

Methodology for the Puerto Rico Commonwealth and Its Municipios Population Estimates by Age and Sex (Vintage 2011): April 1, 2010 to July 1, 2011

The U.S. Census Bureau produces annual estimates of the resident population for the Commonwealth of Puerto Rico and its municipios. The estimates are produced by age and sex using a cohort-component approach as described below.

Overview

The cohort-component population estimation method starts with a 2010 Census base population by age and sex. It then follows each birth cohort as it ages and experiences mortality and migration. The estimates are produced annually by age and sex by updating the base population with data on the components of population change using the following procedure:

- (1) base population
- (2) plus births to Puerto Rico resident women
- (3) minus deaths to Puerto Rico residents
- (4) plus net migrants

This procedure is repeated for each year of the estimation period, by age and sex.

Methodology

Base Population

The 2010 Census population for the Commonwealth and its municipios serves as the starting point for the estimates by sex and single year of age (0-99 and 100+). We also update the population estimates base to reflect changes to the 2010 Census population due to the Count Question Resolution (CQR) program, legal boundary updates reported by January 1, 2011, and other geographic program revisions.¹

Fertility

Preliminary birth data for each month from January 2010 to December 2010 were obtained from the Puerto Rico Institute of Statistics. The birth records are retrieved from the Puerto Rico Department of Health vital registration system. The birth data includes month and year of birth, sex of the child, mother's age, mother's country and municipio of residence.

Less than one percent of birth records were missing information for one or more variables. Missing information was imputed using information from the previous known record. Births to

¹ The base population and the estimates described in this document do not reflect any CQR changes because no CQR revisions had been determined in time for this cycle of estimates production.

women who reside outside Puerto Rico are excluded from the estimates. Births for 2011 are projected by holding the preliminary births for 2010 constant.

Mortality

Preliminary death data for each month from January 2010 to December 2010 were obtained from the Puerto Rico Institute of Statistics. The death records are retrieved from the Puerto Rico Department of Health vital registration system. The death data includes month and year of death, sex, age, decedent's country of residence and the municipio of residence.

Less than one percent of the death records were missing information for one or more variables.

This missing information was imputed using information from the previous known record.

Deaths to persons who are not residents of Puerto Rico are excluded from the estimates. Deaths for 2011 are projected by holding the preliminary deaths for 2010 constant.

Net Migration

Commonwealth

Migration estimates used in producing the annual Puerto Rico Commonwealth population estimates consist of two components: Inmigrants from the United States (US) to Puerto Rico (PR) and outmigrants from Puerto Rico to the United States. The US/PR migration was estimated using a respondent's current residence and the 'Residence One Year Ago' (ROYA) question in the American Community Survey (ACS) and the Puerto Rico Community Survey (PRCS) single year files. Respondents living in Puerto Rico and indicating residence in the United States during the previous year are categorized as inmigrants. Respondents living in the United States and indicating Puerto Rico residence during the previous year are labeled outmigrants. Because children under 1 year of age would not have a residence one year ago, the value is assumed to be one-half of the estimate for the 1 year olds. Total US/PR inmigrants and outmigrants by sex for the Commonwealth are calculated using the 1-year (2010) ACS file. Age distributions are derived from the 3-year (2008-2010) ACS file.

Municipio

Net migration for Puerto Rico municipios is estimated using a residual method. The expected population for April 1, 2010 was projected by accounting for change since the last census due to births and deaths. Differences between the expected population and the population enumerated in the 2010 Census are assumed to represent net migration over the decade. The residual, which represents events over a period of 10 years, was converted into an annual average migration rate by age and sex for each municipio.