Residential Telephone Service Survey

Microdata User Guide

Special Surveys Division

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Table of

Contents

1.0 Introduction 1

2.0 Background 3

3.0 Objectives 5

4.0 Concepts and Definitions 7

5.0 Survey Methodology 9

5.1 Population Coverage 9
5.2 Sample Design 9
5.2.1 Primary Stratification 10
5.2.2 Types of Areas 10
5.2.3 Secondary Stratification 11
5.2.4 Cluster Delineation and Selection . 11
5.2.5 Dwelling Selection 12
5.2.6 Person Selection 12
5.3 Sample Size 14
5.4 Sample Rotation 14
5.5 Modifications to the L.F.S design for the Supplement 15
5.6 Sample size by Province for the Supplement 15

6.0 Data Collection 17

6.1 Interviewing for the LFS 17
6.2 Supervision and Control 18
6.3 Non-Response to the LFS 18
6.4 Data Collection Modifications for Residential Telephone Service Survey 18
6.5 Non-Response to the Residential Telephone Service Survey 19

7.0 Data Processing 21

7.1 Data Capture 21
7.2 Editing 21
7.3 Coding of Open-ended Questions 21
7.4 Creation of Derived Variables 21
7.5 Weighting 22
7.6 Suppression of Confidential Information 22

8.0 Data Quality 23

8.1 Response Rates 23
8.2 Survey Errors 24
8.2.1 The Frame 24
8.2.2 Data Collection 25
8.2.3 Data Processing 25
8.2.4 Non-response 25

9.0 Guidelines for Tabulation, Analysis and Release 29

9.1 Rounding Guidelines 29
9.2 Sample Weighting Guidelines for Tabulation 30
9.2.1 Definitions of types of estimates: Categorical vs. Quantitative 30
9.2.2 Tabulation of Categorical Estimates 32
9.2.3 Tabulation of Quantitative Estimates 32
9.3 Guidelines for Statistical Analysis 33
9.4 C.V. Release Guidelines 34

10.0 Approximate Sampling Variability Tables 37

10.1 How to use the C.V. tables for Categorical Estimates 38
10.1.1 Examples of using the C.V. tables for Categorical Estimates 40
10.2 How to use the C.V. tables to obtain Confidence Limits 43
10.2.1 Example of using the C.V. tables to obtain confidence limits 44
10.3 How to use the C.V. tables to do a t-test . 45
10.3.1 Example of using the C.V. tables to do a t-test 45
10.4 Coefficients of Variation for Quantitative Estimates 46
10.5 Release cut-off's for the RTSS 46
10.6 C.V. Tables 48

11.0 Weighting 63

11.1 Weighting Procedures for the LFS 63
11.2 Weighting Procedures for the Residential Telephone Service Survey 65

12.0 Questionnaires and Code Sheets 67

13.0 Record Layout and Univariates 71

1.0

Introduction

The second quarter of the Residential Telephone Service Survey was conducted by Statistics Canada in February 1997 with the cooperation and support of Stentor Resource Centre Inc. This manual has been produced to facilitate the manipulation of the microdata file of the survey results.

Any questions about the data set or its use should be directed to:

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2.0 Background

Statistics Canada was approached by Stentor Resource Centre Inc. to conduct a quarterly survey in order to monitor the phone penetration rates across Canada. The second quarter was conducted in February 1997 as a supplement to the Labour Force Survey. Currently, Bell Canada and other companies, through Stentor Resource Centre Inc, are negotiating local service pricing options for phone rates with the Canadian Radio-Television and Telecommunication Commission. Penetration rates are the most reliable indicator of affordability as there is no price range that can be identified as affordable or not affordable. As a result, the importance of monitoring any changes in phone penetration rates and analysing the reasons for non-subscribers is necessary to properly guide regulators in decisions about rate increases, decreases or subsidies.

Concern has been expressed that the current mechanism for monitoring penetration rates is not adequate in providing timely results to indicate whether Canadian penetration rates fall as a result of increases in local rates. At present, data on penetration rates are available from the Household Facilities and Equipment Survey (HFE) but only on an annual basis. Given the changes that are and will be occurring in the basic residential telephone rates, an annual survey was not adequate to accurately reflect the impact that these changes are having on Canadian telephone subscribership.

3.0 Objectives

There are two main objectives which Stentor Resource Centre Inc. has outlined. They are:

(I) to collect information on penetration rates across Canada (and make them available by province);
(ii) to collect information on non-subscriber characteristics.

To accommodate these goals, and to ensure that the survey is focused on fulfilling these objectives, Stentor Resource Centre Inc. submitted an analysis plan which outlined their data needs. This plan was used to design the questionnaire and to justify the variables requested.

4.0

Concepts and Definitions

This chapter outlines concepts and definitions of interest to the users. Users are referred to Chapter 12 of this document for a copy of the actual survey questions used.

Number of telephone numbers for the residence:

Includes cellular telephone numbers and telephone numbers used for business even if the business is not within the residence or if the employer is paying for the persons's telephone service within that person's household. It includes cellular telephones from work that are brought home. Pagers are excluded.

5.0

Survey Methodology

The second quarter of the Residential Telephone Service Survey was administered in February 1997 to a sub-sample of the dwellings in the Labour Force Survey (LFS) sample, and therefore its sample design is closely tied to that of the LFS. The LFS design is briefly described in Sections 5.1 to 5.4[1]. Sections 5.5 and 5.6 describe how the Residential Telephone Service Survey departed from the basic LFS design in February 1997.

5.1 Population Coverage

The LFS is a monthly household survey whose sample of individuals is representative of the civilian, non-institutionalized population 15 years of age or older in Canada's ten provinces. Specifically excluded from the survey's coverage are residents of the Yukon[2] and Northwest Territories, persons living on Indian Reserves, full-time members of the Canadian Armed Forces and inmates of institutions. These groups together represent an exclusion of approximately 2% of the population aged 15 or over.

5.2 Sample Design

The LFS has undergone an extensive redesign, culminating in the introduction of a new design at the end of 1994. The LFS sample is based upon a stratified, multi-stage design employing probability sampling at all stages of the design. The design principles are the same for each province. A diagram summarizing the design stages appears at the end of this section.

1 A detailed description of the previous LFS design is available in the Statistics Canada publication entitled **Methodology of the Canadian Labour Force Survey,** 1984-1990 (catalogue #71-526).

2 Since 1992, the LFS has been administered in the Yukon, using an alternative methodology that accommodates some of the operational difficulties inherent to remote locales. To improve reliability due to small sample size, estimates are available on a three month average basis only. These estimates are not included in national totals.

5.2.1 Primary Stratification

Provinces are divided into economic regions and employment insurance regions. Economic regions (ERs) are geographic areas of more or less homogeneous economic structure formed on the basis of federal provincial agreements. They are relatively stable over time. Employment insurance economic regions (EIERs) are also geographic areas, and are roughly the same size and number as ERs, but they do not share the same definitions. Labour force estimates are produced for the EIER regions for the use of Human Resources Development Canada.

The intersections of the two types of regions form the first level of stratification for the LFS. These ER/EIER intersections are treated as primary strata and further stratification is carried out within them (see section 5.2.3). Note that a third set of regions, Census Metropolitan Areas (CMAs), is also respected by stratification in the current LFS design, since each CMA is also an EIER.

5.2.2 Types of Areas

The primary strata (ER/EIER intersections) are further disaggregated into 3 types of areas: rural, urban, and remote areas. Urban and rural areas are loosely based on the Census definitions of urban and rural, with some exceptions to allow for the formation of strata in some areas. Urban areas include the largest CMAs down to the smallest villages categorized by the 1991 Census as urban (1000 people or more), while rural areas are made up of areas not designated as urban or remote.

All urban areas are further subdivided into two types: those using an apartment list frame and an area frame, as well as those using only an area frame.

Approximately 1% of the LFS population is found in remote areas of provinces which are less accessible to LFS interviewers than other areas. For administrative purposes, this portion of the population is sampled separately through the remote area frame. Some populations, not congregated in places of 25 or more people, are excluded from the sampling frame.

5.2.3 Secondary Stratification

In urban areas with sufficiently large numbers of apartment buildings, the strata are subdivided into apartment frames and area frames. The apartment list frame is a register which is based upon information supplied by CMHC and is maintained in the 18 largest cities across Canada. The purpose of this is to ensure better representation of apartment dwellers in the sample as well as to minimize the effect of growth in clusters, due to construction of new apartment buildings. In the major cities, the apartment strata are further stratified into low income strata and regular strata.

Where it is possible and/or necessary, the urban area frame is further stratified into regular strata, high income strata, and low population density strata. Most urban areas fall into the regular urban strata, which, in fact, cover the majority of Canada's population. High income strata are found in major urban areas, while low density urban strata consist of small towns that are geographically scattered.

In rural areas, the population density can vary greatly from relatively high population density areas to low population density areas, resulting in the formation of strata that reflect these variations. The different stratification strategies for rural areas were based not only on concentration of population, but also on cost-efficiency and interviewer constraints.

In each province, remote settlements are sampled proportional to the number of dwellings in the settlement, with no further stratification taking place. Dwellings are selected using systematic sampling in each of the places sampled.

5.2.4 Cluster Delineation and Selection

Households in final strata are not selected directly. Instead, each stratum is divided into clusters, and then a sample of clusters is selected within the stratum. Dwellings are then sampled from selected clusters. Different methods are used to define the clusters, depending on the type of stratum.

Within each urban stratum in the urban area frame, a number of geographically contiguous groups of dwellings, or clusters, are formed based upon 1991 Census counts. These clusters are generally a set of one or more city blocks or block faces. The selection of a sample of clusters (always 6 or a multiple of 6 clusters) from each of these secondary strata represents the first stage of sampling in most urban areas. In some other urban areas, Census Enumeration Areas (EAs) are used as clusters. In the low density urban strata, a three stage design is followed. Under this design, two towns within a stratum are sampled, and then six or 24 clusters within each town are sampled.

For urban apartment strata, instead of defining clusters, the apartment building is the primary sampling unit. Apartment buildings are sampled from the list frame with probability proportional to the number of units in each building.

Within each of the secondary strata in rural areas, where necessary, further stratification is carried out in order to reflect the differences among a number of socio-economic characteristics within each stratum. Within each rural stratum, six EAs or two or three groups of EAs are sampled as clusters.

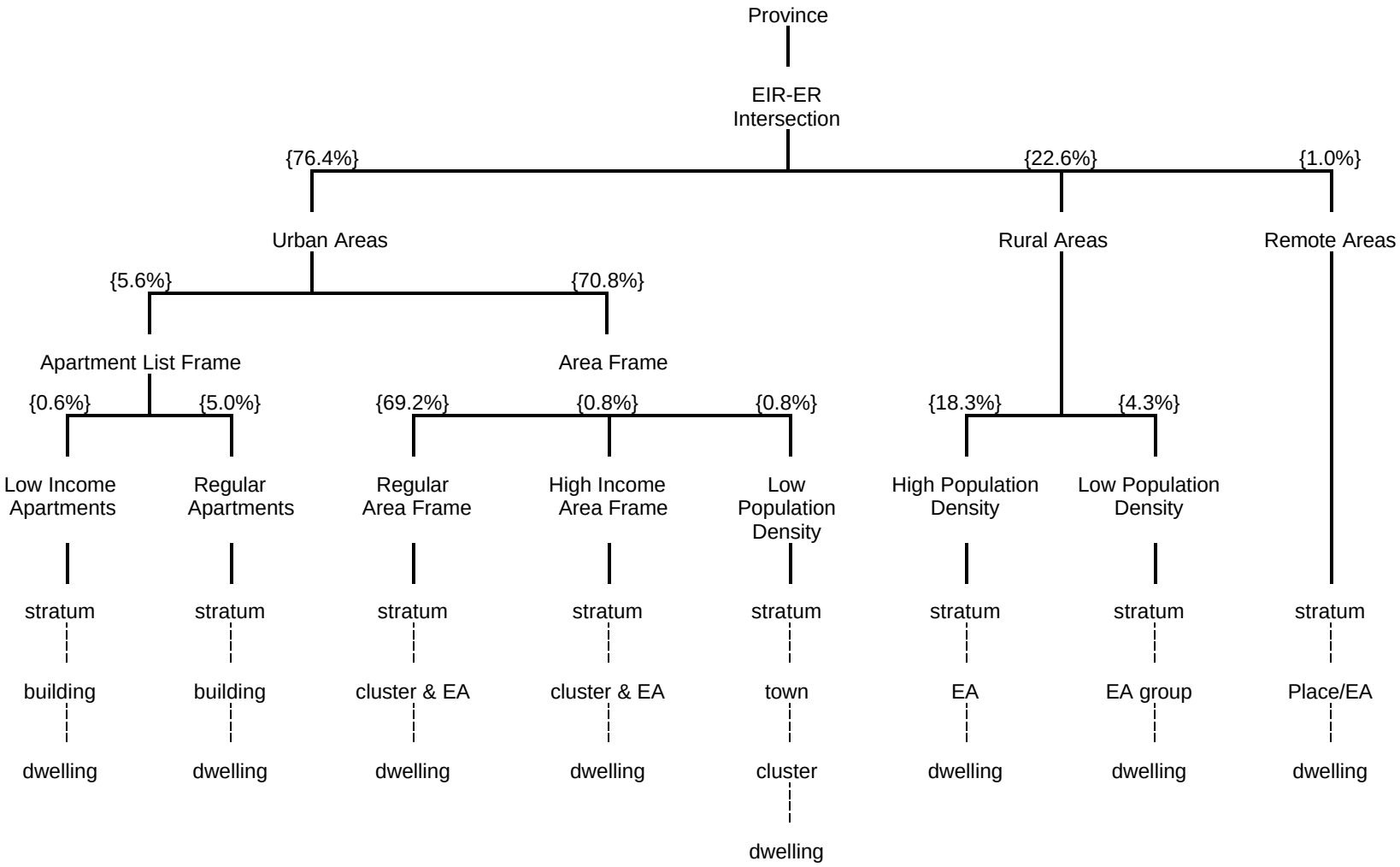
5.2.5 Dwelling Selection

In all three types of areas (urban, rural and remote areas) selected clusters are first visited by enumerators in the field and a listing of all private dwellings in the cluster is prepared. From the listing, a sample of dwellings is then selected. The sample yield depends on the type of stratum. For example, in the urban area frame, sample yields are either 6 or 8 dwellings, depending on the size of the city. In the urban apartment frame, each cluster yields 5 dwellings, while in the rural areas and EA parts of cities, each cluster yields 10 dwellings. In all clusters, dwellings are sampled systematically. This represents the final stage of sampling.

5.2.6 Person Selection

Demographic information is obtained for all persons for whom the selected dwelling is the usual place of residence. LFS information is obtained for all civilian household members 15 years of age or older. Response burden is minimized for the elderly (70 years of age or older) by carrying forward their responses for the initial interview to the subsequent five months in the survey.

Labour Force Survey Sample Design - 1995+



= level of stratification

= stage of sampling

EIR - Employment Insurance Region
ER - Economic Region
{%} - percentage of total sample

EA - Census Enumeration Area
cluster - set of blockfaces

5.3 Sample Size

The sample size of eligible persons in the LFS is determined so as to meet the statistical precision requirements for various labour force characteristics at the provincial and sub-provincial level, and to meet the requirements of federal, provincial and municipal governments as well as a host of other data users.

The monthly LFS sample consists of approximately 59,000 dwellings. After excluding dwellings found to be vacant, dwellings demolished or converted to non-residential uses, dwellings containing only ineligible persons, dwellings under construction, and seasonal dwellings, about 52,350 dwellings remain which are occupied by one or more eligible persons. From these dwellings, LFS information is obtained for approximately 102,000 civilians aged 15 or over.

5.4 Sample Rotation

The LFS employs a panel design whereby the entire monthly sample of dwellings consists of 6 panels, or rotation groups, of approximately equal size. Each of these panels is, by itself, representative of the entire LFS population. All dwellings in a rotation group remain in the LFS sample for 6 consecutive months after which time they are replaced (rotated out of the sample) by a new panel of dwellings selected from the same or similar clusters.

This rotation pattern was adopted to minimize any problems of non-response or respondent burden that would occur if households were to remain in the sample for longer than 6 months. It also has the statistical advantage of providing a common sample base for short-term month-to-month comparisons of LFS characteristics, since five of the six rotation groups in the LFS sample are common from month to month.

Because of the rotation group feature, it is possible to readily conduct supplementary surveys using the LFS design but employing less than the full size sample.

5.5 Modifications to the L.F.S design for the Supplement

The Residential Telephone Service Survey used five of the six rotation groups in the February 1997 LFS sample. For the RTSS, the coverage of the LFS was set at the household level. Unlike the LFS where information is collected for all eligible household members, the Residential Telephone Service Survey only collected information from one household member who reported the information at the household level.

5.6 Sample size by Province for the Supplement

The following table shows the number of household in the LFS sampled rotations who were eligible for the Residential Telephone Service Survey supplement.

PROVINCE	SAMPLE SIZE
Newfoundland	1,554
Prince Edward Island	1,143
Nova Scotia	2,826
New Brunswick	2,692
Quebec	8,749
Ontario	12,961
Manitoba	3,119
Saskatchewan	2,730
Alberta	3,279
British Columbia	3,933
CANADA	42,986

6.0

Data Collection

Data collection for the LFS is carried out each month using the computer-assisted method during the week following the LFS reference week, usually the third week of the month.

6.1 Interviewing for the LFS

Statistics Canada interviewers, who are part-time employees hired and trained specifically to carry out the LFS, contact each of the sampled dwellings to obtain the required labour force information. Each interviewer contacts approximately 70 dwellings per month.

Dwellings new to the sample are contacted through a personal visit. The interviewer first obtains socio-demographic information for each household member and then obtains labour force information for all eligible members. All interviews are conducted using a notebook computer. Provided there is a telephone in the dwelling and permission has been granted, subsequent interviews are conducted by telephone. As a result, approximately 85% of all dwellings are interviewed by telephone. In these subsequent monthly interviews, as they are called, the interviewer confirms the socio-demographic information collected in the first month and collects the labour force information for the current month.

In all dwellings, information about all household members is obtained from a knowledgeable household member - usually the person at home when the interviewer calls. Such 'proxy' reporting, which accounts for approximately 55% of the information collected, is used to avoid the high cost and extended time requirements that would be involved in repeat visits or calls necessary to obtain information directly from each respondent.

At the conclusion of the LFS monthly interviews, interviewers introduce the supplementary survey, if any, to be administered to some or all household members that month.

If, during the course of the six months that a dwelling normally remains in the sample, an entire household moves out and is replaced by a new household, information is obtained about the new household for the remainder of the six-month period.

6.2 Supervision and Control

All LFS interviewers are under the supervision of a staff of senior interviewers who are responsible for ensuring that interviewers are familiar with the concepts and procedures of the LFS and its many supplementary surveys, and also for periodically monitoring their interviewers and reviewing their completed documents. The senior interviewers are, in turn, under the supervision of the LFS program managers, located in each of the six Statistics Canada regional offices.

6.3 Non-Response to the LFS

Interviewers are instructed to make all reasonable attempts to obtain LFS interviews with members of eligible households. For individuals who at first refuse to participate in the LFS, a letter is sent from the Regional Office to the dwelling address stressing the importance of the survey and the household's cooperation. This is followed by a second call (or visit) from the interviewer. For cases in which the timing of the interviewer's call (or visit) is inconvenient, an appointment is arranged to call back at a more convenient time. For cases in which there is no one home, numerous call backs are made. Under no circumstances are sampled dwellings replaced by other dwellings for reasons of non-response.

Each month, after all attempts to obtain interviews have been made, a small number of non-responding households remain. For households non-responding to the LFS and for which LFS information was obtained in the previous month, this information is brought forward and used as the current month's LFS information. No supplementary survey information is collected for these households.

6.4 Data Collection Modifications for Residential Telephone Service Survey

Information for the Residential Telephone Service Survey was obtained from a knowledgable household member. Upon completion of the Labour Force Survey interview, the interviewer introduced the RTSS and proceeded with the interview with the respondent’s permission.

The Residential Telephone Service Survey was programmed to appear on the list of surveys to be completed on the notebook computer after the demographic component for the LFS had been completed. Any RTSS component not completed at the time the LFS was transmitted to one of the Statistics Canada regional offices was left incomplete and transmitted with the LFS.

6.5 Non-Response to the Residential Telephone Service Survey

For households responding to the LFS, the next stage of data collection was to administer the Residential Telephone Service Survey. In total, 42,986 households were eligible for the supplementary survey; the Residential Telephone Service Survey interview was completed for 39,960 of these households for a response rate of 93.0%. Most non-response cases for the supplementary survey in February 1997 are directly linked to the computer-assisted collection method. Some questionnaires for RTSS were not created because the application was not properly installed on some laptop computers or they were not completed before the LFS questionnaires from which they are dependent were transmitted. More detailed information on response rates is presented in Chapter 8 (Data Quality).

7.0

Data Processing

The main output of the Residential Telephone Service Survey is a "clean" microdata file. This section presents a brief summary of the processing steps involved in producing this file.

7.1 Data Capture

Capture of survey data was done directly on notebook computers by interviewers at the time of collection. A partly edited version of the computer record was electronically transmitted to Ottawa for further processing. In total, 40,911 interviews were captured and transmitted for the survey.

7.2 Editing

The type of error treated involved a lack of information in questions which should have been answered. For this type of error, a non-response or "not-stated" code was assigned to the item.

7.3 Coding of Open-ended Questions

No data items on the questionnaire were recorded by interviewers in an open-ended format. A total of two partially open-ended questions were included in the survey. These were items relating to reasons households do not have telephone service for their residence and why they cancelled their telephone service.

7.4 Creation of Derived Variables

A number of data items on the microdata file have been derived by combining items on the questionnaire in order to facilitate data analysis. CMA, for example, is actually a combination of Census Metropolitan Area (CMA) and Census Agglomeration(CA). The CAs have been recoded to 0, while the CMAs remain the same. A ‘size of urban area’ variable was also created. This variable provides a population size code based on 1991

Census definitions for every urban/non-urban area in the LFS sample frame.

7.5 Weighting

The principle behind estimation in a probability sample such as the LFS is that each person in the sample "represents", besides himself or herself, several other persons not in the sample. For example, in a simple random 2% sample of the population, each person in the sample represents 50 persons in the population. The same principle also applies to households.

The weighting phase is a step which calculates, for each record, what this number is. This weight appears on the microdata file, and must be used to derive meaningful estimates from the survey. For example, if the number of households with one or more telephone numbers for their residence is to be estimated, it is done by selecting the records referring to those households in the sample with that characteristic and summing the weights entered on those records.

Details of the method used to calculate these weights are presented in Chapter 11.

7.6 Suppression of Confidential Information

It should be noted that the 'Public Use' microdata files described above differ in a number of important respects from the survey 'master' files held by Statistics Canada. These differences are the result of actions taken to protect the anonymity of individual survey respondents. Users requiring access to information excluded from the microdata files may purchase custom tabulations. Estimates generated will be released to the user, subject to meeting the guidelines for analysis and release outlined in Section 9 of this document.

Province - Suppression of Geographic Identifiers

The survey master data file includes explicit geographic identifiers for province, stratum and Census Metropolitan Area. It is also possible to obtain, where sample sizes permit, estimates by urban size class. The survey public-use microdata files usually do not contain any geographic identifiers below the provincial level. However, since the RTSS is a household based survey, the variables CMA and urban size class will be on the microdata file. Note that, in some provinces, urban size class values may be suppressed for certain unique areas where disclosure risk may be high.

None of the questions in the RTSS survey were completely open-ended. The two questions that were partially open-ended (Q02 and Q03) were regrouped in the CAI application and therefore appear as such on the master and microdata files.

8.0

Data Quality

8.1 Response Rates

The following table summarizes the response rates to the Labour Force Survey and to the Residential Telephone Service Survey in February 1997.

	Household response rate for full LFS (02, 97) (*1)	Household response rate for LFS rotations (1, 3, 4, 5, 6) (*1)	Household response rate to Residential Telephone Service Survey (*2)
Newfoundland	97.0%	97.5%	97.5%
Prince Edward Island	97.3%	97.4%	97.7%
Nova Scotia	94.6%	95.1%	96.6%
New Brunswick	96.2%	96.8%	95.4%
Quebec	94.0%	94.7%	94.0%
Ontario	94.3%	95.3%	89.4%
Manitoba	96.5%	96.9%	95.6%
Saskatchewan	95.5%	96.0%	94.1%
Alberta	94.8%	95.5%	92.0%
British Columbia	94.3%	94.9%	93.0%
CANADA	94.8%	95.5%	93.0%

Note:

(*1) Response rate is number of responding households as a percentage of number of eligible households.

(*2) Response rate is number of households responding to the Residential Telephone Service Survey as a percentage of number of households responding to LFS in rotations sampled.

8.2 Survey Errors

The estimates derived from this survey are based on a sample of households. Somewhat different figures might have been obtained if a complete census had been taken using the same questionnaire, interviewers, supervisors, processing methods, etc. as those actually used. The difference between the estimates obtained from the sample and the results from a complete count taken under similar conditions is called the sampling error of the estimate.

Errors which are not related to sampling may occur at almost every phase of a survey operation. Interviewers may misunderstand instructions, respondents may make errors in answering questions, the answers may be incorrectly entered on the questionnaire and errors may be introduced in the processing and tabulation of the data. These are all examples of non-sampling errors.

8.2.1 The Frame

Because the RTSS was a supplement to the LFS, the frame used was the LFS frame. Any non-response to the LFS had an impact on the RTSS frame. Because non-response to the LFS is quite low (usually less than 5%) this impact was minimal. The quality of the sampling variables in the frame was very high. The RTSS sample consisted of five rotation groups from the LFS. No records were dropped due to missing rotation group number or any other type of sampling variable.

Note that the LFS frame excludes about 2% of all households in the 10 provinces of Canada. Therefore, the RTSS frame also excludes the same proportion of households in the same geographical area. It is likely that this exclusion introduces little, if any, significant bias into the survey data.

All variables in the LFS frame are updated monthly.

Some variables on the sampling frame play a critical role with respect to software application used in the survey. For example, in the RTSS CAI application, each record must have accurate stratum, cluster and rotation group codes. These variable are always of very high quality each month in the LFS.

At times, duplication of records occurs. 51 such records were dropped from the RTSS data file for the February 1997 collection.

8.2.2 Data Collection

Interviewer training consisted of reading the RTSS Procedures Manual, practising with the RTSS training cases on the laptop computer, and discussing any questions with senior interviewers before the start of the survey. A description of the background and objectives of the survey was provided, as well as a glossary of terms and a set of questions and answers. Interviewers collected RTSS information at the same time that LFS information was collected. The collection period ran from February 17 - 26, 1997.

8.2.3 Data Processing

During processing of the data, 103 RTSS records did not match to corresponding records in the LFS. Thus they were coded as out-of-scope and were dropped from further processing. When supplementary survey records do not match to host survey records they must be dropped since a weight cannot be derived for them.

Conversely, 2,185 records in the LFS were found that should have matched to an RTSS record but did not. These records were coded as in-scope, since they were eligible records from the frame which, for one reason or another, did not have corresponding RTSS records. These records were considered to be non-responding records, and were used in the weighting process to adjust for non-response.

Data processing of the RTSS was straightforward since there were only five questions on the CAI application. Any record that contained a refusal or don’t know in the first question (Q01B) was coded as a non-response. Note that 886 records were treated this way. Since the data was collected using a CAI instrument, data quality before processing was very high. Very few changes were made to the data during editing.

No imputation was done for this survey.

8.2.4 Non-response

Over a large number of observations, randomly occurring errors will have little effect on estimates derived from the survey. However, errors occurring systematically will contribute to biases in the survey estimates. Considerable time and effort was made to reduce non-sampling errors in the survey. Quality assurance measures were implemented at each step of the data collection and processing cycle to monitor the quality of the data. These measures included the use of highly skilled interviewers, extensive training of interviewers with respect to the survey procedures and questionnaire, observation of interviewers to detect problems of questionnaire design or misunderstanding of instructions, procedures to ensure that data capture errors were minimized and coding and edit quality checks to verify the processing logic.

A major source of non-sampling errors in surveys is the effect of non-response on the survey results. The extent of non-response varies from partial non-response (failure to answer just one or some questions) to total non-response. Total non-response occurred because the interviewer was either unable to contact the respondent, no member of the household was able to provide the information, or the respondent refused to participate in the survey. Total non-response was handled by adjusting the weight of households who responded to the survey to compensate for those who did not respond.

In most cases, partial non-response to the survey occurred when the respondent did not understand or misinterpreted a question, refused to answer a question, or could not recall the requested information.

Item non-response was very low for the RTSS. Q02, Q03, Q04_1, Q04_2, and Q04_3 all had non-response rates which were less than 0.1%. Q05, which was the income class question, had a non-response rate of 4.3%, which is considered to be quite low, especially for an income related question.

Since it is an unavoidable fact that estimates from a sample survey are subject to sampling error, sound statistical practice calls for researchers to provide users with some indication of the magnitude of this sampling error. This section of the documentation outlines the measures of sampling error which Statistics Canada commonly uses and which it urges users producing estimates from this microdata file to use also.

The basis for measuring the potential size of sampling errors is the standard error of the estimates derived from survey results.

However, because of the large variety of estimates that can be produced from a survey, the standard error of an estimate is usually expressed relative to the estimate to which it pertains. This resulting measure, known as the coefficient of variation (C.V.) of an estimate, is obtained by dividing the standard error of the estimate by the estimate itself and is expressed as a percentage of the estimate.

For example, suppose that, based upon the survey results, one estimates that 1.8% of Canadian households did not have telephone service to their residence during the month of February, 1997, and this estimate is found to have a standard error of .00095. Then the coefficient of variation of the estimate is calculated as:

$$\left(\frac{.00095}{.018} \right) \times 100\% = 5.3\%$$

9.0

Guidelines for Tabulation, Analysis and Release

This section of the documentation outlines the guidelines to be adhered to by users tabulating, analysing, publishing or otherwise releasing any data derived from the survey microdata file. With the aid of these guidelines, users of microdata should be able to produce the same figures as those produced by Statistics Canada and, at the same time, will be able to develop currently unpublished figures in a manner consistent with these established guidelines.

9.1 Rounding Guidelines

In order that estimates for publication or other release derived from this microdata file correspond to those produced by Statistics Canada, users are urged to adhere to the following guidelines regarding the rounding of such estimates:

a) Estimates in the main body of a statistical table are to be rounded to the nearest hundred units using the normal rounding technique. In normal rounding, if the first or only digit to be dropped is 0 to 4, the last digit to be retained is not changed. If the first or only digit to be dropped is 5 to 9, the last digit to be retained is raised by one. For example, in normal rounding to the nearest 100, if the last two digits are between 00 and 49, they are changed to 00 and the preceding digit (the hundreds digit) is left unchanged. If the last digits are between 50 and 99 they are changed to 00 and the preceding digit is incremented by 1.

b) Marginal sub-totals and totals in statistical tables are to be derived from their corresponding unrounded components and then are to be rounded themselves to the nearest 100 units using normal rounding.

c) Averages, proportions, rates and percentages are to be computed from unrounded components (i.e. numerators and/or denominators) and then are to be rounded themselves to one decimal using normal rounding. In normal rounding to a single digit, if the final or only digit to be dropped is 0 to 4, the last digit to be retained is not changed. If the first or only digit to be dropped is 5 to 9, the last digit to be retained is increased by 1.

d) Sums and differences of aggregates (or ratios) are to be derived from their corresponding unrounded components and then are to be rounded themselves to the nearest 100 units (or the nearest one decimal) using normal rounding.

e) In instances where, due to technical or other limitations, a rounding technique other than normal rounding is used resulting in estimates to be published or otherwise released which differ from corresponding estimates published by Statistics Canada, users are urged to note the reason for such differences in the publication or release document(s).

f) Under no circumstances are unrounded estimates to be published or otherwise released by users. Unrounded estimates imply greater precision than actually exists.

9.2 Sample Weighting Guidelines for Tabulation

The sample design used for the Residential Telephone Service Survey was not self-weighting. When producing simple estimates, including the production of ordinary statistical tables, users must apply the proper sampling weight.

If proper weights are not used, the estimates derived from the microdata file cannot be considered to be representative of the survey population, and will not correspond to those produced by Statistics Canada.

Users should also note that some software packages may not allow the generation of estimates that exactly match those available from Statistics Canada, because of their treatment of the weight field.

9.2.1 Definitions of types of estimates: Categorical vs. Quantitative

Before discussing how the Residential Telephone Service Survey data can be tabulated and analysed, it is useful to describe the two main types of point estimates of population characteristics which can be generated from the microdata file for the RTSS.

Categorical Estimates

Categorical estimates are estimates of the number, or percentage of the surveyed population possessing certain characteristics or falling into some defined category. The number of households which did not have telephone service for their residence during the reference month or the proportion of households which had two or more telephone lines for their residence are examples of such estimates. An estimate of the number of households possessing a certain characteristic may also be referred to as an estimate of an aggregate.

Examples of Categorical Questions:

Q: How many different telephone numbers are there for your residence?
R: 0, 1, 2 or more

Q: In 1996, what was your total annual household income before taxes and deductions?
R: Less than $10,000 / Between $10,000 and $15,000 / Over $15,000

Quantitative Estimates

Quantitative estimates are estimates of totals or of means, medians and other measures of central tendency of quantities based upon some or all of the members of the surveyed population. They also specifically involve estimates of the form $\bar{X}/\hat{Y}$ where $\bar{X}$ is an estimate of surveyed population quantity total and $\hat{Y}$ is an estimate of the number of persons in the surveyed population contributing to that total quantity. Note that there were no true quantitative questions in the RTSS application.

An example of a quantitative estimate is the average number of weeks for which unemployment insurance was collected for absences due to illness (taken from an unemployment survey). The numerator is an estimate of the total number of weeks for which unemployment insurance was collected for all persons experiencing an absence due to illness, and its denominator is the number of persons reporting an absence due to illness.

Examples of Quantitative Questions :

Q: How many consecutive weeks was this last absence?
R: |_|_| Weeks

Q: How many separate periods of 2 or more weeks were you unable to work due to your own illness, accident or pregnancy?
R: |_|_| Periods

9.2.2 Tabulation of Categorical Estimates

Estimates of the number of people with a certain characteristic can be obtained from the microdata file by summing the final weights of all records possessing the characteristic(s) of interest. Proportions and ratios of the form X/Y are obtained by:

(a) summing the final weights of records having the characteristic of interest for the numerator (X),
(b) summing the final weights of records having the characteristic of interest for the denominator (Y), then
(c) dividing the numerator estimate by the denominator estimate.

9.2.3 Tabulation of Quantitative Estimates

Estimates of quantities can be obtained from the microdata file by multiplying the value of the variable of interest by the final weight for each record, then summing this quantity over all records of interest. For example, using an unemployment survey, to obtain an estimate of the total number of weeks of employment insurance received by people whose last absence was due to pregnancy, multiply the value reported for weeks received EI by the final weight for the record, then sum this value over all records which report last absence due to pregnancy.

To obtain a weighted average of the form X/Y, the numerator (X) is calculated as for a quantitative estimate and the denominator (Y) is calculated as for a categorical estimate. For example, to estimate the average number of weeks EI was received by people whose last absence was due to pregnancy,

(a) estimate the total number of weeks as described above,

(b) estimate the number of people in this category by summing the final weights of all records which report last absence due to pregnancy, then
(c) divide estimate (a) by estimate (b).

9.3 Guidelines for Statistical Analysis

The Residential Telephone Services Survey is based upon a complex sample design, with stratification, multiple stages of selection, and unequal probabilities of selection of respondents. Using data from such complex surveys presents problems to analysts because the survey design and the selection probabilities affect the estimation and variance calculation procedures that should be used. In order for survey estimates and analyses to be free from bias, the survey weights must be used.

While many analysis procedures found in statistical packages allow weights to be used, the meaning or definition of the weight in these procedures differ from that which is appropriate in a sample survey framework, with the result that while in many cases the estimates produced by the packages are correct, the variances that are calculated are poor. Variances for simple estimates such as totals, proportions and ratios (for qualitative variables) are provided in the accompanying Sampling Variability Tables.

For other analysis techniques (for example linear regression, logistic regression and analysis of variance), a method exists which can make the variances calculated by the standard packages more meaningful, by incorporating the unequal probabilities of selection. The method rescales the weights so that there is an average weight of 1.

For example, suppose that analysis of all male respondents is required. The steps to rescale the weights are as follows:

- select all respondents from the file who reported SEX=male
- Calculate the AVERAGE weight for these records by summing the original person weights from the microdata file for these records and then dividing by the number of respondents who reported SEX=male
- for each of these respondents, calculate a RESCALED weight equal to the original person weight divided by the AVERAGE weight
- perform the analysis for these respondents using the RESCALED weight.

However, because the stratification and clustering of the sample's design are still not taken into account, the variance estimates calculated in this way are likely to be under-estimates.

The calculation of truly meaningful variance estimates requires detailed knowledge of the design of the survey. Such detail cannot be given in this microdata file because of confidentiality. Variances that take the complete sample design into account can be calculated for many statistics by Statistics Canada on a cost recovery basis.

9.4 C.V. Release Guidelines

Before releasing and/or publishing any estimate from the Residential Telephone Service Survey, users should first determine the quality level of the estimate. The quality levels are *acceptable*, *marginal* and *unacceptable*. Data quality is affected by both sampling and non-sampling errors as discussed in section 8. However for this purpose, the quality level of an estimate will be determined only on the basis of sampling error as reflected by the coefficient of variation as shown in the table below. Nonetheless, users should be sure to read section 8 to be more fully aware of the quality characteristics of these data.

First, the number of respondents who contribute to the calculation of the estimate should be determined. If this number is less than 30, the weighted estimate should be considered to be of unacceptable quality.

For weighted estimates based on sample sizes of 30 or more, users should determine the coefficient of variation of the estimate and follow the guidelines below. These quality level guidelines should be applied to weighted rounded estimates.

All estimates can be considered releasable. However, those of marginal or unacceptable quality level must be accompanied by a warning to caution subsequent users.

Quality Level Guidelines

Quality Level of Estimate	Guidelines
1. Acceptable	Estimates have: a sample size of 30 or more, and low coefficients of variation in the range 0.0% - 16.5% No warning is required.
2. Marginal	Estimates have: a sample size of 30 or more, and high coefficients of variation in the range 16.6% - 33.3%. Estimates should be flagged with the letter M (or some similar identifier). They should be accompanied by a warning to caution subsequent users about the high levels of error, associated with the estimates.
3. Unacceptable	Estimates have: a sample size of less than 30, or very high coefficients of variation in excess of 33.3%. Statistics Canada recommends not to release estimates of unacceptable quality. However, if the user chooses to do so then estimates should be flagged with the letter U (or some similar identifier) and the following warning should accompany the estimates: "The user is advised that . . . (specify the data) . . . do not meet Statistics Canada's quality standards for this statistical program. Conclusions based on these data will be unreliable, and most likely invalid. These data and any consequent findings should not be published. If the user chooses to publish these data or findings, then this disclaimer must be published with the data."

10.0

Approximate Sampling Variability Tables

In order to supply coefficients of variation which would be applicable to a wide variety of categorical estimates produced from this microdata file and which could be readily accessed by the user, a set of Approximate Sampling Variability Tables has been produced. These "look-up" tables allow the user to obtain an approximate coefficient of variation based on the size of the estimate calculated from the survey data.

The coefficients of variation (C.V.) are derived using the variance formula for simple random sampling and incorporating a factor which reflects the multi-stage, clustered nature of the sample design. This factor, known as the design effect, was determined by first calculating design effects for a wide range of characteristics and then choosing from among these a conservative value to be used in the look-up tables which would then apply to the entire set of characteristics.

The table below shows the design effects, sample sizes and population counts by province which were used to produce the Approximate Sampling Variability Tables.

PROVINCE	DESIGN EFFECT	SAMPLE SIZE	POPULATION
Newfoundland	1.08	1,515	193,695
Prince Edward Island	0.95	1,117	50,856
Nova Scotia	1.24	2,729	357,437
New Brunswick	1.67	2,568	283,506
Quebec	1.92	8,225	3,039,542
Ontario	1.84	11,581	4,208,896
Manitoba	1.32	2,982	432,012
Saskatchewan	2.90	2,569	393,063
Alberta	1.14	3,018	1,043,107
British Columbia	1.15	3,656	1,512,857
Atlantic Provinces	1.27	7,929	885,494
Prairies	1.89	8,569	1,868,192
Canada	1.99	39,960	11,514,971

All coefficients of variation in the Approximate Sampling Variability Tables are approximate and, therefore, unofficial. Estimates of actual variance for specific variables may be obtained from Statistics Canada on a cost-recovery basis. The use of actual variance estimates would allow users to release otherwise unreleaseable estimates, i.e., estimates with coefficients of variation in the 'confidential' range.

Remember: if the number of observations on which an estimate is based is less than 30, the weighted estimate should not be released regardless of the value of the coefficient of variation for this estimate. This is because the formulas used for estimating the variance do not hold true for small sample sizes.

10.1 How to use the C.V. tables for Categorical Estimates

The following rules should enable the user to determine the approximate coefficients of variation from the Sampling Variability Tables for estimates of the number, proportion or percentage of the surveyed population possessing a certain characteristic and for ratios and differences between such estimates.

Rule 1: Estimates of Numbers Possessing a Characteristic (Aggregates)

The coefficient of variation depends only on the size of the estimate itself. On the Sampling Variability Table for the appropriate geographic area, locate the estimated number in the left-most column of the table (headed "Numerator of Percentage") and follow the asterisks (if any) across to the first figure encountered. This figure is the approximate coefficient of variation.

Rule 2: Estimates of Proportions or Percentages Possessing a Characteristic

The coefficient of variation of an estimated proportion or percentage depends on both the size of the proportion or percentage and the size of the total upon which the proportion or percentage is based. Estimated proportions or percentages are relatively more reliable than the corresponding estimates of the numerator of the proportion or percentage, when the proportion or percentage is based upon a sub-group of the population. For example, the proportion of "households which did not have telephone service for their residence during the reference period" is more reliable than the estimated number of "households which did not have telephone service for their residence during the reference period". (Note that in the tables the cv's decline in value reading from left to right).

When the proportion or percentage is based upon the total population of the geographic area covered by the table, the cv of the proportion or percentage is the same as the cv of the numerator of the proportion or percentage. In this case, Rule 1 can be used.

When the proportion or percentage is based upon a subset of the total population (e.g. those in a particular sex or age group), reference should be made to the proportion or percentage (across the top of the table) and to the numerator of the proportion or percentage (down the left side of the table). The intersection of the appropriate row and column gives the coefficient of variation.

Rule 3: Estimates of Differences Between Aggregates or Percentages

The standard error of a difference between two estimates is approximately equal to the square root of the sum of squares of each standard error considered separately. That is, the standard error of a difference ($\hat{d} = \hat{X}_1 - \hat{X}_2$) is:

$$\sigma_{\hat{d}} = \sqrt{(\hat{X}_1 \alpha_1)^2 + (\hat{X}_2 \alpha_2)^2}$$

where $\hat{X}_1$ is estimate 1, $\hat{X}_2$ is estimate 2, and α_1 and α_2 are the coefficients of variation of $\hat{X}_1$ and $\hat{X}_2$ respectively. The coefficient of variation of $\hat{d}$ is given by $\sigma_{\hat{d}}/\hat{d}$. This formula is accurate for the difference between separate and uncorrelated characteristics, but is only approximate otherwise.

Rule 4: Estimates of Ratios

In the case where the numerator is a subset of the denominator, the ratio should be converted to a percentage and Rule 2 applied. This would apply, for example, to the case where the denominator is the number of “households which did not have telephone service for their residence during the reference period” and the numerator is the number of "households which did not have telephone service to their residence during the reference period because they could not afford it".

In the case where the numerator is not a subset of the denominator, as for example, the ratio of the number of "households in Quebec whose total annual income for 1996 was less than $10,000 " as compared to the number of "households in Ontario whose total annual income for 1996 was less than $10,000", the standard deviation of the ratio of the estimates is approximately equal to the square root of the sum of squares of each coefficient of variation considered separately multiplied by R. That is, the standard error of a ratio ($R = \hat{X}_1 / \hat{X}_2$) is:

$$\sigma_{\hat{R}} = \hat{R}\sqrt{\alpha_1^2 + \alpha_2^2}$$

where α_1 and α_2 are the coefficients of variation of $\hat{X}_1$ and $\hat{X}_2$ respectively. The coefficient of variation of $\hat{R}$ is given by $\sigma_{\hat{R}}/\hat{R}$. The formula will tend to overstate the error, if $\hat{X}_1$ and $\hat{X}_2$ are positively correlated and understate the error if $\hat{X}_1$ and $\hat{X}_2$ are negatively correlated.

Rule 5: Estimates of Differences of Ratios

In this case, Rules 3 and 4 are combined. The cv's for the two ratios are first determined using Rule 4, and then the cv of their difference is found using Rule 3.

10.1.1 Examples of using the C.V. tables for Categorical Estimates

The following 'real life' examples are included to assist users in applying the foregoing rules.

Example 1 : Estimates of Numbers Possessing a Characteristic (Aggregates)

Suppose that a user estimates that 210,356 households did not have telephone service for their residence during the reference period. How does the user determine the coefficient of variation of this estimate?

(1) Refer to the cv table for CANADA.

(2) The estimated aggregate (210,356) does not appear in the left-hand column (the 'Numerator of Percentage' column), so it is necessary to use the figure closest to it, namely 200,000.

(3) The coefficient of variation for an estimated aggregate is found by referring to the first non-asterisk entry on that row, namely, 5.3%.

(4) So the approximate coefficient of variation of the estimate is 5.3%.

The finding that there were 210,356 households did not have telephone service for their residence during

the reference period is publishable with no qualifications.

Example 2 : Estimates of Proportions or Percentages Possessing a Characteristic

Suppose that the user estimates that 127,249/210,356=60.5% of households which did not have telephone service for their residence during the reference period reported that they could not afford telephone service. How does the user determine the coefficient of variation of this estimate?

(1) Refer to the table for CANADA.

(2) Because the estimate is a percentage which is based on a subset of the total population (i.e.,households which did not have telephone service for their residence during the reference period), it is necessary to use both the percentage (60.5%) and the numerator portion of the percentage (127,249) in determining the coefficient of variation.

(3) The numerator, 127,249, does not appear in the left-hand column (the 'Numerator of Percentage' column) so it is necessary to use the figure closet to it, namely 125,000. Similarly, the percentage estimate does not appear as any of the column headings, so it is necessary to use the figure closest to it, 70.0%.

(4) The figure at the intersection of the row and column used, namely 3.7% is the coefficient of variation to be used.

(5) So the approximate coefficient of variation of the estimate is 3.7%. The finding that 60.5% of households which did not have telephone service for their residence during the reference period could not afford telephone service can be published with no qualifications.

Example 3 : Estimates of Differences Between Aggregates or Percentages

Suppose that a user estimates that 272,032/3,039,542=8.9% of households in Quebec reported that their total annual income for 1996 was less than $10,000, while 178,134/4,208,896=4.2% of households in Ontario reported that their total annual income for 1996 was less than $10,000. How does the user determine the coefficient of variation of the difference between these two estimates?

(1) Using the QUEBEC and ONTARIO cv table for in the same manner as described in example 2 gives the cv of the estimate for households in Quebec as 5.0%, and the cv of the estimate for households in Ontario as 5.6%.

(2) Using rule 3, the standard error of a difference ($\hat{d} = \hat{X}_1 - \hat{X}_2$) is:

$$\sigma_{\hat{d}} = \sqrt{(\hat{X}_1 \alpha_1)^2 + (\hat{X}_2 \alpha_2)^2}$$

where $\hat{X}_1$ is estimate 1, $\hat{X}_2$ is estimate 2, and α_1 and α_2 are the coefficients of variation of $\hat{X}_1$ and $\hat{X}_2$ respectively.

That is, the standard error of the difference $\hat{d}$ = (.089 -.042) = .047 is:

$$\sigma_{\hat{d}} = \sqrt{[(.089)(.050)]^2 + [(.042)(.056)]^2}$$

$$= \sqrt{(.0000198) + (.0000055)}$$

$$= .0050$$

(3) The coefficient of variation of $\hat{d}$ is given by $\sigma_{\hat{d}}/\hat{d}$ = .0050/.047 = .107.

(4) So the approximate coefficient of variation of the difference between the estimates is 10.7%. This estimate is publishable with no qualifications.

Example 4 : Estimates of Ratios

Suppose that the user estimates that 272,032 households in Quebec reported that their total annual income for 1996 was less than $10,000, while 178,134 households in Ontario reported that their total annual income for 1996 was less than $10,000. The user is interested in comparing the estimate of Quebec households versus that of Ontario households in the form of a ratio. How does the user determine the coefficient of variation of this estimate?

(1) First of all, this estimate is a ratio estimate, where the numerator of the estimate (= $\hat{X}_1$) is the number of households in Quebec which reported that their total annual income for 1996 was less than $10,000. The denominator of the estimate (= $\hat{X}_2$) is the number of households in Ontario which reported that their total annual income for 1996 was less than $10,000.

(2) Refer to the tables for QUEBEC and ONTARIO.

(3) The numerator of this ratio estimate is 272,032. The figure closest to it is 250,000. The coefficient of variation for this

estimate is found by referring to the first non-asterisk entry on that row in the QUEBEC table, namely, 5.0%.

(4) The denominator of this ratio estimate is 178,134. The figure closest to it is 200,000. The coefficient of variation for this estimate is found by referring to the first non-asterisk entry on that row in the ONTARIO table, namely, 5.6%.

(5) So the approximate coefficient of variation of the ratio estimate is given by rule 4, which is,

$$\alpha_{\hat{R}} = \sqrt{\alpha_1^2 + \alpha_2^2}$$

where α_1 and α_2 are the coefficients of variation of $\hat{X}_1$ and $\hat{X}_2$ respectively.

That is ,

$$\alpha_{\hat{R}} = \sqrt{(.050)^2 + (.056)^2}$$

$$= 0.075$$

The obtained ratio of Quebec versus Ontario households whose total annual income for 1996 is less than $10,000 is 272,032/178,134 - which is 1.53:1. The coefficient of variation of this estimate is 7.5%, which is releasable with no qualifications.

10.2 How to use the C.V. tables to obtain Confidence Limits

Although coefficients of variation are widely used, a more intuitively meaningful measure of sampling error is the confidence interval of an estimate. A confidence interval constitutes a statement on the level of confidence that the true value for the population lies within a specified range of values. For example a 95% confidence interval can be described as follows:

If sampling of the population is repeated indefinitely, each sample leading to a new confidence interval for an estimate, then in 95% of the samples the interval will cover the true population value.

Using the standard error of an estimate, confidence intervals for estimates may be obtained under the assumption that under repeated sampling of the population, the various estimates obtained for a population characteristic are normally distributed about the true population value.

Under this assumption, the chances are about 68 out of 100 that the difference between a sample estimate and the true population value would be less than one standard error, about 95 out of 100 that the difference would be less than two standard errors, and about 99 out of 100 that the differences would be less than three standard errors. These different degrees of confidence are referred to as the confidence levels.

Confidence intervals for an estimate, $\hat{X}$, are generally expressed as two numbers, one below the estimate and one above the estimate, as ($\hat{X}$-k, $\hat{X}$+k) where k is determined depending upon the level of confidence desired and the sampling error of the estimate.

Confidence intervals for an estimate can be calculated directly from the Approximate Sampling Variability Tables by first determining from the appropriate table the coefficient of variation of the estimate $\hat{X}$, and then using the following formula to convert to a confidence interval CI:

$$CI_X = [\hat{X} - t\hat{X}\alpha_{\hat{X}} , \hat{X} + t\hat{X}\alpha_{\hat{X}}]$$

where $\alpha_{\hat{X}}$ is the determined coefficient of variation of $\hat{X}$, and

t = 1 if a 68% confidence interval is desired
t = 1.6 if a 90% confidence interval is desired
t = 2 if a 95% confidence interval is desired
t = 3 if a 99% confidence interval is desired.

Note: Release guidelines which apply to the estimate also apply to the confidence interval. For example, if the estimate is not releasable, then the confidence interval is not releasable either.

10.2.1 Example of using the C.V. tables to obtain confidence limits

A 95% confidence interval for the estimated proportion of households which did not have telephone service for their residence during the reference period because they could not afford telephone service (from Example 2, section 10.2) would be calculated as follows.

$\hat{X}$ = 60.5% (or expressed as a proportion = .605)

t = 2

$\alpha_{\hat{X}}$ = 3.7% (.037 expressed as a proportion) is the coefficient of variation of this estimate as determined from the tables.

CI_X = {.605 - (2) (.605) (.037), .605 + (2) (.605) (.037)}

CI_X = {.605 - .045, .605 + .045}

CI_X = {.560, .650}

With 95% confidence it can be said that between 56.0% and 65.0% of households which did not have telephone service for their residence during the reference period reported that they could not afford telephone service.

10.3 How to use the C.V. tables to do a t-test

Standard errors may also be used to perform hypothesis testing, a procedure for distinguishing between population parameters using sample estimates. The sample estimates can be numbers, averages, percentages, ratios, etc. Tests may be performed at various levels of significance, where a level of significance is the probability of concluding that the characteristics are different when, in fact, they are identical.

Let $\mathbf{X_1}$ and $\mathbf{X_2}$ be sample estimates for 2 characteristics of interest. Let the standard error on the difference $\hat{X}_1 - \hat{X}_2$ be $\sigma_{\hat{d}}$.

If $t = \dfrac{\hat{X}_1 - \hat{X}_2}{\sigma_{\hat{d}}}$ is between -2 and 2, then no conclusion about the difference between the characteristics is justified at the 5% level of significance. If however, this ratio is smaller than -2 or larger than +2, the observed difference is significant at the 0.05 level. That is to say that the characteristics are significant.

10.3.1 Example of using the C.V. tables to do a t-test

Let us suppose we wish to test, at a 5% level of significance, the hypothesis that there is no difference between the proportion of households in Quebec which reported that their total annual income for 1996 was less than $10,000, and the proportion of households in Ontario which reported that their total annual income for 1996 was less than $10,000. From example 3, section 10.2, the standard error of the difference between these two estimates was found to be = .005. Hence,

$$t = \frac{\hat{X}_1 - \hat{X}_2}{\sigma_{\hat{d}}} = \frac{.089 - .042}{.005} = \frac{.047}{.005} = 9.40.$$

Since t = 9.40 is greater than 2, it must be concluded that there is a significant difference between the two estimates at the 0.05 level of significance.

10.4 Coefficients of Variation for Quantitative Estimates

For quantitative estimates, special tables would have to be produced to determine their sampling error. Since all of the variables for the RTSS are primarily categorical in nature, this has not been done.

As a general rule, however, the coefficient of variation of a quantitative total will be larger than the coefficient of variation of the corresponding category estimate (i.e., the estimate of the number of persons contributing to the quantitative estimate). If the corresponding category estimate is not releasable, the quantitative estimate will not be either. For example, in an absence from work survey, the coefficient of variation of the total number of weeks absent from work would be greater than the coefficient of variation of the corresponding proportion of paid workers with an absence. Hence if the coefficient of variation of the proportion is not releasable, then the coefficient of variation of the corresponding quantitative estimate will also not be releasable.

Coefficients of variation of such estimates can be derived as required for a specific estimate using a technique known as pseudo replication. This involves dividing the records on the microdata files into subgroups (or replicates) and determining the variation in the estimate from replicate to replicate. Users wishing to derive coefficients of variation for quantitative estimates may contact Statistics Canada for advice on the allocation of records to appropriate replicates and the formulae to be used in these calculations.

10.5 Release cut-off's for the RTSS

The minimum size of the estimate at the provincial, regional and Canada levels are specified in the table below. Estimates smaller than the minimum size given in the "Not Releasable" column may not be released under any circumstances.

Table of Release Cut-offs

Province	Unqualified	Qualified	Confidential	Not Releasable
Newfoundland	5,000 & +	2,000-4,900	1,000-1,900	under 1,000
Prince Edward Island	1,500 & +	1,000-1,400	500-900	under 500
Nova Scotia	6,000 & +	2,500 - 5,900	1,500 - 2,400	under 1,500
New Brunswick	6,500 & +	3,000 - 6,400	1,500 - 2,900	under 1,500
Quebec	26,000 & +	11,500 - 25,900	6,500 - 11,400	under 6,500
Ontario	24,500 & +	10,500 - 24,400	6,000 - 10,400	under 6,000
Manitoba	7,000 & +	3,000 - 6,900	1,500 - 2,900	under 1,500
Saskatchewan	15,500 & +	7,000 - 15,400	4,000 - 6,900	under 4,000
Alberta	14,500 & +	6,500 - 14,400	3,500 - 6,400	under 3,500
British Columbia	17,500 & +	7,500 - 17,400	4,500 - 7,400	under 4,500
Atlantic Provinces	5,000 & +	2,500 - 4,900	1,500 - 2,400	under 1,500
Prairie Provinces	15,000 & +	6,500 - 14,900	3,500 - 6,400	under 3,500
CANADA	21,000 & +	9,000 - 20,900	5,000 - 8,900	under 5,000

10.6 C.V. Tables

RESIDENTIAL TELEPHONE SERVICES SURVEY - 0297

Approximate Sampling Variability Tables for NEWFOUNDLAND

NUMERATOR OF PERCENTAGE ('000)	ESTIMATED PERCENTAGE										
	0.1%	1.0%	2.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
50.0%	70.0%	90.0%									
1	********	36.8	36.6	36.1	35.1	34.1	33.1	32.1	31.0	29.8	28.7
26.2	20.3	11.7									
2	**********	25.9	25.5	24.8	24.1	23.4	22.7	21.9	21.1	20.3	
18.5	14.3	8.3									
3	**********	21.2	20.8	20.3	19.7	19.1	18.5	17.9	17.2	16.6	
15.1	11.7	6.8									
4	**********	18.0	17.6	17.1	16.6	16.0	15.5	14.9	14.3		
13.1	10.1	5.9									
5	**********	16.1	15.7	15.3	14.8	14.3	13.8	13.3	12.8		
11.7	9.1	5.2									
6	**********	14.7	14.3	13.9	13.5	13.1	12.6	12.2	11.7		
10.7	8.3	4.8									
7	**********	13.6	13.3	12.9	12.5	12.1	11.7	11.3	10.8		
9.9	7.7	4.4									
8	**********	12.8	12.4	12.1	11.7	11.3	10.9	10.6	10.1		
9.3	7.2	4.1									
9	**********	12.0	11.7	11.4	11.0	10.7	10.3	9.9	9.6		
8.7	6.8	3.9									
10	**********	11.1	10.8	10.5	10.1	9.8	9.4	9.1			
8.3	6.4	3.7									
11	**********	10.6	10.3	10.0	9.7	9.3	9.0	8.6			
7.9	6.1	3.5									
12	**********	10.1	9.9	9.6	9.3	8.9	8.6	8.3			
7.6	5.9	3.4									
13	**********	9.7	9.5	9.2	8.9	8.6	8.3	8.0			
7.3	5.6	3.2									
14	**********	9.4	9.1	8.8	8.6	8.3	8.0	7.7			
7.0	5.4	3.1									
15	**********	9.1	8.8	8.5	8.3	8.0	7.7	7.4			
6.8	5.2	3.0									
16	**********	8.8	8.5	8.3	8.0	7.7	7.5	7.2			
6.5	5.1	2.9									
17	**********	8.5	8.3	8.0	7.8	7.5	7.2	7.0			
6.3	4.9	2.8									
18	**********	8.3	8.0	7.8	7.6	7.3	7.0	6.8			
6.2	4.8	2.8									
19	**********	8.1	7.8	7.6	7.4	7.1	6.8	6.6			
6.0	4.7	2.7									
20	**********	7.6	7.4	7.2	6.9	6.7	6.4				
5.9	4.5	2.6									
21	**********	7.4	7.2	7.0	6.8	6.5	6.3				
5.7	4.4	2.6									
22	**********	7.3	7.1	6.8	6.6	6.4	6.1				
5.6	4.3	2.5									

```
     23     ************************************     7.1     6.9     6.7     6.5     6.2     6.0
5.5     4.2     2.4
     24     ************************************     7.0     6.8     6.5     6.3     6.1     5.9
5.3     4.1     2.4
     25     ************************************     6.8     6.6     6.4     6.2     6.0     5.7
5.2     4.1     2.3
     30     *********************************************     6.0     5.9     5.7     5.4     5.2
4.8     3.7     2.1
     35     *********************************************     5.6     5.4     5.2     5.0     4.8
4.4     3.4     2.0
     40     ************************************************     5.1     4.9     4.7     4.5
4.1     3.2     1.9
     45     ************************************************     4.8     4.6     4.4     4.3
3.9     3.0     1.7
     50     ****************************************************     4.4     4.2     4.1
3.7     2.9     1.7
     55     ****************************************************     4.2     4.0     3.9
3.5     2.7     1.6
     60     ********************************************************     3.9     3.7
3.4     2.6     1.5
     65     ********************************************************     3.7     3.6
3.2     2.5     1.5
     70     **********************************************************     3.4
3.1     2.4     1.4
     75     **********************************************************     3.3
3.0     2.3     1.4
     80     ************************************************************
2.9     2.3     1.3
     85     ************************************************************
2.8     2.2     1.3
     90     ************************************************************
2.8     2.1     1.2
     95     ************************************************************
2.7     2.1     1.2
    100
**************************************************************************************     2.0
 1.2
    125
**************************************************************************************     1.8
 1.0
    150
**************************************************************************************
 1.0
```

NOTE: FOR CORRECT USAGE OF THESE TABLES PLEASE REFER TO MICRODATA DOCUMENTATION

RESIDENTIAL TELEPHONE SERVICES SURVEY - 0297

Approximate Sampling Variability Tables for PRINCE EDWARD ISLAND

NUMERATOR OF PERCENTAGE ('000)	ESTIMATED PERCENTAGE										
	0.1%	1.0%	2.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
50.0%	70.0%	90.0%									
1	**********	20.4	20.0	19.5	19.0	18.4	17.8	17.2	16.6	15.9	
14.5	11.3	6.5									
2	**********	14.2	13.8	13.4	13.0	12.6	12.2	11.7	11.3		
10.3	8.0	4.6									
3	**********	11.3	10.9	10.6	10.3	9.9	9.6	9.2			
8.4	6.5	3.8									
4	**********	9.8	9.5	9.2	8.9	8.6	8.3	8.0			
7.3	5.6	3.3									
5	**********	8.7	8.5	8.2	8.0	7.7	7.4	7.1			
6.5	5.0	2.9									
6	**********	7.7	7.5	7.3	7.0	6.8	6.5				
5.9	4.6	2.7									
7	**********	7.2	7.0	6.7	6.5	6.3	6.0				
5.5	4.3	2.5									
8	**********	6.5	6.3	6.1	5.9	5.6					
5.1	4.0	2.3									
9	**********	6.1	5.9	5.7	5.5	5.3					
4.8	3.8	2.2									
10	**********	5.8	5.6	5.4	5.2	5.0					
4.6	3.6	2.1									
11	**********	5.4	5.2	5.0	4.8						
4.4	3.4	2.0									
12	**********	5.1	5.0	4.8	4.6						
4.2	3.3	1.9									
13	**********	4.8	4.6	4.4							
4.0	3.1	1.8									
14	**********	4.6	4.4	4.3							
3.9	3.0	1.7									
15	**********	4.4	4.3	4.1							
3.8	2.9	1.7									
16	**********	4.1	4.0								
3.6	2.8	1.6									
17	**********	4.0	3.9								
3.5	2.7	1.6									
18	**********	3.8									
3.4	2.7	1.5									
19	**********	3.7									
3.3	2.6	1.5									
20	**********	3.6									
3.3	2.5	1.5									
21	**********										
3.2	2.5	1.4									
22	**********										
3.1	2.4	1.4									
23	**********										
3.0	2.3	1.4									
24	**********										
3.0	2.3	1.3									
25	**********										
2.9	2.3	1.3									

```
     30
**************************************************************************************************      2.1
 1.2
     35
**************************************************************************************************      1.9
 1.1
     40
**************************************************************************************************
 1.0
     45
**************************************************************************************************
 1.0
```

NOTE: FOR CORRECT USAGE OF THESE TABLES PLEASE REFER TO MICRODATA DOCUMENTATION

RESIDENTIAL TELEPHONE SERVICES SURVEY - 0297

Approximate Sampling Variability Tables for NOVA SCOTIA

NUMERATOR OF PERCENTAGE ('000)	ESTIMATED PERCENTAGE										
	0.1%	1.0%	2.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
50.0%	70.0%	90.0%									
1	********	39.9	39.7	39.1	38.1	37.0	35.9	34.8	33.6	32.4	31.1
28.4	22.0	12.7									
2	********	28.2	28.1	27.7	26.9	26.2	25.4	24.6	23.8	22.9	22.0
20.1	15.5	9.0									
3	********	23.1	22.9	22.6	22.0	21.4	20.7	20.1	19.4	18.7	18.0
16.4	12.7	7.3									
4	**********	19.9	19.6	19.0	18.5	18.0	17.4	16.8	16.2	15.5	
14.2	11.0	6.3									
5	**********	17.8	17.5	17.0	16.6	16.1	15.5	15.0	14.5	13.9	
12.7	9.8	5.7									
6	**********	16.2	16.0	15.5	15.1	14.7	14.2	13.7	13.2	12.7	
11.6	9.0	5.2									
7	**********	15.0	14.8	14.4	14.0	13.6	13.1	12.7	12.2	11.8	
10.7	8.3	4.8									
8	**********	13.8	13.5	13.1	12.7	12.3	11.9	11.4	11.0		
10.0	7.8	4.5									
9	**********	13.0	12.7	12.3	12.0	11.6	11.2	10.8	10.4		
9.5	7.3	4.2									
10	**********	12.4	12.0	11.7	11.4	11.0	10.6	10.2	9.8		
9.0	7.0	4.0									
11	**********	11.8	11.5	11.2	10.8	10.5	10.1	9.8	9.4		
8.6	6.6	3.8									
12	**********	11.3	11.0	10.7	10.4	10.0	9.7	9.3	9.0		
8.2	6.3	3.7									
13	**********	10.9	10.6	10.3	10.0	9.6	9.3	9.0	8.6		
7.9	6.1	3.5									
14	**********	10.5	10.2	9.9	9.6	9.3	9.0	8.7	8.3		
7.6	5.9	3.4									
15	**********	10.1	9.8	9.6	9.3	9.0	8.7	8.4	8.0		
7.3	5.7	3.3									
16	**********	9.8	9.5	9.3	9.0	8.7	8.4	8.1	7.8		
7.1	5.5	3.2									
17	**********	9.5	9.2	9.0	8.7	8.4	8.1	7.9	7.5		
6.9	5.3	3.1									
18	**********	9.0	8.7	8.5	8.2	7.9	7.6	7.3			
6.7	5.2	3.0									
19	**********	8.7	8.5	8.2	8.0	7.7	7.4	7.1			
6.5	5.0	2.9									
20	**********	8.5	8.3	8.0	7.8	7.5	7.2	7.0			
6.3	4.9	2.8									
21	**********	8.3	8.1	7.8	7.6	7.3	7.1	6.8			
6.2	4.8	2.8									
22	**********	8.1	7.9	7.7	7.4	7.2	6.9	6.6			
6.1	4.7	2.7									
23	**********	7.9	7.7	7.5	7.2	7.0	6.7	6.5			
5.9	4.6	2.6									
24	**********	7.8	7.6	7.3	7.1	6.9	6.6	6.3			
5.8	4.5	2.6									
25	**********	7.6	7.4	7.2	7.0	6.7	6.5	6.2			
5.7	4.4	2.5									
30	**********	7.0	6.8	6.6	6.3	6.1	5.9	5.7			
5.2	4.0	2.3									

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     35     *******************************     6.4     6.3     6.1     5.9     5.7     5.5     5.3
4.8     3.7     2.1
     40     ************************************     5.9     5.7     5.5     5.3     5.1     4.9
4.5     3.5     2.0
     45     ************************************     5.5     5.4     5.2     5.0     4.8     4.6
4.2     3.3     1.9
     50     ************************************     5.2     5.1     4.9     4.8     4.6     4.4
4.0     3.1     1.8
     55     *********************************************     4.8     4.7     4.5     4.4     4.2
3.8     3.0     1.7
     60     *********************************************     4.6     4.5     4.3     4.2     4.0
3.7     2.8     1.6
     65     *********************************************     4.5     4.3     4.2     4.0     3.9
3.5     2.7     1.6
     70     *********************************************     4.3     4.2     4.0     3.9     3.7
3.4     2.6     1.5
     75     ******************************************************     4.0     3.9     3.7     3.6
3.3     2.5     1.5
     80     ******************************************************     3.9     3.8     3.6     3.5
3.2     2.5     1.4
     85     ******************************************************     3.8     3.6     3.5     3.4
3.1     2.4     1.4
     90     ************************************************************     3.5     3.4     3.3
3.0     2.3     1.3
     95     ************************************************************     3.4     3.3     3.2
2.9     2.3     1.3
    100     ************************************************************     3.4     3.2     3.1
2.8     2.2     1.3
    125     ************************************************************************     2.9     2.8
2.5     2.0     1.1
    150     ***************************************************************************************
2.3     1.8     1.0
    200
*********************************************************************************************     1.6
 0.9
    250
*********************************************************************************************     1.4
 0.8
    300
*********************************************************************************************************
 0.7
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NOTE: FOR CORRECT USAGE OF THESE TABLES PLEASE REFER TO MICRODATA DOCUMENTATION

RESIDENTIAL TELEPHONE SERVICES SURVEY - 0297

Approximate Sampling Variability Tables for NEW BRUNSWICK

NUMERATOR OF PERCENTAGE ('000)	ESTIMATED PERCENTAGE										
	0.1%	1.0%	2.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
50.0%	70.0%	90.0%									
1	********	42.5	42.3	41.7	40.5	39.4	38.2	37.0	35.8	34.5	33.1
30.2	23.4	13.5									
2	********	30.1	29.9	29.5	28.7	27.9	27.0	26.2	25.3	24.4	23.4
21.4	16.6	9.6									
3	**********	24.4	24.1	23.4	22.8	22.1	21.4	20.6	19.9	19.1	
17.4	13.5	7.8									
4	**********	21.2	20.8	20.3	19.7	19.1	18.5	17.9	17.2	16.6	
15.1	11.7	6.8									
5	**********	18.9	18.6	18.1	17.6	17.1	16.6	16.0	15.4	14.8	
13.5	10.5	6.0									
6	**********	17.0	16.6	16.1	15.6	15.1	14.6	14.1	13.5		
12.3	9.6	5.5									
7	**********	15.7	15.3	14.9	14.4	14.0	13.5	13.0	12.5		
11.4	8.8	5.1									
8	**********	14.7	14.3	13.9	13.5	13.1	12.6	12.2	11.7		
10.7	8.3	4.8									
9	**********	13.9	13.5	13.1	12.7	12.3	11.9	11.5	11.0		
10.1	7.8	4.5									
10	**********	13.2	12.8	12.5	12.1	11.7	11.3	10.9	10.5		
9.6	7.4	4.3									
11	**********	12.6	12.2	11.9	11.5	11.2	10.8	10.4	10.0		
9.1	7.1	4.1									
12	**********	12.0	11.7	11.4	11.0	10.7	10.3	9.9	9.6		
8.7	6.8	3.9									
13	**********	11.6	11.2	10.9	10.6	10.3	9.9	9.6	9.2		
8.4	6.5	3.7									
14	**********	11.1	10.8	10.5	10.2	9.9	9.6	9.2	8.8		
8.1	6.3	3.6									
15	**********	10.5	10.2	9.9	9.6	9.2	8.9	8.5			
7.8	6.0	3.5									
16	**********	10.1	9.9	9.6	9.3	8.9	8.6	8.3			
7.6	5.9	3.4									
17	**********	9.8	9.6	9.3	9.0	8.7	8.4	8.0			
7.3	5.7	3.3									
18	**********	9.6	9.3	9.0	8.7	8.4	8.1	7.8			
7.1	5.5	3.2									
19	**********	9.3	9.0	8.8	8.5	8.2	7.9	7.6			
6.9	5.4	3.1									
20	**********	9.1	8.8	8.5	8.3	8.0	7.7	7.4			
6.8	5.2	3.0									
21	**********	8.8	8.6	8.3	8.1	7.8	7.5	7.2			
6.6	5.1	2.9									
22	**********	8.6	8.4	8.2	7.9	7.6	7.3	7.1			
6.4	5.0	2.9									
23	**********	8.5	8.2	8.0	7.7	7.5	7.2	6.9			
6.3	4.9	2.8									
24	**********	8.3	8.0	7.8	7.6	7.3	7.0	6.8			
6.2	4.8	2.8									
25	**********	8.1	7.9	7.6	7.4	7.2	6.9	6.6			
6.0	4.7	2.7									
30	**********	7.2	7.0	6.8	6.5	6.3	6.0				
5.5	4.3	2.5									

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     35     ***************************************     6.7     6.5     6.3     6.0     5.8     5.6
5.1     4.0     2.3
     40     ***************************************     6.2     6.0     5.9     5.7     5.4     5.2
4.8     3.7     2.1
     45     ***********************************************     5.7     5.5     5.3     5.1     4.9
4.5     3.5     2.0
     50     ***********************************************     5.4     5.2     5.1     4.9     4.7
4.3     3.3     1.9
     55     ***********************************************     5.2     5.0     4.8     4.6     4.5
4.1     3.2     1.8
     60     ******************************************************     4.8     4.6     4.4     4.3
3.9     3.0     1.7
     65     ******************************************************     4.6     4.4     4.3     4.1
3.7     2.9     1.7
     70     ******************************************************     4.4     4.3     4.1     4.0
3.6     2.8     1.6
     75     ***************************************************************     4.1     4.0     3.8
3.5     2.7     1.6
     80     ***************************************************************     4.0     3.9     3.7
3.4     2.6     1.5
     85     ***************************************************************     3.9     3.7     3.6
3.3     2.5     1.5
     90     ************************************************************************     3.6     3.5
3.2     2.5     1.4
     95     ************************************************************************     3.5     3.4
3.1     2.4     1.4
    100     ******************************************************************************     3.3
3.0     2.3     1.4
    125     ************************************************************************************
2.7     2.1     1.2
    150
*******************************************************************************************     1.9
 1.1
    200
*******************************************************************************************
 1.0
    250
*******************************************************************************************
 0.9
```

NOTE: FOR CORRECT USAGE OF THESE TABLES PLEASE REFER TO MICRODATA DOCUMENTATION

RESIDENTIAL TELEPHONE SERVICES SURVEY - 0297

Approximate Sampling Variability Tables for QUEBEC

NUMERATOR OF PERCENTAGE ('000)	ESTIMATED PERCENTAGE										
	0.1%	1.0%	2.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
50.0%	70.0%	90.0%									
1	84.1	83.7	83.3	82.0	79.8	77.6	75.2	72.8	70.4	67.8	65.2
59.5	46.1	26.6									
2	59.5	59.2	58.9	58.0	56.4	54.8	53.2	51.5	49.8	48.0	46.1
42.1	32.6	18.8									
3	48.5	48.3	48.1	47.3	46.1	44.8	43.4	42.1	40.6	39.2	37.6
34.3	26.6	15.4									
4	********	41.8	41.6	41.0	39.9	38.8	37.6	36.4	35.2	33.9	32.6
29.7	23.0	13.3									
5	********	37.4	37.2	36.7	35.7	34.7	33.6	32.6	31.5	30.3	29.1
26.6	20.6	11.9									
6	********	34.2	34.0	33.5	32.6	31.7	30.7	29.7	28.7	27.7	26.6
24.3	18.8	10.9									
7	********	31.6	31.5	31.0	30.2	29.3	28.4	27.5	26.6	25.6	24.6
22.5	17.4	10.1									
8	********	29.6	29.4	29.0	28.2	27.4	26.6	25.8	24.9	24.0	23.0
21.0	16.3	9.4									
9	********	27.9	27.8	27.3	26.6	25.9	25.1	24.3	23.5	22.6	21.7
19.8	15.4	8.9									
10	********	26.5	26.3	25.9	25.2	24.5	23.8	23.0	22.3	21.4	20.6
18.8	14.6	8.4									
11	********	25.2	25.1	24.7	24.1	23.4	22.7	22.0	21.2	20.4	19.6
17.9	13.9	8.0									
12	********	24.2	24.0	23.7	23.0	22.4	21.7	21.0	20.3	19.6	18.8
17.2	13.3	7.7									
13	********	23.2	23.1	22.7	22.1	21.5	20.9	20.2	19.5	18.8	18.1
16.5	12.8	7.4									
14	********	22.4	22.3	21.9	21.3	20.7	20.1	19.5	18.8	18.1	17.4
15.9	12.3	7.1									
15	********	21.6	21.5	21.2	20.6	20.0	19.4	18.8	18.2	17.5	16.8
15.4	11.9	6.9									
16	********	20.9	20.8	20.5	20.0	19.4	18.8	18.2	17.6	17.0	16.3
14.9	11.5	6.7									
17	********	20.3	20.2	19.9	19.4	18.8	18.2	17.7	17.1	16.4	15.8
14.4	11.2	6.5									
18	********	19.7	19.6	19.3	18.8	18.3	17.7	17.2	16.6	16.0	15.4
14.0	10.9	6.3									
19	********	19.2	19.1	18.8	18.3	17.8	17.3	16.7	16.1	15.6	14.9
13.6	10.6	6.1									
20	********	18.7	18.6	18.3	17.8	17.3	16.8	16.3	15.7	15.2	14.6
13.3	10.3	5.9									
21	********	18.3	18.2	17.9	17.4	16.9	16.4	15.9	15.4	14.8	14.2
13.0	10.1	5.8									
22	********	17.8	17.8	17.5	17.0	16.5	16.0	15.5	15.0	14.5	13.9
12.7	9.8	5.7									
23	********	17.5	17.4	17.1	16.6	16.2	15.7	15.2	14.7	14.1	13.6
12.4	9.6	5.5									
24	********	17.1	17.0	16.7	16.3	15.8	15.4	14.9	14.4	13.8	13.3
12.1	9.4	5.4									
25	********	16.7	16.7	16.4	16.0	15.5	15.0	14.6	14.1	13.6	13.0
11.9	9.2	5.3									
30	********	15.3	15.2	15.0	14.6	14.2	13.7	13.3	12.8	12.4	11.9
10.9	8.4	4.9									

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     35     ****************    14.1    13.9    13.5    13.1    12.7    12.3    11.9    11.5    11.0
10.1     7.8     4.5
     40     ****************    13.2    13.0    12.6    12.3    11.9    11.5    11.1    10.7    10.3
9.4      7.3     4.2
     45     ****************    12.4    12.2    11.9    11.6    11.2    10.9    10.5    10.1     9.7
8.9      6.9     4.0
     50     ****************    11.8    11.6    11.3    11.0    10.6    10.3    10.0     9.6     9.2
8.4      6.5     3.8
     55     ****************    11.2    11.1    10.8    10.5    10.1     9.8     9.5     9.1     8.8
8.0      6.2     3.6
     60     ****************    10.8    10.6    10.3    10.0     9.7     9.4     9.1     8.8     8.4
7.7      5.9     3.4
     65     ************************    10.2     9.9     9.6     9.3     9.0     8.7     8.4     8.1
7.4      5.7     3.3
     70     ************************     9.8     9.5     9.3     9.0     8.7     8.4     8.1     7.8
7.1      5.5     3.2
     75     ************************     9.5     9.2     9.0     8.7     8.4     8.1     7.8     7.5
6.9      5.3     3.1
     80     ************************     9.2     8.9     8.7     8.4     8.1     7.9     7.6     7.3
6.7      5.2     3.0
     85     ************************     8.9     8.7     8.4     8.2     7.9     7.6     7.4     7.1
6.5      5.0     2.9
     90     ************************     8.6     8.4     8.2     7.9     7.7     7.4     7.1     6.9
6.3      4.9     2.8
     95     ************************     8.4     8.2     8.0     7.7     7.5     7.2     7.0     6.7
6.1      4.7     2.7
    100     ************************     8.2     8.0     7.8     7.5     7.3     7.0     6.8     6.5
5.9      4.6     2.7
    125     ************************     7.3     7.1     6.9     6.7     6.5     6.3     6.1     5.8
5.3      4.1     2.4
    150     ************************     6.7     6.5     6.3     6.1     5.9     5.7     5.5     5.3
4.9      3.8     2.2
    200     ********************************     5.6     5.5     5.3     5.2     5.0     4.8     4.6
4.2      3.3     1.9
    250     ********************************     5.0     4.9     4.8     4.6     4.5     4.3     4.1
3.8      2.9     1.7
    300     ********************************     4.6     4.5     4.3     4.2     4.1     3.9     3.8
3.4      2.7     1.5
    350     ****************************************     4.1     4.0     3.9     3.8     3.6     3.5
3.2      2.5     1.4
    400     ****************************************     3.9     3.8     3.6     3.5     3.4     3.3
3.0      2.3     1.3
    450     ****************************************     3.7     3.5     3.4     3.3     3.2     3.1
2.8      2.2     1.3
    500     ************************************************     3.4     3.3     3.1     3.0     2.9
2.7      2.1     1.2
    750     ********************************************************     2.7     2.6     2.5     2.4
2.2      1.7     1.0
   1000     ************************************************************************     2.1     2.1
1.9      1.5     0.8
   1500     ********************************************************************************************
1.5      1.2     0.7
   2000
**************************************************************************************************     1.0
 0.6
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NOTE: FOR CORRECT USAGE OF THESE TABLES PLEASE REFER TO MICRODATA DOCUMENTATION

RESIDENTIAL TELEPHONE SERVICES SURVEY - 0297

Approximate Sampling Variability Tables for ONTARIO

NUMERATOR OF PERCENTAGE ('000)	0.1%	1.0%	2.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%	50.0%	70.0%	90.0%
					ESTIMATED PERCENTAGE									
1	81.6	81.3	80.8	79.6	77.5	75.3	73.0	70.7	68.3	65.8	63.3	57.7	44.7	25.8
2	57.7	57.5	57.2	56.3	54.8	53.2	51.6	50.0	48.3	46.6	44.7	40.8	31.6	18.3
3	47.1	46.9	46.7	46.0	44.7	43.5	42.2	40.8	39.4	38.0	36.5	33.3	25.8	14.9
4	40.8	40.6	40.4	39.8	38.7	37.6	36.5	35.4	34.2	32.9	31.6	28.9	22.4	12.9
5	********	36.3	36.2	35.6	34.6	33.7	32.7	31.6	30.6	29.4	28.3	25.8	20.0	11.5
6	********	33.2	33.0	32.5	31.6	30.7	29.8	28.9	27.9	26.9	25.8	23.6	18.3	10.5
7	********	30.7	30.6	30.1	29.3	28.5	27.6	26.7	25.8	24.9	23.9	21.8	16.9	9.8
8	********	28.7	28.6	28.1	27.4	26.6	25.8	25.0	24.2	23.3	22.4	20.4	15.8	9.1
9	********	27.1	26.9	26.5	25.8	25.1	24.3	23.6	22.8	21.9	21.1	19.2	14.9	8.6
10	********	25.7	25.6	25.2	24.5	23.8	23.1	22.4	21.6	20.8	20.0	18.3	14.1	8.2
11	********	24.5	24.4	24.0	23.4	22.7	22.0	21.3	20.6	19.9	19.1	17.4	13.5	7.8
12	********	23.5	23.3	23.0	22.4	21.7	21.1	20.4	19.7	19.0	18.3	16.7	12.9	7.5
13	********	22.5	22.4	22.1	21.5	20.9	20.3	19.6	18.9	18.3	17.5	16.0	12.4	7.2
14	********	21.7	21.6	21.3	20.7	20.1	19.5	18.9	18.3	17.6	16.9	15.4	12.0	6.9
15	********	21.0	20.9	20.6	20.0	19.4	18.9	18.3	17.6	17.0	16.3	14.9	11.5	6.7
16	********	20.3	20.2	19.9	19.4	18.8	18.3	17.7	17.1	16.5	15.8	14.4	11.2	6.5
17	********	19.7	19.6	19.3	18.8	18.3	17.7	17.2	16.6	16.0	15.3	14.0	10.8	6.3
18	********	19.2	19.1	18.8	18.3	17.7	17.2	16.7	16.1	15.5	14.9	13.6	10.5	6.1
19	********	18.6	18.5	18.3	17.8	17.3	16.8	16.2	15.7	15.1	14.5	13.2	10.3	5.9
20	********	18.2	18.1	17.8	17.3	16.8	16.3	15.8	15.3	14.7	14.1	12.9	10.0	5.8
21	********	17.7	17.6	17.4	16.9	16.4	15.9	15.4	14.9	14.4	13.8	12.6	9.8	5.6
22	********	17.3	17.2	17.0	16.5	16.1	15.6	15.1	14.6	14.0	13.5	12.3	9.5	5.5
23	********	16.9	16.9	16.6	16.2	15.7	15.2	14.7	14.2	13.7	13.2	12.0	9.3	5.4
24	********	16.6	16.5	16.2	15.8	15.4	14.9	14.4	13.9	13.4	12.9	11.8	9.1	5.3
25	********	16.3	16.2	15.9	15.5	15.1	14.6	14.1	13.7	13.2	12.7	11.5	8.9	5.2
30	********	14.8	14.8	14.5	14.1	13.7	13.3	12.9	12.5	12.0	11.5	10.5	8.2	4.7

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     35      ********    13.7    13.7    13.5    13.1    12.7    12.3    12.0    11.5    11.1    10.7
9.8      7.6      4.4
     40      ********    12.8    12.8    12.6    12.2    11.9    11.5    11.2    10.8    10.4    10.0
9.1      7.1      4.1
     45      **********************    12.1    11.9    11.5    11.2    10.9    10.5    10.2     9.8     9.4
8.6      6.7      3.8
     50      **********************    11.4    11.3    11.0    10.6    10.3    10.0     9.7     9.3     8.9
8.2      6.3      3.7
     55      **********************    10.9    10.7    10.4    10.2     9.8     9.5     9.2     8.9     8.5
7.8      6.0      3.5
     60      **********************    10.4    10.3    10.0     9.7     9.4     9.1     8.8     8.5     8.2
7.5      5.8      3.3
     65      **********************    10.0     9.9     9.6     9.3     9.1     8.8     8.5     8.2     7.8
7.2      5.5      3.2
     70      **********************     9.7     9.5     9.3     9.0     8.7     8.5     8.2     7.9     7.6
6.9      5.3      3.1
     75      **********************     9.3     9.2     8.9     8.7     8.4     8.2     7.9     7.6     7.3
6.7      5.2      3.0
     80      **********************     9.0     8.9     8.7     8.4     8.2     7.9     7.6     7.4     7.1
6.5      5.0      2.9
     85      ************************     8.6     8.4     8.2     7.9     7.7     7.4     7.1     6.9
6.3      4.9      2.8
     90      ************************     8.4     8.2     7.9     7.7     7.5     7.2     6.9     6.7
6.1      4.7      2.7
     95      ************************     8.2     7.9     7.7     7.5     7.3     7.0     6.8     6.5
5.9      4.6      2.6
    100      ************************     8.0     7.7     7.5     7.3     7.1     6.8     6.6     6.3
5.8      4.5      2.6
    125      ************************     7.1     6.9     6.7     6.5     6.3     6.1     5.9     5.7
5.2      4.0      2.3
    150      ************************     6.5     6.3     6.1     6.0     5.8     5.6     5.4     5.2
4.7      3.7      2.1
    200      ************************     5.6     5.5     5.3     5.2     5.0     4.8     4.7     4.5
4.1      3.2      1.8
    250      ********************************     4.9     4.8     4.6     4.5     4.3     4.2     4.0
3.7      2.8      1.6
    300      ********************************     4.5     4.3     4.2     4.1     3.9     3.8     3.7
3.3      2.6      1.5
    350      ********************************     4.1     4.0     3.9     3.8     3.7     3.5     3.4
3.1      2.4      1.4
    400      ********************************     3.9     3.8     3.7     3.5     3.4     3.3     3.2
2.9      2.2      1.3
    450      ************************************     3.5     3.4     3.3     3.2     3.1     3.0
2.7      2.1      1.2
    500      ************************************     3.4     3.3     3.2     3.1     2.9     2.8
2.6      2.0      1.2
    750      ********************************************     2.7     2.6     2.5     2.4     2.3
2.1      1.6      0.9
   1000      ****************************************************     2.2     2.2     2.1     2.0
1.8      1.4      0.8
   1500      ********************************************************************************     1.6
1.5      1.2      0.7
   2000      ********************************************************************************
1.3      1.0      0.6
   3000
************************************************************************************************************
 0.5
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NOTE: FOR CORRECT USAGE OF THESE TABLES PLEASE REFER TO MICRODATA DOCUMENTATION

RESIDENTIAL TELEPHONE SERVICES SURVEY - 0297

Approximate Sampling Variability Tables for MANITOBA

NUMERATOR OF PERCENTAGE ('000)	ESTIMATED PERCENTAGE										
	0.1%	1.0%	2.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
50.0%	70.0%	90.0%									
1	********	43.4	43.1	42.5	41.3	40.2	39.0	37.7	36.5	35.1	33.8
30.8	23.9	13.8									
2	********	30.7	30.5	30.0	29.2	28.4	27.6	26.7	25.8	24.8	23.9
21.8	16.9	9.7									
3	********	25.0	24.9	24.5	23.9	23.2	22.5	21.8	21.1	20.3	19.5
17.8	13.8	8.0									
4	********	21.7	21.6	21.2	20.7	20.1	19.5	18.9	18.2	17.6	16.9
15.4	11.9	6.9									
5	**********	19.3	19.0	18.5	18.0	17.4	16.9	16.3	15.7	15.1	
13.8	10.7	6.2									
6	**********	17.6	17.3	16.9	16.4	15.9	15.4	14.9	14.3	13.8	
12.6	9.7	5.6									
7	**********	16.3	16.1	15.6	15.2	14.7	14.3	13.8	13.3	12.8	
11.6	9.0	5.2									
8	**********	15.3	15.0	14.6	14.2	13.8	13.3	12.9	12.4	11.9	
10.9	8.4	4.9									
9	**********	14.2	13.8	13.4	13.0	12.6	12.2	11.7	11.3		
10.3	8.0	4.6									
10	**********	13.4	13.1	12.7	12.3	11.9	11.5	11.1	10.7		
9.7	7.5	4.4									
11	**********	12.8	12.5	12.1	11.8	11.4	11.0	10.6	10.2		
9.3	7.2	4.2									
12	**********	12.3	11.9	11.6	11.3	10.9	10.5	10.1	9.7		
8.9	6.9	4.0									
13	**********	11.8	11.5	11.1	10.8	10.5	10.1	9.7	9.4		
8.5	6.6	3.8									
14	**********	11.4	11.0	10.7	10.4	10.1	9.7	9.4	9.0		
8.2	6.4	3.7									
15	**********	11.0	10.7	10.4	10.1	9.7	9.4	9.1	8.7		
8.0	6.2	3.6									
16	**********	10.6	10.3	10.0	9.7	9.4	9.1	8.8	8.4		
7.7	6.0	3.4									
17	**********	10.3	10.0	9.7	9.5	9.2	8.8	8.5	8.2		
7.5	5.8	3.3									
18	**********	10.0	9.7	9.5	9.2	8.9	8.6	8.3	8.0		
7.3	5.6	3.2									
19	**********	9.7	9.5	9.2	8.9	8.7	8.4	8.1	7.7		
7.1	5.5	3.2									
20	**********	9.5	9.2	9.0	8.7	8.4	8.2	7.9	7.5		
6.9	5.3	3.1									
21	**********	9.3	9.0	8.8	8.5	8.2	8.0	7.7	7.4		
6.7	5.2	3.0									
22	**********	8.8	8.6	8.3	8.0	7.8	7.5	7.2			
6.6	5.1	2.9									
23	**********	8.6	8.4	8.1	7.9	7.6	7.3	7.0			
6.4	5.0	2.9									
24	**********	8.4	8.2	8.0	7.7	7.4	7.2	6.9			
6.3	4.9	2.8									
25	**********	8.3	8.0	7.8	7.5	7.3	7.0	6.8			
6.2	4.8	2.8									
30	**********	7.5	7.3	7.1	6.9	6.7	6.4	6.2			
5.6	4.4	2.5									

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     35     ********************************     7.0     6.8     6.6     6.4     6.2     5.9     5.7
5.2     4.0     2.3
     40     ********************************     6.5     6.4     6.2     6.0     5.8     5.6     5.3
4.9     3.8     2.2
     45     ************************************     6.0     5.8     5.6     5.4     5.2     5.0
4.6     3.6     2.1
     50     ************************************     5.7     5.5     5.3     5.2     5.0     4.8
4.4     3.4     1.9
     55     ************************************     5.4     5.3     5.1     4.9     4.7     4.6
4.2     3.2     1.9
     60     ************************************     5.2     5.0     4.9     4.7     4.5     4.4
4.0     3.1     1.8
     65     ********************************************     4.8     4.7     4.5     4.4     4.2
3.8     3.0     1.7
     70     ********************************************     4.7     4.5     4.4     4.2     4.0
3.7     2.9     1.6
     75     ********************************************     4.5     4.4     4.2     4.1     3.9
3.6     2.8     1.6
     80     ********************************************     4.4     4.2     4.1     3.9     3.8
3.4     2.7     1.5
     85     ********************************************     4.2     4.1     4.0     3.8     3.7
3.3     2.6     1.5
     90     ************************************************     4.0     3.8     3.7     3.6
3.2     2.5     1.5
     95     ************************************************     3.9     3.7     3.6     3.5
3.2     2.4     1.4
    100     ************************************************     3.8     3.6     3.5     3.4
3.1     2.4     1.4
    125     ************************************************     3.3     3.1     3.0
2.8     2.1     1.2
    150     ************************************************     2.9     2.8
2.5     1.9     1.1
    200     ************************************************
2.2     1.7     1.0
    250
**************************************************************************************     1.5
 0.9
    300
**************************************************************************************     1.4
 0.8
    350
**************************************************************************************
 0.7
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NOTE: FOR CORRECT USAGE OF THESE TABLES PLEASE REFER TO MICRODATA DOCUMENTATION

RESIDENTIAL TELEPHONE SERVICES SURVEY - 0297

Approximate Sampling Variability Tables for SASKATCHEWAN

NUMERATOR OF PERCENTAGE ('000)	ESTIMATED PERCENTAGE										
	0.1%	1.0%	2.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
50.0%	70.0%	90.0%									
1	********	66.1	65.7	64.7	63.0	61.2	59.4	57.5	55.5	53.5	51.4
46.9	36.4	21.0									
2	********	46.7	46.5	45.8	44.5	43.3	42.0	40.7	39.3	37.8	36.4
33.2	25.7	14.8									
3	********	38.1	37.9	37.4	36.4	35.3	34.3	33.2	32.1	30.9	29.7
27.1	21.0	12.1									
4	**********	32.9	32.4	31.5	30.6	29.7	28.7	27.8	26.8	25.7	
23.5	18.2	10.5									
5	**********	29.4	28.9	28.2	27.4	26.6	25.7	24.8	23.9	23.0	
21.0	16.3	9.4									
6	**********	26.8	26.4	25.7	25.0	24.2	23.5	22.7	21.9	21.0	
19.2	14.8	8.6									
7	**********	24.8	24.5	23.8	23.1	22.4	21.7	21.0	20.2	19.4	
17.7	13.7	7.9									
8	**********	22.9	22.3	21.6	21.0	20.3	19.6	18.9	18.2		
16.6	12.9	7.4									
9	**********	21.6	21.0	20.4	19.8	19.2	18.5	17.8	17.1		
15.6	12.1	7.0									
10	**********	20.5	19.9	19.4	18.8	18.2	17.6	16.9	16.3		
14.8	11.5	6.6									
11	**********	19.5	19.0	18.5	17.9	17.3	16.7	16.1	15.5		
14.2	11.0	6.3									
12	**********	18.7	18.2	17.7	17.1	16.6	16.0	15.5	14.8		
13.6	10.5	6.1									
13	**********	17.9	17.5	17.0	16.5	15.9	15.4	14.8	14.3		
13.0	10.1	5.8									
14	**********	17.3	16.8	16.4	15.9	15.4	14.8	14.3	13.7		
12.5	9.7	5.6									
15	**********	16.7	16.3	15.8	15.3	14.8	14.3	13.8	13.3		
12.1	9.4	5.4									
16	**********	16.2	15.7	15.3	14.8	14.4	13.9	13.4	12.9		
11.7	9.1	5.2									
17	**********	15.7	15.3	14.8	14.4	13.9	13.5	13.0	12.5		
11.4	8.8	5.1									
18	**********	15.3	14.8	14.4	14.0	13.6	13.1	12.6	12.1		
11.1	8.6	4.9									
19	**********	14.8	14.5	14.0	13.6	13.2	12.7	12.3	11.8		
10.8	8.3	4.8									
20	**********	14.1	13.7	13.3	12.9	12.4	12.0	11.5			
10.5	8.1	4.7									
21	**********	13.7	13.4	13.0	12.5	12.1	11.7	11.2			
10.2	7.9	4.6									
22	**********	13.4	13.1	12.7	12.3	11.8	11.4	11.0			
10.0	7.8	4.5									
23	**********	13.1	12.8	12.4	12.0	11.6	11.2	10.7			
9.8	7.6	4.4									
24	**********	12.9	12.5	12.1	11.7	11.3	10.9	10.5			
9.6	7.4	4.3									
25	**********	12.6	12.2	11.9	11.5	11.1	10.7	10.3			
9.4	7.3	4.2									
30	**********	11.5	11.2	10.8	10.5	10.1	9.8	9.4			
8.6	6.6	3.8									

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     35     ********************************    10.6    10.3    10.0     9.7     9.4     9.0     8.7
7.9     6.1     3.5
     40     ************************************     9.7     9.4     9.1     8.8     8.5     8.1
7.4     5.7     3.3
     45     ************************************     9.1     8.9     8.6     8.3     8.0     7.7
7.0     5.4     3.1
     50     ************************************     8.7     8.4     8.1     7.9     7.6     7.3
6.6     5.1     3.0
     55     ************************************     8.3     8.0     7.8     7.5     7.2     6.9
6.3     4.9     2.8
     60     ********************************************     7.7     7.4     7.2     6.9     6.6
6.1     4.7     2.7
     65     ********************************************     7.4     7.1     6.9     6.6     6.4
5.8     4.5     2.6
     70     ********************************************     7.1     6.9     6.6     6.4     6.1
5.6     4.3     2.5
     75     ********************************************     6.9     6.6     6.4     6.2     5.9
5.4     4.2     2.4
     80     ****************************************************     6.4     6.2     6.0     5.7
5.2     4.1     2.3
     85     ****************************************************     6.2     6.0     5.8     5.6
5.1     3.9     2.3
     90     ****************************************************     6.1     5.9     5.6     5.4
4.9     3.8     2.2
     95     ****************************************************     5.9     5.7     5.5     5.3
4.8     3.7     2.2
    100     ************************************************************     5.6     5.4     5.1
4.7     3.6     2.1
    125     ************************************************************************     4.8     4.6
4.2     3.3     1.9
    150     ********************************************************************************     4.2
3.8     3.0     1.7
    200
**************************************************************************************************     2.6
 1.5
    250
**************************************************************************************************     2.3
 1.3
    300
**************************************************************************************************
 1.2
    350
**************************************************************************************************
 1.1
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NOTE: FOR CORRECT USAGE OF THESE TABLES PLEASE REFER TO MICRODATA DOCUMENTATION

RESIDENTIAL TELEPHONE SERVICES SURVEY - 0297

Approximate Sampling Variability Tables for ALBERTA

NUMERATOR OF PERCENTAGE ('000)	ESTIMATED PERCENTAGE										
	0.1%	1.0%	2.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
50.0%	70.0%	90.0%									
1	62.6	62.4	62.0	61.1	59.5	57.8	56.1	54.3	52.4	50.5	48.6
44.3	34.3	19.8									
2	********	44.1	43.9	43.2	42.0	40.9	39.6	38.4	37.1	35.7	34.3
31.3	24.3	14.0									
3	********	36.0	35.8	35.3	34.3	33.4	32.4	31.3	30.3	29.2	28.0
25.6	19.8	11.4									
4	********	31.2	31.0	30.5	29.7	28.9	28.0	27.1	26.2	25.3	24.3
22.2	17.2	9.9									
5	********	27.9	27.7	27.3	26.6	25.8	25.1	24.3	23.5	22.6	21.7
19.8	15.4	8.9									
6	********	25.5	25.3	24.9	24.3	23.6	22.9	22.2	21.4	20.6	19.8
18.1	14.0	8.1									
7	********	23.6	23.5	23.1	22.5	21.8	21.2	20.5	19.8	19.1	18.4
16.8	13.0	7.5									
8	********	22.0	21.9	21.6	21.0	20.4	19.8	19.2	18.5	17.9	17.2
15.7	12.1	7.0									
9	********	20.8	20.7	20.4	19.8	19.3	18.7	18.1	17.5	16.8	16.2
14.8	11.4	6.6									
10	********	19.7	19.6	19.3	18.8	18.3	17.7	17.2	16.6	16.0	15.4
14.0	10.9	6.3									
11	**********	18.7	18.4	17.9	17.4	16.9	16.4	15.8	15.2	14.6	
13.4	10.4	6.0									
12	**********	17.9	17.6	17.2	16.7	16.2	15.7	15.1	14.6	14.0	
12.8	9.9	5.7									
13	**********	17.2	16.9	16.5	16.0	15.5	15.1	14.5	14.0	13.5	
12.3	9.5	5.5									
14	**********	16.6	16.3	15.9	15.4	15.0	14.5	14.0	13.5	13.0	
11.8	9.2	5.3									
15	**********	16.0	15.8	15.4	14.9	14.5	14.0	13.5	13.0	12.5	
11.4	8.9	5.1									
16	**********	15.5	15.3	14.9	14.4	14.0	13.6	13.1	12.6	12.1	
11.1	8.6	5.0									
17	**********	15.0	14.8	14.4	14.0	13.6	13.2	12.7	12.3	11.8	
10.7	8.3	4.8									
18	**********	14.6	14.4	14.0	13.6	13.2	12.8	12.4	11.9	11.4	
10.4	8.1	4.7									
19	**********	14.2	14.0	13.6	13.3	12.9	12.5	12.0	11.6	11.1	
10.2	7.9	4.5									
20	**********	13.9	13.7	13.3	12.9	12.5	12.1	11.7	11.3	10.9	
9.9	7.7	4.4									
21	**********	13.3	13.0	12.6	12.2	11.8	11.4	11.0	10.6		
9.7	7.5	4.3									
22	**********	13.0	12.7	12.3	12.0	11.6	11.2	10.8	10.4		
9.4	7.3	4.2									
23	**********	12.7	12.4	12.0	11.7	11.3	10.9	10.5	10.1		
9.2	7.2	4.1									
24	**********	12.5	12.1	11.8	11.4	11.1	10.7	10.3	9.9		
9.0	7.0	4.0									
25	**********	12.2	11.9	11.6	11.2	10.9	10.5	10.1	9.7		
8.9	6.9	4.0									
30	**********	11.2	10.9	10.6	10.2	9.9	9.6	9.2	8.9		
8.1	6.3	3.6									

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     35     ************************    10.3    10.1     9.8     9.5     9.2     8.9     8.5     8.2
7.5     5.8     3.4
     40     ************************     9.7     9.4     9.1     8.9     8.6     8.3     8.0     7.7
7.0     5.4     3.1
     45     ************************     9.1     8.9     8.6     8.4     8.1     7.8     7.5     7.2
6.6     5.1     3.0
     50     ************************     8.6     8.4     8.2     7.9     7.7     7.4     7.1     6.9
6.3     4.9     2.8
     55     ********************************     8.0     7.8     7.6     7.3     7.1     6.8     6.5
6.0     4.6     2.7
     60     ********************************     7.7     7.5     7.2     7.0     6.8     6.5     6.3
5.7     4.4     2.6
     65     ********************************     7.4     7.2     7.0     6.7     6.5     6.3     6.0
5.5     4.3     2.5
     70     ********************************     7.1     6.9     6.7     6.5     6.3     6.0     5.8
5.3     4.1     2.4
     75     ********************************     6.9     6.7     6.5     6.3     6.1     5.8     5.6
5.1     4.0     2.3
     80     ********************************     6.6     6.5     6.3     6.1     5.9     5.6     5.4
5.0     3.8     2.2
     85     ********************************     6.4     6.3     6.1     5.9     5.7     5.5     5.3
4.8     3.7     2.1
     90     ********************************     6.3     6.1     5.9     5.7     5.5     5.3     5.1
4.7     3.6     2.1
     95     ********************************     6.1     5.9     5.8     5.6     5.4     5.2     5.0
4.5     3.5     2.0
    100     ********************************     5.9     5.8     5.6     5.4     5.2     5.1     4.9
4.4     3.4     2.0
    125     ************************************     5.2     5.0     4.9     4.7     4.5     4.3
4.0     3.1     1.8
    150     ************************************     4.7     4.6     4.4     4.3     4.1     4.0
3.6     2.8     1.6
    200     ********************************************     4.0     3.8     3.7     3.6     3.4
3.1     2.4     1.4
    250     ************************************************     3.4     3.3     3.2     3.1
2.8     2.2     1.3
    300     ********************************************************     3.0     2.9     2.8
2.6     2.0     1.1
    350     ************************************************************     2.7     2.6
2.4     1.8     1.1
    400     ********************************************************************     2.4
2.2     1.7     1.0
    450     ****************************************************************************
2.1     1.6     0.9
    500     ****************************************************************************
2.0     1.5     0.9
    750
********************************************************************************************************
 0.7
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NOTE: FOR CORRECT USAGE OF THESE TABLES PLEASE REFER TO MICRODATA DOCUMENTATION

RESIDENTIAL TELEPHONE SERVICES SURVEY - 0297

Approximate Sampling Variability Tables for BRITISH COLUMBIA

NUMERATOR OF PERCENTAGE ('000)	ESTIMATED PERCENTAGE										
	0.1%	1.0%	2.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
50.0%	70.0%	90.0%									
1	68.9	68.6	68.2	67.2	65.4	63.5	61.6	59.7	57.6	55.5	53.4
48.7	37.7	21.8									
2	********	48.5	48.2	47.5	46.2	44.9	43.6	42.2	40.8	39.3	37.7
34.5	26.7	15.4									
3	********	39.6	39.4	38.8	37.7	36.7	35.6	34.5	33.3	32.1	30.8
28.1	21.8	12.6									
4	********	34.3	34.1	33.6	32.7	31.8	30.8	29.8	28.8	27.8	26.7
24.4	18.9	10.9									
5	********	30.7	30.5	30.0	29.2	28.4	27.6	26.7	25.8	24.8	23.9
21.8	16.9	9.7									
6	********	28.0	27.8	27.4	26.7	25.9	25.2	24.4	23.5	22.7	21.8
19.9	15.4	8.9									
7	********	25.9	25.8	25.4	24.7	24.0	23.3	22.6	21.8	21.0	20.2
18.4	14.3	8.2									
8	********	24.2	24.1	23.7	23.1	22.5	21.8	21.1	20.4	19.6	18.9
17.2	13.3	7.7									
9	********	22.9	22.7	22.4	21.8	21.2	20.5	19.9	19.2	18.5	17.8
16.2	12.6	7.3									
10	********	21.7	21.6	21.2	20.7	20.1	19.5	18.9	18.2	17.6	16.9
15.4	11.9	6.9									
11	********	20.7	20.6	20.2	19.7	19.2	18.6	18.0	17.4	16.7	16.1
14.7	11.4	6.6									
12	********	19.8	19.7	19.4	18.9	18.3	17.8	17.2	16.6	16.0	15.4
14.1	10.9	6.3									
13	********	19.0	18.9	18.6	18.1	17.6	17.1	16.5	16.0	15.4	14.8
13.5	10.5	6.0									
14	********	18.3	18.2	17.9	17.5	17.0	16.5	15.9	15.4	14.8	14.3
13.0	10.1	5.8									
15	********	17.7	17.6	17.3	16.9	16.4	15.9	15.4	14.9	14.3	13.8
12.6	9.7	5.6									
16	**********	17.1	16.8	16.3	15.9	15.4	14.9	14.4	13.9	13.3	
12.2	9.4	5.4									
17	**********	16.5	16.3	15.9	15.4	14.9	14.5	14.0	13.5	12.9	
11.8	9.2	5.3									
18	**********	16.1	15.8	15.4	15.0	14.5	14.1	13.6	13.1	12.6	
11.5	8.9	5.1									
19	**********	15.6	15.4	15.0	14.6	14.1	13.7	13.2	12.7	12.2	
11.2	8.7	5.0									
20	**********	15.3	15.0	14.6	14.2	13.8	13.3	12.9	12.4	11.9	
10.9	8.4	4.9									
21	**********	14.9	14.7	14.3	13.9	13.4	13.0	12.6	12.1	11.6	
10.6	8.2	4.8									
22	**********	14.5	14.3	13.9	13.5	13.1	12.7	12.3	11.8	11.4	
10.4	8.0	4.6									
23	**********	14.2	14.0	13.6	13.2	12.8	12.4	12.0	11.6	11.1	
10.2	7.9	4.5									
24	**********	13.9	13.7	13.3	13.0	12.6	12.2	11.8	11.3	10.9	
9.9	7.7	4.4									
25	**********	13.6	13.4	13.1	12.7	12.3	11.9	11.5	11.1	10.7	
9.7	7.5	4.4									
30	**********	12.5	12.3	11.9	11.6	11.3	10.9	10.5	10.1	9.7	
8.9	6.9	4.0									

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     35     ************************    11.4    11.0    10.7    10.4    10.1     9.7     9.4     9.0
8.2     6.4     3.7
     40     ************************    10.6    10.3    10.0     9.7     9.4     9.1     8.8     8.4
7.7     6.0     3.4
     45     ************************    10.0     9.7     9.5     9.2     8.9     8.6     8.3     8.0
7.3     5.6     3.2
     50     ************************     9.5     9.2     9.0     8.7     8.4     8.2     7.9     7.5
6.9     5.3     3.1
     55     ************************     9.1     8.8     8.6     8.3     8.0     7.8     7.5     7.2
6.6     5.1     2.9
     60     ************************     8.7     8.4     8.2     8.0     7.7     7.4     7.2     6.9
6.3     4.9     2.8
     65     ************************     8.3     8.1     7.9     7.6     7.4     7.2     6.9     6.6
6.0     4.7     2.7
     70     ************************     8.0     7.8     7.6     7.4     7.1     6.9     6.6     6.4
5.8     4.5     2.6
     75     ************************     7.8     7.5     7.3     7.1     6.9     6.7     6.4     6.2
5.6     4.4     2.5
     80     ********************************     7.3     7.1     6.9     6.7     6.4     6.2     6.0
5.4     4.2     2.4
     85     ********************************     7.1     6.9     6.7     6.5     6.3     6.0     5.8
5.3     4.1     2.4
     90     ********************************     6.9     6.7     6.5     6.3     6.1     5.9     5.6
5.1     4.0     2.3
     95     ********************************     6.7     6.5     6.3     6.1     5.9     5.7     5.5
5.0     3.9     2.2
    100     ********************************     6.5     6.4     6.2     6.0     5.8     5.6     5.3
4.9     3.8     2.2
    125     ********************************     5.8     5.7     5.5     5.3     5.2     5.0     4.8
4.4     3.4     1.9
    150     ********************************     5.3     5.2     5.0     4.9     4.7     4.5     4.4
4.0     3.1     1.8
    200     ************************************     4.5     4.4     4.2     4.1     3.9     3.8
3.4     2.7     1.5
    250     ********************************************     3.9     3.8     3.6     3.5     3.4
3.1     2.4     1.4
    300     ********************************************     3.6     3.4     3.3     3.2     3.1
2.8     2.2     1.3
    350     ************************************************************     3.2     3.1     3.0     2.9
2.6     2.0     1.2
    400     ****************************************************************     2.9     2.8     2.7
2.4     1.9     1.1
    450     ****************************************************************     2.7     2.6     2.5
2.3     1.8     1.0
    500     ************************************************************************     2.5     2.4
2.2     1.7     1.0
    750     ************************************************************************************************
1.8     1.4     0.8
   1000
************************************************************************************************     1.2
 0.7
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NOTE: FOR CORRECT USAGE OF THESE TABLES PLEASE REFER TO MICRODATA DOCUMENTATION

RESIDENTIAL TELEPHONE SERVICES SURVEY - 0297

Approximate Sampling Variability Tables for ATLANTIC

NUMERATOR OF PERCENTAGE ('000)	ESTIMATED PERCENTAGE										
	0.1%	1.0%	2.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
50.0%	70.0%	90.0%									
1	********	37.3	37.1	36.5	35.6	34.6	33.5	32.5	31.4	30.2	29.0
26.5	20.5	11.9									
2	********	26.4	26.2	25.8	25.2	24.4	23.7	23.0	22.2	21.4	20.5
18.7	14.5	8.4									
3	********	21.5	21.4	21.1	20.5	20.0	19.4	18.7	18.1	17.5	16.8
15.3	11.9	6.8									
4	********	18.7	18.6	18.3	17.8	17.3	16.8	16.2	15.7	15.1	14.5
13.3	10.3	5.9									
5	********	16.7	16.6	16.3	15.9	15.5	15.0	14.5	14.0	13.5	13.0
11.9	9.2	5.3									
6	********	15.2	15.2	14.9	14.5	14.1	13.7	13.3	12.8	12.3	11.9
10.8	8.4	4.8									
7	********	14.1	14.0	13.8	13.4	13.1	12.7	12.3	11.9	11.4	11.0
10.0	7.8	4.5									
8	********	13.2	13.1	12.9	12.6	12.2	11.9	11.5	11.1	10.7	10.3
9.4	7.3	4.2									
9	**********	12.4	12.2	11.9	11.5	11.2	10.8	10.5	10.1	9.7	
8.8	6.8	4.0									
10	**********	11.7	11.6	11.2	10.9	10.6	10.3	9.9	9.6	9.2	
8.4	6.5	3.7									
11	**********	11.2	11.0	10.7	10.4	10.1	9.8	9.5	9.1	8.8	
8.0	6.2	3.6									
12	**********	10.7	10.5	10.3	10.0	9.7	9.4	9.1	8.7	8.4	
7.7	5.9	3.4									
13	**********	10.3	10.1	9.9	9.6	9.3	9.0	8.7	8.4	8.1	
7.4	5.7	3.3									
14	**********	9.9	9.8	9.5	9.2	9.0	8.7	8.4	8.1	7.8	
7.1	5.5	3.2									
15	**********	9.6	9.4	9.2	8.9	8.7	8.4	8.1	7.8	7.5	
6.8	5.3	3.1									
16	**********	9.3	9.1	8.9	8.6	8.4	8.1	7.8	7.6	7.3	
6.6	5.1	3.0									
17	**********	9.0	8.9	8.6	8.4	8.1	7.9	7.6	7.3	7.0	
6.4	5.0	2.9									
18	**********	8.6	8.4	8.1	7.9	7.7	7.4	7.1	6.8		
6.2	4.8	2.8									
19	**********	8.4	8.2	7.9	7.7	7.4	7.2	6.9	6.7		
6.1	4.7	2.7									
20	**********	8.2	8.0	7.7	7.5	7.3	7.0	6.8	6.5		
5.9	4.6	2.7									
21	**********	8.0	7.8	7.5	7.3	7.1	6.8	6.6	6.3		
5.8	4.5	2.6									
22	**********	7.8	7.6	7.4	7.1	6.9	6.7	6.4	6.2		
5.7	4.4	2.5									
23	**********	7.6	7.4	7.2	7.0	6.8	6.5	6.3	6.1		
5.5	4.3	2.5									
24	**********	7.5	7.3	7.1	6.8	6.6	6.4	6.2	5.9		
5.4	4.2	2.4									
25	**********	7.3	7.1	6.9	6.7	6.5	6.3	6.0	5.8		
5.3	4.1	2.4									
30	**********	6.7	6.5	6.3	6.1	5.9	5.7	5.5	5.3		
4.8	3.7	2.2									

```
     35     ************************     6.2     6.0     5.8     5.7     5.5     5.3     5.1     4.9
4.5     3.5     2.0
     40     ************************     5.8     5.6     5.5     5.3     5.1     5.0     4.8     4.6
4.2     3.2     1.9
     45     *******************************     5.3     5.2     5.0     4.8     4.7     4.5     4.3
4.0     3.1     1.8
     50     *******************************     5.0     4.9     4.7     4.6     4.4     4.3     4.1
3.7     2.9     1.7
     55     *******************************     4.8     4.7     4.5     4.4     4.2     4.1     3.9
3.6     2.8     1.6
     60     *******************************     4.6     4.5     4.3     4.2     4.0     3.9     3.7
3.4     2.7     1.5
     65     *******************************     4.4     4.3     4.2     4.0     3.9     3.7     3.6
3.3     2.5     1.5
     70     *******************************     4.3     4.1     4.0     3.9     3.7     3.6     3.5
3.2     2.5     1.4
     75     *******************************     4.1     4.0     3.9     3.7     3.6     3.5     3.4
3.1     2.4     1.4
     80     *******************************     4.0     3.9     3.7     3.6     3.5     3.4     3.2
3.0     2.3     1.3
     85     *******************************     3.9     3.7     3.6     3.5     3.4     3.3     3.1
2.9     2.2     1.3
     90     ************************************     3.6     3.5     3.4     3.3     3.2     3.1
2.8     2.2     1.2
     95     ************************************     3.5     3.4     3.3     3.2     3.1     3.0
2.7     2.1     1.2
    100     ************************************     3.5     3.4     3.2     3.1     3.0     2.9
2.7     2.1     1.2
    125     ************************************     3.1     3.0     2.9     2.8     2.7     2.6
2.4     1.8     1.1
    150     ********************************************     2.7     2.7     2.6     2.5     2.4
2.2     1.7     1.0
    200     ****************************************************     2.3     2.2     2.1     2.1
1.9     1.5     0.8
    250     ************************************************************     2.0     1.9     1.8
1.7     1.3     0.7
    300     ********************************************************************     1.7     1.7
1.5     1.2     0.7
    350     ************************************************************************     1.6
1.4     1.1     0.6
    400     ******************************************************************************
1.3     1.0     0.6
    450
**************************************************************************************     1.0
 0.6
    500
**************************************************************************************     0.9
 0.5
    750
**********************************************************************************************
 0.4
```

NOTE: FOR CORRECT USAGE OF THESE TABLES PLEASE REFER TO MICRODATA DOCUMENTATION

RESIDENTIAL TELEPHONE SERVICES SURVEY - 0297

Approximate Sampling Variability Tables for PRAIRIES

NUMERATOR OF PERCENTAGE ('000)	ESTIMATED PERCENTAGE										
	0.1%	1.0%	2.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
50.0%	70.0%	90.0%									
1	64.0	63.7	63.4	62.4	60.8	59.0	57.3	55.5	53.6	51.6	49.6
45.3	35.1	20.3									
2	********	45.1	44.8	44.1	43.0	41.8	40.5	39.2	37.9	36.5	35.1
32.0	24.8	14.3									
3	********	36.8	36.6	36.0	35.1	34.1	33.1	32.0	30.9	29.8	28.6
26.1	20.3	11.7									
4	********	31.9	31.7	31.2	30.4	29.5	28.6	27.7	26.8	25.8	24.8
22.6	17.5	10.1									
5	********	28.5	28.4	27.9	27.2	26.4	25.6	24.8	24.0	23.1	22.2
20.3	15.7	9.1									
6	********	26.0	25.9	25.5	24.8	24.1	23.4	22.6	21.9	21.1	20.3
18.5	14.3	8.3									
7	********	24.1	24.0	23.6	23.0	22.3	21.7	21.0	20.3	19.5	18.8
17.1	13.3	7.7									
8	********	22.5	22.4	22.1	21.5	20.9	20.3	19.6	18.9	18.3	17.5
16.0	12.4	7.2									
9	********	21.2	21.1	20.8	20.3	19.7	19.1	18.5	17.9	17.2	16.5
15.1	11.7	6.8									
10	********	20.2	20.0	19.7	19.2	18.7	18.1	17.5	16.9	16.3	15.7
14.3	11.1	6.4									
11	********	19.2	19.1	18.8	18.3	17.8	17.3	16.7	16.2	15.6	15.0
13.7	10.6	6.1									
12	********	18.4	18.3	18.0	17.5	17.0	16.5	16.0	15.5	14.9	14.3
13.1	10.1	5.8									
13	********	17.7	17.6	17.3	16.9	16.4	15.9	15.4	14.9	14.3	13.8
12.6	9.7	5.6									
14	********	17.0	16.9	16.7	16.2	15.8	15.3	14.8	14.3	13.8	13.3
12.1	9.4	5.4									
15	********	16.5	16.4	16.1	15.7	15.2	14.8	14.3	13.8	13.3	12.8
11.7	9.1	5.2									
16	********	15.9	15.9	15.6	15.2	14.8	14.3	13.9	13.4	12.9	12.4
11.3	8.8	5.1									
17	********	15.5	15.4	15.1	14.7	14.3	13.9	13.5	13.0	12.5	12.0
11.0	8.5	4.9									
18	********	15.0	14.9	14.7	14.3	13.9	13.5	13.1	12.6	12.2	11.7
10.7	8.3	4.8									
19	**********	14.5	14.3	13.9	13.5	13.1	12.7	12.3	11.8	11.4	
10.4	8.0	4.6									
20	**********	14.2	14.0	13.6	13.2	12.8	12.4	12.0	11.5	11.1	
10.1	7.8	4.5									
21	**********	13.8	13.6	13.3	12.9	12.5	12.1	11.7	11.3	10.8	
9.9	7.7	4.4									
22	**********	13.5	13.3	13.0	12.6	12.2	11.8	11.4	11.0	10.6	
9.7	7.5	4.3									
23	**********	13.2	13.0	12.7	12.3	11.9	11.6	11.2	10.8	10.3	
9.4	7.3	4.2									
24	**********	12.9	12.7	12.4	12.1	11.7	11.3	10.9	10.5	10.1	
9.2	7.2	4.1									
25	**********	12.7	12.5	12.2	11.8	11.5	11.1	10.7	10.3	9.9	
9.1	7.0	4.1									
30	**********	11.6	11.4	11.1	10.8	10.5	10.1	9.8	9.4	9.1	
8.3	6.4	3.7									

```
     35      ****************    10.7    10.6    10.3    10.0     9.7     9.4     9.1     8.7     8.4
7.7     5.9     3.4
     40      ************************     9.9     9.6     9.3     9.1     8.8     8.5     8.2     7.8
7.2     5.5     3.2
     45      ************************     9.3     9.1     8.8     8.5     8.3     8.0     7.7     7.4
6.8     5.2     3.0
     50      ************************     8.8     8.6     8.4     8.1     7.8     7.6     7.3     7.0
6.4     5.0     2.9
     55      ************************     8.4     8.2     8.0     7.7     7.5     7.2     7.0     6.7
6.1     4.7     2.7
     60      ************************     8.1     7.8     7.6     7.4     7.2     6.9     6.7     6.4
5.8     4.5     2.6
     65      ************************     7.7     7.5     7.3     7.1     6.9     6.6     6.4     6.2
5.6     4.4     2.5
     70      ************************     7.5     7.3     7.1     6.8     6.6     6.4     6.2     5.9
5.4     4.2     2.4
     75      ************************     7.2     7.0     6.8     6.6     6.4     6.2     6.0     5.7
5.2     4.1     2.3
     80      ************************     7.0     6.8     6.6     6.4     6.2     6.0     5.8     5.5
5.1     3.9     2.3
     85      ************************     6.8     6.6     6.4     6.2     6.0     5.8     5.6     5.4
4.9     3.8     2.2
     90      ************************     6.6     6.4     6.2     6.0     5.8     5.6     5.4     5.2
4.8     3.7     2.1
     95      ********************************     6.2     6.1     5.9     5.7     5.5     5.3     5.1
4.6     3.6     2.1
    100      ********************************     6.1     5.9     5.7     5.5     5.4     5.2     5.0
4.5     3.5     2.0
    125      ********************************     5.4     5.3     5.1     5.0     4.8     4.6     4.4
4.1     3.1     1.8
    150      ********************************     5.0     4.8     4.7     4.5     4.4     4.2     4.1
3.7     2.9     1.7
    200      ****************************************     4.2     4.1     3.9     3.8     3.7     3.5
3.2     2.5     1.4
    250      ****************************************     3.7     3.6     3.5     3.4     3.3     3.1
2.9     2.2     1.3
    300      ************************************************     3.3     3.2     3.1     3.0     2.9
2.6     2.0     1.2
    350      ************************************************     3.1     3.0     2.9     2.8     2.7
2.4     1.9     1.1
    400      ********************************************************     2.8     2.7     2.6     2.5
2.3     1.8     1.0
    450      ********************************************************     2.6     2.5     2.4     2.3
2.1     1.7     1.0
    500      ****************************************************************     2.4     2.3     2.2
2.0     1.6     0.9
    750      ****************************************************************************************
1.7     1.3     0.7
   1000
*********************************************************************************************     1.1
 0.6
   1500
*****************************************************************************************************
 0.5
```

NOTE: FOR CORRECT USAGE OF THESE TABLES PLEASE REFER TO MICRODATA DOCUMENTATION

RESIDENTIAL TELEPHONE SERVICES SURVEY - 0297

Approximate Sampling Variability Tables for CANADA

NUMERATOR OF PERCENTAGE ('000)	ESTIMATED PERCENTAGE										
	0.1%	1.0%	2.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
50.0%	70.0%	90.0%									
1	75.6	75.2	74.8	73.7	71.7	69.7	67.6	65.5	63.2	60.9	58.6
53.5	41.4	23.9									
2	53.4	53.2	52.9	52.1	50.7	49.3	47.8	46.3	44.7	43.1	41.4
37.8	29.3	16.9									
3	43.6	43.4	43.2	42.5	41.4	40.2	39.0	37.8	36.5	35.2	33.8
30.9	23.9	13.8									
4	37.8	37.6	37.4	36.8	35.9	34.8	33.8	32.7	31.6	30.5	29.3
26.7	20.7	12.0									
5	33.8	33.6	33.5	33.0	32.1	31.2	30.2	29.3	28.3	27.3	26.2
23.9	18.5	10.7									
6	30.8	30.7	30.6	30.1	29.3	28.5	27.6	26.7	25.8	24.9	23.9
21.8	16.9	9.8									
7	28.6	28.4	28.3	27.8	27.1	26.3	25.6	24.7	23.9	23.0	22.1
20.2	15.6	9.0									
8	26.7	26.6	26.5	26.0	25.4	24.6	23.9	23.1	22.4	21.5	20.7
18.9	14.6	8.5									
9	25.2	25.1	24.9	24.6	23.9	23.2	22.5	21.8	21.1	20.3	19.5
17.8	13.8	8.0									
10	23.9	23.8	23.7	23.3	22.7	22.0	21.4	20.7	20.0	19.3	18.5
16.9	13.1	7.6									
11	22.8	22.7	22.6	22.2	21.6	21.0	20.4	19.7	19.1	18.4	17.7
16.1	12.5	7.2									
12	********	21.7	21.6	21.3	20.7	20.1	19.5	18.9	18.3	17.6	16.9
15.4	12.0	6.9									
13	********	20.9	20.8	20.4	19.9	19.3	18.8	18.2	17.5	16.9	16.2
14.8	11.5	6.6									
14	********	20.1	20.0	19.7	19.2	18.6	18.1	17.5	16.9	16.3	15.6
14.3	11.1	6.4									
15	********	19.4	19.3	19.0	18.5	18.0	17.5	16.9	16.3	15.7	15.1
13.8	10.7	6.2									
16	********	18.8	18.7	18.4	17.9	17.4	16.9	16.4	15.8	15.2	14.6
13.4	10.4	6.0									
17	********	18.2	18.2	17.9	17.4	16.9	16.4	15.9	15.3	14.8	14.2
13.0	10.0	5.8									
18	********	17.7	17.6	17.4	16.9	16.4	15.9	15.4	14.9	14.4	13.8
12.6	9.8	5.6									
19	********	17.3	17.2	16.9	16.5	16.0	15.5	15.0	14.5	14.0	13.4
12.3	9.5	5.5									
20	********	16.8	16.7	16.5	16.0	15.6	15.1	14.6	14.1	13.6	13.1
12.0	9.3	5.3									
21	********	16.4	16.3	16.1	15.6	15.2	14.8	14.3	13.8	13.3	12.8
11.7	9.0	5.2									
22	********	16.0	16.0	15.7	15.3	14.9	14.4	14.0	13.5	13.0	12.5
11.4	8.8	5.1									
23	********	15.7	15.6	15.4	15.0	14.5	14.1	13.7	13.2	12.7	12.2
11.1	8.6	5.0									

24	********	15.4	15.3	15.0	14.6	14.2	13.8	13.4	12.9	12.4	12.0	10.9	8.5	4.9
25	********	15.0	15.0	14.7	14.3	13.9	13.5	13.1	12.6	12.2	11.7	10.7	8.3	4.8
30	********	13.7	13.7	13.5	13.1	12.7	12.3	12.0	11.5	11.1	10.7	9.8	7.6	4.4
35	********	12.7	12.6	12.5	12.1	11.8	11.4	11.1	10.7	10.3	9.9	9.0	7.0	4.0
40	********	11.9	11.8	11.6	11.3	11.0	10.7	10.4	10.0	9.6	9.3	8.5	6.5	3.8
45	********	11.2	11.2	11.0	10.7	10.4	10.1	9.8	9.4	9.1	8.7	8.0	6.2	3.6
50	********	10.6	10.6	10.4	10.1	9.9	9.6	9.3	8.9	8.6	8.3	7.6	5.9	3.4
55	********	10.1	10.1	9.9	9.7	9.4	9.1	8.8	8.5	8.2	7.9	7.2	5.6	3.2
60	********	9.7	9.7	9.5	9.3	9.0	8.7	8.5	8.2	7.9	7.6	6.9	5.3	3.1
65	********	9.3	9.3	9.1	8.9	8.6	8.4	8.1	7.8	7.6	7.3	6.6	5.1	3.0
70	********	9.0	8.9	8.8	8.6	8.3	8.1	7.8	7.6	7.3	7.0	6.4	4.9	2.9
75	********	8.7	8.6	8.5	8.3	8.0	7.8	7.6	7.3	7.0	6.8	6.2	4.8	2.8
80	********	8.4	8.4	8.2	8.0	7.8	7.6	7.3	7.1	6.8	6.5	6.0	4.6	2.7
85	********	8.2	8.1	8.0	7.8	7.6	7.3	7.1	6.9	6.6	6.4	5.8	4.5	2.6
90	********	7.9	7.9	7.8	7.6	7.3	7.1	6.9	6.7	6.4	6.2	5.6	4.4	2.5
95	********	7.7	7.7	7.6	7.4	7.2	6.9	6.7	6.5	6.3	6.0	5.5	4.2	2.5
100	********	7.5	7.5	7.4	7.2	7.0	6.8	6.5	6.3	6.1	5.9	5.3	4.1	2.4
125	**********	6.7	6.6	6.4	6.2	6.0	5.9	5.7	5.5	5.2	4.8	3.7	2.1	
150	**********	6.1	6.0	5.9	5.7	5.5	5.3	5.2	5.0	4.8	4.4	3.4	2.0	
200	**********	5.3	5.2	5.1	4.9	4.8	4.6	4.5	4.3	4.1	3.8	2.9	1.7	
250	**********	4.7	4.5	4.4	4.3	4.1	4.0	3.9	3.7	3.4	2.6	1.5		
300	**********	4.3	4.1	4.0	3.9	3.8	3.7	3.5	3.4	3.1	2.4	1.4		
350	**********	3.9	3.8	3.7	3.6	3.5	3.4	3.3	3.1	2.9	2.2	1.3		
400	**********	3.7	3.6	3.5	3.4	3.3	3.2	3.0	2.9	2.7	2.1	1.2		
450	**********	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.5	2.0	1.1		
500	**********	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.4	1.9	1.1		
750	**********	2.6	2.5	2.5	2.4	2.3	2.2	2.1	2.0	1.5	0.9			
1000	**********	2.3	2.2	2.1	2.1	2.0	1.9	1.9	1.7	1.3	0.8			

```
   1500      ************************************     1.8      1.7      1.7      1.6      1.6      1.5
1.4      1.1      0.6
   2000      *******************************************     1.5      1.5      1.4      1.4      1.3
1.2      0.9      0.5
   3000      ************************************************************     1.2      1.1      1.1
1.0      0.8      0.4
   4000      ********************************************************************     1.0      0.9
0.8      0.7      0.4
   5000      ***************************************************************************************
0.8      0.6      0.3
   6000
*****************************************************************************************************     0.5
 0.3
   7000
*****************************************************************************************************     0.5
 0.3
   8000
*****************************************************************************************************     0.5
 0.3
   9000
*****************************************************************************************************
 0.3
  10000
*****************************************************************************************************
 0.2
```

NOTE: FOR CORRECT USAGE OF THESE TABLES PLEASE REFER TO MICRODATA DOCUMENTATION

11.0

Since the Residential Telephone Service Survey used a sub-sample of the LFS sample, the derivation of weights for the survey records is clearly tied to the weighting procedure used for the LFS. The LFS weighting procedure is briefly described below.

11.1 Weighting Procedures for the LFS

In the LFS, the final weight attached to each record is the product of the following factors: the basic weight, the cluster sub-weight, the balancing factor for non-response, and the province-age-sex ratio adjustment factor. Each is described below.

Basic Weight

In a probability sample, the sample design itself determines weights which must be used to produce unbiased estimates of the population. Each record must be weighted by the inverse of the probability of selecting the person to whom the record refers. In the example of a 2% simple random sample, this probability would be .02 for each person and the records must be weighted by 1/.02=50. Because all eligible individuals in a dwelling are interviewed (directly or by proxy), this probability is essentially the same as the probability with which the dwelling is selected.

Cluster Sub-weight

The cluster delineation is such that the number of dwellings in the sample increases very slightly with moderate growth in the housing stock. Substantial growth can be tolerated in an isolated cluster before the additional sample represents a field collection problem. However, if growth takes place in more than one cluster in an interviewer assignment, the cumulative effect of all increases may create a workload problem. In clusters where substantial growth has taken place, sub-sampling is used as a means of keeping interviewer assignments manageable. The cluster sub-weight represents the inverse of this sub-sampling ratio in clusters where sub-sampling has occurred.

Non-response

Notwithstanding the strict controls of the LFS, some non-response is inevitable, despite all the efforts made by the interviewers. The LFS non-response rate is approximately 5%. For certain types of non-response (eg. household temporarily absent, refusal), data from a previous month's interview with the household if any, is brought forward and used as the current month's data for the household.

In other cases, non-response is compensated for by proportionally increasing the weights of responding households. The weight of each responding record is increased by the ratio of the number of households that should have been interviewed, divided by the number that were actually interviewed. This adjustment is done separately for non-response areas, which are defined by employment insurance region, type of area, and rotation group. It is based on the assumption that the households that have been interviewed represent the characteristics of those that should have been interviewed. To the extent that this assumption is not true, the estimates will be somewhat biased.

LFS Sub-Weight

The product of the previously described weighting factors is called the LFS sub-weight. All members of the same sampled dwelling have the same sub-weight. Therefore, when calculating a household subweight, we use the subweight of one record (or person) from the household.

Sub-provincial and Province-Age-Sex Adjustments

The sub-weight can be used to derive a valid estimate of any characteristic for which information is collected by the LFS. In particular, estimates are produced of the total number of persons 15+ in provincial economic regions and the 24 large metropolitan areas as well as of designated age-sex groups in each of the ten provinces.

Independent estimates are available monthly for various age and sex groups by province. These are population projections based on the most recent Census data, records of births and deaths, and estimates of migration. In the final step, this auxiliary information is used to transform the sub-weight into the final weight. This is done using a calibration method. This method ensures that the final weights it produces sum to the census projections for the auxiliary variables, namely various age-sex groups, economic regions, census metropolitan areas, and rotation groups.

This weighting procedure ensures consistency with external Census counts and that each rotation group is representative of the population, and also ensures that every member of the economic family is assigned the same weight.

11.2 Weighting Procedures for the Residential Telephone Service Survey

The principles behind the calculation of the weights for the Residential Telephone Service Survey are nearly identical to those for the LFS. However, this survey is a household-weighted survey, not a person-weighted survey. Also, further adjustments are made to the LFS weights in order to derive a final weight for the individual records on the Residential Telephone Service Survey microdata file.

(1) An adjustment to account for the use of a five-sixths sub-sample, instead of the full LFS sample.

(2) An adjustment to account for the additional non-response to the supplementary survey, i.e., non-response to the Residential Telephone Service Survey for individuals who did respond to the LFS or for which previous month's LFS data was brought forward.

(3) A readjustment to account for independent province-stratum projections, after the above adjustments are made. These province-stratum totals are simply the final weighted province-stratum totals from the LFS. Note that a stratum roughly corresponds to an EIR-ER region (described in section 5.2.2).

Adjustments (1) and (2) are taken into account by multiplying the LFS sub-weight for each responding Residential Telephone Service Survey record by:

$$\frac{\textit{sum of LFS subweights from each household responding to LFS}}{\textit{sum of LFS subweights from each household responding to the RTSS}}$$

to obtain a non-response adjusted Residential Telephone Service Survey sub-weight (WEIGHT1).

Adjustment (3) is calculated by multiplying WEIGHT1 for each Residential Telephone Service Survey respondent by :

$$\frac{\textit{population total for province–stratum } i}{\textit{sum of WEIGHT1 for survey respondents in province–stratum } i}$$

to give the resulting weight (FINWT), which is the final weight which appears on the Residential Telephone Service Survey microdata file.

Calibration Estimation Adjustments

The weights for each respondent were adjusted in Adjustment 3 by an iterative process using a calibrated estimation procedure. This procedure ensured that estimates produced for a province-stratum group would agree with the population totals for that province-stratum group. This adjustment was made by using a two-stage iterative weighting procedure, each time using the weight obtained from the previous step, until the set of estimates agreed with the LFS population totals (which were created using Census population projections). The final statistical weight can be found in the "WEIGHT" field on the microdata file. Note that this field has a decimal and should be read as (99999V9999) where V represents the location of the decimal place.

12.0 Questionnaires and Code Sheets

The Residential Telephone Service Survey questionnaire was used in February 1997 to collect the information for the supplementary survey.

RTSI01

This is a voluntary survey to determine how many households have telephones.

RTSQ01A

How many different telephone numbers are there for your residence? %LFSMAIL ADDR%
(Include cellular phone numbers and phone numbers used for business).

<1> 0 . . . . . go to RTSQ02
<2> 1 . . . . . go to RTSQ05
<3> 2 or more . . . . . go to RTSQ05
<7> Don't know . . . . . go to RTSQ05
<8> Refused . . . . . go to RTSQ05

Note: F1 HELP: Include: phone numbers used for businesses even if the business is not within the residence or if the employer is paying for the person's phone service within that person's household. This includes cell phones from work that are brought home. Exclude pagers.

RTSQ02

Why don't you have a phone?

Interviewer: DO NOT READ THE CATEGORIES. MARK ONE ONLY.

<1> I cancelled it . . . . . go to RTSQ03
<2> Can't afford it . . . . . go to RTSQ04
<3> Moved . . . . . go to RTSQ05
<4> All other responses . . . . . go to RTSQ05
<7> Don't know . . . . . go to RTSQ05
<8> Refused . . . . . go to RTSQ05

Note: F1 NOTES: The following answers should be coded to "Can't afford it": Too expensive, Can't afford the phone, Unpaid phone bills, Service cancelled by the phone company, Moved and can't afford the installation price, Lost job, Unemployed, I'm on... (any form of social assistance), etc. The following answers should be coded to "Moved": Respondent moved, on vacation, going south for the winter, moved and don't want/need the phone anymore etc. The following answers should be coded to "Any other response": Sharing a phone, receiving harassing calls, getting a private number, hard of hearing, dissatisfied with the phone company, don't want other household members to receive calls, etc.

RTSQ03

Why did you cancel it?
Interviewer: DO NOT READ CATEGORIES

<1> Can't afford it . . . . . go to RTSQ04
<2> Moved . . . . . go to RTSQ05
<3> All other responses . . . . . go to RTSQ05
<7> Don't know . . . . . go to RTSQ05
<8> Refused . . . . . go to RTSQ05

Note: F1 NOTES: The following answers should be coded to "Can't afford it": Too expensive, Can't afford the phone, Unpaid phone bills, Service cancelled by the phone company, Moved and can't afford the installation price, Lost job, Unemployed, I'm on... (any form of social assistance), etc. The following answers should be coded to "Moved": Respondent moved, on vacation, going south for the winter, moved and don't want/need the phone anymore etc. The following answers should be coded to "Any other response": Sharing a phone, receiving harassing calls, getting a private number, hard of hearing, dissatisfied with the phone company, don't want other household members to receive

calls, etc.

RTSQ04

What part of your telephone charges do you find difficult to afford...
INTERVIEWER: MARK ALL THAT APPLY

<1> the local basic monthly rate
<2> the installation charge
<3> all the other charges including long distance telephone charges
<7> Don't know
<8> Refused

Note: Other charges besides long distance phone charges include options and displays (such as call answer, call waiting etc.)

RTSQ05

In YY-1, what was your total annual household income before tax? Was it...

<1> Less than $10,000
<2> Between $10,000 and $15,000
<3> Over $15,000

RTSQ06

Thank you for your cooperation.

13.0

Record Layout and Univariates

Record Layout - RESIDENTIAL TELEPHONE SERVICES SURVEY (0297)

Pos.	Name	Length	Position	Question and variable description	Unweighted	Weighted
@1	***PROV***	***2.***	***01-02***	<10> Newfoundland	1,515	193,695
				<11> Prince Edward Island	1,117	50,856
				<12> Nova Scotia	2,729	357,437
				<13> New Brunswick	2,568	283,506
				<24> Quebec	8,225	3,039,542
				<35> Ontario	11,581	4,208,896
				<46> Manitoba	2,982	432,012
				<47> Saskatchewan	2,569	393,063
				<48> Alberta	3,018	1,043,107
				<59> British Columbia	3,656	1,512,857
@3	***CMA***	***2.***	***03-04***	<00> Non-CMA	27,050	5,060,270
				<01> Halifax	650	133,201
				<02> Quebec	607	305,919
				<03> Montreal	1,671	1,459,586
				<04> Ottawa	661	312,762
				<05> Toronto	1,925	1,586,682
				<06> Kitchener	649	149,758
				<07> Hamilton	538	248,051
				<08> St. Catharines	552	143,606
				<09> London	526	171,485
				<10> Windsor	349	107,741
				<11> Winnipeg	1,530	286,046
				<12> Calgary	662	332,103
				<13> Edmonton	840	337,831
				<14> Vancouver	1,379	739,860
				<15> Victoria	371	140,070
@5	***RTSQ01***	***1.***	***05***	**How many different telephone numbers are there for your residence? (Include cellular phone numbers and phone numbers used for business).**		
				<1> 0	891	210,356
				<2> 1	32,849	9,428,784
				<3> 2 or more	6,220	1,875,831

Pos.	Name	Length	Position	Question and variable description	Unweighted	Weighted
@6	***RTSQ02***	***1.***	***06***	**Why don't you have a phone?**		
				<1> I cancelled it	53	13,336
				<2> Can't afford it	540	127,249
				<3> Moved	29	6,962
				<4> All other responses	231	53,814
				<6> Valid skip	39,069	11,304,615
				<7> Don't know	6	1,999
				<8> Refused	32	6,996
@7	***RTSQ03***	***1.***	***07***	**Why did you cancel it?**		
				<1> Can't afford it	30	7,014
				<2> Moved	2	720
				<3> All other responses	20	5,411
				<6> Valid skip	39,907	11,501,635
				<8> Refused	1	190
@8	***RTSQ04-1***	***1.***	***08***	**What part of your telephone charges do you find difficult to afford...**		
				<1> the local basic monthly rate	328	74,162
				<6> Valid skip	39,619	11,435,956
				<7> Don't know	5	2,361
				<8> Refused	8	2,492
@9	***RTSQ04_2***	***1.***	**09**	**What part of your telephone charges do you find difficult to afford...**		
				<2> the installation charge	321	70,991
				<6> Valid skip	39,626	11,439,128
				<7> Don't know	5	2,361
				8> Refused	8	2,492
@10	***RTSQ04_3***	***1.***	***10***	**What part of your telephone charges do you find difficult to afford...**		
				<3> all the other charges including long distance telephone charges	335	75,358
				<6> Valid skip	39,612	11,434,760
				<7> Don't know	5	2,361
				<8> Refused	8	2,492

Pos.	Name	Length	Position	Question and variable description	Unweighted	Weighted
@11	*RTSQ05*	*1.*	*11*	**In 1996, what was your total annual household income before tax? Was it...**		
				<1> Less than $10,000	2,555	705,985
				<2> Between $10,000 and $15,000	4,302	1,100,450
				<3> Over $15,000	31,381	9,224,965
				<7> Don't know	865	241,162
				<8> Refused	857	242,410
@12	*WEIGHT*	*9.4*	*12-20*	Weight - decimal in 5th byte of the field		
@21	*SIZE CODE 1*	*1.*	*21*	**Size of area of residence....**		
				<1> Urban, population of 500,000 or more	9,813	5 ,608,840
				<2> Urban, population of 100,000 - 499,999	9,546	1,830,250
				<3> Urban, population of 30,000 - 99,999	3,641	963,335
				<4> Urban, population of 15,000 - 29,999	2,194	385,530
				<5> Urban, population under 15,000	5,127	972,746
				<6> Rural areas	9,639	1,754,269
@22	*SIZE CODE 3*	*3.1*	*22-24*	**Size of area of residence....** - used to derive *@21*		
				<1.0> Urban, population of 500,000 or more	9,813	5,608,840
				<2.0> Urban, population of 100,000 - 499,999	9,546	1,830,250
				<3.0> Urban, population of 30,000 - 99,999	3,641	963,335
				<4.0> Urban, population of 15,000 - 29,999	2,194	385,530
				<5.1> Urban, population of 2,500 - 14,999	4,100	785,230
				<5.2> Urban, population under 2,500	1,027	187,516
				<6.0> Rural areas	9,639	1,754,269
				****** suppressed on the microdata file ******		
@25	*REALUSER*	*15.*	*25-39*	Case identifier ****** suppressed on the microdata file ******		
@40	*REPLICATE*	*2.*	*40-41*	Variable used for variance estimation ****** suppressed on the microdata file ******		