports which stress that re-accreditation requirements are important factors mediating the labour market integration of the foreign trained.



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1. Both medical and engineering associations require demonstration of language proficiency for reasons of public safety. However, there can be significant disparities between licensing associations and applicants as to what constitutes acceptable levels of language "proficiency." Case studies reveal that professional immigrants are told that their language skills are insufficient when in fact they believe their language proficiencies are good. At issue here may be different perceptions over the number of words that are known or considered to represent a good level of language skills, the knowledge of technical terms used in Canada, and accent.
2. For the years 1996 to 1999, the number of international medical graduates (IMG) accepted in the second iteration of the resident match ranged from 11 to 35. Numbers rose thereafter, but in 2005 only 80 matches were made, involving IMG placements in Canadian medical schools. This represented 13% of the total number of foreign trained applicants who applied to the 2005 Canadian Resident Matching Service, and this rate is in general higher than observed in the early 1990s. ([www.carms.ca/jsp/main.jsp?path=.../content/statistics/report/re\\_2005#table23](http://www.carms.ca/jsp/main.jsp?path=.../content/statistics/report/re_2005#table23), accessed June 9, 2005; [www.carms.ca/eng/operations\\_R1stat\\_2005\\_e.shtml#imgs2nd](http://www.carms.ca/eng/operations_R1stat_2005_e.shtml#imgs2nd), accessed June 14, 2007). In 2006 and 2007, placements in the second iteration rose to 111 then fell to 69 foreign trained doctors respectively. However, following a motion agreed upon by the Association of Faculties of Medicine in Canada (AFMC), international medical graduates who meet the eligibility criteria are now permitted to apply to the first iteration in six out of eight provinces ([www.carms.ca/eng/r1\\_about\\_intro\\_e.shtml](http://www.carms.ca/eng/r1_about_intro_e.shtml), accessed June 15, 2007).
3. In February 2007, the Canadian Council of Professional Engineers changed its name to [engineerscanada/ingenieurscanada](http://engineerscanada.com).
4. Boyd, M. and D. Thomas. 2001. "Match or Mismatch? The Labour Market Performances of Foreign-Born Engineers." *Population Research & Policy Review* 20: 107-133; Sweetman, A. 2004. "Immigrant Source Country Educational Quality And Canadian Labour Market Outcomes." Analytical Studies Branch Research Paper Series, Statistics Canada, Catalogue no. 11F0019MIE No 234.
5. Alboim, N. and E. McIsaac. 2007. "Making the Connections: Ottawa's Role in Immigrant Employment." *Choices* Vol. 13, No. 3 (May) 2-24; Szafran, O., R. A. Crutcher, and S. R. Banner Mamoru Watanabe. 2005. "Canadian and immigrant international medical graduates." *Canadian Family Physician*, Vol. 51 September 2005: 1242-1243; Wanner, R.A. 1998. "Prejudice, profit or productivity: Explaining returns to human capital among male immigrants to Canada." *Canadian Ethnic Studies*, Vol. 30, No. 3: 24-32.

**Table A.1 Selected characteristics of the population aged 32 to 54, with medical fields of study, by age at immigration, 2001**

|   | Canadian-born                         | Age 0 to 18 | Age 28 or older | Total  |                                    | Canadian-born | Age 0 to 18 | Age 28 or older | Total |
|---|---------------------------------------|-------------|-----------------|--------|------------------------------------|---------------|-------------|-----------------|-------|
| Population                                | 24,485                                | 3,825       | 5,395           | 33,705 |                                    |               |             |                 |       |
|   | <b>Percentage (distribution down)</b> |             |                 |        |                                    |               |             |                 |       |
| <b>Sex</b>                                |                                       |             |                 |        | <b>Years since arrival</b>         |               |             |                 |       |
| Men                                       | 65                                    | 69          | 62              | 65     | Not applicable                     | 100           | ...         | ...             | 73    |
| Women                                     | 35                                    | 31          | 38              | 35     | 4 to 5                             | ...           | ...         | 18              | 3     |
| <b>Age</b>                                |                                       |             |                 |        | 6 to 10                            | ...           | ...         | 38              | 6     |
| 32 to 39                                  | 32                                    | 44          | 14              | 30     | 11 to 20                           | ...           | 6           | 38              | 7     |
| 40 to 49                                  | 51                                    | 41          | 56              | 50     | 21 years or more                   | ...           | 94          | 6               | 12    |
| 50 to 54                                  | 18                                    | 16          | 30              | 20     | <i>Average years since arrival</i> | ...           | 32.0        | 10.8            | ...   |
| <i>Average age</i>                        | 43.7                                  | 41.5        | 45.8            | 43.3   | <b>Highest level of schooling</b>  |               |             |                 |       |
| <b>Place of residence</b>                 |                                       |             |                 |        | Medical only                       | 87            | 87          | 75              | 85    |
| Montréal                                  | 16                                    | 10          | 10              | 14     | Medical and masters                | 10            | 9           | 14              | 10    |
| Toronto                                   | 12                                    | 27          | 30              | 17     | Medical and Ph.D.                  | 3             | 4           | 12              | 5     |
| Vancouver                                 | 7                                     | 12          | 11              | 8      | <b>Years of university</b>         |               |             |                 |       |
| Other census metropolitan areas           | 37                                    | 38          | 34              | 37     | 5 years <sup>1</sup>               | 6             | 2           | ...             | 5     |
| All other areas                           | 28                                    | 14          | 15              | 24     | 6 years                            | 13            | 13          | 30              | 16    |
| <b>Region of residence</b>                |                                       |             |                 |        | 7 years                            | 12            | 16          | 20              | 14    |
| Atlantic provinces                        | 8                                     | 5           | 5               | 7      | 8 years                            | 16            | 16          | 14              | 15    |
| Québec                                    | 32                                    | 12          | 13              | 27     | 9 years                            | 11            | 10          | 6               | 10    |
| Ontario                                   | 32                                    | 50          | 47              | 37     | 10 years                           | 13            | 11          | 10              | 12    |
| Manitoba and Saskatchewan                 | 6                                     | 5           | 6               | 6      | 11 years                           | 8             | 11          | 6               | 8     |
| Alberta                                   | 9                                     | 12          | 12              | 10     | 12 years                           | 9             | 8           | 6               | 8     |
| British Columbia                          | 13                                    | 16          | 16              | 14     | 13 years or more                   | 13            | 14          | 7               | 12    |
| Territories and Nunavut                   | 0.2                                   | 0.1         | 0.1             | 0.1    | <i>Average years of university</i> | 9.7           | 9.3         | 8.3             | 9.0   |
| <b>Visible minority status</b>            |                                       |             |                 |        | <b>Field of study</b>              |               |             |                 |       |
| No  | 97                                    | 56          | 50              | 85     | General practitioner               | 82            | 83          | 79              | 81    |
| Yes                                       | 3                                     | 44          | 50              | 15     | Specialist                         | 18            | 18          | 21              | 19    |
| <b>Home language</b>                      |                                       |             |                 |        | <b>Employment status</b>           |               |             |                 |       |
| Only English and/or French                | 99                                    | 91          | 54              | 91     | Not employed during reference week | 2             | 3           | 12              | 4     |
| Other languages                           | 0.5                                   | 9           | 47              | 9      | Employed during reference week     | 98            | 98          | 88              | 97    |
| <b>Birthplace</b>                         |                                       |             |                 |        | <b>Occupation</b>                  |               |             |                 |       |
| Canada                                    | 100                                   | ...         | ...             | 73     | Medical doctor                     | 90            | 90          | 55              | 85    |
| North America, Western Europe and Oceania | ...                                   | 44          | 20              | 8      | All other health occupations       | 4             | 2           | 12              | 5     |
| Eastern Europe                            | ...                                   | 6           | 16              | 3      | All other occupations              | 6             | 8           | 33              | 11    |
| Caribbean, Central and South America      | ...                                   | 6           | 6               | 2      |                                    |               |             |                 |       |
| Africa                                    | ...                                   | 9           | 22              | 5      |                                    |               |             |                 |       |
| South Asia                                | ...                                   | 10          | 9               | 3      |                                    |               |             |                 |       |
| South East Asia                           | ...                                   | 6           | 8               | 2      |                                    |               |             |                 |       |
| East Asia                                 | ...                                   | 16          | 14              | 4      |                                    |               |             |                 |       |
| West Asia                                 | ...                                   | 3           | 7               | 1      |                                    |               |             |                 |       |

... not applicable

1. Fewer years of schooling are required to obtain a bachelor's degree in Quebec.

Note: Figures may not sum to 100 due to rounding.

Source: Statistics Canada, 2001 Census of Population.



**Table A.2 Selected characteristics of the population aged 32 to 54, with engineering fields of study, by age at immigration, 2001**

|   | Canadian-born                         | Age 0 to 18 | Age 28 or older | Total   |                                       | Canadian-born | Age 0 to 18 | Age 28 or older | Total |
|---|---------------------------------------|-------------|-----------------|---------|---------------------------------------|---------------|-------------|-----------------|-------|
| Population estimate                       | 78,150                                | 11,670      | 34,150          | 123,970 |                                       |               |             |                 |       |
|   | <b>Percentage (distribution down)</b> |             |                 |         |                                       |               |             |                 |       |
| <b>Sex</b>                                |                                       |             |                 |         | <b>Years since arrival</b>            |               |             |                 |       |
| Men                                       | 92                                    | 91          | 83              | 89      | Not applicable                        | 100           | ...         | ...             | 63    |
| Women                                     | 8                                     | 9           | 17              | 11      | 4 to 5                                | ...           | ...         | 28              | 8     |
| <b>Age</b>                                |                                       |             |                 |         | 6 to 10                               | ...           | ...         | 41              | 11    |
| 32 to 39                                  | 42                                    | 46          | 23              | 37      | 11 to 20                              | ...           | 12          | 27              | 9     |
| 40 to 49                                  | 43                                    | 36          | 54              | 45      | 21 years or more                      | ...           | 88          | 4               | 9     |
| 50 to 54                                  | 15                                    | 19          | 23              | 18      | <i>Average years since arrival</i>    | ...           | 31.4        | 9.3             | ...   |
| <i>Average age</i>                        | 41.7                                  | 41.7        | 44.5            | 42.4    | <b>Highest level of schooling</b>     |               |             |                 |       |
| <b>Place of residence</b>                 |                                       |             |                 |         | Bachelors                             | 77            | 75          | 50              | 70    |
| Montréal                                  | 18                                    | 14          | 11              | 16      | Bachelors with certificate or diploma | 5             | 6           | 12              | 7     |
| Toronto                                   | 14                                    | 34          | 44              | 24      | Masters                               | 15            | 15          | 29              | 19    |
| Vancouver                                 | 6                                     | 10          | 14              | 8       | Ph.D.                                 | 3             | 4           | 9               | 4     |
| Other census metropolitan areas           | 43                                    | 34          | 27              | 37      | <b>Years of university</b>            |               |             |                 |       |
| All other areas                           | 20                                    | 8           | 4               | 14      | 3 years <sup>1</sup>                  | 3             | 2           | ...             | 2     |
| <b>Region</b>                             |                                       |             |                 |         | 4 years                               | 50            | 51          | 31              | 45    |
| Atlantic provinces                        | 7                                     | 3           | 1               | 5       | 5 years                               | 22            | 23          | 42              | 28    |
| Québec                                    | 31                                    | 16          | 13              | 24      | 6 years                               | 12            | 12          | 12              | 12    |
| Ontario                                   | 36                                    | 56          | 60              | 44      | 7 years                               | 6             | 6           | 5               | 6     |
| Manitoba and Saskatchewan                 | 4                                     | 2           | 2               | 3       | 8 years or more                       | 6             | 7           | 11              | 8     |
| Alberta                                   | 14                                    | 12          | 9               | 13      | <i>Average years of university</i>    | 4.9           | 5.0         | 5.4             | 5.1   |
| British Columbia                          | 9                                     | 12          | 15              | 11      | <b>Field of study</b>                 |               |             |                 |       |
| Territories and Nunavut                   | 0.2                                   | 0.2         | 0.1             | 0.2     | Electrical                            | 19            | 22          | 24              | 21    |
| <b>Visible minority status</b>            |                                       |             |                 |         | Chemical                              | 7             | 7           | 7               | 7     |
| No  | 98                                    | 57          | 47              | 80      | Civil                                 | 16            | 12          | 18              | 16    |
| Yes                                       | 3                                     | 43          | 53              | 20      | Mechanical                            | 17            | 16          | 21              | 18    |
| <b>Home language</b>                      |                                       |             |                 |         | Other engineering fields of study     | 15            | 14          | 14              | 15    |
| Only English and/or French                | 99                                    | 82          | 31              | 79      | Engineering not elsewhere classified  | 25            | 30          | 17              | 23    |
| Other languages                           | 1                                     | 18          | 69              | 21      | <b>Employment status</b>              |               |             |                 |       |
| <b>Birthplace</b>                         |                                       |             |                 |         | Not employed during reference week    | 5             | 6           | 11              | 7     |
| Canada                                    | 100                                   | ...         | ...             | 63      | Employed during reference week        | 95            | 94          | 89              | 93    |
| North America, Western Europe and Oceania | ...                                   | 45          | 13              | 8       | <b>Occupation</b>                     |               |             |                 |       |
| Eastern Europe                            | ...                                   | 5           | 29              | 8       | Engineering                           | 41            | 36          | 26              | 37    |
| Caribbean, Central and South America      | ...                                   | 7           | 5               | 2       | Managerial                            | 28            | 28          | 17              | 25    |
| Africa                                    | ...                                   | 6           | 8               | 3       | Technical                             | 11            | 17          | 21              | 15    |
| South Asia                                | ...                                   | 5           | 8               | 3       | All other occupations                 | 19            | 19          | 35              | 24    |
| South East Asia                           | ...                                   | 8           | 11              | 4       |                                       |               |             |                 |       |
| East Asia                                 | ...                                   | 18          | 17              | 7       |                                       |               |             |                 |       |
| West Asia                                 | ...                                   | 5           | 10              | 3       |                                       |               |             |                 |       |

... not applicable

1. Fewer years of schooling are required to obtain a bachelor's degree in Quebec.

Note: Figures may not sum to 100 due to rounding.

Source: Statistics Canada, 2001 Census of Population.