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Research Paper

Improvements in 2006 to the Labour Force Survey (LFS)

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Improvements in 2006 to the LFS

Introduction

As a matter of ensuring the highest quality service to Canadians, the Labour Force Survey (LFS) is constantly improving.

In 2006, the key improvements to the survey involve changes to the population estimates used by the sample survey in the estimation process. Since the LFS is a sample survey (rather than a census), the sample results need to be multiplied by a factor (or "weight") to represent the entire target population. In the case of the LFS, the target population is the civilian population 15 and older living off-reserve in the ten provinces.

The survey weights are thus products of an estimate of the population. This population estimate used by the LFS is a projection of the 2001 Census, projected using the most current information on births, deaths, immigration and emigration. To create the LFS estimates, population data for age/sex groups are created. As well, provincial and sub-provincial population estimates are produced on a monthly basis.

It is normal for surveys to update to new population estimates when new demographic information becomes available. Over the last seven years, this is the third time the LFS has updated the population estimate used in the weighting process. This population revision is the smallest of the three, and involves minimal change on the data. It impacts the data from July 2001 to December 2005.

Aside from a switch to new population estimates, improvements to the estimates for the public and private sector for the January 1987 to June 1999 period are also being introduced with this revision. Although the public and private sector data (and some associated industries) are the most affected, the improvement required a change to the survey weights and therefore all data for the January 1987 to June 1999 period are impacted.

Finally, the geographic coding of several small Census Agglomerations (CA) have been updated historically from 1996 urban centre boundaries to 2001 CA boundaries. This affects data from January 1987 to December 2004.

The following document will describe in more detail the improvements outlined above.

Population estimates

There are two parts to the population revision. One involves improved data on non-permanent residents (NPR) to Canada (e.g. people on student visas, and other foreign-born population who have not formally immigrated to the country but who are in the country legally). This segment of the population is concentrated in Canada's large urban centres, and thus the impact of these changes is at a sub-provincial level.

In late 2004 when the population rebasing to the 2001 Census was being conducted, preliminary estimates of the count of NPR's were used in deriving population totals. When the final estimates became available, it was determined the difference between the two was large enough that to simply begin using the new counts would cause notable artificial movements in the population estimates and hence labour market estimates for sub-provincial regions. Therefore, to avoid a break in some sub-provincial series, the most appropriate way to integrate the new NPR data was to update the historical data. As a result, this change affects sub-provincial estimates for July 2001 to the present.

Table 1: New estimates of population 15 and older by Census metropolitan areas (CMA) (thousands of people), 2001 to 2005 annual averages

	2001	2002	2003	2004	2005
St. John's, Newfoundland and Labrador	143.5	145.1	147.2	149.0	150.4
Halifax, Nova Scotia	292.8	297.7	301.8	305.6	308.9
Saint John, New Brunswick	101.1	101.5	102.0	102.6	103.2
Saguenay, Quebec	128.2	127.4	126.9	126.6	126.3
Québec, Quebec	568.7	574.2	579.3	585.6	592.2
Trois-Rivières, Quebec	114.9	115.2	115.8	116.9	118.0
Sherbrooke, Quebec	126.1	127.7	129.5	131.4	133.4
Montréal, Quebec	2,826.8	2,863.2	2,893.8	2,928.7	2,966.3
Ottawa-Gatineau, Ontario/Quebec	875.2	891.6	904.6	918.2	932.2
Kingston, Ontario	119.0	120.7	121.9	123.3	124.8
Greater Sudbury / Grand Sudbury, Ontario	130.1	130.4	130.8	131.3	132.0
Oshawa, Ontario	234.6	241.6	249.2	257.3	265.9
Toronto, Ontario	3,899.3	4,011.0	4,096.2	4,186.8	4,282.0
Hamilton, Ontario	550.1	558.7	565.8	573.1	580.9
St. Catharines - Niagara, Ontario	316.3	318.8	320.6	322.6	324.8
London, Ontario	357.6	362.7	366.3	369.9	373.8
Windsor, Ontario	253.9	258.5	261.5	264.5	267.8
Kitchener, Ontario	339.0	346.1	351.9	357.9	364.3
Thunder Bay, Ontario	101.6	101.8	102.4	103.1	103.9
Winnipeg, Manitoba	547.8	552.3	557.4	563.4	568.6
Regina, Saskatchewan	155.5	155.9	157.1	158.7	160.3
Saskatoon, Saskatchewan	180.4	181.8	183.3	185.2	187.2
Calgary, Alberta	778.3	800.7	817.5	835.5	855.6
Edmonton, Alberta	758.0	774.8	787.1	799.4	812.9
Abbotsford, British Columbia	117.8	119.5	121.0	122.8	124.9
Vancouver, British Columbia	1,695.2	1,728.6	1,756.3	1,788.1	1,824.6
Victoria, British Columbia	263.5	265.5	267.3	270.0	273.3

Table 2: Difference (new minus old) in population estimates (in thousands), by Census metropolitan areas (CMA), 2001 to 2005 annual averages

	2001	2002	2003	2004	2005
St. John's, Newfoundland and Labrador	0.0	-0.1	-0.3	-0.7	-1.0
Halifax, Nova Scotia	0.0	-0.1	-1.0	-1.9	-2.7
Saint John, New Brunswick	0.0	0.0	0.1	0.3	0.4
Saguenay, Quebec	0.0	0.0	0.0	0.0	-0.1
Québec, Quebec	0.0	0.1	-0.6	-1.1	-1.6
Trois-Rivières, Quebec	0.0	0.0	-0.2	-0.3	-0.4
Sherbrooke, Quebec	0.0	0.0	-0.3	-0.9	-1.4
Montréal, Quebec	0.3	2.1	-0.3	-2.4	-4.2
Ottawa-Gatineau, Ontario/Quebec	0.1	0.8	0.4	-0.5	-1.4
Kingston, Ontario	0.5	0.1	-0.1	-0.4	-0.8
Greater Sudbury / Grand Sudbury, Ontario	0.0	0.0	0.4	0.7	1.0
Oshawa, Ontario	0.0	0.3	1.2	2.2	2.9
Toronto, Ontario	0.5	3.1	2.7	5.4	6.9
Hamilton, Ontario	0.1	0.3	0.6	0.5	0.3
St. Catharines - Niagara, Ontario	0.0	0.1	0.1	0.0	-0.3
London, Ontario	0.0	0.1	-0.4	-1.2	-2.0
Windsor, Ontario	0.1	0.1	-0.6	-1.6	-2.4
Kitchener, Ontario	0.0	0.2	0.1	-0.1	-0.4
Thunder Bay, Ontario	0.0	0.2	1.0	1.9	2.5
Winnipeg, Manitoba	0.1	0.2	0.0	-0.3	-0.4
Regina, Saskatchewan	0.0	0.0	0.3	0.7	1.0
Saskatoon, Saskatchewan	0.0	-0.1	-0.8	-1.5	-2.0
Calgary, Alberta	0.1	0.8	0.7	1.0	1.4
Edmonton, Alberta	0.1	0.2	-1.3	-3.3	-4.9
Abbotsford, British Columbia	0.0	-0.2	-1.7	-3.4	-4.7
Vancouver, British Columbia	0.1	0.3	1.7	4.0	5.9
Victoria, British Columbia	0.0	0.2	1.1	2.2	3.1

For the period July 2003 to June 2004 a revision to provincial level population estimates is introduced. This change is required because other preliminary population estimates were used when the data were initially produced in late 2004.

Table 3: Population 15 and older (in thousands) by province, new and old estimates, average July 2003 to June 2004

	New	Old	Difference	
			Thousands	Percent
Canada	25,271.6	25,258.0	13.6	0.1%
Newfoundland and Labrador	429.6	429.4	0.2	0.0%
Prince Edward Island	110.4	110.4	0.0	0.0%
Nova Scotia	755.0	754.9	0.1	0.0%
New Brunswick	606.2	606.0	0.2	0.0%
Quebec	6,079.9	6,077.3	2.6	0.0%
Ontario	9,821.0	9,813.1	7.9	0.1%
Manitoba	877.7	877.3	0.4	0.0%
Saskatchewan	744.5	744.1	0.4	0.1%
Alberta	2,483.1	2,482.0	1.1	0.0%
British Columbia	3,364.1	3,363.4	0.7	0.0%

The largest impact on the month-to-month change estimates occurs between June and July 2004. Table 4 gives the change in population between these two months for the new and old figures.

Table 4: Population 15 and older (in thousands) by province, June and July 2004

	New			Old		
	June 2004	July 2004	Change	June 2004	July 2004	Change
Canada	25,434.7	25,461.5	26.8	25,405.7	25,461.1	55.4
Newfoundland and Labrador	429.4	429.4	0.0	429.3	429.4	0.1
Prince Edward Island	110.9	110.9	0.0	111.0	111.0	0.0
Nova Scotia	756.8	757.1	0.3	756.5	757.2	0.7
New Brunswick	607.7	607.8	0.1	607.1	607.8	0.7
Quebec	6,109.7	6,115.0	5.3	6,104.8	6,115.0	10.2
Ontario	9,899.7	9,912.3	12.6	9,882.7	9,912.0	29.3
Manitoba	881.7	882.2	0.5	881.0	882.2	1.2
Saskatchewan	745.9	746.1	0.2	745.2	746.1	0.9
Alberta	2,504.5	2,508.1	3.6	2,502.4	2,508.0	5.6
British Columbia	3,388.4	3,392.5	4.1	3,385.8	3,392.5	6.7

Class of worker

Back in 1999, a change was introduced to the definition of the “public sector” in order to harmonize LFS data for the public and private sector definitions used by the System of National Accounts. Prior to January 1999, “ownership” rules were used as the basis for classification of health care institutions and universities to the public sector by the LFS. Since January 1999, “funding” rules are used. As a result, any institution which was privately owned (many hospitals in Canada are like this), but publicly funded (all hospitals received their funding from a government source), are now counted as “public” sector, rather than “private” under the old rules.

When the definition changed in 1999, employees of all universities and health care institutions, who were classified as working in the private sector, were re-classified as public employees, historically, for the entire LFS series. However, a group of employees in some health and social care institutions could not be properly re-classified. Most notable are employees of residential care, and individual and family services institutions. As the new classification rules were assigned as new households entered the LFS sample, these groups were gradually moved from the private to the public sector. The impact of this was an artificial growth in public employment through the first half of 1999. By June, 1999 the impact of the break in the series was fully apparent.

Shortly after this break was noticed, an imputation methodology was devised to improve the historical continuity of the public sector data. The old time series for public employees from 1987 to 1998 was projected forward through 1999 (using ARIMA modeling) to estimate the impact of this change in definition. These estimates of the difference were then used to "back cast" the new series to 1987. This aggregate series was used to establish benchmarks so that an appropriate percentage of relevant employees could be randomly selected and have their codes changed from private to public employee. In such a way, the LFS micro-data (record level) was fixed.

Initial tabulations from the new imputed variable looked reasonable. However, the imputation procedure was "longitudinally inconsistent". Respondents in the LFS are in the sample for six months, and the record for some respondents may have shown that they switched from private to public in one month but not in others, as a result of the imputation. Because the initial imputation was carried out after the survey weighting process, this had no impact on level or net change estimates.

When the LFS conducted the re-basing exercise in January 2005 (see *Improvements to the Labour Force Survey in 2005*) the break in the public private series re-appeared. The weighting method used by the LFS uses COW as a "compositing variable" (see *Improvements to the Labour Force Survey in 2000* for a description of composite estimation). While all variables should be longitudinally consistent, the special status of COW in weighting caused the break to be re-introduced. To address this problem an improved imputation methodology was developed in mid-2005 that is longitudinally consistent. As shown in Charts 1 through 5 the estimates that result after this new process are more reasonable. The new series are very similar to those initially produced and used prior to the 2005 population rebasing.

Census agglomerations

With the redesign of the LFS in 2005 and the change to 2001 census boundaries it was decided to adopt 2001 CA boundaries for production of special tabulations for non-CMA cities. An "urban centre" definition was used in the past. Several smaller CA's were not changed as they were not used in weighting LFS data and retained there old boundaries. The affected CA's are listed below.

N.L.	Corner Brook	Que.	Baie-Comeau
			Rimouski
P.E.I.	Summerside		Rouyn-Noranda/Val-d'Or
N.S.	New Glasgow	Man.	Brandon
	Truro		
		Sask.	Moose Jaw
N.B.	Bathurst		Prince Albert
	Miramichi		
	Edmunston	B.C.	Dawson Creek

These areas will now use the 2001 CA boundary definition from 1987 to the present.

Chart 1
Thousands of employees in public sector, new and old estimates, 1976 to 2005 annual average

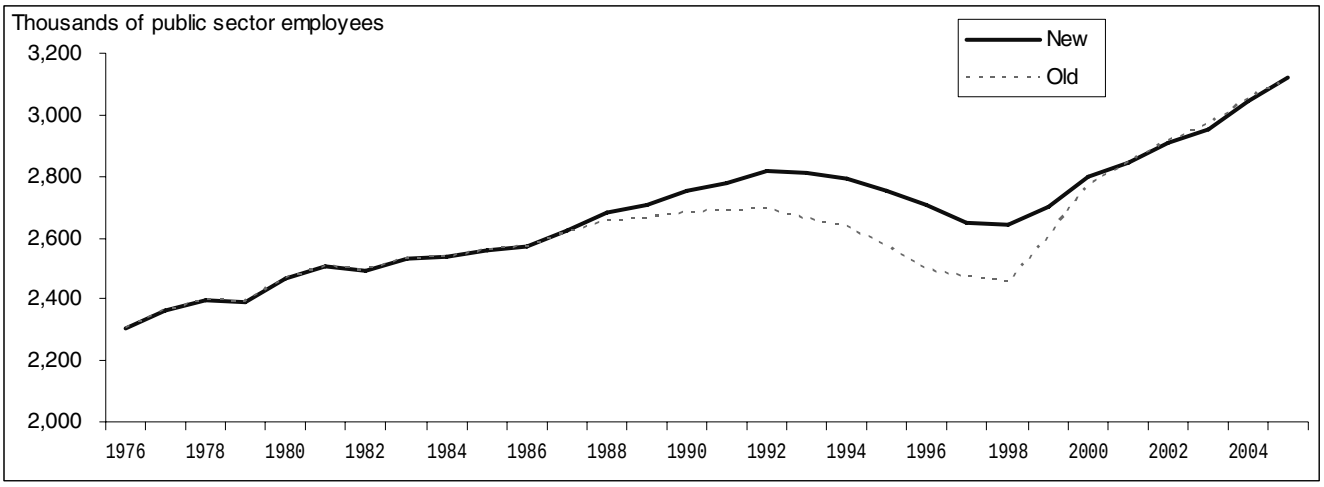

Chart 2
Thousands of employees in public sector in health care and social assistance industry, new and old estimates, 1976 to 2005 annual average

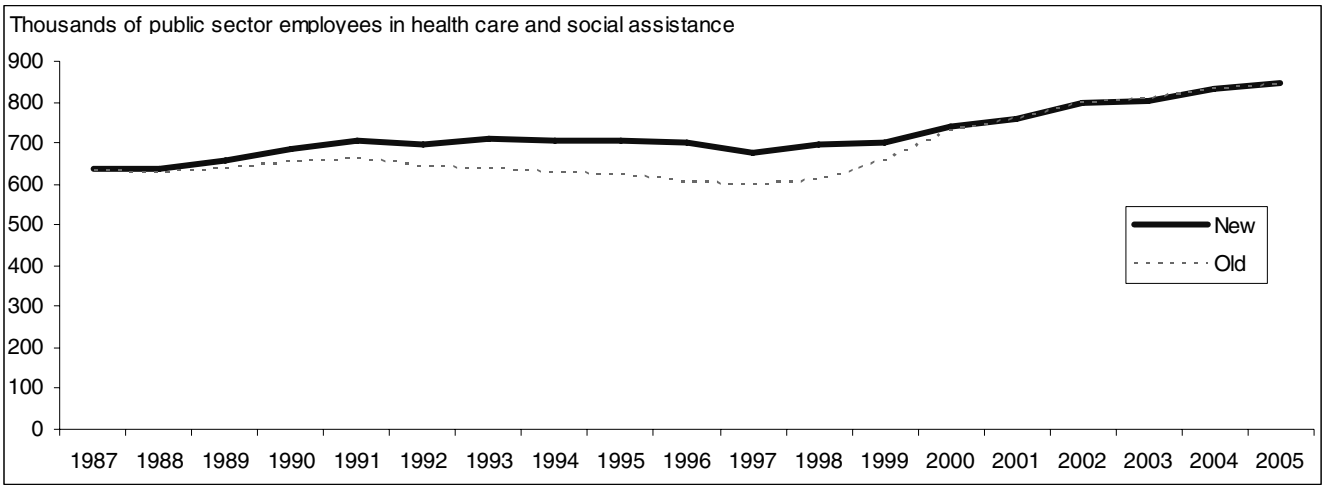

Chart 3
Thousands of employees in public sector in education services industry, new and old estimates, 1976 to 2005 annual average

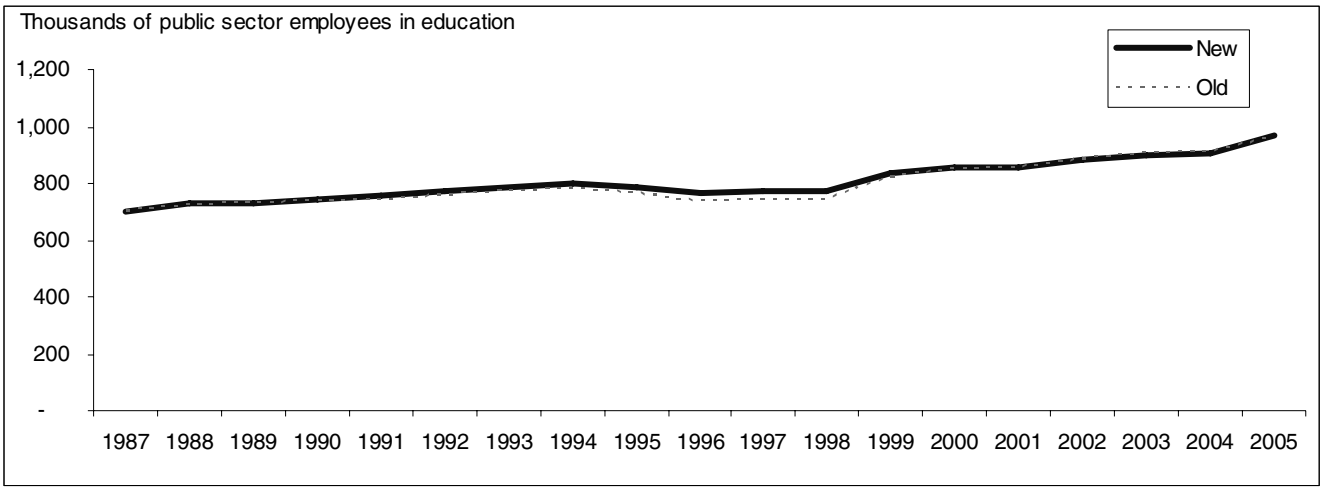

Chart 4

Thousands of employees in public sector in public administration, new and old estimates, 1976 to 2005 annual average

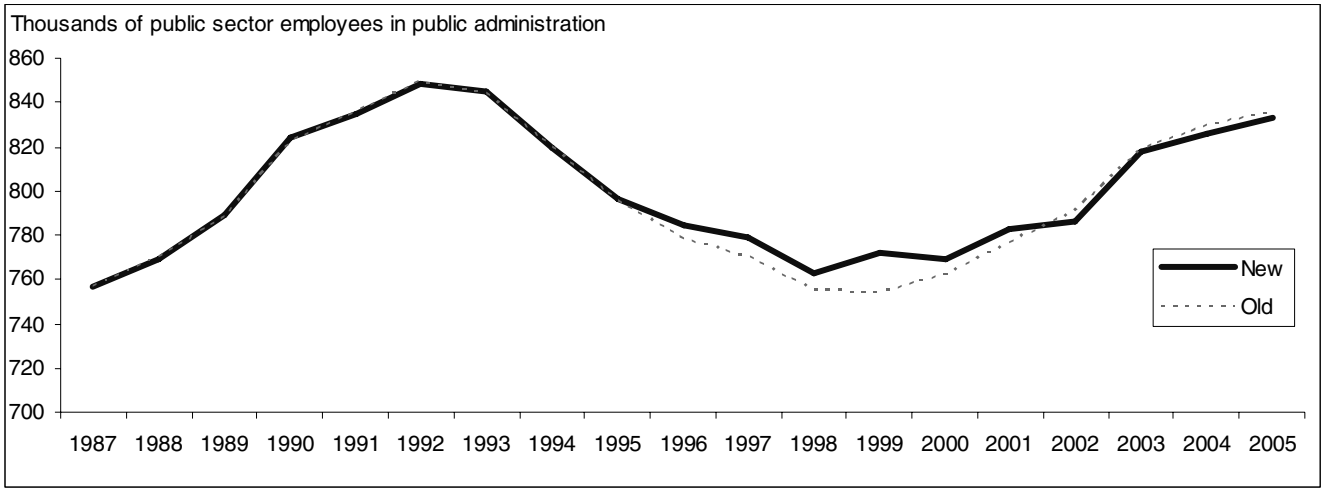

Chart 5

Thousands of employees in public sector in transportation and warehousing, new and old estimates, 1976 to 2005 annual average