

1990 Census of Population and Housing Public Use Microdata Samples (PUMS): Puerto Rico Technical Documentation

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CENSUS '90



1990 Census of
Population and Housing

**Public Use
Microdata
Samples**
Puerto Rico

TECHNICAL
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The Decennial Planning Division, **Susan M. Miskura**, Chief, coordinated and directed all census operations. **Patricia A. Berman**, Assistant Division Chief for Content and Data Products, and **Lourdes N. Flaim**, Chief, Puerto Rico and Outlying Areas Branch, developed, directed, and coordinated the 1990 Census of Puerto Rico. Other assistant division chiefs were **Robert R. Bair**, **Rachel F. Brown**, **James L. Dinwiddie**, **Allan A. Stephenson**, and **Edwin B. Wagner, Jr.** The following other branch chiefs made significant contributions: **Cheryl R. Landman**, **Adolfo L. Paez**, **A. Edward Pike**, and **William A. Starr**. Other important contributors were **Julia Buckley-Ess**, **Ada Costa-Cash**, **Idabelle B. Hovland**, **Ivonne Pabón-Marrero**, **Abraham A. Piceno**, and **Gloria J. Porter**.

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1990 Census of
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DOCUMENTATION**

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Ronald H. Brown, Secretary
Economics and Statistics Administration
BUREAU OF THE CENSUS
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Economics and Statistics Administration



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For additional information concerning the technical documentation or file content, contact Data User Services Division, Microdata Access Branch, Bureau of the Census, Washington, DC 20233. Telephone: 301-763-2005.

CONTENTS

	Page
Abstract-----	AB-1
Introduction-----	1-1
How to Use This File-----	2-1
Accuracy of the Microdata Sample Estimates-----	3-1
Sample Design and Estimation-----	4-1

Record Contents-----	5-1
Indexes to Variables-----	5-1
Data Dictionary-----	5-10

User Notes-----	6-1
-----------------	-----

APPENDIXES

A. Area Classifications-----	A-1
B. Definitions of Subject Characteristics-----	B-1
C. Notes on Selected Data Items-----	C-1
D. Collection and Processing Procedures-----	D-1
E. Facsimiles of Respondent Instructions and Questionnaire Pages-----	E-1
F. Data Products and User Assistance-----	F-1
G. Maps-----	G-1
H. Record Layout of Machine-Readable Data Dictionary-----	H-1
I. Code Lists-----	I-1

ABSTRACT

Citation-----	AB-1
File Availability-----	AB-3
Geographic Coverage-----	AB-2
Related Electronic Media Products-----	AB-2
Related Printed Reports-----	AB-2
Related Reference Materials-----	AB-2
Software Considerations-----	AB-3
Subject Matter Description-----	AB-1
Technical Description-----	AB-3
Type of File-----	AB-1
Universe Description-----	AB-1

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-Washington: The Bureau [producer and distributor], 1993.

TYPE OF FILE

Microdata

UNIVERSE DESCRIPTION

All persons and housing units in Puerto Rico.

SUBJECT MATTER DESCRIPTION

Public Use Microdata Samples (PUMS) contain records representing 5% or 1% samples of the housing units in Puerto Rico and the persons in them. Selected group quarters persons are also included. The file contains individual weights for each person and housing unit which, when applied to the individual records, expand the sample to the total population. Most population and housing items are listed below. Please see the Data Dictionary for a complete listing of variables and recodes. Both the 5% and 1% samples have the same subject content and vary only in geographic composition of the Public Use Microdata Area (PUMA).

Items on the housing record include:

Air Conditioning	Condition of Housing Unit
Allocation Flags for Housing	Condominium Status
Items	Contract Rent
Bathrooms	Cost of Utilities
Bedrooms	Family Income in 1989

The user should note that there are limitations to many of these data. Please refer to the technical documentation provided with the Public Use Microdata Samples for a further explanation on the limitations of the data.

Family, Subfamily and	Sewage Disposal
Relationship Recodes	Source of Water
Farm Status and Value	Telephone in Housing Unit
Fire, Hazard, Flood Insurance	Tenure
Cooking Fuel	Type of Construction
Gross Rent	Units in Structure
Household Income in 1989	Utilities
Household Type	Vacancy Status
Housing Unit Weight	Vehicles Available
Kitchen Facilities	Year Housholder Moved into Unit
Mortgage Status and Selected	Year Structure Built
Monthly Owner Costs	
Plumbing Facilities	
Presence of Subfamilies in	
Household	
Property Value	
Real Estate Taxes	
Rooms	

Items on the person record include:

Ability to Speak English	Migration (State)
Ability to Speak Spanish	Military Status, Periods of Active Duty Military Service, Veteran Period of Service
Age	Mobility Status
Allocation Flags for Population Items	Mother's Place of Birth
Children Ever Born	Occupation
Citizenship	Person's Weight
Class of Worker	Personal Care Limitation
Disability Status	Place of Birth
Educational Attainment	Place of Work (PUMA)
Father's Place of Birth	Place of Work (State)
Hours Worked in 1989	Poverty Status in 1989
Income in 1989 by Type	Presence and Age of Own Children
Industry	Relationship
Literacy	
Marital Status	
Means of Transportation	
Migration (PUMA)	

School Enrollment and	Weeks Worked in 1989
Type of School	Work Status in 1989
Time of Departure for Work	Work Limitations Status
Travel Time to Work	Year of Entry
Vehicle Occupancy	
Vocational Training	

GEOGRAPHIC COVERAGE

Each PUMS file provides records for Puerto Rico and many of its geographic levels. The hierarchy is shown below: The 5% sample identifies various subdivisions of the commonwealth called "Public Use Microdata Areas", each with at least 100,000 persons. These PUMAs were primarily based on municipios, and may be whole municipios, groups of municipios, and places. When these entities have more than 200,000 persons, PUMAs can represent parts of municipios, places, etc.

On the other hand, the 1% sample was based primarily on metropolitan/nonmetropolitan areas, and contains PUMAs which were made from whole central cities, whole MSAs or PMSAs, MSA or PMSAs outside the central city, groups of MSAs or PMSAs, and groups of areas outside MSAs or PMSAs. When the areas have more than 200,000 persons, 1% PUMAs can represent parts of central cities, MSA/PMSAs, and so forth. See examples of PUMAs in figure 2-4.

RELATED PRINTED REPORTS

Since individual weights are provided on PUMS, most estimates derived from PUMS tabulations can be checked for reasonableness against other 1990 printed reports, STF's or microfiche produced from sample data.

Listed below are the 1990 census printed reports for Puerto Rico containing sample data from summary tape products STF 3 and STF 4 which may be used to verify estimates provided from PUMS files. These reports will be available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. An order form follows this abstract.

1990 CPH-3-53, *Population and Housing Characteristics for Census Tracts and Block Numbering Areas*. One report will be published for each metropolitan area (MA) and one for the non-metropolitan balance of Puerto Rico showing data for most of the population and housing subjects included in the 1990 census. Some tables will be based on the 100-percent tabulations, others on the sample tabulations.

1990 CPH-5-53, *Summary Social, Economic, and Housing Characteristics*. Provides sample population and housing data for Puerto Rico, its municipios, barrios-pueblo and barrios, subbarrios, and places.

1990 CP-2-53, *Social and Economic Characteristics*. Focuses on the population subjects collected on a sample basis in 1990. Data are shown for Puerto Rico, its municipios, MAS, UAs; barrios-pueblo and barrios, subbarrios, and places of 2,500 or more inhabitants, and summary geographic areas.

1990 CH 2-53, *General Housing Characteristics*. Presents statistics on housing subjects collected on a sample basis in 1990 for Puerto Rico, its municipios; MAS; UAs; barrios-pueblo and barrios, subbarrios, and places of 2,500 or more inhabitants; and summary geographic areas.

RELATED ELECTRONIC MEDIA PRODUCTS

PUMS data on compact disk-read only memory (CD-ROM) are issued after all the tape files are released. CENDATA, the Census Bureau's online system, carries PUMS Technical Documentation. STF 3 data also will be available on CD-ROM. Contact Customer Services (301-763-4100) for additional information on electronic media products.

FILE AVAILABILITY

Information on the PUMS files for Puerto Rico are available from Customer Services, Data User Services Division, Bureau of the Census, Washington, DC 20233. (See above for phone and FAX information.) A machine-readable data dictionary is included on the tape without charge. Options include 6250 or 1600 bpi, ASCII or EBCDIC, labeled or unlabeled. The files are also available on tape cartridges (IBM3480 or compatible format) for the same price. When ordering, please use the order form at the end of this Chapter.

RELATED REFERENCE MATERIALS

1990 Census Population and Housing Tabulation and Publication Program for Puerto Rico. This booklet provides descriptions of the data products available from the 1990 census of Puerto Rico. Available without charge from Customer Services (see above).

Census '90 Basics. This booklet provides a general overview of census activities and detailed information on census content, geographic areas, and products. Available without charge from Customer Services (see above).

Census ABC's-Applications in Business and Community. This booklet highlights key information about the 1990 census and illustrates a variety of ways the data can be used. Available without charge from Customer Services (see above).

A comprehensive *1990 Census of Population and Housing Guide* is available. It provides detailed information about all aspects of the census, a comprehensive glossary of census terms, and an index to summary tape files. Contact Customer Services for ordering information.

TECHNICAL DESCRIPTION

The file contains two record types a "housing" record and a "person" record each consisting of 233 characters of data. Each housing unit record is followed by a variable number of persons records, one for each occupant. Vacant housing units will have no person record, and selected persons in group quarters will have a dummy housing record and a person record.

The 5% (A) sample and the 1% (B) sample are on separate files. The block size for the files varies with each user's specifications, however the standard block size is 32,387 characters for 1990 PUMS.

SOFTWARE CONSIDERATIONS

The 1990 Public Use microdata files are a special type of nonrectangular file-hierarchical. That is, the file contains several record types each with different variables, rather than one gigantic record with all the variables. We release the PUMS in this format because of the tremendous amount of data contained in one record. The file is sorted to maintain the relationship between both record types.

Although these records are extremely large they can be handled by most statistical or report writing software. There are two basic record types: the housing unit record and the person record. For 1990, each of the records contains a serial number which links the persons in the housing unit to the proper housing unit record, so that a user no longer needs to worry about keeping the record sequence as the file was delivered.

In today's information processing environment, most standard statistical software packages are now capable of handling the file in either format: hierarchical or rectangular structure. Most software packages, such as SAS, SPSS, BMDP, and some relational data base systems, will in fact

rectangularize hierarchical files. Further, the manuals accompanying most packages contain samples of code showing how to process the files. Several of the packages also have extract procedures already coded into the software.

The 1990 PUMS will be accompanied by electronic data dictionaries in a format which will allow the user to read in ASCII characters and prepare statements transforming the variables and their corresponding descriptions and values to the proper statements required by the software package of choice.

The files will be ASCII, with no special software appended, so as to be compatible with most software packages. But the technical documentation will include a section on "how to use this file", where software concerns will be addressed. The user must be familiar with the processing system's limitations and the efficiency of the procedures within the software packages.

Users may also write their own code enabling them to perform custom tabulations on their system of choice.

Order Form : 1990 Public Use Microdata Samples for Guam, Puerto Rico, and the U.S. Virgin Islands on Computer Tape**Product Overview**

The 1990 Public Use Microdata Samples (PUMS) for Guam, Puerto Rico, and the U.S. Virgin Islands contain individual records of responses to questionnaires with unique identifiers (names, addresses, etc.) removed so that the confidentiality of respondents is protected. These files, on computer tape, enable users to produce their own tabulations within the limits of the data provided. For 1990, the Bureau will produce PUMS for those outlying areas which meet a 100,000 minimum population size threshold. Currently, the standard PUMS products are 5% and 1% samples for Puerto Rico, and 10% samples for Guam and the U.S. Virgin Islands. There were no 1980 PUMS for Guam and the U.S. Virgin Islands. Besides obvious differences in sample size, the 5% and 1% files for Puerto Rico differ in geography. For example, the Public Use Microdata Area (PUMA) in the 5% file is basically a municipio level file; that is the PUMA can be a single (or group of) municipios, a place, or municipio place parts if it had 200,000 or more persons. The 1% sample is basically a metropolitan/non-metropolitan area file. For this, the PUMA can be either an MSA (or groups or parts), a non-metropolitan area, or a mixed MSA/non-MSA area.

The PUMS files for Guam and the U.S. Virgin Islands do not contain any PUMAs as the population in both areas are fewer than 200,000. The file structure of all PUMS files is hierarchical, with special features to aid in their use with commercial/existing software packages. While no "value-added" user software will be provided by the Census Bureau, the technical documentation will include a section with suggestions and pointers on how to use these files. All PUMS files have two record types, one for housing units, and one for persons.

Product Order Form Checklist

Yes, Please send:

Guam ☐ 10% (\$175);

Puerto Rico ☐ 5% (\$175) and/or Puerto Rico ☐ 1% (\$175);

U.S. Virgin Islands ☐ 10% (\$175); PUMS Files on computer tape.

Note: The PUMS files for Guam and the U.S. Virgin Islands will also be available on flexible diskette in the near future. Price and availability to be determined.

Customer Typology

To enable us to learn more about our customers, please check from among the following:

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Also, if your organization is associated with the Census Bureau, please check one of the following:

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Do you work in your library?

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Fax

Important: When ordering PUMS on computer tape only, please specify the format of choice.

Density:

☐ 6250 BPI

☐ 1600 BPI

Translation coding:

☐ EBCDIC

☐ ASCII

Labeling:

☐ Standard IBM Label

☐ Unlabeled

Or, you may select:

☐ IBM 3480 Tape Cartridge

To be completed by customer:

Total this Order: _____

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☐ VISA or MasterCard Account:

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CHAPTER 1. INTRODUCTION

OVERVIEW

Public-use microdata samples are computer accessible files which contain records for a sample of housing units, with information on the characteristics of each unit and the people in it. We exclude information which would identify a household or an individual in order to protect the confidentiality of respondents. Within the limits of the sample size and geographic detail, these files allow users to prepare virtually any tabulations they require.

Separate public-use microdata samples are available, each representing five percent or one percent of the population and housing of Puerto Rico:

- o 5% Sample, identifying most municipios with 100,000 or more inhabitants;
- o 1% Sample, identifying MAs with 100,000 or more inhabitants.

WHAT IS MICRODATA?

We provide computer accessible data products in several formats as summary data or as microdata. Summary data are the type of data found in census printed reports, summary tape files, microfiche, and most special tabulations; microdata are the information collected from each person and housing unit on the questionnaire.

In summary data, the basic unit of analysis is a specific geographic area (for example, a census tract, municipio or the commonwealth) for which counts of persons or housing units (or aggregated data) in particular categories are provided. In microdata, the basic unit is an individual housing unit and the persons who live in it. Figure 1 illustrates the basic distinctions between summary data and microdata.

Often, there are two types of microdata: Confidential microdata include the census basic record types, computerized versions of the questionnaires collected from households, as coded and edited during census processing. The Census Bureau tabulates these confidential microdata in order to produce the summary data that go into the various reports, summary tape files (STFs), and special tabulations.

Public-use microdata samples are extracts from the confidential microdata taken in a manner that avoids disclosure of information about identifiable households or individuals.

PROTECTING CONFIDENTIAL INFORMATION

All data released (in print or electronic media) by the Bureau of the Census are subject to strict confidentiality measures imposed by the legislation under which our data are collected: Title 13, U.S. Codes which protects the confidentiality of individual respondents. Responses to the questionnaire can be used only for statistical purposes, and Census Bureau employees are sworn to protect respondents' identities.

Records on public-use microdata samples are selected after the confidentiality edit is performed, and contain no names or addresses. Also, the Bureau limits the detail (topcodes, recodes) on place of residence, place of work, high incomes, and other selected items to further protect the confidentiality of the records.

Microdata records identify no geographic area with fewer than 100,000 inhabitants. Microdata samples include only a small fraction of the population, drastically limiting the chance that the record of a given individual is even contained in a public-use microdata file, much less identifiable.

Uses Of Microdata Files

Public-use microdata files essentially make possible "do-it-yourself" special tabulations. Since the 1990 files furnish nearly all of the detail recorded on long-form questionnaires in the census, subject to the limitations of sample size and geographic identification, users can construct an infinite variety of tabulations interrelating any desired set of variables. Users have the same freedom to manipulate the data that they would have if they had collected the data in their own sample survey, yet these files offer the precision of census data collection techniques and sample sizes larger than would be feasible in most independent sample surveys.

Microdata samples will be useful to users (1) who are doing research that does not require the identification of specific small geographic areas or detailed cross tabulations for small populations, and (2) who have access to programming and computer time needed to process the samples. Microdata

users frequently study relationships among census variables not shown in existing census tabulations, or concentrate on the characteristics of certain specially defined populations, such as unemployed homeowners or families with four or more children.

SAMPLE DESIGN AND SIZE

The Puerto Rico microdata file is a stratified sample of the population, actually a subsample of the full census sample (approximately 15% of all housing units) that received census long-form questionnaires. Sampling was done housing unit-by-housing unit in order to allow study of family relationships and housing unit characteristics. Sampling of persons in institutions and other group quarters was done on a person-by-person basis. Vacant units were sampled also.

There are two independently drawn samples, designated "5% (A)" and "1% (B)", each featuring a different geographic scheme, as discussed below. Samples from the 1970 and 1960 censuses also employed a 1% sample size, the 5% sample was new for 1980. In Puerto Rico, the 1990 5% Sample gives the user records for over 176,000 persons and over 59,000 housing units. On the other hand, since processing a smaller sample is less expensive, some users will want to produce extracts using the subsample numbers provided in the housing record. Sample design is discussed more thoroughly in chapter 4.

Unlike 1980, each file contains individual weights for both the housing unit and the persons in the unit. The user can estimate the frequency of a particular characteristic for the entire population by summing the weight variables for records with that characteristic from the microdata file. A section of Chapter 4 discusses the preparation and verification of estimates (see page 4-1).

Reliability improves with increases in sample size, so the choice of sample size must represent a balance between the level of precision desired and the resources available for working with microdata files. By using tables provided in chapter 3 (see page 3-2), one can estimate the degree to which sampling error will affect any specific estimate prepared from a microdata file of a particular sample size.

Many factors affect the user's decision on which file to use. Users of microdata files for State or MSA estimates would normally use a 1% or 5% sample, while users concerned only with national figures can frequently get by with a smaller sample, say a 0.1-percent (one-in-a-thousand) sample. **Although we no longer provide the 0.1% file we do provide subsample numbers which allow scientifically**

designed extracts of various sizes to be drawn. Users may need a 1% or a 5% sample if extremely detailed tabulations are needed, or if users are concerned with very small segments of the population, for example, females 75 years old or over.

One of the examples in chapter 3 discusses the selection of the appropriate sample size for a particular study.

SUBJECT CONTENT

Microdata files contain the full range of population and housing information collected in the 1990 census: 500 occupation categories, age by single years up to 90, wages in dollars up to \$60,000 and so forth. Because the samples provide data for all persons living in a sampled household, users can study how characteristics of household members are interrelated (for example, income and educational attainment of husbands and wives).

Information for each housing unit in the sample appears on a 233-character record with geographic and housing items, followed by a variable number of 233-character records with person's information, one record for each member of the household. Items on the housing record are listed beginning on page 5-1; items on the persons record are listed beginning on page -. Although each of the items as collected is further defined in the glossary (reprinted from the 1990 Census Users' Guide) presented as appendix B to this document, it is important to note that we modified several items on the microdata file to provide protection for individual respondents. We also include many transformed variables (recodes), such as those appearing on the STF 3A files, so that users can analyze many complex relationships between records. Data users will frequently want to generate additional variables or develop recodes to meet their individual needs.

While it is impossible to predict all the transformations (recodes) required by data users, we included many of the more common ones (household income, selected monthly owner costs, poverty status, and so forth). Transformations such as these, as well as corrections that apply to certain subjects, are discussed in appendix C.

We edited the sample questionnaires for completeness and consistency, and made substitutions or allocations for any missing data. Allocation flags appear at the end of each record indicating each item which has been allocated. Thus, a user desiring to tabulate only actually observed values can eliminate variables with allocated values. Editing and allocation flags are discussed beginning on page 3-15.

- Basic unit is an identified geographic entity
- Data summarized on people and housing in areas
- Available for small areas

Place	Total population	Occupied housing units	Persons per unit	Renter occupied units	Contract rent		
					Under \$100	\$100-149	\$150-199
Arrozal	554	151	3.43	21	-	-	-
Jacaguas	3,959	1,047	3.52	154	35	35	25
Tejas	2,279	599	3.46	68	6	11	8

- Basic unit is an unidentified housing unit and its occupants
- Unaggregated data to be summarized by the user
- Allows detailed study of relationships among characteristics
- Not available for small areas

	State of residence	PUMA	Persons in household	Telephone	Complete plumbing	Monthly rent	Vehicles	Household type
Housing unit #1	Puerto Rico	Area name or code	3	Yes	Yes	\$525-549	2	Married-couple family

	Housing unit no.	Relationship	Sex	Age	Race	Place of birth	Occupation	Earnings
Person a	1	Householder	M	37	W	Puerto Rico	Plumber	\$28,100
Person b	1	Spouse	F	35	W	Puerto Rico	NA	0
Person c	1	Child	M	6	W	Puerto Rico	NA	0

Housing unit #2	Puerto Rico	Area name or code	1	Yes	Yes	\$650-699	1	Nonfamily householder
Person a	2	Householder	F	62	B	Alabama	Postsecondary economics teacher	\$45,300

Housing unit #3	Puerto Rico	Area name or code	0	N/A	Yes	\$300-324	N/A	Vacant
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INTRODUCTION

GEOGRAPHIC IDENTIFICATION

The 5% and 1% Samples each feature a different geographic scheme: We call the geographic areas PUMAs for Public Use Microdata Areas. We use the term to apply to each of the areas identified on these files. A 5-digit number, unique within the commonwealth, identifies each PUMA. The first three digits is the PUMA code and the last two are the sub-PUMA. The sub-PUMA is used when municipios or metropolitan areas are subdivided by groupings of census tracts. For example, in the 1% file, the PUMAs for San Juan municipio consist of several groups of census tracts numbered from 01201 through 01204, whereas the PUMA numbered 01300 is made up of 3 municipios: Humacao, Juncos, and Las Piedras. The Puerto Rico Planning Board provided the PUMAs for Puerto Rico.

The 5% Sample identifies most municipios, with 100,000 or more inhabitants, many individual cities or groups of places with 100,000 or more inhabitants, and for municipios with at least 200,000 inhabitants groupings of Census tracts are also identified.

Areas with populations under 100,000 have been grouped into reasonable analytic units often equivalent to planning district boundaries.

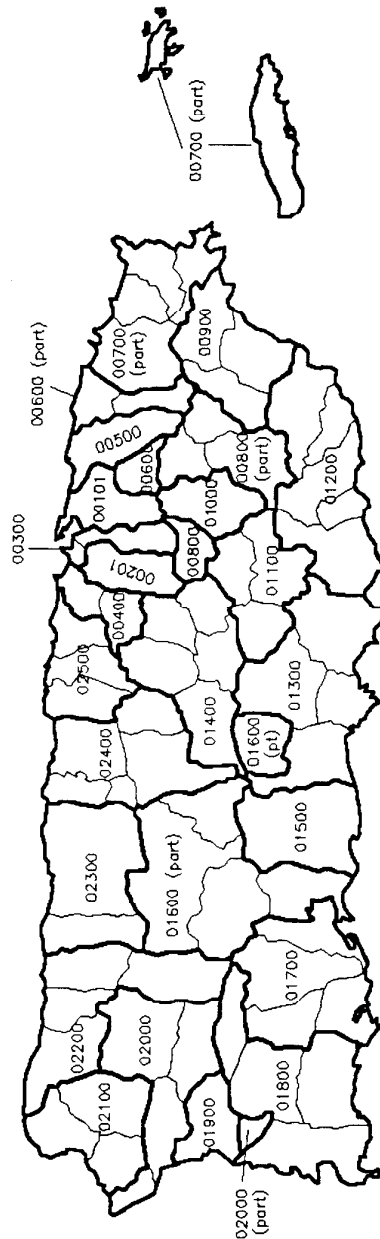
The 1% Sample identifies MAs of 100,000 or more inhabitants. The remaining MAs are paired together so that metropolitan and nonmetropolitan territory can be separately analyzed. Large cities are identified within large MAs.

The characteristics of the different geographic schemes are compared in the maps and charts which follow in figures 2, 3, and 4.

CORRESPONDING MICRODATA FROM EARLIER CENSUSES

PUMS files for Puerto Rico exist for the 1980 census. Items which were added, dropped, or substantially changed between 1980 and 1990 are listed in figure 5. Appendix B discusses historical comparability of items in greater detail.

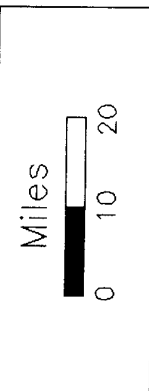
FIGURE 2
 PUERTO RICO 5% PUMA BOUNDARIES



PUERTO RICO 5% PUMA Boundaries

- ☐ Counties
- ☐ PUMAs

PUMAs in:	
San Juan Municipio	00101
	00102
	00103
	00104
Bayamon Municipio	00201
	00202



PUERTO RICO 1% PUMA Boundaries

- Counties
- PUMAs

PUMAs in:	
Bayamon Municipio	00801 00802
San Juan Municipio	01201 01202 01203 01204

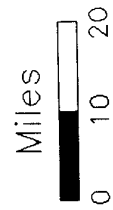


FIGURE 3
PUERTO RICO 1% PUMA BOUNDARIES

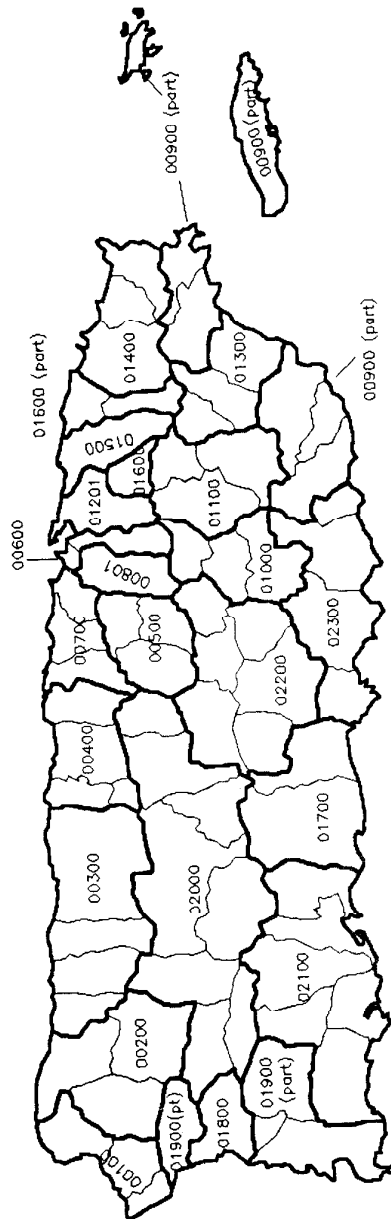


FIGURE: 4

COMPONENTS OF 5% SAMPLE PUMAs

STATE: 72 FUMA: 01800 MSA/PMSA: 9997 TOTAL POPULATION: 102960
TYPE OF AREA: MIXED MSA/PMSA/NON-MSA/PMSA AREA

NAME	POPULATION	ST	COU	MCD	PLACE	TRACT	MSA/PMSA
CABO ROJO MUNICIPIO	38521	72	023				4840
LAJAS MUNICIPIO	23271	72	079				9999
MARICAO MUNICIPIO	6206	72	093				9999
SANGERMAN MUNICIPIO	34962	72	125				4840

COMPONENTS OF 1% SAMPLE PUMAs

STATE: 72 FUMA: 01203 MSA/PMSA: 7440 TOTAL POPULATION: 103913
TYPE OF AREA: CENTRAL CITY (PART)

NAME	POPULATION	ST	COU	MCD	PLACE	TRACT	MSA/PMSA
SAN JUAN ZONA URBANA (PART)	11	72	127	030	1705	008601	7440
SAN JUAN ZONA URBANA (PART)	4183	72	127	030	1705	008602	7440
SAN JUAN ZONA URBANA (PART)	2221	72	127	030	1705	008603	7440
SAN JUAN ZONA URBANA (PART)	3059	72	127	040	1705	008601	7440
SAN JUAN ZONA URBANA (PART)	2826	72	127	040	1705	007600	7440
SAN JUAN ZONA URBANA (PART)	3426	72	127	040	1705	007700	7440
SAN JUAN ZONA URBANA (PART)	4508	72	127	040	1705	008400	7440
SAN JUAN ZONA URBANA (PART)	3454	72	127	040	1705	007900	7440
SAN JUAN ZONA URBANA (PART)	6241	72	127	040	1705	007800	7440
SAN JUAN ZONA URBANA (PART)	2736	72	127	040	1705	008300	7440
SAN JUAN ZONA URBANA (PART)	1346	72	127	040	1705	008202	7440
SAN JUAN ZONA URBANA (PART)	602	72	127	070	1705	008602	7440
SAN JUAN ZONA URBANA (PART)	3086	72	127	070	1705	008601	7440
SAN JUAN ZONA URBANA (PART)	3125	72	127	070	1705	008700	7440
SAN JUAN ZONA URBANA (PART)	3756	72	127	090	1705	008202	7440
SAN JUAN ZONA URBANA (PART)	457	72	127	090	1705	007900	7440
SAN JUAN ZONA URBANA (PART)	3149	72	127	100	1705	005601	7440
SAN JUAN ZONA URBANA (PART)	2584	72	127	100	1705	009000	7440
SAN JUAN ZONA URBANA (PART)	4083	72	127	100	1705	005602	7440
SAN JUAN ZONA URBANA (PART)	1344	72	127	110	1705	008800	7440
SAN JUAN ZONA URBANA (PART)	1749	72	127	110	1705	008900	7440
SAN JUAN ZONA URBANA (PART)	770	72	127	110	1705	009200	7440
SAN JUAN ZONA URBANA (PART)	0	72	127	110	1705	009121	7440
SAN JUAN ZONA URBANA (PART)	2273	72	127	120	1705	005204	7440
SAN JUAN ZONA URBANA (PART)	2987	72	127	120	1705	005223	7440
SAN JUAN ZONA URBANA (PART)	2807	72	127	120	1705	005300	7440
SAN JUAN ZONA URBANA (PART)	2436	72	127	120	1705	005201	7440
SAN JUAN ZONA URBANA (PART)	1623	72	127	130	1705	005602	7440
SAN JUAN ZONA URBANA (PART)	1	72	127	130	1705	009200	7440
SAN JUAN ZONA URBANA (PART)	3483	72	127	130	1705	009111	7440
SAN JUAN ZONA URBANA (PART)	4500	72	127	130	1705	005500	7440
SAN JUAN ZONA URBANA (PART)	0	72	127	130	1705	008800	7440
SAN JUAN ZONA URBANA (PART)	5019	72	127	130	1705	009112	7440
SAN JUAN ZONA URBANA (PART)	7611	72	127	130	1705	005401	7440
SAN JUAN ZONA URBANA (PART)	4046	72	127	130	1705	009121	7440
SAN JUAN ZONA URBANA (PART)	5444	72	127	130	1705	005403	7440
SAN JUAN ZONA URBANA (PART)	2967	72	127	130	1705	005402	7440

CHAPTER 2. HOW TO USE THIS FILE

This chapter serves as a guide for data users to both the tape and the technical documentation. Novice users trying to understand how to use the documentation and the file should read this chapter first.

DOCUMENTATION CHAPTERS

The Abstract chapter in this documentation provides a quick overview of the file, including the formal title, geographic coverage, subject coverage, and file availability. Also shown are citations for related reference materials and printed reports. Their titles and geography are included in this section, along with purchasing information.

Chapter 1 describes microdata, chapter 3 describes accuracy of the data, and chapter 4 describes the sample design and estimation for PUMS.

USER NOTES

Information about file or documentation changes sometimes becomes available after the documentation has been printed. User notes inform the user community about these changes. These are issued in a numbered series. If there are technical documentation changes, revised pages usually accompany them. The revised pages should be inserted in their proper location, but the user note cover sheet should be filed in the User Notes chapter. Technical notes, which contain file errata, are also issued by the Census Bureau. We suggest filing these following appendix I.

DATA DICTIONARY

The data dictionary (code book) describes the file and provides character locations for each variable.

The components include a short mnemonic or field name for use with software packages; field size; starting position; and a description of field contents with possible values.

There also is a machine-readable data dictionary file on the data tape. This dictionary is designed to be converted for use with various software packages.

APPENDIXES

Detailed information on geographic areas is in appendix A followed by subject-matter definitions in

appendix B. Appendix C provides information about the data changes on PUMS while appendix D outlines the data collection and processing procedures. Facsimiles of both the respondent instructions and 1990 census long-form questionnaire are in appendix E.

Appendix F furnishes detailed information on all the data products of the 1990 census, as well as suggested sources of information and assistance. Maps are included in Appendix G. The record layout for the machine-readable data dictionary file that accompanies each tape order is in appendix H.

Appendix I contains the code lists used in processing the data for most sample products. These are especially helpful in determining the components included in categories such as occupation, industry, and group quarters. On the PUMS, the information on these lists may be changed for disclosure protection purposes. Those changes are indicated in the data dictionary and further explained in appendix C.

INTERNAL FILE LABELS

System Labels

Tape orders which specify labeled tapes will have a standard American National Standards Institute (ANSI) label. The system label consists of 17 characters, but only the first 12 are active. The remaining five characters will be 'x' filled. The 1990 PUMS files have a Data Set Name (DSN) of PUMStXss.Fnnxxxxx where t is A or B depending on the file, ss is the Puerto Rico Postal Service (USPS) abbreviation, and nn is a two-digit number with leading zeroes identifying the tape volume sequence. (The "X", "F", and "x" in the DSN remain constant).

User Labels

Each user tape will have two user header labels and two user trailer labels. These labels combine information from the system label and the identification portion of the first and last record. These labels enable the user to quickly identify the beginning and ending records on each tape.

User Header Labels

The user header labels are designated UHL1 and UHL2. UHL1 and UHL2 repeat information from the system label in HDR1 and HDR2.

User Trailer Labels

The user trailer labels are designated UTL1 and UTL2. UTL1 and UTL2 contain information from the system trailer label.

The tape creation sheet received with the tape should be filed in the technical documentation notebook or with other tape information maintained by the user.

File Structure

Each file consists of a series of 233-character logical records of two types; housing and persons. Each housing unit record is followed by a variable number of person records, one for each member of the housing unit or none if vacant, as illustrated in figure 1. Each person in group quarters has two records--a dummy "housing unit" record (most nongeographic fields are not applicable), as well as a person record. For 1990, we made several improvements to the file to aid in processing the data. Two improvements allowing users more processing flexibility are the inclusion of the housing unit serial number on both record types and the inclusion of individual weights on each record. Including the housing unit serial number on both records affords the user an option as to how to process the data--either rectangularly or hierarchically. With the introduction of individual weights, users can more closely approximate published data. Another improvement for 1990 is providing many of the recodes (data transformations) which appear on the summary tape file (STF 3A). While the changes increase the file size, we should see an associative increase in file utility.

In the text of this document, the numeric identification of a particular data item is the same as its character location within a record. Items on the housing record are prefixed with an *H*, items on the person record with a *P*. For instance, Age, item P14-15, is a two-digit code beginning in character 14 of the person record. We continue to provide in the data dictionary, or record layout, mnemonic identifiers, many of which are the same as those used in 1980. Geographic identifiers and subsample identifiers appear only on the housing unit record. Thus, most tabulations of person characteristics require manipulation of

both housing and person records. An item on the housing record indicates the exact number of person records following before the next housing record (PERSONS). This feature allows a program to anticipate what type of record will appear next, if necessary.

In today's data manipulation environment, users have many options for processing data and are limited only by the amount and type of resources. Most statistical software packages (e.g. BMDP, SAS, SPSS, to name a few) are capable of handling the data either hierarchically or rectangularly. Many users may still want to create extract files with any desired household data repeated with each person's record. Users with limited resources (funds, personnel, software/hardware) may want to create or obtain extracts containing only those variables of interest. All fields are numeric, except for the Record Type which are "H" and "P."

File Size

Every file purchased from the Census Bureau includes a printout showing the total record count. Estimated file sizes are not shown now, but in a future user note record counts for each state will be identified.

Record Sequence

Records on these files are sorted by geographic area within Puerto Rico. On the 5% and 1% Samples, all households sampled within a particular PUMA appear together. PUMAs are sequenced in ascending order. In order to provide an extra measure of protection from disclosure of individual households within each geographic area, we scramble the records to avoid any implication of geographic information beyond that which meets Census Bureau disclosure rules for the 1990 PUMS. Person records within household are sequenced by relationship code (P11). The householder record always immediately follows the housing unit record for an occupied unit. This feature simplifies tabulation of households or families by ancestry of householder, and even poverty status--since the desired indicators are always on the first person record. Where the household contains more than one person of a given relationship, person records appear in sequence of decreasing age (P14-15).

Persons sampled from within the same group quarters are not identifiable as such, since each has an independent dummy housing unit record.

Machine-Readable Documentation

Every file includes a machine readable "data dictionary" or record layout. Irrespective of the PUMS sample used, the record layout is the same. A user can produce hard copy documentation for extract files or labels for tabulations created; or with minor modifications, can use the data dictionary file with software packages or user programs to automatically specify the layout of the microdata files.

Also available in machine-readable form is the PUMA Equivalency File, which lists the geographic components (municipios, places, tracts where available) and their assigned PUMA codes for the 5% and 1% samples.

Handling Invalid Codes

The data dictionary shows each category as having a unique representation. Although we reviewed test files, we may have a small number of cases outside the specified range for a variable. We will correct these errors when found, but users may follow the standard census practice to assign invalid codes to the next lower numbered valid category. For example, on an allocation flag with valid codes 0, 2 and 3, a 1 would be counted with code 0, and a code of 4 or more would be counted with 3. Exceptions to this rule occur in occupation and industry codes, where invalid codes are assigned to the next higher valid category.

Preparing and Verifying Tabulations

Estimation of totals - Estimates of complete-count census figures may be made from tabulations of public use microdata samples by using a simple inflation estimate - that is, summing the weights associated with that variable; (e.g. for housing characteristics, use the housing unit weight; for persons characteristics, use the person weight.) Those users using subsample numbers to vary the sample size must apply an appropriate factor, or, otherwise adjust the weights to derive an appropriate estimation of totals. We further explain the use of weights and subsample numbers in Chapter 4.

Estimation of percentages - a user can estimate percentages by simply dividing the weighted estimate of persons or housing units with a given characteristic by the weighted sample estimate for the base. Normally, this yields the same as would be obtained if one made the computation using sample tallies rather than weighted estimates. For example, the percentage of housing units with air conditioning in a one-in-one-hundred sample can be obtained by simply dividing the tally of sample housing units with air conditioning by the total number of sample housing units.

Verifying tabulations - Producing desired estimates from the public-use microdata samples is relatively easy. File structure and coding of items is straightforward. There are no missing data (see the section on allocations, page 3-38). Records not applicable for each item are assigned to specific "NA" categories, and it is frequently not necessary to determine in a separate operation whether a record is in the universe or not. PUMs "universe" and "variable" definitions may differ from other products produced from sample data primarily because of concerns about disclosure risks (e.g. PUMs files may have different topcodes from STF 3A, or the recodes may vary because the components were topcoded). A user must, however, anticipate the possibility of errors in his or her own processing. Thus, user tabulations should be verified against other available tallies. Two ways for the user to verify estimates follow:

1. Using control tabulations from the samples. As each public-use microdata sample was produced, counts of persons, housing units, vacant housing units, and group quarters persons selected into the sample were tallied within each identified geographic area. These control counts will be published as a supplement to this documentation. (In the interim, counts for specific areas may be requested from Customer Services.) If users cannot replicate these exact counts, review of the user's programs, and the shipping advices accompanying the files are in order.
2. Using published data from the 1990 censuses. Tabulations from the 1990 census data base are available in the printed census publications and on summary tape files. Users may check the reasonableness of statistics derived from public-use microdata samples against these sources. A familiarity with summary data already available may also facilitate planning of tabulations to be made from microdata. Those publications series likely to be of greatest use for this purpose are listed in Figure 5. In comparing sample tabulations with published data one must carefully note the universe of the published tabulation. For instance, on microdata records, Industry (P113-115) is reported for the civilian labor force and for persons not in the labor force who reported having worked in 1985 or later. Industry

tabulations in 1990 census publications are presented only for the employed population or the experienced civilian labor force. Thus, a tally of Industry for all persons from whom industry is reported in microdata records would not correspond directly to any published tabulation. **"A user should always pay particular attention to concept definitions as presented in the glossary."** One cannot, of course, expect exact agreement between census publications which are based on the complete census count, full sample estimates, or a subsample of the census sample and user estimates based on tallies of a 5-percent or smaller sample. They will inevitably differ to some extent due to chance in selection of actual cases for Public Use Microdata Samples. Since the amount of likely chance variation for a given statistic can be measured, any discrepancy beyond a certain level can be identified as a likely error in programming. Chapter 3 discusses sampling variability and its measurement. User experience has indicated that careful verification of sample tabulations is essential -- so important that it may frequently be advisable to include additional cells in a tabulation for no other reason than to provide counts or to yield marginal totals, not otherwise available, which may be verified against available tabulations.

Figure 5. 1980-1990 Subject Comparability

Most of the items for 1990 are comparable to 1980. Several items found in 1980 PUMS are not in the 1990 file primarily because the inquiries were not asked or because we are providing a measure of protection for respondents. Full descriptions of item comparability are given in appendix B. However, users should read appendix C for differences in PUMS definitions and those of other census products.

1990 Items not on 1980 Files

Condominium fees
Employment status of parents recode
Flag indicating all 100% person's data substituted
Flag indication all 100% housing unit data substituted
Gross rent as a percentage of 1989 Household Income
Housing unit/GQ person serial number
Housing unit weight
Time of departure for work
Married, spouse present/absent recode
Number of related children in household recode
Number of stepchildren in household recode
Number of persons in family recode
Person's weight
Presence of subfamilies in household
Presence of person under 65 years in household
Presence of person under 60 years in household
Presence of nonrelatives in household
Presence of person under 18 years in household
Selected monthly owner costs as a percentage of 1989 household income
Value unit recode
Workers in family recode
Years of active military duty

1980 Items Not on 1990 Files

Access to unit
Age at first marriage
Heating equipment
Land Tenure
Monthly Land Rent
Place of work MSA recode
Place of work place size recode
Place of work central city recode
Quarter of birth
Spanish surname
Stories in structure

Concepts Substantially changed

Grade & Finished Highest Grade - now combined and grouped to show highest level completed

CHAPTER 3 - ACCURACY OF THE MICRODATA SAMPLE ESTIMATES

INTRODUCTION

The tabulations prepared from a public use microdata sample are based on a subset of the 1990 Census sample. The data summarized from this file are estimates of the actual figures that would have been obtained from a 100-percent enumeration. Estimates derived from this sample are expected to be different from the 100-percent figures because they are subject to sampling and nonsampling errors. Sampling error in data arises from the selection of persons and housing units to be included in the sample. Nonsampling error affects both sample and 100 percent data. Errors are introduced during the collection and processing phases of the census. A more detailed discussion of both sampling and nonsampling error is given below.

In microdata samples, the basic unit is an individual housing unit and the persons who live in occupied housing units or group quarters. However, microdata records in these samples do not contain names or addresses. A more detailed discussion of methods to protect confidentiality of individual responses follows.

CONFIDENTIALITY OF THE DATA

To maintain the confidentiality required by law (Title 13, United States Code), the Bureau of the Census applies a confidentiality edit to the 1990 census data to assure that published data do not disclose information about specific individuals, households, or housing units. As a result, a small amount of uncertainty is introduced into the estimates of census characteristics. The sample itself provides adequate protection for most areas for which sample data are published since the resulting data are estimates of the actual counts; however, small areas require more protection. The edit is controlled so that the basic structure of the data is preserved.

The confidentiality edit was implemented by selecting a small subset of individual households from the internal sample data files and blanking a subset of the data items on these household records. Responses to those data items were then imputed using the same imputation procedures that were used for nonresponse. A larger subset of households was

selected for the confidentiality edit for small areas to provide greater protection for these areas. The editing process is implemented in such a way that the quality and usefulness of the data were preserved.

Since microdata records are the actual housing unit and person records, the Bureau of the Census takes further steps to prevent the identification of specific individuals, households, or housing units.

The main disclosure avoidance method used is to limit the geographic detail shown in the files. A geographic area must have a minimum of 100,000 population to be fully identified. Furthermore, certain variables are topcoded, or the actual value of the characteristics is replaced by a descriptive statistic, such as the median.

SOURCES OF ERRORS IN THE DATA

Since the estimates that users produce are based on a sample, they may differ somewhat from 100-percent figures that would have been obtained if all housing units, persons within those housing units, and persons living in group quarters had been enumerated using the same questionnaires, instructions, enumerators, and so forth. The sample estimate also would differ from other samples of housing units, persons within those housing units, and persons living in group quarters. The deviation of a sample estimate from the average of all possible samples is called the sampling error. The standard error of a sample estimate is a measure of the variation among the estimates from all the possible samples, and thus, is a measure of the precision with which an estimate from a particular sample approximates the average result of all possible samples. The sample estimate and its estimated standard error permit the construction of interval estimates with prescribed confidence that the interval includes the average result of all samples. The method of calculating standard errors and confidence intervals for the data in the microdata samples, is described in the next section.

In addition to the variability which arises from the sampling procedures, both sample data and 100-percent data are subject to nonsampling error.

Nonsampling error may be introduced during any of the various complex operations used to collect and process census data. For example, operations such as editing, reviewing, or handling questionnaires may introduce error into the data. A detailed discussion of the sources of nonsampling error is given in the section on "Control of Nonsampling Error" in this chapter.

Nonsampling error may affect the data in two ways. Errors that are introduced randomly will increase the variability of the data and should, therefore, be reflected in the standard error. Errors that tend to be consistent in one direction will make both sample and 100-percent data biased in that direction. For example, if respondents consistently tend to under report their income, then the resulting counts of households or families by income category will tend to be understated for the higher income categories and overstated for the lower income categories. Such biases are not reflected in the standard error.

CALCULATIONS OF STANDARD ERRORS USING TABLES

A standard sampling theory text should be helpful if the user needs more information about confidence intervals and nonsampling errors.

Two methods for estimating standard errors of estimated totals and percentages are described in this section. The first method is very simple. This method uses already calculated standard errors for specific sizes of estimated totals and percentages given in tables A through D, shown later in this section. The estimated standard errors shown in tables A through D were calculated assuming simple random sampling while the microdata sample (and the census sample) were selected using a systematic sampling procedure. The numbers shown in table E, referred to as design factors, are defined as the ratio of the standard error from the actual sample design to the standard error from a simple random sample.

The standard errors in tables A through D used in conjunction with the appropriate design factors from table E produce a reasonable measure of reliability for microdata sample estimates. Table E, the Table of Design Factors, is on pages 3-7 and 3-8. An alternative methodology by which more precise standard errors can be obtained requires additional data processing and file manipulation. The trade off

is more precision for more data processing. However, with the technology available today, the second method is preferable and strongly recommended. However, the standard error tables could be very useful. For instance, they would be useful when one is trying to determine, prior to purchase, whether a 1-percent sample will yield estimates of adequate precision for a given study, or whether it is necessary to use the 5-percent sample instead. For these purposes the method described in this section should produce an acceptable approximation. On the other hand, for many statistics, particularly from detailed cross-tabulations, standard errors using the second method are also applicable to a wider variety of statistics, e.g., means and ratios.

To produce standard error estimates, one obtains (1) the unadjusted standard error for the characteristic that would result from a simple random sample design (of persons, families, or housing units) and estimation technique; and (2) a design factor, which partially reflects the effects of the actual sample design and estimation procedure used for the 1990 census public use microdata sample, for the particular characteristic estimated. The design factors provided in this chapter are based on computations from the full census sample and, as such, do not reflect the additional stratification used in the selection of the public use microdata samples (see Chapter 4). In general, these factors will provide conservative estimates of the standard error. In addition, these factors only pertain to individual data items (e.g., educational attainment, employment status) and are not entirely appropriate for use with detailed cross-tabulated data. To calculate the approximate standard error of a 5-percent or 1-percent sample estimate follow the steps given below.

1. Obtain the unadjusted standard error for the sampling rate to be used from table A or C for estimated totals or from tables B or D for estimated percentages. Alternately, the formula given at the bottom of each table may be used to calculate the unadjusted standard error (for sample sizes other than 5 or 1-percent, see the subsampling section).

In using tables A or C, or corresponding formulas for estimated totals, use weighted figures rather than unweighted sample counts to select the appropriate row. To select the

applicable column for person characteristics, use the total population in the area being tabulated (not just the total of the universe being examined), or use the total count of housing units if the estimated total is a housing unit characteristic. Similarly in using table B or D or the corresponding formula for estimated percentages, use weighted figures to select the appropriate column.

2. Use table E to obtain the design factor for the characteristic (e.g., place of work or educational attainment). If the estimate is a cross-tabulation of more than one characteristic, scan table E for each appropriate factor and use the largest factor. Multiply the unadjusted standard error from step 1 by the factor obtained in step 2.

Example 1: Standard Error of a Total - Suppose we tally a 5-percent public use microdata sample for Puerto Rico. Further, suppose that for municipio A, the sum of the PUMS weights for all persons is 131,220. The sum of the PUMS weights for those persons who are age 16 years and over and in the civilian labor force is 59,948.

The basic standard error for the estimated total is obtained from table A or from the formula given below table A. To avoid interpolation, the use of the formula will be demonstrated here. The formula for the basic standard error, SE, is:

$$SE(59,948) = \sqrt{19(59,948) (1-59,948/131,220)} \\ = 787 \text{ persons}$$

The standard error of the estimated 59,948 persons 16 years and over who were in the civilian labor force is found by multiplying the basic standard error 787 by the appropriate design factor (Employment Status) from table E. Suppose the design factor for Employment Status is 1.2, then the standard error is

$$SE(59,948) = 787(1.2) = 945 \text{ persons}$$

Note that in this example the total weighted count of persons in municipio A of 131,220 was used.

Example 2: Standard Error of a Percent - Suppose

there are 95,763 persons in municipio A in Puerto Rico aged 16 years and over. The estimated percent of persons 16 years and over who were in the civilian labor force is 62.6. Using the formula given in table B, the unadjusted standard error is found to be approximately 0.68 percent. The standard error for the estimated 62.6 percent of persons 16 years and over who were in the civilian labor force is $0.68 (1.2) = 0.82$ percentage points. Note that in this example the base is defined as the weighted count of persons 16 years old and over.

A note of caution concerning numerical values is necessary. Standard errors of percentages derived in this manner are approximate. Calculations can be expressed to several decimal places, but to do so would indicate more precision in the data than is justifiable. Final results should contain no more than two decimal places.

Sums and Differences - The standard errors estimated from these tables are not directly applicable to sums of and differences between two sample estimates. To estimate the standard error of a sum or difference, the tables are to be used somewhat differently in the following three situations:

1. For the sum of or difference between a sample estimate and a 100-percent value, use the standard error of the sample estimate. The complete count value is not subject to sampling error.
2. For the sum of or difference between two sample estimates, the appropriate standard error is approximately the square root of the sum of the two individual standard errors squared, that is, for standard errors:

SE_x and SE_y of estimates \hat{x} and \hat{y}

$$SE_{(\hat{x} \pm \hat{y})} = SE_{(\hat{x} - \hat{y})} = \sqrt{(SE_{\hat{x}})^2 + (SE_{\hat{y}})^2}$$

This method, however, will underestimate (overestimate) the standard error if the two items in a sum are highly positively (negatively) correlated or if the two items in

a difference are highly negatively (positively) correlated. This method may also be used for the difference between (or sum of) sample estimates from two censuses or from a census sample and another survey. The standard error for estimates not based on the 1990 census sample must be obtained from an appropriate source outside of this appendix.

3. For the differences between two estimates, one of which is a subclass of the other, use the tables directly where the calculated difference is the estimate of interest.

For example, to determine the estimate of non-Black teachers, one may subtract the estimate of Black teachers from the estimate of total teachers. To determine the standard error of the estimate of non-Black teachers apply the above formula directly.

Ratios - Frequently, the statistic of interest is the ratio of two variables, where the numerator is not a subset of the denominator. For example, the ratio of teachers to students in public elementary schools. The standard error of the ratio between two sample estimates is estimated as follows:

1. If the ratio is a proportion, then follow the procedure outlined for "Totals and Percentages."
2. If the ratio is not a proportion, then approximate the standard error using the formula below.

$$SE_{(\hat{x}/\hat{y})} = \frac{\hat{x}}{\hat{y}} \sqrt{\frac{(SE_{\hat{x}})^2}{\hat{x}^2} + \frac{(SE_{\hat{y}})^2}{\hat{y}^2}}$$

Medians - For the standard error of the median of a characteristic, it is necessary to examine the distribution from which the median is derived, as the size of the base and the distribution itself affect the standard error. An approximate method is given here. As the first step, compute one-half of the number on which the median is based (refer to this result as N/2). Treat N/2 as if it were an ordinary estimate and obtain its standard error as instructed above. Compute the desired confidence interval about N/2.

Starting with the lowest value of the characteristic, compute the frequencies in each category of the characteristic until the sum equals or first exceeds the lower limit of the confidence interval about N/2. By linear interpolation, obtain a value of the characteristic corresponding to this sum. This is the lower limit of the confidence interval of the median. In a similar manner, continue cumulating frequencies until the sum equals or exceeds the count in excess of the upper limit of the interval about N/2. Interpolate as before to obtain the upper limit of the confidence interval for the estimated median.

When interpolation is required in the upper open-ended interval of a distribution to obtain a confidence bound, use 1.5 times the lower limit of the open-ended confidence interval as the upper limit of the open-ended interval.

CONFIDENCE INTERVALS AND INFERENCES BASED ON THE SAMPLE

A sample estimate and its estimated standard error may be used to construct confidence intervals about the estimate. These intervals are ranges that will contain the average value of the estimated characteristic that results over all possible samples, with a known probability. For example, if all possible samples that could result under the 1990 census sample design were independently selected and surveyed under the same conditions, and if the estimate and its estimated standard error were calculated for each of these samples, then:

1. Approximately 68 percent of the intervals from one estimated standard error below the estimate to one estimated standard error above the estimate would contain the average result from all possible samples.
2. Approximately 90 percent of the intervals from 1.645 times the estimated standard error below the estimate to 1.645 times the estimated standard error above the estimate would contain the average result from all possible samples.
3. Approximately 95 percent of the intervals from two estimated standard errors below the estimate to two estimated standard errors

Table A: Unadjusted Standard Errors for Estimated Totals, 5 Percent Sample

Estimated Total ¹	Size of Geographic area Tabulated ²				
	100,000	250,000	500,000	750,000	1 M
1,000	140	140	140	140	140
2,500	220	220	220	220	220
5,000	300	310	310	310	310
10,000	410	430	430	430	430
15,000	490	520	530	530	530
25,000	600	650	670	680	680
75,000	600	1,000	1,100	1,130	1,150
100,000	-	1,070	1,230	1,280	1,310
250,000	-	-	-	1,280	1,890
500,000	-	-	-	1,780	2,180
750,000	-	-	-	-	968
1,000,000	-	-	-	-	-
5,000,000	-	-	-	-	-
10,000,000	-	-	-	-	-

¹For estimated totals larger than 10,000,000, the standard error is somewhat large than the table values. The formula given below should be used to calculate the standard error.

$$SE(\hat{Y}) = \sqrt{19\hat{Y}\left(1 - \frac{\hat{Y}}{N}\right)} \quad \text{Where: } N = \text{Size of area}$$

\hat{Y} = Estimate of characteristic total

²Total count of persons, housing units, or families in area if the estimated total is a person, housing unit, or family characteristic, respectively.

Table B: Unadjusted Standard Error for Estimated Percentages, 5 Percent Sample (Standard errors expressed in percentage points)

Estimated Percent	Base (weighted total) of percentage ¹									
	1000	1500	2500	5000	7500	10000	25000	50000	100000	500000
2 or 98	1.9	1.6	1.2	0.9	0.7	0.6	0.4	0.3	0.2	0.1
5 or 95	3.0	2.4	1.9	1.3	1.1	1.0	0.6	0.4	0.3	0.1
10 or 90	4.1	3.4	2.6	1.8	1.5	1.3	0.8	0.6	0.4	0.2
15 or 85	4.9	4.0	3.1	2.2	1.8	1.6	1.0	0.7	0.5	0.2
20 or 80	5.5	4.5	3.5	2.5	2.0	1.7	1.1	0.8	0.6	0.2
25 or 75	6.0	4.9	3.8	2.7	2.2	1.9	1.2	0.8	0.6	0.3
30 or 70	6.3	5.2	4.0	2.8	2.3	2.0	1.3	0.9	0.6	0.3
35 or 65	6.6	5.4	4.2	2.9	2.4	2.1	1.3	0.9	0.7	0.3
50	6.9	5.6	4.4	3.1	2.5	2.2	1.4	1.0	0.7	0.3

¹For a percentage and/or base of percent age not shown in the table, the formula given below may be used to calculate the standard error.

$$SE(\hat{p}) = \sqrt{\frac{19}{B}\hat{p}(100 - \hat{p})} \quad \text{Where: } B = \text{Base of estimated percentage (weighted total)}$$

\hat{p} = Estimated percentage

Table C: Unadjusted Standard Errors for Estimated Totals, 1 Percent Sample

Estimated Total ¹	Size of Geographic area Tabulated ²				
	100,000	250,000	500,000	750,000	1 M
1,000	310	310	310	310	310
2,500	490	500	500	500	500
5,000	690	700	700	700	700
10,000	940	970	980	990	990
15,000	1,120	1,180	1,200	1,210	1,210
25,000	1,360	1,490	1,530	1,550	1,550
75,000	1,360	2,280	2,510	2,590	2,620
100,000	-	2,440	2,810	2,930	2,980
250,000	-	-	3,520	4,060	4,310
500,000	-	-	-	4,060	4,970
750,000	-	-	-	-	7,462
1,000,000	-	-	-	-	-
5,000,000	-	-	-	-	-
10,000,000	-	-	-	-	-

¹For estimated totals larger than 10,000,000, the standard error is somewhat larger than the table values. The formula given below should be used to calculate the standard error.

$$SE(\hat{Y}) = \sqrt{99\hat{Y}\left(1 - \frac{\hat{Y}}{N}\right)} \quad \text{Where: } N = \text{Size of area}$$

\hat{Y} = Estimate of characteristic total

²Total count of persons, housing units, or families in area if the estimated total is a person, housing unit, or family characteristic, respectively.

Table D: Unadjusted Standard Error for Estimated Percentages, 1 Percent Sample (Standard errors expressed in percentage points)

Estimated Percent	Base (weighted total) of percentage ¹										
	1000	1500	2500	5000	7500	10000	25000	50000	100000	250000	500000
2 or 98	4.4	3.6	2.8	2.0	1.6	1.4	0.9	0.6	0.4	0.3	0.2
5 or 95	6.9	5.6	4.3	3.1	2.5	2.2	1.4	1.0	0.7	0.4	0.3
10 or 90	9.4	7.7	6.0	4.2	3.4	3.0	1.9	1.3	0.9	0.6	0.4
15 or 85	11.2	9.2	7.1	5.0	4.1	3.6	2.2	1.6	1.1	0.7	0.5
20 or 80	12.6	10.3	8.0	5.6	4.6	4.0	2.5	1.8	1.3	0.8	0.6
25 or 75	13.6	11.1	8.6	6.1	5.0	4.3	2.7	1.9	1.4	0.9	0.6
30 or 70	14.4	11.8	9.1	6.4	5.3	4.6	2.9	2.0	1.4	0.9	0.6
35 or 65	15.0	12.8	9.5	6.7	5.5	4.7	3.0	2.1	1.5	0.9	0.7
50	15.8	12.8	9.9	7.0	5.7	5.0	3.1	2.2	1.6	1.0	0.7

¹For a percentage and/or base of percentage not shown in the table, the formula given below may be used to calculate the standard error.

$$SE(\hat{p}) = \sqrt{\frac{99}{B}\hat{p}(100 - \hat{p})} \quad \text{Where: } B = \text{Base of estimated percentage (weighted total)}$$

\hat{p} = Estimated percentage

Table E. Standard Error Design Factors-Puerto Rico

Characteristic	Design factors
POPULATION	
Age.....	1.2
Sex.....	1.8
Marital status.....	1.2
Household type and relationship.....	1.4
Children ever born.....	3.1
Work disability and mobility limitation status.....	1.2
Place of birth.....	2.5
Citizenship.....	2.1
Residence in 1985.....	2.5
Year of entry.....	3.2
Ability to speak Spanish and/or English.....	1.5
Educational attainment.....	1.3
School enrollment.....	1.9
Ability to read and write.....	1.5
Vocational training.....	1.6
Length of last stay in the United States.....	3.2
School attendance.....	3.3
Type of residence (urban/rural).....	2.8
Household type.....	1.2
Family type.....	1.4
Subfamily type and presence of children.....	1.2
Group quarters.....	1.1
Employment status.....	1.2
Industry.....	1.2
Occupation.....	1.2
Class of worker.....	1.3
Hours per week and weeks worked in 1989.....	1.2
Number of workers in family.....	1.3
Place of work.....	1.3
Means of transportation to work.....	1.3
Travel time to work.....	1.3
Time leaving home to go to work.....	1.3
Private Vehicle occupancy.....	1.3
Type of income in 1989.....	1.4
Household Income in 1989.....	1.2
Family income in 1989.....	1.2
Poverty status in 1989 (persons).....	1.3
Poverty status in 1989 families).....	1.2
Armed Forces and veteran status.....	1.7

Table E. Standard Error Design Factors-Puerto Rico

[Percent of persons or housing units in sample]

Characteristic	Design factors
HOUSING	
Age of householder.....	1.0
Type of residence (urban/rural).....	1.1
Units in structure.....	1.2
Tenure.....	1.2
Occupancy status.....	1.5
Condominium status.....	1.2
Value.....	1.1
Gross rent.....	1.2
Household income in 1989.....	1.2
Year structure built.....	1.1
Type of construction.....	1.3
Condition of housing unit.....	1.4
Rooms, bedrooms, and bathrooms.....	1.2
Kitchen facilities.....	1.6
Cooking fuel.....	1.2
Source of water, plumbing facilities.....	1.2
Type of water heater.....	1.2
Sewage disposal.....	1.1
Air conditioning.....	1.4
Telephone in housing unit.....	1.2
Vehicles available.....	1.2
Year householder moved into structure.....	1.2
Mortgage status and monthly mortgage costs.....	1.2
Mortgage status and selected monthly owner costs.....	1.2
Gross rent as a percentage of household income in 1989.....	1.2
Household income in 1989 by selected owner costs as a percentage of income.....	1.2

above the estimate would contain the average result from all possible samples.

The intervals are referred to as 68 percent, 90 percent, and 95 percent confidence intervals, respectively.

The average value of the estimated characteristic that could be derived from all possible samples is or is not contained in any particular computed interval. Thus, we cannot make the statement that the average value has a certain probability of falling between the limits of the calculated confidence interval. Rather, one can say with a specified probability of confidence, that the calculated confidence interval includes the average estimate from all possible samples (approximately the 100-percent value).

Confidence intervals also may be constructed for the ratio, sum of, or difference between two sample figures. This is done by first computing the ratio, sum, or difference, then obtaining the standard error of the ratio, sum, or difference (using the formulas given earlier), and finally forming a confidence interval for this estimated ratio, sum, or difference as above. One can then say with specified confidence that this interval includes the ratio, sum, or difference that would have been obtained by averaging the results from all possible samples.

The estimated standard errors given in this chapter do not include all portions of the variability due to nonsampling error that may be present in the data. The standard errors reflect the effect of simple response variance, but not the effect of correlated errors introduced by enumerators, coders, or other field or processing personnel. Thus, the standard errors calculated represent a lower bound of that total error. As a result, confidence intervals formed using these estimated standard errors may not meet the stated levels of confidence (i.e., 68, 90, or 95 percent).

Thus, some care must be exercised in the interpretation of the data in this data product based on the estimated standard errors.

In example 1, the standard error of the 59,948 persons 16 years and over in municipio A who were in the civilian labor force was found to be 945. Thus, a 90 percent confidence interval for this estimated total is found to be:

$$[59,948 - 1.645 (945)] \text{ to } [59,948 + 1.645(945)]$$

or

$$58,393 \text{ to } 61,502$$

One can say, with about 90 percent confidence, that this interval includes the value that would have been obtained by averaging the results from all possible samples.

The following is an illustration of the calculation of standard errors and confidence intervals when a difference between two sample estimates is obtained. For example, suppose the number of persons in municipio B age 16 years and over who were in the civilian labor force was 69,314 and the total number of persons 16 years and over was 116,666. Further, suppose the population of municipio B was 225,225. Thus, the estimated percentage of persons 16 years and over who were in the civilian labor force is 59.4 percent. The unadjusted standard error from table B is 0.63 percentage points. The design factors table (table E) shows the design factor to be 1.2 for "Employment Status." Thus, the approximate standard error of the percentage (59.4 percent) is $0.63 \times 1.2 = 0.76$ percentage points.

Now suppose that one wished to obtain the standard error of the difference between municipio A and municipio B of the percentage of persons who were 16 years and over and who were in the civilian labor force. The difference in the percentages of interest for the two cities is:

$$62.6 - 59.4 = 3.2 \text{ percent.}$$

Using the results of the previous example:

$$SE(3.2) = \sqrt{(SE(62.6))^2 + (SE(59.4))^2} = \sqrt{(0.82)^2 + (0.76)^2}$$

$$= 1.12 \text{ percentage points}$$

The 90 percent confidence interval for the difference is formed as before:

$$[3.20 - 1.645(1.12)] \text{ to } [3.20 + 1.645(1.12)]$$

or

$$1.36 \text{ to } 5.04$$

One can say with 90 percent confidence that the interval includes the difference that would have been obtained by averaging the results from all possible samples. When, as in this example, the interval does not include zero, one can conclude, again with 90 percent confidence, that the difference observed between the two municipios on this characteristic is greater than can be attributed to sampling error.

For reasonably large samples, ratio estimates are normally distributed, particularly for the census population. Therefore, if we can calculate the standard error of a ratio estimate, then we can form a confidence interval around the ratio. Suppose that one wished to obtain the standard error of the ratio of the estimate of persons who were 16 years and over and who were in the civilian labor force in municipio A to the estimate of persons who were 16 years and over and who were in the civilian labor force in municipio B. The ratio of the two estimates of interest is:

$$59,948 / 69,314 = .86$$

$$SE(0.86) = \left(\frac{59948}{69314} \right) \sqrt{\frac{945^2}{(59948)^2} + \frac{1145^2}{(69314)^2}}$$

$$= .02$$

Using the results above, the 90 percent confidence interval for this ratio would be:

$$[0.86 - 1.645(.02)] \text{ to } [0.86 + 1.645(.02)]$$

or

$$.83 \text{ to } .89$$

Selecting an Appropriate Sample Size - One virtue in the use of the tables A through E for calculating standard errors and confidence intervals is that this method can be employed prior to making any sample tabulation, and thus, can help the user decide prior to purchase whether a 5-percent or 1-percent sample size is most appropriate for a proposed study.

Suppose that in the foregoing example, the 59,948 figure was a guess, perhaps based on published data. The confidence interval could be calculated as above. In this case, tabulating a 5-percent sample for this particular characteristic would result in a 90 percent confidence interval 58,393 to 61,502. The width of this

interval is 3,109. Tabulating from a 1-percent sample for the same characteristic would result in a confidence interval of 56,403 to 63,492. The width of the interval from the 1-percent sample is 7,089 (over two times the width of the confidence interval from the 5-percent sample). Another criterion used in making this type of decision is the coefficient of variation (CV). The CV is a measure of reliability and is defined as the ratio of the standard error of the estimate and the absolute value of the expected value of the estimate. To get an estimate of the CV, substitute the estimate itself for the expected value in the CV formula. In this example, if the 59,948 estimate is obtained from the 5-percent sample, the CV would be 1.4 percent. If the 1-percent sample is tallied to get the estimate then the CV would be 3 percent. The smaller the CV, the more reliable the estimate. There is no particular rule of thumb that dictates how large a confidence interval or CV is acceptable. This depends on the relative precision necessary for a particular application as balanced against the relative cost of tabulating microdata samples of the various sizes.

USING TABLE A THROUGH D FOR OTHER SAMPLE SIZES

Tables A through D may also be used to approximate the unadjusted standard errors for other sample sizes by adjusting for the sample size desired. The adjustment for sample size is obtained as follows:

Let

f_1 be the sampling rate in any of the tables A through D, and

f_2 be the sampling rate for the sample size to be used. The adjustment for sample size can be read from the following table:

f_2	Sample Size Adjustment Factor
.11	.65 Multiply the standard errors
.10	.69 in tables A or B (where $f_1 = .05$)
.06	.91 by this factor.
.04	1.12
.03	1.30
.02	1.61
.009	1.05 Multiply the standard errors
.007	1.20 in table C or D (where $f_1 = .01$)
.005	1.42 by this factor.
.003	1.83
.002	2.25

For example, if the user were to select a subsample of one half of a 1-percent sample, i.e., $f_2 = .005$, then the standard errors shown in tables C or D for a 1-percent sample must be multiplied by 1.42 to obtain the standard errors for a .005 sample. The factor of 1.42 shows that the standard errors increase by 42 percent when the sample size is halved.

The principle is also applicable when combining microdata samples to achieve a sample size larger than 5 percent. If, for example, all three samples are combined for the same area to obtain an estimate of a characteristic for the elderly population, the standard errors for this sample size (i.e., 6 percent) can be obtained by multiplying those shown in tables A and B by .91. Thus, the increase from a 5-percent to a 11-percent sample reduces the standard error by 9 percent.

Alternatively, the user may wish to use the following formulas to directly calculate the unadjusted standard errors. For estimated totals, calculate as

$$SE(\hat{Y}) = \sqrt{\left(\frac{1}{f_2} - 1\right) \hat{Y}(1 - \hat{Y}/N)}$$

where

N = size of area tabulated

\hat{Y} = estimate (weighted) of characteristic total.

Example 1 shows the unadjusted standard error for the figure 59,948 to be 787. Using the above formula with $f_2 = .06$ yields an unadjusted standard error $SE(\hat{Y}) = 716$ for a 9 percent reduction in the standard error as shown in the above table.

For an estimated percentage, calculate

$$SE(\hat{P}) = \sqrt{\left(\frac{1}{f_2} - 1\right) \frac{\hat{P}(100 - \hat{P})}{B}}$$

where \hat{P} = estimated percentage and

B = base of estimated percentage (weighted estimate)

ESTIMATION OF STANDARD ERRORS DIRECTLY FROM THE MICRODATA SAMPLES

Use of tables or formulas to derive approximate standard error as discussed above is simple and does not complicate processing. Nonetheless, a more accurate estimate of the standard error can be obtained from the samples themselves, using the random group method. Using this method it is also possible to compute standard errors for mean ratios, indexes, correlation coefficients, or other statistics for which the tables or formulas presented earlier do not apply.

The random group method does increase processing time somewhat since it requires that the statistic of interest, for example a total, be computed separately for each of up to 100 random groups. The variability of that statistic for the sample as a whole is estimated from the variability of the statistic among the various random groups within the sample. The procedure for calculating a standard error by the random group method for various statistics is given below.

Totals - to obtain the standard errors of estimated totals the following method should be used. The random groups estimate of variance of \hat{X} is given by

$$\text{var}(\hat{X}) = \left(\frac{t}{t-1} \right) \sum_{g=1}^t \left[x_g - \frac{1}{t} \left(\sum_{g=1}^t x_g \right) \right]^2$$

or the computational formula

$$\text{var}(\hat{X}) = \left(\frac{t}{t-1} \right) \sum_{g=1}^t x_g^2 - t \bar{x}_g^2$$

where

t = number of random groups

x_g = the weighted microdata sample total of the characteristic of interest from the g-th random group.

$$\bar{x}_g = \sum_{g=1}^t x_g / t, \text{ the average random group total}$$

The standard error of the estimated total is the square root of $\text{var}(\hat{X})$.

It is suggested that $t=100$ for estimating the standard error of a total since, as it is discussed in the next chapter, each of the sample records was assigned a two-digit subsample number sequentially from 00 to 99. The two-digit number can be used to form 100 random groups.

For example, a sample case with 01 as the two-digit number will be in random group 1. All sample cases with 02 as the two digit number will be in random group 2, etc., up to 00 as the one-hundredth random group. The reliability of the random group variance estimator is a function of both the kurtosis of the estimator and the number of groups t. If t is small, the coefficient of variation (CV) will be large, and therefore, the variance estimator will be of low precision. In general, the larger t is, the more reliable the variance estimator will be.¹

Percentages, Ratios, and Means - To obtain the estimated standard error of a percent, ratio, or mean,

the following method should be used. Let $\hat{r} = \frac{\hat{x}}{\hat{y}}$ be the estimated percent, ratio, or mean

where \hat{x} and \hat{y} = the estimated totals as defined above for the X and Y characteristics.

For the case where both numerator and denominator are obtained from the full microdata sample then the variance of \hat{r} is given by

$$\text{var}(\hat{r}) = \left(\frac{t}{t-1} \right) \left(\frac{1}{\hat{y}} \right)^2 \sum_{g=1}^t (x_g - \hat{r} y_g)^2$$

where t and x_g are defined above,

\hat{y} = the weighted full microdata sample total for the y characteristic, and

y_g = the corresponding weighted total for the g-th random group.

¹Wolter, Kirk M., Introduction to Variance Estimation, 1985, pp. 55-71.

Correlation Coefficients, and Regression Coefficients and Complex Statistics - The random group method for computing the variance of correlation coefficients, regression coefficients, and other complex nonlinear statistics may be expressed as:

$$\text{Var}(\hat{\theta}) = \frac{t}{(t-1)} \sum_{g=1}^t (\hat{\theta}_g - \hat{\theta})^2$$

where

- $\hat{\theta}_g$ - the weighted estimate (at the tabulation area level) of the statistic of interest computed from the g-th random group, and
- $\hat{\theta}$ - corresponding weighted estimate computed from the full microdata sample.

Care must be exercised when using this variance estimator for complex nonlinear statistics as its properties have not been fully explored for such statistics. In particular, the choice of the number of random groups must be considered more carefully. When using the 5-percent sample, use of $t = 100$ for all areas tabulated is recommended. When using the 1-percent sample or samples having a smaller sampling fraction, the user should consider using a smaller number of random groups to insure that each random group contains at least 25 records. Fewer than 100 random groups can be formed by appropriate combination of the two-digit subsample numbers. For example, to construct 50 random groups assign all records in which the subsample number is 01 or 51 to the first random group; all records in which the subsample number is 02 or 52 to the second random group, etc. Finally, assign all records in which the subsample number is 00 or 50 to random group 50. Ten random groups can be constructed by including all records having subsample numbers with the same "units" digit in a particular random group. For example, subsample numbers 00, 10, ..., 90 would form one random group; subsample numbers 01, 11, ..., 91 would form a second random group, etc.

STANDARD ERRORS FOR SMALL ESTIMATES

Percentage estimates of zero and estimated totals of zero are subject to both sampling and nonsampling error. While the magnitude of the error is difficult to quantify, users should be aware that such estimates are nevertheless subject to both sampling and nonsampling error even though in the case of zero estimates the corresponding random groups estimate of variance will be zero.

A second point concerning standard errors, the standard error estimates obtained using the random groups method do not include all components

of the variability due to nonsampling error that may be present in the data. Therefore, the standard error calculated using the methods described in this section represent a lower bound for the total error. Data users should be aware that in general confidence intervals formed using these estimated standard errors do not meet the stated levels of confidence. Data users are advised to be conservative when making inferences from the data provided in this data product.

CONTROL OF NONSAMPLING ERROR

As mentioned earlier, both sample and 100-percent data are subject to nonsampling error. This component of error could introduce serious bias into the data, and the total error could increase dramatically over that which would result purely from sampling. While it is impossible to eliminate completely nonsampling error from an operation as large and complex as the decennial census, the Bureau of the Census attempted to control the sources of such error during the collection and processing operations. Described below are the primary sources of nonsampling error and the programs instituted for control of this error. The success of these programs, however, was contingent upon how well the instructions actually were carried out during the census. As part of the 1990 census evaluation program, both the effects of these programs and the amount of error remaining after their application will be evaluated.

Undercoverage--It is possible for some households or persons to be missed entirely by the census. The undercoverage of persons and housing units can introduce biases into the data.

Several coverage improvement programs were implemented during the development of the census address list and census enumeration and processing to minimize undercoverage of the population and housing units. These programs were developed based on experience from the 1980 census and results from the 1990 census testing cycle.

- Addresses were listed concurrent with enumeration. A recheck of units initially classified as vacant or nonexistent improved further the coverage of persons and housing units. All local officials were given the opportunity to participate in a post-census local review, and census enumerators conducted an additional recanvass. In addition, efforts were made to improve the coverage of unique population groups.
- As a test of the feasibility of using an administrative records list to improve

coverage, the Census Bureau obtained a list of residential customers from the Puerto Rico electric company, clerically matched addresses (for large multi-unit structures) on the list to the census address listing books and followed up on units identified on the electric company list but not in the census.

More extensive discussion of the programs implemented to improve coverage will be published by the Census Bureau when the evaluation of the coverage improvement program is completed.

Respondent and Enumerator Error--The persons answering the questionnaire or responding to the questions posed by an enumerator could serve as a source of error, although the questions were phrased as clearly as possible based on precensus tests, and detailed instructions for completing the questionnaire were provided to each household. In addition, respondents' answers were edited for completeness and consistency, and problems were followed up as necessary.

The enumerator may misinterpret or otherwise incorrectly record information given by a respondent; may fail to collect some of the information for a person or household; or may collect data for households that were not designated as part of the sample. To control these problems, the work of enumerators was monitored carefully. Field staff were prepared for their tasks by using standardized training packages that included hands-on experience in using census materials. A sample of the households interviewed by enumerators for nonresponse were reinterviewed to control for the possibility of data for fabricated persons being submitted by enumerators. Also, the estimation procedure was designed to control for biases that would result from the collection of data from households not designated for the sample.

Processing Error--The many phases involved in processing the census data represent potential sources for the introduction of nonsampling error. The processing of the census questionnaires includes the field editing, followup, and transmittal of completed questionnaires; the manual coding of write-in responses; and the electronic data processing. The various field, coding and computer operations undergo a number of quality control checks to insure their accurate application.

Nonresponse--Nonresponse to particular questions on the census questionnaire allows for the introduction of bias into the data, since the characteristics of the nonrespondents have not been observed and may differ from those reported by respondents. As a

result, any imputation procedure using respondent data may not completely reflect this difference either at the elemental level (individual person or housing unit) or on the average. Some protection against the introduction of large biases is afforded by minimizing nonresponse. In the census, nonresponse was reduced substantially during the field operations by the various edit and followup operations aimed at obtaining a response for every question. Characteristics for the nonresponses remaining after this operation were imputed by the computer by using reported data for a person or housing unit with similar characteristics.

EDITING OF UNACCEPTABLE DATA

The objective of the processing operation is to produce a set of data that describes the population as accurately and clearly as possible. To meet this objective, questionnaires were edited during field data collection operations for consistency, completeness, and acceptability. Questionnaires also were reviewed by census clerks for omissions, certain specific inconsistencies, and population coverage. For example, write-in entries such as "Don't know" or "NA" were considered unacceptable. For some district offices, the initial edit was automated; however, for the majority of the district offices, it was performed by clerks. As a result of this operation, a telephone or personal visit followup was made to obtain missing information. Potential coverage errors were included in the followup, as well as a sample of questionnaires with omissions and/or inconsistencies.

Subsequent to field operations, remaining incomplete or inconsistent information on the questionnaire was assigned using imputation procedures during the final automated edit of the collected data. Imputations, or computer assignments of acceptable codes in place of unacceptable entries or blanks, are needed most often when an entry for a given item is lacking or when the information reported for a person or housing unit on that item is inconsistent with other information for that same person or housing unit. As in previous censuses, the general procedure for changing unacceptable entries was to assign an entry for a person or housing unit that was consistent with entries for persons or housing units with similar characteristics. The assignment of acceptable codes in place of blanks or unacceptable entries enhances the usefulness of the data.

Another way in which corrections were made during the computer editing process was through substitution; that is, the assignment of a full set of characteristics for a person or housing unit. When there was an indication that a housing unit was occupied but the questionnaire contained no information for the people within the household or the occupants were not listed on the questionnaire, a

previously accepted household was selected as a substitute, and the full set of characteristics for the substitute was duplicated. The assignment of the full set of housing characteristics occurred when there was no housing information available. If the housing unit was determined to be occupied, the housing characteristics were assigned from a previously processed occupied unit. If the housing unit was vacant, the housing characteristics were assigned from a previously processed vacant unit.

USE OF ALLOCATION FLAGS IN THESE FILES

As a result of the editing there are no blank fields or missing data in public use microdata sample files. Each field contains a data value or a "not applicable" indicator, except for the few items where allocation was not appropriate and a "not reported" indicator is included. For every subject item it is possible for the user to differentiate between entries which were allocated, by means of "allocation flags" in items H157 through H203, and P181 through P233 in the microdata files. For all items it is possible to compute the allocation rate and, if the rate is appreciable, compute the distribution of actually observed values (with allocated data omitted) and compare it with the overall distribution including allocated values. The flags indicate the changes in values between input and output.

These flags may indicate up to four possible types of allocations:

- A. Pre-edit - When the original entry was rejected because it fell outside the range of acceptable values.
- B. Consistency - Imputed missing characteristics based on other information recorded for the person or housing unit.
- C. Hot Deck - Supplied the missing information from the record of another person or housing unit.
- D. Cold Deck - Supplied missing information from a predetermined distribution.

In general, the allocation procedures provide better data than could be obtained by simply weighting up the observed distribution to account for missing values. The procedures reflect local variations in characteristics as well as variations among the strata used in imputation. There are, however, certain circumstances where allocated data may introduce undesirable bias. It may be particularly important to analyze allocations of data in detailed studies of subpopulations or in statistics derived from cross-classification of variables, such as correlation

coefficients or measures of regression. The degree of editing required was greater for some subjects than for others. While the allocation procedure was designed to yield appropriate statistics for the overall distribution or for specific subpopulations (the strata used in the allocation process), allocated characteristics will not necessarily observe a valid relationship with other observed variables for the same individual. For example, consider a tabulation of persons 80 years old and over by income. Income allocations were made separately for different age groupings, including the category 65 years old and over, but not separately for persons 80 years old and over.

Since persons 65 to 70 or 75 are more likely to have significant earnings than persons 80 or over, allocated income data for the latter group might be biased upward. Thus, if the rate of allocations for the group is appreciably large, and a bias in the allocated value is evident, it may be desirable to exclude allocated data from the analysis.

It should also be apparent from this illustration that knowledge of the specific allocation procedures is valuable in detailed subject analysis. Descriptions of the editing and allocation procedures for each item are being incorporated in the History of the 1990 Census of Population and Housing to be published later. A user may contact either the Population Division or Housing and Household Economic Statistics Division, Bureau of the Census, if more information is desired on the allocation scheme for a specific subject item.

All of Puerto Rico was enumerated by the list/enumerate method. Each enumerator was given a blank address register with designated sample lines. Beginning about Census Day, the enumerator systematically canvassed an assigned area and listed all housing units in the address register in the order they were encountered. Completed 100-percent questionnaires were collected or filled out through a personal interview by enumerators. All sample questionnaires or long forms were administered by personal visits. All housing units in Puerto Rico were sampled at a 1-in-6 sampling rate.

CHAPTER 4 - SAMPLE DESIGN AND ESTIMATION

SAMPLE DESIGN AND ESTIMATION FOR THE PUBLIC USE MICRODATA SAMPLES

This chapter discusses the selection procedure for the public use microdata samples in terms of four major operations, (1) the selection of the full 1990 census sample, (2) the estimation procedure for the full census sample, (3) the selection of the public use microdata samples from the persons and housing units included in the full 1990 census sample, and (4) estimation for the PUMS samples.

PRODUCING ESTIMATES OR TABULATIONS

Estimation of totals and percentages - The 1980 Public Use Microdata Samples (PUMS) were self-weighted. It is very important to note that the 1990 PUMS samples are not self-weighted. To produce estimates on tabulations of 100 percent characteristics from the PUMS files simply add the weights of all persons or housing units that possess the characteristic of interest. For instance, if the characteristic of interest is total number of males aged 5-17, simply determine the sex and age of all persons and cumulate the weights of those who match the characteristic of interest. The PUMS weight is a function of the full census sample weight and the PUMS sample design.

To get estimates of proportions simply divide the weighted estimate of persons or housing units with a given characteristic by the base sample estimate. For example, the proportion of owner occupied housing units with plumbing facilities is obtained by dividing the PUMS estimate of owner occupied housing units with plumbing facilities by the PUMS estimates of total housing units.

To get estimates of characteristics such as the total number of related children in households for (housing unit level aggregates), simply multiply the PUMS weight by the value of the characteristic and sum across all household records. If the desired estimate is the number of households with at least one related child in household add the PUMS householder weight for all households with a value not equal to zero for the characteristic.

SAMPLE DESIGN

Every person and housing unit in Puerto Rico was asked certain basic demographic questions (for example, age, relationship, housing value, or rent). A sample of these persons and housing units was asked more detailed

questions about such items as income, occupation, and housing costs in addition to the basic demographic and housing information. The primary sampling unit for the 1990 census was the housing unit, including all occupants. For persons living in group quarters, the sampling unit was the person. Persons in group quarters were sampled at a 1-in-6 rate.

All of Puerto Rico was enumerated by the list/enumerate method. Each enumerator was given a blank address register with designated sample lines. Beginning about Census Day, the enumerator systematically canvassed an assigned area and listed all housing units in the address register in the order they were encountered. Completed 100-percent questionnaires were collected or filled out through a personal interview by enumerators. All sample questionnaires or long forms were administered by personal visits. All housing units in Puerto Rico were sampled at a 1-in-6 sampling rate.

ESTIMATION PROCEDURE

Estimates from the census sample were obtained from an iterative ratio estimation procedure (iterative proportional fitting) resulting in the assignment of a weight to each sample person or housing unit record. For any given tabulation area, a characteristic total was estimated by summing the weights assigned to the persons or housing units processing the characteristic in the tabulation area. Estimates of family or household characteristics were based on the weight assigned to the person designated as householder. Each sample person or housing unit record was assigned exactly one weight to be used to produce estimates of all characteristics. For example, if the weight given to a sample person or housing unit had the value 6, all characteristics of that person or housing unit would be tabulated with the weight of 6. The estimation procedure, however, did assign weights varying from person to person or housing unit to housing unit. The estimation procedure used to assign the weight was performed in geographically defined "weighting areas". Weighting areas were generally formed of contiguous portions of geography which closely agreed with census tabulation areas within municipios. Weighting areas were never allowed to cross municipio boundaries. In small municipios with a sample unit below 400 persons, the minimum required sample condition was relaxed to permit the entire municipio to become a weighting area.

Within a weighting area, the ratio estimation procedure for persons was performed in three stages. For persons, the first stage applied 17 household-type groups. The second stage used the dichotomy householder/nonhouseholder. The third stage applied 18 aggregate age/sex categories.

The stages were as follows:

Stage I: Type of Household

Group Persons in Housing Units With a Family With Own Children Under 18

- | | |
|---|--------------------------------|
| 1 | 2 persons in housing unit |
| 2 | 3 persons in housing unit |
| 3 | 4 persons in housing unit |
| 4 | 5 to 7 persons in housing unit |
| 5 | 8 or more in housing unit |

Persons in Housing Units With a Family Without Own Children Under 18

- | | |
|------|---|
| 6-10 | 2 through 8 or more persons in housing unit |
|------|---|

Persons in All Other Housing Units

- | | |
|-------|---|
| 11 | 1 person in housing unit |
| 12-16 | 2 through 8 or more persons in housing unit |

Persons in Group Quarters

- | | |
|----|---------------------------|
| 17 | Persons in Group Quarters |
|----|---------------------------|

Stage II: Householder/Nonhouseholder

- | | |
|---|----------------|
| 1 | Householder |
| 2 | Nonhouseholder |

Stage III: Age/Sex

Group Male

- | | |
|---|----------------------|
| 1 | 0 to 4 years of age |
| 2 | 5 to 14 years of age |

- | | |
|---|--------------------------|
| 3 | 15 to 19 years of age |
| 4 | 20 to 24 years of age |
| 5 | 25 to 34 years of age |
| 6 | 35 to 54 years of age |
| 7 | 55 to 64 years of age |
| 8 | 65 to 74 years of age |
| 9 | 75 years of age or older |

Female

- | | |
|-------|--|
| 10-18 | Same age categories as group 1 through 9 |
|-------|--|

Within a weighting area, the first step in the estimation procedure was to assign an initial weight to each sample person record. This weight was approximately equal to the inverse of the probability of selecting a person for the census sample.

The next step in the estimation procedure, prior to iterative proportional fitting, was to combine categories in each of the four estimation stages, when needed, to increase the reliability of the ratio estimation procedure. For each stage, any group that did not meet certain criteria for the unweighted sample count or for the ratio of the 100 percent to the initially weighted sample count, was combined, or collapsed, with another group in the same stage according to a specified collapsing pattern. At the third stage, an additional criterion concerning the number of 100-percent persons in category was applied.

As the final step, the initial weights underwent three stages of ratio adjustment applying the grouping procedures described above. At the first stage, the ratio of the 100-percent to the sum of the initial weights for each sample person was computed for each stage I group. The initial weight assigned to each person in a group was then multiplied by the stage I group ratio to produce an adjusted weight.

In stage II, the stage I adjusted weights were again adjusted by the ratio of the 100-percent to the sum of the stage I weights for sample persons in each stage II group. Next, at stage III, the stage II weights were adjusted by the ratio of the 100-percent to the sum of the stage II weights for sample persons in each stage III group. The three stages of ratio adjustment were performed two times (two iterations) in the order given above. The weights obtained from the second iteration for stage III were assigned to the sample person records. However, to avoid complications in rounding for tabulated data, only whole number weights were assigned. For example, if the final weight of the persons in a particular group was 7.25 then 1/4 of the

sample persons in this group were randomly assigned a weight of 8, while the remaining 3/4 received a weight of 7.

The ratio estimation procedure for housing units was essentially the same as that for persons, except that vacant units were treated differently. The occupied housing unit ratio estimation procedure was done in three stages, and the vacant housing unit ratio estimation procedure was done in a single stage. The first stage for occupied housing units applied 16 household type categories. The second stage applied three units-in-building categories, i.e. single units, multiunit less than 10 and multiunit 10 or more. The third stage could potentially use 20 tenure/value/rent groups. The stages for ratio estimation for housing units were as follows:

OCCUPIED HOUSING UNITS

Stage I: Type of Household

Group Housing Units With a Family With Own Children Under 18.

1	2 persons in housing unit
2	3 persons in housing unit
3	4 persons in housing unit
4	5 to 7 persons in housing unit
5	9 or more persons in housing unit

Housing Units With a Family Without Own Children Under 18.

6-10 unit	2 through 8 or more persons in housing unit
-----------	---

All Other Housing Units

11	1 person in housing unit
12-16	2 persons in housing unit through 8 or more persons in housing unit

Stage II: Units in Building

1	Single unit structure
2	Multiunit consisting of fewer than 10 individual units
3	Multiunit consisting of 10 or more individual units

Stage III: Tenure/Value of Rent

Group	Owner Householder Value of Housing Unit
1	Less than \$20,000
2	\$20,000 to \$39,999
3	\$40,000 to \$59,999
4	\$60,000 to \$79,999
5	\$80,000 to \$99,999
6	\$100,000 to \$149,999
7	\$150,000 to \$249,999
8	\$250,000 to \$299,999
9	\$300,000 +
10	Other

Group Rent categories

11	Less than \$100
12	\$100 to \$199
13	\$200 to \$299
14	\$300 to \$399
15	\$400 to \$499
16	\$500 to \$599
17	\$600 to \$749
18	\$750 to \$999
19	\$1000+
20	No cash rent

VACANT HOUSING UNIT

1	Vacant for Rent
2	Vacant for Sale
3	Other Vacant

The estimates produced by this procedure realize some of the gains in sampling efficiency that would have resulted if the population had been stratified into the ratio-estimation group before sampling, and the sampling rate had been applied independently to each group. The net effect is a reduction in both the standard error and the possible bias of most estimated characteristic to levels below what would have resulted from simply using the initial (unadjusted) weight. A by-product of this estimation procedure is that the estimates from the sample will for the most part be consistent with the 100-percent figures for the population and housing unit groups used in the estimation procedure.

SELECTION OF THE PUBLIC USE MICRODATA SAMPLES

A stratified systematic selection procedure with equal probability was used to select each of the public use microdata samples. The sampling universe was defined as all occupied housing units including all occupants, vacant housing units, and GQ persons in the census sample. The sample units were stratified during the selection process. The stratification was intended to improve the reliability of estimates derived from the public use microdata samples by defining strata within which there is a high degree of homogeneity among the census sample households with respect to characteristics of major interest.

A total of 35 strata were defined; 24 household strata, 8 strata for GQ persons, and 3 strata for vacant housing units. First, the units were divided into three major groups: households, vacant housing units, and GQ population. The household universe was stratified by household and family type and non-family, tenure, and age.

The vacant housing units universe was stratified by vacancy status. Finally, the GQ population was stratified by GQ type (institutions, non-institutions) and age. The stratification matrices are defined in tables A, B, and C.

SUBSAMPLING THE PUMS FILES

The sample selection procedures were as follows. The number of 1-percent public use microdata samples for Puerto Rico was determined by the full census sample size for Puerto Rico which was 15 percent. Then the census sample was divided into 20 subsamples of equal size. The 1-percent public use microdata sample was designated at random from the 20 subsamples. From the remaining 14 subsamples, five 1 percent subsamples were designated at random and merged to produce the 5-percent public use microdata sample.

During the sample selection operation, consecutive two-digit subsample numbers from 00 to 99 were assigned to each sample case in the 5-percent and 1-percent samples to allow for the designation of various size subsamples and, as discussed in the preceding chapter, to allow for the calculation of standard error. As an example, for a 1-percent public use microdata sample, the choice of records having subsample numbers with the same "units" digit (e.g., the two "units" digit includes subsample numbers (2,12,22,....,92) will provide a 1-in-1000 subsample.

Samples of any size between 1/20 and 1/10000 may be selected in a similar manner by using appropriate two-digit subsample numbers assigned to either of the microdata samples. Care must be exercised when selecting such samples. If only one "units" digit is required, the units digit should be randomly selected. If two "units" digits are required, the first should be randomly selected and the second should be either 5 more or 5 less than the first. Failure to use this procedure, e.g., selection of records with the same "tens" digit instead of records with the same "units" digit, would provide a 1-in-10 subsample but one that would be somewhat more clustered and as a result subject to larger sampling error.

Table A - PUMS Stratification Matrix - Households

Household Type	Age	Owner	Renter
Family with own children under 18	0-59		
	60-74		
	75-89		
	90+		
Family w/out own children under 18	0-59		
	60-74		
	75-89		
	90+		
Other household (Non-family)	0-59		
	60-74		
	75-89		
	90+		

Table B - PUMS Stratification Matrix - Group Quarters

GQ Type/Age	Institutional/Military	Non-Institutional/Non-Military
0-59		
60-74		
75-89		
90+		

Table C - PUMS Stratification Matrix - Vacant Housing Units

Vacant, for sale
Vacant, for rent
Vacant, other

CHAPTER 5: RECORD CONTENTS

This chapter, in conjunction with several appendices, defines the record layout and applicable codes for the public-use microdata samples. The detailed data dictionary begins on page 5-7 for the housing record and page 5-15 for the person record, with explanatory notes on page C-1 in appendix C.

Below is an index to the basic data items. The index by character location of the items on the housing and person records follows. In these introductory pages, data fields are specified in the form "H9" or "P11-12," where the letter indicates the Housing or Person record and the numbers indicate the character positions occupied on that record. For example, "P12-14" is a two-character field beginning in character 11 of the person record. In the data dictionary, itself, the "P" or "H" designation appears only at the top of the page, and location is expressed in terms of two separate elements, the beginning location and the size for each mnemonic. The mnemonic is a name for a variable or item.

INDEX TO HOUSING ITEMS (BY DESCRIPTION)

<u>MNEMONIC</u>	<u>CHARACTER LOCATION</u>	<u>DESCRIPTION</u>
AGSALES	H56	1989 sales of agricultural products
AAGSALES	H175	Agricultural sales allocation
AIRCOND	H186	Air conditioning allocation
AIRCOND	H67	Air conditioning
HUSFLAG	H32	All 100% housing unit data substituted
PDSFLAG	H33	All 100% person data substituted
AREATYPE	H17	Areatype for PUMS equivalency file
ABATHRMS	H182	Bathrooms allocation
ABATHTUB	H160	Bathtub/shower allocation
BATHTUB	H38	Bathtub or shower
ABEDROOM	H181	Bedroom allocation
BEDROOMS	H62	Bedrooms
AVACNCY3	H172	Boarded up status allocation
VACANCY3	H53	Boarded up status
BLDMAT	H59	Building construction material
ABLDMAT	H178	Building material allocation
COMMUSE	H44	Commercial establishment on property
ACOMMUSE	H166	Commercial establishment allocation
KITCHEN	H66	Complete kitchen facilities
AKITCHEN	H185	Complete kitchen allocation
HUCOND2	H108	Condition of housing unit
CONDOFEE	H103	Condo fee (monthly amount)
ACONDO	H163	Condominium status allocation
CONDO	H41	Condominium
ACNDOFEE	H201	Condominium fee allocation
ACOOKFUL	H184	Cooking facilities allocation
COOKFUEL	H65	Cooking fuel
AWATRCST	H191	Cost of water allocation
AGASCST	H190	Cost of gas allocation
AEECCST	H189	Cost of electricity allocation
AFUELCST	H192	Cost of fuel allocation
RFAMINC	H133	Family income (signed)
RFARM	H124	Farm/non-farm status
STATE	H10	FIPS commonwealth code
AINSNCL	H198	Fire/hazard/flood insurance included allocation
INSAMT	H85	Fire/hazard/flood insurance (yearly amount)
AINSAMT	H194	Fire/hazard/flood insurance allocation
ATOILET	H161	Flush toilet allocation
TOILET	H39	Flush toilet
RGRENT	H148	Gross rent
RGRAP1	H152	Gross rent as a percentage of household income in 1989
GQINST	H31	Group quarters institution
ALOTSIZE	H174	House lot size allocation
RHHINC	H126	Household income (signed)
RHHFAMTP	H122	Household/family type
HOUSWGT	H25	Housing weight
SERIALNO	H2	Housing unit/GQ person serial number
LOTSIZE	H55	Housing lot size

INDEX TO HOUSING ITEMS (BY DESCRIPTION) CON.

<u>MNEMONIC</u>	<u>CHARACTER LOCATION</u>	<u>DESCRIPTION</u>
MEDUSE	H45	Medical office on property
AMEDUSE	H167	Medical office allocation
ARENT1	H170	Monthly rent allocation
ELECCOST	H70	Monthly cost for electricity (dollars)
WATRCOST	H76	Monthly cost for water (dollars)
GASCOST	H73	Monthly cost for gas (dollars)
RENT1	H49	Monthly rent
AVACNCY4	H173	Months vacant allocation
VACANCY4	H54	Months vacant
AMRTAMT1	H196	Mortgage payment allocation
AMORTG1	H195	Mortgage status allocation
MORTGAG	H89	Mortgage status
MORTGAG3	H90	Mortgage payment (monthly amount)
MSAPMSA	H19	MSA/PMSA
RSTPCHLD	H116	Number of stepchildren in household
RNAPADPT	H114	Number of own/adopted children in HH
RRELCHLD	H118	Number of related children in household
RFAMPERS	H120	Number of persons in family
AUTOS	H69	Number of vehicles available
BATHRMS	H63	Number of bathrooms
PERSONS	H29	Number of persons records following this housing record
CUERDAS3	H43	On three cuerdas or more (1 cuerda = 0.93 acre)
ACUERDA3	H165	On 3 cuerdas or more allocation
AHUCOND1	H202	Original condition of unit allocation
HUCOND1	H107	Original condition of unit
PROFUSE	H46	Other professional office on property
APROFUSE	H168	Other professional office allocation
TAXINCL	H95	Payment include real estate taxes
INSINCL	H96	Payment include fire/hazard/flood insurance
APIPEWTR	H159	Piped water allocation
PIPEWATER	H37	Piped water in house/apartment
RNONREL	H109	Presence of nonrelative in household (HH)
R60OVER	H111	Presence of Persons 60 years & over in HH
RSUBFAM	H113	Presence of Subfamilies in household
R18UNDR	H110	Presence of persons under 18 in HH
R65OVER	H112	Presence of persons 65 years & over in HH
AHUCOND2	H203	Present condition of unit allocation
ATAxAMT	H193	Property tax allocation
AVALUE	H169	Property value allocation
VALUE	H47	Property value
PUMA	H12	Public Use Microdata Area
ATAxINCL	H197	Real estate taxes included allocation
RECTYPE	H1	Record type
ROOMS	H36	Rooms
AROOMS	H158	Rooms allocation
SAMPLE	H9	Sample identifier
MORTGAG2	H97	Second mortgage or home equity loan
MORTAMT2	H98	Second mortgage payment (monthly amount)
AMRTAMT2	H200	Second mortgage payment allocation
AMORTG2	H199	Second mortgage status allocation
ROWNRCST	H140	Selected monthly owner costs
RNSMOCPI	H145	Selected monthly owner costs as a percentage of household income
SEWAGE	H61	Sewage disposal
ASEWAGE	H180	Sewage disposal allocation
WATER	H60	Source of water
AWATER	H179	Source of water allocation
RRENTUNT	H156	Specified rent indicator
RVALUNT	H155	Specified value indicator
SUBSAMPL	H23	Subsample number (use to pull extracts - 1/1000. etc)
RTAXAMT	H83	Taxes on property (yearly amount)
ATELEPHON	H187	Telephone allocation
TELEPHON	H68	Telephone in unit
ATENURE	H164	Tenure allocation
TENURE	H42	Tenure

INDEX TO HOUSING ITEMS (BY DESCRIPTION) CON.

<u>MNEMONIC</u>	<u>CHARACTER LOCATION</u>	<u>DESCRIPTION</u>
TOILETYP	H40	Type of toilet facilities
ATOILTYP	H162	Type of toilet facilities allocation
WTRHTR	H64	Type of water heater
AWTRHTR	H183	Type of water heater allocation
AUNITS	H157	Units in structure allocation
UNITS1	H34	Units in structure
VACANCY2	H52	Vacancy status
AVACANCY1	H171	Vacancy status allocation
VACANCY1	H51	Vacant usual home elsewhere (UHE)
AAUTOS	H188	Vehicles allocation
YRBUILT	H58	When structure first built
YRMOVED	H57	When moved into this house or apartment
RWRKR89	H125	Workers in family in 1989
AYRBUILT	H177	Year structure built allocation
AYRMOVED	H176	Year moved in allocation
FUELCOST	H79	Yearly cost for fuel (oil, charcoal, kerosene, wood, etc.) in dollars

INDEX TO POPULATION ITEMS (BY DESCRIPTION)

<u>MNEMONIC</u>	<u>CHARACTER LOCATION</u>	<u>DESCRIPTION</u>
AUSACTIV	P198	Activity in the U.S. allocation
AAGE	P184	Age allocation
AGE	P14	Age
INCOME8	P176	All other income in 1989
AINCOME8	P233	All other income allocation
AAUGMENT	P181	Augmented person
AVAIL	P111	Available for work
AFERTIL	P202	Children ever born allocation
ACITIZEN	P187	Citizenship allocation
CITIZEN	P40	Citizenship
AClass	P222	Class of worker allocation
CLASS	P119	Class of worker
AVOCTRNG	P210	Completed vocational training allocation
VOCTRNG	P86	Completed vocational training
RELAT2	P29	Detailed relationship (other relative)
YEARSCH	P44	Educational attainment
ALABOR	P212	Employment status recode allocation
REMPAR	P21	Employment status of parents
RLABOR	P88	Employment status
AENGLISH	P201	English ability allocation
ENGLISH	P67	English ability
AINCOME3	P228	Farm self-employment income allocation
INCOME3	P149	Farm self-employment income (signed)
FPOB	P46	Father's place of birth
AFPOB	P191	Father's place of birth allocation
AYEARSch	P190	Highest degree allocation
HOURS	P90	Hours worked last week
AHOURS	P213	Hours worked last week allocation
SERIALNO	P2	Housing unit/GQ person serial number
AINDUSTR	P220	Industry allocation
INDUSTRY	P113	Industry
INCOME4	P155	Interest, dividends, and net rental income (signed)
AINCOME4	P229	Interest, dividend, and net rental income allocation
VOSCHOL	P87	Kind of school for vocational training
LASTSTAY	P62	Length of last stay in U.S.
ALSTSTAY	P196	Length of stay in U.S. allocation
ALITERCY	P199	Literacy in any language allocation
LITERACY	P65	Literacy (in any language)
LOOKING	P110	Looking for work
USACTIV	P64	Main activity in US during that time
AMARITAL	P185	Marital status allocation
MARITAL	P16	Marital status
RSPOUSE	P25	Married - spouse present/spouse absent
AMEANS	P215	Means of transportation to work allocation
AMIGSTAT	P194	Migration - state allocation
MIGSTATE	P53	Migration - state or foreign country
MIGPUMA	P56	Migration - PUMA
AVETS	P204	Military periods of service allocation
MILITARY	P70	Military service status
AMILTRY	P203	Military service allocation
AMOBIL	P193	Mobility status allocation
AMOBILIM	P208	Mobility limitation status allocation
MOBILIM	P84	Mobility limitation
MOBILITY	P52	Mobility status (lived here on April 1, 1985)
MPOB	P49	Mother's place of birth
AMPOB	P192	Mother's place of birth allocation
INCOME2	P143	Nonfarm self-employment income (signed)
AINCOME2	P227	Nonfarm self-employment income allocation
FERTIL	P68	Number of children ever born
OCCUP	P116	Occupation
AOCCUP	P221	Occupation allocation
ROWNCHLD	P26	Own child
PWGT1	P17	Person's weight
APERCARE	P209	Personal care limitation status allocation

INDEX TO POPULATION ITEMS (BY DESCRIPTION) CON.

<u>MNEMONIC</u>	<u>CHARACTER LOCATION</u>	<u>DESCRIPTION</u>
PERSCARE	P85	Personal care limitation
PSEQNO	P9	Persons sequence number within HH
POB	P37	Place of birth
ABIRTHPL	P186	Place of birth allocation
POWPUMA	P95	Place of work PUMA
POWSTATE	P92	Place of work - state or foreign country
RPOB	P35	Place of birth - recode
APOWST	P214	Place of work - state allocation
RPARPOB	P24	Place of birth and parent's place of birth-recode
POVERTY	P32	Poverty status
RAGECHLD	P27	Presence and age of own children
MEANS	P100	Principal means of transportation to work
AINCOME6	P231	Public assistance income allocation
INCOME6	P166	Public assistance income (amount)
RECTYPE	P1	Record type
RRELCHLD	P28	Related child
ARELAT1	P182	Relationship allocation
RELAT1	P11	Relationship
AUSRES	P195	Residence in U.S. allocation
USRES	P61	Residence in the U.S between 1980 & 1990
AINCOME7	P232	Retirement income allocation
INCOME7	P171	Retirement income (amount)
AVOCSCHL	P211	School for vocational training allocation
SCHOOL	P43	School enrollment
ASCHOOL	P189	School enrollment allocation
MAY7580	P74	Served May 1975 to August 1980
SEPT80	P73	Served September 1980 or later
FEB55	P76	Served February 1955 - July 1964
VIETNAM	P75	Served Vietnam era (August 1964 - April 1975)
OTHRSERV	P79	Served any other time
WWII	P78	Served world war II (September 1940 - July 1947)
KOREAN	P77	Served Korean conflict (June 1950 - January 1955)
SEX	P13	Sex
ASEX	P183	Sex allocation
AINCOME5	P230	Social security income allocation
INCOME5	P161	Social security income (amount)
SPANISH	P66	Speak spanish
ASPAISH	P200	Speak spanish allocation
SUBFAM2	P30	Subfamily
SUBFAM1	P31	Subfamily relationship
TMPABSNT	P109	Temporary absence from work
DEPART	P103	Time of departure for work - hour and minute
ADEPART	P217	Time of departure to work allocation
RPINCOME	P125	Total person's income (signed)
REARNING	P131	Total person's earnings (signed)
TRAVTIME	P107	Travel time to work
ATRAVTIME	P218	Travel time to work allocation
AHOUR89	P225	Usual hours worked in 1989 allocation
HOUR89	P123	Usual hours worked last year (1989)
ARIDERS	P216	Vehicle occupancy allocation
RIDERS	P102	Vehicle occupancy
RVETSERV	P71	Veteran's period of service
AINCOME1	P226	Wages and salary income allocation
INCOME1	P137	Wages or salary income in 1989
WEEK89	P121	Weeks worked last year (1989)
AWEEK89	P224	Weeks worked in 1989 allocation
ADISABL2	P207	Work prevention status allocation
ADISABL1	P206	Work limitation status allocation
DISABL1	P82	Work limitation status
DISABL2	P83	Work prevented status
WORK89	P120	Worked last year (1989)
WORKLWK	P89	Worked last week (unallocated)

INDEX TO POPULATION ITEMS (BY DESCRIPTION) CON.

<u>MNEMONIC</u>	<u>CHARACTER LOCATION</u>	<u>DESCRIPTION</u>
AWORK89	P223	Worked last year allocation
IMMIGR	P41	Year of entry
RETURN	P63	Year of return to Puerto Rico from U.S.
ARETURN	P197	Year of return to P.R. allocation
AIMMIGR	P188	Year of entry allocation
YEARWRK	P112	Year last worked
ALSTWRK	P219	Year last worked allocation
YRSSERV	P80	Years of active duty military service
AYRSERV	P205	Years of military service allocation

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
HOUSING UNIT RECORD**

DATA	SIZE	BEGIN
D RECTYPE	1	1
Record Type		
V H		
H .Housing Record		
D SERIALNO	7	2
Housing unit/GQ person serial number		
V 0000000..		
9999999 .Serial number of persons within household		
D SAMPLE	1	9
Sample Identifier		
V 1		
.5% sample		
V 2		
.1% sample		
D STATE	2	10
FIPS commonwealth code		
V 72		
.Puerto Rico		
D PUMA	5	12
Public use microdata area		
V 00100..		
02500 .PUMA code (includes tracts groups)		
V .1st 3 digits = main PUMA		
V .Last 2 digits = groups of tracts, BNA		
D AREATYPE	2	17
Area types for 1% PUMS		
V 10		
.Central city		
V 11		
.Central city (part)		
V 20		
.MSA/PMSA - Outside central city		
V 21		
.MSA/PMSA - Outside central city (part)		
V 22		
.Central City (part) and outside central city		
V .(part)		
V 30		
.Entire MSA		
V 31		
.2 or more MSAs/PMSAs		
V 40		
.Mixed MSA/PMSA/NON-MSA/PMSA area		
Area types for 5% PUMS		
V 50		
.Outside MSA/PMSA		
V 60		
.Place		
V 61		
.Place (part)		
V 71		
.Two or more MSAs/PMSAs		
V 73		
.Mixed MSA/PMSA/Non-MSA/PMSA area		
V 80		
.Municipios (2 or more)		
V 81		
.Municipio (part)		
V 82		
.Municipio		
D MSAPMSA	4	19
MSA/PMSA		
V 0060..		
7440 .FIPS MSA/PMSA codes		
V 9997		
.Mixed MSA/PMSA NONMSA/PMSA area		
V 9998		
.2 or more MSAs		
V 9999		
.Not in MA		
D SUBSAMPL	2	23
Subsample number (Use to pull extracts - 1/1000/etc.)		
V 00..99		
.See text. p. 4-4		

DATA	SIZE	BEGIN
D HOUSWGT	4	25
Housing Weight		
V 0000..		
1584 .Integer weight of housing unit		
D PERSONS	2	29
Number of person records following this housing record		
V 00		
.Vacant unit		
V 01		
.One person record (one person in household		
.or any person in group quarter)		
V 02..29		
.Number of persons in household		
D GQINST	1	31
Group quarters institution		
V 0		
.NA (housing unit)		
V 1		
.Institutionalized		
V 2		
.Not institutionalized		
D HUSFLAG	1	32
All 100% housing unit data substituted		
V 0		
.No		
V 1		
.Yes		
D PDSFLAG	1	33
All 100% person data substituted		
V 0		
.No		
V 1		
.Yes		
D UNITS1	2	34
Units in structure		
V 00		
.NA (GQ)		
V 01		
.Mobile home or trailer		
V 02		
.One-family house detached		
V 03		
.One-family house attached		
V 04		
.2 apartments		
V 05		
.3-4 apartments		
V 06		
.5-9 apartments		
V 07		
.10-19 apartments		
V 08		
.20-49 apartments		
V 09		
.50 or more apartments		
V 10		
.Other		
D ROOMS	1	36
Rooms		
V 0		
.NA (GQ)		
V 1		
.1 Room		
V 2		
.2 Rooms		
V 3		
.3 Rooms		
V 4		
.4 Rooms		
V 5		
.5 Rooms		
V 6		
.6 Rooms		
V 7		
.7 Rooms		
V 8		
.8 Rooms		
V 9		
.9 or more rooms		

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
HOUSING UNIT RECORD**

DATA	SIZE	BEGIN	DATA	SIZE	BEGIN
D PIPEWATR	1	37	D VALUE	2	47
		Piped water in house/apartment			Property value
V	0	.NA (GQ)	V	00	.NA (GQ/rental unit/occupied without cash
V	1	.Yes, hot and cold piped water	V		.rent/vacant/not for sale only)
V	2	.No, only cold piped water	V	01	.Less than \$ 10000
V	3	.No, piped water	V	02	.\$ 10000 - \$ 14999
D BATHTUB	1	38	V	03	.\$ 15000 - \$ 19999
		Bathtub or shower	V	04	.\$ 20000 - \$ 24999
V	0	.NA(GQ)	V	05	.\$ 25000 - \$ 29999
V	1	.Yes	V	06	.\$ 30000 - \$ 34999
V	2	.No bathtub or shower	V	07	.\$ 35000 - \$ 39999
D TOILET	1	39	V	08	.\$ 40000 - \$ 44999
		Flush toilet	V	09	.\$ 45000 - \$ 49999
V	0	.NA (GQ)	V	10	.\$ 50000 - \$ 54999
V	1	.Yes	V	11	.\$ 55000 - \$ 59999
V	2	.No	V	12	.\$ 60000 - \$ 64999
D TOILETYP	1	40	V	13	.\$ 65000 - \$ 69999
		Type of toilet facilities	V	14	.\$ 70000 - \$ 74999
V	0	.NA (GQ)	V	15	.\$ 75000 - \$ 79999
V	1	.Privy	V	16	.\$ 80000 - \$ 89999
V	2	.Other or none	V	17	.\$ 90000 - \$ 99999
D CONDO	1	41	V	18	.\$100000 - \$124999
		Condominium	V	19	.\$125000 - \$149999
V	0	.NA (GQ)	V	20	.\$150000 - \$174999
V	1	.Yes	V	21	.\$175000 - \$199999
V	2	.No	V	22	.\$200000 - \$249999
D TENURE	1	42	V	23	.\$250000 - \$299999
		Tenure	V	24	.\$300000 - \$399999
V	0	.NA (GQ/vacant)	V	25	.\$400000 or more
V	1	.Owned with mortgage or loan	D RENT1	2	49
V	2	.Owned free and clear			Monthly rent
V	3	.Rented for cash rent	V	00	.NA (GQ/not a rental unit)
V	4	.No cash rent	V	01	.Less than \$ 60
D CUERDAS3	1	43	V	02	.\$ 60 - \$ 79
		On three cuerdas or more (1 cuerda = 0.93 acre)	V	03	.\$ 80 - \$ 99
V	0	.NA (GQ/not a one-family house or mobile home)	V	04	.\$ 100 - \$124
V	1	.Yes	V	05	.\$ 125 - \$149
V	2	.No	V	06	.\$ 150 - \$174
D COMMUSE	1	44	V	07	.\$ 175 - \$199
		Commercial establishment on property	V	08	.\$ 200 - \$224
V	0	.NA (GQ/not a one-family house or mobile home)	V	09	.\$ 225 - \$249
V	1	.Yes	V	10	.\$ 250 - \$274
V	2	.No	V	11	.\$ 275 - \$299
D MEDUSE	1	45	V	12	.\$ 300 - \$324
		Medical office on property	V	13	.\$ 325 - \$349
V	0	.NA (GQ/not a one-family house or mobile home)	V	14	.\$ 350 - \$374
V	1	.Yes	V	15	.\$ 375 - \$399
V	2	.No	V	16	.\$ 400 - \$424
D PROFUSE	1	46	V	17	.\$ 425 - \$449
		Other professional office on property	V	18	.\$ 450 - \$474
V	0	.NA (GQ/not a one-family house or mobile home)	V	19	.\$ 475 - \$499
V	1	.Yes	V	20	.\$ 500 - \$549
V	2	.No	V	21	.\$ 550 - \$599
			V	22	.\$ 600 - \$649
			V	23	.\$ 650 - \$699
			V	24	.\$ 700 - \$749
			V	25	.\$ 750 - \$999
			V	26	.\$1000 or more
			V	27	.No cash rent (NCR)

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
HOUSING UNIT RECORD**

DATA	SIZE	BEGIN
D VACANCY1	1	51
Vacant usual home elsewhere (UHE)		
V 0	.NA (GQ/occupied housing unit or regular vacant)	
V 1	.Vacant UHE-owner	
V 2	.Vacant UHE-renter	
V 3	.Vacant UHE-undetermined	
D VACANCY2	1	52
Vacancy status		
V 0	.NA (GQ/occupied housing unit)	
V 1	.For rent	
V 2	.For sale only	
V 3	.Rented or sold, not occupied	
V 4	.For seasonal/recreational/occasional use	
V 5	.For migratory workers	
V 6	.Other vacant	
D VACANCY3	1	53
Boarded up status		
V 0	.NA (GQ/occupied housing unit)	
V 1	.Yes	
V 2	.No	
D VACANCY4	1	54
Months vacant		
V 0	.NA (GQ/occupied housing unit)	
V 1	.Less than 1 month	
V 2	.1 up to 2 months	
V 3	.2 up to 6 months	
V 4	.6 up to 12 months	
V 5	.1 up to 2 years	
V 6	.2 or more years	
D LOTSIZE	1	55
Housing lot size		
V 0	.NA (GQ/not in a 1-family house)	
V 1	.Less than 3 cuerdas	
V 2	.3 to 9 cuerdas	
V 3	.10 or more cuerdas	
D AGSALES	1	56
1989 sales of agricultural products		
V 0	.NA (GQ/vacant/2 or mor units in structure)	
V 1	.None	
V 2	\$.1 to \$99	
V 3	\$.100 to \$499	
V 4	\$.500 to \$999	
V 5	\$.1000 to \$2499	
V 6	\$.2500 or more	
D YRMOVED	1	57
When moved into this house or apartment		
V 0	.NA (GQ/vacant)	
V 1	.1989 or 1990	
V 2	.1985 to 1988	
V 3	.1980 to 1984	
V 4	.1970 to 1979	
V 5	.1960 to 1969	
V 6	.1959 or earlier	

DATA	SIZE	BEGIN
D YRBUILT	1	58
When structure first built		
V 0	.NA (GQ)	
V 1	.1989 or 1990	
V 2	.1985 to 1988	
V 3	.1980 to 1984	
V 4	.1970 to 1979	
V 5	.1960 to 1969	
V 6	.1950 to 1959	
V 7	.1940 to 1949	
V 8	.1939 or earlier	
D BLDMAT	1	59
Building construction material		
V 0	.NA (GQ)	
V 1	.Concrete walls/concrete slab roof	
V 2	.Concrete walls/wood frame roof	
V 3	.Wood frame walls/concrete foundation	
V 4	.Wood frame walls/wood stilt foundation	
V 5	.Mixed concrete and wood walls	
V 6	.Other type of construction materials	
D WATER	1	60
Source of water		
V 0	.NA (GQ)	
V 1	.Public system	
V 2	.Individual drilled well	
V 3	.Cistern, tanks, or drums	
V 4	.Spring or some other source	
D SEWAGE	1	61
Sewage disposal		
V 0	.NA (GQ)	
V 1	.Public sewer	
V 2	.Septic tank or cesspool	
V 3	.Other means	
D BEDROOMS	1	62
Bedrooms		
V 0	.NA (GQ)	
V 1	.No bedroom	
V 2	.1 bedroom	
V 3	.2 bedrooms	
V 4	.3 bedrooms	
V 5	.4 bedrooms	
V 6	.5 or more bedrooms	
D BATHRMS	1	63
Number of bathrooms		
V 0	.NA (GQ)	
V 1	.None	
V 2	.Only half bathrooms	
V 3	.1 complete bathroom	
V 4	.1 complete bathroom plus half bath(s)	
V 5	.2 or more complete bathrooms	

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
HOUSING UNIT RECORD**

DATA	SIZE	BEGIN	DATA	SIZE	BEGIN
D WTRHTR	1	64	D GASCOST	3	73
Type of water heater			Monthly cost for gas (dollars)		
V 0 .NA (GQ/vacant)			V 000 .NA (GQ/vacant)		
V 1 .Electric - tank type			V 001 .Included in rent or in condo fee		
V 2 .Shower			V 002 .No charge or gas not used		
V 3 .Solar			V 003..		
V 4 .Other			079 .\$.3 to \$79		
V 5 .None			V 080 .Topcode		
D COOKFUEL	1	65	V 081+ .\$.81 or more (mdian of topcoded		
Cooking fuel			.values for Puerto Rico)		
V 0 .NA (GQ/vacant)			D WATRCOST	3	76
V 1 .Electricity			Monthly cost for water (dollars)		
V 2 .Gas			V 000 .NA (GQ/vacant)		
V 3 .Other			V 001 .Included in rent or in condo fee		
D KITCHEN	1	66	V 002 .No charge		
Complete kitchen facilities			V 003..099 .\$.3 to \$.99		
V 0 .NA (GQ)			V 100 .Topcode		
V 1 .Yes			V 101+ .\$.101+ or more (median of topcoded		
V 2 .No			.values for Puerto Rico)		
D AIRCOND	1	67	D FUELCOST	4	79
Air conditioning			Yearly cost for fuel (oil, charcoal, kerosene, wood,		
V 0 .NA (GQ)			etc.) in dollars		
V 1 .Yes, central air conditioning			V 0000 .NA (GQ/vacant)		
V 2 .Yes, 1 individual room unit			V 0001 .Included in rent or in condo fee		
V 3 .Yes, 2 or more individual room units			V 0002 .No charge or these fuels not used		
V 4 .No air conditioning			V 0003..		
D TELEPHON	1	68	0999 .\$.3 to \$.999		
Telephone in unit			V 1000 .Topcode		
V 0 .NA (GQ/vacant)			V 1001+ .\$.1,001 or more (median of topcoded		
V 1 .Yes			.values for Puerto Rico)		
V 2 .No			D RTAXAMT	2	83
D AUTOS	1	69	Taxes on property (yearly amount)		
Number of vehicles available			V 00 .NA (GQ/vacant/not owned or being bought/not a		
V 0 .NA (GQ/vacant)			one-family house)		
V 1 .No vehicles			V 01 .None		
V 2 .1 vehicle			V 02 .\$. 2 - \$ 49		
V 3 .2 vehicles			V 03 .\$. 50 - \$ 99		
V 4 .3 vehicles			V 04 .\$. 100 - \$ 149		
V 5 .4 or more vehicles			V 05 .\$. 150 - \$ 199		
D ELECCOST	3	70	V 06 .\$. 200 - \$ 249		
Monthly cost for electricity (dollars)			V 07 .\$. 250 - \$ 299		
V 000 .NA (GQ/vacant)			V 08 .\$. 300 - \$ 349		
V 001 .Included in rent or in condo fee			V 09 .\$. 350 - \$ 399		
V 002 .No charge or electricity not used			V 10 .\$. 400 - \$ 449		
V 003..			V 11 .\$. 450 - \$ 499		
199 .\$.3 to \$199			V 12 .\$. 500 - \$ 549		
V 200 .Topcode			V 13 .\$. 550 - \$ 599		
V 201+ .\$.201 or more (median of topcoded			V 14 .\$. 600 - \$ 649		
.values for Puerto Rico)			V 15 .\$. 650 - \$ 699		
			V 16 .\$. 700 - \$ 749		
			V 17 .\$. 750 - \$ 799		
			V 18 .\$. 800 - \$ 849		
			V 19 .\$. 850 - \$ 899		
			V 20 .\$. 900 - \$ 949		
			V 21 .\$. 950 - \$ 999		
			V 22 .\$.1000 - \$1099		
			V 23 .\$.1100 - \$1199		
			V 24 .\$.1200 - \$1299		
			V 25 .\$.1300 - \$1399		
			V 26 .\$.1400 - \$1499		

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
HOUSING UNIT RECORD**

DATA	SIZE	BEGIN
V 27	\$.1500 - \$1599	
V 28	\$.1600 - \$1699	
V 29	\$.1700 - \$1799	
V 30	\$.1800 - \$1899	
V 31	\$.1900 - \$1999	
V 32	\$.2000 = Topcode	
V 33	\$.2001 - \$2499	Range for Medians
V 34	\$.2500 - \$2999	
V 35	\$.3000 or more	

D INSAMT	4	85
	Fire/hazard/flood insurance (yearly amount)	
V 0000	.NA (vacant/GQ/not owned or being bought/not a one family house)	
V 0001	.None	
V 0002..		
V 1099	\$.2 to \$1,099	
V 1100	.Topcode	
V 1101+	\$.1,101 or more (median of topcoded values for Puerto Rico)	

D MORTGAG	1	89
	Mortgage status	
V 0	.NA (vacant/GQ/not owned or being bought/not a one family house)	
V 1	.Yes, mortgage, deed of trust, or similar debt	
V 2	.Yes, contract to purchase	
V 3	.None	

D MORTGAG3	5	90
	Mortgage payment (monthly amount)	
V 00000	.NA (vacant/GQ/not owned or being bought/not a one family house/not mortgaged)	
V 00001	.None	
V 00002..		
V 00899	\$.2 to \$899	
V 00900	.Topcode	
V 00901+	\$.901 or more (median of topcoded values for Puerto Rico)	

D TAXINCL	1	95
	Payment include real estate taxes	
V 0	.NA (vacant/GQ/not owned or being bought/not a one family house or condo/not mortgaged/no regular mortgage payment)	
V 1	.Yes, taxes included in payment	
V 2	.No, taxes paid separately or taxes not required	

D INSINCL	1	96
	Payment include fire/hazard/flood insurance	
V 0	.NA (vacant/GQ/not owned or being bought/Not a one family house, MHT or condo/not mortgaged/no regular mortgage payment)	
V 1	.Yes, insurance included in payment	
V 2	.No, insurance paid separately or no insurance	

D MORTGAG2	1	97
	Second mortgage or home equity loan	
V 0	.NA (vacant/GQ/not owned or being bought/not a one-family house/not mortgaged)	
V 1	.Yes	
V 2	.No	
D MORTAMT2	5	98
	Second mortgage payment (monthly amount)	
V 00000	.NA (vacant/GQ/not owned or being bought/not a one family house/not mortgaged/no second mortgage)	
V 00001	.No regular payment required	
V 00002..		
V 01099	\$.2 to \$1099	
V 01100	.Topcode	
V 01101+	\$.1101 or more (median of topcoded values for Puerto Rico)	

D CONDOFEE	4	103
	Condo fee (monthly amount)	
V 0000	.NA (vacant/GQ/not owned or being bought/not a condo/no condo fee)	
V 0001..		
V 0499	\$.1 - \$499	
V 0500	.Topcode	
V 0501+	\$.501 or more (median of topcoded values for Puerto Rico)	

D HUCOND1	1	107
	Original condition of unit	
V 0	.NA (GQ)	
V 1	.Adequate	
V 2	.Inadequate	

D HUCOND2	1	108
	Condition of housing unit	
V 0	.NA (GQ/inadequate)	
V 1	.Sound	
V 2	.Deteriorating	
V 3	.Dilapidated	

D RNONREL	1	109
	Presence of nonrelative in household	
V 0	.NA (GQ/vacant/none)	
V 1	.One or more nonrelatives	

D R18UNDR	1	110
	Presence of persons under 18 in household	
V 0	.NA (GQ/vacant/none)	
V 1	.One or more persons under 18 in household	

D R60OVER	1	111
	Presence of persons 60 years and over in household	
V 0	.NA (GQ/vacant/none)	
V 1	.One person 60 or over	
V 2	.2 or more persons 60 years or over	

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
HOUSING UNIT RECORD**

DATA	SIZE	BEGIN	DATA	SIZE	BEGIN
D R65OVER	1	112	D RHHINC	7	126
V	0	Presence of persons 65 years and over in household	V	0000000	Household income (signed)
V	1	.NA (GQ/vacant/none)	V	-176813	.NA (GQ/vacant/no income)
V	2	.One person 65 years or over	V	-176812..	.Loss of \$176813 or more
V	2	.2 or more persons 65 years or over	V	6235000	.Total household income in dollars
D RSUBFAM	1	113	D RFAMINC	7	133
V	0	Presence of subfamilies in household	V	0000000	Family income (signed)
V	1	.NA (GQ/vacant/none)	V	-176813	.NA (GQ/vacant/nonfamily/no income)
V	1	.One or more subfamilies	V	-176812..	.Loss of \$176813 or more
D RNAPADPT	2	114	V	6235000	.Total family income in dollars
V	00	Number of own/adopted children in household	D ROWNRCST	5	140
V	01..28	.NA (GQ/vacant/none)	V	00000	Selected monthly owner costs
V	01..28	.Number of own children in household	V	00001..	.NA (GQ/vacant/no costs/not owned or
D RSTPCHLD	2	116	V	27875	.being bought)
V	00	Number of stepchildren in household	V	27875	.Monthly owner costs in dollars
V	01..28	.NA (GQ/vacant/none)	D RNSMOCPI	3	145
V	01..28	.Number of own stepchildren in household	V	000	Selected monthly owner costs as a
D RRELCHLD	2	118	V	001..100	percentage of household income
V	00	Number of related children in household	V	101	.NA (GQ/vacant/no household income/
V	01..28	.NA (GQ/vacant/none)	V	101	.not owned or being bought)
V	01..28	.Number of related children in household	V	101	.1% to 100%
D RFAMPERS	2	120	V	101	.101% or more
V	00	Number of persons in family	D RGRENT	4	148
V	01..29	.NA (GQ/vacant/nonfamily household)	V	0000	Gross rent
V	01..29	.Number of persons in family	V	0001..	.NA (GQ/vacant/not rented/not rented for cash
D RHHFAMTP	2	122	V	3542	.rent)
V	00	Household/family type	V	3542	.Gross rent (dollars)
V	01	.NA (GQ/vacant)	D RGRAP1	3	152
V	01	.Married couple family household	V	000	Gross rent as a percentage of household income in
V	02	.Other family household:	V	001..100	1989
V	03	.Male householder	V	101	.NA (GQ/vacant/not rented for cash rent/no
V	03	.Female householder	V	101	.household income)
V	03	.Non-family household:	V	101	.1% to 100%
V	11	.Male householder	V	101	.101% or more
V	11	.Living alone	D RVALUNT	1	155
V	12	.Not living alone	V	0	Specified value indicator
V	21	.Female householder	V	1	.Not specified
V	22	.Living alone	V	1	.Specified
V	22	.Not living alone	D RRENTUNT	1	156
D RFARM	1	124	V	0	Specified rent indicator
V	0	Farm/nonfarm status	V	1	.Not specified
V	1	.NA (urban/GQ/vacant)	V	1	.Specified
V	1	.Rural-farm	D AUNITS	1	157
V	2	.Rural-non-farm	V	0	Units in structure allocation
D RWRKR89	1	125	V	1	.No
V	0	Workers in family in 1989	V	1	.Yes
V	1	.NA (GQ/vacant/nonfamily household)	D AROOMS	1	158
V	1	.No workers in family	V	0	Rooms allocation
V	2	.One worker in family	V	1	.No
V	3	.Two workers in family	V	1	.Yes
V	4	.3 or more workers in family			

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
HOUSING UNIT RECORD**

DATA SIZE BEGIN

D APIEWTR 1 159

Piped water allocation

V 0 .No

V 1 .Yes

D ABATHTUB 1 160

Bathtub/shower allocation

V 0 .No

V 1 .Yes

D ATOILET 1 161

Flush toilet allocation

V 0 .No

V 1 .Yes

D ATOILTYP 1 162

Type of toilet facilities allocation

V 0 .No

V 1 .Yes

D ACONDO 1 163

Condominium status allocation

V 0 .No

V 1 .Yes

D ATENURE 1 164

Tenure allocation

V 0 .No

V 1 .Yes

D ACUERDA3 1 165

On 3 cuerdas or more allocation

V 0 .No

V 1 .Yes

D ACOMMUSE 1 166

Commercial establishment allocation

V 0 .No

V 1 .Yes

D AMEDUSE 1 167

Medical office allocation

V 0 .No

V 1 .Yes

D APROFUSE 1 168

Other professional office allocation

V 0 .No

V 1 .Yes

D AVALUE 1 169

Property value allocation

V 0 .No

V 1 .Yes

D ARENT1 1 170

Monthly rent allocation

V 0 .No

V 1 .Yes

DATA SIZE BEGIN

D AVACNCY1 1 171

Vacancy status allocation

V 0 .No

V 1 .Yes

D AVACNCY3 1 172

Boarded up status allocation

V 0 .No

V 1 .Yes

D AVACNCY4 1 173

Months vacant allocation

V 0 .No

V 1 .Yes

D ALOTSIZE 1 174

House lot size allocation

V 0 .No

V 1 .Yes

D AAGSALES 1 175

Agricultural sales allocation

V 0 .No

V 1 .Yes

D AYRMOVED 1 176

Year moved in allocation

V 0 .No

V 1 .Yes

D AYRBUILT 1 177

Year structure built allocation

V 0 .No

V 1 .Yes, not answered

V 2 .Yes, don't know

D ABLDMAT 1 178

Building material allocation

V 0 .No

V 1 .Yes

D AWATER 1 179

Source of water allocation

V 0 .No

V 1 .Yes

D ASEWAGE 1 180

Sewage disposal allocation

V 0 .No

V 1 .Yes

D ABEDROOM 1 181

Bedroom allocation

V 0 .No

V 1 .Yes

D ABATHRMS 1 182

Bathrooms allocation

V 0 .No

V 1 .Yes

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
HOUSING UNIT RECORD**

DATA	SIZE	BEGIN
D AWRHTR	1	183
Type of water heater allocation		
V	0 .No	
V	1 .Yes	
D ACOOKFUL	1	184
Cooking facilities allocation		
V	0 .No	
V	1 .Yes	
D AKITCHEN	1	185
Complete kitchen allocation		
V	0 .No	
V	1 .Yes	
D AAIRCOND	1	186
Air conditioning allocation		
V	0 .No	
V	1 .Yes	
D ATELPON	1	187
Telephones allocation		
V	0 .No	
V	1 .Yes	
D AAUTOS	1	188
Vehicles allocation		
V	0 .No	
V	1 .Yes	
D AELECCST	1	189
Cost of electricity allocation		
V	0 .No	
V	1 .Yes	
D AGASCST	1	190
Cost of gas allocation		
V	0 .No	
V	1 .Yes	
D AWATRCST	1	191
Cost of water allocation		
V	0 .No	
V	1 .Yes	
D AFUELCST	1	192
Cost of fuel allocation		
V	0 .No	
V	1 .Yes	
D ATAXAMT	1	193
Property tax allocation		
V	0 .No	
V	1 .Yes	
D AINSAMT	1	194
Fire/hazard/flood insurance allocation		
V	0 .No	
V	1 .Yes	

DATA	SIZE	BEGIN
D AMORTG1	1	195
Mortgage status allocation		
V	0 .No	
V	1 .Yes, no answer	
V	2 .Yes, from junior mortgage	
D AMRTAMT1	1	196
Mortgage payment allocation		
V	0 .No	
V	1 .Yes	
D ATAXINCL	1	197
Real estate taxes included allocation		
V	0 .No	
V	1 .Yes	
D AINSINCL	1	198
Fire/hazard/flood insurance included allocation		
V	0 .No	
V	1 .Yes	
D AMORTG2	1	199
Second mortgage status allocation		
V	0 .No	
V	1 .Yes	
D AMRTAMT2	1	200
Second mortgage payment allocation		
V	0 .No	
V	1 .Yes	
D ACNDOFEE	1	201
Condominium fee allocation		
V	0 .No	
V	1 .Yes	
D AHUCOND1	1	202
Original condition of unit allocation		
V	0 .No	
V	1 .Yes	
D AHUCOND2	1	203
Present condition of unit allocation		
V	0 .No	
V	1 .Yes	

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
PERSON RECORD**

DATA	SIZE	BEGIN
D RECTYPE	1	1
Record Type		
V	P	.Person Record
D SERIALNO	7	2
V	0000000..	
V	9999999	.Housing unit/GQ person serial number
D PSEQNO	2	9
V	01..29	.Sequence number of persons within household
D RELAT1	2	11
Relationship		
V	00	.Householder
V		<u>.Relative:</u>
V	01	.Husband/wife
V	02	.Son/daughter
V	03	.Stepson/stepdaughter
V	04	.Brother/sister
V	05	.Father/mother
V	06	.Grandchild
V	07	.Other relative
V		<u>.Nonrelative:</u>
V	08	.Roomer/boarder/foster child
V	09	.Housemate/roommate
V	10	.Unmarried partner
V	11	.Other nonrelative
V		<u>.In group quarters:</u>
V	12	.Institutionalized person
V	13	.Other persons in group quarters
D SEX	1	13
Sex		
V	0	.Male
V	1	.Female
D AGE	2	14
Age		
V	00	.Less than 1 year old
V	01..89	.Age in years
V	90	.90 or more years old (topcode)
D MARITAL	1	16
Marital status		
V	0	.Now married
V	1	.Consensually married
V	2	.Widowed
V	3	.Divorced
V	4	.Separated
V	5	.Never married (include all persons under 15 years)
D PWGT1	4	17
Person's weight		
V	0000..	
V	1584	.Person's weight

DATA	SIZE	BEGIN
D REMPLPAR	3	21
Employment status of parents		
V	000	.NA (not own child in family and not child in subfamily)
V	1XX	<u>Living with two own parents:</u>
V	11X	<u>Both in the labor force:</u>
V	111	.Both parents at work 35 or more hours
V	112	.Father only at work 35 or more hours
V	113	.Mother only at work 35 or more hours
V	114	.Neither parent at work 35 or more hours
V	12X	<u>Father only in the labor force:</u>
V	121	.At work 35 or more hours
V	122	.Not at work 35 or more hours
V	13X	<u>Mother only in labor force:</u>
V	131	.At work 35 or more hours
V	132	.Not at work 35 or more hours
V	141	.Neither parent in labor force
V	2XX	<u>Living with one parent:</u>
V	21X	<u>Living with father:</u>
V	21X	<u>Father in labor force</u>
V	211	.At work 35 or more hours
V	212	.Not at work 35 or more hours force
V	213	.Not in the labor force
V	22X	<u>Living with mother</u>
V		<u>Mother in labor force</u>
V	221	.At work 35 or more hours
V	222	.Not at work 35 or more hours
V	223	.Not in the labor force
D RPARPOB	1	24
Place of birth and parent's place of birth - recode		
V		<u>.Persons born in Puerto Rico:</u>
V	0	. Both parents born in Puerto Rico
V	1	. Only one parent born in Puerto Rico
V	2	. Neither parent born in Puerto Rico
V		<u>.Person born in the U.S.:</u>
V	3	. Both parents born in Puerto Rico
V	4	. Only one parent born in Puerto Rico
V	5	. Neither parent born in Puerto Rico
V		<u>.Person born elsewhere:</u>
V	6	. Person born elsewhere
D RSPOUSE	1	25
Married - spouse present/spouse absent		
V	0	.NA (less than 15 years old)
V	1	.Now married, spouse present
V	2	.Now married, spouse absent
V	3	.Widowed
V	4	.Divorced
V	5	.Separated
V	6	.Never married
D ROWNCHLD	1	26
Own child		
V	0	.Not own child
V	1	.Own child

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
PERSON RECORD**

DATA	SIZE	BEGIN	DATA	SIZE	BEGIN
D RAGECHLD	1	27	D POB	3	37
Presence and age of own children			Place of birth		
V 0 . NA (male/female under 15 years old)			V 001..059 .U.S. State or D.C.		
V .With own children:			V 072 .Puerto Rico		
V 1 . Less than 6 years old only			V 060..071,		
V 2 . 6 to 17 years old only			V 073..099 .U.S. outlying areas		
V 3 . Under 6 years and 6 to 17 years old			V 100..553 .Foreign country		
V 4 . No own children			V 554 .Born at sea		
			V 555 .Born abroad, country not specified		
D RRELCHLD	1	28	D CITIZEN	1	40
Related child			Citizenship		
V 0 .Not related child			V 0 .Born in Puerto Rico		
V 1 .Related child			V 1 .Born in a U.S. State/outlying area		
			V 2 .Born abroad of American parents		
D RELAT2	1	29	V 3 .Naturalized		
Detailed relationship (other relative)			V 4 .Not a citizen		
V 0 .NA (GQ/not an other relative)			D IMMIGR	2	41
V 1 .Son-in-law/daughter-in-law			Year of entry		
V 2 .Father-in-law/mother-in-law			V 00 .NA (Born in Puerto Rico)		
V 3 .Brother-in-law/sister-in-law			V 01 .1987 to 1990		
V 4 .Nephew/niece			V 02 .1985 or 1986		
V 5 .Grandparent			V 03 .1982 to 1984		
V 6 .Uncle/aunt			V 04 .1980 or 1981		
V 7 .Cousin			V 05 .1975 to 1979		
V 8 .Other related by blood or marriage			V 06 .1970 to 1974		
V 9 .Other relative			V 07 .1965 to 1969		
			V 08 .1960 to 1964		
D SUBFAM2	1	30	V 09 .1950 to 1959		
Subfamily			V 10 .Before 1950		
V 0 .NA (GQ/not in a subfamily)			D SCHOOL	1	43
V 1 .In subfamily 1			School enrollment		
V 2 .In subfamily 2			V 0 .NA (less than 3 years old)		
V 3 .In subfamily 3			V 1 .No, has not attended since		
			V .February 1, 1990		
D SUBFAM1	1	31	V 2 .Public school/public college		
Subfamily relationship			V 3 .Private school/private college		
V 0 .NA (GQ/not in a subfamily)					
V 1 .Husband/wife			D YEARSCH	2	44
V 2 .Single parent			Educational attainment		
V 3 .Child in subfamily			V 00 .NA (less than 3 years old)		
			V 01 .No school completed		
D POVERTY	3	32	V 02 .Pre-kindergarten		
Poverty status			V 03 .Kindergarten		
V 000 .NA			V 04 .1st grade		
V 001..500 .% Below or above poverty status value			V 05 .2nd grade		
V 501 .501% or more of poverty value			V 06 .3rd grade		
			V 07 .4th grade		
D RPOB	2	35	V 08 .5th grade		
Place of birth - recode			V 09 .6th grade		
V 1X Born in Puerto Rico			V 10 .7th grade		
V 10 .Same municipio			V 11 .8th grade		
V 11 .Different municipio			V 12 .9th grade		
V 2X Born in the U.S./outlying areas:			V 13 .10th grade		
V 22 .Born in the U.S.			V 14 .11th grade		
V 23 .Born in a U.S. outlying area			V 15 .12 grade, no diploma		
V 24 .Born abroad of American parents			V 16 .High school graduate, diploma or GED		
V 3X Born elsewhere			V 17 .Some college, no degree		
V 31 .Naturalized citizen			V 18 .Associate degree, occupational program		
V 32 .Not a citizen			V 19 .Associate degree, academic program		

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
PERSON RECORD**

DATA SIZE BEGIN

V 20 .Bachelor's degree
V 21 .Master's degree
V 22 .Professional school degree
V 23 .Doctorate degree

D FPOB 3 46
 Father's place of birth

V 001..059 .U.S. State or D.C.
V 072 .Puerto Rico
V 060..071,
V 073..099 .U.S. outlying area
V 100..553 .Foreign country
V 554 .At sea
V 555 .Abroad

D MPOB 3 49
 Mother's place of birth

V 001..059 .U.S. State or D.C.
V 072 .Puerto Rico
V 060..071,
V 073..099 .U.S. outlying area
V 100..553 .Foreign country
V 554 .At sea
V 555 .Abroad, country not specified

D MOBILITY 1 52
 Mobility status (lived here on April 1, 1985)
V 0 .NA (Less than 5 years old)
V 1 .Yes, same house (nonmovers)
V 2 .No, different house (movers)

D MIGSTATE 3 53
 Migration - state or foreign country
V 000 .NA (Person less than 5 years old/lived
 .in the same house in 1985)
V 001..059 .U.S. state or D.C.
V 072 .Puerto Rico
V 060..071,
V 073..099 .U.S. outlying area
V 100..553 .Foreign country
V 554 .At sea
V 555 .Abroad, country not specified

D MIGPUMA 5 56
 Migration - PUMA
V 00000 .NA (person less than 5 years old/lived in the
 .same house in 1985)
V 00100..
 99800 .Migration PUMA
V 99900 .Outside Puerto Rico or the United States

D USRES 1 61
 Residence in the U.S. between 1980 and 1990
V 0 .NA (person less than 5 years old)
V 1 .Yes
V 2 .No

D LASTSTAY 1 62
 Length of last stay in U.S.
V 0 .NA (person less than 5 years old/
V .no residence in U.S. between 1980 and 1990)

DATA SIZE BEGIN

V 1 .6 months to 1 year
V 2 .1 to 2 years
V 3 .3 to 4 years
V 4 .5 years
V 5 .6 to 9 years
V 6 .10 or more years

D RETURN 1 63
 Year of return to Puerto Rico from U.S.
V 0 .NA (person less than 5 years old/
 .no residence in U.S. between 1980 and 1990)
V 1 .1990
V 2 .1989
V 3 .1988
V 4 .1987
V 5 .1986
V 6 .1985
V 7 .1984
V 8 .1983
V 9 .1980 to 1982

D USACTIV 1 64
 Main activity in US during that time
V 0 .NA (person less than 5 years old/no residence in
 .U.S. between 1980 and 1990)
V 1 .In U.S. Armed Forces
V 2 .Working at a job or business
V 3 .Attending school or college
V 4 .Other

D LITERACY 1 65
 Literacy (in any language)
V 0 .NA (less than 5 years old)
V 1 .Yes
V 2 .No

D SPANISH 1 66
 Speak spanish
V 0 .NA (less than 5 years old)
V 1 .Yes
V 2 .No

D ENGLISH 1 67
 English ability
V 0 .NA (less than 5 years old)
V 1 .Yes, easily
V 2 .Yes, with difficulty
V 3 .No

D FERTIL 2 68
 Number of children ever born
V 00 .NA (less than 15 years old/male)
V 01 .No child
V 02 .1 child
V 03 .2 children
V 04 .3 children
V 05 .4 children
V 06 .5 children
V 07 .6 children
V 08 .7 children
V 09 .8 children

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
PERSON RECORD**

DATA	SIZE	BEGIN	DATA	SIZE	BEGIN
V 10 .9 children			V 0 .Did not serve this period/less than 16 years old		
V 11 .10 children			V 1 .Served this period		
V 12 .11 children					
V 13 .12 or more children			D YRSSERV 2 80		
D MILITARY 1 70			Years of active duty military service		
Military service status			V 00 .NA (less than 16 years old/no active duty		
V 0 .NA (less than 16 years old)			.military service)		
V 1 .Yes, now on active duty			V 01 .1 Year or less of service		
V 2 .Yes, active duty in past, but not now			V 02..49 .2 to 49 years of service		
V 3 .Yes, service in the reserves or national guard			V 50 .50 or more years of service		
V .only			D DISABL1 1 82		
V 4 .No service			Work limitation status		
D RVETSERV 2 71			V 0 .NA (less than 16 years old/institutionalized		
Veteran's period of service			V .person		
V 00 .NA (less than 16 years old/no active duty)			V 1 .Yes		
V 01 .September 1980 or later only			V 2 .No limitation		
V 02 .May 1975 to August 1980 only			D DISABL2 1 83		
V 03 .May 1975 to August 1980 and September 1980			Work prevented status		
V .or later only			V 0 .NA (less than 16 years old/institutionalized		
V 04 .Vietnam era, no Korean conflict, nor WWII			.person)		
V 05 .Vietnam era and Korean conflict, no WWII			V 1 .Yes, prevented from working		
V 06 .Vietnam era and Korean conflict, and WWII			V 2 .No, not prevented from working		
V 07 .February 1955 to July 1964 only			D MOBILIM 1 84		
V 08 .Korean conflict, no Vietnam era, nor WWII			Mobility limitation		
V 09 .Korean conflict and WWII, no Vietnam era			V 0 .NA (less than 15 years old/institutionalized		
V 10 .WWII, no Korean conflict, nor Vietnam era			V .person)		
V 11 .Other service			V 1 .Yes		
D SEPT80 1 73			V 2 .No		
Served September 1980 or later			D PERSCARE 1 85		
V 0 .Did not serve this period/less than 16 years old			Personal care limitation		
V 1 .Served this period			V 0 .N/A (less than 15 years old/institutionalized		
D MAY75880 1 74			V .person)		
Served May 1975 to August 1980			V 1 .Yes, has a personal care limitation		
V 0 .Did not serve this period/ less than 16 years old			V 2 .No, does not have a personal care limitation		
V 1 .Served this period			D VOCTRNG 1 86		
D VIETNAM 1 75			Completed vocational training		
Served Vietnam era (August 1964 - April 1975)			V 0 .NA (less than 15 years old)		
V 0 .Did not serve this period/less than 16 years old			V 1 .Yes		
V 1 .Served this period			V 2 .No		
D FEB55 1 76			D VOCSCHOL 1 87		
Served February 1955 - July 1964			Kind of school for vocational training		
V 0 .Did not serve this period/less than 16 years old			V 0 .NA (less than 15 years old/no		
V 1 .Served this period			.vocational training)		
D KOREAN 1 77			V 1 .Business/trade school/junior college		
Served Korean conflict (June 1950 - January 1955)			V 2 .High school vocational program		
V 0 .Did not serve this period/less than 16 years old			V 3 .Training program at place of work		
V 1 .Served this period			V 4 .Other school		
D WWII 1 78			D RLABOR 1 88		
Served World War II (September 1940 - July 1947)			Employment status		
V 0 .Did not serve this period/less than 16 years old			V 0 .NA (less than 16 years old)		
V 1 .Served this period			V 1 .Civilian employed, at work		
D OTHRSERV 1 79			V 2 .Civilian employed, but not at work		
Served any other time			V 3 .Civilian unemployed		
			V 4 .Armed forces, at work		
			V 5 .Armed forces, with a job, but not at work		

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
PERSON RECORD**

DATA	SIZE	BEGIN	DATA	SIZE	BEGIN
V	6	.Not in the labor force	V		.labor force/unemployed/not by car, truck, or van)
D WORKLWK	1	89	V	1	.Drove alone
		Worked last week (unallocated)	V	2	.2 People
V	0	.NA (less than 16 years old/not at work/	V	3	.3 People
V		.unemployed/not in the labor force/Q22 not	V	4	.4 People
V		.reported)	V	5	.5 People
V	1	.Worked	V	6	.6 People
V	2	.Did not work	V	7	.7 to 9 people
			V	8	.10 or more people
D HOURS	2	90	D DEPART	4	103
		Hours worked last week			Time of departure for work - hour and minute
V	00	.NA (less than 16 years old/not at	V	0000	.NA (less than 16 years old/employed or in
V		.work/unemployed/not in labor force)	V		.armed forces but not at work/worked at home/
V	01..98	.1 to 98 hours worked last week	V		.unemployed/not in labor force)
V	99	.99 or more hours worked last week	V	0001..	
D POWSTATE	3	92		2400	.Time of departure for work (hour and minute,
		Place of work - state or foreign country	V		.2400=midnight)
V	000	.NA (Less than 16 years old/employed	D TRAVTIME	2	107
V		.or Armed Forces but not at work/not in labor			Travel time to work
		.force/unemployed)	V	00	.NA (Less than 16 years old/employed or
V	001..059	.U.S. state or D.C.	V		.in armed forces but not at work/worked at home/
V	072	.Puerto Rico	V		.unemployed/not in labor force)
V	060..071,		V	01..98	.1 to 98 minutes to get to work
V	073..099	.U.S. outlying area	V	99	.99 minutes or more to get to work
V	100..553	.Foreign country	D TMPABSNT	1	109
V	554	.At sea			Temporary absence from work
V	555	.Abroad, country not specified	V	0	.NA (less than 16 years old/at work/did not
D POWPUMA	5	95			.report Q26)
		Place of work PUMA	V	1	.Yes, on layoff
V	00000	.NA (not a worker/not in the labor force/	V	2	.Yes, on vacation, temporary illness, labor
V		.less than 16 years old/unemployed/			.force dispute
V		.employed but not at work/armed forces	V	3	.No
V		.with a job, but not at work)	D LOOKING	1	110
V	00100..				Looking for work
V	02500	.Place of work PUMA in Puerto Rico	V	0	.NA (less than 16 years old/at work/did not
V	99900	.Place of work outside Puerto Rico			.report Q27A)
D MEANS	2	100	V	1	.Yes
		Principal means of transportation to work	V	2	.No
V	00	.NA (Less than 16 years old/employed or	D AVAIL	1	111
V		.armed forces, but not at work/not in labor			Available for work
V		.force/unemployed)	V	0	.NA (less than 16 years old/at work/did not
V	01	.Car, truck, or van	V		.report Q27A/not looking for work/did not
V	02	.Bus	V		.report Q27B)
V	03	.Publico	V	1	.No, already has a job
V	04	.Ferryboat	V	2	.No, temporarily ill
V	05	.Taxicab	V	3	.No, other reasons (in school, etc.)
V	06	.Motorcycle	V	4	.Yes, could have taken a job
V	07	.Bicycle	D YEARWRK	1	112
V	08	.Walked			Year last worked
V	09	.Worked at home	V	0	.NA (less than 16 years old)
V	10	.Other means	V	1	.1990
D RIDERS	1	102	V	2	.1989
		Vehicle occupancy	V	3	.1988
V	0	.NA (Less than 16 years/employed or	V	4	.1985 to 1987
V		.armed forces but not at work/not in			

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
PERSON RECORD**

DATA	SIZE	BEGIN	DATA	SIZE	BEGIN
V 5	.1980 to 1984		V 000000	.NA (less than 15 years old/no income)	
V 6	.1979 or earlier		V -06097	.Loss of \$6097 or more	
V 7	.Never worked		V -06096..		
			214999	.Total person's income in dollars	
D INDUSTRY	3	113	V 215000	.Topcode of total person's income	
Industry			V 215001+	.Medians of topcoded values for Puerto Rico	
V 000	.N/A (less than 16 years old/unemployed who		V	.included	
	.never worked/not in labor force who last worked				
V	.before 1985)		D REARNING	6	131
V 010..960	.Specific industry codes (see appendix I)		Total person's earnings (signed)		
V 992	.Unemployed, last worked before 1985		V 000000	.Less than 16 years old/no income	
			V -05998	.Loss of \$5998 or more	
D OCCUP	3	116	V -05997..		
Occupation			129999	.Total person's earnings in dollars	
V 000	.NA (less than 16 years old/unemployed who		V 130000	.130000 = Topcode of total person's earnings	
	.never worked/not in labor force who last worked		V 130001+	.Medians of topcoded values for Puerto Rico	
V	.before 1985)		V	.included	
V 003..905	.Specific occupation codes (see appendix I)				
V 909	.Unemployed, last worked prior to 1985		D INCOME1	6	137
			Wages or salary income in 1989		
D CLASS	1	119	V 000000	.NA (less than 16 years old/none)	
Class of worker			V 000001..		
V 0	.NA (less than 16 years old/unemployed who		V 059999	\$.1 to \$59999	
V	.never worked/not in labor force who last worked		V 060000	.Topcode	
V	.before 1985)		V 060001+	\$.60001 or more (median of topcoded values	
V 1	.Employee of a private for profit company or		V	. for Puerto Rico)	
V	.business or of an individual, for wages,				
V	.salary, or commissions		D INCOME2	6	143
V 2	.Employee of a private not-for-profit,		Nonfarm self-employment income in 1989 (signed)		
V	.tax-exempt, or charitable organization		V 000000	.NA (less than 16 years/none)	
V 3	.Municipal government employee (city, municipio,		V -04999	.Loss of \$4,999 or more	
V	.etc.)		V -00001..		
V 4	.Commonwealth government employee		V -04998	.Loss \$1 to \$4,998	
V 5	.Federal government employee		V 000001	.Break even or \$1	
V 6	.Self-employed in own not incorporated		V 000002..		
V	.business, professional practice, or farm		049999	\$.2 To \$49999	
V 7	.Self-employed in own incorporated		V 050000	.Topcode	
V	.business, professional practice or farm		V 050001+	\$.50,001 or more (median of topcoded	
V 8	.Working without pay in family business or farm		V	.values for Puerto Rico)	
V 9	.Unemployed, last worked before 1985				
D WORK89	1	120	D INCOME3	6	149
Worked last year (1989)			Farm self-employment income in 1989 (signed)		
V 0	.NA (less than 16 years old)		V 000000	.NA (less than 16 years/none)	
V 1	.Worked last year		V -00999	.Loss of \$999 or more	
V 2	.Did not work last year		V -00001 to		
			-00998	.Loss of \$1 to \$998	
D WEEK89	2	121	V 000001	.Break even or \$1	
Weeks worked last year (1989)			V 000002..		
V 00	.NA (less than 16 years old/did not work in		019999	\$.2 To \$19999	
	.1989)		V 020000	.Topcode	
V 01..52	.Worked 1 to 52 weeks last year		V 20001+	\$.20001 or more (median of topcoded values for	
			V	.Puerto Rico)	
D HOUR89	2	123	D INCOME4	6	155
Usual hours worked last year (1989)			Interest, dividends, and net rental income in 1989		
V 00	.NA (less than 16 years old/did not work in		(signed)		
	.1989)		V 000000	.NA (less than 15 years old/none)	
V 01..98	.1 to 98 usual hours		V -00099	.Loss of \$99 or more	
V 99	.99 or more usual hours		V -00001 to		
			-00098	.Loss \$1 to \$98	
D RPINCOME	6	125	V 000001	.Break even or \$1	
Total person's income (signed)					

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
PERSON RECORD**

DATA	SIZE	BEGIN	DATA	SIZE	BEGIN
V 000002..			V 1 .Yes		
029999 .\$.2 To \$29999					
V 030000 .Topcode			D AMARITAL 1 185		
V 030001+ .\$.30001 or more (median of topcoded values			Marital status allocation		
V .for Puerto Rico)			V 0 .No		
			V 1 .Yes		
D INCOME5 5 161			D ABIRTHPL 1 186		
Social security income (amount)			Place of birth allocation		
V 00000 .NA (less than 15 years old/none)			V 0 .No		
V 00001..			V 1 .Yes		
14999 .\$.1 to \$14999					
V 15000 .Topcode			D ACITIZEN 1 187		
V 15001+ .\$.15001 or more (median of topcoded values			Citizenship allocation		
V .for Puerto Rico)			V 0 .No		
			V 1 .Yes		
D INCOME6 5 166			D AIMMIGR 1 188		
Public assistance income (signed)			Year of entry allocation		
V 00000 .NA (less than 15 years old/none)			V 0 .No		
V 00001..			V 1 .Yes		
09999 .\$.1 To \$9999					
V 10000 .Topcode			D ASCHOOL 1 189		
V 10001+ .\$.10001 or more (median of topcoded values for			School enrollment allocation		
V .Puerto Rico)			V 0 .No		
			V 1 .Yes		
D INCOME7 5 171			D AYEARSCH 1 190		
Retirement income (amount)			Highest degree allocation		
V 00000 .NA (less than 15 years old/none)			V 0 .No		
V 00001..			V 1 .Yes		
14999 .\$.1 to \$14999					
V 15000 .Topcode			D AFPOB 1 191		
V 15001+ .\$.15001 or more (median of topcoded values for			Father's place of birth allocation		
V .Puerto Rico)			V 0 .No		
			V 1 .Yes		
D INCOME8 5 176			D AMPOB 1 192		
All other income in 1989			Mother's place of birth allocation		
V 00000 .N/A (less than 15 years old/none)			V 0 .No		
V 00001..			V 1 .Yes		
14999 .\$.1 to \$14999					
V 15000 .Topcode			D AMOBIL 1 193		
V 15001+ .\$.15001 or more (median of topcoded values for			Mobility status allocation		
V .Puerto Rico)			V 0 .No		
			V 1 .Yes		
D AAUGMENT 1 181			D AMIGSTAT 1 194		
Augmented person			Migration - State allocation		
V 0 .No			V 0 .No		
V 1 .Yes			V 1 .Yes		
D ARELAT1 1 182			D AUSRES 1 195		
Relationship allocation			Residence in U.S. allocation		
V 0 .No			V 0 .No		
V 1 .Yes			V 1 .Yes		
D ASEX 1 183			D ALSTSTAY 1 196		
Sex allocation			Length of stay in U.S. allocation		
V 0 .No			V 0 .No		
V 1 .Yes					
D AAGE 1 184					
Age allocation					
V 0 .No					

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
PERSON RECORD**

DATA	SIZE	BEGIN
V 1 .Yes		
D ARETURN 1 197		
Year of return to Puerto Rico allocation		
V 0 .No		
V 1 .Yes		
D AUSACTIV 1 198		
Activity in the U.S. allocation		
V 0 .No		
V 1 .Yes		
D ALITERCY 1 199		
Literacy in any language allocation		
V 0 .No		
V 1 .Yes		
D ASPANISH 1 200		
Speaks spanish allocation		
V 0 .No		
V 1 .Yes		
D AENGLISH 1 201		
Ability to speak English allocation		
V 0 .No		
V 1 .Yes		
D AFERTIL 1 202		
Children ever born allocation		
V 0 .No		
V 1 .Yes		
D AMILTRY 1 203		
Military service allocation		
V 0 .No		
V 1 .Yes		
D AVETS 1 204		
Military periods of service allocation		
V 0 .No		
V 1 .Yes		
D AYRSSERV 1 205		
Years of military service allocation		
V 0 .No		
V 1 .Yes		
D ADISABL1 1 206		
Work limitation status allocation		
V 0 .No		
V 1 .Yes		
D ADISABL2 1 207		
Work prevention status allocation		
V 0 .No		
V 1 .Yes		
D AMOBLIM 1 208		
Mobility limitation status allocation		
V 0 .No		
V 1 .Yes		

DATA	SIZE	BEGIN
D APERCARE 1 209		
Personal care limitation status allocation		
V 0 .No		
V 1 .Yes		
D AVOCTRNG 1 210		
Completed vocational training allocation		
V 0 .No		
V 1 .Yes		
D AVOCSCHL 1 211		
School for vocational training allocation		
V 0 .No		
V 1 .Yes		
D ALABOR 1 212		
Employment status recode allocation		
V 0 .No		
V 1 .Yes		
D AHOURS 1 213		
Hours worked last week allocation		
V 0 .No		
V 1 .Yes		
D APOWST 1 214		
Place of work-state allocation		
V 0 .No		
V 1 .Yes		
D AMEANS 1 215		
Means of transportation to work allocation		
V 0 .No		
V 1 .Yes		
D ARIDERS 1 216		
Vehicle occupancy allocation		
V 0 .No		
V 1 .Yes		
D ADEPART 1 217		
Time of departure to work allocation		
V 0 .No		
V 1 .Yes		
D ATRAVTIME 1 218		
Travel time to work allocation		
V 0 .No		
V 1 .Yes		
D ALSTWRK 1 219		
Year last worked allocation		
V 0 .No		
V 1 .Yes		
D AINDUSTR 1 220		
Industry allocation		
V 0 .No		
V 1 .Yes		
D AOCCUP 1 221		
Occupation allocation		

**1990 PUBLIC USE MICRODATA SAMPLES, PUERTO RICO DATA DICTIONARY
PERSON RECORD**

DATA	SIZE	BEGIN	DATA	SIZE	BEGIN
V 0 .No			D AINCOME7 1 232		
V 1 .Yes			Retirement income allocation		
D ACLASS 1 222			V 0 .No		
Class of worker allocation			V 1 .No (derived)		
V 0 .No			V 2 .Yes		
V 1 .Yes			D AINCOME8 1 233		
D AWORK89 1 223			All other income allocation		
Worked last year allocation			V 0 .No		
V 0 .No			V 1 .No (derived)		
V 1 .Yes			V 2 .Yes		
D AWEEK89 1 224					
Weeks worked in 1989 allocation					
V 0 .No					
V 1 .Yes					
D AHOUR89 1 225					
Usual hours worked in 1989 allocation					
V 0 .No					
V 1 .Yes					
D AINCOME1 1 226					
Wages and salary income allocation					
V 0 .No					
V 1 .No (derived)					
V 2 .Yes					
D AINCOME2 1 227					
Nonfarm self-employment income allocation					
V 0 .No					
V 1 .No (derived)					
V 2 .Yes					
D AINCOME3 1 228					
Farm self-employment income allocation flag					
V 0 .No					
V 1 .No (derived)					
V 2 .Yes					
D AINCOME4 1 229					
Interest, dividend, and net rental income allocation					
V 0 .No					
V 1 .No (derived)					
V 2 .Yes					
D AINCOME5 1 230					
Social security income allocation					
V 0 .No					
V 1 .No (derived)					
V 2 .Yes					
D AINCOME6 1 231					
Public assistance income allocation					
V 0 .No					
V 1 .No (derived)					
V 2 .Yes					

USER NOTES

User Notes supply file purchasers with additional or corrected information which becomes available after the technical documentation or files are prepared. They are issued in a numbered series and automatically mailed to all users who purchase technical documentation from the Census Bureau. Other users may obtain them by subscribing to the User Note series. Contact Customer Services (301-763-4100) for subscription information.

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APPENDIX A. Area Classifications

These definitions are for all geographic entities and concepts that the Census Bureau will include in its standard 1990 census data products for Puerto Rico. Not all entities and concepts are shown in any one 1990 census data product. For a description of geographic areas, see appendix F in this documentation.

CONTENTS

Area Measurement	A-1
Barrio (See <i>Municipio Subdivision</i>)	
Barrio-Pueblo (See <i>Municipio Subdivision</i>)	
Block	A-2
Block Group (BG)	A-2
Block Numbering Area (BNA) (See <i>Census Tract and Block Numbering Area</i>)	
Boundary Changes	A-2
Census Block (See <i>Block</i>)	
Census Code (See <i>Geographic Code</i>)	
Census Designated Place (CDP) (See <i>Place</i>)	
Census Geographic Code (See <i>Geographic Code</i>)	
Census Region and Census Division	A-2
Census Tract and Block Numbering Area	A-2
Central City (See <i>Metropolitan Area</i>)	
Central Place (See <i>Urbanized Area</i>)	
Comunidad (See <i>Place</i>)	
Congressional District	A-3
Consolidated Metropolitan Statistical Area (CMSA) (See <i>Metropolitan Area</i>)	
Crews of Vessels (See <i>Area Measurement</i> , see <i>Block</i> , see <i>Census Tract and Block Numbering Area</i>)	
Election District (See <i>Voting District</i>)	
Farm (See <i>Urban and Rural</i>)	
Federal Information Processing Standards (FIPS) Code (See <i>Geographic Code</i>)	
Geographic Block Group (See <i>Block Group</i>)	
Geographic Code	A-3
Geographic Presentation	A-4
Hierarchical Presentation (See <i>Geographic Presentation</i>)	
Historical Counts	A-4
Internal Point	A-4
Inventory Presentation (See <i>Geographic Presentation</i>)	
Land Area (See <i>Area Measurement</i>)	
Latitude (See <i>Internal Point</i>)	
Longitude (See <i>Internal Point</i>)	
Metropolitan Area	A-5
Metropolitan Statistical Area (MSA) (See <i>Metropolitan Area</i>)	
Municipio	A-5
Municipio Subdivision	A-6
Outlying Areas of the United States (See <i>State</i> , see <i>United States</i>)	
Place	A-6
Population or Housing Unit Density	A-6
Precinct (See <i>Voting District</i>)	
Primary Metropolitan Statistical Area (PMSA) (See <i>Metropolitan Area</i>)	
Puerto Rico (See <i>State</i>)	
Rural (See <i>Urban and Rural</i>)	
State	A-6
Subbarrio (See <i>Municipio Subdivision</i>)	
Tabulation Block Group (See <i>Block Group</i>)	
TIGER	A-6
Tract (See <i>Census Tract and Block Numbering Area</i>)	
United States	A-7
Urban and Rural	A-7
Urbanized Area	A-7
Voting District (VTD)	A-8
Water Area (See <i>Area Measurement</i>)	
Zona Urbana (See <i>Place</i>)	

AREA MEASUREMENT

Area measurements provide the size, in square kilometers (also in square miles in printed reports), recorded for each geographic entity for which the Census Bureau tabulates data in general-purpose data products (except crews-of-vessels entities). (Square kilometers may be divided by 2.59 to convert an area measurement to square miles.) Area was calculated from the specific set of boundaries recorded for the entity in the Census Bureau's geographic data base (see "TIGER"). On machine-readable files, area measurements are shown to three decimal places; the decimal point is implied. In printed reports and listings, area measurements are shown to one decimal.

The Census Bureau provides measurements for both land area and total water area for the 1990 census; the water figure for Puerto Rico includes inland, coastal, and territorial water. (For the 1980 census, the Census Bureau provided area measurements for land and inland water.) The Census Bureau will provide measurements for the component types of water for the affected entities in a separate file. "Inland water" consists of any lake, reservoir, pond, or similar body of water that is recorded in the Census Bureau's geographic data base. It also includes any river, creek, canal, stream, or similar feature that is recorded in that data base as a two-dimensional feature (rather than as a single line). The portions of the ocean, related large embayments, and the Caribbean Sea that belong to the United States and its territories are considered to be "coastal" and "territorial" water. Rivers and bays that empty into these bodies of water are treated as "inland water" from the point beyond which they are narrower than one nautical mile across. Identification of land and inland, coastal, and territorial waters is for statistical purposes, and does not necessarily reflect legal definitions thereof.

By definition, census blocks do not include water within their boundaries; therefore, the water area of a block is always zero. Land area measurements may disagree with the information displayed on census maps and in the TIGER File because, for area measurement purposes, features identified as "intermittent water" are reported as land area. For this reason, it may not be possible to derive the land area for an entity by summing the land area of its component census blocks. In addition, the water area measurement reported for some geographic entities includes water that is not included in any lower-level geographic entity. Therefore, because water is contained only in a higher-level geographic entity, summing the water measurements for all the component lower-level geographic

entities will not yield the water area of that higher-level entity. This occurs, for example, where water is associated with a municipio subdivision but is not assigned to any census tract. Crews-of-vessels entities (see "Census Tract and Block Numbering Area" and "Block") do not encompass territory and therefore have no area measurements.

The accuracy of any area measurement figure is limited by the inaccuracy inherent in (1) the location and shape of the various boundary features in the data base, and (2) rounding affecting the last digit in all operations that compute and/or sum the area measurements.

BLOCK

Census blocks are small areas bounded on all sides by visible features such as streets, roads, and streams and by invisible boundaries such as municipio and barrio limits, property lines, and short, imaginary extensions of streets and roads.

Tabulation blocks, used in census data products, are in most cases the same as collection blocks, used in the census enumeration. In some cases, collection blocks have been "split" into two or more parts required for data tabulations. Tabulation blocks do not cross the boundaries of municipios, municipio subdivisions, places, census tracts or block numbering areas, voting districts, urban or rural areas, or urbanized areas. The 1990 census is the first for which all of Puerto Rico is block-numbered.

Blocks are numbered uniquely within each census tract or BNA. A block is identified by a three-digit number, sometimes with a single alphabetical suffix. Block numbers with suffixes generally represent collection blocks that were "split" in order to identify separate geographic entities that divide the original block. For example, when a barrio boundary runs through data collection block 101, the data for the portion inside one barrio is tabulated in block 101A and the portion in the other barrio, in block 101B. A block number with the suffix "Z" represents a "crews-of-vessels" entity for which the Census Bureau tabulates data, but that does not represent a true geographic area; such a block is shown on census maps associated with an anchor symbol and a census tract or block numbering area with a .99 suffix. Some block group records may not have any block numbers associated with them; this occurs where the entire area of the block group consists only of water.

BLOCK GROUP (BG)

Geographic Block Group

A geographic block group (BG) is a cluster of blocks having the same first digit of their identifying numbers within a census tract or block numbering area (BNA).

For example, BG 3 within a census tract or BNA includes all blocks numbered between 301 and 397. In most cases, the numbering involves substantially fewer than 97 blocks. Geographic BG's never cross census tract or BNA boundaries, but may cross the boundaries of municipio subdivisions, places, urbanized areas, and voting districts. BG's generally contain between 250 and 550 housing units, with the ideal size being 400 housing units. Local officials delineated BG's for the 1990 census using Census Bureau guidelines.

Tabulation Block Group

In the data tabulations, a geographic BG may be split to present data for every unique combination of municipio subdivision, place, urbanized area, voting district, and urban/ rural shown in the data product; for example, if

BG 3 is located in two barrios, there will be separate tabulated records for each portion of BG 3. BG's are used in tabulating decennial census data throughout Puerto Rico for the 1990 census, but only in block-numbered areas for the 1980 census. For purposes of data presentation, BG's are a substitute for the enumeration districts (ED's) used for reporting data in many parts of Puerto Rico for the 1980 census and throughout Puerto Rico for pre-1980 censuses.

BOUNDARY CHANGES

The boundaries of some places changed from those reported for the 1980 census. The historical counts shown for places are not updated for such changes, and thus reflect the population and housing units in the area as delineated at each census. Boundary changes are not reported for statistical areas.

CENSUS REGION AND CENSUS DIVISION

For statistical purposes, the United States is divided into four census regions, which are further subdivided into nine divisions. Puerto Rico is not assigned to any region or division.

CENSUS TRACT AND BLOCK NUMBERING AREA

Block Numbering Area (BNA)

Block numbering areas (BNA's) are small statistical subdivisions of a municipio for grouping and numbering blocks in municipios that do not have census tracts. The Puerto Rico Planning Board and the Census Bureau delineated BNA's for the 1990 census, using guidelines similar to those for the delineation of census tracts. BNA's do not cross municipio boundaries.

BNA's are identified by a four-digit basic number and may have a two-digit suffix; for example, 9901.07. The decimal point separating the four-digit basic BNA number from the two-digit suffix is shown in printed reports, in microfiche, and on census maps; in machine-readable files, the decimal point is implied. Many BNA's do not have a suffix; in such cases, the suffix field is left blank in all data products. BNA numbers range from 9501 through 9989.99, and are unique within a municipio (numbers in the range of 0001 through 9499.99 denote a census tract). The suffix .99 identifies a BNA that was populated entirely by persons aboard one or more civilian or military ships. A "crews-of-vessels" BNA appears on census maps only as an anchor symbol with its BNA number (and block numbers on maps showing block numbers); the BNA relates to the ships associated with the onshore BNA's having the same four-digit basic number. Suffixes in the range .80 through .98 identify BNA's that either were revised or were created during the 1990 census data collection activities. Some of these revisions produced BNA's that have extremely small land area and may have little or no population or housing. For data analysis, such a BNA can be summarized with an adjacent BNA.

Census Tract

Census tracts are small, relatively permanent statistical subdivisions of a municipio. Census tracts in Puerto Rico are delineated for all metropolitan areas (MA's) and other highly populated municipios by the Puerto Rico Planning Board, in consultation with municipio officials and following Census Bureau guidelines. Census tracts usually have between 2,500 and 8,000 persons and, when first delineated, are designed to be homogeneous with respect to population characteristics, economic status, and living conditions. Census tracts do not cross municipio boundaries. The spatial size of census tracts varies widely depending on the density of settlement. Census tract boundaries are delineated with the intention of being maintained over a long time so that statistical comparisons can be made from census to census. However, physical changes in street patterns caused by highway construction, new development, etc., may require occasional revisions; census tracts occasionally are split due to large population growth, or combined as a result of substantial population decline. Census tracts are referred to as "tracts" in all 1990 data products.

Census tracts are identified by a four-digit basic number and may have a two-digit suffix; for example, 6059.02. The decimal point separating the four-digit basic number from the two-digit suffix is shown in printed reports, in microfiche, and on census maps; in machine-readable files, the decimal point is implied. Many census tracts do not have a suffix; in such cases, the suffix field is left blank in all data products. Leading zeros in a census tract number (for example, 002502) are shown only on machine-readable files.

Census tract numbers range from 0001 through 9499.99 and are unique within a municipio (numbers in the range of 9501 through 9989.99 denote a block numbering area). The suffix .99 identifies a census tract that was populated entirely by persons aboard one or more civilian or military ships. A "crews-of-vessels" census tract appears on census maps only as an anchor symbol with its census tract number (and block numbers on maps showing block numbers). These census tracts relate to the ships associated with the onshore census tract having the same four-digit basic number. Suffixes in the range .80 through .98 usually identify census tracts that either were revised or were created during the 1990 census data collection activities. Some of these revisions may have resulted in census tracts that have extremely small land area and may have little or no population or housing. For data analysis, such a census tract can be summarized with an adjacent census tract.

CONGRESSIONAL DISTRICT

Puerto Rico is represented in the U.S. House of Representatives by a nonvoting delegate, referred to as a "resident commissioner."

GEOGRAPHIC CODE

Geographic codes are shown primarily on machine-readable data products, such as computer tape and compact disc-read only memory (CD-ROM), but also appear on other products such as microfiche; they also are shown on some census maps. Codes are identified as "census codes" only if there also is a Federal Information Processing Standards (FIPS) code for the same geographic entity. A code that is not identified as either "census" or "FIPS" usually is a census code for which there is no FIPS equivalent or for which the Census Bureau does not use the FIPS code. The exceptions, which use only the FIPS code in census products, are municipio, congressional district, and metropolitan area (that is, metropolitan statistical area, consolidated metropolitan statistical area, and primary metropolitan statistical area).

Census Code

Census codes are assigned for a variety of geographic entities, including Puerto Rico, municipio subdivision, place, urbanized area, and voting district. The structure, format, and meaning of census codes appear in the 1990 census *Geographic Identification Code Scheme* and in the data dictionary portion of the technical documentation for summary tape files and CD-ROM's.

Federal Information Processing Standards (FIPS) Code

Federal Information Processing Standards (FIPS) codes are assigned for a variety of geographic entities,

including congressional district, county (including statistically equivalent entities such as municipio), barrio-pueblo and barrio, metropolitan area, place, and State (including statistically equivalent entities such as Puerto Rico). The structure, format, and meaning of FIPS codes used in the census are shown in the 1990 census *Geographic Identification Code Scheme* and in the data dictionary portion of the technical documentation for summary tape files and CD-ROM's.

The objective of the FIPS codes is to improve the use of data resources of the Federal Government and avoid unnecessary duplication and incompatibilities in the collection, processing, and dissemination of data. More information about the FIPS and FIPS code documentation is available from the National Technical Information Service, Springfield, VA 22161.

United States Postal Service (USPS) Code

The United States Postal Service (USPS) code for Puerto Rico is used in all 1990 census data products. The code is a two-character alphabetic abbreviation: PR. The code is the same as the FIPS two-character alphabetic abbreviation.

GEOGRAPHIC PRESENTATION

Hierarchical Presentation

A hierarchical geographic presentation shows the geographic entities in a superior/subordinate structure in census products. This structure is derived from the legal, administrative, or areal relationships of the entities. The hierarchical structure is depicted in report tables by means of indentation, and is explained for machine-readable media in the discussion of file structure in the geographic coverage portion of the abstract in the technical documentation. An example of hierarchical presentation for Puerto Rico is the "standard census geographic hierarchy": block, within block group, within census tract or block numbering area, within place, within municipio subdivision, within municipio, within Puerto Rico. Graphically, this is shown as:

Puerto Rico
 Municipio
 Municipio subdivision
 Place (or part)
 Census tract/block numbering area (or part)
 Block group (or part)
 Block

Inventory Presentation

An inventory presentation of geographic entities is one in which all entities of the same type are shown in alphabetical or code sequence, without reference to their hierarchical relationships. Generally, an inventory presentation shows totals for entities that may be split in

a hierarchical presentation, such as place, census tract/block numbering area, or block group. An example of a series of inventory presentations is: Puerto Rico, followed by all the municipios, followed by all the places in Puerto Rico. Graphically, this is shown as:

Puerto Rico
 Municipio "A"
 Municipio "B"
 Municipio "C"

 Place "X"
 Place "Y"
 Place "Z"

HISTORICAL COUNTS

Historical counts for total population and total housing units are shown in the 1990 CPH-2, *Population and Housing Unit Counts* report series. As in past censuses, the general rule for presenting historical data is to show historical counts only for single, continually existing entities. Stated another way, if an entity existed for both the current and preceding censuses, the tables show counts for the preceding censuses. Included in this category are entities of the same type (municipio, municipio subdivision, place) even if they had changed their names. The historical counts shown are for each entity as it was bounded at each census.

In cases where an entity was formed since a preceding census, such as a new place, the symbol three dots "..." is shown for earlier censuses. The three-dot symbol also is shown for those parts of a place that have extended into an additional municipio or municipio subdivision since the preceding census.

In some cases, population and housing unit counts for individual areas were revised since publication of the 1980 reports (indicated by the prefix "r"). In a number of tables of 1990 CPH-2, *Population and Housing Unit Counts*, 1980 counts are shown for aggregations of individual areas, such as the number, population, and housing unit counts of places in size groups, or urban and rural distributions. Revisions of population and housing unit counts for individual areas were not applied to the various aggregations. Therefore, it may not be possible to determine the individual areas in a given aggregation using the historical counts; conversely, the sum of the counts shown for individual areas may not agree with the aggregation.

INTERNAL POINT

An internal point is a set of geographic coordinates (latitude and longitude) that is located within a specified geographic entity. A single point is identified for each entity; for many entities, this point may approximate the geographic center of that entity. If the shape of the

entity caused this point to be located outside the boundaries of the entity, it is relocated from the center so that it is within the entity. By definition, the internal point for a block cannot fall in a body of water. On machine-readable products, internal points are shown to six decimal places; the decimal point is implied.

METROPOLITAN AREA

The general concept of a metropolitan area (MA) is one of a large population nucleus, together with adjacent communities that have a high degree of economic and social integration with that nucleus. Some MA's are defined around two or more nuclei.

The MA classification is a statistical standard, developed for use by Federal agencies in the production, analysis, and publication of data on MA's. The MA's are designated and defined by the Federal Office of Management and Budget, following a set of official published standards. These standards were developed by the interagency Federal Executive Committee on Metropolitan Areas, with the aim of producing definitions that are as consistent as possible for all MA's throughout the United States and Puerto Rico.

An MA in Puerto Rico must contain either a place with a minimum population of 50,000 or a Census Bureau-defined urbanized area and a total MA population of at least 100,000. An MA comprises one or more municipios that have close economic and social relationships. An outlying municipio must have a specified level of commuting to the central municipio(s) and also must meet certain standards regarding metropolitan character, such as population density, urban population, and population growth, to be included in an MA.

The territory, population, and housing units in MA's are referred to as "metropolitan." The metropolitan category is subdivided into "inside central city" and "outside central city." The territory, population, and housing units located outside MA's are referred to as "nonmetropolitan." The metropolitan and nonmetropolitan classification cuts across the other hierarchies; for example, there is generally both urban and rural territory within both metropolitan and nonmetropolitan areas.

To meet the needs of various users, the standards provide for a flexible structure of metropolitan definitions that classify an MA either as a metropolitan statistical area (MSA), or as a consolidated metropolitan statistical area (CMSA) that is divided into primary metropolitan statistical areas (PMSA's). Documentation of the MA standards and how they are applied is available from the Secretary, Federal Executive Committee on Metropolitan Areas, Population Division, U.S. Bureau of the Census, Washington, DC 20233.

Central City

In each MSA and CMSA in Puerto Rico, the largest place and, in some cases, additional places are designated as "central cities" under the official standards.

The largest central city and, in some cases, up to two additional central cities may be included in the title of the MA; there also may be central cities that are not included in an MA title.

Consolidated and Primary Metropolitan Statistical Area (CMSA and PMSA)

If an area that qualifies as an MA has more than one million persons, primary metropolitan statistical areas (PMSA's) may be defined within it. In Puerto Rico, PMSA's consist of a large urbanized municipio or cluster of municipios that demonstrates very strong internal economic and social links, in addition to close ties to other portions of the larger area. When PMSA's are established, the larger area of which they are component parts is designated a consolidated metropolitan statistical area (CMSA).

Metropolitan Statistical Area (MSA)

Metropolitan statistical areas (MSA's) are relatively freestanding MA's and are not closely associated with other MA's.

Metropolitan Area Title and Code

The title of an MSA contains the name of its largest central city and up to two additional place names, provided that the additional places meet specified levels of population, employment, and commuting.

The title of a PMSA may contain up to three place names, as determined above, or up to three municipio names, sequenced in order of population. A CMSA title also may include up to three names, the first of which generally is the most populous central city in the area. The second name may be the first place or municipio name in the most populous remaining PMSA; the third name may be the first place or municipio name in the next most populous PMSA. A regional designation may be substituted for the second and/or third names in a CMSA title if such a designation is supported by local opinion and is deemed to be unambiguous and suitable by the Office of Management and Budget.

The titles for all MA's in Puerto Rico also contain the name of the Commonwealth. Each MA is assigned a four-digit FIPS code in alphabetical order of all MA's. If the fourth digit of the code is a "2," it identifies a CMSA. Additionally, there is a separate set of two-digit codes for CMSA's, also assigned alphabetically.

MUNICIPIO

The primary political divisions of Puerto Rico are termed "municipios." The Census Bureau, for statistical purposes, treats a municipio as the equivalent of a county in the United States. Each municipio is assigned a unique three-digit FIPS code in alphabetical order within Puerto Rico.

MUNICIPIO SUBDIVISION

The Census Bureau recognizes barrios-pueblos and barrios as the primary legal subdivisions (minor civil divisions, or MCD's) of municipios. The barrios-pueblos replace the "pueblos" reported in previous decennial censuses. In agreement with the Puerto Rico government, the Census Bureau no longer includes ciudades in its data tabulations.

Each municipio subdivision is assigned a three-digit census code in alphabetical order within municipio and a five-digit FIPS code in alphabetical order within Puerto Rico.

Subbarrio

Subbarrios in 23 municipios are legal subdivisions of the barrios-pueblos and some barrios. The Census Bureau presents the same types of 1990 census data for these "sub-MCD's" as it does for the barrios-pueblos and barrios. Each subbarrio is assigned a two-digit census code in alphabetical order within municipio and a five-digit FIPS code in alphabetical order within Puerto Rico.

PLACE

For the reporting of decennial census data, places in Puerto Rico consist of zonas urbanas and comunidades. Each place is assigned a four-digit census code and a five-digit FIPS code that are unique within Puerto Rico. Both the census and FIPS codes are assigned based on alphabetical order within Puerto Rico.

Because Puerto Rico does not have incorporated places—legally defined governmental units that perform services, raise taxes, and have elected officials specifically for closely settled communities—the Census Bureau recognizes only places delineated for statistical purposes. These census designated places (CDP's) are delineated by the Puerto Rico Planning Board, following Census Bureau guidelines, for the decennial census as the statistical counterparts of incorporated places in the States. Their boundaries, which usually coincide with visible features, have no legal status. CDP boundaries may change with changes in the settlement pattern; a CDP with the same name as in previous censuses does not necessarily have the same boundaries.

The Census Bureau provides data for two types of CDP's in Puerto Rico: (1) zonas urbanas, representing the governmental center of each municipio; there is no minimum population requirement for a zona urbana, and (2) comunidades (called "aldeas" in previous censuses), representing other settlements with a 1990 census population of at least 1,000. Comunidades qualified on the basis of the population counts prepared for the 1990 Postcensus Local Review Program. Because these counts were subject to change, a few may have final population counts lower than 1,000.

POPULATION OR HOUSING UNIT DENSITY

Population or housing unit density is computed by dividing the total population or housing units of a geographic unit (for example, Puerto Rico, municipio, place) by its land area measured in square kilometers or square miles. Density is expressed as both "persons (or housing units) per square kilometer" and "persons (or housing units) per square mile" of land area in 1990 census printed reports.

STATE

States are the primary governmental divisions of the United States. The District of Columbia is treated as a statistical equivalent of a State for census purposes. The Census Bureau treats the Outlying Areas as the statistical equivalents of States for presenting the 1990 census data. The Outlying Areas include American Samoa, Guam, the Commonwealth of the Northern Mariana Islands (Northern Mariana Islands), the Republic of Palau (Palau), Puerto Rico, and the Virgin Islands of the United States (Virgin Islands).

Each State and equivalent entity is assigned a two-digit numeric Federal Information Processing Standards (FIPS) code in alphabetical order by State name, followed by the Outlying Area names. Each State and equivalent entity also is assigned a two-digit census code. The first digit of the code is the code for the respective division except for Puerto Rico, the Virgin Islands, and the Outlying Areas of the Pacific, which are assigned "0" as the first digit because they are not part of any division. Each State and equivalent area also is assigned the two-letter FIPS/ United States Postal Service (USPS) code.

TIGER

TIGER is an acronym for the new digital (computer-readable) geographic data base that automates the mapping and related geographic activities required to support the Census Bureau's census and survey programs. The Census Bureau developed the Topologically Integrated Geographic Encoding and Referencing (TIGER) System to automate the geographic support processes needed to meet the major geographic needs of the 1990 census: producing the cartographic products to support data collection and map publication, providing the geographic structure for tabulation and publication of the collected data, assigning residential and employer addresses to their geographic location and relating those locations to the Census Bureau's geographic units, and so forth. The content of the TIGER data base is made available to the public through a variety of "TIGER Extract" files that may be obtained from the Data User Services Division, U.S. Bureau of the Census, Washington, DC 20233.

UNITED STATES

The United States comprises the 50 States and the District of Columbia. In addition, the Census Bureau treats the Outlying Areas (see "State") as statistical equivalents of States for the 1990 census.

URBAN AND RURAL

The Census Bureau defines "urban" for the 1990 census as comprising all territory, population, and housing units in urbanized areas and in places of 2,500 or more persons outside urbanized areas. More specifically, "urban" consists of territory, persons, and housing units in:

1. Places of 2,500 or more persons.
2. All other territory included in urbanized areas.

Territory, population, and housing units not classified as urban constitute "rural." In the 100-percent data products, "rural" is divided into "places of less than 2,500" and "not in places." The "not in places" category comprises "rural" outside zonas urbanas and comunidades. In many data products, the term "other rural" is used; "other rural" is a residual category specific to the classification of the rural in each data product.

In the sample data products, rural population and housing units are subdivided into "rural farm" and "rural nonfarm." "Rural farm" comprises all rural households and housing units on farms (places from which \$1,000 or more of agricultural products were sold in 1989); "rural nonfarm" comprises the remaining rural.

The urban and rural classification cuts across the other hierarchies; for example, there generally is both urban and rural territory within both metropolitan and nonmetropolitan areas.

In censuses prior to 1950, "urban" comprised all territory, persons, and housing units in places of 2,500 or more persons. The definition of urban that restricted itself to places having 2,500 or more persons excluded many large, densely settled areas merely because they were not places. To improve its measure of urban territory, population, and housing units, the Census Bureau adopted the concept of the urbanized area.

URBANIZED AREA

The Census Bureau delineates urbanized areas (UA's) to provide a better separation of urban and rural territory, population, and housing in the vicinity of large places. A UA comprises one or more places ("central place") and the adjacent densely settled surrounding territory ("urban fringe") that together have a minimum of 50,000 persons. The urban fringe generally consists of contiguous territory having a density of at least 1,000

persons per square mile. The urban fringe also includes outlying territory of such density if it is connected to the core of the contiguous area by road and is within 1 1/2 road miles of that core, or within 5 road miles of the core but separated by water or other undevelopable territory. Other territory with a population density of fewer than 1,000 people per square mile is included in the urban fringe if it eliminates an enclave or closes an indentation in the boundary of the urbanized area. The population density is determined by (1) outside of a place, one or more contiguous census blocks with a population density of at least 1,000 persons per square mile or (2) inclusion of a place containing census blocks that have at least 50 percent of the population of the place and a density of at least 1,000 persons per square mile. The complete criteria are available from the Chief, Geography Division, U.S. Bureau of the Census, Washington, DC 20233.

Urbanized Area Central Place

One or more central places function as the dominant centers of each UA. The identification of a UA central place permits the comparison of this dominant center with the remaining territory in the UA. There is no limit on the number of central places, and not all central places are necessarily included in the UA title. UA central places include:

1. Each place entirely within the UA that is a central city of a metropolitan area (MA).
2. If the UA does not contain an MA central city or is located outside of an MA, the central place(s) is determined by population size.

Urbanized Area Title and Code

The title of a UA identifies those places that are most important within the UA; it links the UA to the encompassing MA, where appropriate. If a single MA includes most of the UA, the title and code of the UA generally are the same as the title and code of the MA. If the UA is not mostly included in a single MA, if it does not include any place that is a central city of the encompassing MA, or if it is not located in an MA, the Census Bureau uses the population size of the included places to determine the UA title. The name of Puerto Rico is included in the title of each UA in the Commonwealth.

The numeric code used to identify each UA is the same as the code for the mostly encompassing MA (including CMSA and PMSA). If MA title cities represent multiple UA's, or the UA title city does not correspond to the first name of an MA title, the Census Bureau assigns a code based on the alphabetical sequence of the UA title in relationship to the other UA and MA titles.

VOTING DISTRICT (VTD)

A voting district (VTD) is any of a variety of types of areas (for example, election districts, precincts, legislative districts) established by the Puerto Rico government for purposes of elections. For census purposes, the Puerto Rico Planning Board outlined the boundaries of VTD's around groups of whole census blocks on census maps. The entities identified as VTD's are not necessarily those legally or currently established. Also,

to meet the "whole block" criterion, it may have been necessary to adjust VTD boundaries to nearby block boundaries. Therefore, the VTD's shown on the 1990 census tapes, listings, and maps may not represent the actual VTD's in effect at the time of the census.

Each VTD is assigned a four-character alphanumeric code that is unique within each municipio. The code "ZZZZ" is assigned to nonparticipating areas; the Census Bureau reports data for areas coded "ZZZZ."

APPENDIX B.

Definitions of Subject Characteristics

CONTENTS

POPULATION CHARACTERISTICS	B-2
Ability to Read and Write	B-2
Ability to Speak Spanish and English	B-2
Actual Hours Worked Last Week (See Employment Status)	B-2
Age	B-2
Carpooling (See Journey to Work)	
Children Ever Born (See Fertility)	B-3
Citizenship	B-3
Civilian Labor Force (See Employment Status)	
Class of Worker (See Industry, Occupation, and Class of Worker)	
Disability (See Mobility Limitation Status, see Self-Care Limitation Status, see Work Disability Status)	
Earnings in 1989 (See Income in 1989)	B-3
Educational Attainment	B-4
Employment Status	B-4
Families (See Household Type and Relationship)	
Family Composition (See Household Type and Relationship)	
Family Income in 1989 (See Income in 1989)	
Family Size (See Household Type and Relationship)	
Family Type (See Household Type and Relationship)	
Farm Population (See Farm Residence under Housing Characteristics)	B-6
Fertility	B-6
Foster Children (See Household Type and Relationship)	B-6
Group Quarters	B-6
Household (See Household Type and Relationship)	
Household Income in 1989 (See Income in 1989)	
Household Size (See Household Type and Relationship)	B-11
Household Type and Relationship	B-11
Householder (See Household Type and Relationship)	
Income Deficit (See Poverty Status in 1989)	B-13
Income in 1989	B-13
Income Type in 1989 (See Income in 1989)	
Industry, Occupation, and Class of Worker	B-16
Institutionalized Persons (See Group Quarters)	B-18
Journey to Work	B-18
Labor Force Status (See Employment Status)	B-21
Marital Status	B-21
Married Couples (See Marital Status)	
Means of Transportation to Work (See Journey to Work)	
Migration (See Residence in 1985)	B-21
Mobility Limitation Status	B-21
Noninstitutionalized Persons (See Group Quarters)	
Occupation (See Industry, Occupation, and Class of Worker)	
Own Children (See Household Type and Relationship)	B-22
Parents' Place of Birth	B-22
Per Capita Income (See Income in 1989)	
Period of Military Service (See Veteran Status)	
Persons in Family (See Household Type and Relationship)	B-22
Persons in Households (See Household Type and Relationship)	B-22
Place of Birth	B-22
Place of Work (See Journey to Work)	B-22
Poverty Status in 1989	B-22
Presence of Children (See Household Type and Relationship)	
Private Vehicle Occupancy (See Journey to Work)	B-24
Reference Week	B-24
Related Children (See Household Type and Relationship)	B-24
Residence in 1985	B-25
Residence in the United States Between 1980 and 1990	B-25
School Enrollment and Labor Force Status	B-26
School Enrollment and Type of School	B-27
Self-Care Limitation Status	B-27
Sex	B-27
Stepfamily (See Household Type and Relationship)	
Subfamily (See Household Type and Relationship)	
Time Leaving Home to Go to Work (See Journey to Work)	

Travel Time to Work (See Journey to Work)	
Type of School (See School Enrollment and Type of School)	
Usual Hours Worked Per Week Worked in 1989 (See Work Status in 1989)	B-27
Veteran Status	B-28
Vocational Training	B-28
Weeks Worked in 1989 (See Work Status in 1989)	B-28
Work Disability Status	B-29
Work Status in 1989	B-29
Worker (See Employment Status; see Industry, Occupation, and Class of Worker; see Journey to Work; see Work Status in 1989)	
Workers in Family in 1989 (See Work Status in 1989)	B-29
Year of Entry	B-29
Years of Military Service (See Veteran Status)	
HOUSING CHARACTERISTICS	B-30
Acreage (See Number of Cuerdas)	
Age of Structure (See Year Structure Built)	B-31
Agricultural Sales	B-31
Air Conditioning	B-31
Bathub or Shower	B-31
Bathrooms	B-31
Bedrooms	B-32
Boarded-Up Status	B-32
Commercial Establishment on Property	B-32
Condition of Housing Unit	B-32
Condominium Fee	B-33
Condominium Status	B-33
Contract Rent	B-33
Cooking Fuel	B-34
Crop Sales (See Agricultural Sales)	B-34
Duration of Vacancy	B-34
Farm Residence	B-34
Gross Rent	B-35
Gross Rent as a Percentage of Household Income in 1989	B-35
Homeowner Vacancy Rate (See Vacancy Status)	
Housing Units (See Living Quarters)	B-35
Insurance for Fire, Hazard, and Flood	B-35
Kitchen Facilities	B-35
Living Quarters	B-35
Medical Office on Property (See Commercial Establishment on Property)	B-36
Months Vacant (See Duration of Vacancy)	B-36
Mortgage Payment	B-36
Mortgage Status	B-36
Number of Cuerdas	B-36
Occupied Housing Units (See Living Quarters)	
Owner-Occupied Housing Units (See Tenure)	
Persons (See Persons in Unit)	B-37
Persons in Unit	B-37
Persons Per Room	B-37
Piped Water (See Water Supply)	B-37
Plumbing Facilities	B-37
Poverty Status of Households in 1989	B-37
Real Estate Taxes	B-37
Rental Vacancy Rate (See Vacancy Status)	
Renter-Occupied Housing Units (See Tenure)	
Rooms	B-38
Second or Junior Mortgage Payment	B-38
Selected Monthly Owner Costs	B-38
Selected Monthly Owner Costs as a Percentage of Household Income in 1989	B-39
Sewage Disposal	B-39
Source of Water	B-39
Telephone in Housing Unit	B-39
Tenure	B-40

CONTENTS—Con.

Toilet Facilities	B-40
Type of Construction	B-40
Type of Structure (See Units in Structure)	
Type of Water Heater	B-41
Units in Structure	B-41
Usual Home Elsewhere	B-41
Utilities	B-41
Vacancy Status	B-42
Vacant Housing Units (See Living Quarters)	
Value	B-42
Vehicles Available	B-43
Water Supply	B-43
Year Householder Moved Into Unit	B-43
Year Structure Built	B-44
DERIVED MEASURES	B-44
Interpolation	B-44
Mean	B-44
Median	B-44
Percentages, Rates, and Ratios	B-44
Quartile	B-44

POPULATION CHARACTERISTICS

ABILITY TO READ AND WRITE

Data on ability to read and write (literacy) were derived from answers to questionnaire item 14, which was asked of a sample of persons 5 years old and over. The data are shown in selected data products for persons 10 years old and over since persons younger than 10 years old have not yet completed the fifth grade and are more likely to be considered not literate only because of the limited exposure to schooling.

The question on ability to read and write was not limited to any particular language. The category, "able to read and write," included respondents who were able to read and write in Spanish, English, or any other language. The enumerators were instructed that a literate person must have the ability to read a letter from someone else and also write a letter. Persons who could only read and those who could write only their own names were classified as unable to read and write. Persons who reported their level of educational attainment to be high school graduate or higher were considered literate.

Comparability—This question has been in each decennial census since the United States government started conducting the census in Puerto Rico.

ABILITY TO SPEAK SPANISH AND ENGLISH

The data on ability to speak Spanish were derived from answers to questionnaire item 15a. Ability to speak English was reported in questionnaire item 15b as one of three categories: "Yes, easily," "Yes, with difficulty," or "No." These questions were asked on a sample basis.

The questions on language usage were intended to determine the extent to which Spanish and English are spoken in Puerto Rico. From these responses, it is possible to determine how many persons cannot speak Spanish and how many persons have difficulty speaking English or cannot speak English at all. The questions were not intended to determine which language was the person's main language.

Comparability—While the question on ability to speak English has been included on the census questionnaires for Puerto Rico since 1910, the question on ability to speak Spanish was added to the questionnaire for the first time in 1980.

AGE

The data on age were derived from answers to questionnaire item 4, which was asked of all persons. The age classification is based on the age of the person in completed years as of April 1, 1990. The age response in question 4a was normally used to represent a person's age. However, when the age response was unacceptable or unavailable, a person's age was derived from an acceptable year of birth response in question 4b.

Data on age are used to determine the applicability of other questions for a person and to classify other characteristics in census tabulations. Age data are needed to interpret most social and economic characteristics used to plan and examine many programs and policies. Therefore, age is tabulated by single years of age and by many different groupings, such as 5-year age groups.

Some tabulations are shown by the age of the householder. These data were derived from the age responses for each householder. (For more information on householder, see the discussion under "Household Type and Relationship.")

Median Age—This measure divides the age distribution into two equal parts: one-half of the cases falling below the median value and one-half above the value. Generally, median age is computed on the basis of more detailed age intervals than are shown in some census publications; thus, a median based on a less detailed distribution may differ slightly from a corresponding median for the same population based on a more detailed distribution. (For more information on medians, see the discussion under "Derived Measures.")

Limitation of the Data—Counts in 1970 and 1980 for persons 100 years old and over were substantially overstated. Improvements were made in the questionnaire design, in the allocation procedures, and to the respondent instruction guide to attempt to minimize this problem in 1990.

Review of detailed 1990 information indicated that respondents tended to provide their age as of the date of completion of the questionnaire, not their age as of April 1, 1990. In addition, there may have been a tendency for respondents to round their age up if they were close to having a birthday. It is likely that approximately 10 percent of persons in most age groups are actually 1 year younger. For most single years of age, the misstatements are largely offsetting. The problem is most pronounced at age 0 because persons lost to age 1 may not have been fully offset by the inclusion of babies born after April 1, 1990 and because there may have been more rounding up to age 1 to avoid reporting age as 0 years. (Age in completed months was not collected for infants under age 1.)

The reporting of age 1 year older than age on April 1, 1990 is likely to have been greater in areas where the census data were collected later in 1990. The magnitude of this problem was much less in the three previous censuses where age was typically derived from respondent data on year of birth and quarter of birth. (For more information on the design of the age question, see the section below that discusses "Comparability.")

Comparability—Age data have been collected in Puerto Rico in every census. For the first time since 1960, the 1990 data are not available by quarter year of age. This change was made so that coded information could be obtained for both age and year of birth. In each census since 1950, the age of a person was assigned when it was not reported. Since 1960, assignment of unknown age has been performed by a general procedure described as "imputation." The specific procedures for imputing age have been different in each census. (For more information on imputation, see Appendix C, Accuracy of the Data.)

CITIZENSHIP

The data on citizenship were derived from answers to questionnaire item 7, which was asked of a sample of persons.

Citizen—Persons who indicated that they were native-born and foreign-born persons who indicated that they have become naturalized. (For more information on native and foreign born, see the discussion under "Place of Birth.")

There are four categories of citizenship: (1) born in Puerto Rico, (2) United States, Guam, the U.S. Virgin Islands, or the Northern Mariana Islands, (3) born abroad of American parents, and (4) U.S. citizen by naturalization.

Naturalized Citizen—Foreign-born persons who had completed the naturalization process at the time of the census and upon whom the rights of citizenship had been conferred.

Not a Citizen—Foreign-born persons who were not citizens, including persons who had begun but not completed the naturalization process at the time of the census.

Limitation of the Data—Evaluation studies completed after previous censuses indicated that some persons may have reported themselves as citizens although they had not yet attained the status.

Comparability—Similar questions on citizenship were asked in the censuses of 1950, 1970, and 1980. The 1980 question was asked of a sample of the foreign-born population. In 1990, both native and foreign-born persons who were enumerated using the long-form questionnaire were asked to respond to the citizenship question.

EDUCATIONAL ATTAINMENT

Data on educational attainment were derived from answers to questionnaire item 10, which was asked of a sample of persons. Data are tabulated as attainment for persons 15 years old and over. Persons are classified according to the highest grade of school completed or the highest degree received. The question included instructions to report the previous grade attended or the highest degree received for persons currently enrolled in school. The question included response categories which allowed persons to report completing the 12th grade without receiving a high school diploma, and which instructed respondents to report as "high school graduate(s)"—persons who received either a high school diploma or the equivalent, for example, passed the Test of General Educational Development (G.E.D.), and did not attend college. (On the Military Census Report questionnaire, the lowest response category was "Less than 9th grade.")

Enumerators were instructed that schooling completed in foreign or ungraded school systems should be reported as the equivalent level of schooling in the regular American system; that vocational certificates or diplomas from vocational, trade, or business schools or colleges were not to be reported unless they were college level degrees; and that honorary degrees were not to be reported. The instructions gave "medicine, dentistry, chiropractic, optometry, osteopathic medicine, pharmacy, podiatry, veterinary medicine, law, and theology" as examples of professional school degrees, and specifically excluded "barber school, cosmetology, or other training for a specific trade" from the professional school category. The order in which they were listed suggested that doctorate degrees were "higher" than professional school degrees, which were "higher" than master's degrees.

Persons who did not report educational attainment were assigned the attainment of a person of the same age and sex who resided in the same or a nearby area.

High School Graduate or Higher—Includes persons whose highest degree was a high school diploma or its equivalent, persons who attended college or professional school, and persons who received a college, university, or professional degree. Persons who reported completing the 12th grade but not receiving a diploma are not included.

Not Enrolled, Not High School Graduate—Includes persons of compulsory school attendance age or above who were not enrolled in school and were not high school graduates; these persons may be taken to be “high school dropouts.” There is no restriction on when they “dropped out” of school, and they may have never attended high school.

In prior censuses, “Median school years completed” was used as a summary measure of educational attainment. In 1990, the median can only be calculated for groups of which less than half the members have attended college. “Percent high school graduate or higher” and “Percent bachelor’s degree or higher” are summary measures which offer quite readily interpretable measures of differences between population subgroups. To make comparisons over time, “Percent high school graduate or higher” can be calculated and “Percent bachelor’s degree or higher” can be approximated with data from previous censuses.

Comparability—In censuses prior to 1950, the only educational attainment question asked about basic literacy. The same literacy question was asked in 1990. Questions on educational attainment, in terms of years of school completed, were included from 1950 to 1980. In these censuses, a two-part question asking highest grade of school attended and whether that grade was finished was used to construct highest grade or year of school completed. For persons who have not attended college, the response categories in the 1990 educational attainment question should produce data which are comparable to data on highest grade completed from earlier censuses.

The response categories for persons who have attended college were modified from earlier censuses because there was some ambiguity in interpreting responses in terms of the number of years of college completed. For instance, it was not clear whether “completed the fourth year of college,” “completed the senior year of college,” and “college graduate” were synonymous. Research conducted shortly before the census suggests that these terms were more distinct in 1990 than in earlier decades, and this change may have threatened the ability to estimate the number of “college graduates” from the number of persons reported as having completed the fourth or a higher year of college. It was even more difficult to make inferences about post-baccalaureate degrees and “Associate” degrees from highest year of college completed. Thus, comparisons of post-secondary

educational attainment in this and earlier censuses should be made with great caution.

In the 1960 and subsequent censuses, persons for whom educational attainment was not reported were assigned the same attainment level as a similar person whose residence was in the same or a nearby area. In the 1950 census, persons for whom educational attainment was not reported were not allocated.

EMPLOYMENT STATUS

The data on employment status were derived from answers to questionnaire items 22, 26, and 27, which were asked of a sample of persons. The series of questions on employment status was asked of all persons 15 years old and over and was designed to identify, in this sequence: (1) persons who worked at any time during the reference week; (2) persons who did not work during the reference week but who had jobs or businesses from which they were temporarily absent (excluding layoff); (3) persons on layoff; and (4) persons who did not work during the reference week, but who were looking for work during the last four weeks and were available for work during the reference week. (For more information, see the discussion under “Reference Week.”)

The employment status data shown in this and other 1990 census tabulations relate to persons 16 years old and over. Some tabulations showing employment status, however, include persons 15 years old. By definition, these persons are classified as “Not in Labor Force.” In the 1940, 1950, and 1960 censuses, employment status data were presented for persons 14 years old and over. The change in the universe was made in 1970 to agree with the official measurement of the labor force as revised in January 1967 by the U.S. Department of Labor. The 1970 census was the last to show employment data for persons 14 and 15 years old.

Employed—All civilians 16 years old and over who were either (1) “at work”—those who did any work at all during the reference week as paid employees, worked in their own business or profession, worked on their own farm, or worked 15 hours or more as unpaid workers on a family farm or in a family business; or (2) were “with a job but not at work”—those who did not work during the reference week but had jobs or businesses from which they were temporarily absent due to illness, bad weather, industrial dispute, vacation, or other personal reasons. Excluded from the employed are persons whose only activity consisted of work around the house or unpaid volunteer work for religious, charitable, and similar organizations; also excluded are persons on active duty in the U.S. Armed Forces.

Unemployed—All civilians 16 years old and over are classified as unemployed if they (1) were neither “at work” nor “with a job but not at work” during the

reference week, and (2) were looking for work during the last 4 weeks, and (3) were available to accept a job. Also included as unemployed are civilians who did not work at all during the reference week and were waiting to be called back to a job from which they had been laid off. Examples of job seeking activities are:

- Registering at a public or private employment office
- Meeting with prospective employers
- Investigating possibilities for starting a professional practice or opening a business
- Placing or answering advertisements
- Writing letters of application
- Being on a union or professional register

Civilian Labor Force—Consists of persons classified as employed or unemployed in accordance with the criteria described above.

Experienced Unemployed—These are unemployed persons who have worked at any time in the past.

Experienced Civilian Labor Force—Consists of the employed and the experienced unemployed.

Labor Force—All persons classified in the civilian labor force plus members of the U.S. Armed Forces (persons on active duty with the U.S. Army, Air Force, Navy, Marine Corps, or Coast Guard).

Not in Labor Force—All persons 16 years old and over who are not classified as members of the labor force. This category consists mainly of students, housewives, retired workers, seasonal workers enumerated in an *off* season who were not looking for work, institutionalized persons, and persons doing only incidental unpaid family work (less than 15 hours during the reference week).

Worker—This term appears in connection with several subjects: journey-to-work items, class of worker, weeks worked in 1989, and number of workers in family in 1989. Its meaning varies and, therefore, should be determined in each case by referring to the definition of the subject in which it appears.

Actual Hours Worked Last Week—All persons who reported working during the reference week were asked to report in questionnaire item 22b the number of hours that they worked. The statistics on hours worked pertain to the number of hours actually worked at all jobs, and do not necessarily reflect the number of hours typically or usually worked or the scheduled number of hours. The concept of "actual hours" differs from that of "usual hours" described below. The number of persons who worked only a small number of hours is probably

understated since such persons sometimes consider themselves as not working. Respondents were asked to include overtime or extra hours worked, but to exclude lunch hours, sick leave, and vacation leave.

Limitation of the Data—The census may understate the number of employed persons because persons who have irregular, casual, or unstructured jobs sometimes report themselves as not working. The number of employed persons "at work" is probably overstated in the census (and conversely, the number of employed "with a job, but not at work" is understated) since some persons on vacation or sick leave erroneously reported themselves as working. This problem has no effect on the total number of employed persons. The reference week for the employment data is not the same for all persons. Since persons can change their employment status from one week to another, the lack of a uniform reference week may mean that the employment data do not reflect the reality of the employment situation of any given week. (For more information, see the discussion under "Reference Week.")

Comparability—The questionnaire items and employment status concepts for the 1990 census are essentially the same as those used in the 1980 and 1970 censuses. However, these concepts differ in many respects from those associated with the 1950 and 1960 censuses.

Since employment data from the census are obtained from respondents in households, they differ from statistics based on reports from individual business establishments, farm enterprises, and certain government programs. Persons employed at more than one job are counted only once in the census and are classified according to the job at which they worked the greatest number of hours during the reference week. In statistics based on reports from business and farm establishments, persons who work for more than one establishment may be counted more than once. Moreover, some tabulations may exclude private household workers, unpaid family workers, and self-employed persons, but may include workers less than 16 years of age.

An additional difference in the data arises from the fact that persons who had a job but were not at work are included with the employed in the census statistics, whereas many of these persons are likely to be excluded from employment figures based on establishment payroll reports. Furthermore, the employment status data in census tabulations include persons on the basis of place of residence regardless of where they work, whereas establishment data report persons at their place of work regardless of where they live. This latter consideration is particularly significant when comparing data for workers who commute between areas.

Census data on actual hours worked during the reference week may differ from data from other sources. The census measures hours actually worked, whereas

some surveys measure hours paid for by employers. Comparability of census actual hours worked data may also be affected by the nature of the reference week (see "Reference Week").

For several reasons, the unemployment figures of the Census Bureau may not be comparable with published figures on unemployment compensation claims. For example, figures on unemployment compensation claims exclude persons who have exhausted their benefit rights, new workers who have not earned rights to unemployment insurance, and persons losing jobs not covered by unemployment insurance systems (including some workers in agriculture, domestic services, and religious organizations, and self-employed and unpaid family workers). In addition, the qualifications for drawing unemployment compensation differ from the definition of unemployment used by the Census Bureau. Persons working only a few hours during the week and persons with a job but not at work are sometimes eligible for unemployment compensation but are classified as "Employed" in the census. Differences in the geographical distribution of unemployment data arise because the place where claims are filed may not necessarily be the same as the place of residence of the unemployed worker.

FERTILITY

The data on fertility (also referred to as "children ever born") were derived from answers to questionnaire item 17, which was asked of a sample of women 15 years old and over regardless of marital status. Stillbirths, step-children, and adopted children were excluded from the number of children ever born. Ever-married women were instructed to include all children born to them before and during their most recent marriage, children no longer living, and children away from home, as well as children who were still living in the home. Never-married women were instructed to include all children born to them.

Data are most frequently presented in terms of the aggregate number of children ever born to women in the specified category and in terms of the rate per 1,000 women. For purposes of calculating the aggregate, the open-ended response category, "12 or more" is assigned a value of 13.

Comparability—The wording of the question on children ever born was the same in 1990 as in 1980. However, in virtually all of the tables in 1970 census volumes, data presented on children ever born assumed that single women were childless even though it was known that some of the women had had children. Therefore, rates and numbers of children ever born to all women are not comparable between the 1970 reports and later census reports, since the 1980 and 1990 reports include data on children ever born to single

women. Data presented for children ever born to women ever married are comparable between the 1990 census and previous censuses containing this question.

GROUP QUARTERS

All persons not living in households are classified by the Census Bureau as living in group quarters. Two general categories of persons in group quarters are recognized: (1) institutionalized persons and (2) other persons in group quarters (also referred to as "noninstitutional group quarters").

Institutionalized Persons—Includes persons under formally authorized, supervised care or custody in institutions at the time of enumeration. Such persons are classified as "patients or inmates" of an institution regardless of the availability of nursing or medical care, the length of stay, or the number of persons in the institution. Generally, institutionalized persons are restricted to the institutional buildings and grounds (or must have passes or escorts to leave) and thus have limited interaction with the surrounding community. Also, they are generally under the care of trained staff who have responsibility for their safekeeping and supervision.

Type of Institution—The type of institution was determined as part of census enumeration activities. For institutions which specialize in only one specific type of service, all patients or inmates were given the same classification. For institutions which had multiple types of major services (usually general hospitals and Veterans' Administration hospitals), patients were classified according to selected types of wards. For example, in psychiatric wards of hospitals, patients were classified in "mental (psychiatric) hospitals;" in hospital wards for persons with chronic diseases, patients were classified in "hospitals for the chronically ill." Each patient or inmate was classified in only one type of institution. Institutions include the following types:

Correctional Institutions—Includes commonwealth prisons, military stockades and jails, police lockups, halfway houses, local jails, and other confinement facilities.

Commonwealth Prisons—Where persons convicted of crimes serve their sentences. Residents who are criminally insane were classified on the basis of where they resided at the time of enumeration: (1) in institutions (or hospital wards) operated by a commonwealth prison; or (2) in institutions operated by departments of mental health or similar agencies.

Military Stockades, Jails—Operated by military police and used to hold persons awaiting trial or convicted of violating military laws.

Local Jails and Other Confinement Facilities—Includes facilities operated by municipios that primarily hold persons beyond arraignment, usually for more than 48 hours.

Police Lockups—Temporary-holding facilities operated by municipio police that hold persons for 48 hours or less only if they have not been formally charged in court.

Halfway Houses—Operated for correctional purposes and include probation and restitution centers, pre-release centers, and community-residential centers.

Other Types of Correctional Institutions—Correctional facilities specifically for alcohol/ drug abuse.

Nursing Homes—Comprises a heterogeneous group of places. The majority of patients are elderly, although persons who require nursing care because of chronic physical conditions may be found in these homes regardless of their age. Included in this category are skilled-nursing facilities, intermediate-care facilities, long-term care rooms in wards or buildings on the grounds of hospitals, or long-term care rooms/ nursing wings in congregate housing facilities. Also included are nursing, convalescent, and rest homes, such as soldiers', sailors', veterans', and fraternal or religious homes for the aged, with or without nursing care. In some census products, nursing homes are classified by type of ownership as "Commonwealth of Puerto Rico," "Private not-for-profit," and "Private for profit."

Mental (Psychiatric) Hospitals—Includes hospitals or wards for the criminally insane not operated by a prison, and psychiatric wards of general hospitals and veterans' hospitals. Patients receive supervised medical/ nursing care from formally-trained staff. In some census products, mental hospitals are classified by type of ownership as "Commonwealth of Puerto Rico."

Hospitals for Chronically Ill—Includes hospitals for patients who require long-term care, including those in military hospitals and wards for the chronically ill located on military bases; or other hospitals or wards for the chronically ill, which include tuberculosis hospitals or wards, wards in general and Veterans' Administration hospitals for the chronically ill, neurological wards, hospices, wards for patients with incurable diseases and other unspecified wards for the chronically ill. Patients who had no usual home elsewhere were enumerated as part of the institutional population in the wards of general and military hospitals. Most hospital patients are at the hospital temporarily and were enumerated at their usual place

of residence. (For more information, see "Wards in General and Military Hospitals for Patients Who Have No Usual Home Elsewhere.")

Schools, Hospitals, or Wards for the Mentally Retarded—Includes those institutions such as wards in hospitals for the mentally retarded, and intermediate-care facilities for the mentally retarded that provide supervised medical/ nursing care from formally-trained staff. In some census products, this category is classified by type of ownership as "Commonwealth of Puerto Rico," "Private," and "Ownership not known."

Schools, Hospitals, or Wards for the Physically Handicapped—Includes three types of institutions: institutions for the blind, those for the deaf, and orthopedic wards and institutions for the physically handicapped. Institutions for persons with speech problems are classified with "institutions for the deaf." The category "orthopedic wards and institutions for the physically handicapped" includes those institutions providing relatively long-term care to accident victims, and to persons with polio, cerebral palsy, and muscular dystrophy. In some census products, this category is classified by type of ownership as "Commonwealth of Puerto Rico," "Private," and "Ownership not known."

Hospitals, and Wards for Drug/ Alcohol Abuse—Includes hospitals, and hospital wards in psychiatric and general hospitals. These facilities are equipped medically and designed for the diagnosis and treatment of medical or psychiatric illnesses associated with alcohol or drug abuse. Patients receive supervised medical care from formally-trained staff.

Wards in General and Military Hospitals for Patients Who Have No Usual Home Elsewhere—Includes maternity, neonatal, pediatric (including wards for boarder babies), military, and surgical wards of hospitals, and wards for persons with infectious diseases.

Juvenile Institutions—Includes homes, schools, and other institutions providing care for children (short- or long-term care). Juvenile institutions include the following types:

Homes for Abused, Dependent, and Neglected Children—Includes orphanages and other institutions which provide long-term care (usually more than 30 days) for children. This category is classified in some census products by type of ownership as "Commonwealth of Puerto Rico" and "Private."

Detention Centers—Includes institutions providing short-term care (usually 30 days or less) primarily for delinquent children pending disposition of their

cases by a court. This category also covers diagnostic centers. In practice, such institutions may be caring for both delinquent and neglected children pending court disposition.

Other Persons in Group Quarters (also referred to as "noninstitutional group quarters")—Includes all persons who live in group quarters other than institutions. Persons who live in the following living quarters are classified as "other persons in group quarters"

drug/alcohol addiction and to recovering alcoholics and drug abusers. Places providing community-based care for drug and alcohol abusers include group homes, detoxification centers, quarterway houses (residential treatment facilities that work closely with accredited hospitals), halfway houses, and recovery homes for ambulatory, mentally competent recovering alcoholics and drug abusers who may be re-entering the work force.

Maternity Homes for Unwed Mothers—Includes

as rooming units.

Rooming Houses—Includes persons residing in room-

or more unrelated persons.

Group Homes—Includes "community-based homes" that provide care and supportive services. Such places include homes for the mentally ill, mentally retarded, and physically handicapped; drug/alcohol halfway houses; communes; and maternity homes for unwed mothers.

Homes for the Mentally Ill—Includes community-based homes that provide care primarily for the mentally ill. In some data products, this category is classified by type of ownership as "Federal," "Commonwealth of Puerto Rico," "Private," and "Ownership not known." Homes which combine treatment of the physically handicapped with treatment of the mentally ill are counted as homes for the mentally ill.

Homes for the Mentally Retarded—Includes community-based homes that provide care primarily for the mentally retarded. Homes which combine treatment of the physically handicapped with treatment of the mentally retarded are counted as homes for the mentally retarded. This category is classified by type of ownership in some census products, as "Commonwealth of Puerto Rico," "Private," or "Ownership not known."

Homes for the Physically Handicapped—Includes community-based homes for the blind, for the deaf, and other community-based homes for the physically handicapped. Persons with speech problems are classified with homes for the deaf. In some census products, this category is classified by type of ownership as "Commonwealth of Puerto Rico," "Private," or "Ownership not known."

Homes or Halfway Houses for Drug/Alcohol Abuse—Includes persons with no usual home elsewhere in places that provide community-based care and supportive services to persons suffering from a

their children. These homes may provide social services and post-natal care within the facility, or

such services in the community. Nursing services are usually available in the facility.

Other Group Homes—Includes persons with no usual home elsewhere in communes, foster care homes, and job corps centers with 10 or more unrelated persons. These types of places provide communal living quarters, generally for persons who have formed their own community in which they have common interests and often share or own property jointly.

Religious Group Quarters—Includes, primarily, group quarters for nuns teaching in parochial schools and for priests living in rectories. It also includes other convents and monasteries, except those associated with a general hospital or an institution.

College Quarters Off Campus—Includes privately-owned rooming and boarding houses off campus, if the place is reserved exclusively for occupancy by college students and if there are 10 or more unrelated persons. In census products, persons in this category are classified as living in a college dormitory.

Persons residing in certain other types of living arrangements are classified as living in "noninstitutional group quarters" regardless of the number of people sharing the unit. These include persons residing in the following types of group quarters:

College Dormitories—Includes college students in dormitories (provided the dormitory is restricted to students who do not have their families living with them), fraternity and sorority houses, and on-campus residential quarters used exclusively for those in religious orders who are attending college. Students in privately-owned rooming and boarding houses off campus are also included, if the place is reserved exclusively for occupancy by college-level students and if there are 10 or more unrelated persons.

Military Quarters—Includes military personnel living in barracks and dormitories on base, transient quarters on base for temporary residents (both civilian and military), and military ships. However, patients in military hospitals receiving treatment for chronic diseases or who have no usual home elsewhere, and persons being held in military stockades were included as part of the institutional population.

Agriculture Workers' Dormitories—Includes persons in migratory farm workers' camps on farms, bunkhouses for ranch hands, and other dormitories on farms.

Other Workers' Dormitories—Includes persons in logging camps, construction workers' camps, firehouse dormitories, job-training camps, and nonfarm migratory workers' camps.

Emergency Shelters for Homeless Persons (with sleeping facilities) and Visible in Street Locations—Includes persons enumerated during the "Shelter-and-Street-Night" operation primarily on March 20-21, 1990. Enumerators were instructed not to ask if a person was "homeless." If a person was at one of the locations below on March 20/21, the person was counted as described below. (For more information on the "Shelter-and-Street-Night" operation, see Appendix D, Collection and Processing Procedures.) This category is divided into four classifications:

Emergency Shelters for Homeless Persons (with sleeping facilities)—Includes persons who stayed overnight on March 20, 1990, in permanent and temporary emergency housing, missions, Salvation Army shelters, hotels, and motels used *entirely* for homeless persons regardless of the nightly rate charged; rooms in hotels and motels used *partially* for the homeless; and similar places known to have persons who have no usual home elsewhere staying overnight. If not shown separately, shelters and group homes which provide *temporary* sleeping facilities for runaway, neglected, and homeless children are included in this category in data products.

Shelters for Runaway, Neglected, and Homeless Children—Includes shelters/group homes which provide *temporary* sleeping facilities for juveniles.

Visible in Street Locations—Includes street blocks and open public locations designated before March 20, 1990 by municipio and community officials as places where the homeless congregate at night. *All* persons found at predesignated street sites from 2 a.m. to 4 a.m. and leaving abandoned or boarded-up buildings from 4 a.m. to 8 a.m. on March 21, 1990, were enumerated during "street"

enumeration, except persons in uniform such as police and persons engaged in obvious money-making activities other than begging or panhandling. Enumerators were instructed not to ask if a person was "homeless."

This cannot be considered a complete count of all persons living on the streets because those who were so well hidden that local people did not know where to find them were likely to have been missed as were persons moving about or in places not identified by local officials. It is also possible that persons with homes could have been included in the count of "visible in street locations" if they were present when the enumerator did the enumeration of a particular block.

Predesignated street sites include street corners, parks, bridges, persons emerging from abandoned and boarded-up buildings, noncommercial campsites, all-night restaurants, emergency hospital waiting rooms, airports, and bus stations.

Shelters for Abused Women (Shelters Against Domestic Violence or Family Crisis Centers)—Includes community-based homes or shelters that provide domiciliary care for women who have sought shelter from family violence and who may have been physically abused. Most shelters also provide care for children of abused women. These shelters may provide social services, meals, psychiatric treatment, and counseling. In some census products, "shelters for abused women" are included in the category "other noninstitutional group quarters."

Dormitories for Nurses and Interns in General and Military Hospitals—Includes group quarters for nurses and other staff members. It excludes patients.

Crews of Maritime Vessels—Includes officers, crew members, and passengers of Maritime U.S. flag vessels. All ocean-going ships are included.

Staff Residents of Institutions—Includes staff residing in group quarters on institutional grounds who provide formally-authorized, supervised care or custody for the institutionalized population.

Other Nonhousehold Living Situations—Includes persons with no usual home elsewhere enumerated during transient, or "T-Night" enumeration at YMCA's, YWCA's, commercial and government-run campgrounds, campgrounds at racetracks, fairs, and carnivals, and similar transient sites.

Living Quarters for Victims of Natural Disasters—Includes living quarters for persons temporarily displaced by natural disasters.

Limitation of the Data—Two types of errors can occur in the classification of “types of group quarters”:

1. *Misclassification of Group Quarters*—During the 1990 Special Place Prelist operation, the enumerator determined the type of group quarters associated with each special place in their assignment. The enumerator used the Alphabetical Group Quarters Code List and Index to the Alphabetical Group Quarters Code List to assign a two-digit code number followed by either an “I,” for institutional, or an “N,” for noninstitutional to each group quarters. In 1990, unacceptable group quarter codes were edited. (For more information on editing of unacceptable data, see Appendix C, Accuracy of the Data.)
2. *No Classification (unknowns)*—Improvements were made to the 1990 Alphabetical Group Quarters Code List; that is, the inclusion of more group quarters categories and an “Index to the Alphabetical Group Quarters Code List.”

Shelter and Street Night (S-Night)—For the 1990 census “Shelter-and-Street-Night” operation, persons well-hidden, moving about, or in locations enumerators did not visit were likely to be missed. The number of people missed will never be known; thus, the 1990 census cannot be considered to include a definitive count of Puerto Rico’s total homeless population. It does, however, give an idea of relative differences among areas of Puerto Rico. Other components were counted as part of regular census procedures.

The count of persons in shelters and visible on the street could have been affected by many factors. How much the factors affected the count can never be answered definitively, but some elements include:

1. How well enumerators were trained and how well they followed procedures.
2. How well the list of shelter and street locations given to the Census Bureau by the local government reflected the actual places that homeless persons stay at night.
3. Municipios were encouraged to open temporary shelters for census night. Thus, people who may have been on the street otherwise were in shelters the night of March 20, so that the ratio of shelter-to-street population could be different than usual.
4. The media occasionally interfered with the ability to do the count.
5. How homeless people perceived the census and whether they wanted to be counted or feared the census and hid from it.

Comparability—For the 1990 census, the definition of institutionalized persons was revised so that the definition of “care” only includes persons under organized

medical or formally-authorized, supervised care or custody. As a result of this change to the institutional definition, maternity homes are classified as noninstitutional rather than institutional group quarters as in previous censuses. The following types of other group quarters are classified as institutional rather than noninstitutional group quarters: “halfway houses (operated for correctional purposes)” and “wards in general and military hospitals for patients who have no usual home elsewhere,” which includes maternity, neonatal, pediatric, military, and surgical wards of hospitals, other-purpose wards of hospitals, and wards for persons with infectious diseases. These changes should not significantly affect the comparability of data with earlier censuses because of the relatively small number of persons involved.

As in 1980, 10 or more unrelated persons living together were classified as living in noninstitutional group quarters. In 1970, the criteria was six or more unrelated persons.

Several changes also have occurred in the identification of specific types of group quarters. For the first time, the 1990 census identifies separately the following types of correctional institutions: persons in halfway houses (operated for correctional purposes), military stockades and jails, and police lockups. In 1990, tuberculosis hospitals or wards are included with hospitals for the chronically ill; in 1980, they were shown separately. For 1990, the noninstitutional group quarters category, “Group homes” is further classified as: group homes for drug/ alcohol abuse; maternity homes (for unwed mothers), group homes for the mentally ill, group homes for the mentally retarded, and group homes for the physically handicapped. Persons living in communes, foster-care homes, and job corps centers are classified with “Other group homes” only if 10 or more unrelated persons share the unit; otherwise, they are classified as housing units.

In 1990, workers’ dormitories were classified as group quarters regardless of the number of persons sharing the dorm. In 1980, 10 or more unrelated persons had to share the dorm for it to be classified as a group quarters. In 1960, data on persons in military barracks were shown only for men. In subsequent censuses, they include both men and women.

In 1990 census data products, the phrase “inmates of institutions” was changed to “institutionalized persons.” Also, persons living in noninstitutional group quarters were referred to as “other persons in group quarters,” and the phrase “staff residents” was used for staff living in institutions.

In 1990, there are additional institutional categories and noninstitutional group quarters categories compared with the 1980 census. The institutional categories added include “hospitals and wards for drug/ alcohol abuse” and “military hospitals for the chronically ill.” The noninstitutional group quarters categories added

include emergency shelters for homeless persons; shelters for runaway, neglected, and homeless children; shelters for abused women; and visible in street locations. Each of these noninstitutional group quarters categories was enumerated on March 20-21, 1990, during the "Shelter and Street Night" operation. (For more information on the "Shelter-and-Street-Night" operation, see Appendix D, Collection and Processing Procedures.)

HOUSEHOLD TYPE AND RELATIONSHIP

Household

A household includes all the persons who occupy a housing unit. A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live and eat separately from any other persons in the building and which have direct access from the outside of the building or through a common hall. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated persons who share living arrangements.

In 100-percent tabulations, the count of households or householders always equals the count of occupied housing units. In sample tabulations, the numbers may differ as a result of the weighting process.

Persons Per Household—A measure obtained by dividing the number of persons in households by the number of households (or householders).

Relationship to Householder

Householder—The data on relationship to householder were derived from answers to questionnaire item 2, which was asked of all persons in housing units. One person in each household is designated as the householder. In most cases, this is the person, or one of the persons, in whose name the home is owned, being bought, or rented and who is listed in column 1 of the census questionnaire. If there is no such person in the household, any adult household member 15 years old and over could be designated as the householder.

Households are classified by type according to the sex of the householder and the presence of relatives. Two types of householders are distinguished: a family householder and a nonfamily householder. A family householder is a householder living with one or more persons related to him or her by birth, marriage, or adoption. The householder and all persons in the household related to him or her are family members. A nonfamily householder is a householder living alone or with nonrelatives only.

Spouse—Includes a person married to and living with a householder. This category includes persons in formal marriages, as well as persons classified as "consensually married."

The number of spouses is equal to the number of "married-couple families" or "married-couple households" in 100-percent tabulations. The number of spouses, however, is generally less than half of the number of "married persons with spouse present" in sample tabulations, since more than one married couple can live in a household, but only spouses of householders are specifically identified as "spouse." For sample tabulations, the number of "married persons with spouse present" includes married-couple subfamilies and married-couple families.

Child—Includes a son or daughter by birth, a stepchild, or adopted child of the householder, regardless of the child's age or marital status. The category excludes sons-in-law, daughters-in-law, and foster children.

Natural-Born or Adopted Son/Daughter—A son or daughter of the householder by birth, regardless of the age of the child. Also, this category includes sons or daughters of the householder by legal adoption, regardless of the age of the child. If the stepson/stepdaughter of the householder has been legally adopted by the householder, the child is still classified as a stepchild.

Stepson/Stepdaughter—A son or daughter of the householder through marriage but not by birth, regardless of the age of the child. If the stepson/stepdaughter of the householder has been legally adopted by the householder, the child is still classified as a stepchild.

Own Child—A never-married child under 18 years who is a son or daughter by birth, a stepchild, or an adopted child of the householder. In certain tabulations, own children are further classified as living with two parents or with one parent only. Own children of the householder living with two parents are by definition found only in married-couple families.

In a subfamily, an "own child" is a never-married child under 18 years of age who is a son, daughter, stepchild, or an adopted child of a mother in a mother-child subfamily, a father in a father-child subfamily, or either spouse in a married-couple subfamily.

"Related children" in a family include own children and all other persons under 18 years of age in the household, regardless of marital status, who are related to the householder, except the spouse of the householder. Foster children are not included since they are not related to the householder.

Other Relatives—In tabulations, includes any household member related to the householder by birth, marriage, or adoption, but not included specifically in another relationship category. In certain detailed tabulations, the following categories may be shown:

Grandchild—The grandson or granddaughter of the householder.

Brother/Sister—The brother or sister of the householder, including stepbrothers, stepsisters, and brothers and sisters by adoption. Brothers-in-law and sisters-in-law are included in the "Other relative" category on the questionnaire.

Parent—The father or mother of the householder, including a stepparent or adoptive parent. Fathers-in-law and mothers-in-law are included in the "Other relative" category on the questionnaire.

Other Relatives—Anyone not listed in a reported category above who is related to the householder by birth, marriage, or adoption (brother-in-law, grandparent, nephew, aunt, mother-in-law, daughter-in-law, cousin, and so forth).

Nonrelatives—Includes any household member, including foster children not related to the householder by birth, marriage, or adoption. The following categories may be presented in more detailed tabulations:

Roomer, Boarder, or Foster Child—Roomer, boarder, lodger, and foster children or foster adults of the householder.

Housemate or Roommate—A person who is not related to the householder and who shares living quarters primarily in order to share expenses.

Unmarried Partner/Compañero—A person who is not related to the householder, who shares living quarters, and who has a close personal relationship with the householder.

Other Nonrelatives—A person who is not related by birth, marriage, or adoption to the householder and who is not described by the categories given above.

When relationship is not reported for an individual, it is imputed according to the responses for age, sex, and marital status for that person while maintaining consistency with responses for other individuals in the household. (For more information on imputation, see Appendix C, Accuracy of the Data.)

Unrelated Individual

An unrelated individual is: (1) a householder living alone or with nonrelatives only, (2) a household member who is not related to the householder, or (3) a person living in group quarters who is not an inmate of an institution.

Family Type

A family consists of a householder and one or more other persons living in the same household who are related to the householder by birth, marriage, or adoption. All persons in a household who are related to the householder are regarded as members of his or her family. A household can contain only one family for purposes of census tabulations. Not all households contain families since a household may comprise a group of unrelated persons or one person living alone.

Families are classified by type as either a "married-couple family" or "other family" according to the sex of the householder and the presence of relatives. The data on family type are based on answers to questions on sex and relationship which were asked on a 100-percent basis.

Married-Couple Family—A family in which the householder and his or her spouse are enumerated as members of the same household.

Other Family:

Male Householder, No Wife Present—A family with a male householder and no spouse of householder present.

Female Householder, No Husband Present—A family with a female householder and no spouse of householder present.

Persons Per Family—A measure obtained by dividing the number of persons in families by the total number of families (or family householders).

Subfamily

A subfamily is a married couple (husband and wife enumerated as members of the same household) with or without never-married children under 18 years old, or one parent with one or more never-married children under 18 years old, living in a household and related to, but not including, either the householder or the householder's spouse. The number of subfamilies is not included in the count of families, since subfamily members are counted as part of the householder's family.

Subfamilies are defined during processing of sample data. In selected tabulations, subfamilies are further classified by type: married-couple subfamilies, with or without own children; mother-child subfamilies; and father-child subfamilies.

Lone parents include people maintaining either one-parent families or one-parent subfamilies. Married couples include husbands and wives in both married-couple families and married-couple subfamilies.

Unmarried-Partner/ Compañero Household

An unmarried-partner/ compañero household is a household other than a "married-couple household" that includes a householder and an "unmarried partner/ compañero." An "unmarried partner/ compañero" can be of the same sex or of the opposite sex of the householder. An "unmarried partner/ compañero" in an "unmarried partner/ compañero household" is an adult who is unrelated to the householder, but shares living quarters and has a close personal relationship with the householder.

Unmarried-Couple Household

An unmarried-couple household is composed of two unrelated adults of the opposite sex (one of whom is the householder) who share a housing unit with or without the presence of children under 15 years old.

Foster Children

Foster children are nonrelatives of the householder and are included in the category, "Roomer, boarder, or foster child" on the questionnaire. Foster children are identified as persons under 18 years old and living in households that have no nonrelatives 18 years old and over (who might be parents of the nonrelatives under 18).

Stepfamily

A stepfamily is a "married-couple family" with at least one stepchild of the householder present, where the householder is the husband.

Comparability—The 1990 definition of a household is the same as that used in 1980. The 1980 relationship category "Son/ daughter" has been replaced by two categories, "Natural-born or adopted son/ daughter" and "Stepson/ stepdaughter." "Grandchild" has been added as a separate category. The 1980 nonrelative categories: "Roomer, boarder" and "Roommate" have been replaced by the categories "Roomer, boarder, or foster child," "Housemate, roommate," and "Unmarried partner/ compañero." The 1980 nonrelative category "Paid employee" has been dropped.

INCOME IN 1989

The data on income in 1989 were derived from answers to questionnaire items 33 and 34. Information on money income received in the calendar year 1989 was requested from persons 15 years old and over. "Total income" is the algebraic sum of the amounts reported separately for wage or salary income; net nonfarm self-employment income; net farm self-employment income; interest, dividend, or net rental or royalty income;

Social Security or railroad retirement income; public assistance or welfare income; retirement or disability income; and all other income. "Earnings" is defined as the algebraic sum of wage or salary income and net income from farm and nonfarm self-employment. "Earnings" represent the amount of income received regularly before deductions for personal income taxes, Social Security, bond purchases, union dues, medicare deductions, etc.

Receipts from the following sources are not included as income: money received from the sale of property (unless the recipient was engaged in the business of selling such property); the value of income "in kind" from food stamps, public housing subsidies, medical care, employer contributions for persons, etc.; withdrawal of bank deposits; money borrowed; tax refunds; exchange of money between relatives living in the same household; gifts and lump-sum inheritances, insurance payments, and other types of lump-sum receipts.

Income Type in 1989

The eight types of income reported in the census are defined as follows:

1. **Wage or Salary Income**—Includes total money earnings received for work performed as an employee during the calendar year 1989. It includes wages, salary, Armed Forces pay, commissions, tips, piece-rate payments, and cash bonuses earned before deductions were made for taxes, bonds, pensions, union dues, etc.
2. **Nonfarm Self-Employment Income**—Includes net money income (gross receipts minus expenses) from one's own business, professional enterprise, or partnership. Gross receipts include the value of all goods sold and services rendered. Expenses includes costs of goods purchased, rent, heat, light, power, depreciation charges, wages and salaries paid, business taxes (not personal income taxes), etc.
3. **Farm Self-Employment Income**—Includes net money income (gross receipts minus operating expenses) from the operation of a farm by a person on his or her own account, as an owner, renter, or sharecropper. Gross receipts include the value of all products sold, government farm programs, money received from the rental of farm equipment to others, and incidental receipts from the sale of wood, sand, gravel, etc. Operating expenses include cost of feed, fertilizer, seed, and other farming supplies, cash wages paid to farmhands, depreciation charges, cash rent, interest on farm mortgages, farm building repairs, farm taxes (not commonwealth and Federal personal income taxes), etc. The value of fuel, food, or other farm products used for family living is not included as part of net income.

4. **Interest, Dividend, or Net Rental Income**—Includes interest on savings or bonds, dividends from stockholdings or membership in associations, net income from rental of property to others and receipts from boarders or lodgers, net royalties, and periodic payments from an estate or trust fund.
5. **Social Security Income**—Includes Social Security pensions and survivors benefits and permanent disability insurance payments made by the Social Security Administration prior to deductions for medical insurance, and railroad retirement insurance checks from the U.S. Government. Medicare reimbursements are not included.
6. **Public Assistance Income**—Includes: (1) supplementary security income payments made by Federal, commonwealth, or local welfare agencies to low income persons who are aged (65 years old or over), blind, or disabled; (2) aid to families with dependent children; (3) money received under the food stamps program; and (4) general assistance. Separate payments received for hospital or other medical care (vendor payments) are excluded from this item.
7. **Retirement or Disability Income**—Includes: (1) retirement pensions and survivor benefits from a former employer, labor union, or Federal, commonwealth, municipio, or other governmental agency; (2) disability income from sources such as worker's compensation; companies or unions; Federal, commonwealth, or local government; and the U.S. military; (3) periodic receipts from annuities and insurance; and (4) regular income from IRA and KEOGH plans.
8. **All Other Income**—Includes unemployment compensation, Veterans Administration (VA) payments, alimony and child support, contributions received periodically from persons not living in the household, military family allotments, net gambling winnings, and other kinds of periodic income other than earnings.

Income of Households—Includes the income of the householder and all other persons 15 years old and over in the household, whether related to the householder or not. Because many households consist of only one person, average household income is usually less than average family income.

Income of Families and Persons—In compiling statistics on family income, the incomes of all members 15 years old and over in each family are summed and treated as a single amount. However, for persons 15 years old and over, the total amounts of their own incomes are used. Although the income statistics covered the calendar year 1989, the characteristics of persons and the composition of families refer to the time of enumeration (April 1990). Thus, the income of the

family does not include amounts received by persons who were members of the family during all or part of the calendar year 1989 if these persons no longer resided with the family at the time of enumeration. Yet, family income amounts reported by related persons who did not reside with the family during 1989 but who were members of the family at the time of enumeration are included. However, the composition of most families was the same during 1989 as in April 1990.

Median Income—The median divides the income distribution into two equal parts, one having incomes above the median and the other having incomes below the median. For households and families, the median income is based on the distribution of the total number of units including those with no income. The median for persons is based on persons with income. The median income values for all households, families, and persons are computed on the basis of more detailed income intervals than shown in most tabulations. Median household or family income figures of \$20,000 or less are calculated using linear interpolation. For persons, corresponding median values of \$20,000 or less are also computed using linear interpolation. All other median income amounts are derived through Pareto interpolation. (For more information on medians and interpolation, see the discussion under "Derived Measures.")

Mean Income—This is the amount obtained by dividing the total income of a particular statistical universe by the number of units in that universe. Thus, mean household income is obtained by dividing total household income by the total number of households. For the various types of income the means are based on households having those types of income. "Per capita income" is the mean income computed for every man, woman, and child in a particular group. It is derived by dividing the total income of a particular group by the total population in that group.

Care should be exercised in using and interpreting mean income values for small subgroups of the population. Because the mean is influenced strongly by extreme values in the distribution, it is especially susceptible to the effects of sampling variability, misreporting, and processing errors. The median, which is not affected by extreme values, is, therefore, a better measure than the mean when the population base is small. The mean, nevertheless, is shown in some data products for most small subgroups because, when weighted according to the number of cases, the means can be added to obtained summary measures for areas and groups other than those shown in census tabulations.

Limitation of the Data—Since questionnaire entries for income frequently are based on memory and not on records, many persons tended to forget minor or irregular sources of income and, therefore, underreport their

income. Underreporting tends to be more pronounced for income sources that are not derived from earnings, such as Social Security, public assistance, or from interest, dividends, and net rental income.

There are errors of reporting due to the misunderstanding of the income questions such as reporting gross rather than net dollar amounts for the two questions on net self-employment income, which resulted in an overstatement of these items. Another common error is the reporting of identical dollar amounts in two of the eight type of income items where a respondent with only one source of income assumed that the second amount should be entered to represent total income. Such instances of overreporting had an impact on the level of mean nonfarm or farm self-employment income and mean total income published for the various geographical subdivisions of Puerto Rico.

Extensive computer editing procedures were instituted in the data processing operation to reduce some of these reporting errors and to improve the accuracy of the income data. These procedures corrected various reporting deficiencies and improved the consistency of reported income items associated with work experience and information on occupation and class of worker. For example, if persons reported they were self-employed on their own farm, not incorporated, but had reported wage and salary earnings only, the latter amount was shifted to net farm self-employment income. Also, if any respondent reported total income only, the amount was generally assigned to one of the type of income items according to responses to the work experience and class-of-worker questions. Another type of problem involved nonreporting of income data. Where income information was not reported, procedures were devised to impute appropriate values with either no income or positive or negative dollar amounts for the missing entries. (For more information on imputation, see Appendix C, Accuracy of the Data.)

In income tabulations for households and families, the lowest income group (e.g., less than \$1,000) includes units that were classified as having no 1989 income. Many of these were living on income "in kind," savings, or gifts, were newly created families, or families in which the sole breadwinner had recently died or left the household. However, many of the households and families who reported no income probably had some money income which was not recorded in the census.

The income data presented in the tabulations covers money income only. The fact that many farm families receive an important part of their income in the form of "free" housing and goods produced and consumed on the farm rather than in money should be taken into consideration in comparing the income of farm and nonfarm residents. Nonmoney income such as business expense accounts, use of business transportation and facilities, or partial compensation by business for medical and educational expenses was also received by some nonfarm residents. Many low income families also

receive income "in kind" from public welfare programs. In comparing income data for 1989 with earlier years, it should be noted that an increase or decrease in money income does not necessarily represent a comparable change in real income, unless adjustments for changes in prices are made.

Comparability—The income data collected in the 1980 and 1970 censuses are similar to the 1990 census data, but there are variations in the detail of the questions. In 1980, income information for 1979 was collected from persons in approximately 19 percent of all housing units and group quarters. Each person was required to report:

- Wage or salary income
- Net nonfarm self-employment income
- Net farm self-employment income
- Interest, dividend, or net rental or royalty income
- Social Security income
- Public assistance income
- Income from all other sources

Between the 1980 and 1990 censuses, there were minor differences in the processing of the data. In both censuses, all persons with missing values in one or more of the detailed type of income items *and* total income were designated as allocated. Each missing entry was imputed either as a "no" or as a dollar amount. If total income was reported *and* one or more of the type of income fields was not answered, then the entry in total income generally was assigned to one of the income types according to the socioeconomic characteristics of the income recipient. This person was designated as unallocated.

In 1980 and 1990, all nonrespondents with income not reported (whether heads of households or other persons) were assigned the reported income of persons with similar characteristics. (For more information on imputation, see Appendix C, "Accuracy of the Data.")

There was a difference in the method of computer derivation of aggregate income from individual amounts between the two census processing operations. In the 1980 census, income amounts less than \$100,000 were coded in tens of dollars, and amounts of \$100,000 or more were coded in thousands of dollars; \$5 was added to each amount coded in tens of dollars and \$500 to each amount coded in thousands of dollars. Entries of \$999,000 or more were treated as \$999,500 and losses of \$9,999 or more were treated as minus \$9,999. In the 1990 census, income amounts less than \$999,999 were keyed in dollars. Amounts of \$999,999 or more were treated as \$999,999 and losses of \$9,999 or more were treated as minus \$9,999 in all of the computer derivations of aggregate income.