Employment Equity Data Program

Programme statistique sur l'équité en matière d'emploi

c.2

Profiling Designated Group Presence in Canada's Labour Market Based on 1988 National Graduate Survey Data

(1.21)

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SYMBOLS

The following symbols are used throughout this publication

- nil or zero

* numbers marked with this symbol have a coefficient of variation between 16.6% and 25% and are less reliable than unmarked numbers

-- data are not reliable enough to be released; coefficient of variation greater than 25%

EXECUTIVE SUMMARY

Except for women, there is little information about the transition from school to labour market among members of the employment equity designated groups that have recently graduated from postsecondary educational institutions. To fill this void, data from the 1988 National Graduate Survey (NGS), and the 1991 Follow-up to the 1988 NGS, where examined to determine if they could supply information on the demographic characteristics, educational qualifications and labour market experiences of designated group members. Specifically, 1988 NGS results were examined to see if national and provincial level estimates of designated group members with a postsecondary education could be obtained along with basic information about the transitions of these graduates to the labour market. Such information is essential to the development of a Canadian Occupational Projection Systems (COPS) Student Flow Model that incorporates designated groups.

The evaluations revealed that reliable estimates could be obtained at general levels of analysis. However, when the data were disaggregated by variables such as province and occupation, estimates diminished in reliability. This cast doubt on the appropriateness of using 1988 NGS data. For this reason, new data collection mechanisms and alternative data sources were examined.

Several collection strategies designed to enhance the reliability of designated groups data produced from future NGS's were examined. Alternatives such as expanding the NGS sample population base would not necessarily produce more reliable employment equity population counts, since the graduating population in a given year does not include adequate numbers of members of the employment equity designated groups. It was therefore suggested that the NGS be expanded to look at graduates over a longer period, say, five years. This would, however, imply higher data collection costs and perhaps changes to the COPS model to accommodate data for a longer period.

The Labour Market Activity Survey (LMAS) and the Census of Population results were examined as alternative data sources. The LMAS option was dismissed, because information on field of study is not collected. The sample size of the LMAS may also limit the level of data disaggregation. The 1991 Census data could provide information for COPS student flow applications geared to the employment equity designated groups. Graduates that have recently received Canadian-recognized postsecondary qualifications could be established using proxies based on age and, for persons not born in Canada, year of immigration. Levels of certification could be established using the Census' Highest Degree, Certificate or Diploma variable. The Census' occupation variable could easily be adapted to the COPS Student Flow Model given that both the Census and COPS make use of the Standard Occupational Classification (SOC). The Census' Major Field of Study classification, while differing from that used for COPS applications, could be adapted by using concordance tables to convert Census results to COPS classifications. Published 1991 Census results for women and men suggest that they could produce comparisons valid for COPS student flow applications. To determine whether they could also be used for persons with disabilities, Aboriginal peoples and visible minorities would require special 1991 Census tabulations, which went beyond this study's mandate. The above findings and conclusions led to four recommendations:

- The use of 1988 NGS results, for COPS student flow applications incorporating the employment equity designated groups, should proceed only in cases where these results provide coefficients of variance pointing to releasable data. Women may be the only group for which data can provide matrices with enough releasable cells to warrant COPS student flow applications;

- Future NGS results could be used for COPS student flow applications involving designated groups, if the required data matrices reveal enough data cells with releasable data. Broadening future NGS population bases, for example to include graduates over a five year period, may produce greater numbers of releasable estimates, but may not be an alternative given the costs and possible COPS adaptations;

- Surveys such as the Labour Market Activity Survey (LMAS) should not be examined as an alternative to establish COPS student flow applications incorporating designated groups. The LMAS lacks field of study information necessary for the COPS Student Flow Model. Also, results would be subject to the same release guidelines as were the 1988 NGS results and in all likelihood would not provide valid designated group estimates for COPS student flow purposes;

- The possibility of using special 1991 Census tabulations to provide valid estimates of the employment equity designated groups for COPS student flow applications should be examined further. This analysis has examined some ways by which 1991 Census results could be adapted and used for COPS student flow applications.

1.0 INTRODUCTION

Declines in the labour force over the next decade are expected to create a tighter labour market and sectoral shortages of qualified human resources. Solving these problems may involve tapping specific segments of the labour force, for instance the four groups (i.e. women, persons with disabilities, Aboriginal peoples and visible minorities) designated in the *Employment Equity Act* in Canada. At present, labour market information on these groups is limited. Except for women, there is little information about their presence in postsecondary educational institutions and their subsequent labour force activities.

Therefore, a better understanding of the distributions of the designated groups by level of education and major field of study is needed. While there are now attempts to correct the under-representation of women in fields such as science and engineering, the same is not true for persons with disabilities, Aboriginal peoples and members of groups designated as visible minorities. Information about education and achievements of the employment equity designated groups as growing segments of the labour force is lacking. One reason for this may be the lack of data analysis on the educational qualifications of their members.

This study was sponsored by the Interdepartmental Working Group on Employment Equity Data (IWGEED), a group formed to address data requirements for the *Employment Equity Act* and its Regulations. The group includes representatives from Statistics Canada, Human Resources Development, the Canadian Human Rights Commission, the Treasury Board Secretariat and the Public Service Commission of Canada.

The purpose was to examine the possibility of using data from the 1988 National Graduate Survey (NGS) and the 1991 Follow-up Survey to produce national and provincial level estimates of the number of designated group members with a postsecondary education. If these estimates were reliable, data on cohorts, such as visible minorities that graduated in 1986, could lead to a better understanding of the labour force participation, skills and experience of members of designated groups. It was also hoped that these estimates could be used to project data on labour force participation, based on the educational characteristics of members of designated groups.

As well, the 1988 NGS data may set a base for comparisons with the upcoming results of the 1992 NGS of 1990 graduates. They may also allow an evaluation of the feasibility of using estimates from the NGS for basic information about graduates transitions into the labour market. This information is essential to development of the Canadian Occupational Projection Systems (COPS) Student Flow Model incorporating designated groups.

2.0 DESIGNATED GROUPS AS DEFINED IN THE *EMPLOYMENT EQUITY ACT*

The groups designated in the *Employment Equity Act* are women, Aboriginal peoples, persons with disabilities and persons who because of their race or colour are in a visible minority in Canada. Specifically:

- Aboriginal peoples are persons who are Indians, Inuit or Metis and who identify themselves to an employer, or agree to be identified by an employer, as North American Indians, Inuit or Metis;

- Persons with disabilities include persons who have any persistent physical, mental, psychiatric, sensory or learning impairment, and persons who consider themselves to be, or believe that an employer or a potential employer would be likely to consider them to be, disadvantaged in employment by reason of this;

- Visible minorities include persons, other than Aboriginal peoples, who because of their race or colour are in a visible minority in Canada; that is, persons who are non-Caucasian in race or non-white in colour and who for the purposes of the *Employment Equity Act*, identify themselves to an employer, or agree to be identified by an employer, as non-Caucasian in race or non-white in colour.

3.0 THE NATIONAL GRADUATE SURVEY

3.1 The National Graduate Survey Database

The 1988 National Graduate Survey (NGS) originally surveyed 1986 trade-vocational, college and university graduates in May of 1988, two years after they graduated. In 1991, a follow-up survey was conducted on the same 1986 graduates, if they could be contacted and were still living in Canada and if they agreed to participate.

The database used here contained responses to questions on the original 1988 NGS as well as participant responses to the 1991 Follow-up Survey. The survey population included approximately 246,000 students (weighted counts) of trade/vocational, colleges and universities who graduated in 1986. The analysis excluded approximately 22,000 university-transfer students[1]. The excluded students were very likely to have pursued further studies between graduation and the survey. They were also excluded because university-transfer graduates are not included in the COPS Student Flow Model. The survey population was therefore reduced by 9% to approximately 223,000 students.

Table 1. Reduction of the employment equity designated group populations by excluding university-transfer graduates, NGS 1988

Designated group	Proportion excluded
Women	9%
Visible minorities	7%
Persons with disabilities based on 1988 question	4%
Persons with disabilities based on 1991 question	3%
Aboriginal peoples based on 1988 question	3%
Aboriginal peoples based on 1991 question	4%

It was natural to question how this reduction affected the target population. If a significant proportion of a particular designated group had graduated from university-transfer programs in 1986, this would have reduced the designated group population considerably. However, this did not prove to be the case (Table 1).

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[1] University-transfer students would have graduated from programs of postsecondary non-university institutions. These require secondary school completion to enter and provide a student with standing equivalent to the first or second year of a university degree program. With this one can apply for admission to subsequent senior years at a degree granting institution. The "CEGEP général" programs of the Quebec institutions, completion of which is prerequisite for entry into Quebec universities, are included in this classification.

3.2 Data Analysis Strategy

The NGS database comprised many variables. Some provided demographic information while others touched upon the studies of 1986 graduates and their transition into the labour market. Since this analysis was to profile groups identified by the original 1988 NGS results and the 1991 follow-up, the wording of the questions used to identify them formed part of the general analysis. Ways of identifying the designated groups for COPS student flow applications were also examined.

Identification of women was straightforward, using the question on gender. However, identifying other groups was more complex and involved a number of questions. Persons with disabilities were identified using answers to two sets of almost identical questions, one in the original 1988 NGS, the other in the 1991 Follow-up. Aboriginal peoples were identified through an Aboriginal identification question asked in the original 1988 NGS and through a broader ethnic ancestry question in the 1991 Follow-up. Visible minorities were also identified using the ancestry question.

To profile employment equity groups, response frequencies to identifying questions were shown, then cross-tabulated with other variables such as province, occupation and labour force status. This provided a better understanding of the data, particularly as to which combinations of questions best identified certain groups. For example, were Aboriginal peoples best identified using the original survey question or the broader ancestry question in the follow-up? Or, should responses to both questions be combined?

Producing profiles also helped determine to what extent the NGS data could be used to establish Student Flow Models in the context of the Canadian Occupational Projection Systems (COPS). Finally, they helped determine whether the estimates fell within Statistics Canada's data release policy, which prevents publication of estimates with a coefficient of variance greater than 25%.

3.3 The National Graduate Survey Results

3.3.1 Persons with disabilities

In both the 1988 NGS and the 1991 Follow-up Survey, persons with disabilities were identified using a series of three questions. (See Figure 1) Because questions were almost identical in 1988 and 1991, persons who reported having a disability in both surveys could be confirmed. Persons who may have developed a disability between 1988 and 1991 or those who no longer considered themselves as having one could also be evaluated.

Figure 1

1. Are you limited in the kind or amount of activity you can do because of a long-term physical condition, mental condition or health problem...

   a) at home?
   b) at school or work?
   c) in other activities, such as transportation or leisure-time activities?

Persons who indicated yes to any of the above items were then asked:

2. Are you handicapped or disabled with regard to...

3. How many years have you been handicapped or disabled in this way?

				Number of years
a)	Mobility, agility?	No	Yes	|__|__|
b)	Sight, seeing?	No	Yes	|__|__|
c)	Hearing?	No	Yes	|__|__|
d)	Speech, speaking?	No	Yes	|__|__|
e)	Learning?	No	Yes	|__|__|
f)	Emotions, mental problems?	No	Yes	|__|__|
g)	Anything else? (Specify)	No	Yes	|__|__|

_____

_____

Table 2. Relative proportion* of persons with disabilities based on responses to the original 1988 question, NGS 1988

Had a disability	%
1988 question	100
1991 question	143
1988 and 1991 questions	47
1988 question but **not** 1991 question	53
Note: 67% of those who indicated having a disability in response to the 1991 question had <u>not</u> indicated having one in response to the 1988 question.	

* Results of the NGS questions on persons with disabilities were examined in terms of relative proportions. The proportions were based on the responses to the original 1988 question. The relative proportion of persons with disabilities at the time of the 1988 survey, the base, was set at 100%. All other results were presented relative to this 100% base.

In this analysis, persons with disabilities were identified by answers to the first of the three questions. A "yes" answer to any item classified respondents as having a disability.

Comparing responses to the original 1988 question and the 1991 Follow-up question revealed unexpected results. (See Table 2.) For example, the proportion of persons with disabilities, in response to the two surveys was very low (47%). The fact that 67% of those who indicated having a disability in 1991, had not reported having one in 1988 also required further investigation.

These percentages could be explained in part by the fact that persons with disabilities in 1988 did not necessarily have the disability in 1991. Likewise persons with disabilities in 1991 may have not have had a disability in 1988. Responses to questions about duration of a disability, by type of disability, for persons who reported one in 1988 and 1991 were examined (Table 3). This revealed discrepancies. In some cases the number of years of disability reported did not correspond to the time elapsed between 1988 and 1991. Recall problems could partially explain this. However, they do not explain wide fluctuations such as "40 years and over" in 1988, corresponding to "5 to 9 years" in 1991.

That the NGS data was edited differently in each survey is also worthy of note. In 1988, years of disability were accepted at "face value". The 1991 results however, were edited so that the duration of disability would not exceed the respondent's age.

Given the discrepancies between the original and follow-up survey results, it is not obvious which should be used to define persons with disabilities.

Table 3. Percentage distribution of the number of years with a disability according to the type of disability in 1988, by the number of years with a disability in 1991, NGS 1988 and 1991

Disability/ Years with a disability 1988	Years with a disability 1991					
	1 to 4 years (%)	5 to 9 years (%)	10 to 19 years (%)	20 to 39 years (%)	40 years and over (%)	Unknown/Not indicated (%)
Mobility:						
1 to 4 yrs	20	48	3	-	-	29
5 to 9 yrs	3	32	41	-	-	24
10 to 19 yrs	9	7	47	11	-	25
20 to 39 yrs	23	3	3	47	1	23
40 yrs and over	-	8	-	77	15	-
Unknown/ Not indicated	9	3	5	3	-	79
Sight:						
1 to 4 yrs	-	29	-	-	-	70
5 to 9 yrs	-	9	56	18	-	18
10 to 19 yrs	-	-	-	33	-	67
20 to 39 yrs	-	-	-	58	-	42
40 yrs and over	-	-	-	-	-	100
Unknown/ Not indicated	1	-	1	1	0	97
Hearing:						
1 to 4 yrs	27	38	-	-	-	34
5 to 9 yrs	-	-	-	-	-	100
10 to 19 yrs	9	19	8	41	-	24
20 to 39 yrs	-	-	6	83	-	11
40 yrs and over	-	-	-	-	100	-
Unknown/ Not indicated	0	0	0	0	-	98
Speaking:						
1 to 4 yrs	-	-	-	-	-	-
5 to 9 yrs	-	-	100	-	-	-
10 to 19 yrs	-	-	49	51	-	-
20 to 39 yrs	-	-	6	22	-	72
40 yrs and over	-	-	-	-	-	-
Unknown/ Not indicated	1	-	0	1	-	98
Learning:						
1 to 4 yrs	-	28	-	-	-	72
5 to 9 yrs	-	-	17	-	-	83
10 to 19 yrs	-	-	-	-	-	100
20 to 39 yrs	-	-	-	22	-	78
40 yrs and over	-	-	100	-	-	-
Unknown/ Not indicated	1	-	1	0	-	99
Intellectually:						
1 to 4 yrs	12	61	-	-	-	28
5 to 9 yrs	-	46	35	-	-	19
10 to 19 yrs	-	-	100	-	-	-
20 to 39 yrs	-	37	12	24	-	27
40 yrs and over	-	-	-	-	-	-
Unknown/ Not indicated	2	1	0	1	-	95
Other*:	10	4	5	3	0	78

* Not asked in 1988.

3.3.2 Aboriginal peoples

In the 1988 NGS survey, Canada's Aboriginal peoples were identified through the following two questions: (Figure 2)

Figure 2

1. Do you consider yourself Inuit, North American Indian or Metis?

|__| No, none of them
|__| Inuit
|__| North American Indian
|__| Metis

2. Are you a Status or Non-Status Indian?

|__| Status
|__| Non-Status

In the 1991 Follow-up, they were identified through a broader question about ancestry. (Figure 3) This question allowed people of mixed ancestry to specify all groups from which their parents or grandparents descended. The follow-up question was quite different from that on the original survey. A person's ancestry does not necessarily coincide with how a person identifies oneself, and this may be especially true for persons of mixed ancestry.

Figure 3

From which of the following groups did your parents or grandparents descend? *(Read list: mark all responses reported)*

a) Chinese	Yes	No
b) Japanese	Yes	No
c) Korean	Yes	No
d) Filipino	Yes	No
e) East Indian *(from India, Pakistan, Bangladesh, East Africa, Guyana, etc.)*	Yes	No
f) Black *(from Africa, the Caribbean, Haiti, the U.S.A., Canada, etc.)*	Yes	No
g) North American Indian	Yes	No
h) Metis	Yes	No
i) Inuit *(Eskimo)*	Yes	No
j) Arab *(from Egypt, Jordan, Lebanon, Iraq, etc.)*	Yes	No
k) West Asian *(from Syria, Turkey, Afghanistan, Armenia, Iran, etc.)*	Yes	No
l) South East Asian *(from Burma, Cambodia, Kampuchea, Laos, Thailand, Vietnam, etc.)*	Yes	No
m) North African *(from Egypt, Morocco, Algeria, Tunisia, etc.)*	Yes	No
n) Latin American *(from Mexico, Central America, South America)*	Yes	No
o) British *(from England, Scotland, Ireland, etc.)*	Yes	No
p) French	Yes	No
q) Any other European groups	Yes	No
r) Canadian	Yes	No
s) Any others (Specify):	Yes	No

_____

_____

It was unclear which definition best identified Canada's Aboriginal peoples. It was also unclear whether the issue of Status versus Non-Status North American Indians, part of the original questionnaire, would affect the way persons identified themselves in the follow-up. Response distributions were examined to help answer these questions.

Table 4 compares responses identifying Aboriginal peoples based on the 1988 question and the 1991 follow-up. Some differences in the proportions were to be expected given that different questions were used. It was, however, peculiar that the changes produced such wide response swings. For example, the proportion of Aboriginal peoples based on 1991 responses was 19% lower than in 1988. The proportion of Aboriginal peoples based on combined 1988 and 1991 responses was also low (46%). The fact that 43% of those claiming Aboriginal ancestry in 1991 had not identified themselves as Aboriginal peoples in 1988 could be explained by differences in the questions.

Table 4. Relative proportion* of Aboriginal peoples based on responses to the original 1988 Aboriginal identification question, NGS 1988 and 1991

Aboriginal peoples	%
1988 question	100
1991 question	81
1988 and 1991 questions	46
1988 question but not 1991 question	53
Note: 43% of those who indicated Aboriginal ancestry in response to the 1991 question had not identified themselves as Aboriginal in response to the 1988 question.	

* Results of the NGS questions on Aboriginal peoples were analyzed in terms of relative proportions. The responses to the 1988 Aboriginal identification question were assigned a value of 100%. All other data were related proportionally to this 100% figure.

Table 5 shows how persons who indicated "North American Indian" in 1988 responded to the ethnic ancestry question in 1991. Status North American Indians were far more likely to indicate native ancestry in 1991 than their Non-Status counterparts. Practically all of those who claimed they did not know their status in 1988 claimed Non-Aboriginal ancestry in 1991. This seemed to confirm that the 1988 and 1991 questions identified different populations.

Table 5. Percentage distribution of indication of Status/Non-Status Indian in 1988, by Aboriginal/Non-Aboriginal ancestry indicated in 1991, NGS 1988 and 1991

	Aboriginal/Non-Aboriginal ancestry, 1991	
	Aboriginal	Non-Aboriginal
Status Indian	83%	17%
Non-status Indian	33%	67%
Unknown	2%	98%

How persons who identified themselves as Aboriginal peoples in 1988 responded to the 1991 ethnic ancestry question is revealed in Table 6. The 1991 question allowed persons who identified themselves as Aboriginal in 1988 to claim multiple ethnic ancestries in 1991. Table 6 also reveals that minimal proportions of Aboriginal peoples identified in 1988 went on to indicate Aboriginal ancestries in 1991: 34% for North American Indian ancestry, 13% Metis, 4% Inuit.

Table 6. Percentage distribution of persons who identified themselves as Aboriginal/Non-Aboriginal peoples in 1988, by the ethnic ancestries identified in 1991, NGS 1988 and 1991

Ethnic Ancestries, 1991	Aboriginal/Non-Aboriginal identification, 1988	
	Aboriginal	Non-Aboriginal
Chinese	1%	99%
Japanese	0%	100%
Korean	0%	100%
Filipino	0%	100%
East Indian	1%	99%
Black	1%	99%
North American Indian	34%	66%
Metis	13%	87%
Inuit	4%	96%
Arab	-	100%
West Indian	-	100%
South East Asian	1%	99%
North African	-	100%
Latin American	0%	100%
British	21%	79%
French	15%	85%
Other European	18%	82%
Canadian	51%	49%
Other	1%	99%

The Aboriginal identification question in the original 1988 questionnaire (Figure 2) was modelled on question 7 asked on the 1986 Census, which asked:

Figure 4

7. Do you consider yourself an Aboriginal person or a native Indian of North America, that is, Inuit, North American Indian or Metis?

|__| No, I do not consider myself Inuit, North American Indian or Metis
|__| Yes, Inuit
|__| Yes, status or registered Indian
|__| Yes, non-status Indian
|__| Yes, Metis

The 1986 Census question yielded unusable results, perhaps because the concepts "Aboriginal person" and "native Indian" were not well understood. The 1988 NGS question did not use the terms "Aboriginal person or native Indian", but instead used the more direct "Inuit, North American Indian or Metis" identification. Also, the 1988 NGS did not use a self-enumeration approach, as did the 1986 Census. Instead trained interviewers administered the questionnaire and helped to clarify it when necessary.

The ethnic ancestry question of the 1991 Follow-up was also fashioned from a Census question. While such a question was well suited to the Census' self-enumeration approach, it was not well adapted to an interviewer administered questionnaire. Interviewers had to ask respondents to say "yes" or "no" to each ethnic group listed. The problem was further compounded by the length of the follow-up questionnaire and the ethnic ancestry question's placement near the end. Biases may have been introduced due to respondent fatigue. Requiring responses to a list of ethnic groups may have prompted respondents to jump ahead of the question series and simply state "I am ...". There was also a possibility of interviewer bias in that they may have thought the question was tedious and simply marked responses which they felt were appropriate.

This is not to say that biases actually occurred. However, they could help to explain why so many persons who identified themselves as Aboriginal peoples in the 1988 NGS did not claim Aboriginal ancestry in 1991.

3.3.3 Visible Minorities

The original 1988 NGS did not contain a question designed to identify visible minorities. However, the 1991 Follow-up survey asked the question "From which of the following groups did your parents or grandparents descend?", provided in Figure 3.

In this analysis, members of Canada's visible minorities include persons who indicated, either as a single response or as part of a multiple response, being of the following ancestries:

- Chinese
- Japanese
- Korean
- Filipino
- East Indian *(from India, Pakistan, Bangladesh, East Africa, Guyana, etc.)*
- Black *(from Africa, the Caribbean, Haiti, the U.S.A., Canada, etc.)*
- Arab *(from Egypt, Jordan, Lebanon, Iraq, etc.)*
- West Asian *(from Syria, Turkey, Afghanistan, Armenia, Iran, etc.)*
- South East Asian *(from Burma, Cambodia, Kampuchea, Laos, Thailand, Vietnam, etc.)*
- North African *(from Egypt, Morocco, Algeria, Tunisia, etc.)*
- Latin American *(from Mexico, Central America, South America)*

Problems in identifying the above groups as visible minorities, as designated in the *Employment Equity Act* and its regulations, were similar to those with 1986 Census data[2]. How should multiple responses be handled? As well, it is unclear whether persons of Haitian origin for example, claimed French or Black origins. Further, the NGS does not contain a "Place of birth" question to help sort out the problem. Finally, it is unclear how to exclude such groups as Chileans and Argentineans, who are not considered to be visible minorities for the purposes of the *Employment Equity Act* and its regulations.

3.4 The National Graduate Survey Employment Equity Designated Group Populations

The proportions of women who received career/technical or bachelor's certificates and degrees in 1986 was higher than that of men. (Table 7) Proportions for women were, however, lower for trade/vocational, master's and doctorate certificates or degrees. Aboriginal peoples and persons with disabilities made up a very small part of the NGS population, whether the 1988 or 1991 results were used. These populations included high proportions of trade/vocational certificate holders in 1986. Numbers of doctoral graduates among Aboriginal peoples were not releasable at the national level, while those for persons with disabilities were releasable with qualification. Data for Aboriginal peoples with master's degrees were also deemed releasable with qualification. Visible minorities made up a relatively small part of the NGS population, but were well-represented among persons who had received a master's or doctorate degree in 1986.

The sizes of some of these representations were small enough to affect data that were further disaggregated by province, by highest level of schooling, by field of study, and by combinations of variables such as field of study and province. This concern had to be addressed especially for Aboriginal peoples, persons with disabilities and somewhat for visible minorities.

Since one purpose of this study was to examine the feasibility and reliability of using 1988 NGS data to produce national and provincial estimates of designated group members with a postsecondary education, it was useful to examine how these groups fared in provincial breakdowns. Note that the coefficients of variation applied to provincial distributions were based on provincial rather than national cut-off points. Province of study was used to match the COPS Student Flow Model.

Tables 8A to 8F[3] show distributions of 1986 graduates by level of certification according to province of study, for the employment equity designated groups and the rest of the 1986 graduate population. In all these tables, results for persons who received doctorates in 1986 provided no counts or were not releasable, for any provinces except Quebec, Ontario, Alberta and B.C.. For provinces with data which are not releasable, results were at the outset based on numbers not sufficient to make them releasable. The same was true of many of the N.W.T and Yukon data cells, but this is not critical to this study since the COPS model excludes the northern territories.

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[2] Identification of visible minorities based on the 1986 Census results will be discussed later in this report (Section 4.2).

[3] Based on the population counts presented in Table A1, Appendix A.

Table 7. Percentage distributions* of 1986 graduates, by level of certification for designated groups, NGS 1988 and 1991

Designated Group and Survey	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Gender					
Women	44	55	55	46	35
Men	55	44	45	54	65
Persons with/without disabilities (based on 1988 question)					
With	5	3	2	2	2*
Without	94	97	98	98	97
Persons with/without disabilities (based on 1991 question)					
With	7	3	2	3	3*
Without	93	97	98	97	97
Aboriginal/Non-Aboriginal (based on 1988 question)					
Aboriginal	4	2	1	1*	–
Non-Aboriginal	96	98	99	99	99
Aboriginal/Non-Aboriginal (based on 1991 question)					
Aboriginal	4	2	1	1*	–
Non-Aboriginal	96	98	99	99	100
Visible minority/Non-visible minority (based on 1991 question)					
Visible	7	6	7	8	12
Non-visible	93	94	93	92	88
Total: Number	**40,300**	**62,700**	**104,900**	**13,800**	**1,300**
%	**100**	**100**	**100**	**100**	**100**

* Based on weighted counts, NGS 1988.

In provincial distributions for women and men, proportions of women who received career/technical or bachelor's certificates and degrees in 1986 were generally equal to or higher than the proportions of men (Table 8A). This was especially true for women career/technical graduates in Nova Scotia (74%), Manitoba (63%) and Saskatchewan (62%). Proportions of women were generally lower among persons with trade/vocational certificates, especially in Nova Scotia (38%) and Manitoba (27%), and among persons with master's and doctorate degrees.

Table 8B shows distributions for persons with disabilities based on the 1988 disability question, Table 8C shows distributions based on the 1991 disability question. Together they reveal that

most of the provincial data on persons with disabilities were not releasable. In Table 8B, data in 6 cells were releasable with qualification, and 8 cells were releasable without a cautionary note. The corresponding numbers for Table 8C were 13 and 11 cells respectively.

Table 8D reveals province of study distributions for Aboriginal peoples based on the 1988 Aboriginal identity question. Table 8E reveals Aboriginal ancestry distributions based on the 1991 ancestry question. Most of the provincial data in these tables were not releasable. In Table 8D, data in 9 cells were deemed releasable with qualification and only 6 cells presented data which were releasable without a cautionary note. In Table 8E, data in 8 cells were releasable with qualification while an additional 5 cells were releasable without a cautionary note.

Table 8F shows distributions for visible minorities based on selected responses to the 1991 ethnic ancestry question. In this case as well, most of the provincial data were not releasable. Data presented in 10 cells were releasable with qualification and only 17 cells presented data releasable without a cautionary note. However, Ontario data were releasable for all levels of certification.

The fact that most provincial data on the designated groups were not releasable, certainly has implications for this analysis and brings into question whether it was worth continuing to attempt to profile these populations. It was important to determine which variables were needed to produce COPS models and how they would interact within the models to produce student flow estimates. The variables and functioning of these models are examined below.

Table 8A. Percentage distributions of 1986 graduates' province of study and gender, by level of certification in 1986, NGS 1988

Province/Gender	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Newfoundland					
Women	42	59	57	38	--
Men	58	41	43	62	--
Prince Edward Island					
Women	50	55	50	-	-
Men	50	45	50	-	-
Nova Scotia					
Women	38	74	55	48	--
Men	60	26	45	52	--
New Brunswick					
Women	42	47	52	36	--
Men	58	53	48	64	--
Quebec					
Women	42	54	57	43	41
Men	58	46	43	57	59
Ontario					
Women	45	55	56	46	32
Men	55	44	44	54	67
Manitoba					
Women	27	63	53	40	--
Men	72	37	47	60	--
Saskatchewan					
Women	43	62	53	39	--
Men	57	38	47	62	--
Alberta					
Women	54	52	53	50	41
Men	46	43	47	50	59
British Columbia					
Women	51	50	54	52	27*
Men	48	50	46	48	73
Northwest Territories					
Women	--	65	-	-	-
Men	--	35*	-	-	-
Yukon					
Women	54	--	-	-	-
Men	46	--	-	-	-

Table 8B. Percentage distributions of 1986 graduates' province of study and 1988 persons with/without disabilities, by level of certification in 1986, NGS 1988

Province/ With/Without disabilities	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Newfoundland					
With	--	--	--	--	-
Without	96	98	99	99	--
Prince Edward Island					
With	--	--	--	-	-
Without	97	99	98	-	-
Nova Scotia					
With	4	--	--	--	--
Without	96	99	99	97	--
New Brunswick					
With	--	--	--	--	-
Without	95	98	98	96	--
Quebec					
With	4	--	1*	--	--
Without	95	99	98	99	98
Ontario					
With	6	3	2	2*	--
Without	93	97	97	98	96
Manitoba					
With	3*	3*	--	--	--
Without	96	97	97	97	--
Saskatchewan					
With	--	--	--	--	-
Without	96	96	97	98	--
Alberta					
With	8	4	3	--	--
Without	91	95	97	97	98
British Columbia					
With	4	3*	--	--	--
Without	94	95	96	97	98
Northwest Territories					
With	-	--	-	-	-
Without	--	93	-	-	-
Yukon					
With	--	-	-	-	-
Without	96	--	-	-	-

Table 8C. Percentage distributions of 1986 graduates' province of study and 1991 persons with/without disabilities, by level of certification in 1986, NGS 1988 and 1991

Province/ With/Without disabilities	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Newfoundland					
With	4*	--	--	--	-
Without	96	97	98	98	--
Prince Edward Island					
With	--	--	--	-	-
Without	96	98	99	-	-
Nova Scotia					
With	6	--	3*	--	--
Without	94	98	97	95	--
New Brunswick					
With	--	4*	--	--	-
Without	96	96	98	94	--
Quebec					
With	6	--	2*	--	--
Without	94	99	98	99	98
Ontario					
With	9	4	2	3	--
Without	90	96	98	97	96
Manitoba					
With	4*	4*	3*	--	--
Without	96	96	97	96	--
Saskatchewan					
With	4*	4*	3*	--	--
Without	96	96	97	98	--
Alberta					
With	9	4	3	4*	--
Without	91	96	97	95	96
British Columbia					
With	8	5	4*	6*	--
Without	92	95	96	94	96
Northwest Territories					
With	-	--	-	-	-
Without	--	91	-	-	-
Yukon					
With	--	-	-	-	-
Without	97	--	-	-	-

Table 8D. Percentage distributions of 1986 graduates' province of study and 1988 Aboriginal/Non-Aboriginal identification, by level of certification in 1986, NGS 1988

Province/ Aboriginal Identification	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Newfoundland					
Aboriginal	--	--	--	-	-
Non-Aboriginal	99	99	99	100	--
Prince Edward Island					
Aboriginal	--	--	--	-	-
Non-Aboriginal	98	99	99	-	-
Nova Scotia					
Aboriginal	--	--	--	-	-
Non-Aboriginal	98	99	100	100	--
New Brunswick					
Aboriginal	--	--	--	--	-
Non-Aboriginal	97	99	100	99	--
Quebec					
Aboriginal	4	--	1*	--	-
Non-Aboriginal	96	99	99	99	100
Ontario					
Aboriginal	4	2	1*	--	--
Non-Aboriginal	96	98	99	99	99
Manitoba					
Aboriginal	8	4*	2*	--	-
Non-Aboriginal	92	96	98	99	--
Saskatchewan					
Aboriginal	6*	5*	--	--	-
Non-Aboriginal	94	95	98	99	--
Alberta					
Aboriginal	9	3	1*	--	--
Non-Aboriginal	91	97	99	99	99
British Columbia					
Aboriginal	4	2*	--	--	--
Non-Aboriginal	96	98	99	98	98
Northwest Territories					
Aboriginal	--	93	-	-	-
Non-Aboriginal	--	--	-	-	-
Yukon					
Aboriginal	--	-	-	-	-
Non-Aboriginal	85	--	-	-	-

Table 8E. Percentage distributions of 1986 graduates' province of study and 1991 Aboriginal/Non-Aboriginal ancestry, by level of certification in 1986, NGS 1988 and 1991

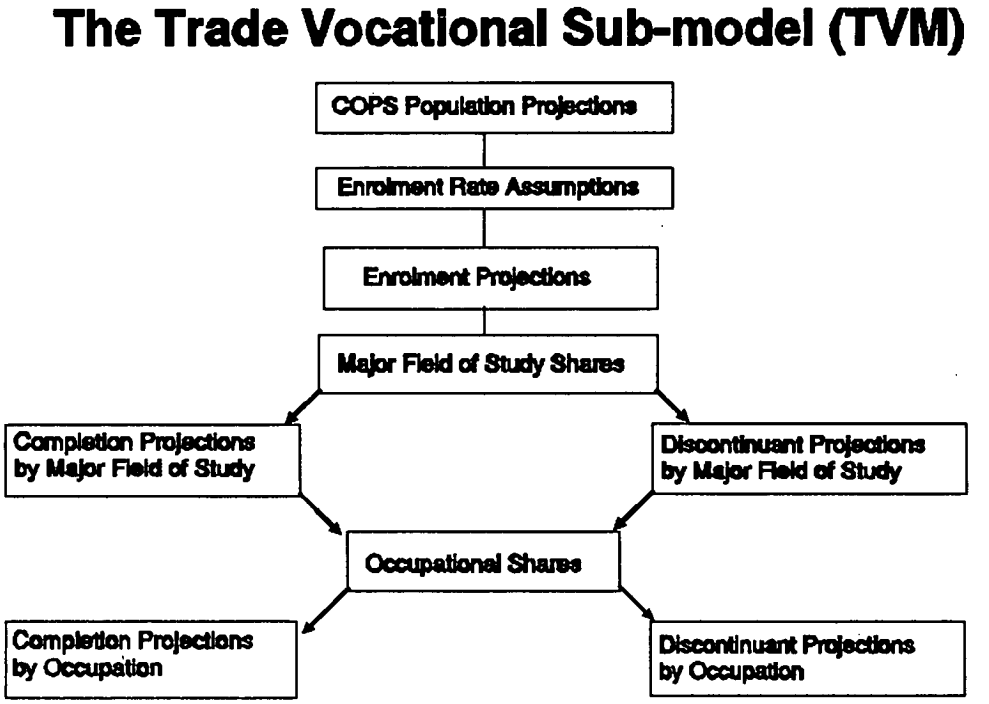
Province/ Aboriginal Ancestry	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Newfoundland					
Aboriginal	--	--	--	-	-
Non-Aboriginal	98	99	99	100	--
Prince Edward Island					
Aboriginal	--	--	--	-	-
Non-Aboriginal	98	99	99	-	-
Nova Scotia					
Aboriginal	2*	--	--	--	-
Non-Aboriginal	98	99	98	99	--
New Brunswick					
Aboriginal	--	--	--	--	-
Non-Aboriginal	98	99	98	99	--
Quebec					
Aboriginal	3*	--	--	--	--
Non-Aboriginal	97	99	100	99	100
Ontario					
Aboriginal	4	1*	--	--	--
Non-Aboriginal	96	99	99	99	99
Manitoba					
Aboriginal	8	4*	2*	--	-
Non-Aboriginal	92	96	98	100	--
Saskatchewan					
Aboriginal	4*	5*	--	--	-
Non-Aboriginal	96	95	98	99	--
Alberta					
Aboriginal	11	3	2*	--	-
Non-Aboriginal	89	97	99	99	100
British Columbia					
Aboriginal	4	2*	--	--	-
Non-Aboriginal	96	98	99	99	100
Northwest Territories					
Aboriginal	--	98	-	-	-
Non-Aboriginal	--	--	-	-	-
Yukon					
Aboriginal	--	-	-	-	-
Non-Aboriginal	81	--	-	-	-

Table 8F. Percentage distributions of 1986 graduates' province of study and visible minority ancestry, by level of certification in 1986, NGS 1988 and 1991

Province/ Visible Minority	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Newfoundland					
Visible	--	--	3*	--	--
Non-visible	100	99	97	92	--
Prince Edward Island					
Visible	--	--	--	-	-
Non-visible	99	99	99	-	-
Nova Scotia					
Visible	2*	--	6	6*	--
Non-visible	98	98	94	94	--
New Brunswick					
Visible	--	--	--	--	--
Non-visible	100	99	98	95	--
Quebec					
Visible	3*	--	4	7	11*
Non-visible	97	98	96	93	89
Ontario					
Visible	9	7	10	9	12
Non-visible	91	93	90	91	88
Manitoba					
Visible	3*	6*	7	12*	--
Non-visible	97	94	93	88	--
Saskatchewan					
Visible	--	--	3*	8*	--
Non-visible	99	98	97	92	--
Alberta					
Visible	10	7	8	10	--
Non-visible	90	93	92	90	85
British Columbia					
Visible	15	14	17	9	--
Non-visible	85	86	83	91	88
Northwest Territories					
Visible	-	-	-	-	-
Non-visible	--	100	-	-	-
Yukon					
Visible	-	-	-	-	-
Non-visible	100	--	-	-	-

3.5 National Graduate Survey Data and the COPS Student Flow Model

There are in fact two COPS Student Flow Models. One applies to Career/Technology and University graduates. The other, known as the Trade Vocational Sub-model (TVM), applies to Trade/Vocational graduates. The TVM is simpler than its Career/Technology and University counterpart. Thus, any conclusions concerning the application of the 1988 NGS data on the employment equity designated groups to the TVM would also apply to the Career/Technology and University model. The TVM is summarized below:



The actual workings of the model were not as important to this study as the variables involved. Two variables stood out, namely "Field of Study" and "Occupation". For the purposes of the TVM, the Field of Study variable was grouped into 49 categories. The occupation variable reported in the 1988 NGS, was coded according to the 1980 Standard Occupational Classification, and consisted of 24 major groups broken down further into 83 minor groups and even more unit groups. The COPS model was able to use all of these levels of classification in addition to an employment equity occupation classification made up of 13 categories.

Assuming for the moment that the TVM would accommodate 49 fields of study and 13 occupational groups, the data matrix would contain 637 data cells. What effects would this have on the employment equity designated group data? Already many national and provincial level cells contained data which were not releasable or only releasable with qualifications. The fact that the 1988 NGS occupation data pertained only to persons who had a job as of May 1988 introduced even further complexity.

Table 9.* Percentages of 1986 graduates retained by level of certification when analysis was limited to those employed in May 1988, NGS 1988 and 1991

Employment Equity Groups	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Gender					
Women	79	90	84	86	89
Men	80	90	83	86	93
Persons with/without disabilities (based on the 1988 question)					
With	60	82	75	83	90
Without	81	90	84	86	92
Persons with/without disabilities (based on the 1991 question)					
With	67	84	79	85	82
Without	80	90	84	86	92
Aboriginal/Non-Aboriginal (based on the 1988 question)					
Aboriginal	64	81	88	88	--
Non-Aboriginal	80	90	84	86	92
Aboriginal/Non-Aboriginal (based on the 1991 question)					
Aboriginal	61	81	83	95	--
Non-Aboriginal	80	90	84	86	92
Visible Minority/Non-visible minority (based on the 1991 question)					
Visible	84	89	78	76	88
Non-visible	79	89	84	87	93

* Based on the employed population counts presented in Table A2, Appendix A.

Table 9 presents percentages retained after the unemployed, persons out of the labour force and persons with an undetermined labour force status in May 1988, were excluded. Population counts were reduced by 7% to 40% depending upon the levels of certification and upon whether or not results pertained to the employment equity designated groups. In one-on-one comparisons, retained proportions of the designated groups were often lower than those of persons not in the designated groups. Comparatively, the proportions of employed individuals were lower for Aboriginal peoples and persons with disabilities who graduated with a trade vocational certificate in 1986, regardless of whether 1988 or 1991 populations were used. With regard to data releasability, Table 9 revealed findings similar to those in Table 7. In short, limiting COPS student flow applications to employed persons in 1988 would reduce the proportions of some

segments of the employment equity designated group populations but would not adversely affect NGS data releasability.

In Tables 10A to 10F[4], the 1988 NGS employed population is broken down by employment equity occupation groupings according to the level of certification received in 1986. Table 10A provides occupation distributions for women and men. Out of a total of 65 cells for women, 25 cells contained results deemed releasable; 30 cells had either no counts or counts which were not releasable; and 10 cells contained data releasable with qualification.

The fact that only about one third of the data cells in Table 10A revealed releasable data put into question the feasibility of basing estimates of designated groups to be used in COPS student flow applications on 1988 NGS results. Since the COPS model would require occupation breakdowns to be further broken down by variables such as the field of study classification there is certainly some question about using 1988 NGS results for women.

Table 10B provides occupation distributions for persons with disabilities, according to the level of certification in 1986. Data were deemed releasable in two of 65 possible data cells: in all, 56 cells show no counts or counts which were not releasable and 8 cells contain data releasable only with qualification. In other words, 1988 NGS data cannot be used to estimate persons with disabilities for COPS student flow applications.

Similarly, Table 10C, based on the 1991 question, reveals releasable data in only 6 cells. Tables 10D and 10E contain no reliable data cells for Aboriginal peoples and Table 10F contains only 10 cells where data are releasable without caution for visible minorities.

[4] Based on the employed population counts presented in Table A2, Appendix A.

Table 10A. Percentage distributions of employment equity occupation groupings for 1986 graduates employed in May 1988, by level of certification in 1986, for men and women, NGS 1988

Employment Equity (EE) Occupations/EE Groups	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Upper level managers					
Women	--	--	1*	2*	--
Men	--	--	1*	3	--
Middle and other managers					
Women	4	7	11	19	8*
Men	4	10	14	26	6*
Professionals					
Women	10	36	59	65	85
Men	5	19	54	59	82
Semi-professionals and technicians					
Women	13	17	7	7	--
Men	5	18	7	6	7*
Supervisors					
Women	--	1*	1*	--	-
Men	1*	--	1*	--	-
Foremen/Forewomen					
Women	--	--	--	--	-
Men	2	2*	1*	--	--
Clerical workers					
Women	37	26	12	3	--
Men	5	6	5	2*	--
Sales workers					
Women	4	4	3	1*	-
Men	4	7	7	2*	--
Service workers					
Women	21	6	3	--	-
Men	9	7	3	--	-
Skilled crafts and trades workers					
Women	1*	--	--	--	-
Men	28	16	2	--	--
Semi-skilled manual workers					
Women	2	--	--	-	-
Men	17	5	2	--	--
Other manual workers					
Women	6	2*	1*	--	-
Men	20	8	3	--	--
Other not elsewhere classified					
Women	1*	--	--	--	--
Men	1*	--	--	--	--

Table 10B. Percentage distributions of 1986 graduates employed in May 1988, by occupation and level of certification, for persons with or without disabilities based on the 1988 question, NGS 1988

Employment Equity (EE) Occupations/EE Groups	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Upper level managers					
With	--	--	--	--	-
Without	--	--	1	3	--
Middle and other managers					
With	--	--	--	--	-
Without	4	8	12	23	7
Professionals					
With	10*	27	52	54*	--
Without	7	29	57	62	83
Semi-professionals and technicians					
With	--	--	--	--	--
Without	9	18	7	6	6
Supervisors					
With	-	--	--	-	-
Without	1	1*	1	1*	-
Foremen/Forewomen					
With	--	--	--	-	-
Without	1	1*	1*	--	--
Clerical workers					
With	16*	--	--	--	-
Without	19	17	9	2	--
Sales workers					
With	--	--	--	--	-
Without	4	5	5	1	--
Service workers					
With	11*	--	--	-	-
Without	14	6	3	1*	-
Skilled crafts and trades workers					
With	13*	--	--	-	-
Without	16	7	1	--	--
Semi-skilled manual workers					
With	11*	--	--	-	--
Without	11	3	1	--	--
Other manual workers					
With	20*	--	--	-	-
Without	14	4	2	--	--
Other not elsewhere classified					
With	--	--	-	--	-
Without	1	--	0*	1*	--

Table 10C. Percentage distributions of 1986 graduates employed in May 1988, by occupation and level of certification for persons with or without disabilities based on the 1991 question, NGS 1988 and 1991

Employment Equity (EE) Occupations/EE Groups	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Upper level managers					
With	--	-	--	--	-
Without	--	--	1	3	--
Middle and other managers					
With	--	--	--	23*	-
Without	4	8	12	23	7
Professionals					
With	7*	36*	61	60	87*
Without	7	29	57	62	83
Semi-professionals and technicians					
With	9*	--	--	--	--
Without	9	17	7	6	6
Supervisors					
With	--	--	--	--	-
Without	1	1*	1	1*	-
Foremen/Forewomen					
With	--	--	--	-	-
Without	1	1*	1*	--	--
Clerical workers					
With	16	--	18*	--	-
Without	19	17	9	2	--
Sales workers					
With	--	--	--	--	-
Without	4	5	5	1	--
Service workers					
With	19	--	--	--	-
Without	14	6	3	1*	-
Skilled crafts and trades workers					
With	13	--	--	-	-
Without	16	7	1	--	--
Semi-skilled manual workers					
With	11*	--	--	-	-
Without	10	3	1	--	--
Other manual workers					
With	16	--	--	-	-
Without	14	5	2	--	--
Other not elsewhere classified					
With	-	--	--	--	-
Without	1	--	0*	1*	--

Table 10D. Percentage distributions of 1986 graduates employed in May 1988, by occupation and level of certification for Aboriginal peoples based on the 1988 identification question, NGS 1988

Employment Equity (EE) Occupations/EE Groups	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Upper level managers					
Aboriginal	--	--	--	--	-
Non-Aboriginal	--	--	1	3	--
Middle and other managers					
Aboriginal	--	--	--	--	--
Non-Aboriginal	4	8	12	23	6
Professionals					
Aboriginal	--	--	55*	67*	--
Non-Aboriginal	7	29	57	62	83
Semi-professionals and technicians					
Aboriginal	--	--	--	--	-
Non-Aboriginal	9	17	7	6	6
Supervisors					
Aboriginal	--	-	--	-	-
Non-Aboriginal	1	1*	1	1*	-
Foremen/Forewomen					
Aboriginal	--	--	--	-	-
Non-Aboriginal	1	1*	1*	--	--
Clerical workers					
Aboriginal	22*	--	--	--	-
Non-Aboriginal	19	17	9	2	--
Sales workers					
Aboriginal	--	--	--	-	-
Non-Aboriginal	4	5	5	1	--
Service workers					
Aboriginal	17*	--	--	-	-
Non-Aboriginal	14	6	3	1*	-
Skilled crafts and trades workers					
Aboriginal	16*	--	--	-	-
Non-Aboriginal	16	7	1	--	--
Semi-skilled manual workers					
Aboriginal	12*	--	--	-	-
Non-Aboriginal	11	3	1	--	--
Other manual workers					
Aboriginal	12*	--	--	-	--
Non-Aboriginal	14	5	2	--	--
Other not elsewhere classified					
Aboriginal	--	--	--	-	--
Non-Aboriginal	1	--	0*	1*	--

Table 10E. Percentage distributions of 1986 graduates employed in May 1988, by occupation and level of certification for Aboriginal peoples based on the 1991 ancestry question, NGS 1988 and 1991

Employment Equity (EE) Occupations/EE Groups	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Upper level managers					
Aboriginal	--	--	--	-	-
Non-Aboriginal	--	--	1	3	--
Middle and other managers					
Aboriginal	--	--	--	--	-
Non-Aboriginal	4	8	12	23	6
Professionals					
Aboriginal	--	--	60*	--	--
Non-Aboriginal	7	29	57	62	83
Semi-professionals and technicians					
Aboriginal	--	--	--	--	--
Non-Aboriginal	9	17	7	6	6
Supervisors					
Aboriginal	-	-	--	-	-
Non-Aboriginal	1	1*	1	1*	-
Foremen/Forewomen					
Aboriginal	--	--	-	-	-
Non-Aboriginal	1	1*	1*	--	--
Clerical workers					
Aboriginal	18*	--	--	--	-
Non-Aboriginal	19	17	9	2	--
Sales workers					
Aboriginal	--	--	--	--	-
Non-Aboriginal	4	5	5	1	--
Service workers					
Aboriginal	19*	--	--	-	-
Non-Aboriginal	14	6	3	1*	-
Skilled crafts and trades workers					
Aboriginal	14*	--	--	-	-
Non-Aboriginal	16	7	1	--	--
Semi-skilled manual workers					
Aboriginal	12*	--	-	-	-
Non-Aboriginal	10	3	1	--	--
Other manual workers					
Aboriginal	13*	--	--	--	-
Non-Aboriginal	14	5	2	--	--
Other not elsewhere classified					
Aboriginal	--	--	-	-	-
Non-Aboriginal	1	--	0*	1*	--

Table 10F. Percentage distributions of 1986 graduates employed in May 1988, by occupation and level of certification for visible minorities, NGS 1988 and 1991

Employment Equity (EE) Occupations/EE Groups	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Upper level managers					
Visible	--	--	--	--	-
Non-visible	--	--	1	3	--
Middle and other managers					
Visible	--	--	14	13*	--
Non-visible	4	8	12	24	7
Professionals					
Visible	8*	26	54	69	88
Non-visible	7	29	57	61	83
Semi-professionals and technicians					
Visible	9*	15*	5*	9*	--
Non-visible	9	18	7	6	6
Supervisors					
Visible	--	--	--	--	-
Non-visible	1	1*	1	1*	-
Foremen/Forewomen					
Visible	--	--	--	--	--
Non-visible	1	1*	1*	--	-
Clerical workers					
Visible	23	19*	12	--	--
Non-visible	19	17	9	2	--
Sales workers					
Visible	--	--	--	--	-
Non-visible	4	5	5	1	--
Service workers					
Visible	20	--	--	-	-
Non-visible	14	6	3	1*	-
Skilled crafts and trades workers					
Visible	12	--	--	--	--
Non-visible	16	7	1	--	--
Semi-skilled manual workers					
Visible	6*	--	--	--	--
Non-visible	11	3	1	--	--
Other manual workers					
Visible	13	--	--	--	-
Non-visible	14	5	2	--	--
Other not elsewhere classified					
Visible	--	--	--	--	-
Non-visible	1	--	0*	1*	--

The 1988 NGS employment equity designated group distributions provided reliable estimates at general levels of analysis. However, when estimates were broken down by variables such as province and occupation, they diminished in reliability and cast doubt on the appropriateness of using 1988 NGS data for this analysis. The more finely the data were broken down the less reliable they became. Even though these breakdowns represented only a few of the actual manipulations the data needed to fit into the COPS model, serious reliability problems appeared. In conclusion, the 1988 NGS file appeared to be unsuitable for use in the COPS model. Other data sources that might provide better estimates of employment equity designated group populations were considered.

3.6 Profiling the National Graduate Survey Employment Equity Designated Group Populations

Although 1988 NGS data could not be used to produce COPS models for all the designated groups, they could provide a general profile of some employment equity populations. Table 10A, and to some extent Table 10F, for example, compare information about occupations of women and visible minorities with the rest of the employed population. Where data were deemed releasable, women were more likely than men to be represented in clerical and professional occupations and less likely to be represented in the middle and other managers, and skilled and manual workers categories (Table 10A). Visible minorities were well-represented among professionals and in the semi-professional and technical areas (Table 10F). They were also well-represented in the clerical area and, for those with trade-vocational qualifications, in the service area.

Because 1988 NGS results could, in some cases, provide useful information on the designated groups, it seemed worthwhile to attempt to profile these populations further. Results on the following pages could improve the understanding of the situation of employment equity designated groups; however, data and analysis will only be provided when results reveal enough data cells deemed releasable or releasable with qualification.

Table 11[5] provdes the percentage distributions of 1986 graduates employed in May 1988, by employment equity industry groupings by level of certification, for women and men. Women were under-represented in the manufacturing and construction sectors and over-represented in the education services and the health and social services sectors. For the other designated groups, distributions did not reveal enough releasable cells to warrant analysis.

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[5] Based on the population distributions presented in Table A2, Appendix A.

Table 11. Percentage distributions of 1986 graduates employed in May 1988, by employment equity industry groupings for men and women, by level of certification in 1986, NGS 1988

Employment Equity (EE) Industry/EE Groups	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Agricultural and related					
Women	–	1*	–	–	-
Men	2	2*	1*	–	–
Fishing and Trapping					
Women	–	–	–	–	-
Men	1*	–	–	–	–
Logging and Forestry					
Women	–	–	–	–	-
Men	1*	–	–	–	–
Mining, Quarrying and Oil Well					
Women	–	–	1*	–	-
Men	2	2*	1*	2*	–
Manufacturing					
Women	9	8	6	4	-
Men	26	21	14	10	6*
Construction					
Women	2	–	1*	–	-
Men	13	7	3	1*	–
Transportation and Storage					
Women	1*	1*	1*	–	-
Men	5	3*	2	1*	–
Communication and Other Utility					
Women	3	2*	2	2	–
Men	3	7	4	4	–
Wholesale Trade					
Women	3	3	2	–	–
Men	6	7	4	2	–
Retail Trade					
Women	9	7	4	–	–
Men	13	7	5	2*	–
Finance and Insurance					
Women	4	5	6	3	–
Men	1*	3*	7	5	–

Table 11. **Percentage distributions of 1986 graduates employed in May 1988, by employment equity industry groupings for men and women, by level of certification in 1986, NGS 1988 (continued)**

Employment Equity (EE) Industry/EE Groups	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Real Estate Operations					
Women	1*	1*	1*	–	-
Men	1*	–	2	1*	–
Business Services					
Women	8	9	9	7	8*
Men	4	11	16	14	9
Government Services					
Women	9	7	9	13	10*
Men	5	10	11	15	14
Education Services					
Women	4	5	32	43	53
Men	2	2*	18	28	53
Health and Social Services					
Women	30	39	19	19	27
Men	4	8	7	8	10
Accommodation, Food and Beverage Services					
Women	7	3	2	–	–
Men	6	3*	1*	–	–
Other Services					
Women	8	5	5	4	–
Men	4	4	4	4	–
Other not elsewhere classified					
Women	1*	–	–	–	–
Men	1*	–	–	–	-

Table 12[6] provides unemployment rates and labour force participation rates of 1986 graduates in May 1988, by level of certification for the designated groups. Results, where deemed releasable or releasable with qualification, often revealed comparatively higher unemployment rates among those in the designated groups, especially for trade-vocational certificates recipients in 1986. There were some exceptions among women and visible minorities.

Most of the labour force participation rates presented in Table 12 were releasable. At first glance, members of the designated groups seemed to have fared well in labour force participation. Participation rates were mixed, in relation to undesignated groups, but in most cases were comparatively lower. As expected, where unemployment rates were higher, participation rates were lower, especially for persons who had received trade-vocational qualifications in 1986. This suggests that members of designated groups who completed trade-vocational qualifications in 1986 had more difficulty finding jobs in 1988, or that many had abandoned looking for work.

[6] Based on the population distributions presented in Table 7.

Table 12. **Unemployment and labour force participation rates of 1986 graduates of the employment equity designated groups in May 1988, by level of certification in 1986, NGS 1988 and 1991**

Employment Equity Groups/Rates	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Gender					
Unemployment Rate					
Women	14.1	6.6	8.5	6.9	6.6*
Men	17.5	8.3	10.4	6.4	3.8*
Participation Rate					
Women	91.5	95.8	92.0	91.9	95.7
Men	94.9	96.6	93.1	91.6	97.0
Persons with/without disabilities (based on the 1988 question)					
Unemployment Rate					
With	28.7	--	--	--	--
Without	15.4	7.3	9.3	6.6	4.7*
Participation Rate					
With	84.5	89.5	83.9	89.6	94.6*
Without	95.6	97.0	93.0	91.9	97.1
Persons with/without disabilities (based on the 1991 question)					
Unemployment Rate					
With	22.9	--	13.2*	--	--
Without	15.5	7.3	9.2	6.6	4.4*
Participation Rate					
With	87.4	93.3	91.5	93.2	96.1*
Without	94.9	96.6	92.5	91.7	96.6
Aboriginal/Non-Aboriginal (based on the 1988 question)					
Unemployment Rate					
Aboriginal	26.3	--	--	--	-
Non-Aboriginal	15.5	7.2	9.4	6.6	4.8*
Participation Rate					
Aboriginal	87.5	94.7	94.1	93.9*	--
Non-Aboriginal	94.6	96.5	92.5	91.7	96.6
Aboriginal/Non-Aboriginal (based on the 1991 question)					
Unemployment Rate					
Aboriginal	28.4	--	--	--	-
Non-Aboriginal	15.5	7.2	9.3	6.6	4.7*
Participation Rate					
Aboriginal	85.5	95.3	98.7	100.0*	--
Non-Aboriginal	94.7	96.5	92.5	91.7	96.6
Visible Minority/Non-visible minority (based on the 1991 question)					
Unemployment Rate					
Visible	12.4	--	10.9	11.7*	--
Non-visible	16.2	7.3	9.2	6.2	4.6*
Participation Rate					
Visible	95.3	96.6	87.7	85.8	93.2
Non-visible	94.3	96.5	92.9	92.2	97.1

Lower proportions of women than men worked full-time after graduating, especially women with trade-vocational certification (Table 13[7]). For persons with disabilities, full-time employment proportions were in most cases slightly lower than persons without disabilities. The exception was for persons with disabilities (based on the 1988 question) with a master's degree and a full-time job. The proportion was much lower. For Aboriginal peoples, it was very difficult to accurately determine shares based on employment status because results from many cells were not releasable or releasable only with qualifications. Where data were releasable for Aboriginal peoples, proportions employed full-time were in most cases about the same as those for non-Aboriginal peoples. However, for Aboriginal peoples having graduated with a master's degree (based on the 1988 question), the proportion of persons with a full-time job was much higher than for their non-Aboriginal counterparts. Full-time employment proportions for visible minorities were somewhat lower comparatively, except at the doctorate level where they were equal and at the bachelor's level where they were higher.

[7] Based on the population distributions presented in Table A2 of Appendix A.

Table 13. Employment status of 1986 graduates for the employment equity designated groups employed in May 1988, by level of certification in 1986, NGS 1988 and 1991

Employment Equity Groups/ Employment Status	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Gender					
Full-time					
Women	77.4	88.1	85.1	86.0	89.3
Men	95.2	95.1	93.7	93.2	95.3
Part-time					
Women	21.6	11.6	14.7	13.8	10.3*
Men	4.2	4.6	6.1	6.5	4.5*
Persons with/without disabilities (based on the 1988 question)					
Full-time					
With	85.8	90.9	89.3	78.8	--
Without	87.5	91.3	89.0	90.1	93.6
Part-time					
With	12.7*	--	--	--	--
Without	11.8	8.4	10.9	9.7	6.2
Persons with/without disabilities (based on the 1991 question)					
Full-time					
With	82.9	92.7	85.8	89.2	95.8*
Without	87.6	91.2	89.1	89.9	93.2
Part-time					
With	16.2	--	14.2*	--	--
Without	11.6	8.5	10.7	9.8	6.6
Aboriginal/Non-Aboriginal (based on the 1988 question)					
Full-time					
Aboriginal	87.8	92.6	98.7	86.5*	--
Non-Aboriginal	87.3	91.3	88.8	90.0	93.4
Part-time					
Aboriginal	10.9*	--	--	--	--
Non-Aboriginal	11.9	8.5	10.9	9.8	6.4
Aboriginal/Non-Aboriginal (based on the 1991 question)					
Full-time					
Aboriginal	87.2	89.4*	90.6*	88.3*	--
Non-Aboriginal	87.3	91.3	88.9	89.9	93.4
Part-time					
Aboriginal	11.5*	--	--	--	--
Non-Aboriginal	11.9	8.4	10.9	9.8	6.4
Visible Minority/Non-visible minority (based on the 1991 question)					
Full-time					
Visible	85.6	88.8	92.3	86.1	93.3
Non-visible	87.5	91.4	88.7	90.2	93.3
Part-time					
Visible	12.9	10.6*	7.4*	13.8*	--
Non-visible	11.8	8.3	11.1	9.5	6.6

Respondents employed in May 1988 were asked whether they felt that their job was related to the qualifications they had received in 1986. Results (Table 14[8]), do not include Aboriginal peoples because not enough data cells were releasable. Comparisons for women and men show that women often felt that their job was directly related to the certificate received. Men often saw partial or no relation, especially at the bachelor's and master's levels. At the bachelor's and master's levels women perceived less relation than at other levels.

Results for persons with disabilities (based on the 1988 NGS question) offered little information because there were few releasable data cells. They were nonetheless presented because results based on the 1991 Follow-up revealed some information. In general, persons with disabilities often felt their job related to their educational qualifications only partly or not at all.

For visible minorities, perceived relations were similar to those of others at the trade-vocational, and higher at the doctorate level. At all other levels, visible minorities perceived less relation between education and job than non-visible minorities.

[8] Based on the population distributions presented in Table A2, Appendix A.

Table 14. Relation between certification received in 1986 and occupation in 1988 by level of certification, graduates employed in May 1988, NGS 1988 and 1991

Employment Equity Groups/ Relation	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Gender					
Directly related					
Women	67.6	67.4	46.0	54.5	64.8
Men	59.7	55.5	46.3	48.6	63.9
Partly related					
Women	13.8	20.0	37.3	37.9	30.9
Men	13.5	27.5	36.3	41.8	30.8
Not related					
Women	18.1	11.8	16.1	6.5	--
Men	26.4	16.0	16.5	9.0	4.6*
Not determinable					
Women	--	--	1.0*	1.2*	--
Men	--	--	1.0*	--	--
Persons with/without disabilities (based on the 1988 question)					
Directly related					
With	49.7	51.9*	39.6*	47.8*	--
Without	63.8	62.2	46.3	51.4	64.8
Partly related					
With	18.1*	30.6*	43.4*	37.9*	--
Without	13.4	23.3	36.7	40.0	30.3
Not related					
With	31.5	--	--	--	--
Without	22.4	13.6	16.2	7.8	4.2*
Not determinable					
With	--	--	-	--	-
Without	0.4*	1.0*	1.0*	1.0*	--
Persons with/without disabilities (based on the 1991 question)					
Directly related					
With	55.3	56.5	53.0	49.4	--
Without	63.7	62.2	45.9	51.4	65.1
Partly related					
With	15.1	29.7*	29.4*	40.7	--
Without	13.5	23.2	37.1	40.0	30.1
Not related					
With	29.4	--	17.6*	--	--
Without	22.3	13.6	16.2	7.8	4.1*
Not determinable					
With	--	--	-	--	-
Without	0.5*	1.0*	1.0	1.0*	--
Visible Minority (based on the 1991 question)					
Directly related					
Visible	62.0	54.6	40.8	42.2	67.3
Non-visible	63.3	62.4	46.5	52.0	63.7
Partly related					
Visible	11.5	26.5	36.5	41.8	29.5*
Non-visible	13.7	23.2	36.9	39.9	31.1
Not related					
Visible	25.5	17.5*	21.2	14.8	--
Non-visible	22.5	13.4	15.9	7.3	4.4*
Not determinable					
Visible	--	--	--	--	--
Non-visible	0.4*	1.0*	1.0*	1.0*	--

Average annual employment earnings (Table 15) were based on full-time full-year work equivalence. They were reported by NGS respondents to the nearest $1,000 dollars. Comparisons are for women and visible minorities only; those of other designated groups were often not releasable. One finding was that average earnings of women were consistently lower than those of men, with differences in average earnings highest among trade-vocational graduates, followed by career-technical and university graduates. The earnings gaps between women and men university graduates, whether they had bachelor's, master's or doctorate qualifications, were practically identical. Average earnings were consistently lower for visible minorities with trade-vocational, master's and doctorate level qualifications than for non-visible minorities. Visible minorities with career-technical and bachelor's level qualifications showed comparatively higher average earnings, based on numbers releasable with qualifications.

Table 15. Average annual employment earnings* for selected employment equity designated groups employed in May 1988, by level of certification in 1986, NGS 1988 and 1991

Employment Equity Groups	Level of Certification 1986				
	Trade/ Vocational ($)	Career/ Technical ($)	Bachelor's ($)	Master's ($)	Doctorate ($)
Gender					
Women	17,000	21,000	26,000	36,000	37,000
Men	24,000	26,000	30,000	40,000	39,000
Visible Minority (based on the 1991 question)					
Visible	19,000	30,000*	29,000*	36,000	37,000
Non-visible	21,000	23,000	28,000	39,000	39,000

* Employment earnings are based on full-time full-year work equivalence. They were reported to the nearest $1,000 dollars.

Table 16 shows the average ages at graduation for which comparisons revealed enough releasable information, that is, for women and visible minorities. In general, the average age of trade-vocational graduates was higher than for career-technical and bachelor level graduates. This can be explained by the fact that trade-vocational programs often involve persons who return to school to upgrade skills after being in the labour force. For employment equity groups, the average age of women was one to two years higher than for men at all levels except in career-technical programs, where the average age for both sexes in 1986 was 23 years. The average age at graduation for visible minorities was approximately three years higher than non-visible minorities for trade-vocational and career-technical levels. The age of visible minority graduates was slightly lower at the bachelor's and master's levels and slightly higher at the doctorate level.

Table 16. Average age at graduation of 1986 graduates of selected employment equity designated groups, by level of certification, NGS 1988 and 1991

Employment Equity Groups	Level of Certification 1986				
	Trade/ Vocational (age)	Career/ Technical (age)	Bachelor's (age)	Master's (age)	Doctorate (age)
Gender					
Women	28	23	27	32	35
Men	26	23	25	31	33
Visible Minority (based on the 1991 question)					
Visible	29	26*	25	31	35
Non-visible	27	23	26	32	34

Tables 17A to 17D present fields of study of members of selected[9] employment equity groups. We have already mentioned the COPS Trade-Vocational Sub-model (TVM) would involve 49 fields of study. To increase the number of releasable cells, results here show collapsed field of study categories. How these categories translate into the COPS fields of study is outlined in Appendices B, C and D.

Note also that Tables 17A to 17D[10] present data on the major field of study corresponding to the highest degree, certificate or diploma ever received by 1986 graduates. This means that the fields of study shown do not necessarily correspond to the level of certification received in 1986. If, for example, a person who received a trade-vocational certificate in 1986 had previously obtained a bachelor's degree, his or her major field of study would correspond to the bachelor's degree. This could explain why Tables 17A to 17D reveal high proportions of "Unknown and Not Elsewhere Classified" and "No Specialization and Not Elsewhere Classified". The COPS model would use the field of study corresponding to the highest degree, certificate or diploma ever received.

Major field of study distributions for women, men, visible minorities and non-visible minorities are grouped by levels of certification received in 1986. Where comparisons involve releasable data, women who received trade-vocational certificates were over-represented in the management and administration and health fields, and equal in proportion to men in the service technologies field (Table 17A). There were lower proportions of women than men in all other fields, especially the mechanical and engineering technologies. Where data were releasable, visible minority groups were highly represented in the management and administration and health fields, especially in the service technologies field. They were under-represented in the mechanical and engineering technologies field.

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[9] Comparisons involving persons with disabilities and Aboriginal peoples did not provide enough releasable data cells for analysis.

[10] Based on the population distributions presented in Table 7.

Among persons who received career-technical certificates in 1986, women were over-represented in management and administration and health and social sciences and services (Table 17B). The arts field had equal proportions of women and men. Men dominated all other fields, especially mechanical and engineering technologies. For visible minorities, the lack of releasable data limited the number of comparisons that could be made. It can be noted that some fields had visible minority representations which were practically identical to the non-visible population.

Distributions by major field of study for women and men who received university degrees, certificates or diplomas in 1986 are shown in Table 17C. Where the data provided releasable comparisons, women were highly represented in the education and medicine and health fields, whether they had received bachelor's, master's or doctorate degrees in 1986. Those having received bachelor's or master's degrees were slightly over-represented in the humanities and arts field. The proportion of women in the social sciences who had received a doctoral degree was also higher than among their male counterparts. Women lagged behind in engineering and applied sciences, physical sciences and agriculture-biology fields.

Table 17A. Percentage distributions of 1986 trade-vocational graduates for selected employment equity groups, by field of study, NGS 1988

Field of Study	Trade-Vocational Level of Certification in 1986			
	Employment Equity Groups			
	Women (%)	Men (%)	Visible Minorities (%)	Non-visible Minorities (%)
Arts	–	1*	–	0*
Social Sciences and Services	2	1*	–	1
Management and Administration	40	5	21	20
Mathematics and Computer Science	–	–	–	–
Health	18	2	12	9
Mechanical and Engineering Technologies	5	61	29	37
Natural Sciences	2	4	–	3
Service Technologies	7	7	13	7
Unknown and Not Elsewhere Classified	25	20	22	22

Table 17B. Percentage distributions of 1986 career-technical graduates for selected employment equity groups, by field of study, NGS 1988

Field of Study	Trade-Vocational Level of Certification in 1986			
	Employment Equity Groups			
	Women (%)	Men (%)	Visible Minorities (%)	Non-visible Minorities (%)
Arts	7	7	--	7
Humanities	1*	--	--	1*
Social Sciences and Services	15	8	--	12
Management and Administration	29	17	23	24
Mathematics and Computer Science	5	8	--	6
Health	23	5	15*	15
Mechanical and Engineering Technologies	3	28	16*	14
Natural Sciences	2	8	--	5
Service Technologies	1*	--	--	1*
Unknown and Not Elsewhere Classified	14	17	18*	15

Table 17C. Percentage distributions of 1986 university graduates for women and men, by field of study, NGS 1988

Field of Study	University Level of Certification in 1986					
	Bachelor's		Master's		Doctorate	
	Women (%)	Men (%)	Women (%)	Men (%)	Women (%)	Men (%)
Education	18	9	23	13	14	6*
Arts	5	3	3	1*	--	--
Humanities	13	9	17	9	13	16
Social Sciences	37	37	34	43	37	23
Agriculture - Biology	4	5	4	4	7*	12
Engineering and Applied Sciences	2	15	2	14	--	14
Medicine and Health	11	5	9	4	14	7
Physical Sciences	4	11	3	8	8*	18
No Specialization and Not Elsewhere Classified	6	6	4	4	--	--

Table 17D. Percentage distributions of 1986 university graduates for visible minorities and non-visible minorities, by field of study, NGS 1988 and 1991

Field of Study	University Level of Certification in 1986					
	Bachelor's		Master's		Doctorate	
	Visible Minorities (%)	Non-visible Minorities (%)	Visible Minorities (%)	Non-visible Minorities (%)	Visible Minorities (%)	Non-visible Minorities (%)
Education	5*	15	7*	19	--	10
Arts	--	4	--	2	-	--
Humanities	6*	11	9*	13	--	16
Social Sciences	36	37	33	40	--	30
Agriculture - Biology	6*	5	--	4	--	11
Engineering and Applied Sciences	15	7	25	7	36*	6
Medicine and Health	9	8	6*	6	--	11
Physical Sciences	15	6	9*	5	21*	14
No Specialization and Not Elsewhere Classified	7*	6	6*	4	-	2*

Where results are reliable, visible minorities were over-represented in the engineering and applied sciences among those who received bachelor's degrees in 1986 and especially well represented at the master's level (Table 17D). They were also over-represented in the physical sciences field, and to some extent in the medicine and health field, among bachelor's degree recipients.

3.7 Enhancing National Graduate Survey Data Reliability

What could be done in future NGS's to enhance the reliability of estimates and render the employment equity designated groups data usable for COPS applications? To answer this question, it is important to summarize the above analysis:

- unexplained discrepancies between original 1988 and 1991 follow-up responses to questions identifying Aboriginal peoples and persons with disabilities;
- provincial distributions with high proportions of unreliable or qualified cells for Aboriginal peoples, persons with disabilities and visible minority groups, especially for master's and doctorate level graduates;
- distributions based on the employment equity occupations groups (13 categories), industry and field of study which produced very high proportions of data cells that were unreleasable or releasable only with qualifications for Aboriginal peoples, persons with disabilities and visible minorities, and, in some cases, relatively high proportions for women.

Some of the above problems could easily be remedied. For instance, discrepancies between original and follow-up responses to practically identical questions, could be reduced using flags and subsequent questions to rectify or explain reported discrepancies. The COPS model could also be modified to accommodate grouped classifications of field of study categories, similar to the ones presented earlier. However, these grouped results suggest the under-representation problem could still exist for certain employment equity designated groups.

Could over-sampling among specific equity designated groups, enhance NGS data releasability? This is doubtful, given that the NGS data would be weighted to reflect the actual population of graduates for a given year. The lack of reliability of the some 1988 NGS data, for example, was because there were simply not enough recent designated group graduates for representative samples.

Another question is whether adding questions to future NGS's, would better identify recent graduates and members of the designated groups. It seems that it would not, since results would be subject to the same release guidelines as the 1988 NGS. The NGS could only provide valid employment equity group estimates if its base was expanded. Broadening the NGS survey population base would require expanding the surveyed population, for example to persons who graduated between 1981 and 1986. Such a strategy applied to future NGSs could yield five times more designated group members than were reported for one graduation year. However, it would also likely increase collection and production costs and would require adjustment of the COPS Student Flow Model to factor in results over five years instead of one.

4.0 ALTERNATIVE DATA SOURCES

Given that the 1988 NGS results had, in many cases, proved unreliable for designated groups, other data sources with a broader population base were explored for more reliable estimates. These include the Labour Market Activity Survey (LMAS) and the census both of which contained questions that identified members of designated groups.

To fully comprehend additional problems in using LMAS or census results, it is important to remember that this analysis set out to determine whether the employment equity designated group data from the NGS could be incorporated into COPS Models. One reason the NGS data were chosen was because they dealt with recent graduates of Canadian postsecondary education institutions. This was crucial, because it meant that student flow applications were based only upon persons whose credentials were current and recognized in Canada.

4.1 The Labour Market Activity Survey (LMAS)

The Labour Market Activity Survey (LMAS) collected information on patterns of work and types of jobs held during a one-year period and provided annual and long-term measures of employment and unemployment as well as characteristics of paid worker jobs. It answered questions the Labour Force Survey (LFS) cannot, such as: how many Canadian individuals and members of their families are unemployed; how many periods of unemployment the average Canadian has; which groups are most at risk during a period of economic recession. The following summary refers to the 1990 questionnaire, the latest for which LMAS data were available.

The LMAS questions by which persons with disabilities could be identified were quite different from those in the NGS. Chronic health problems often have an impact on one's ability to perform certain tasks and may therefore limit or restrict labour force participation. It was important to consider such limitations in attempts to measure labour market activity. The LMAS (1990) questions devoted to health limitations therefore were aimed not only at identifying persons with disabilities, but also at determining how chronic health problems could affect participation in the labour market.

The LMAS identified Aboriginal peoples through an ethnic ancestry question. As in the NGS, there were problems with this type of identification, especially with multiple responses. The LMAS (1990) seemed to further complicate matters with a question pertaining to a person's race or colour.

The LMAS (1990) contained six questions which could be used to identify visible minorities. The main one identified respondents based on their ancestry. A specific open-ended question followed, asking whether there were other groups from which the parents or grandparents descended. Other questions asked if, by virtue of their race or colour, persons were in a visible minority in Canada, and if so, to which group did they belong. Two final questions (mother tongue and place of birth) could be used to better identify the population.

While this detailed set of questions could provide very specific information that would help identify visible minorities, it could also confuse the issue. Certain persons who are considered visible minorities under the *Employment Equity Act* may not necessarily see themselves as such, for example, persons of Latin American, Arab, West Asian or North African descent. Similarly, Aboriginal peoples may have also considered themselves as visible minorities based on race or colour.

One problem in using the LMAS data is that it was not particularly geared to producing data on recent graduates. Using it would require estimating numbers of recent graduates. Age could be used as a proxy to identify recent graduates, for example, by limiting analysis to 20 to 34 year olds with trade-vocational or postsecondary qualifications. A second problem with using the LMAS is that results do not provide information about individuals fields of study. LMAS results would also be subject to the same release guidelines as 1988 NGS results where subjected to and would therefore produce designated group estimates no better than those of the 1988 NGS.

4.2 The Census

The census could also provide data for COPS applications, and there are advantages to using census data. They could provide a more accurate picture than other surveys because they are based on the Canadian population as a whole. Releasability would not be the concern it was with the NGS, LMAS and LFS.

The census is, however, not without problems when it comes to the identification of designated groups. To identify persons with disabilities, both the 1986 and 1991 Census questionnaires contained questions on activity limitations and long term disabilities or handicaps. However, their purpose was not to identify the persons with disabilities population as such, but rather to establish a sampling frame for the post-censal Health and Activity Limitation Survey (HALS). In 1986, (1991 questions were almost identical) the questions related to disability read as follows:

Figure 6

20. a) Are you limited in the kind or amount of activity that you can do because of a long-term physical condition, mental condition or health problem:

At home?
|__| No, I am not limited
|__| Yes, I am limited

At school or at work?
|__| No, I am not limited
|__| Yes, I am limited
|__| Not applicable

In other activities, e.g., transportation to and from work, leisure time activities?

|__| No, I am not limited
|__| Yes, I am limited

20. b) Do you have any long-term disabilities or handicaps?

|__| No
|__| Yes

The 1986 Census questionnaire contained two questions dealing with Canada's Aboriginal peoples. The first was part of the questionnaire distributed to all households. It read as follows: (Figure 7)

Figure 7

7. Do you consider yourself an Aboriginal person or a native Indian of North America, that is, Inuit, North American Indian or Metis?

|__| No, I do not consider myself Inuit, North American Indian or Metis
|__| Yes, Inuit
|__| Yes, status or registered Indian
|__| Yes, non-status Indian
|__| Yes, Metis

Figure 8

17. To which ethnic or cultural group(s) do you or your ancestors belong? (See Guide) Mark or specify as many as applicable

|__| French
|__| English
|__| Irish
|__| Scottish
|__| German
|__| Italian
|__| Ukrainian
|__| Dutch (Netherlands)
|__| Chinese
|__| Jewish
|__| Polish
|__| Black
|__| Inuit
|__| North American Indian
|__| Metis

Other ethnic or cultural group(s). For example, Portuguese, Greek, Italian, Indian (India), Pakistani, Filipino, Japanese, Vietnamese. (specify below)

|__|__|__| _____
|__|__|__| _____
|__|__|__| _____
Other(s) (specify)

The second question, was part of the questionnaire distributed to one in five Canadian households. It dealt with the broader concept of ancestry. (Figure 8)

For employment equity purposes, Aboriginal peoples were identified through responses to this second question. Respondents who checked the box identifying Inuit, North American Indian or Metis as a single or multiple ethnic ancestry response were included in the count of Aboriginal peoples. Those who provided both Aboriginal and visible minority responses were counted separately and included in the totals of both Aboriginal peoples and visible minorities.

The 1991 Census questionnaire also contained two questions dealing with the identification of Aboriginal peoples. The first was very similar to that on the 1986 Census (Figure 9), the second dealt specifically with registered Indians (Figure 10).

Neither the 1986 nor the 1991 Census questionnaires contained questions to specifically identify visible minorities. They did, however, contain an "ethnic origin" question which asked persons to which ethnic or cultural group(s) they or their ancestors belonged. The 1991 question included a note to explain why the question was asked.

In both 1986 and 1991, respondents could enter more than one response to the ethnic origin question, for example, they could indicate having both Black and Chinese origins. Such respondents could not be included in both visible minority subgroups without artificially increasing the total population counts. There were other complications in identifying the visible minority population. For example, Haitians could indicate being of French origin but omit indicating being of Black origin and as such, would not be included in the population based solely on their response to the ethnic origin question. Such situations were remedied by assigning persons whose reported ethnic origin was French and whose place of birth was Haiti, into the Black subgroup. (For a more complete discussion of such issues related to the 1986 and 1991 Censuses, please see Boxhill, December 1990.)

Figure 9

15. To which ethnic or cultural group(s) did this person's ancestors belong?

Mark or specify as many as applicable.

Note: While most people of Canada view themselves as Canadian, information about their ancestral origins has been collected since the 1901 Census to reflect the changing composition of the Canadian population and is needed to ensure that everyone, regardless of his/her ethnic or cultural background, has **equal opportunity** to share fully in the economic, social, cultural and political life of Canada. Therefore, this question refers to the origins of this person's **ancestors.**

See Guide.

☐	French	☐	Dutch (Netherlands)
☐	English	☐	Jewish
☐	German	☐	Polish
☐	Scottish	☐	Black
☐	Italian	☐	North American Indian
☐	Irish	☐	Metis
☐	Ukrainian	☐	Inuit/Eskimo
☐	Chinese		

Other ethnic or cultural group(s) - Specify

Examples of other ethnic or cultural groups are: Portuguese, Greek, Indian from India, Pakistani, Filipino, Vietnamese, Japanese, Lebanese, Haitian, etc.

_____

_____

Figure 10

16. Is this person a **registered Indian** as defined by the *Indian Act* of Canada?

See Guide.

|__| No
|__| Yes, registered Indian

Specify Indian Band or First Nation (for example, Musqueam)

_____

The 1986 and 1991 Censuses did not contain questions on year or institution of graduation that would identify recent Canadian graduates or graduates whose qualifications are recognized in Canada. This could make it difficult to ensure that COPS student flow applications deal with persons whose credentials are on an "equal footing".

There may be ways around the problem, to provide a recent graduate proxy and a Canadian recognition proxy. Analysis of 1991 Census data, for example, could be restricted to persons aged 20 to 34 born in Canada or whose reported year of immigration was prior to 1976, which would mean that they arrived in Canada before they were 17 years of age.

Census variables used in a COPS Student Flow Model would therefore include sex, ethnic origin entries which identify Canada's Aboriginal peoples, and the derived visible minority variable based on ethnic origin, place of birth and language. Census disability variables, originally designed to provide a sampling frame for HALS, could also be included.

Variables to define limits and to interact within the COPS Student Flow Model would also be needed. Highest level of schooling would determine populations of the COPS Trade-Vocational Sub-model and the COPS College-University model, as well as the various levels of qualification - trade-vocational, career-technical, bachelor's, master's and doctorate. Labour force status could be determined from questions about work in the week prior to census day. The 1991 Census' occupation variable has been classified using both the Standard Occupational Classification (SOC), last revised in 1981, and the National Occupational Classification (NOC), a reorganized and updated SOC. Since the COPS model also presently relies on the SOC coding structure applying census occupation results would involve straightforward use of the occupation results without complex manipulations. The 1991 Census also offers the opportunity for COPS to eventually use the NOC without jeopardizing applications for the employment equity designated groups.

The ease with which census occupation results could be incorporated into the COPS Model, does not, however, apply the Census' Major Field of Study or Training (MFS) classification, which was developed specifically for the 1986 Census and modified for 1991. It is unique to the census, although it has been explored for use in some surveys. The COPS model is not geared to the census MFS structure. Instead it incorporates information stemming from two field of study classification systems, the Community College Student Information System (CCSIS), used to code trade-vocational and career-technical fields of study, and the University Student Information System (USIS), used to code university level fields of study. How can the census MFS results

be incorporated into the COPS Model when the classification differs from those used for COPS? A solution lies in the fact that the census has developed concordance tables for these classifications. These would unfortunately not be one to one, but could provide a way to integrate census MFS data into the COPS Model.

These arguments offer some support for using census data in COPS applications geared to employment equity designated groups. They may not be the best data, since they would require proxies and conversions. However, given the problems related to using 1988 NGS results, the census emerges as a workable alternative. Because they are based on the total Canadian population, it may be that census results could yield population counts suitable for COPS applications.

Arguments to support using census data have so far been based on using 1991 Census results. The reason for this is that the 1991 Census contained a school attendance question, not asked in 1986. Members of the Interdepartmental Working Group on Employment Equity Data (IWGEED), raised reservations about using the 20-to-29 years age group, for instance as a proxy to identify recent graduates. This would misrepresent women who often enrol as part-time postsecondary students and therefore take longer to graduate. Persons in fields such as medicine or studying at the master's and doctorate levels are also more likely to be older when they graduate. Analysis of 1988 NGS results in fact, support these contentions. Analyzing school attendance data could help determine whether this also occurred in 1991 Census results, and perhaps whether the target age group should be changed to include more women and post-bachelor graduates.

4.3 Published 1991 Census Results

Having established that the census could be used for applications in COPS Models geared to the designated groups, it must be determined whether the numbers would be large enough to be usable. It is difficult to accurately determine what the cell sizes would be for Canada's Aboriginal peoples, for example, when the population is limited to persons 20 to 34 years of age with postsecondary degrees, certificates or diplomas, and broken down by 49 to 54 fields of study and at least 13 occupational categories. To do so would require special tabulations from Statistics Canada and this, could prolong study deadlines and prove costly. However, existing publications may indicate whether 1991 Census results provide high enough counts when broken down into categories for COPS.

For example, the following estimates can be established for women. In 1991, some 988,635 women and 866,465 men between 20 and 29 years of age, reported having trade-vocational or postsecondary degrees, certificates or diplomas (Statistics Canada, 93-329, pp. 210 and 231). These 20-to-29 year-olds accounted for 10.3% and 8.6% respectively of all women and men 15 years of age and over in Canada. In comparison, the 1988 NGS sample population accounted for approximately 117,000 women and 105,000 men, based on weighted results. Note that the proportions of women to men are approximately the same. The census reported approximately 14% more women than men between 20 and 29 years of age while the NGS reported approximately 11% more women than men graduating from trade-vocational or postsecondary institutions in 1986.

Census data for COPS applications for women 20-to-29 years of age with trade-vocational qualifications, would provide a base population approximately 8.5 times larger than that provided by 1988 NGS results. This does not invalidate NGS results - the 1988 NGS dealt with 1986 graduates while the census results could deal with anyone who may have graduated during the past ten years.

Published 1991 Census results also suggested that the numbers of women and men 20-to-29 years of age with trade-vocational and other non-university or career-technical qualifications could be high enough to produce valid COPS trade-vocational sub-model (TVM) applications and career-technical COPS applications. The same may be said for persons with university degrees or certificates, although it was uncertain whether high enough numbers would be produced at the doctorate level, for instance. This would need to be investigated further using census special tabulations.

The 1991 Census data consistently revealed higher proportions of women 30 years of age and over attending school full-time. They also showed that proportions of women attending school part-time were often higher than for men regardless of age. Therefore age group delimitations targeting recent graduates would also have to be examined further using census special tabulations. The number of women could be unfairly limited if the analysis were restricted to 20-to-34 year-olds. The age restriction could also exclude many graduates in fields such as medicine and at the master's and doctorate levels.

As noted, the 1991 Census results were used as a sampling frame to identify potential respondents to the post-censal Health and Activities Limitations Survey. In the 1991 HALS, 4,184,685 persons, or 15.5% of the Canadian population, reported some degree of disability. Of these, 334,775, or about 8% of all Canadians with disabilities were between 15 and 34 years of age. Unfortunately, published 1991 HALS results do not provide more detailed age breakdowns or information on the education and occupations of persons with disabilities. However, special tabulations could be used.

The 1991 Census ethnic origin question yielded 470,615 single responses pointing to Aboriginal origins. Another 532,060 indicated Aboriginal origins in multiple ethnic responses. In all, 175,890 persons aged 15 to 34 reported single Aboriginal origins and 201,455 reported Aboriginal origins as part of multiple responses. As was the case for persons with disabilities, the published results do not give more detailed age breakdowns or information on education and occupations. Again, such information could be gained from special tabulations.

At the time of writing this report, the 1991 Census results had not been released for persons who because of their race or colour are deemed to be members of visible minorities. However, results for ethnic origin were available, and could be used to calculate approximate counts of members of visible minorities. More accurate numbers would require use of the place of birth and mother tongue variables. Counts in this analysis are based on simple additions of ethnic origins identified as visible minorities in the 1988 NGS. These counts include the following ethnic origins: Chinese, Japanese, Korean, Filipino, East Indian, Black, Arab, West Asian, South East Asian, North African and Latin American.

Single responses to the 1991 Census ethnic origin question, indicate a total of 1,950,000 members of visible minorities in Canada. Another 420,000 could be added, based on multiple responses

to the 1991 Census ethnic origin question. However, these results refer to the possible total population of visible minorities. Determining this population for COPS applications would require further breakdowns for persons aged 20-to-34 whose highest degree, certificate or diploma reflect trade-vocational qualification or a postsecondary degree, certificate or diploma.

In summary, it appears that 1991 Census results could provide information for COPS student flow applications involving the employment equity designated groups. Indications of recent graduates with Canadian recognized postsecondary qualifications would have to be established using age and, for persons not born in Canada, year of immigration proxies. Levels of certification could be determined using the census' highest degree, certificate or diploma variable. The census' occupation variable could be easily adapted to the COPS model because both use the Standard Occupational Classification (SOC). The census major field of study classification could also be adapted to COPS classifications using existing concordance tables.

Published 1991 Census results for women and men, indicate that the numbers of persons 20-to-29 years of age, with a postsecondary degree, certificate or diploma could produce valid comparisons for COPS applications. However, confirming this would require special 1991 Census tabulations by occupation and field of study as defined in COPS. Numbers of persons with disabilities, Aboriginal peoples and visible minorities reported in the 1991 Census would also require special tabulations to determine whether results could provide high enough numbers for COPS student flow applications.

5.0 CONCLUSION AND RECOMMENDATIONS

Evaluations of 1988 NGS estimates and sample sizes reveal that estimates of key variables required for COPS student flow applications are reliable at general levels of analysis. However, broken down by variables such as province and occupation, estimates diminished in reliability casting doubt upon the appropriateness of using 1988 NGS data. The distributions presented in this report reflect only a few of the manipulations needed to fit the data into the COPS model. Still, serious reliability problems arose. In conclusion, the 1988 NGS file was deemed not suitable for providing estimates of the designated groups for COPS. The following recommendation stems from these findings:

> *Use of 1988 NGS results for COPS student flow applications incorporating the employment equity designated groups, should proceed only in cases where these results provide coefficients of variance pointing to releasable data. Women may be the only group for which data can provide matrices with enough releasable cells to warrant COPS student flow applications.*

Several alternative new collection mechanisms aimed at enhancing future NGS results for the employment equity designated groups were suggested. In the end, it was determined that alternatives such as expanding the NGS sample population base would not necessarily produce better employment equity population counts. The graduate population of a given year simply does not have enough members of the designated groups to provide usable samples. It was therefore suggested that the NGS could perhaps look at graduates over a five year period, which would, however, incur higher data collection costs and could require changes to the COPS model to accommodate the resulting data. This brought the next recommendation:

> *Future NGS results could be used for COPS student flow applications involving designated groups, if the required data matrices reveal enough data cells with releasable data. Broadening future NGS population bases, for example to include graduates over a five year period, may produce greater numbers of releasable estimates but this may not be a viable alternative given the costs and possible COPS adaptations involved.*

The Labour Market Activity Survey (LMAS) was considered as an alternative data source. However, it could not provide information on field of study and results would possibly be no better than those of the NGS given that they are subject to the same data release guidelines. This leads to the third recommendation:

> *Surveys such as the Labour Market Activity Survey (LMAS) should not be examined as an alternative to establish COPS student flow applications incorporating designated groups. Results would be subject to the same release guidelines as were the 1988 NGS results and in all likelihood would not provide valid designated group estimates for COPS student flow purposes. The LMAS also lacks field of study information necessary for the COPS Student Flow Model.*

Census results, especially those of the 1991 Census, were also examined as alternative data sources. It was determined that 1991 Census results could be used for COPS student flow

applications involving the employment equity designated groups. Recent graduates with Canadian-recognized postsecondary qualifications could be determined using age and, for persons not born in Canada, year of immigration proxies. Levels of certification could be established using the census' highest degree, certificate or diploma variable and the census' occupation variable could easily be adapted to the COPS Student Flow Model since that they both make use of the Standard Occupational Classification (SOC). The census' major field of study classification, although different from that used for COPS applications, could be adapted using existing concordance tables to convert census classifications to COPS. Published 1991 Census results for women and men indicated that they could produce comparisons valid for COPS student flow applications. To accurately determine whether such would in fact be the case for women and men, persons with disabilities, Aboriginal peoples and visible minorities would require special 1991 Census tabulations, a proposition not part of this study's mandate, given the costs and delays involved. The resulting fourth recommendation is:

> *The possibility of using special 1991 Census tabulations to provide valid estimates of the employment equity designated groups for COPS student flow applications should be examined further. This analysis has examined some ways by which 1991 Census results could be adapted and used for COPS student flow applications.*

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APPENDICES

APPENDIX A

Table A1. Distributions[1] of 1986 graduates' province of study, by level of certification in 1986, NGS 1988

Province	Level of Certification 1986				
	Trade/ Vocational	Career/ Technical	Bachelor's	Master's	Doctorate
Total	40,300	62,700	104,900	13,800	1,300
Newfoundland	2,600	800	1,800	200	--
Prince-Edward-Island	200	400	300	-	-
Nova Scotia	3,100	900	4,600	500	--
New Brunswick	1,800	900	2,500	200	--
Quebec	7,600	14,900	33,500	4,100	200
Ontario	10,400	29,400	39,800	5,800	700
Manitoba	2,300	1,300	4,300	400	--
Saskatchewan	1,400	1,200	4,000	300	--
Alberta	2,300	8,000	7,400	1,100	100
British Columbia	8,300	4,800	6,600	1,100	100
Northwest Territories	--	100	-	-	-
Yukon	100	--	-	-	-

[1] Based on weighted counts, NGS 1988.

Table A2. Percentage distributions[1] of 1986 graduates employed in May 1988, by level of certification for designated groups, NGS 1988 and 1991

Designated Group and Survey	Level of Certification 1986				
	Trade/ Vocational (%)	Career/ Technical (%)	Bachelor's (%)	Master's (%)	Doctorate (%)
Gender					
Women	44	55	56	46	34
Men	55	44	44	54	66
Persons with/without disabilities (based on the 1988 question)					
With	4	2	2	2	2*
Without	96	98	98	98	98
Persons with/without disabilities (based on the 1991 question)					
With	6	3	2	3	3*
Without	94	97	98	97	97
Aboriginal/Non-Aboriginal (based on the 1988 question)					
Aboriginal	3	2	1	1*	--
Non-Aboriginal	97	98	99	99	99
Aboriginal/Non-Aboriginal (based on the 1991 question)					
Aboriginal	3	2	1	1*	--
Non-Aboriginal	97	98	99	99	100
Visible Minority (based on the 1991 question)					
Visible	7	6	7	7	12
Non-visible	93	94	93	93	88
Total: Number	**31,900**	**56,100**	**88,000**	**11,800**	**1,200**
%	**100**	**100**	**100**	**100**	**100**

[1] Based on weighted counts, NGS 1988.

APPENDIX B

TRADE-VOCATIONAL MAJOR FIELD OF STUDY BREAKDOWNS BASED ON THE COPS TRADE-VOCATIONAL SUB-MODEL

Arts

1. General arts and sciences
2. Commercial and promotional arts
3. Creative and design art
4. Graphic and audio-visual arts
5. Personal arts
6. Other arts

Social Sciences and Services

7. Social services
8. Other social services

Management and Administration

9. Commerce (Business administration)
10. Accounting
11. Retail sales
12. Other management & administration
13. Secretary - general
14. Secretary - legal
15. Secretary - medical
16. Secretary - word processing
17. Secretary - accounting
18. Other secretary/clerical

Math and Computer Science

19. Math & computer science

Health

20. Nursing aide/orderly
21. Other nursing
22. Dental hygiene/assistant tech.
23. Other health

Mechanical and Engineering Technologies

24. Electrical/electronic engineering tech.
25. Other electrical/electronic tech.
26. Transportation technologies
27. Agricultural equipment mechanic
28. Auto mechanic
29. Auto body repairs
30. Heavy equipment mechanic
31. Other mechanical engineering
32. Architectural design/drafting technology
33. Construction technology
34. Welding technology
35. Other arch. & const. tech.
36. Manufacturing technology
37. Machinists
38. Other industrial engineering
39. Civil technologies
40. Drafting
41. Other engineering

Natural Sciences

42. Agriculture
43. Food processing technologies
44. Other primary technologies
45. Other natural sciences & primary industry technologies

Service Technologies

46. Cooking
47. Other food preparation
48. Other service industry technologies

Unknown and Not Elsewhere Classified

49. Unknown
    Other not elsewhere classified

APPENDIX C

CAREER-TECHNICAL MAJOR FIELD OF STUDY BREAKDOWNS BASED ON THE COPS STUDENT FLOW MODEL

Arts

1. Commercial and promotional arts
2. Creative and design art
3. Fine arts
4. Graphic and audio-visual arts
5. Mass communications
6. Other arts

Humanities

7. Humanities

Social Sciences and Services

8. Protection and correction services
9. Social services
10. Sports and recreation
11. Education/counselling
12. Other social sciences and services

Management and Administration

13. Management and Administration business and Commerce
14. Accounting
15. Other financial management
16. Institutional management
17. Other management and administration
18. Marketing
19. Retail sales
20. Other merchandising and sales
21. Secretary - general
22. Secretary - legal
23. Secretary - medical
24. Other secretary/clerical

Math and Computer Science

25. Mathematics
26. Computer science

Health

27. Nursing, diploma
28. Other nursing
29. Medical laboratory technologies
30. X-ray/nuclear medicine technologies
31. Dental hygiene/assistant tech.
32. Other diagnostic and treatment tech.
33. Medical equipment technologies
34. Other health

Mechanical and Engineering Technologies

35. Chemical engineering technologies
36. Electrical engineering technologies
37. Electronic engineering technologies
38. Other electrical/electronic tech.
39. Transportation engineering tech.
40. Aircraft mechanics
41. Other mechanical engineering tech.
42. Architectural design/drafting tech.
43. Other arch. & const. tech.
44. Industrial engineering tech.
45. Civil engineering tech.
46. Surveying
47. Instrumentation
48. Other engineering tech.

Natural Sciences

49. Agriculture
50. Forestry technologies
51. Other primary technologies
52. Environmental and conservation tech.
53. Resource processing technologies

Service Technologies

54. Service industry technologies

Unknown and Not Elsewhere Classified

45. Unknown
    Other not elsewhere classified

APPENDIX D

UNIVERSITY MAJOR FIELD OF STUDY BREAKDOWNS BASED ON THE COPS STUDENT FLOW MODEL

Education

2. Elementary/secondary teaching
3. Other teaching
4. Education non-teaching
5. Physical education

Arts

6. Music
7. Other fine and performing arts
8. Applied arts

Humanities

9. English
10. French
11. History
12. Classical and other languages
13. Library and records science
14. Linguistics, translation and interpretation
15. Mass communication
16. Philosophy
17. Religion and theological studies
18. Other humanities

Social Sciences

19. Area studies
20. Commerce
21. Specialized administration
22. Economics
23. Geography
24. Law
25. Planning and resource management
26. Political science
27. Psychology
28. Sociology
29. Social work, social welfare
30. Other social sciences

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31. Animal and plant sciences
32. Other agriculture
33. Biology
34. Food and household sciences
35. Veterinary sciences and medicine
36. Other agriculture and biology sciences

Engineering and Applied Sciences

37. Architecture
38. Chemical engineering
39. Civil engineering
40. Electrical engineering
41. Mechanical engineering
42. Other engineering
43. Forestry
44. Other applied sciences

Medicine and Health

45. Dentistry
46. Medicine
47. Basic medical sciences
48. Medical, surgical specialties
49. Nursing
50. Pharmacy
51. Rehabilitation medicine
52. Other health

Physical Sciences

53. Computer science
54. Mathematics
55. Chemistry
56. Geology
57. Physics
58. Other physical sciences

No Specialization and Not Elsewhere Classified

1. No specialization
   Other not elsewhere classified

DEC 19 1994

FEB 9 1995

MAR 14 1995

DATE DUE

	MAY 25 1995		
JAN	8 1996		
	AUG 07 2000		