

## **APPENDIX B:**

### **DESIGN OF THE CANADIAN LABOUR FORCE SURVEY**

#### **1.Stratification**

Stratification in an area frame is basically a process of classifying (usually compact) area units into certain collections called strata. For the Labour Force Survey each of the ten provinces in Canada is divided into a number of economic regions (ERs). An ER has areas of similar economic structure formed on the basis of recent information and is stable over a period of time. These ERs are treated as a period of time. These ERs are treated as primary strata and further stratification is carried out within the self-representing and non-self-representing parts independently in each ER.

This stratification is carried out using the following methods:

- 1) using an optimization procedure which forms a prespecified number of strata, each of which is homogeneous with respect to up to 17 Census characteristics, (labour force, dwelling and population related variables);
- 2) using simple geographic criteria; or
- 3) using the optimization procedure with a constraint that geographic contiguity be maintained within strata.

#### **2. Self Representing Units (SRUs)**

The self-representing part of the sample comprises those cities whose population exceed a certain predetermined value, this value varying from region to region. Some cities with population less than this lower limit are also classified as SRUs, in cases where they possess unique labour force characteristics. Within all SRUs, the sample is selected independently so that each of them is represented in the survey by a sample of its own population and hence, the name 'self-representing'. Three different stratification schemes are used depending on the size and composition of the SRU. The larger SRUs are subdivided geographically into 'super-strata', within which non-geographic strata are formed using the optimization procedure. In the smaller block-faced SRUs, these optimal non-geographic area strata are formed directly. In the non-block-faced cities with considerably less scope for stratification, simple geographic strata are used.

Within each stratum, a sample of clusters (normally a city block or block-face) is selected by a sampling procedure known as the random group method. Clusters are randomized and assigned to groups and then within each group, a cluster is selected with probability proportional to the number of dwellings contained in it. Generally, six clusters (and in some cases, 12 clusters) are selected from each stratum.

The second and final stage of selection in the SRUs is the systematic selection of dwellings within selected clusters. This is done by first obtaining a listing of the dwellings in each cluster and then performing the selection. On average, approximately 4-5 dwellings are selected from a cluster in block-faced areas and 6-8 dwellings in non-block-faced areas. Basic demographic information is obtained for all permanent residents of the household and LFS questionnaires are

administered to all individuals 15 years of age or older, within a selected household.

In the 17 largest self-representing units, a special selection is made of large apartment buildings (30 or more units and 5 or more stories) to improve the representativeness of the sample and to reduce the variance of the sample estimates. The sampling procedure for the apartment sample is similar to that of the regular sample, each apartment building constituting a cluster.

### **3. Non-Self-Representing Units (NSRUs)**

The NSRUs are the areas outside the SRUs containing rural portions and small urban centers. Before discussing the selection stages used in the NSRUs, it is necessary to briefly describe the two methods of stratification and Primary Sampling Unit (PSU) formation.

In economic regions with sufficient NSR urban and rural populations (70% of the ERs), separate urban and rural strata are set up. Stratification is done using the optimization procedure separately within urban and rural portions. Each stratum of an NSRU within an economic region is delineated into a number of primary sampling units (PSUs). The delineation is done using a modified version of the optimization procedure used for stratification, so as to form similar rather than dissimilar groupings, each representing the stratum in which they are located with respect to the census characteristics.

In the remaining 30% of economic regions which do not have sufficient NSR urban and rural population for explicit urban/rural stratification, strata are formed using the optimization procedure and PSUs are formed in such a way as to represent the stratum with respect to the census characteristics and the urban/rural population split in the stratum (according to 1981 census figures). Within those PSUs selected for the sample, urban and rural portions are sampled independently.

Two to four PSUs are selected in each stratum. Urban areas (selected urban PSUs or urban portions of selected PSUs where explicit urban/rural stratification was not done) are further subdivided into clusters; a cluster being a well defined area with boundaries recognizable both on maps and in the field. A number of clusters are selected from each group using systematic sampling. Dwellings are systematically selected within selected clusters. From selected rural areas (consisting of nearby rural census enumeration areas of EAs), secondaries (EAs) and dwellings are selected as described for urban areas.

It should be noted that in Prince Edward Island, due to the high sampling levels required to produce estimates with the desired levels of reliability, a less clustered design has been adopted. Geographic strata are formed within which a two stage sample of clusters and dwellings is selected.

#### **4. Special Areas**

In addition to the SRUs, a small proportion of the LFS population is found in institutions such as hospitals, schools, hotels, on military establishments, in remote areas, etc. Because the labour force characteristics of people in these institutions are unique and because some of these areas are not regularly accessible to LFS interviewers, they are handled by the special area frame, which for sampling purposes is divided into the following strata: military establishments, hospitals and other institutions, and remote areas. It should be noted that only the civilian population living on military establishments is included in the survey and that in the case of institutions, inmates of the institutions are not included in the survey.

The special areas are sampled in three stages. The first stage units correspond to census enumeration areas and are selected systematically with probability proportional to size, the eligible labour force population as of the 1981 census being the size measure. Subsequent stages of sampling are clusters and households, as described earlier.

#### **5. Sample Rotation**

Each household in the LFS sample remains in the sample for a period of six consecutive months. After the sixth month, the household 'rotates out' of the sample and is replaced by a new household. One-sixth of the sample is rotated out in this manner each month and a new sixth is brought in to replace it. This rotation, as it is called, is done primarily to minimize the non-response that might occur if respondents were asked to remain in the survey for a longer period of time. The rotation procedure is designed in such a way as to effectively divide the whole sample into six equally representative parts. This facilitates subsampling of the LFS sample.

(A detailed description of the old design of the Labour Force Survey is available in the Statistics Canada publication entitled Methodology of the Canadian Labour Force Survey 1976 (catalogue E71-526). A description of the redesign can be found in the paper M.P. Singh, J.D. Drew and G.H. Choudry, "Post '81 Censal Redesign of the Canadian Labour Force Survey", Survey Methodology A Journal of Statistics Canada, December 1984 (catalogue No. 12-001, Vol. 10, No. 2).