

# Atlantic Canada Human Development Index Study

Commissioned by  
Atlantic Canada Opportunities Agency

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## **Atlantic Canada Human Development Index Study**

### **Executive Summary**

Despite regional, domestic and global circumstances that have curbed economic development in Atlantic Canada over past decades, evidence from recent years reveals an economy which has continued to diversify and progress.

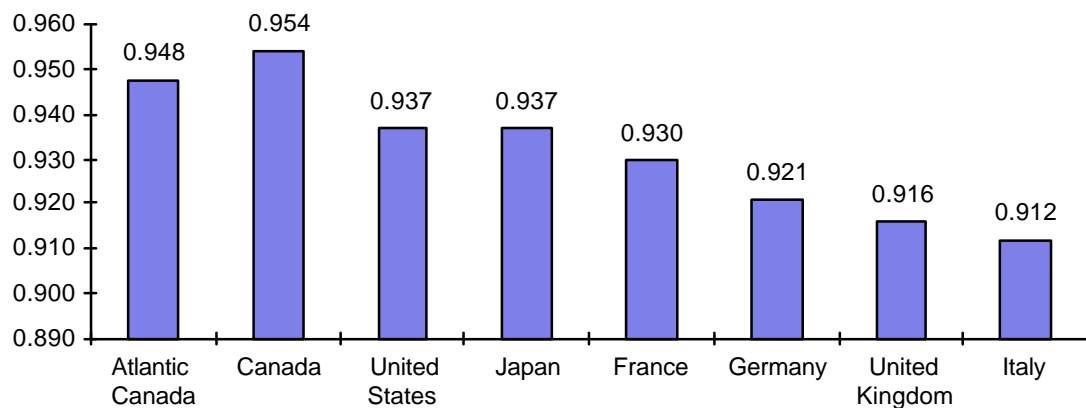
This diversification has resulted in the industrial character of Atlantic Canada being notably different today from what it was two or three decades ago. Primary sectors continue to have an important role in the economy of the region. However, new growth industries are having a positive impact. These include machinery and aircraft manufacturing, food processing, energy, trade and distribution, finance and insurance, business services, recreation and tourism.

Importantly, Atlantic Canada entrepreneurs have been responsible for many of the success stories in these emerging industries. Possibly even more significant is that private investors from other provinces and countries have begun to recognize the many attributes of Atlantic Canada and to pursue opportunities in keeping with the growing potential of the region.

The results of this study add to the information base for Atlantic Canada available to potential domestic and foreign investors. Investment location choices are founded on a region's relative competitiveness in terms of direct costs, as well as other factors such as social structure and amenities available to employees. The focus of this analysis is on economic and other quality-of-life indicators, complementary to existing and ongoing research aimed at measuring direct costs of investment.

This study assembles for Atlantic Canada the United Nations' (UN) Human Development Index (HDI) and other indicators from the UN Development Programme's Human Development Report (HDR). By way of these measures, a relative ranking of the region vis-à-vis Canada and other industrialized countries can be determined, revealing underlying strengths and weaknesses in Atlantic Canada's make-up. These indicators can also be used to identify the status of economic and social development in the region, assess potential investment opportunities and focus policy action.

### Human Development Index, 1992



Last year, Canada was ranked number one on the United Nations' HDI scale, using 1992 data. If Atlantic Canada was integrated into the UN's HDI rankings, the region would be positioned ahead of the United States, which occupies the number two spot in country rankings.

In addition to ranking ahead of all other countries, Atlantic Canada attains an HDI only marginally below the Canada average. Given no differences in educational attainment across provinces and the heavy discounting the UN applies to income in excess of \$5,120 purchasing power parity dollars (\$PPP), Atlantic Canada's HDI rating, relative to the national average, largely reflects differences in life expectancy.

Relative to other G7 nations, Atlantic Canada's performance, measured on the HDI scale, is roughly 1 per cent ahead of the US and Japan, but as much as 3 to 4 per cent ahead of others.

Recognizing that the HDI has various strengths and weaknesses as an indicator of human development, the UN, as well as others who have examined the index, have offered important recommendations for its application. First and foremost, it is advised that the HDI be used in conjunction with a range of indicators for a more complete assessment of human development. After examining these indicators, Atlantic Canada's major strengths and challenges are:

**Major Strengths:**

- Healthy and long life expectancy
- Strong commitment to education, higher education particularly
- More equitable distribution of income as compared to other G7 nations
- Abundant internal renewable water resources
- Low inflation performance
- Above-average economic growth, 1982-91
- Strong earnings per employee growth, 1980-91

**Major Challenges:**

- Low rate of industrialization
- High rates of unemployment, including youth
- Decelerating population growth
- Low investment effort
- Few scientists and technicians and low tertiary science enrolment
- High rate of energy use per capita

Overall, Atlantic Canada ranks very high relative to other industrial countries, based on the UN's indicators of human development. That is, relative to other nations, Atlantic Canada is not a poor sister.

If we "place" Atlantic Canada as a "country" on the world scene, its size, measured in GDP (\$US) terms, is one-tenth the size of Mexico, three-quarters the size of New Zealand, Ireland or Chile, but about the same size as Hungary and many other former East Bloc nations (Belarus, Kazakhstan, Czech Republic). However, in terms of real GDP per person, adjusted for purchasing power, Atlantic Canada's income is 10 per cent higher than New Zealand's, 30 per cent above Ireland's, double that of Mexico, Chile or the Czech Republic and 2.5 to 4 times greater than that of many former East Bloc countries. In addition, Atlantic Canada has a well-educated labour force, good infrastructure and good social capital, some of which has been encouraged through government action. Overall, Atlantic Canada is an enticing potential investment location!

Nevertheless, some gaps or challenges have been identified for Atlantic Canada and some directions for public policy are indicated. Not all of the region's identified shortcomings can be easily remedied by public policy action (e.g., decelerating population growth), but this analysis suggests that measures to encourage investment, improve technical skill levels of the labour force and reduce unemployment are needed in Atlantic Canada.

A major goal of the HDR is to encourage governments, international organizations, and policy makers to participate in improving statistical indicators of human development. This report responds to that challenge. Information is presented which augments existing data sets and facilitates international comparisons. Although a number of the UN's human development indicators could not be replicated for the region, or were found not to be relevant, most contribute to a better understanding of the region's human and social character.

This analysis has identified valuable sources of data for monitoring Atlantic Canada's human development, but more work is yet to be done. The development of new indicators describing additional aspects of Atlantic Canada's economy, social structure and human progress should be encouraged. In addition, there are areas where data collection must be improved to make international comparisons feasible.

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## **1. Introduction**

Despite regional, domestic and global circumstances that have acted to curb economic development in Atlantic Canada over past decades, evidence from recent years tells the story of an economy which has continued to diversify and progress.

Traditionally a resource-based economy, Atlantic Canada has experienced many of the economic woes and growing pains associated with strong dependencies on external markets, fluctuating resource prices, growing competition from off-shore producers, the depletion of natural resource stocks, and the emergence of new societal priorities. As such factors have frequently interfered with hopes of sustained growth in the region, government support of businesses and households has come to play an integral part in the economy of Atlantic Canada.

Today the industrial character of Atlantic Canada is notably different from what it was two or three decades ago. While primary sectors continue to be important, new growth industries in the region include machinery and aircraft manufacturing, food processing, energy, trade and distribution, finance and insurance, business services, recreation and tourism. Importantly, Atlantic Canada entrepreneurs have been responsible for many of the success stories in these emerging industries. Possibly even more significant is that private investors from other provinces and countries have begun to recognize the many attributes of Atlantic Canada and to pursue opportunities in keeping with the growing potential of the region.

As the economy of Atlantic Canada has evolved, so too has the role of governments in promoting economic development in the region. Conventional means of public sector support, namely direct financial transfers, have been modified or replaced with new measures aimed at enhancing the capabilities of local businesses and workers. Such initiatives have focused on providing assistance aimed at job training and education, research and development, technology transfer, public infrastructure and, generally, other actions to improve the competitiveness of regional industries.



Increasingly, government support of economic development in Atlantic Canada is adopting a strong information focus, directed at improving the intelligence available to industry participants about the marketplace. In part, these "information goods" are intended to assist businesses in their understanding of market trends, the organization of industrial sectors, and the fundamentals of the regional economy. As well, government agencies with responsibility for economic development in the region have come to recognize the value of information as a tool for attracting new businesses, promoting investment, identifying new program demands, and performing related analysis and planning tasks.

The Atlantic Canada Opportunities Agency (ACOA) is pursuing a number of initiatives in support of developing a new base of information about the region. In this analysis, the United Nations (UN) Human Development Index (HDI) and other indicators from the UN Development Programme's Human Development Report (HDR) are assembled for Atlantic Canada. By way of these measures, the relative ranking of the region vis-à-vis Canada and other industrialized countries is determined. By addressing factors that help to define the status of economic and social development in Atlantic Canada, the results of this study will complement other efforts which focus specifically on the region's competitiveness and describe the capabilities of the regional marketplace, replicating, in the context of Atlantic Canada, selected elements of international and national studies on competitiveness.

The objectives of this study are:

1. To determine how the Atlantic Canada region, as a whole, would rank within the UN HDI relative to:
  - a) Canada as a whole; and
  - b) The other industrialized countries ranked by the UN, especially those constituting the G7.

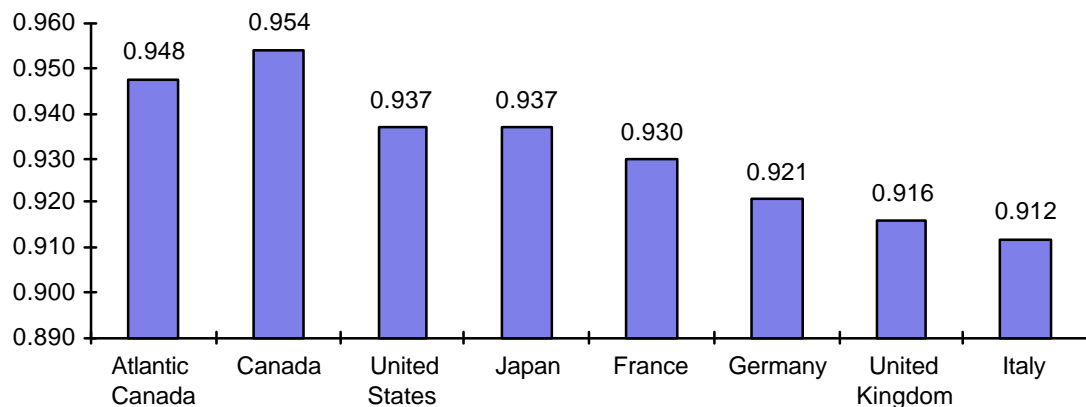
2. To rank Atlantic Canada as a whole according to the indicators used for industrialized countries in the UN HDR study.

## **2. Human Development Index<sup>1</sup>**

Canadians like to think that they live in the "best" country in the world and enjoy a sense of self-satisfaction when the United Nations (UN) says so. Canada has been ranked number one by the UN in 1992, 1994 and 1995 using their Human Development Index (HDI) as a measure of country-specific socio-economic progress.

Conceptually, calculation of the HDI<sup>2</sup> is a rather simple exercise, although, in reality, its derivation is rather involved. Life expectancy at birth is used directly as an indicator before it is transformed into indexed life expectancy. Adult literacy and the gross enrolment ratio are translated into their respective indexes before being combined to create indexed educational attainment. Indexed educational attainment is a weighted average in which the adult literacy index is assigned twice the weight of the gross enrolment ratio index.

**Human Development Index, 1992**

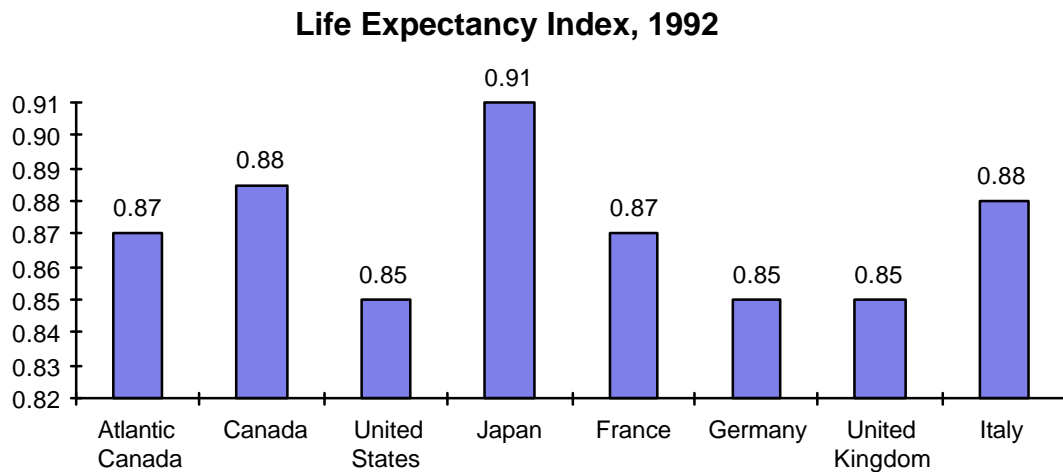


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<sup>1</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 1.

<sup>2</sup> Calculation of the Human Development Index is discussed in Appendix A.

The findings of this analysis suggest that, in 1992, Atlantic Canada would be positioned ahead of the United States on the HDI scale, which occupies the number two spot in country rankings.<sup>3</sup>



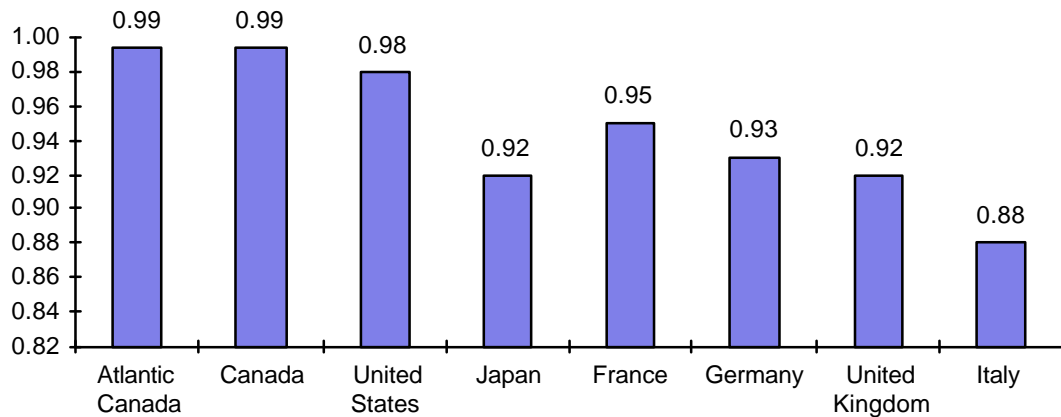
In addition to ranking above all other countries, Atlantic Canada attains an HDI only marginally below the Canada average. Given no differences in educational attainment across provinces and the heavy discounting the UN applies to income in excess of \$5,120 (\$PPP), Atlantic Canada's HDI ratings, relative to the national average, largely reflects differences in life expectancy.

Relative to other G7 nations, Atlantic Canada's performance, measured on the HDI scale, is roughly 1 per cent ahead of the US and Japan, but as much as 3 to 4 per cent ahead of Italy.

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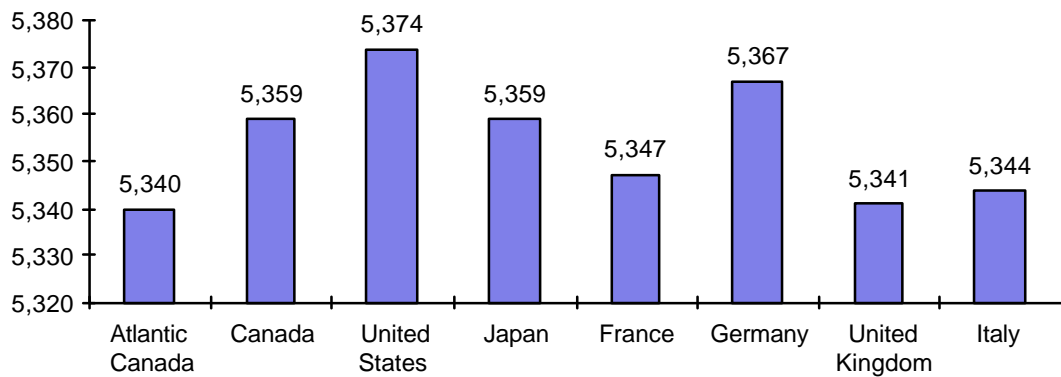
<sup>3</sup> The HDI results reported in the 1995 Human Development Report apply to 1992.

### Education Index, 1992



The HDI shows how far a country or province has to go to provide essential needs to all its people. Atlantic Canada, along with most industrial countries, is very close to achieving 100% of the benchmark goals: life expectancy of 85 years, 100% literacy, 100% school enrolment and about \$5,448 of adjusted real GDP per capita. The region is only 5% away from the target of an HDI of 1.00.

### Adjusted Real GDP Per Capita, 1992



### **3. Human Development Indicators**

#### **3.1. Highlights**

The UN constructed the HDI in an effort to "simplify a complex reality" and its "basic message should be supplemented by analyses to capture other important dimensions".

Recognizing that the HDI has various strengths and weaknesses as an indicator of human development, the UN, as well as others who have examined the index, have offered important recommendations for its application.<sup>4</sup> First and foremost, it is advised that the HDI be used in conjunction with a range of indicators for a more complete assessment of human development. In this context, the Human Development Report contains hundreds of different indicators that address various aspects of human development, dealing both with the components of the HDI (income, education and health), as well as other socio-economic concerns (e.g., the environment, natural resources, urbanization, human rights and equality, security, political stability, international aid and cooperation, etc.).

The following sections present Human Development Indicators for Atlantic Canada comparable to those presented by the UNDP for industrial countries. Comparisons of Atlantic Canada's performance to that of G7 nations and other like industrial countries are made. In some instances, comparisons to developing countries are appropriate.

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<sup>4</sup> Appendix E contains a bibliography of selected articles and reports, some dealing with the attributes of the HDI.

Atlantic Canada's major strengths and challenges identified with these indicators include:

**Major Strengths:**

- Healthy and long life expectancy
- Strong commitment to education, higher education particularly
- More equitable distribution of income as compared to other G7 nations
- Abundant internal renewable water resources
- Low inflation performance
- Above average economic growth, 1982-91
- Strong earnings per employee growth, 1980-91

**Major Challenges:**

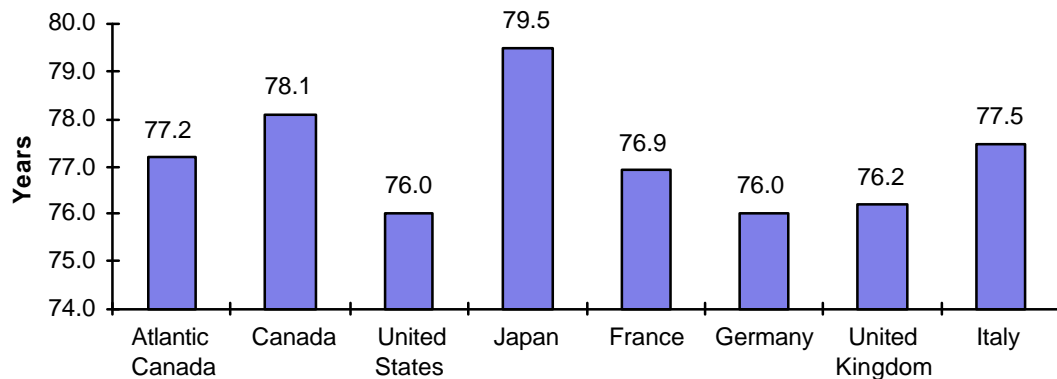
- Low rate of industrialization
- High rates of unemployment, including youth
- Decelerating population growth
- Low investment effort
- Few scientists and technicians and low tertiary science enrolment
- High rate of energy use per capita

### 3.2. Profile of Human Development<sup>5</sup>

**Strengths:** *Long life expectancy at birth*  
*Low maternal mortality*  
*High gross school enrolment ratio*

**Challenges:** *Low rate of scientists and technicians*  
*Low real GDP per capita*

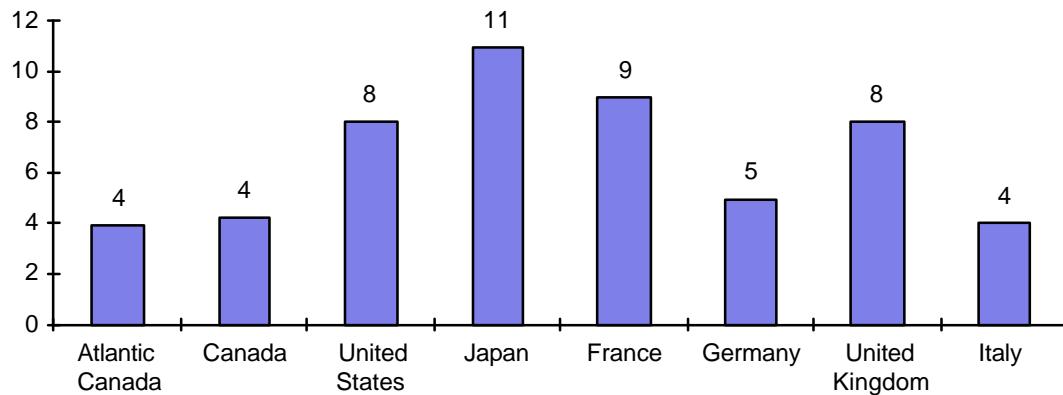
**Life Expectancy at Birth, 1992**



In 1992, Atlantic Canada's **life expectancy** of 77.2 years at birth was roughly 11 months shorter than an average Canadian's. The longevity of the region's population was superior however to all other members of the G7, except Japan (79.5 years) and Italy (77.5 years). When compared to the average of all industrial countries, Atlantic Canadians at birth are expected to live almost two years longer.

<sup>5</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 2.

### Maternal Mortality Rate (Per 100,000 Live Births), 1980-92



The frequency of **maternal mortalities** during child birth in Atlantic Canada, at 4 per 100,000, is equivalent to that of the nation as a whole and significantly less than in most other G7 countries. Only Italy reports a frequency as low at 4 per 100,000 live births; Germany's rate is 5. All other G7 nations reported rates at least double the Atlantic Canada result. Only 6 industrial countries recorded maternal mortality rates lower than those of Atlantic Canada over the 1980-92 period: Ireland, Norway, Denmark, Australia, Belgium and Israel.

On average, 536 Atlantic Canadians are served by one doctor. A typical Canadian doctor has 15% fewer patients. Both France and Italy report **population/doctor ratios** 40 to 60% lower than the Atlantic Canada figures. Data are not available for any other G7 nations. Industrial countries reporting population per doctor ratios in excess of Atlantic Canada's include Romania (552), Switzerland (585), Ireland (633) and Albania (730).



**Occupations in Natural Sciences, Engineers  
Mathematics (Per 1,000), 1992**

	All 1/	Physical & Life Science Only 2/	Architects & Engineers Only 3/
Canada	18	3.1	6
Newfoundland	9	1.7	3
Prince Edward Island	10	3.4	2
Nova Scotia	14	2.5	4
New Brunswick	12	2.7	4
Atlantic Canada	12	2.4	4

1/ Includes National Occupation Code 21.

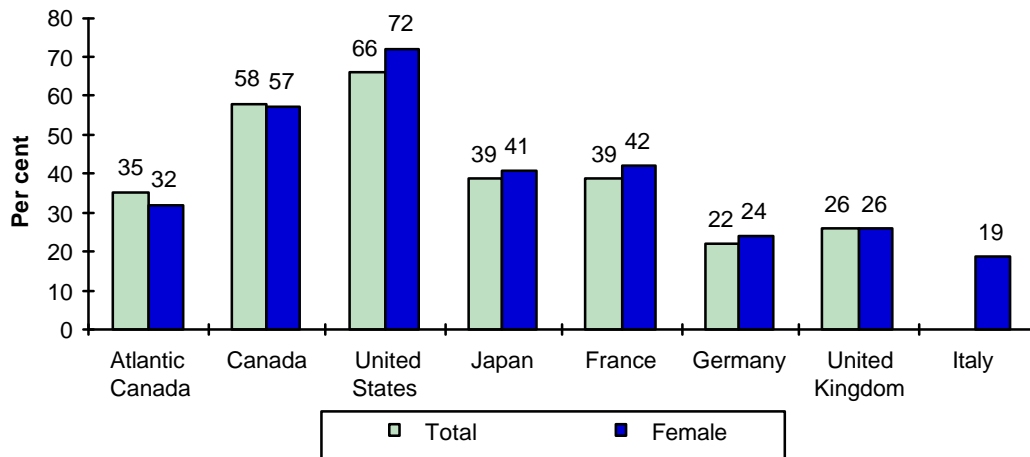
2/ Includes National Occupation Codes 211 & 213.

3/ Includes National Occupation Codes 214 & 215.

Although figures comparable to those found in the HDR could not be identified for Atlantic Canada, information available from Human Resources Development Canada suggests that Atlantic Canada has a smaller number of **scientists and technicians per capita** than most other G7 nations. The HDR reports Canada's rate at 3 per 1,000, while Japan's performance at 7 per 1,000 people is the highest amongst G7 countries. Russia is the only other industrial country to report a rate as high as Japan's

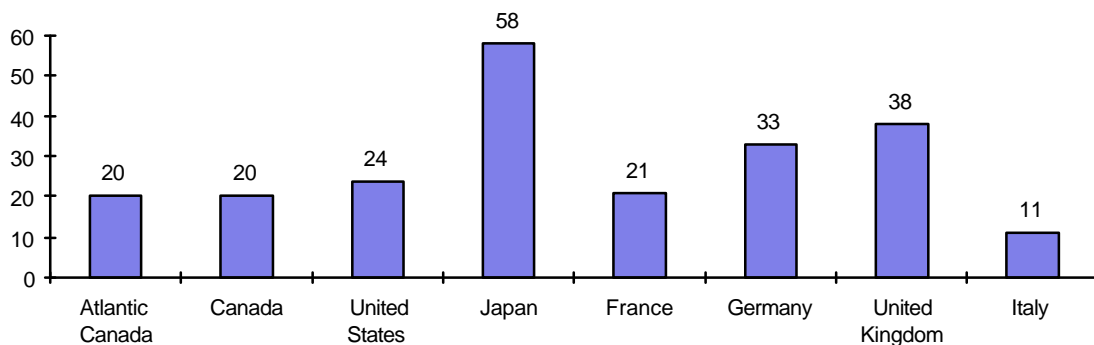
The **combined first-, second- and third-level gross enrolment ratio** reported in the HDR was in excess of 100% for both Atlantic Canada and Canada in 1992. No other countries report rates as high. Based on data available from Statistics Canada, these ratios may be lower at 86% for Atlantic Canada and 91% for Canada. Amongst the other G7, the highest gross enrolment ratio reported is for the United States, 95%, followed by France at 86%. The average gross enrolment ratio was 80% for all industrial countries.

### Tertiary Full-time Equivalent Gross Enrolment Ratio (%), 1992



Atlantic Canada's **tertiary full-time equivalent gross enrolment ratio**<sup>6</sup> stood at 35 in 1991, similar to the ratio's reported for Japan and France. Germany and the UK registered rates roughly 10 percentage points below the Atlantic ratio while Canada and the United States reported figures 20 to 30 percentage points higher. The Canadian and US figures are at the top end of ratios reported for industrial countries.

### Daily Newspapers (Copies Per 100 People), 1991

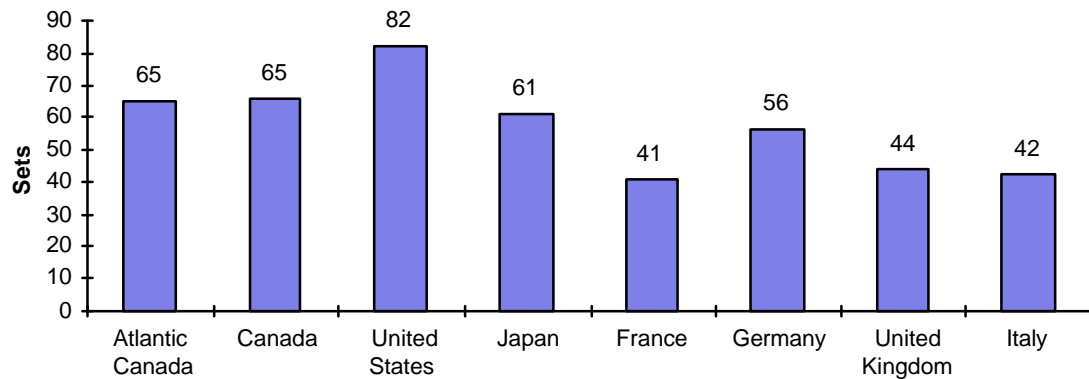


G6 refers to 1992

<sup>6</sup> Tertiary enrolment includes university and college students. University students are assumed to be aged 18-26 and college students are assumed to be aged 18-20. Three part-time students are assumed to equal one full-time student.

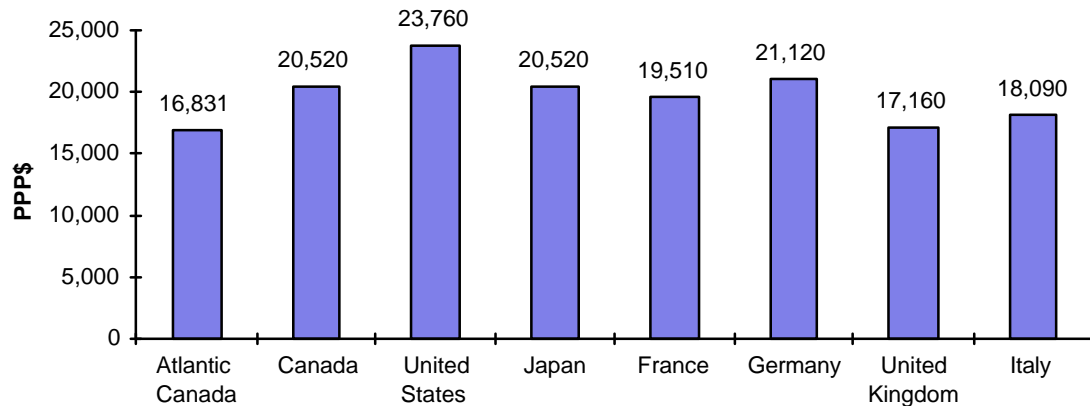
In 1992, twenty copies of **daily newspapers** per 100 people were circulated in Atlantic Canada. The same per capita distribution was reported nationally. Daily newspaper figures reported for other G7 countries ranged from a low of 11 per 100 people in Italy to a high of 58 per 100 people in Japan. On average, 29 daily newspapers were circulated per 100 people in the G7 and other industrial countries in 1992.

**Televisions (Per 100 People), 1992**



In Atlantic Canada, 65 **televisions** could be found per 100 people in 1992. The Canadian figure was identical. This rate is higher than that reported for other G7 countries except the United States where 82 people out of 100 had a television. The Japanese experience was similar to Canada's at 61 per 100 people. The other G7 nations averaged 46 TVs per 100 people.

### Real GDP Per Capita (PPP\$), 1992



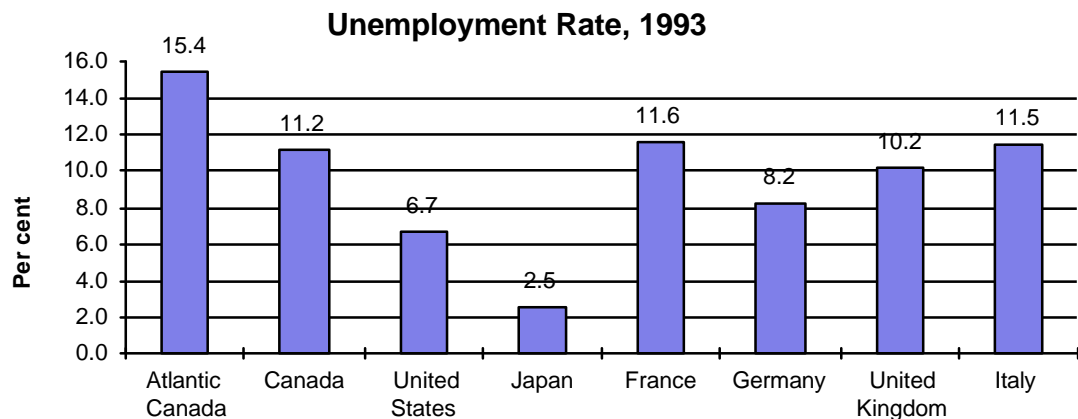
**Real GDP per capita** in US dollars adjusted for purchasing power was \$16,831 in Atlantic Canada in 1992, 18% less than the Canadian average. This level is lower than that reported for all other G7 countries, ranging from only 2% less than the per capita measure in the UK to 29% less than the US figure. However, compared to the average of industrial countries (\$15,324), Atlantic Canada's real GDP per capita is 10 per cent higher. Relative to industrial countries outside the G7, Atlantic Canada's real GDP per capita was most similar to that of Finland (\$16,270).

Not adjusted for purchasing power parity, Atlantic Canada's **GDP per capita** is more than 25% less than the Canadian average and 37% less than per capita income in the US.

### 3.3. Profile of Human Distress<sup>7</sup>

**Strengths:** *Low inflation performance*  
*More even distribution of income as compared to other G7 nations*

**Challenges:** *High rates of unemployment, including youth*

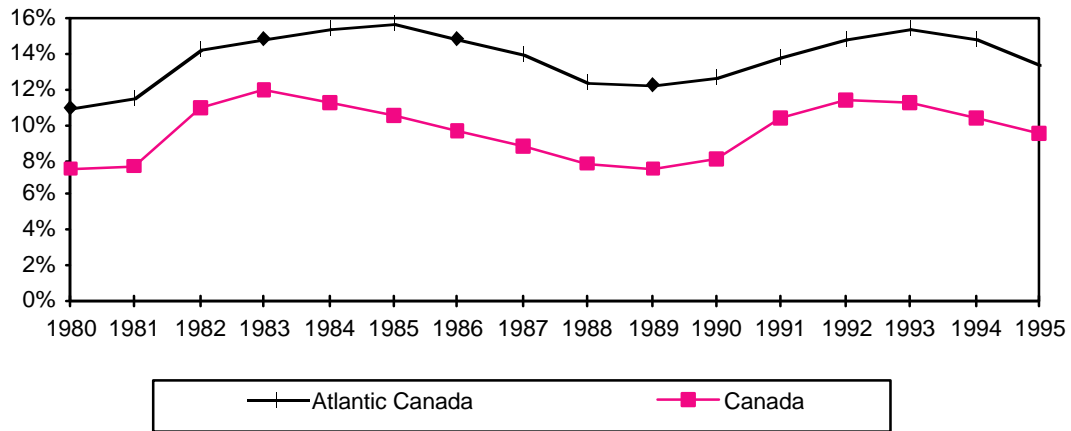


The **unemployment rate** in Atlantic Canada at 15.4% was just over 4 percentage points higher than the national average in 1993. G7 unemployment rates ranged from a low of 2.5% (Japan) to the 10-11% range (France, UK, Italy). The United States and Germany fell in between at 6.7% and 8.2% respectively. Relative to other individual countries, the unemployment rate in the Atlantic region is similar to that of Poland and Ireland. Although it borders on the high end, the Atlantic unemployment rate is not the highest of all individual nations. In 1993, Spain's rate was 22.7% , while Finland reported an unemployment rate of 17.7%.

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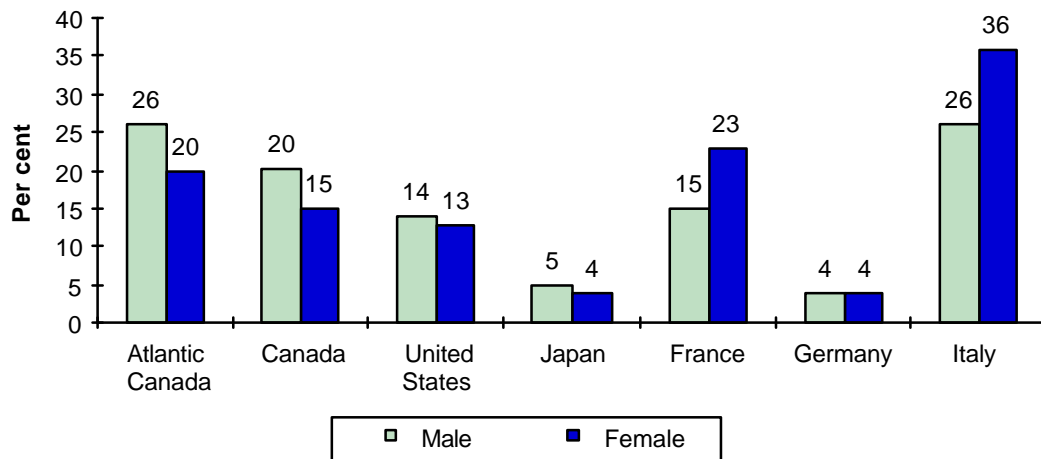
<sup>7</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 3.

### Unemployment Rate, 1980-95



It should be noted that 1993 represented a high water mark in Atlantic Canada's unemployment rate. Since that time, employment has been rising more rapidly than the region's labour force such that by 1995 the unemployment rate had fallen 2 percentage points to 13.4%.

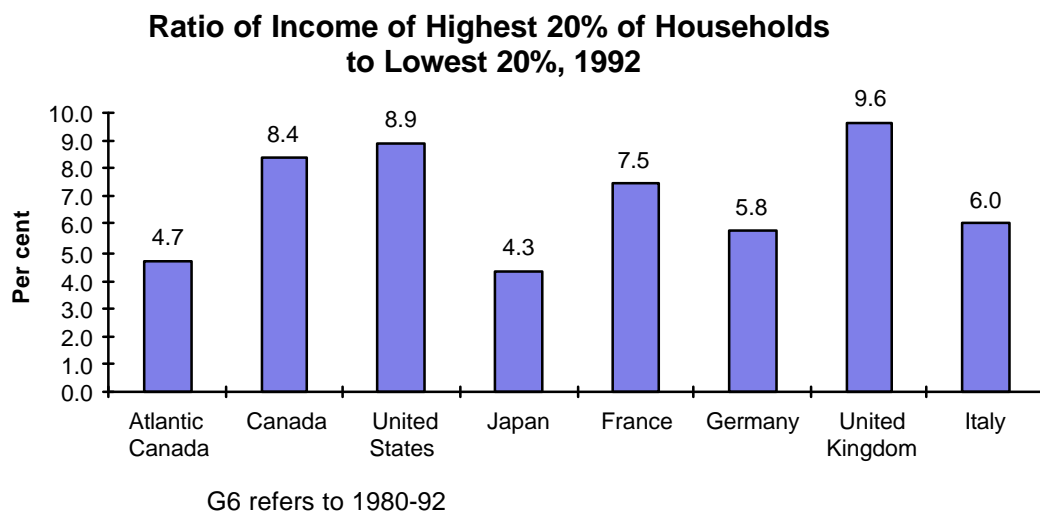
### Youth Unemployment Rate, 1991-92



**Youth unemployment** is a serious problem in Atlantic Canada as 26% of men and 20% of women aged 15-24 are without work. In the G7, only Italy reported worse

figures (26% for males, 36% for females) for 1991-92. Canadian figures are 5-6 percentage points better than those reported for the Atlantic region. Once again, figures for Spain, Finland and Ireland are comparable to the Atlantic Canada numbers.

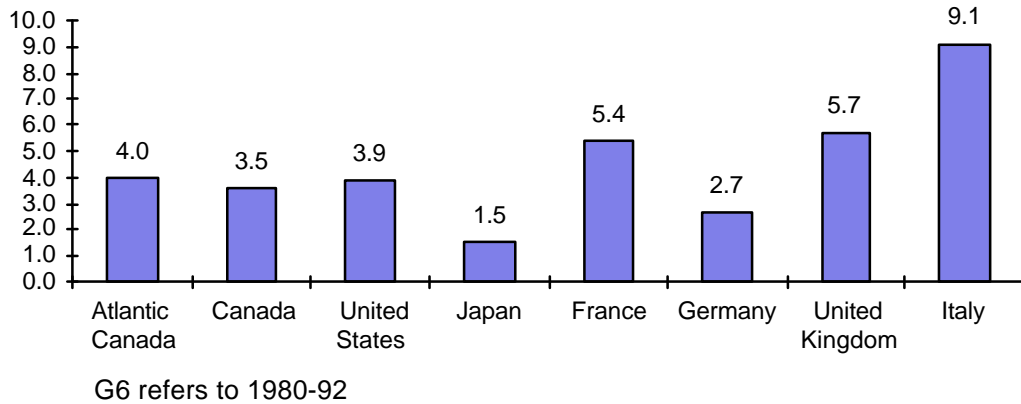
On average, more adults in Atlantic Canada have less than **upper-secondary education** (28.9%) than is the case in Canada (23.3%). However, Canada's average falls within the mid-range of G7 results, which vary widely from a low of 17% in the United States to a high of 72% in Italy. Atlantic Canada's rate is most similar to Japan and Sweden (33%).



Compared to G7 nations, Atlantic Canada's income distribution is closest to that of Japan's when measured as the ratio of **income of the highest 20% of households to the lowest**. (Income includes transfers and is before taxes.) Income distribution is more skewed towards high income households in all other G7 countries including Canada.

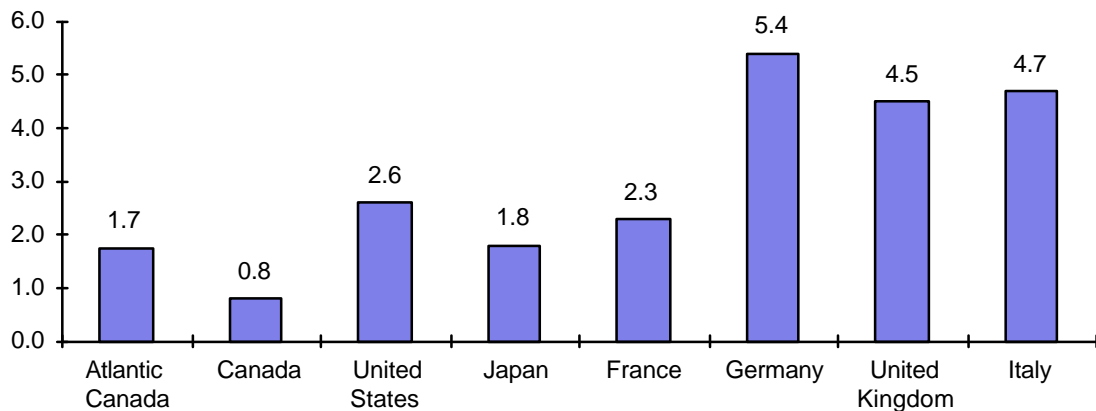
**Female wages as a share of male wages** averaged the same in both Atlantic Canada and the nation as a whole in 1990, and were in line with other reporting G7 countries. With women's wages averaging near the 75% mark, this puts G7 jurisdictions in the middle of other individual countries. Significantly better performances were reported for Iceland (90%) and Australia (91%), while Luxembourg (65%) and, to a lesser extent, Switzerland (68%) did somewhat worse.

### Average Annual Rate of Inflation (%), 1982-92



Over the 1982-92 period, the rate of inflation in Atlantic Canada exceeded the rates experienced in the US, Japan and Germany, but ran well below rates registered in France, the UK and Italy. Relative to the national average, the Atlantic inflation rate also averaged 0.5% higher during 1982-92.

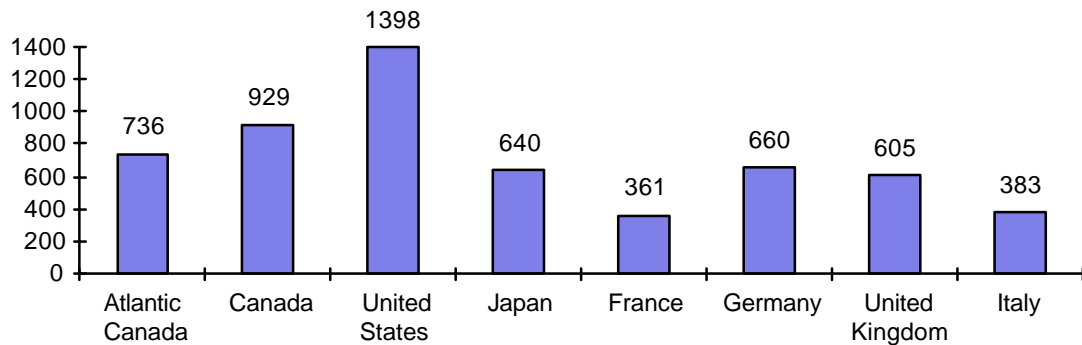
### Annual Rate of Inflation (%), 1992



The **annual inflation rate** experienced in Atlantic Canada (1.7%) fell well below the average reported for the G7 in 1992, despite being double the national rate. Inflation in much of the G7 ran in excess of 4.5% during the year, although Japan, France and the US reported rates in the 2-3% range.



### Injuries from Road Accidents (Per 100,000 People), 1990-91



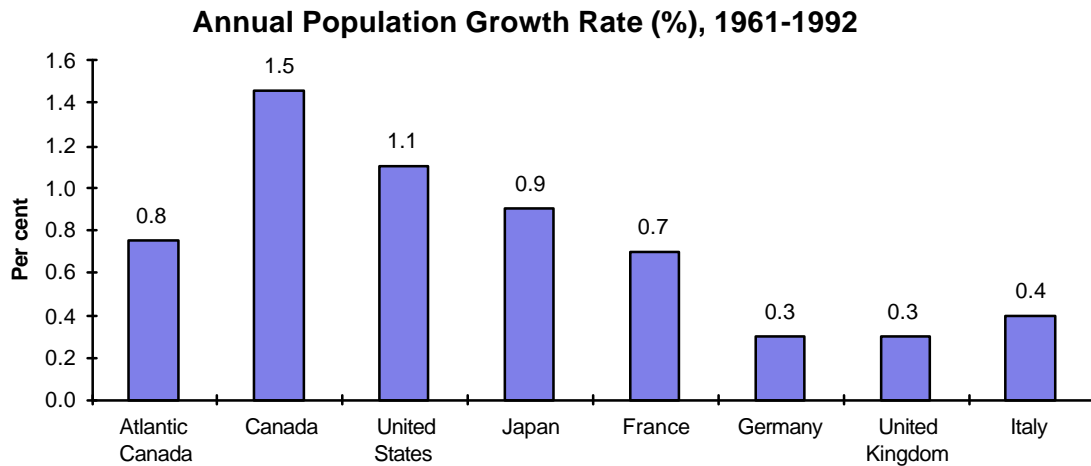
**Injuries from road accidents** per 100,000 people are lower in Atlantic Canada (736) as compared to the Canada average (929). However, they are still well-above other G7 countries with the exception of the United States (1,398). Compared to other individual nations, this statistic is most similar to that reported for Austria. On average, there were 488 injuries from road accidents per 100,000 people in Western and Southern Europe in 1990-91, while Nordic countries reported an average of 253 per 100,000 people.

### 3.4. Demographic Profile<sup>8</sup>

**Strengths:** *Low percentage of population 65+ relative to other G7 nations*

**Challenges:** *Decelerating population growth*  
*Low fertility rate*

In 1992, Atlantic Canada's **population** stood at 2.4 million people, 26% larger than it was in 1961 and roughly 8% of Canada's total population. Population growth has decelerated in the region recently and this trend is expected to continue. As a consequence, the region's population is not likely to be much larger by the year 2000 than it is today.



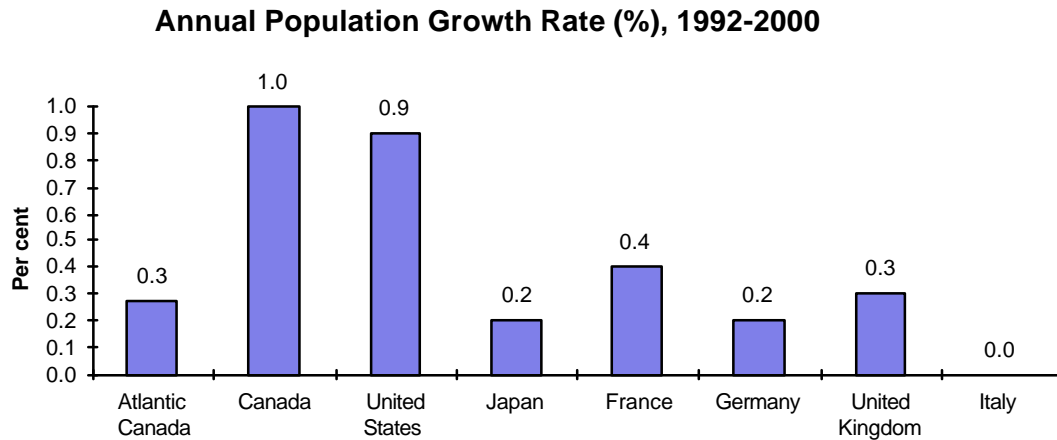
G6 refers to 1960-92

The pace of **population growth** in Atlantic Canada since 1961 has averaged 0.8% per year, roughly half the national rate. Compared to much of the G7 however, this pace is fairly rapid. Average annual population growth in Germany, the UK and Italy averaged

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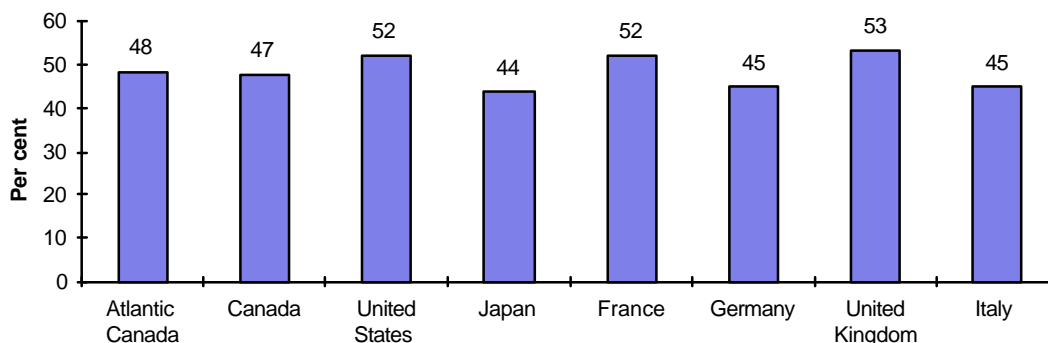
<sup>8</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 4.

0.3-0.4% over the same period. France and Japan experienced rates similar to that of Atlantic Canada, while the US population expanded at a 1.1% rate. The average rate of population growth for all industrial countries over the 1960-92 period was 0.8% per year.



Through the 1992-2000 period, the population of industrial countries is expected to expand by less than half a per cent per year. Atlantic Canada is expected to average slightly less growth at 0.3% per year. Much more rapid population growth, 2% or more, is envisaged in only four industrial countries - Tajikistan, Israel, Uzbekistan and Turkmenistan. Population expansion at one per cent or better per annum is anticipated in only eight of the 103 industrial countries - Kyrgyzstan, Armenia, Australia, Azerbaijan, Luxembourg, New Zealand, Canada and Iceland. Declining populations are projected in 10 industrial countries with the largest contractions foreseen for Latvia (-0.8) and Estonia (-0.6). Atlantic Canada's population expansion is not unlike that expected for most countries in the G7; Canada and the United States are expected to achieve population growth near the 1.0% per year mark.

### Dependency Ratio, 1992



Atlantic Canada's **dependency ratio**, the ratio of the population under 15 and those over 64 relative to the working-age (15-64) population, stood at 48% in 1992, virtually the same as the average Canadian rate. This ratio is intended to describe the percentage of the population dependent on others for economic support. Japan, Germany and Italy reported slightly lower rates at 44-45%, while the US, France and the UK recorded higher ratios, 52-53%. Dependency ratios amongst industrial countries varied from a high of 89% in Tajikistan to the low water mark experienced in Japan and Luxembourg of 44%, but averaged 51% in 1992.

The **total fertility rate** in Atlantic Canada stood at 1.5 in 1991, somewhat below the replacement rate of 2.1. (The replacement rate is the fertility rate necessary to maintain a country's population in the absence of net migration.) However, all G7 countries except the United States exhibited this characteristic in 1991. The lowest G7 fertility rate experienced was 1.3 in Germany and Italy; the highest was 2.1 in the US. The average fertility rate for industrial countries in 1991 was 1.8, whereas for developing nations it was 3.5.

Amongst the G7, Atlantic Canada reports the lowest percentage of its **population aged 65 and above**, 12%. The highest percentage (16%) is reported for the United Kingdom and Italy. The share of the Canadian population aged 65 and over is the same as the Atlantic Canada figure; the US number is 1% higher. Among the industrial countries, Sweden has the highest concentration of 65+ population (18%). Only 4% of Turkmenistan's population has reached the age of 65.

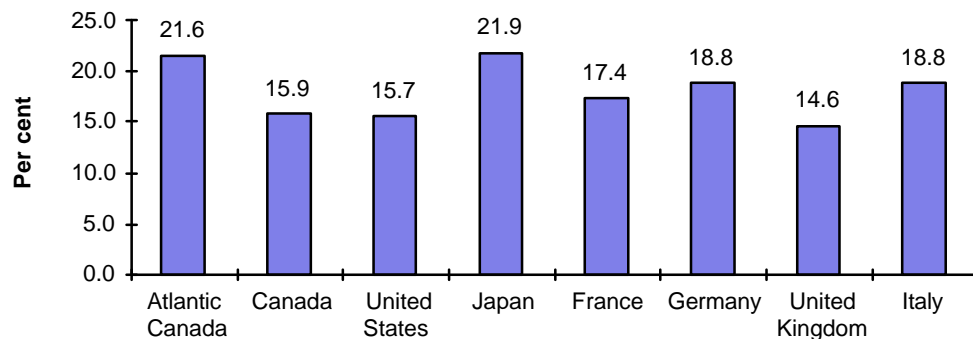
### 3.5. Wealth, Poverty and Social Investment<sup>9</sup>

**Strengths:** *Low income households receive larger share of total income than in most other G7 countries*

**Challenges:** *Social security benefits (UI) represent a major share of total GDP*

As noted earlier, real **GDP per capita** adjusted for purchasing power was \$16,831 in Atlantic Canada in 1992, 18% less than the Canadian average and lower than that reported for other G7 countries. Not adjusted for purchasing power parity, Atlantic Canada's GDP per capita is more than 25% less than the Canadian norm. This level of activity represents 0.2% of the total GDP produced by industrial countries in 1992.

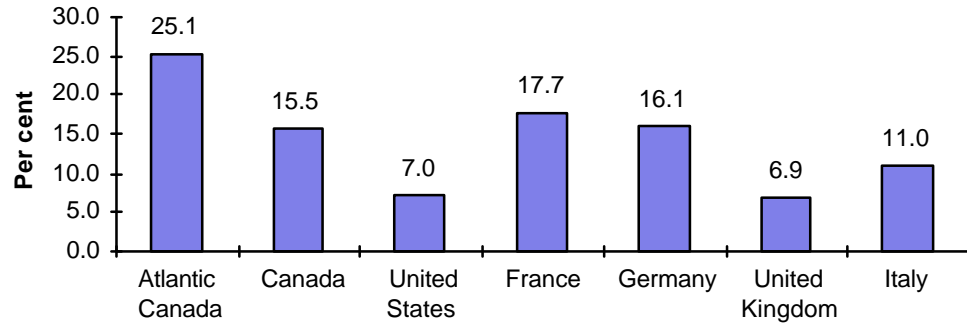
**Income Share of Lowest 40% of Households, 1992**



In Atlantic Canada, 21.6% of **income** rests in the hands of **the poorest 40% of households**. This figure is higher than all other G7 nations except Japan (21.9%). At the national level, the poorest 40% of households only receive 15.9% of total income.

<sup>9</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 5.

### Social Security Benefits Expenditure (as % of GDP), 1992



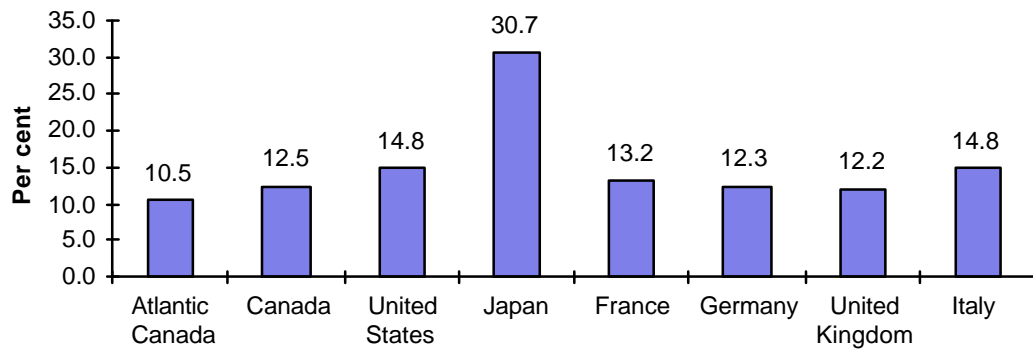
**Social security benefits expenditure** represent 25.1% of Atlantic Canada's GDP<sup>10</sup>. No G7 country reports a rate this high, although France (17.7%), Germany (16.1%) and Canada (15.5%) report percentages well above those of the UK (6.9%) and the US (7.0%). Atlantic Canada's rate tends to be high given the high level of unemployment experienced in the region and the availability of unemployment insurance.

**Public expenditure on education** represents 10.3 per cent of total public expenditure in Atlantic Canada. This percentage is marginally lower than the Canadian (12.1%) and UK (13.2%) rates but far higher than the percentages reported for the US (1.8%) and France (7.0%).

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<sup>10</sup> Social security benefits include compensation for loss of income for persons who are ill and temporarily disabled; payments to the elderly, persons with permanent disability and the unemployed; family, maternity and child allowances; and the cost of welfare services.

**Public Expenditure on Health (as % of Total Public Expenditure), 1989-91**



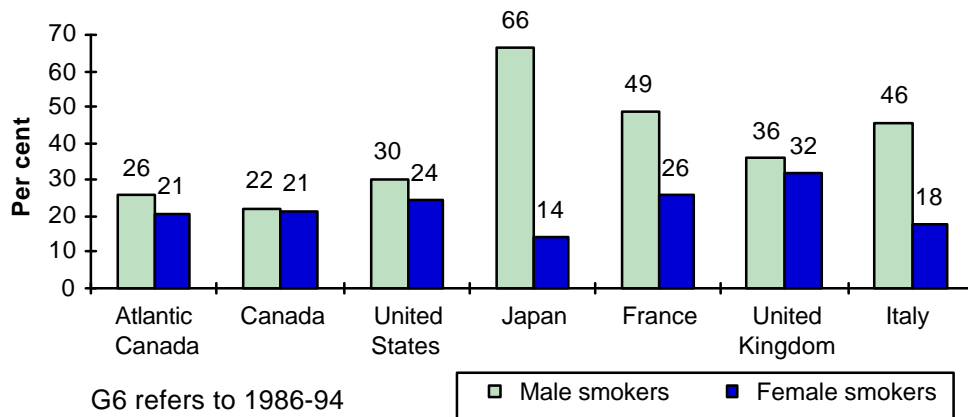
**Public expenditure on health** as a percentage of total public expenditure averaged 10.5% in Atlantic Canada during 1989-91 and most G7 countries reported similar rates. Only Japan spends considerably more on public health care, almost 31% of total government expenditure. The lowest percentage reported for an industrial country was for Sweden at 0.8%.

### 3.6. Health Profile<sup>11</sup>

**Strengths:** *Low incidence of adult smokers*  
*Low alcohol consumption per capita*  
*Low reported number of AIDS cases per capita*

**Challenges:** *Likelihood of dying after age 65 from cancer high relative to other G7 nations*

**Adults Who Smoke (%), 1989-91**

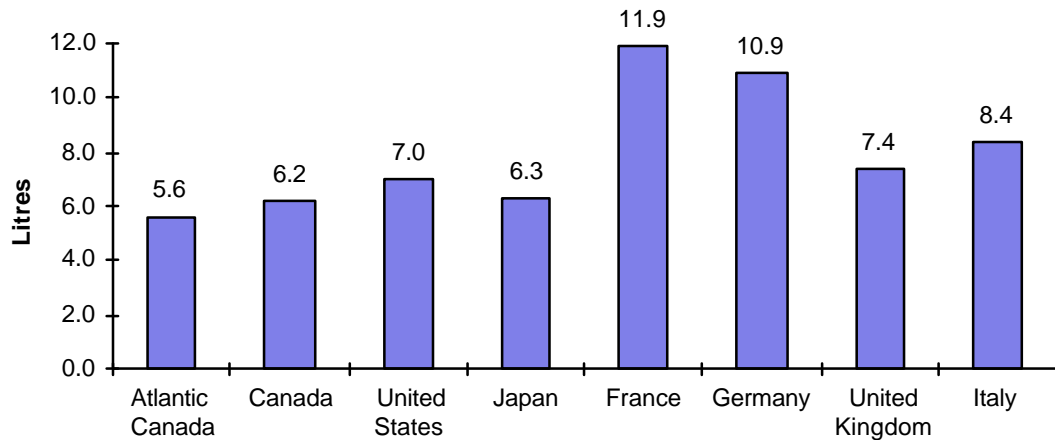


Roughly one quarter of adult Atlantic Canadian males smoke, an incidence that is somewhat higher than the Canadian male average. Nevertheless, when compared to most other countries, the incidence is low. The average rate for all industrialized countries is 44%. Adult females in Atlantic Canada are less likely to be **smokers** than their male counterparts. The female rate at 21% is the same as the national average, and lower than the figures reported for most G7 countries other than Japan (14%) and Italy (18%). The remaining G7 countries report that 24-32% of their female populations smoke.

<sup>11</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 6.



### Alcohol Consumption Per Capita (Litres), 1991



Atlantic Canadians consumed 5.6 litres of **alcohol per capita** in 1991, 10% less than the Canadian average (6.2). Compared to the rest of the G7, Atlantic Canadians consume considerably less alcohol per capita - 11 to 52% less. The heaviest drinkers in the G7 are the French, consuming 11.9 litres of alcohol per capita annually, while the Japanese consume the least, 6.3 litres per capita, next to Canada.

After the age of 65, Atlantic Canadians when they die are more likely to die from heart disease than the average Canadian. However, relative to the Japanese, French and Italians, all Canadians over the age of 65 are much more likely to die from heart disease. The opposite is true relative to the United States whose **likelihood of dying after age 65** from heart disease is more than 5% higher for both men and women when compared to Atlantic Canada.

Atlantic Canadians 65 and over are less likely to die from cancer than heart disease, but the incidence for cancer is higher in both Atlantic Canada and Canada as a whole than in other G7 countries.

In sum, male Atlantic Canadians who die after age 65 are likely to die of cancer or heart disease 63% of the time; for females, the rate is 57%.

Reported **AIDS** cases per 100,000 were 2.2 in Atlantic Canada during 1993. The national rate at more than double Atlantic Canada's result was five times less than the 25.4 per 100,000 reported in the United States, the highest rate reported amongst industrial countries. For the G7, excluding the US, the variation in the number of reported AIDS cases was also considerable, ranging from a low of 0.1 per 100,000 in Japan to a high of 9.9 in France.

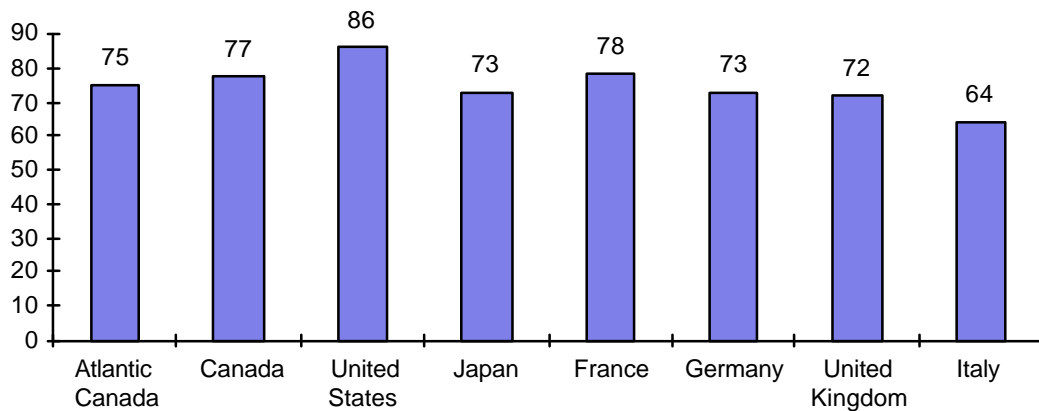
As noted above, public expenditure on health as a percentage of total public expenditure averaged 10.5% in Atlantic Canada during 1989-91 and most G7 countries reported similar rates.

### 3.7. Education Profile<sup>12</sup>

**Strengths:** *A major fiscal commitment to education relative to total GDP*  
*Large percentage of education dollars devoted to post secondary schooling*

**Challenges:** *Low tertiary natural and applied science enrolment*

**Enrolment Ratio for All Levels (% Age 6-23), 1991**



Net **school enrolment** (all levels) as a percentage of the population aged 6 to 23 was 75% in Atlantic Canada during 1991, slightly below the rate reported for Canada as a whole (77%).<sup>13</sup> The Atlantic Canada performance is similar to that reported for most other G7 countries. Only the United States (86%) boasts a much higher enrolment rate. The average enrolment ratio for all industrial countries in 1991 was 77%.

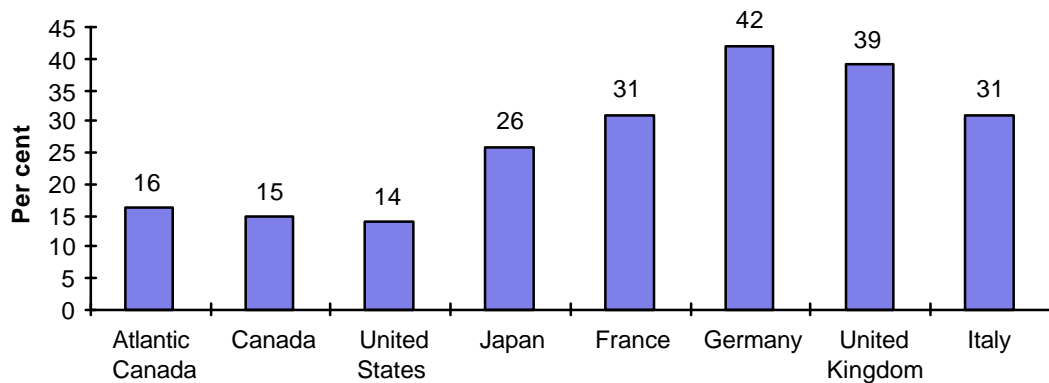
<sup>12</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 7.

<sup>13</sup> In the HDR, the percentage reported for Canada is 89%. More recent data available from Statistics Canada suggests this figure is lower.

**Full-time gross enrolment at the upper-secondary level** (grades 10 to 12) represented 98% of Atlantic Canada's population aged 15 to 17 in 1991. The average for the G7 was 100%. In some G7 nations, this enrolment ratio exceeds 100% as people not in the 15-17 age group attend upper-secondary school. Germany recorded the highest rate at 123%.

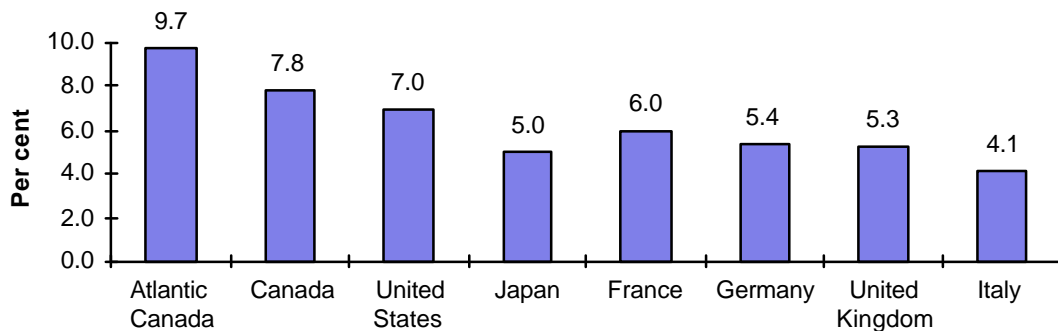
As noted earlier, Atlantic Canada's tertiary full-time equivalent gross enrolment ratio is similar to those experienced in other G7 nations.

**Tertiary Natural and Applied Science Enrolment  
(as % of Total Tertiary), 1990-91**



**Tertiary natural and applied science enrolment** as a percentage of total tertiary enrolment is well below the average of industrial countries (31%) in Atlantic Canada (16%). All G7 countries other than Canada and the United States report percentages well in excess of Atlantic Canada's experience. Both Canada and the US, however, registered somewhat lower ratios.

### Total Expenditure on Education (as % of GDP), 1991



**Expenditure on education** represented almost 10% of Atlantic Canada's GDP in 1991 and 90% of that spending was provided by public sources. All nations in the G7 spend less on education as percentage of their GDP, ranging from 7.8% in Canada down to 4.1 per cent in Italy. Government provides a similar percentage of total education spending in Canada and France compared to Atlantic Canada. In the US, Japan and Germany, 20-25% of education funding comes from private sources. In Italy and the UK all education moneys are provided by the state.

**Expenditure on tertiary (post-secondary) schooling** relative to spending on primary and secondary level education in Atlantic Canada topped 28% in 1991, higher than the percentages reported for most G7 nations. Italy spends only 10% of its education dollars on tertiary schooling. The United States spends somewhat more than the Atlantic Canada average, 34.4%.

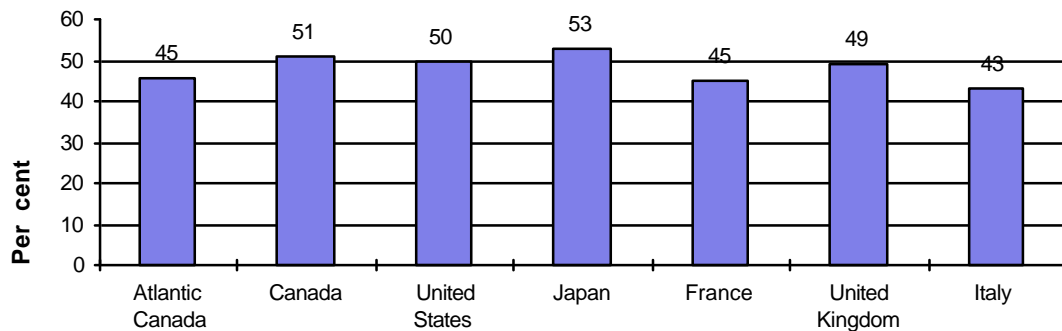
Public expenditure on education represented slightly less than 9% of Atlantic Canada's GDP in 1991, almost 2% more than the national average.

### 3.8. Employment<sup>14</sup>

**Strengths:** *Strong earnings per employee growth, 1980-91*

**Challenges:** *Low rate of labour force participation  
Large share of GDP devoted to expenditures on passive labour market programs*

**Labour Force (as % of Total Population), 1992**

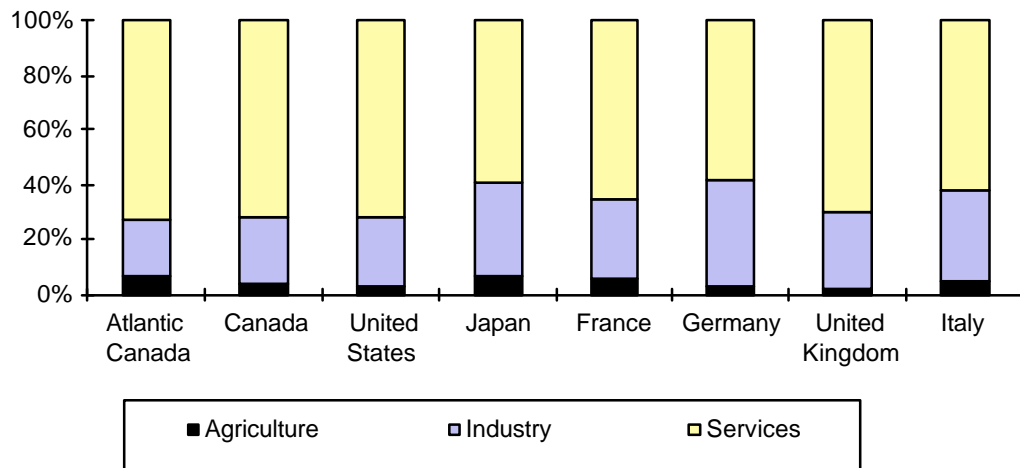


G6 refers to 1992-93

Atlantic Canada's **labour force** represented 45% of its population base in 1992-93. This rate of participation fell short of the national, US and UK marks by 4-6%, but closely approximated rates experienced in France and Italy. Typically, the labour force represents 50% of an industrial country's population, ranging from a high of 63% in Azerbaijan to a low of 36% in Malta. Countries with unemployment rates similar to those of Atlantic Canada (Ireland and Poland) report participation rates similar to that experienced in the region, 38% and 49% respectively.

<sup>14</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 8.

### Labour Force in Agriculture, Industry and Services, 1990-92



In terms of industrial structure, Atlantic Canada has a larger percentage of its workforce (6%) concentrated in **agriculture** when compared to the Canadian average. Note that agriculture also includes fishing and forestry. Both Japan and France report similar labour force concentrations in the agricultural sector as do Finland, Norway and Denmark. Nevertheless, the average percentage reported for industrial countries is 10%, almost double the Atlantic Canada rate.

Twenty-one per cent of Atlantic Canada's labour force is concentrated in the **industrial** sector, which is comprised of the manufacturing, mining, construction and utilities industries. This is the lowest rate reported for G7 countries; 3-4% less than the Canadian and US figures, but 17-18% less than the Japanese and German rates. Typically, industrial countries report a 32% concentration of labour force in this sector; only Albania, Tajikistan and Uzbekistan report rates lower than that of Atlantic Canada.

**Services** make up the dominant share of Atlantic Canada's labour force, 72%. This rate is similar to the Canadian, US and UK averages, but 14% higher than the industrial country norm.

Atlantic Canada's **future labour force replacement ratio** stood at 97 in 1992, suggesting that the region's population aged 0 to 14 was equal to 32.3% of its population aged 15 to 59. (A country's labour force replacement ratio is equal to three times the share of its population aged 0 to 14.) Countries with older populations report lower replacement ratios such as Italy at 79 and Switzerland at 80. Younger populations yield much higher replacement ratios such as 162 in Albania, 159 in Israel and 135 in Ireland. The average industrial country replacement ratio stood at 96 in 1992.

**Earnings per employee** in Atlantic Canada grew at a 1.8% pace, adjusted for inflation, over the 1980-91 period, roughly equal to the growth experienced in France and Germany. Within the G7, only the United Kingdom and Japan outpaced this performance. The United States recorded 0.5% annual growth while Canada reported no annual change in earnings per employee.

The **unionized share** of Atlantic Canada's labour force (38%) is somewhat higher than the percentage reported for Canada as a whole (35%). This level is more than double the US (17%) and French (12%) rates, but is similar to unionization rates in Germany, the UK and Italy.

Atlantic Canadians employed in the manufacturing sector worked an average of **39 hours per week** in 1992-93. The average Canadian puts in a similar effort. Work weeks in France and Germany are also comparable. The longest industrial country work weeks are found in Japan and the UK (43 hours) while the shortest are found in the Republic of Moldova (28 hours) and Belgium and Denmark (32 hours).

**Expenditures on labour market programs** as a share of total GDP are significant in Atlantic Canada (6.8%) when compared to other G7 nations. Germany reports a 4.2% rate, but a 2-3% level is more common. Expenditures represent less than 1% of GDP in Japan and the United States. Only Finland and Denmark report labour market program efforts as significant as those in Atlantic Canada. Canada spends 2.7% of its GDP on labour market programs.



### 3.9. Unemployment<sup>15</sup>

**Strengths:** *Incidence of long-term unemployment significantly less than G7 average*

**Challenges:** *High male and female unemployment rates  
Unemployment benefits account for large percentage of central government expenditure*

In 1993, an average of 168,000 people were **unemployed** in Atlantic Canada. This represented roughly 10% of the unemployed in Canada as a whole. Given that the region's labour force makes up less than 7.5% of the national total, the region's unemployment rate was more than 4 percentage points above the Canadian average as a consequence.

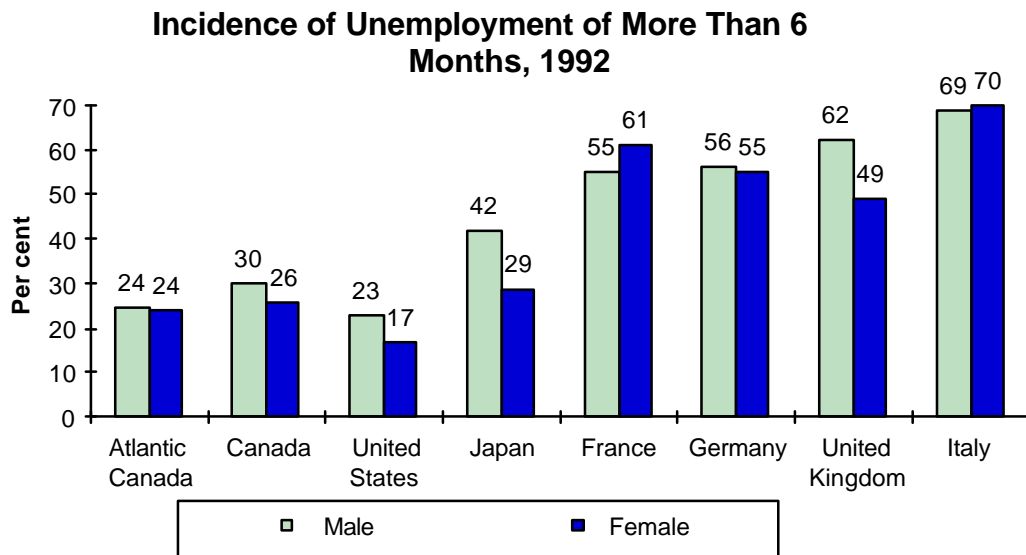
As noted earlier, Atlantic Canada's rate of unemployment is high compared to the rest of the G7, ranging from almost 13 percentage points higher than the Japanese rate to 3.8 percentage points higher than the French. The average unemployment rate in industrial countries was 8.6% in 1993.

During 1993, the **unemployment rate for men** was almost 2 percentage points higher than the rate for **women** in Atlantic Canada, but not unlike the 1 to 1.5 percentage points differential reported for Canada and the United States. In Britain the discrepancy is much greater as male rates are almost 5 percentage points higher than those for women. In Japan, unemployment rates are basically the same for men and women, while in France and Italy female unemployment rates are 3.9 and 9.2 percentage points higher than

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<sup>15</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 9.

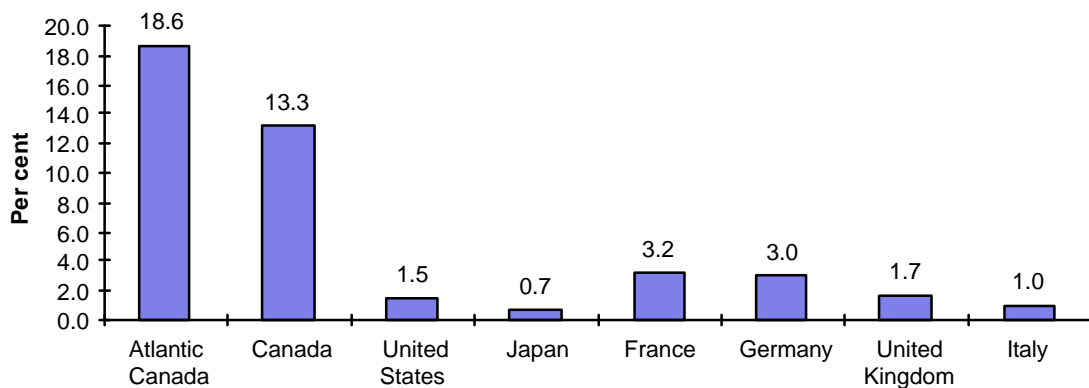
those of men. The average differential between male and female unemployment rates reported for industrial countries in 1993 was 0.8 percentage points.



Twenty-four per cent of the unemployed in Atlantic Canada were out of work for more than 6 months during 1992, but 8% of unemployed men and 3% of unemployed women reported a stretch of unemployment longer than 12 months. Atlantic Canadian **incidences of long-term unemployment** are similar to those in the US and Sweden, and are somewhat less than those reported for Canada as a whole. In general, incidence rates in the rest of the G7 are significantly higher -- 100 to 200% higher.

A relatively low incidence of long-term unemployment in Atlantic Canada may seem counter-intuitive given the region's high rate of unemployment. However, as noted earlier, the region also has a lower than average labour force participation rate which may suggest that there are significant numbers of "discouraged workers" in Atlantic Canada. These results warrant further investigation and may represent a challenge for the region.

**Unemployment Benefits Expenditure  
(as % of Central Government Expenditure), 1991**



**Unemployment benefits** as a percentage of federal government expenditure exceeded 18.6% in Atlantic Canada during 1991. This rate surpassed the Canadian average by 5% but was, at a minimum, 5 times higher than the percentages posted in other G7 countries. No other country spends as large a percentage on unemployment benefits as does Canada. Spain and Ireland are the closest at 7.0% and 6.3% respectively. Note, however, that Canadian figures are biased upwards by the inclusion of maternity leave benefits.

**Public expenditures on social protection** represent 28.7% of Atlantic Canada's GDP.<sup>16</sup> No G7 country reports a rate as high, but France (26.5%), Italy (24.5%), Germany (23.5%) and the UK (22.3%) registered percentages in excess of 20%. Canada (18.3%) and the US (14.6%) experienced rates 10 to 14 percentage points lower.

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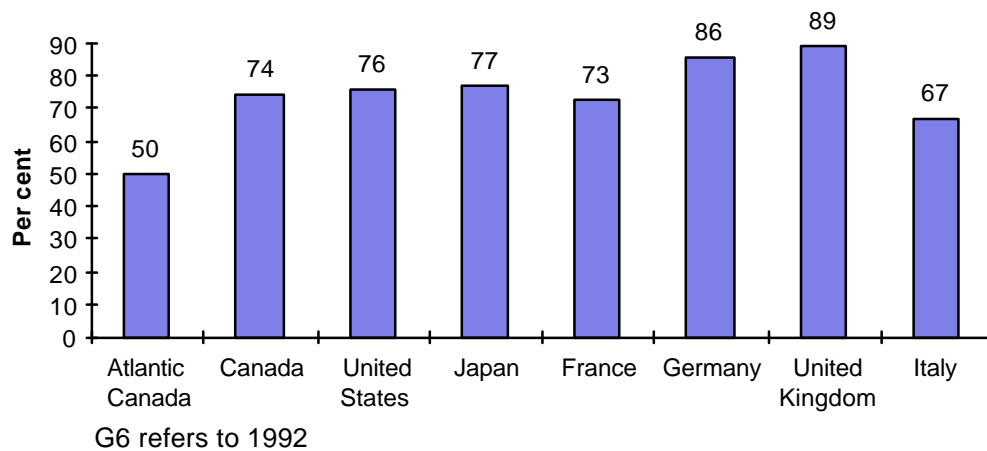
<sup>16</sup> Social protection refers to the provision of social welfare in the areas of health, pensions, unemployment benefits and other income support schemes.

### 3.10. Urbanization<sup>17</sup>

**Strengths:** *Low rate of urbanization*

**Challenges:** *Net out-migration of people*

**Urban Population (as % of Total), 1991**



In 1961, the **urban population** of Atlantic Canada made up 52% of its total citizenry versus a national average of 71%. By 1992, this share had fallen 2% in the Atlantic region while it rose 3% in Canada. Atlantic Canada's level of urbanization falls well below the average reported for the G7 for whom urbanization rates range between 89% in the UK to 67% in Italy.

In 1961, the degree of Atlantic Canada's urbanization compared to Norway and Switzerland. However, unlike Atlantic Canada, these and other nations experienced urban growth over the past 30 years resulting in a more highly urbanized population today. In 1992, the Atlantic region's urban population ratio was most like that of the Republic of

<sup>17</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 10.

Moldova (49) and Austria (55).

**Annual growth in the urban population** in Atlantic Canada at 0.6% averaged less than half the rate for Canada over the 1961-91 period and was most similar to that experienced by Uzbekistan (0.6%), but not unlike Japan (0.7%), Ireland (0.7%), Malta (0.7%), France (0.5%), and Switzerland (0.5%).

The **largest city** in Atlantic Canada is Halifax, which accounts for 21% of the urban population in the region. Although higher than the same measure for Toronto, Canada's largest city, this measure is similar to Paris' share of the France's urban population.

### **3.10.1. Rural Profile**

Atlantic Canada is more rural than most G7 countries. To improve the understanding of rural conditions around the world, the OECD, as part of its Rural Development Program, has begun to collect indicators of rural social, economic and environmental situation in the rural and remote regions. The Research Sub-Committee of the Interdepartmental Committee on Rural and Remote Canada has contributed to this undertaking and produced **Rural Canada: A Profile**. We now draw on this publication to augment this set of urbanization indicators suggested by the HDR.

Three types of regions are reported in **Rural Canada**: agglomerated, intermediate, and rural and remote regions. A rural area is defined as a region whose population density is less than 150 people per square kilometre, while an urban area is one where more than 150 people reside per square kilometre. A region is defined as “rural and remote” if more than 50% of its population lives in rural communities. A region is “intermediate” if between 15% and 50% of its population lives in rural communities. In an “agglomerated” region, less than 15% of the population lives in rural communities.

**Table R1: Population Change, 1981-91  
(%)**

	Canada	Atlantic Canada
Agglomerated (Urban)	14	-5
Intermediate	18	14
Rural & Remote	6	5

Source: *Rural Canada, A Profile*. Research Sub-Committee of the Interdepartmental Committee on Rural and Remote Canada, Government of Canada, 1995.

Atlantic Canada's population in rural and remote regions increased 2% during the 1980s, but most of that increase occurred in areas adjacent to metro areas. The fastest population growth occurred in intermediate areas. As noted earlier, the region's urban population declined.

**Table R2: Natural Balance & Net Migration, 1981-91**

	Canada		Atlantic Canada	
	Natural Balance	Net Migration	Natural Balance	Net Migration
Total	1,973,303	980,427	153,600	-65,630
Agglomerated	8,533,724	662,891	3,851	-8,536
Intermediate	448,160	493,230	32,693	18,142
Rural & Remote	671,419	-175,694	117,136	-75,236

Note: Natural balance equals births minus deaths.

Source: *Rural Canada, A Profile*. Research Sub-Committee of the Interdepartmental Committee on Rural and Remote Canada, Government of Canada, 1995.

Like other countries, Atlantic Canada's population changes due to a combination of two factors: natural balance (births minus deaths) and net migration. Between 1981 and 1991, the natural balance was positive in all regions in Atlantic Canada so the decline in urban population was due to more people moving out than in. Net migration was also large and negative in the rural and remote region, but was more than offset by births minus deaths. If net migration reflects people's perceived economic opportunities, this represents a major challenge for the region.

**Table R3: Regional Employment Rate by Age Class, 1991**

	Canada 15-24	Atlantic Canada 15-24	Canada 25-54	Atlantic Canada 25-54	Canada 55-64	Atlantic Canada 55-64
Total	56	44	77	69	48	38
Agglomerated	59	52	79	73	50	42
Intermediate	58	59	78	78	47	47
Rural & Remote	52	39	75	64	45	35

	Canada 65+	Atlantic Canada 65+	Canada Total*	Atlantic Canada Total*
Total	8	5	71	61
Agglomerated	8	5	72	65
Intermediate	7	6	71	71
Rural & Remote	9	5	67	55

\* Total = (Total employed / population aged 15-64 years)\*100

Source: *Rural Canada, A Profile*. Research Sub-Committee of the Interdepartmental Committee on Rural and Remote Canada, Government of Canada, 1995.

Employment rates were lower in rural Atlantic Canada than for the region as a whole in 1991. Compared to the rural Canada average, the region's employment rates were roughly 12% lower.

**Table R4: Per Capita Incomes, 1990**

	Canada 1990	Atlantic Canada 1990
Total	17,080	13,479*
Agglomerated	18,808	14,608
Intermediate	17,497	17,177
Rural & Remote	14,455	12,940

Source: *Rural Canada, A Profile*. Research Sub-Committee of the Interdepartmental Committee on Rural and Remote Canada, Government of Canada, 1995.

\* Estimated

Although per capita incomes are lower in Atlantic Canada relative to Canada as a whole, the differential between average rural per capita income and the regional total is significantly smaller. Rural per capita incomes are roughly 4% less than the average in Atlantic Canada, but are more than 15% less in Canada as a whole.

**Table R5: Percentage Change in Real Income, 1980-90**

	Canada	Atlantic Canada
Agglomerated	10	11
Intermediate	19	21
Rural and Remote	15	24

Source: *Rural Canada, A Profile*. Research Sub-Committee of the Interdepartmental Committee on Rural and Remote Canada, Government of Canada, 1995.

Over the 1980-90 period, real incomes in rural Atlantic Canada expanded more rapidly than in any other part of the region.

These characteristics only scratch the surface of rural indicators of human development. Further investigation is needed to identify the strengths and challenges of rural life.



### 3.11. Violence and Crime<sup>18</sup>

*Strengths: Low suicide rate*

*Challenges: High rates of incarceration*

Atlantic Canada's **rate of incarceration** (prisoners per 100,000 people) stood at 91 in 1991, down from 96 in 1986. These rates are roughly 10% less than the national averages for the same years. Compared to Japan, France and Italy however, both sets of Canadian numbers are relatively high, more than double the Japanese rates and more than 25% higher than the French figures. Nevertheless, Atlantic Canada's 1991 prisoner rate is below figures reported for Romania (112), Malta (119), Hungary (119) and New Zealand (120) and significantly lower than the extreme rates reported for Austria (261) and Lithuania (225).

**Homicides** occurred less frequently in Atlantic Canada during 1990 when compared to the country at large. The homicide rate in the largest city in the region, Halifax, was also lower than the rates reported for major cities in the G7, except Tokyo.

**Drug crimes** are a much more common occurrence in Atlantic Canada (247 per 100,000 people in 1980-86) than in Japan (31) and Italy (6), but when compared to Canada (246) and the United States (234) the figures are not significantly different.

The total number of **reported rapes** in Atlantic Canada stood at 1,700 in 1986. This figure represented roughly 8% of the Canadian total. When compared to other nations, Canadian rape numbers seem very high. For example, in the United States 90,400 rapes were reported in 1986, a figure less than 4.5 times the Canadian total. Based on demographics alone, a rate 10 times the Canadian total would be anticipated. This

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<sup>18</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 11.

discrepancy results from the nature of the statistics collected. In Canada, rape is not a separately identified crime, instead perpetrators are charged with sexual assault which encompasses a much broader number of charges.

**Suicide rates** per 100,000 people in Atlantic Canada at 18 for men and 3 for women are somewhat lower than those reported in most G7 countries. The United Kingdom and Italy report lower rates for men, 13 and 11 per 100,000 respectively. Average suicide rates per 100,000 in industrial countries are 26 for men and 8 for women.

Looking at more recent statistics, we see that Atlantic Canada's crime rates continue to be significantly lower than average Canadian rates, except for violent crimes where the rates are comparable.

#### **Crime Rates (Per 100,000), 1994**

	Violent Crime Rate	Property Crime Rate	Total Criminal Code Offence Rate
Canada	1,037	5,214	9,002
Atlantic Canada	1,025	3,408	7,051

Source: *Canadian Crime Statistics, 1994*. Statistics Canada, Catalogue 85-002.

### 3.12. Natural Resources Balance Sheet<sup>19</sup>

**Strengths:** *Abundant internal renewable water resources*

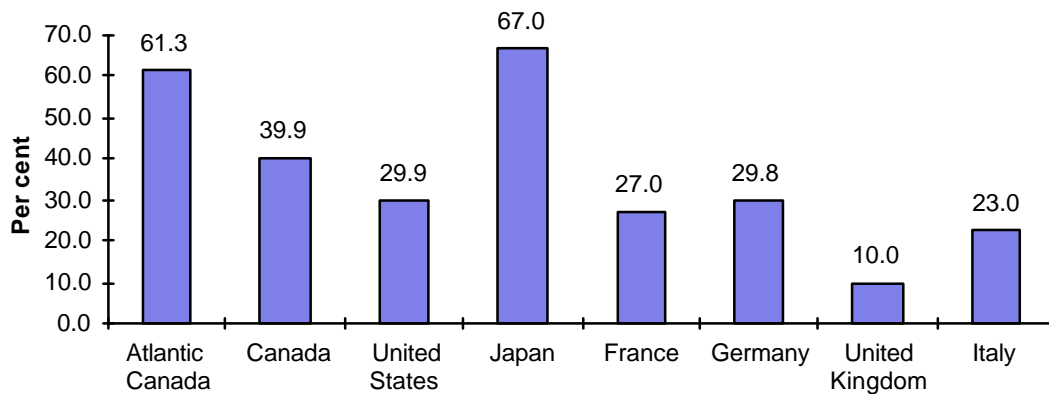
*Low rate of irrigation*

*High rate of forestation*

**Challenges:** *Low percentage of arable land*

Atlantic Canada represents 0.4% of the world's total land area. This is roughly the same area as France and is larger than Japan, Germany, Italy and the UK. Atlantic Canada's land area is about 1/20th the size of Canada's or the United States'.

**Forest and Woodland (as % of Land Area), 1991**



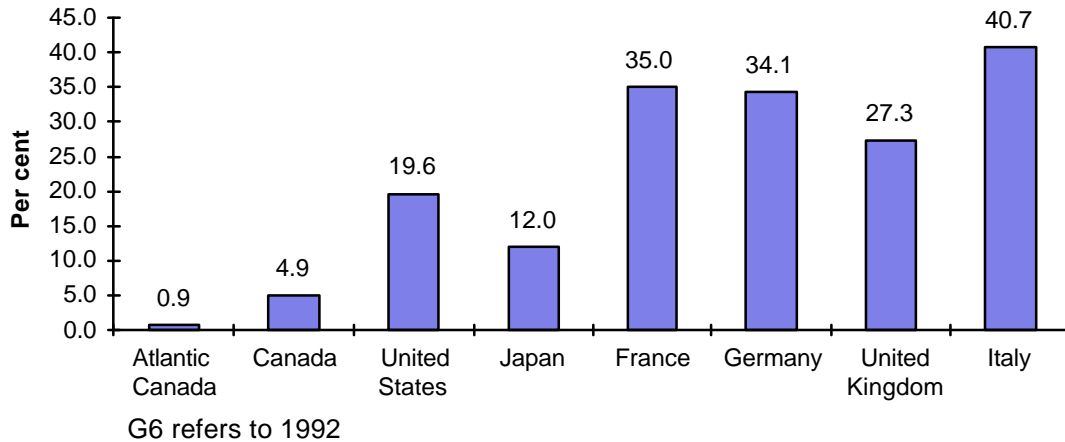
G6 refers to 1992

In excess of 60% of Atlantic Canada's land area is forest and woodland. This

<sup>19</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 12.

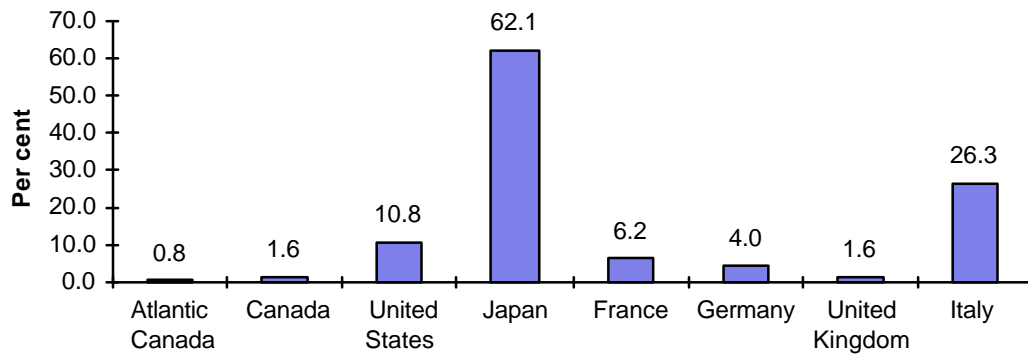
figure is well in excess of the percentages reported for all G7 countries except Japan which has 67% forest and woodland coverage. Finland (76.2%) and Sweden (68.1%) are the only other industrial countries with more forest area. The average **forestation** rate reported for industrial countries is 26.6%; Canada is 39.9% forested.

**Arable Land (as % of Land Area), 1991**



Given significant forest coverage, Atlantic Canada's **arable land** as a percentage of total land area is small, 0.9%. Not surprisingly, this figure is well below the values reported for the G7; Canada's percentage is 4.9. Only Iceland reports a figure less than that of Atlantic Canada, 0.1%. New Zealand has 1.5% arable land.

### Irrigated Land (as % of Arable Land Area), 1990



G6 refers to 1992

Only 0.8% of Atlantic Canada's **arable land is irrigated**, half the Canadian and UK percentages. In contrast, more than 60% of Japan's arable land is irrigated. The other G7 countries irrigate 4 to 26% of their arable land. On average, industrial countries irrigate just shy of 10% of their arable land.

**Internal renewable water resources** are found in abundance in Canada, a fact that is more true for Atlantic Canada. One hundred and thirty thousand cubic metres of renewable water resources per person were available in Atlantic Canada during 1991 a figure higher than any other country except for Iceland (653.9). Most G7 countries report a figure less than the world average of 7.6 cubic metres per capita.

### 3.13. Energy Consumption<sup>20</sup>

*Strengths: Slow increases in energy consumption*

*Challenges: High rate of energy use per capita*

In 1991, Atlantic Canada's **production of primary energy**, excluding electricity, was concentrated in coal, despite established offshore oil and gas reserves. Oil production began in 1992.

**Coal** production as a percentage of the region's reserves was 0.8% in 1991, a depletion rate similar to the Canadian average. With respect to the G7, only Germany and the United States were producing coal at a slower rate. Around the world, coal equivalent to 0.4% of total reserves was extracted during 1991.

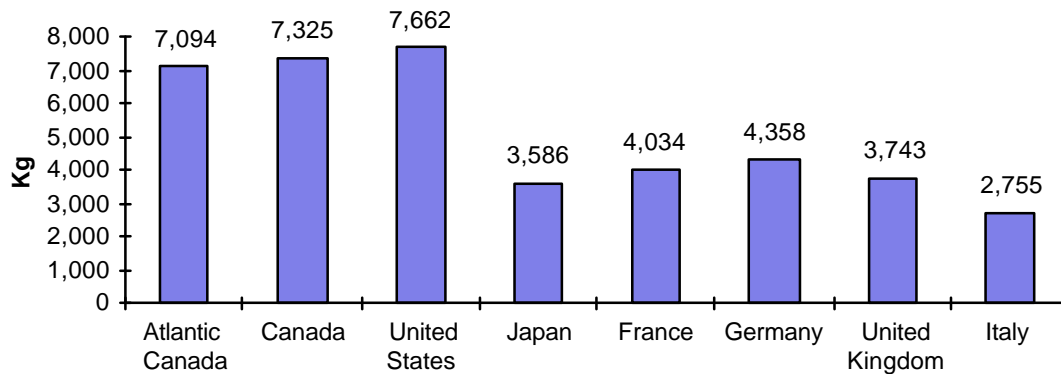
Growth in **commercial energy (primary) production** has been consistently lower in the Atlantic region than in Canada since 1978. Canadian production of commercial energy rose 3% annually over the 1978-80 period, before the rate increased to 4% during the 1980-92 period. These rates of increase in Canadian production are equivalent to the averages experienced around the world. The United Kingdom expanded its rate of energy production rapidly during the 1980s with the opening of the North Sea, while more recently France and Japan have experienced 7% and 5% growth respectively.

Growth in Atlantic Canada's level of **energy consumption** has been much slower than the national and other G7 rates through the 1978-92 period. Since 1981, no increase in energy use has been experienced in Atlantic Canada while around the world, average increases in energy use ran at 4% per year.

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<sup>20</sup>A tabular presentation of the data discussed in this section can be found in Appendix B, Table 13.

### Commercial Energy Use (kg of Oil Equivalent Per Capita), 1992



In terms of **commercial energy use per capita**, Atlantic Canada's rate of consumption is similar to the national average, which, in turn, is similar to usage in the United States. However, compared to other G7 and industrial countries, energy use in Canada and the US is markedly higher on a per capita basis. In 1992 the average for industrial countries was 4,834 kilograms of oil equivalent per capita, more than 30% less than the Atlantic Canada level. Atlantic Canada, along with the G7 and most industrial countries, has improved its energy efficiency over the last 15 years. However, the region, like Canada as a whole, is still extremely energy intensive when compared to other nations.

Atlantic Canada's **energy efficiency** (kilograms of oil equivalent per \$100 of GDP, \$C) is also relatively poor when compared to world standards. Once again some improvement has been achieved since 1981, but the region remains one of the least energy efficient. Only Bulgaria, Romania, Poland and Hungary report usage higher than the Atlantic Canadian and Canadian rates. Energy efficiencies in the G7 excluding Canada and the US are roughly three times better than the Canadian standards.

### 3.14. Environment and Pollution<sup>21</sup>

***Strengths:** Municipal waste services available to all*

***Challenges:** High rate of CO<sub>2</sub> emissions  
Low percentage of population served by  
waste water treatment plants*

Atlantic Canada produces slightly more than 9% of Canada's total **CO<sub>2</sub> emissions**. Given its industrial make-up, the region's contribution to industry-related emissions is less than 4% of the national total.

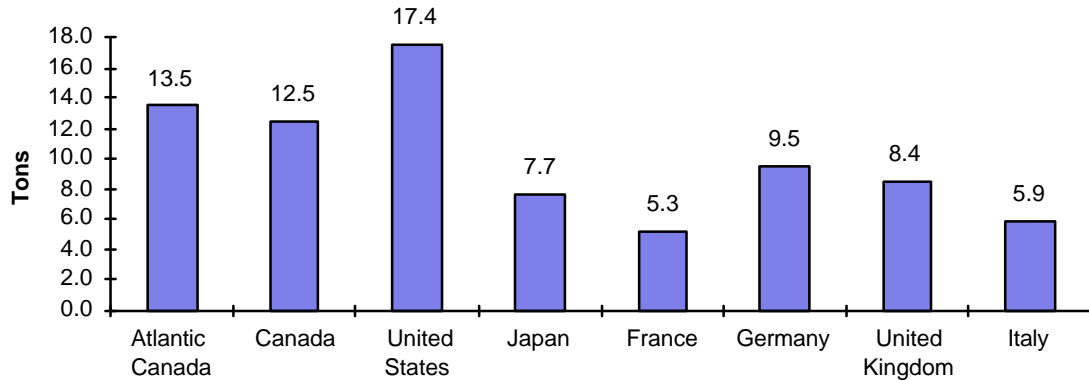
Similar to Germany and the UK, more than 50% of Atlantic Canada's CO<sub>2</sub> emissions are produced during **energy transformation** (electric power generation or petroleum refining). Unlike Germany, however, **industry sources** account for only 11% of total emissions rather than 22%. In the UK, industry accounts for 19% of emissions. Mobile sources make up the remaining 37% of total Atlantic Canada CO<sub>2</sub> emissions. The distribution of CO<sub>2</sub> emission sources are similar in Canada, the United States and Italy with 34% derived from mobile sources, 40-45% produced during energy transformation, and the remainder resulting from industrial activity. Given that much of France's electric power is nuclear, it generates only 23% of its emissions from energy transformation. Thirty per cent of Japan's CO<sub>2</sub> emissions are produced by industry and only 26% by mobile sources.

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<sup>21</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 14.



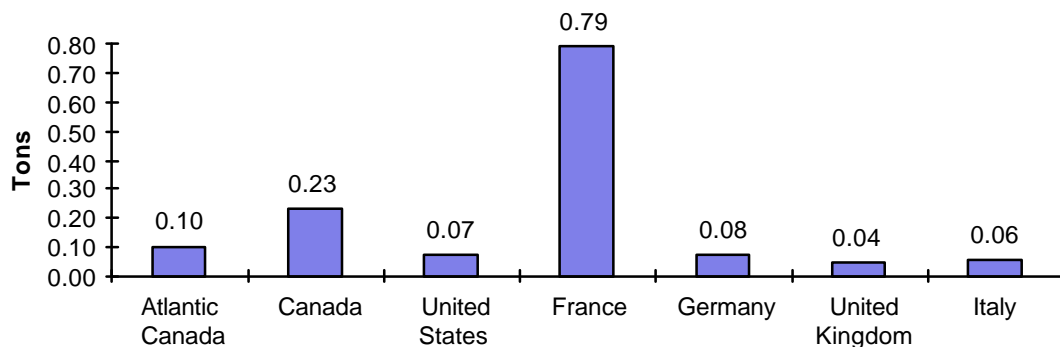
### Mobile, Energy Transformation and Industry CO<sub>2</sub> Emissions Per Capita, 1991



On a per capita basis, Atlantic Canada emits more CO<sub>2</sub> per capita from mobile, energy transformation and industrial sources than most G7 nations. Only the US has a higher emissions rate. Note that the CO<sub>2</sub> emissions reported here exclude residential, commercial, non-energy, off-road gas and refined products use which account for about 19% of total emissions in Atlantic Canada and 22% in Canada.

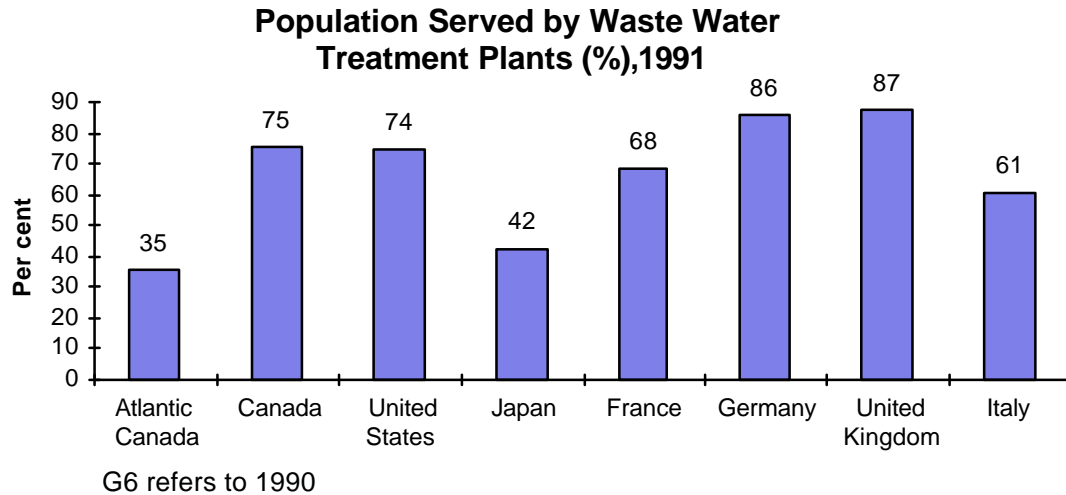
Atlantic Canada produces just shy of 12% of Canada's total **sulfur and nitrogen emissions**.

### Hazardous Waste Production Per Capita, 1986



G6 refers to 1990

New Brunswick's contribution to Canadian nuclear waste from spent fuel was 5% in 1991. Atlantic Canada's share of national **hazardous waste production** was just short of 4% in 1986. On a per capita basis, Atlantic Canada produces somewhat more hazardous waste than most G7 nations, excepting France and Canada.



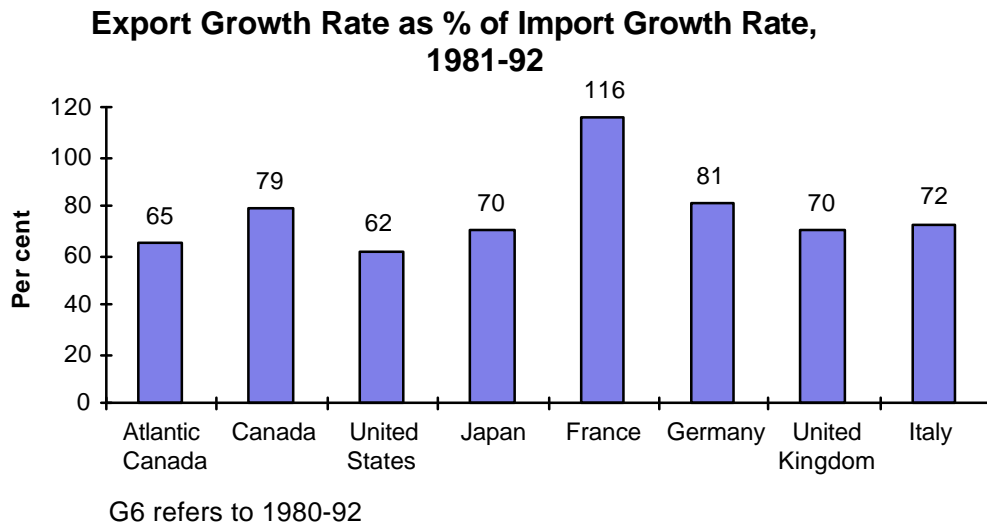
Only 35% of Atlantic Canada's **population was served by waste water treatment** in 1991. This figure is no more than half that of most G7 countries except Japan (42%). The highest coverage is found in the UK (87%) and Germany (86%); 75% of Canadians are served by waste water treatment. The highest percentage of population served by waste water treatment plants is found in Denmark (98%) and the lowest in Iceland (6%).

**Municipal waste services** are available to all Atlantic Canadians as is the norm throughout most of the G7. These services are not as prevalent in Finland (75%) and Norway (85%) or former Eastern Bloc countries (55-70%).

### 3.15. Resource Flow Imbalances<sup>22</sup>

*Challenges: High trade dependency  
High net debt interest payments*

International merchandise exports in current dollars were equivalent to 85% of total international imports in Atlantic Canada during 1992. This figure is lower than that reported for all G7 countries except the United States whose **export-import ratio** stood at 76%. Japan's export sales topped imports by 47%; German and Canadian exports also exceed total imports but by lesser amounts, 6% and 4% respectively. Amongst G7 countries, Atlantic Canada's performance most closely mirrored that of the United Kingdom. The average export/import ratio for industrial countries was 97%.

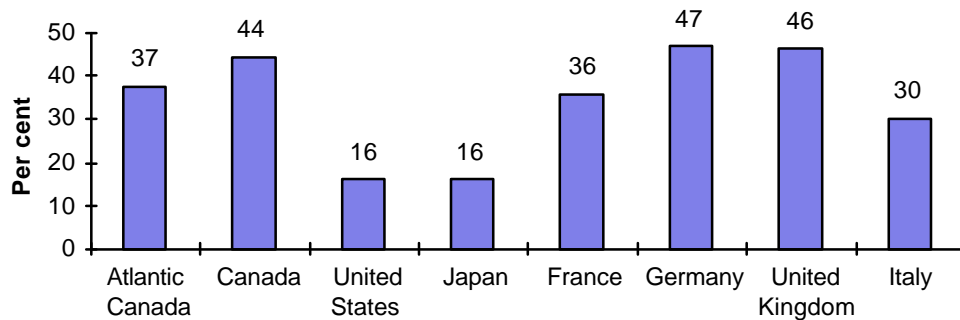


Over the 1981-92 period, exports to other countries from Atlantic Canada grew at 65% of the rate of imports from foreign trading partners. All G7 countries reported

<sup>22</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 15.

import growth more rapid than export growth (81% in the case of Germany down to 62% for the United States) with the exception of France. French exports expanded 16% faster than imports over the time period. The average industrial country's exports expanded at 73% of import growth over the same time frame. Countries experiencing extraordinary **export growth relative to imports** during this period included Hungary (320%), Norway (232%), Ireland (173%) and Poland (167%).

**Trade Dependency (Exports Plus Imports as % of GDP), 1992**



Atlantic Canada's **dependency on trade** (merchandise exports plus merchandise imports as % of GDP) in 1992 was 37%, very similar to that of France. The trade exposure of Canada, Germany and the UK was more elevated, 44-47%, while the United States and Japan were less open (16%). On average, industrial country trade dependency was 29% in 1992, 8% less than the Atlantic Canada experience.

Atlantic Canada's **terms of trade** (export prices relative to import prices indexed to 100 in 1987) remained at 100 in 1992. This implies that the prices of the region's exports and imports moved similarly since 1987. Canada, France and Germany experienced a similar result, but the rest of the G7 saw their export prices rise more rapidly.

Total government net debt interest payments<sup>23</sup>; represented 10% of total government expenditure in Atlantic Canada during 1991, 2 percentage points more than at the national level. With the exception of Italy (18%), the region's rate is higher than those reported for all other G7 central governments.

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<sup>23</sup> The federal debt interest payments used here are apportioned based on shares of population.

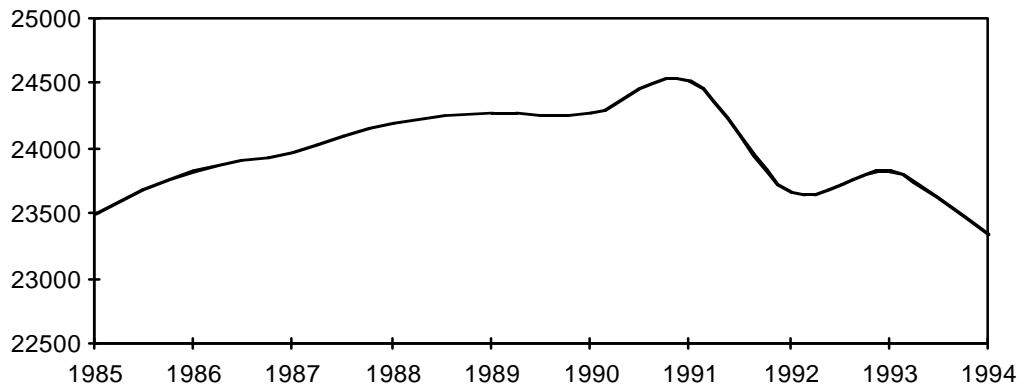
### 3.16. Defence Profile<sup>24</sup>

**Strengths:** *Industry contributes significantly to economic activity*

**Challenges:** *Industry's importance is declining*

Roughly 20% of Canada's **defence personnel** are located in Atlantic Canada. With average wages in excess of \$31,000 per year, defence represents more than \$1 billion or 3% of the region's GDP. At the national level, defence is less important, making up less than 1% of total economic activity.

#### Atlantic Canada Defence Employment, 1992



The importance of the defence industry is declining in Atlantic Canada however. In 1978 the industry represented 3.8% of total employment in the region, almost a full percentage point more than today's rate. Announced base closures suggest this decline will continue for at least another few years.

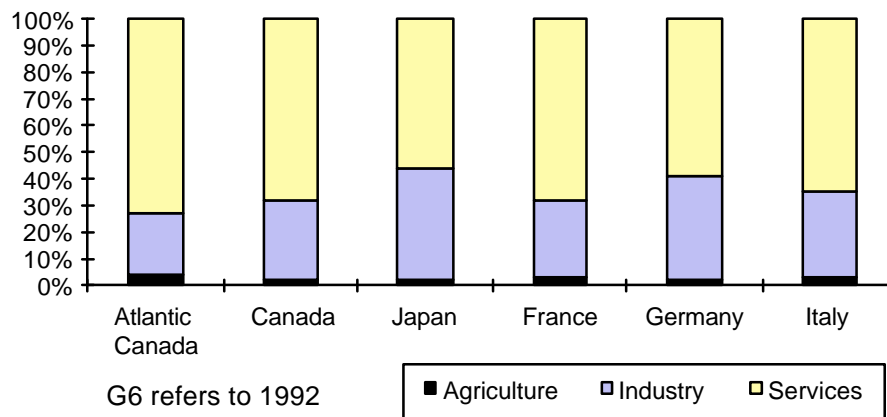
<sup>24</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 16.

### 3.17. National Income Accounts<sup>25</sup>

*Challenges: Low rate of industrialization  
Low investment effort*

Atlantic Canada's **GDP**, at \$31.0 US billion in 1992, accounts for 6% of total Canadian economic activity. Using this gauge, the region was most similar in size (measured in billions) to Belarus (\$30.1) and in the same range as Kazakhstan (\$28.6), Hungary (\$35.2), the Czech Republic (\$26.2), New Zealand (\$41.3 billion) and Ireland (\$43.3) in 1992. Atlantic Canada is roughly three-quarters the size of Chile but only one-tenth the size of Mexico or Brazil.

**GDP in Agriculture, Industry and Services,  
1991**



**Agriculture**, which also includes forestry and fishing, accounts for 3.9% of total economic activity in Atlantic Canada. This is significantly higher than the Canadian figure (2.4%) and the G7 average. Within the G7, France and Italy have the highest percentage of economic production devoted to agriculture (3.0%). Atlantic Canada is not

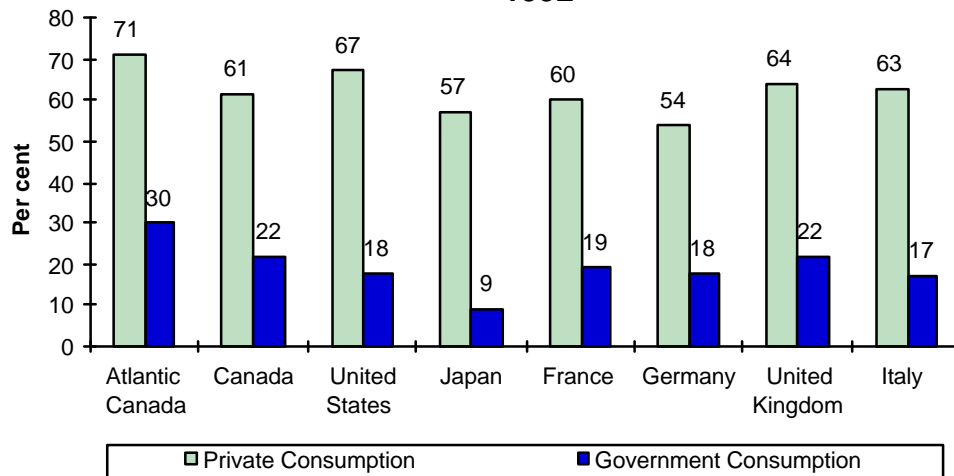
<sup>25</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 17.

the only region with significant agricultural activity. The Netherlands and Denmark report similar concentrations, while Finland, Ireland and much of the former Soviet Union are more agriculture intensive.

**Industrial output**, which includes the manufacturing, mining, construction and utilities sectors, represents 22.8% of total GDP in Atlantic Canada. Compared to Canada as a whole the region is 6.5 percentage points less industrialized. All G7 nations report more industrialization than Atlantic Canada, ranging from 42% in Japan to 29% in France. The region is unlike most other countries in terms of industrial activity as most report concentrations either well above the Atlantic share (30% or above) or well below (Ireland at 10%). The closest similarity is with Denmark (27%).

The bulk of Atlantic Canada's GDP is produced in its **services** sector (73.4%). This is a common feature of most developed economies, but the concentration of economic activity in this sector is particularly high in Atlantic Canada. Amongst G7 countries, Canada and France are most like Atlantic Canada with 68% shares. Most other industrialized countries report less services as a share of total activity, with the exception of Ireland (80%).

**Government and Private Consumption (as % of GDP), 1992**

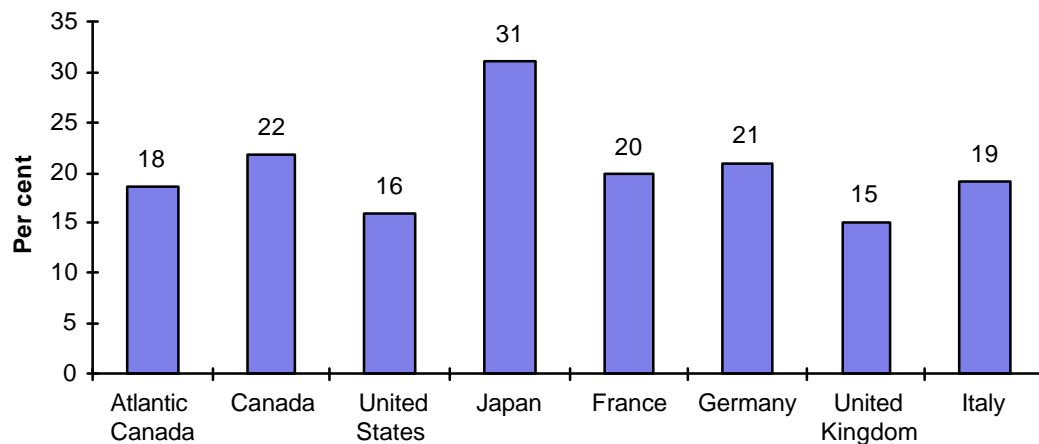


Both **private and government consumption** in Atlantic Canada as a share of total GDP are significantly higher than the Canadian average. In sum, these two expenditure categories accounted for 101.3% of the region's total GDP in 1992; private

spending made up 71.0%. This suggests that investment and net exports are roughly of similar magnitudes and are offsetting in the region. Private consumption as percentage of GDP in Atlantic Canada is the same as that in the Czech Republic, Bulgaria, Armenia and Hungary. Relative to other countries this is a high rate, with only two countries reporting above the Atlantic average, Slovakia (85%) and Greece (73%). Atlantic Canada's government consumption as percentage of GDP (30.3%) is about the same as in Kazakhstan and similar to Sweden (28%), and is the highest of any reporting countries.

Nationally, private consumption accounted for 61% of GDP in 1992 while government current spending reached almost 22%. In general, these percentages are within the range of other G7 experiences but most closely approximate France and Italy on the private side and the United Kingdom and France in the case of government consumption. Consumption constitutes 67% of the United States' GDP, but only 54% in Germany. Japan's government sector is particularly small at 9%.

### Gross Domestic Investment (as % of GDP), 1992

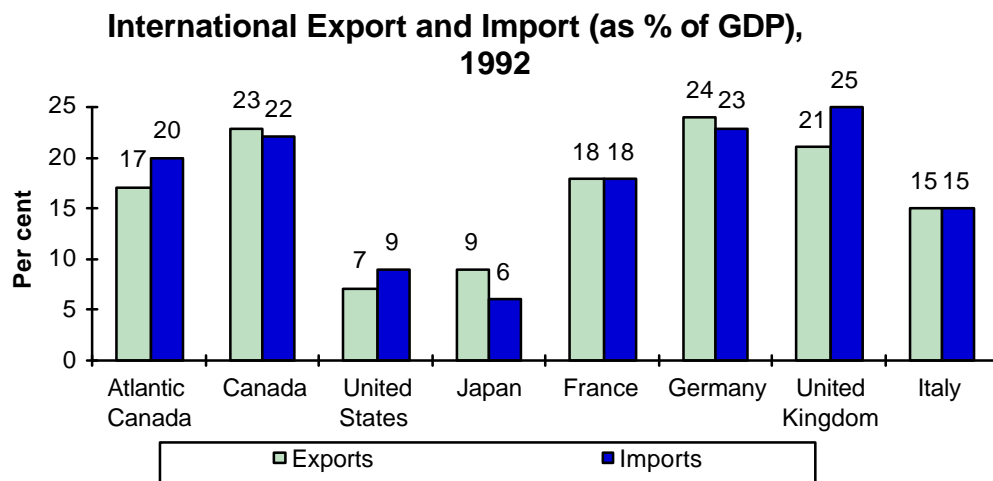


Atlantic Canada **investment as a share of GDP** (18%) is similar to both Canadian and other G7 results. Only Japan demonstrates significantly different behavior as investment accounts for 31% of total activity, significantly higher than other G7 countries. Investment effort in Atlantic Canada falls 3.5% short of the norm reported for all industrial countries and but is basically identical to rates in New Zealand, Italy, Estonia and Hungary. Within the region, the private sector accounts for roughly 80% of total investment.



With the exception of Armenia, all countries report positive **savings** as a percentage of GDP, with the lowest positive share reported for Greece. Negative savings as a share of GDP in Atlantic Canada is indicative of net borrowing, from both foreigners and the rest of Canada. Canada's savings as a share of GDP at 17% is similar to percentages reported for the rest of the G7 with Japan (34%) and Germany (28%) as the major outliers.

When comparing Atlantic Canada's **tax revenue as a share of GDP** with other jurisdictions, the issue of revenue sharing between central and regional governments becomes an issue. Federal tax revenue as a share of GDP is significantly lower in Canada, the United States and Japan than in other G7 countries. However, Canada's total tax revenue as a share of GDP is similar to other G7 central government tax revenue shares. This suggests that Canada's provincial governments have revenue generating powers not available to regional governments in other G7 countries. This would also likely be the case for states within the US. Japan's rate of taxation is significantly lower than in most other G7 countries reflecting the smaller importance of government spending to the total economy.



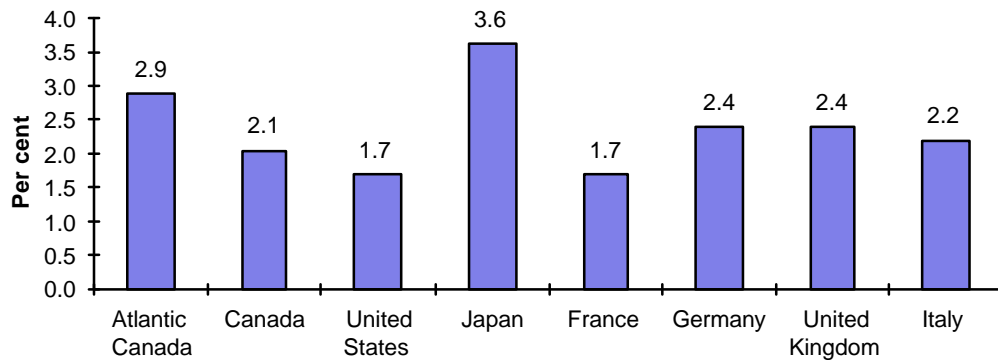
Atlantic Canada's international merchandise **export flows** accounted for 17% of the region's GDP during 1992, but were offset by a 20% leakage to merchandise **imports**. Canada is the one of the most open G7 nations with exports and imports both accounting for about 22-23% of GDP.

### 3.18. Trends in Economic Performance<sup>26</sup>

**Strengths:** Above average economic growth, 1982-91  
Low inflation

**Challenges:** Below average international export growth  
Large government deficits

**GDP Per Capita Annual Growth Rate (%), 1982-92**



**Average annual GDP growth** from 1982 to 1991 was the same in Atlantic Canada, Canada and the United States. Compared to the G7, only Japan's performance was superior. On a **per capita basis**, however, the Atlantic performance was better than the Canadian result. In part, Canada's relative performance reflects the severe recession which hit central Canada in the early 1990s.

<sup>26</sup> A tabular presentation of the data discussed in this section can be found in Appendix B, Table 18.

**Inflation** tended to be higher in Atlantic Canada through the 1982-92 period relative to the Canada average. Compared to the rest of the G7, the region's rate was bettered only by German and Japan, reflecting the success of the Bank of Canada's low inflation policies. In 1992, Atlantic Canada reported an inflation performance similar to Japan's - below 2%.

**International exports** as a percentage of GDP expanded at a 1.1% rate over the 1982-92 period, a pace similar to that experienced in Japan but weaker than the performance registered in all other G7 countries. Canada was the top performer amongst the group registering 2.6% annual export expansion relative to GDP.

**Government deficits** expanded as a per cent of GDP in all G7 countries through the 1980s and into the early 1990s, except in Japan where considerable shrinkage was recorded and in Italy where no change occurred. North American deficits as a percentage of GDP tend to be larger than their other G7 counterparts with the exception of Italy.

#### **4. Final Remarks**

A major goal of the Human Development Report is to encourage governments, international organizations, and policy makers to participate in improving statistical indicators of human development. This report responds to that challenge.

Our analysis has identified potentially valuable sources of data for monitoring Atlantic Canada's human development, but additional work is warranted. Other initiatives are being pursued around the world in an effort to identify the state of human progress, including amongst others the Genuine Progress Indicator and the Oregon Benchmarks: Standards for Measuring Statewide Progress and Institutional Performance.

Some areas where data collection needs to be improved have also been identified, including comprehensive regional prices and some provincial income and expenditure account detail.

## **5. Appendix A - Calculation of the Human Development Index**

First reported in the 1990 edition of the HDR, the HDI was developed by the UN to measure the relative socio-economic progress of different countries. Other indicators often used for this purpose, namely Gross Domestic Product (GDP) per capita, were judged to be deficient in that they ignore key aspects of human development that are not captured through measures of income alone. The HDI combines indicators of longevity (life expectancy), knowledge (school enrolment and literacy) and standard of living (per capita GDP), to provide a more comprehensive measure of human development or socio-economic status.

The HDI indirectly assesses the development of people, as made possible through the existence (or effectiveness) of health services, education, and economic opportunity. It serves as an alternative to using Gross Domestic Product (GDP) per capita as the socio-economic indicator of the progress of nations and it is touted as a valuable tool for use in the prioritization of economic interventionist policies. The HDI does not measure absolute levels of development but, rather, it is a composite measure that ranks countries in relation to each other or to a common goal. Countries are examined with respect to how far they have progressed and how far they have yet to go to attain the current best level of achievement for each of three indicators:

- life expectancy at birth;
- educational attainment (comprising adult literacy, with two-thirds weight, and gross school enrolment ratio, with one-third weight); and
- "adjusted" real GDP per capita.

These indicators are intended to proxy selected basic components of human development: longevity, knowledge, and standard of living.

For each of the indicators, global maxima and minima are used in a comparison with country-specific values to generate the indexed components of the HDI. Insofar as it is the distance traveled by each country from a minimum toward a maximum that forms the methodological basis for computing the HDI, the HDI serves as a country-specific

point of reference, providing a measure of movement toward a quality-of-life goal. In this manner, industrialized countries need not necessarily remain top-rankers and it is unfortunate that the HDI is often regarded as the G7 equivalent of the anecdotal "keeping up with the Joneses" paradigm.

Since its inception, the HDI has been modified on several occasions to address concerns about data availability and the uniformity of component measures derived from different information sources (i.e., individual countries and international agencies like the World Bank and the International Monetary Fund). The methodology used in constructing the HDI has also been tailored to conform with revised benchmarks of socio-economic status (e.g., the "goal-posts" used to define "poverty" and "sufficiency" in income terms, and minimum and maximum values of life expectancy).

Conceptually, calculation of the HDI is a rather simple exercise, although, in reality, its derivation is rather involved. In undertaking this research, we have attempted to conform with UN practices and, in so doing, have made certain methodological assumptions that we believe could be improved in future applications.<sup>27</sup> Life expectancy at birth is used directly as an indicator before it is transformed into indexed life expectancy. Adult literacy and the gross enrolment ratio are translated into their respective indexes before being combined to create indexed educational attainment. Indexed educational attainment is a weighted average in which the adult literacy index is assigned twice the weight of the gross enrolment ratio index.

The treatment of the income component of the HDI is somewhat complex. First, it is expressed in purchasing power parity dollars (\$PPP) as calculated by the World Bank to account for cost-of-living variations across nations. Secondly, it is adjusted for the diminishing utility of higher levels of income to human development. It is assumed that people do not need an extremely high income for a decent standard of living. A threshold income of \$5,120, the average 1992 global real GDP per capita in \$PPP, is assumed to be adequate for a reasonable standard of living. Income up to this level is treated at its full

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<sup>27</sup> In its applications, the UN assumes that 99 per cent of adult Canadians are "literate". Recent survey work by Statistics Canada, using a different concept of literacy, indicates lower literacy rates for adults in Canada, with significant variations among provinces.

value, but income beyond this level is discounted to reflect sharply diminished utility.

To illustrate the derivation of the HDI, let us consider the mythical country of Fredonia, a country wherein there exists a life expectancy of 76.2 years, an adult literacy rate of 92.4%, a gross enrolment ratio of 80%, and adjusted real GDP per capita of \$PPP 5,121. Also, let us assume that the global maximum and minimum life expectancies are 85.0 years and 25.0 years, respectively, the global maximum and minimum adult literacy rates are 100.0% and 0.0%, respectively, the global maximum and minimum gross enrolment ratio are 100.0% and 0.0%, respectively, and the global maximum and minimum adjusted real GDP per capita are \$PPP 5,448 and \$PPP 100, respectively.

Calculation of the three indexed components of the HDI, as well as the HDI itself, are as follows:

$$\text{Fredonia indexed life expectancy} = (76.2 - 25.0)/(85.0 - 25.0) = 0.853$$

$$\text{Fredonia indexed adult literacy} = (92.4 - 0.0)/(100.0 - 0.0) = 0.924$$

$$\text{Fredonia indexed gross enrolment ratio} = (80 - 0.0)/(100.0 - 0.0) = 0.800$$

$$\text{Fredonia indexed educational attainment} = [2(0.924) + 0.800]/3 = 0.883$$

$$\text{Fredonia indexed adjusted income} = (5121 - 100)/(5448 - 100) = 0.939$$

$$\text{Fredonia Human Development Index} = (0.853 + 0.883 + 0.939)/3 = 0.892$$

To calculate the HDI for Atlantic Canada, the requisite pieces of information were collected. Life expectancy at birth is found in Statistics Canada's **Health Reports** 1995, Vol. 7, No. 1 (82-003).

Gross school enrolment, combined primary, secondary and tertiary, is calculated by UNESCO (United Nations Educational, Scientific and Cultural Organization) for HDI purposes. We have not been able to replicate UNESCO's figure exactly using available Canadian data. In private communication with the UN, we learned that the Canadian gross enrolment ratio (GER) was set to 100 for the 1992 HDI calculation even though the

data suggested a much higher value, 116%. After reviewing alternative enrolment measures, it is clear that Atlantic Canada's GER is greater than 100 if Canada's GER is 116. Therefore, for the purposes of this component of our analysis, we have set the region's GER to 100.

**Canada and Atlantic Provinces, 1989  
Percentage Distribution of Adults  
Aged 16-69 by Reading Skill Level**

	Level 1	Level 2	Level 3	Level 4
Canada	7	9	22	62
Newfoundland	7	17	36	39
Prince Edward Island	..	..	..	..
Nova Scotia	5	10	28	57
New Brunswick	6	12	26	56
Atlantic Canada	6	13	29	52

Source: *Adult literacy in Canada: results of a national study*. Statistics Canada, Catalogue 89-525, 1991.

- Level 1: Canadians at this level have difficulty dealing with printed materials. They most likely identify themselves as people who cannot read.
- Level 2: Canadians at this level can use printed materials for limited purposes only, such as finding a familiar word in a simple text. They would likely recognize themselves as having difficulties with common reading materials.
- Level 3: Canadians at this level can use reading materials in a variety of situations, provided the material is simple, clearly laid out, and the tasks involved are not too complicated. While these people generally do not see themselves as having significant reading difficulties, they tend to avoid situations requiring reading.
- Level 4: Canadians at this level meet most everyday reading demands. This is a diverse group which exhibits a wide range of skills.

Adult literacy in Canada is assumed by the United Nations to be 99% and, after reviewing alternative measures produced by Statistics Canada, we assume the same rate for all provinces. Work undertaken by Statistics Canada and reported in **Adult literacy in Canada: results of a national study** (89-525), suggests that only 62% of Canadian adults aged 16-69 have sufficient reading skills to deal with most everyday reading requirements. These data define literacy using much more stringent criteria than that implicit in the data



employed by the UN. In cooperation with the OECD, Statistics Canada released **Literacy, Economy and Society** in December 1995 in which international literacy comparisons are made between Canada, Germany, the Netherlands, Poland, Sweden, Switzerland and the United States. When the regional component of this work is made available, it may provide an alternative measure for calculation of HDIs in the future.

Real GDP at market prices is also available from Statistics Canada's **Provincial Economic Accounts** (13-213) and can be readily converted into US dollars using the appropriate exchange rate. However, conversion of provincial income to \$PPP is not as straightforward.

A major problem in international comparison work is the development of purchasing power parities. PPPs are the rates of currency conversion that equalize the purchasing power of different currencies. This means that a given sum of money, when converted into different currencies at the PPP rates, will buy the same basket of goods and services in all countries. Therefore, when expenditures on GDP for different countries are converted into a common currency by means of PPPs, they are, in effect, expressed at the same set of international prices so that comparisons between countries reflect only differences in the volume of goods and services purchased.

The difficulty associated with the calculation of PPPs is collection of the detailed price information required to achieve the end result. Statistics Canada, the OECD and the World Bank have cooperated to produce PPPs for Canada relative to the US, the OECD and the world. However, comprehensive regional price data are not available with which to calculate intra-regional PPPs in Canada.

It is beyond the scope of this analysis to collect the data required to produce an Atlantic Canada PPP factor. Instead, we draw on work carried out by Raynald Létourneau at the Department of Finance to construct a proxy for an Atlantic Canada PPP.

In 1992, Létourneau constructed regional price indexes which extended for some cities the inter-city price indexes already published by Statistics Canada through the inclusion of data on housing costs. At the end of each year, Statistics Canada publishes

inter-city prices which cover roughly 60 per cent of the total basket of goods and services included in the Consumer Price Index (CPI), but do not cover housing. Therefore, in an effort to augment the available price information, Létourneau collected data on apartment rents, mortgage interest payments on single family dwellings and municipal property taxes. The interest payments were used to approximate the direct costs of owning a house. He estimates that these prices proxy 16 per cent of the total CPI basket and their inclusion raises the coverage of available prices to roughly 75 per cent. The only remaining major price components not included in Létourneau's calculations are clothing and meals outside the home.

**Inter-City Price Indexes  
All-City (Average=100)**

	1982	1988	1992
St John's	99.0	94.2	92.6
Charlottetown	91.6	90.0	92.6
Halifax	101.2	88.6	95.9
Saint John	90.2	88.6	88.2

Note: Cities also included with All-City Index are Montreal, Ottawa, Toronto, Winnipeg, Regina, Edmonton, Vancouver

Létourneau combines the available prices for 11 cities using fixed weights across regions to construct by-city indexes. These indexes describe the purchasing power differences between individual cities and the all-city average. He concluded, for example, that a dollar went almost 15 per cent further in St. John's in 1988 than a dollar spent in Toronto.

We have used Létourneau's results in our analysis to modify the \$PPP factor reported by the UN for Canada to reflect interprovincial price differences. For the cities which represent each of the Atlantic provinces, we extended Létourneau's results using movements in the appropriate city CPIs relative to the movement in an all-city index constructed to reflect the same locations included in his analysis. Compared to using the Canadian \$PPP factor as a proxy for Atlantic Canada, this approach raises the real GDP per capita in the region on a \$PPP basis.

The data used to calculate Atlantic Canada's HDI is summarized in the following table, along with data for Canada and the United States.

**Human Development Index**  
Data and Component Indexes

	Atlantic Canada	Canada	United States
Life expectancy at birth (years), 1992	77.2	78.1	76.0
Adult literacy rate (%), 1992	99.0	99.0	99.0
Combined first-, second- and third-level gross enrolment ratio (%), 1992	100	100	95
Real GDP per capita (PPP\$), 1992	16,831	20,520	23,760
Adjusted real GDP per capita	5,340	5,359	5,374
Life expectancy index	0.87	0.88	0.85
Education index	0.99	0.99	0.98
GDP index	0.98	0.98	0.99
Human development index, 1992	0.948	0.954	0.937

## **6. Appendix B - Human Development Indicators**

Notes on statistics:

.. Data not available

(.) Less than half the unit shown

(..) Less than one-tenth the unit shown

G6 includes the United States, Japan, France, Germany, the United Kingdom and Italy

**Table 1: Human Development Index**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Life expectancy at birth (years), 1992	77.2	78.1	76.0	79.5	76.9	76.0	76.2	77.5
Adult literacy rate (%), 1992	99.0	99.0	99.0	99.0	99.0	99.0	99.0	97.4
Combined first-, second- and third-level gross enrolment ratio (%), 1992	100	100	95	77	86	81	77	70
Real GDP per capita (PPP\$), 1992	16,831	20,520	23,760	20,520	19,510	21,120	17,160	18,090
Adjusted real GDP per capita	5,340	5,359	5,374	5,359	5,347	5,367	5,341	5,344
Life expectancy index	0.87	0.88	0.85	0.91	0.87	0.85	0.85	0.88
Education index	0.99	0.99	0.98	0.92	0.95	0.93	0.92	0.88
GDP index	0.98	0.98	0.99	0.98	0.98	0.98	0.98	0.98
Human development index, 1992	0.948	0.954	0.937	0.937	0.930	0.921	0.916	0.912
Real GDP per capita (PPP\$) rank minus HDI rank		7	-1	5	3	-9	5	-1

**Table 2: Profile of Human Development**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Life expectancy at birth, 1992	77.2	78.1	76.0	79.5	76.9	76.0	76.2	77.5
Maternal mortality rate (per 100,000 live births), 1980-92	4	4	8	11	9	5	8	4
Population per doctor, 1988-91	536	466	..	..	333	..	..	211
Scientists and technicians (per 1,000 people), 1988-92	..	3	..	7	5	..	..	2
Combined first, second and third level gross enrolment ratio (%), 1992	86	91	95	77	86	81	77	70
Tertiary full-time equivalent gross enrolment ratio, 1991								
Total	35	58	66	39	39	22	26	..
Female	32	57	72	41	42	24	26	19
Daily newspapers (copies per 100 people), 1991 1/	20	20	24	58	21	33	38	11
Televisions (per 100 people), 1992	65	65	82	61	41	56	44	42
Real GDP per capita (PPP\$), 1992	16,831	20,520	23,760	20,520	19,510	21,120	17,160	18,090
GDP per capita (US\$), 1992 2/	14,912	20,004	23,830	28,690	22,630	23,360	18,110	20,790

1/ G6 refers to 1992

2/ G6 refers to GNP

**Table 3: Profile of Human Distress**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Unemployment rate (%), 1993	15.4	11.2	6.7	2.5	11.6	8.2	10.2	11.5
Youth unemployment rate (%), (age15-24), 1992 1/								
Male	26	20	14	5	15	4	..	26
Female	20	15	13	4	23	4	..	36
Adults with less than upper-secondary education (as % of age 15-64), 1992 2/	29	23	17	33	49	18	35	72
Ratio of income of highest 20% of households to lowest 20%, 1992 3/	4.7	8.4	8.9	4.3	7.5	5.8	9.6	6.0
Female non-agricultural wages (as % of male wages), 1992 4/	78	77	75	..	81	..	70	..
Average annual rate of inflation (%), 1982-92 5/	4.0	3.5	3.9	1.5	5.4	2.7	5.7	9.1
Average annual rate of inflation (%), 1992	1.7	0.8	2.6	1.8	2.3	5.4	4.5	4.7
Injuries from road accidents (per 100,000 people), 1990-91	736	929	1398	640	361	660	605	383

1/ G6 refers to 1991-92

2/ G6 refers to 1991

3/ G6 refers to 1980-92

4/ G6 refers to 1990

5/ G6 refers to 1980-92

**Table 4: Demographic Profile**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Estimated population (millions), 1961 1/	1.9	18.2	180.7	94.1	45.7	72.7	52.4	50.2
Estimated population (millions), 1992	2.4	28.5	255.2	124.2	57.3	80.4	57.8	57.1
Estimated population (millions), 2000	2.4	30.9	275.1	126.5	59.0	81.7	59.0	57.3
Annual population growth rate (%), 1961-1992 2/	0.8	1.5	1.1	0.9	0.7	0.3	0.3	0.4
Annual population growth rate (%), 1992-2000	0.3	1.0	0.9	0.2	0.4	0.2	0.3	0.0
Total fertility rate, 1992	1.5	1.7	2.1	1.5	1.7	1.3	1.8	1.3
Contraceptive prevalence rate, any method (%), 1986-93 3/	..	73	74	64	81	75	81	..
Dependency ratio (%), 1992	48	47	52	44	52	45	53	45
Population aged 65 and above (%), 1992	12	12	13	14	15	15	16	16

1/ G6 refers to 1960

2/ G6 refers to 1960-92

3/ Canada number is from *World Resources, 1994-95*. New York.



**Table 5: Wealth, Poverty and Social Investment**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Real GDP per capita (PPP\$), 1992	16,831	20,520	23,760	20,520	19,510	21,120	17,160	18,090
GDP per capita (US\$), 1992 1/	14,912	20,004	23,830	28,690	22,630	23,360	18,110	20,790
Share of industrial country GDP (%), 1992 2/	0.2	3.1	31.7	18.6	6.8	9.9	5.5	6.2
Income share, 1992 3/								
Lowest 40% households	21.6	15.9	15.7	21.9	17.4	18.8	14.6	18.8
Ratio of highest 20% to lowest 20%	4.7	8.4	8.9	4.3	7.5	5.8	9.6	6.0
Social security benefits expenditure ( as % of GDP), 1992	25.1	15.5	7.0	..	17.7	16.1	6.9	11.0
Public expenditure on education (as % of total public expenditure), 1992	10.3	12.1	1.8	..	7.0	..	13.2	..
Public expenditure on health (as % of total public expenditure), 1992	10.6	13.0	16.0	..	16.0	..	13.8	..

1/ G6 refers to GNP

2/ G6 refers to GNP

3/ G6 refers to 1980-92

**Table 6: Health Profile**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Adults who smoke (%), 1989-91 1/								
Male smokers	26	22	30	66	49	..	36	46
Female smokers	21	21	24	14	26	..	32	18
Alcohol consumption per capita (litres), 1991	5.6	6.2	7.0	6.3	11.9	10.9	7.4	8.4
Likelihood of dying after age 65, (per 1,000), 1991-93 2/								
Male heart disease	345	317	372	214	221	346	324	252
Female heart disease	360	320	392	265	247	349	299	277
Male cancer	281	283	239	248	287	236	261	261
Female cancer	213	228	177	158	176	180	196	170
AIDS cases (per 100,000 people), 1993	2.2	5.0	25.4	0.1	9.9	3.1	2.8	8.0
Population per doctor, 1988-91	536	466	..	..	333	..	..	211
Health bills paid by public insurance (%), 1991	..	82	61	87	75	92	93	75
Public expenditure on health (as % of total public expenditure), 1989-91	10.5	12.5	14.8	30.7	13.2	12.3	12.2	14.8
Private expenditure on health (as % of total health expenditure), 1989-91	..	27.8	56.1	28.0	26.1	28.2	16.7	22.5
Total expenditure on health (as % of GDP), 1960	..	5.3	5.3	3.0	4.3	4.9	3.9	3.6
Total expenditure on health (as % of GDP), 1991	..	9.9	13.3	6.8	9.1	9.1	6.6	8.3

1/ G6 refers to 1986-94

2/ G6 refers to 1990-92

**Table 7: Education Profile**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Enrolment ratio for all levels (% age 6-23), 1991	75	77	86	73	78	73	72	64
Upper-secondary full-time equivalent gross enrolment , 1991	98	99	89	99	106	123	100	88
Upper-secondary technical enrolment (as % of total upper secondary), 1991	..	..	..	28	54	80	20	71
Tertiary full-time equivalent gross enrolment (as % of total tertiary), 1990-91	33	53	66	39	39	22	26	..
Tertiary natural and applied science enrolment (as % of total tertiary), 1990-91	16	15	14	26	31	42	39	31
Expenditure on tertiary education (as % of all levels), 1991	28.2	28.5	34.4	21.1	17.7	22.0	20.7	10.0
Public expenditure per tertiary student (PPP\$), 1990-91 1/	..	10,420	13,640	7,570	5,870	6,320	7,960	4,250
Public expenditure per tertiary student (CDN\$), 1990-91	14,425	14,007	..	..	..	..	..	..
Total expenditure on education (as % of GDP), 1960	..	4.6	5.3	4.9	3.6	2.4	3.4	4.2
Total expenditure on education (as % of GDP), 1991	9.7	7.8	7.0	5.0	6.0	5.4	5.3	4.1
Public expenditure on education (as % of GDP), 1991	8.9	7.1	5.5	3.7	5.4	4.0	5.3	4.1

1/ PPP factor is not available for Atlantic Canada.

**Table 8: Employment**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Labour force (as % of total population), 1992 1/	45	51	50	53	45	..	49	43
Percentage of labour force in agriculture, 1990-92	6	4	3	7	6	3	2	4
Percentage of labour force in industry , 1990-92	21	24	25	34	29	39	28	32
Percentage of labour force in services, 1990-92	72	72	72	59	65	58	70	59
Future labour force replacement ratio, 1992	97	97	106	83	100	80	96	79
Earnings per employee annual growth rate (%), 1980-91	1.8	0.0	0.5	2.0	1.7	1.9	2.4	0.9
Labour force unionized (%), 1990 2/	38	35	17	27	12	34	42	40
Weekly hours of work (per person in manufacturing), 1992 3/	39	39	41	43	39	38	43	..
Expenditure on labour market programs (as % of GDP), 1992 4/	6.8	2.7	0.9	0.5	3.0	4.2	1.8	1.8
Active programs expenditure as % of GDP	0.01	0.01	..	..	..	..	..	..
Passive programs (UI) expenditure as % of GDP	6.8	2.7	..	..	..	..	..	..

1/ G6 refers to 1992-93

2/ G6 refers to 1989-90

3/ G6 refers to 1992-93

4/ G6 refers to 1992-93

**Table 9: Unemployment**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Unemployed persons (thousands), 1993	168	1,649	8,734	1,660	2,911	2,270	2,891	2,799
Unemployment rate (%), 1993								
Total	15.4	11.2	6.7	2.5	11.6	8.2	10.2	11.5
Male	16.3	11.8	7.0	2.4	9.9	8.0	12.4	8.1
Female	14.5	10.6	6.5	2.6	13.8	8.4	7.5	17.3
Youth unemployment rate (%), (age 15-24), 1992 1/								
Male	26	20	14	5	15	4	..	26
Female	20	15	13	4	23	4	..	36
Incidence of long-term unemployment (%), 1992								
Unemployment more than 6 months, male	24	30	23	42	55	56	62	69
Unemployment more than 6 months, female	24	26	17	29	61	55	49	70
Unemployment more than 12 months, male	8	12	13	20	34	37	40	58
Unemployment more than 12 months, female	3	9	9	10	38	31	27	58
Unemployment benefits expenditure (as % of total government expenditure), 1991	18.6	13.3	1.5	0.7	3.2	3.0	1.7	1.0
Total public expenditure on social protection (as % of GDP), 1990	aif	18.8	14.6	..	26.5	23.5	22.3	24.5

1/ G6 refers to 1991-92

**Table 10: Urbanization**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Urban population (as % of total), 1961 1/ 5/	52	71	70	63	62	76	86	59
Urban population (as % of total), 1991 2/ 5/	50	74	76	77	73	86	89	67
Urban population (as % of total), 2000	..	77	78	78	73	88	90	67
Urban population annual growth rate (%), 1961-1991 3/	0.6	1.6	0.2	0.7	0.5	0.4	0.1	0.4
Urban population annual growth rate (%), 1992-2000	..	0.1	0.3	0.2	0.1	0.3	0.1	0.1
Population in cities of more than 750,000, 1990								
As % of urban population	0	36	41	37	23	43	23	24
As % of total population	0	48	55	48	31	51	26	37
Largest city								
City	Halifax	Toronto	New York	Tokyo	Paris	Essen	London	Naples
Population as % of urban population 1991 4/	21	18	9	26	23	9	14	8

1/ G6 refers to 1960

2/ G6 refers to 1992

3/ G6 refers to 1960-1992

4/ G6 refers to 1990

5/ The census definition of urban changed in 1991 compared to 1961 to account for urban sprawl and may bias the reported change.

**Table 11: Violence and Crime**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Prisoners (per 100,000 people), 1986								
Total	96	103	..	46	77	..	..	59
Federal custody	47	42	..	..	..	..	..	..
Provincial custody	49	60	..	..	..	..	..	..
Prisoners (per 100,000 people), 1990								
Total	91	105	..	38	78	..	..	45
Federal custody	41	41	..	..	..	..	..	..
Provincial custody	50	65	..	..	..	..	..	..
Homicides in selected cities (per 100,000 people), 1992 1/								
City	Halifax	Toronto	..	Tokyo	..	West Berlin	London	..
Homicide rate	2.4	6.1	..	1.6	..	6.8	2.5	..
Homicide rate, 1990	0.9	2.4	..	..	..	..	..	..
Drug crimes (per 100,000 people), 1980-86	247	246	234	31	..	..	..	6
Total number of reported adult rapes (thousands), 1986 2/	1.7	20.5	90.4	1.8	2.9	..	..	0.7
Rapes (per 100,000 people), 1986 2/	70.9	77.9	37.6	1.5	5.2	..	..	1.2
Suicides (per 100,000 people), 1989-92 3/								
Male suicides	18	20	20	22	30	23	13	11
Female suicides	3	5	5	11	11	9	4	4

1/ G6 and Toronto refer to 1990

2/Canadian data refer to all sexual assaults not just rape.

3/ G6 refers to 1989-93

**Table 12: Natural Resources Balance Sheet**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Land area (1,000 km <sup>2</sup> ), 1992	503	9,221	9,573	377	550	350	242	294
Forest and woodland (as % of land area), 1991 1/	61.3	39.9	29.9	67.0	27.0	29.8	10.0	23.0
Arable land (as % of land area), 1991 1/	0.9	4.9	19.6	12.0	35.0	34.1	27.3	40.7
Irrigated land (as % of arable land area), 1990 1/	0.8	1.6	10.8	62.1	6.2	4.0	1.6	26.3
Internal renewable water resources per capita (1,000 m <sup>3</sup> per year), 1991 1/	130.0	103.3	9.7	4.4	3.0	1.2	2.1	3.1
Annual fresh water withdrawals, 1980-89								
As % of water resources	..	2	19	16	24	55	12	30
Per capita	..	1,684	1,952	733	783	1,274	253	984

1/ G6 refers to 1992



**Table 13: Energy Consumption**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Production as % of national energy reserves, 1991								
Coal	0.8	0.8	0.4	1.0	5.8	0.6	2.5	2.9
Natural gas	0.0	4.4	11.0	6.1	4.1	3.0	8.2	6.4
Crude oil	0.0	8.1	10.0	(.)	16.0	5.5	16.0	6.5
Commercial energy production								
average annual growth rate (%)								
1978-80 1/	2	3	1	3	1	1	8	-1
1980-92	1	4	1	5	7	-1	(.)	2
Commercial energy consumption								
average annual growth rate (%)								
1978-80 1/	1	4	2	3	2	2	(.)	2
1980-92	0	1	1	3	2	(.)	1	2
Commercial energy use (kg of oil equivalent per capita)								
1978 2/	7,599	7,587	7,615	2,539	3,019	3,930	3,778	2,143
1992	7,094	7,325	7,662	3,586	4,034	4,358	3,743	2,755
Commercial energy efficiency								
(energy consumption in kg of oil equivalent per \$100 GDP, \$C)								
1981 3/	88	63	173	145	122	176	242	115
1991	48	37	35	13	18	18	24	14
Commercial energy efficiency								
(energy consumption in kg of oil equivalent per \$100 GDP, \$K)								
1981 4/	67	51	56	19	21	..	38	22
1991	58	45	41	14	22	..	31	19
Commercial energy imports (as % of merchandise exports)								
1971	..	5	9	20	14	..	14	18
1992	..	4	14	16	9	7	6	9

1/ G6 figures are for 1971-80

2/ G6 figures are for 1971

3/ G6 figures are for 1965

4/ G6 figures are for 1971

**Table 14: Environment and Pollution**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
CO <sub>2</sub> emissions by source, 1991								
Mobile sources (millions of metric tons), 1991	12.0	120.4	1,489.0	247.2	132.7	182.8	141.8	111.0
Energy transformation (millions of metric tons), 1991	16.7	142.1	2,042.3	419.0	67.9	409.1	249.2	143.3
Industry (millions of metric tons), 1991	3.4	87.8	873.9	281.2	98.9	168.7	93.6	82.3
Sulfur and nitrogen emissions (1,000 metric tons of SO <sub>2</sub> and NO <sub>2</sub> ), 1992	624	5,255	40,440	2,177	2,687	8,931	6,559	4,402
Share of greenhouse gas emissions (greenhouse index) (%), 1991	..	1.62	19.14	5.05	1.63	3.75	2.37	1.72
Greenhouse gas emissions per capita (world median=1), 1991	..	7.10	8.95	4.81	3.39	5.54	4.87	3.53
Nuclear waste from spent fuel (metric tons of heavy metal), 1991	79	1,579	2,100	995	1,200	510	1,022	(.)
Hazardous waste production (1,000 metric tons), 1986 1/	238	6,080	18,000	..	3,958	6,000	2,540	3,246
Population served by, 1990								
Waste water treatment plants (%), 1991 2/	35	75	74	42	68	86	87	61
Municipal waste services (%)	100	100	100	100	99	96	100	..
Waste recycling (as % of consumption), paper and cardboard, glass, 1990								
Paper and Cardboard	..	20	29	50	46	40	31	..
Glass	..	12	20	54	29	45	21	48

1/ G6 refers to 1990

2/ G6 refers to 1990

**Table 15: Resource Flow Imbalances**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
Export-import ratio (exports as % of imports), 1992	85	104	76	147	97	106	86	97
Export growth rate as % of import growth rate, 1981-92 1/	65	79	62	70	116	81	70	72
Trade dependency (exports plus imports as % of GDP), 1992	37	44	16	16	36	47	46	30
Terms of trade (1987=100), 1992	93	100	104	109	101	99	104	108
Net workers' remittances from abroad (US\$ millions), 1992	..	..	-7,550	..	-1,807	-4,375	..	512
Government net debt interest payments (as % of total expenditures), 1991								
Total	10	8	..	..	..	..	..	..
Federal	3	18	7	1	5	5	5	18
PLH 2/	8	2	..	..	..	..	..	..
Gross international reserves (months of import coverage), 1992	..	1.0	2.3	2.4	1.7	2.6	1.4	2.1
Current account balance before official transfers (US\$ millions), 1992	..	-22,405	-47,950	120,950	9,164	-1,222	-12,181	-21,297

1/ G6 refers to 1980-92

2/ PLH is provincial, local and hospital.

**Table 16: Defence Profile**

	Atlantic Canada	Canada
Defence employment, 1992	23,677	117,461
Defence employment as % of total employment, 1992	2.6	0.9
Defence wages, (millions \$), 1992	744.6	3,670.7
Defence wages per employed person, (thousands), 1992	31.4	31.3
Defence GDP, (millions \$), 1991	1121.2	5477.5
Defence GDP as % of total GDP, 1991	3.0	0.9

**Table 17: National Income Accounts**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
GDP (US\$ billions), 1992	31.0	499.3	5920.2	3671.0	1319.9	1789.3	903.1	1223.0
Agriculture (as % of GDP), 1991 2/	4	2	..	2	3	2	..	3
Industry (as % of GDP), 1991 2/	23	29	..	42	29	39	..	32
Services (as % of GDP), 1991 2/	73	68	..	56	68	60	..	65
Consumption, private (as % of GDP), 1992	71	61	67	57	60	54	64	63
Consumption, government (as % of GDP), 1992	30	22	18	9	19	18	22	17
Gross domestic investment (as % of GDP), 1992	18	18	16	31	20	21	15	19
Gross domestic savings (as % of GDP), 1992	-1	17	15	34	21	28	14	20
Total tax revenue (as % of GDP), 1992	36	37	..	..	..	..	..	..
Federal	18	14	18	13	37	30	40	38
PLH 3/	17	21	..	..	..	..	..	..
Total government expenditure (as % of GDP), 1992	71.1	49.3	..	..	..	..	..	..
Federal	35.2	19.4	24.3	15.8	45.4	24.6	39.5	51.6
PLH 3/	32.6	27.4	..	..	..	..	..	..
International exports (as % of GDP), 1992	17	23	7	9	18	24	21	15
International imports (as % of GDP), 1992	20	22	9	6	18	23	25	15

1/ As % of GNP for G6

2/ 1992 for G6

3/ PLH is provincial, local and hospital.

**Table 18: Trends in Economic Performance**

	Atlantic Canada	Canada	United States	Japan	France	Germany	United Kingdom	Italy
GDP (US\$ billions), 1992 1/	37	596	6081	3565	1296	1877	1046	1187
GDP annual growth rate (%), 1982-91 1/, 2/	3.0	3.1	3.1	4.3	2.3	2.3	2.8	2.4
GNP per capita annual growth rate (%), 1965-80		3.3	1.8	5.1	3.7	3.0	2.0	3.2
GDP per capita annual growth rate (%), 1982-92 1/, 3/	2.9	2.1	1.7	3.6	1.7	2.4	2.4	2.2
Average annual rate of inflation (%), 1982-92 3/	4.0	3.5	3.9	1.5	5.4	2.7	5.7	9.1
Average annual rate of inflation (%), 1992	1.7	0.8	2.6	1.8	2.3	5.4	4.5	4.7
Total exports as % of GDP (% annual growth rate), 1982-92	0.0	0.0	..	..	..	..	..	..
Total tax revenue as % of GDP (% annual growth rate), 1982-91	0.7	1.4	..	..	..	..	..	..
Federal	-0.1	0.6	(.)	2.0	0.4	0.4	1.0	2.8
PLH 5/	1.3	1.9	..	..	..	..	..	..
Total government overall budget surplus/deficit (as % of GDP)								
1981	-35.7	-1.5	..	..	..	..	..	..
1992	-27.8	-7.4	..	..	..	..	..	..
Federal								
1981 1/, 4/	-34.5	-2.1	-2.8	-7.0	-0.1	-1.8	-4.6	-10.7
1992 1/	-26.1	-4.2	-4.9	-1.6	-3.8	-2.5	..	-10.0
PLH 5/								
1981	-2.1	-0.3	..	..	..	..	..	..
1992	-1.4	-3.2	..	..	..	..	..	..

1/ G6 figures based on GNP

2/ G6 figures are for 1980-91

3/ G6 figures are for 1980-92

4/ G6 data are for 1980

5/ PLH is provincial, local and hospital

## **7. Appendix C - Human Development Indicator Data Sources**

The following lists the sources used to generate the Human Development Indicators in this report.

The first section catalogues the Statistics Canada (SC) and other publications used to produce the indicators, while the second section identifies the specific source for each component of all indicators, sorted by table.

# Human Development Indicators: Sources by Publication

## Statistics Canada

### Catalogue

Number	Title
--------	-------

11-509	Human activity and the environment 1994.
11-528	Environmental perspectives 1993.
13-014	Financial flow accounts. Quarterly.
13-207	Income distributions by size in Canada. Annual.
13-208	Family incomes, census families. Annual.
13-210	Income after tax, distributions by size in Canada. Annual.
13-213	Provincial economic accounts, annual estimates.
13-214	National balance sheet accounts. Annual.
15-203	Provincial gross domestic product by industry. Annual
25-202	Canadian forestry statistics. Annual.
57-003	Quarterly report on energy supply-demand in Canada.
57-601	Energy statistics handbook. Monthly.
62-001	The consumer price index. Monthly.
62-555	Family expenditure in Canada. Irregular.
63-202	The control and sale of alcoholic beverages in Canada. Annual.
63-224	Market research handbook. Annual.
64-202	Household facilities and equipment. Annual.
65-001	Summary of Canadian international trade. Monthly.
68-212	Public sector finance. Annual.
68-512	Public finance historical data. 1965/66-1991/92.
71-201	Historical labour force statistics. Annual.
71-202	Annual report of the Minister of Regional Industrial Expansion under the Corporations and Labour Unions Returns Act. Part II.
71-220	Labour force annual averages.
72-005	Estimates of labour income. Quarterly.
72-209	Public sector employment and remuneration. Annual.
73-202	Unemployment insurance statistics, annual supplement.
81-003	Education quarterly review.
81-220	Advance statistics of education. Annual.
81-229	Education in Canada, a statistical review. Annual.
82-218	Cancer in Canada.
82-549	Selected infant mortality and related statistics, Canada, 1921-1990.
84-206	Mortality, summary list of causes. Discontinued.
84-208	Causes of death. Annual.
84-209	Mortality, summary list of causes. Annual.
84-210	Births. Annual.
84-537	Life tables, Canada and provinces. Occasional.
85-002	Canadian crime statistics. Irregular.
85-205	Canadian crime statistics. Annual.
85-209	Homicide in Canada. Discontinued.
85-211	Adult correctional services in Canada. Annual.



## Human Development Indicators: Sources by Publication

85-538	Criminal justice processing of sexual assault cases. Occasional.
89-525	Adult literacy in Canada: results of a national study.
91-213	Annual demographic statistics
93-301	A national overview.
93-305	Urban areas.
93-327	Occupation. 1991 census.
93-348	Census overview of Canadian agriculture, 1971-91.
93-350	Agricultural profile of Canada.

### **Other Sources**

Applied Research, Human Resources Development Canada (HRDC).

Bank of Canada Review.

Demography Division, Statistics Canada (SC).

Energy Supply Branch, Natural Resources Canada.

Hazardous Waste Branch, Environment Canada.

Health Information Division, Division of HIV/AIDS Epidemiology, Health Canada

Health Statistics Division, Statistics Canada (SC).

Household Survey Division, Statistics Canada (SC).

*Human Development Report*, United Nations Development Programme,  
New York, 1995 (HDR).

Pollution Data Branch, Environment Canada.

*Research Newsletter*, Canadian Daily Newspaper Association (CDNA).

Road Safety Communications, Transport Canada.

Water and Habitat Conservation Branch, Environment Canada.

World Development Report 1994, World Bank, Oxford University Press, 1994.

## Human Development Indicators Data Sources by Table

	Data Source	Notes
<b>Frequently Used Data (FUD)</b>		
Population	91-213	
Female population	91-213	
Male population	91-213	
Population under age 15	91-213	
Population aged 6-23	91-213	
Population aged 15-24	91-213	
Population aged 15-59	91-213	
Population aged 15-64	91-213	
Population aged 18-20	91-213	
Population aged 18-26	91-213	
Population above age 64	91-213	
Female population 18-20	91-213	
Female population 18-26	91-213	
GDP at factor cost, \$K	15-203	
GDP at factor cost, \$C	15-203	
GDP at market prices, \$C	13-213	
GDP at market prices, \$K	13-213	
Canada/US exchange rate	Bank of Canada	

### **Table 1: Human Development Index**

Life expectancy at birth (years), 1992	84-537
Adult literacy rate (%), 1992	89-525
Combined first, second and third level gross enrolment ratio (%), 1992	
Elementary/Secondary enrolment	81-229
Pre-elementary enrolment (-)	81-229
Part-time university enrolment	81-229
Full-time university enrolment	81-229
Part-time community college enrolment	81-229
Full-time community college enrolment	81-229
Vocational & trade enrolment	81-229
Population aged 6-23	See FUD
Real GDP per capita (PPP\$), 1992	
PPP\$ factor	HDR

## Human Development Indicators Data Sources by Table

	Data Source	Notes
Adjusted real GDP per capita	formula determined	
Life expectancy index	formula determined	
Education index	formula determined	
GDP index	formula determined	
Human development index, 1992	formula determined	
Real GDP per capita (PPP\$) rank minus HDI rank	formula determined	
 <b>Table 2: Profile of Human Development</b>		
Life expectancy at birth, 1992	See Table 1	
Maternal mortality rate (per 100,000 live births), 1980-92		
Maternal mortalities	82-549, 84-208	
Live births	84-210	
Population per doctor, 1988-91		
Doctors	Health Canada	
Scientists and technicians (per 1,000 people), 1988-92	HRDC	
Combined first, second and third level gross enrolment ratio (%), 1992	See Table 1	
Tertiary full-time equivalent gross enrolment ratio, 1991		
Total	See Table 1	
Population aged 18-20		
Population aged 18-26		
Female		
Female part-time university enrolment	81-229	
Female full-time university enrolment	81-229	
Female part-time community college enrolment	81-229	
Female full-time community college enrolment	81-229	
Female population 18-20	See FUD	
Female population 18-26	See FUD	
Daily newspapers (copies per 100 people), 1992		
Newspapers	CDNA	
Televisions (per 100 people), 1992		
Televisions	Household Survey Division, SC	
Real GDP per capita (PPP\$), 1992	See Table 1	
GNP per capita (US\$), 1990	-	current \$

## Human Development Indicators Data Sources by Table

	Data Source	Notes
<b>Table 3: Profile of Human Distress</b>		
Unemployment rate (%), 1993	71-201	
Youth unemployment rate (%), (age15-24), 1991-92	71-220	
Male	71-220, Table 2	
Female	71-220, Table 2	
Adults with less than upper-secondary education (as % of age 15-64), 1991		
Population, age 15-64, 1991	See FUD	
Adults with less than upper-secondary educational attainment	71-220	
Ratio of income of highest 20% of households to lowest 20%, 1980-92	Household Survey Division, SC	
Female non-agricultural wages (as % of male wages), 1990	Special Survey Group, SC	
Average annual rate of inflation (%), 1980-92, 1992	13-213	least-squares method
Injuries from road accidents (per 100,000 people), 1990-91	Transport Canada	
<b>Table 4: Demographic Profile</b>		
Estimated population (millions), 1960, 1992, 2000	See FUD, Inforemetrics	
Annual population growth rate (%), 1960-1992, 1992-2000	formula determined	
Total fertility rate, 1992	84-210	
Contraceptive prevalence rate, any method (%), 1986-93	<i>World Resources, 1994-95</i>	
Dependency ratio (%), 1992	formula determined	
Population under age 15 and above 64	See FUD	
Population aged 15-64	See FUD	
Population aged 65 and above (%), 1992	See FUD	
<b>Table 5: Wealth, Poverty and Social Investment</b>		
Real GDP per capita (PPP\$), 1992	See Table 1	current \$
GDP per capita (US\$), 1992	See Table 21	current \$
Share of industrial GNP (%), 1992	See FUD, World Dev. Report 94	current \$
Income share, 1980-92		
Lowest 40% of households (%)	Household Survey Division, SC	
Ratio of highest 20% to lowest 20%	See Table 22	

## Human Development Indicators Data Sources by Table

	Data Source	Notes
Social security benefits expenditure ( as % of GDP), 1992	13-213	current \$
Public expenditure on education (as % of total public expenditure), 1992		current \$
Public expenditure on education	68-512	
Total public expenditure	68-512	
Public expenditure on health (as % of total public expenditure), 1992	68-512	current \$

### Table 6: Health Profile

Adults who smoke (%), 1986-94		
Male smokers	Health Statistics Division, SC	
Female smokers	Health Statistics Division, SC	
Alcohol consumption per capita (litres), 1991	63-202	
Likelihood of dying after age 65 of heart disease and cancer (per 1,000), 1990-92		
Male heart disease	Health Statistics Division, SC	
Female heart disease	Health Statistics Division, SC	
Male cancer	Health Statistics Division, SC	
Female cancer	Health Statistics Division, SC	
AIDS cases (per 100,000 people), 1993	Health Canada	
Population per doctor, 1988-91	See Table 21	
Health bills paid by public insurance (%), 1991	..	current \$
Public expenditure on health (as % of total public expenditure), 1989-91	68-512	current \$
Private expenditure on health (as % of total health expenditure), 1989-91	..	current \$
Total expenditure on health (as % of GDP), 1960, 1991	..	current \$

### Table 7: Education Profile

Enrolment ratio for all levels (% age 6-23), 1991	81-229	
Tertiary enrolment under age 23	Education, Culture and Tourism Division, SC	
Population age 6-23	See FUD	
Upper-secondary full-time equivalent gross enrolment , 1991	81-229	
Population age 15-17	See FUD	
Upper-secondary technical enrolment (as % of total upper secondary), 1991	-	
Tertiary full-time equivalent gross enrolment (as % of total tertiary), 1990-91	See Table 21	

## Human Development Indicators Data Sources by Table

	Data Source	Notes
Tertiary natural and applied science enrolment (as % of total tertiary), 1990-91	81-229	
College part-time natural and applied science enrolment, 1990-91	Education, Culture and Tourism	Division, SC
Expenditure on tertiary education (as % of all levels), 1991	81-003, Fall 94, Table 4	current \$
Public expenditure per tertiary student (PPPS), 1990-91		current \$
Expenditure on tertiary level, 1990-91	81-003	
Tertiary enrolment	See Table 1	
Total expenditure on education (as % of GDP), 1960, 1991	81-003	current \$
Public expenditure on education, 1960	..	
Private expenditure on education, 1991	81-003	
Public expenditure on education (as % of GDP), 1991	81-003	current \$

### Table 8: Employment

Labour force (as % of total population), 1992-93	71-201	
Percentage of labour force in agriculture, industry and services, 1990-92	Household Surveys	Division, SC
Future labour force replacement ratio, 1992		
Population under age 15	See FUD	
Population aged 15-59 times 1/3	See FUD	
Earnings per employee annual growth rate (%), 1980-91		constant \$
Earnings	72-005	
Employment	71-201	
Labour force unionized (%), 1989-90	71-202, Appendix 1.6	
Weekly hours of work (per person in manufacturing), 1992-93	71-220, Table 22A	
Expenditure on labour market programs (as % of GDP), 1992-93		current \$
Active programs expenditure as % of GDP	HRDC	
Passive programs (UI) expenditure as % of GDP	73-202	

## Human Development Indicators Data Sources by Table

	Data Source	Notes
<b>Table 9: Unemployment</b>		
Unemployed persons (thousands), 1993	71-201	
Unemployment rate (%), 1993		
Total	See Table 22	
Female	71-201	
Male	71-201	
Youth unemployment rate (%), (age 15-24), 1991-92	See Table 22	
Male	See Table 22	
Female	See Table 22	
Incidence of long-term unemployment (%), 1992	71-220	
Unemployment more than 6 months, male	Household Surveys Division, SC	
Unemployment more than 6 months, female	Household Surveys Division, SC	
Unemployment more than 12 months, male	Household Surveys Division, SC	
Unemployment more than 12 months, female	Household Surveys Division, SC	
Unemployment benefits expenditure (as % of total government expenditure), 1991		current \$
Unemployment benefit expenditure	73-202	
Government expenditure	13-213, 68-512	
Total public expenditure on social protection (as % of GDP), 1990	13-213	current \$
<b>Table 10: Urbanization</b>		
Urban population (as % of total), 1960, 1992, 2000	Demography Division SC, 93-305	
Urban population annual growth rate (%), 1960-1992, 1992-2000	formula determined	
Population in cities of more than 750,000, 1990	-	
As % of urban population	-	
As % of total population	-	
Largest city		
City	93-305 Census	
Population as % of urban population 1991	93-305 Census	

## Human Development Indicators Data Sources by Table

	Data Source	Notes
<b>Table 11: Violence and Crime</b>		
Prisoners (per 100,000 people), 1986, 1990	85-211	
Homicides in selected cities (per 100,000 people), city, 1990		
Number of homicides	85-209	
Drug crimes (per 100,000 people), 1980-86	85-205	
Total number of reported adult rapes (thousands), 1986	85-205, 85-538	
Rapes (per 100,000 people), 1986	formula determined	
Suicides (per 100,000 people), 1989-93		
Male suicides	84-206, 84-208, 84-209	
Female suicides	84-206, 84-208, 84-209	
<b>Table 12: Natural Resources Balance Sheet</b>		
Land area (1,000 km <sup>2</sup> ), 1992	93-350 Census	
Forest and woodland (as % of land area), 1992	25-202	
Arable land (as % of land area), 1992	93-348	
Irrigated land (as % of arable land area), 1992	formula determined	
Irrigated land	93-350 Census	
Internal renewable water resources per capita (1,000 m <sup>3</sup> per year), 1992	11-509	
Annual fresh water withdrawals, 1980-89	..	
As % of water resources	..	
Per capita	..	
<b>Table 13: Energy Consumption</b>		
Production as % of national energy reserves, 1991		
Energy production, coal	57-003	
Energy production, crude oil	57-003	
Energy production, natural gas	57-003	
National reserves, coal	57-601	
National reserves, crude oil	57-601	
National reserves, natural gas	57-601	
Commercial energy production average annual growth rate (%), 1971-80, 1980-92	57-003	least-squares methods



## Human Development Indicators Data Sources by Table

	Data Source	Notes
Commercial energy consumption average annual growth rate (%), 1971-80, 1980-92	57-003	least-squares methods
Commercial energy use (kg of oil equivalent per capita), 1971, 1992	57-003	
Commercial energy efficiency , 1965, 1991 (energy consumption in kg of oil equivalent per \$100 GDP)	formula determined	
Commercial energy imports (as % of merchandise exports), 1971, 1992		
Energy imports, international	..	
Merchandise exports, international	..	
 <b>Table 14: Environment and Pollution</b>		
CO <sub>2</sub> emissions by source, 1991		
Mobile sources (millions of metric tons), 1991	Environment Canada	
Energy transformation (millions of metric tons), 1991	Environment Canada	
Industry (millions of metric tons), 1991	Environment Canada	
Sulfur and nitrogen emissions (1,000 metric tons of SO <sub>2</sub> and NO <sub>2</sub> ), 1990	Environment Canada	
Share of greenhouse gas emissions (greenhouse index) (%), 1991	..	
Greenhouse gas emissions per capita (world median=1), 1991	..	
Nuclear waste from spent fuel (metric tons of heavy metal), 1991	Environment Canada	
Hazardous waste production (1,000 metric tons), 1990	Environment Canada	
Population served by, 1990		
Waste water treatment plants (%)	Environment Canada	
Municipal waste services (%)	Environment Canada	
Waste recycling (as % of consumption), paper and cardboard, glass, 1990	..	
 <b>Table 15: Resource Flow Imbalances</b>		
Export-import ratio (exports as % of imports), 1992	13-213	current \$
Export, 1992, international	13-213	
Import, 1992, international	13-213	
Export growth rate as % of import growth rate, 1980-92	formula determined	constant \$, least-squares :
Trade dependency (exports plus imports as % of GDP), 1992	formula determined	current \$
Exports + imports	formula determined	
GDP, 1992	See FUD	

## Human Development Indicators Data Sources by Table

	Data Source	Notes
Terms of trade (1987=100), 1992	13-213	constant \$
Average export prices	13-213	
Average import prices	13-213	
Net workers' remittances from abroad (US\$ millions), 1992	N/A	
Government net debt interest payments (as % of total expenditures), 1991	13-213	current \$
Gross international reserves (months of import coverage), 1992	N/A	
Current account balance before official transfers (US\$ millions), 1992	N/A	

### Table 16: Defence Profiles

Defence employment, 1992	72-209	
Defence employment as % of total employment, 1992	formula determined	
Defence wages, 1992	72-209	current \$
Defence wages per employed person, 1992	formula determined	current \$
Defence GDP, 1991	15-203	current \$
Defence GDP as % of total GDP, 1991	formula determined	current \$

### Table 17: National Income Accounts

GDP (US\$ billions), 1992	See Table 1	current \$
Agriculture (as % of GDP), 1992	15-203	current \$
Industry (as % of GDP), 1992	15-203	current \$
Services (as % of GDP), 1992	15-203	current \$
Consumption, private (as % of GDP), 1992	13-213	current \$
Consumption, government, (as % of GDP), 1992	13-213	current \$
Gross domestic investment (as % of GDP), 1992	13-213	current \$
Gross domestic savings (as % of GDP), 1992	13-213	current \$
Tax revenue (as % of GNP), 1992	13-213	current \$
Central government expenditure (as % of GNP), 1992	13-213	current \$
Exports (as % of GDP), 1992	13-213	current \$
Imports (as % of GDP), 1992	13-213	current \$

## Human Development Indicators Data Sources by Table

	Data Source	Notes
<b>Table 18: Trends in Economic Performance</b>		
GNP (US\$ billions), 1992	See Table 1	current \$
GNP annual growth rate (%), 1980-91	formula determined	constant \$
GNP per capita annual growth rate (%), 1965-80, 1980-92	See Table 1 and FUD	constant \$, least-squares :
Average annual rate of inflation (%), 1980-92, 1992	62-001	constant \$, least-squares :
Exports as % of GDP (% annual growth rate), 1980-92	See Table 37	constant \$, least-squares :
Tax revenue as % of GNP (% annual growth rate), 1980-91	See Table 37	constant \$, least-squares :
Overall budget surplus/deficit (as % of GNP)		current \$
1980	13-213	current \$
1992	13-213	current \$

## **8. Appendix D - Obstacles and Discoveries**

When attempting to replicate the Industrial Country human development indicators presented by the UN in the HDR a number of obstacles and interesting discoveries were uncovered.

A number of problems were encountered moving from a national to a provincial concept. For example, GNP, a commonly used international benchmark, is not available at the provincial level. As a consequence, the indicators prepared for Atlantic Canada are all based on GDP measures. As well, interprovincial as well as international trade is important to a sub-national area. Unfortunately, Canada does not produce inter-regional trade flows, only inter-provincial movements, thereby limiting our analysis somewhat. Finally, some indicators found in the HDR are not relevant at the provincial level. These included:

- Aid flows,
- Gross international reserves,
- Net workers' remittances from abroad,
- Gross international reserves,
- Current account balance before official transfers, and
- Military expenditure and resource use imbalances.

The table describing military activity was replaced with a defence profile for Atlantic Canada given the importance of this industry to the region's economy. Population in cities of more than 750,000 was also found not to be relevant in Atlantic Canada, as there are no centres of this size.

A number of statistics were not reported for Canada in the HDR although Canadian sources are available. These anomalies included:

- Female non-agricultural wages as % of male wages,
- Prisoners per 100,000 people,
- Social security benefits expenditure,

- Public expenditures on education as % of total public expenditure,
- Public expenditures on health as % of total public expenditure,
- Agriculture, industry and services sectors as % of GDP,
- Tax revenue as % of GDP,
- Central government expenditures as % of GDP, and
- Overall budget surplus/deficit as % of GDP.

These measures were added to the tables and their data sources noted.

Some data were not available nationally, provincially, or both. These included:

- Upper-secondary technical enrolment,
- Private expenditure on health, provincial only,
- Urban population, 2000 and annual growth rate 1992-2000, provincial only,
- Scientists and technicians per 100,000 people (alternative measures are presented in section 3),
- Health bills paid by public insurance, provincial only,
- Commercial energy imports and exports in current dollars, provincial only
- Contraceptive prevalence rate, provincial only,
- Annual fresh water withdrawals, provincial only,
- Greenhouse index, provincial only (no data on CFCs were identified), and
- Waste recycling of glass, provincial only.

In some instances, provincial data was not available historically to permit calculations over a time period similar to that presented in the HDR.

## **9. Appendix E - References**

Adamu, Sam O. 1993. "Disaggregated Human Development Index within Nigeria." Background paper for *Human Development Report 1995*. UNDP, New York.

Anderson, Victor. 1991. *Alternative Economic Indicators*. London: Biddles Ltd.

Bollman, Ray. (ed.) 1992. *Rural and Small Town Canada*. Thompson Educational Publishing, Inc. 1992.

Cobb, Clifford, Ted Halstend and Jonathan Rowe. 1995. *The Genuine Progress Indicator: Summary of Data and Methodology*.

Corporation for Enterprise Development. 1995. *The 1995 Development Report Card for the States*.

Cuthbert, J.R., and M. Cuthbert. 1988. "On Aggregation Methods of Purchasing Power Parities." OECD Working Paper No. 56.

Denny, M. and M. Fuss. 1983. "Regional Price Indexes: The Canadian Practice and Some Potential Extensions" from *Price Level Measurement: Proceedings from a Conference*.

El-laithy, Heba. 1993. "The Disaggregated Human Development Index for Egypt." Background paper for *Human Development Report 1994*. UNDP, New York.

Goldschmidt-Clermont, Luisella, and Elisabetta Pagnossin Aligisakis. 1995. "Measures of Unrecorded Economic Activities in fourteen Countries." Background paper for *Human Development Report 1995*. UNDP, New York.

Government of Canada. 1995. *Rural Canada: A Profile*.

Harvey, Andrew S. 1995. "Market and Non-Market Productive Activity in Less Developed and Developing Countries: Lessons from Time Use." Background paper for *Human Development Report 1995*. UNDP, New York.

Henry, Ralph M. 1993. "Trinidad and Tobago: Human Development Index 1993." Background paper for *Human Development Report 1994*. UNDP, New York.

International Labour Office. 1993a. *World Labour Report 1993*. Geneva.

----- . 1993b. *Yearbook of Labour Statistics 1993*. Geneva.

Institute of Strategic and International Studies. 1993. "Disaggregated Human Development Index in Malaysia." Background paper for *Human Development Report 1994*. UNDP, New York.

International Energy Agency. 1995. *World Energy Outlook*. Paris: OECD.

- Justus, Martha. November 1995. "Towards a Provincial Human Development Index." *Monthly Economic Review*. Informetrica, Ottawa.
- Khatib, Hishman. 1990. "*Human Development Report 1990: Jordan: a Follow-up.*" Paper prepared for UNDP, Amman.
- , 1993. "The Human Development Index as a Policy and Planning Tool." Paper Presented at Seminar on the Uses of the Human Development Index, February 17-18. UNDP, New York.
- Létourneau, Raynald. 1992. "Un Indice de Prix Régional de Biens et Services Comparables au Canada et son Application aux Disparités Régionales de Revenu." Working Paper, Department of Finance, No. 92-02.
- Makegela, Neva Seidman. 1993. "South Africa: Submission on Human Development Index." Background paper for *Human Development Report 1994*. UNDP, New York.
- Noll, Heinz-Herbert. 1993. "Disaggregated Human Development Index for Germany." Background paper for *Human Development Report 1994*. UNDP, New York.
- OECD. 1993a. *Purchasing Power Parities and Real Expenditures, 1990*. Paris.
- , 1993b. *Education at a Glance*. Paris
- , 1993c. *OECD Environmental Data, Compendium 1993*. Paris.
- , 1995a. *Education at a Glance*. Paris.
- , 1995b. *OECD Environmental Data, Compendium 1995*. Paris.
- , 1995c. *OECD Education Statistics, 1985-1992*. Paris.
- Osman, M. 1993. "The Uses of the HDI as a Statistical Tool of Policy Planning." Paper Presented at Seminar on the Uses of the Human Development Index, February 17-18, UNDP, New York.
- Shiva Kumar, A.K. 1990. "The UNDP's Human Development Index: A Computation for 17 Indian States." Harvard Center for Population Studies, Cambridge. Mass. Mimeo.
- Spindola, Austregesilo Gomes. 1993. "The Human Development Index and Other Development Indicators of Brazil." Background paper for *Human Development Report 1994*. UNDP, New York.
- Srinivasan, T.N. 1994. "Human Development: A Paradigm or Reinvention of the Wheel?" Paper presented at American Economic Association meeting, January 3, Boston, Mass..
- Statistics Canada. *National Income and Expenditure Accounts, Annual Estimates, 1981-92*.  
-----, 1995. *Literacy, Economy and Society*.
- Streeten, Paul. 1994a. "Human Development: Means and Ends." Paper presented at American

Economic Association meeting, January 3, Boston, Mass.

Svasti, Pongsvas, Naris Chaiyasoot, Waraporn Suvachittanont and Paranee Masnee. 1991. "Human Development Indicators in Thailand." Paper prepared for UNDP. Bangkok.

Svasti, Pongsvas and others. 1991. "Human Development Indicators." UNDP, Bangkok.

Sweeting, Robert. October 1994. "The Human Development Index: Quantifying Disparity." *Monthly Economic Review*. Informetrica, Ottawa.

UNDP (United Nations Development Programme). Various issues. *Human Development Report*. New York: Oxford University Press.

-----, 1994a. Human Report in Nepal: A Situation Analysis. Katmandu.

UNESCO. 1993. *World Education Report 1993*. Paris.

----, 1994. *Statistical Yearbook 1994*. Paris.

World Bank. 1994. *World Development Report 1994*. Washington: Oxford University Press.

-----, 1993. *Social Indicators of Development 1993*. Baltimore: the Johns Hopkins University Press.

-----, 1993. *World Development Report 1993*. New York: Oxford University Press.

World Resources Institute, 1994. *World Resources 1994-95*. New York: Oxford University Press.

Zhizhou, Cai. 1993. "Human Development of China." Background paper for *Human Development Report 1994*. UNDP, New York.