

Population Estimates and Projections

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Estimates of the Population of Puerto Rico and the Outlying Areas: 1970 to 1976

(Estimates in this report supersede those for 1970 to 1973 published in *Current Population Reports*, Series P-25, No. 603)

This report presents estimates of the population for July 1, 1970 to 1976 for Puerto Rico and the five principal outlying areas of the United States. Included are the Commonwealth of Puerto Rico, the Canal Zone, and the Virgin Islands of the United States, located in the Caribbean area south of the United States, and the three large territories in the Pacific Ocean—American Samoa, Guam, and the Trust Territory of the Pacific Islands. These areas had an estimated population of 3.6 million in 1976. Excluded are small areas of American jurisdiction scattered in the Pacific Ocean such as Midway, Wake, Canton, and Johnston Islands, the population of which numbered 4,874 in the 1970 census.

Shown for the first time are estimates for the Northern Mariana Islands, which will eventually separate from the Trust Territory and become the Commonwealth of the Northern Mariana Islands in political affiliation with the United States. This area is conterminous with the former Mariana Islands District of the Trust Territory.

The report also presents the components of population change for these areas for the period 1970-76—natural increase (the number of births minus deaths) and net migration (the number of persons migrating into a particular area minus the number migrating from the area). In several of the areas shown, net migration is not estimated directly but is derived as the difference between the total amount of change and natural increase.

METHODOLOGY

In developing the estimates for the Commonwealth of Puerto Rico and each of the outlying territories, rarely were the same data or a uniform method used as a means for deriving the population estimates of the areas. The availability of data relating to population change varies from territory to territory. The concentration of special population groups in

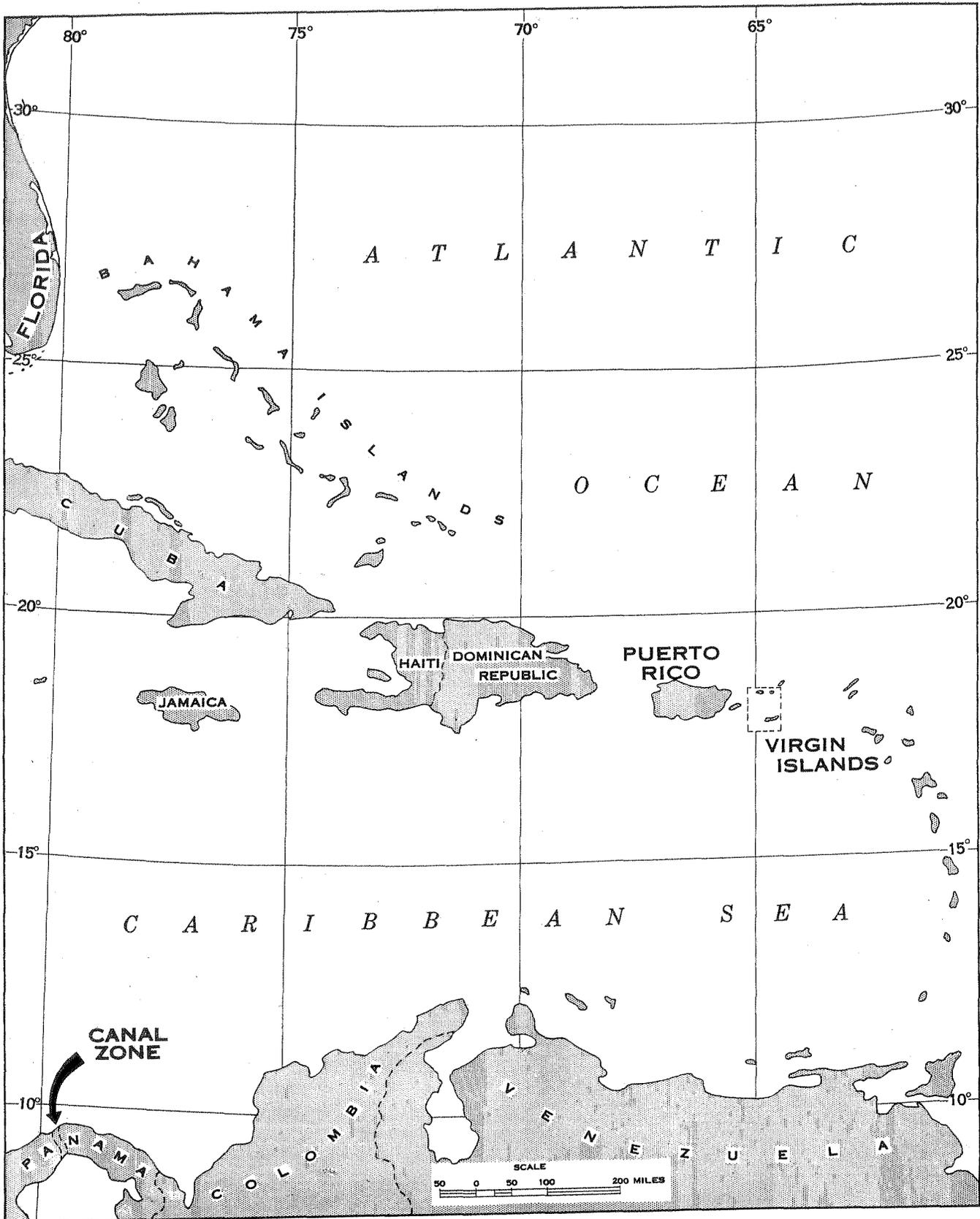
some of the areas makes it difficult to rely on certain kinds of symptomatic data or standard methods. In a very broad sense, however, two general approaches to estimating the population were used:

- A. A component method for making population estimates which involves:
 1. estimating the civilian population on April 1, 1970, from the census figure for that date, and from figures on the Armed Forces stationed in each area,
 2. adding to the civilian population on April 1, 1970, an estimate of births for the period between the census and the estimate date,
 3. subtracting an estimate of deaths,
 4. adding or subtracting an estimate of net migration, and
 5. subtracting an estimate of net loss of civilians to the Armed Forces. The estimate of the total population of each area was obtained by adding an estimate of the number of persons in the Armed Forces stationed there on the estimate date.
- B. A special population method in which the population of the area is estimated by summing various subpopulation counts on the estimate date as reported from administrative records for each area.

A brief explanation of the procedure used for each of the areas is as follows:

Puerto Rico. The estimates for Puerto Rico were based on reported statistics for each of the components of population change, with the migration component derived from monthly passenger statistics on arrivals to and departures from Puerto Rico on all public transport as collected by the Commonwealth government. The migration estimate for Puerto Rico

CARIBBEAN AREA



is the sum of centered 12-month moving averages of the reported monthly data. This compensates for bias as introduced by short-term fluctuations in passenger data which reflect the seasonal movement of transients (tourists and other visitors) rather than the movement of migrants to a new residence. The movement of transients will tend to cancel out over longer periods. Net movement between the civilian population and the Armed Forces is based on the reported number of inductions, enlistments, and separations in Puerto Rico.

Virgin Islands. The estimates for the Virgin Islands were based on Component Method II, a component method variation developed by the Bureau of the Census. In this method, net migration is estimated on the basis of school enrollment or school census data using the difference between the actual population of elementary school age and the population of school age expected on the basis of the most recent census and births since the census.

Canal Zone. The estimates for the Canal Zone were based on the average of Component Method II and a summation of special populations which adds to the 1970 census count the estimated change in (1) Armed Forces and U.S. citizen civilian employees of the Armed Forces and dependents, (2) U.S. citizen employees of Federal civilian agencies and dependents, (3) alien employees of Federal civilian agencies and dependents, and (4) other alien dependents.

American Samoa. The estimates for American Samoa were based on the 1970 census and a special census of the territory, taken September 26, 1974 under the auspices of the Samoan government, which showed a population of 29,190. Net migration for the period between the censuses was calculated by subtracting reported natural increase from the net population change. This migration was prorated back over time from July 1, 1970 to 1974. The estimates for July 1, 1970 to 1974 were then obtained by adding the components of population change to the 1970 population base. For July 1, 1975 and 1976, the average annual amount of net migration between the 1970 and 1974 censuses was estimated to continue, and this figure was combined with reported natural increase and added to the 1974 census to obtain a current population estimate. The 1976 estimate is consistent with the results of a 10 percent sample survey conducted in February of 1977 which yielded a population estimate of 30,600.

Guam. The estimates of the population of Guam were developed by adding the following to the 1970 census count of the population excluding those persons born in the United States or born abroad of American parents:

1. **Natural increase.** The excess of births over deaths to the population based on reported birth and death statistics. Excluded are the births and deaths occurring in the U.S. Naval Hospital, which should be accounted for in step 3.

2. **Change in alien contract workers.** This category is composed primarily of contract workers brought in from the Philippines by the Department of Defense. The estimate is obtained from the Department of Defense.

3. **Federally affiliated population.** Number of Federal civilian employees, Armed Forces, and their dependents, also obtained from the Department of Defense.

No data are available on the movement of the nonfederally affiliated population who are not covered above, but this component of net migration is probably not large.

Trust Territory of the Pacific Islands.—Population estimates for the Trust Territory and for the Northern Mariana Islands were made by using the annual "census" of residents taken by the Territorial High Commissioner, adjusted when necessary to be consistent with the apportionment census taken by the Territory on September 18, 1973. That census showed a total population of 114,982 for the Territory, excluding 269 persons identified as or presumed to have their usual place of residence outside TTPI. The estimates exclude employees and dependents at the Kwajalein Missile Facility, which in the 1973 census amounted to 4,467.

LIMITATIONS OF THE ESTIMATES

The areas for which estimates are presented in this report are unique in terms of size, location, and composition. This creates difficulty in developing appropriate estimating procedures, much less standard procedures that are applicable for all the areas. The poor quality or absence of data series to be utilized in these procedures creates problems that make a reasonable level of accuracy difficult to achieve. The estimation techniques used in this report were selected insofar as possible on the basis of a test of methods against the 1970 census for each of the areas. On the basis of past experience for these areas, however, it should not be assumed that the best procedure for 1970 will necessarily continue to be effective.

Most of the procedures now used in developing the estimates for these areas differ from what was used during the 1960's. In several cases the level of accuracy by the old procedure was so poor that some change in procedure was mandatory. Table A presents a summary of the relative accuracy in 1970 of the procedures now used for estimating the outlying areas. The table also shows the accuracy in 1970 of procedures used by the Bureau during the 1960's when they differed from the current procedures.

For Puerto Rico the estimating technique now used remains essentially unchanged from that used for the 1960's. The accuracy of the estimate depends very heavily upon canceling out in the migration statistics the large number of visitors who move between Puerto Rico and the mainland of the United States. Since gross arrival and departure data obviously contain a large number of tourists, net monthly figures are computed and smoothed using a 12-month

PACIFIC AREA

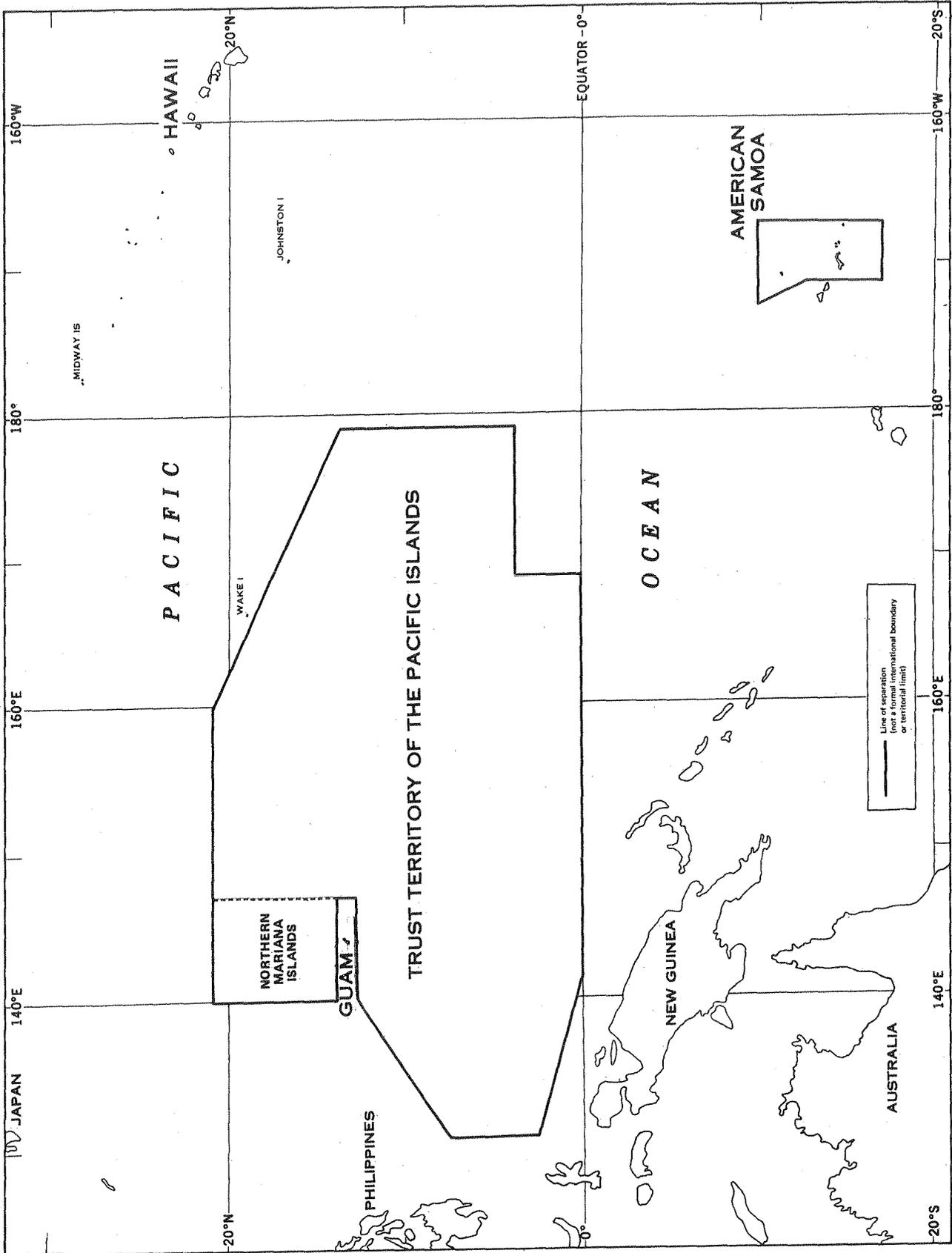


Table A. Percent Deviation of Estimates of Puerto Rico and the Outlying Areas From Census Counts: April 1, 1970

(See text for description of current methods)

Area	Current method 1970's	Previous method 1960's ¹
CARIBBEAN AREAS		
Puerto Rico.....	+2.9	+2.9
Virgin Islands.....	-	+12.3
Canal Zone.....	(²)	+40.3
PACIFIC AREAS		
American Samoa.....	(²)	+38.1
Guam.....	9.8	(Discontinued in 1969)
Trust Territory of the Pacific Islands.....	(³)	(³)

- Represents zero or rounds to zero.

¹Using methods consistent with those used to develop estimates issued for these areas up to 1968.

²Data series for which special population method is based has only been available since 1970. See text.

³No comparison because of apparent deficiencies in the 1970 census count. See text.

moving average. This process provides rough approximations of net migration for Puerto Rico. However, the 1970 test suggests an overstatement of the population in the neighborhood of 3 percent, presumably as a result of weaknesses in the migration data.

In the case of the Virgin Islands, where Component Method II is employed, the difference using that method for 1970 was less than 1 percent. In the past an average of the results of Component Method II and Composite method was used in generating the estimate, augmented by a separate allowance for immigrant aliens. The percentage difference for the two methods was 4 percent, and the further allowance for aliens increased the difference from the census to 12 percent. Consequently, this procedure was abandoned.

Estimates for the Canal Zone in the 1960 decade based on Component Method II were seriously affected by the low enrollment rates in elementary schools and also by the many problems created because of the proximity of the Canal Zone to the Republic of Panama. By 1970, however, enrollment rates in the elementary grades had increased to 98 percent (in 1960 the rate was only 78 percent). Averaging the results of Component Method II with the special population method should yield promising results for the 1970 decade.

For American Samoa there are still many shortcomings to the migration component derived from reported data from the Samoan Office of Immigration which was used for estimating the population in the 1960's. It appears that the

passenger data greatly understate outmigration. Between 1960 and 1970, the reported passenger data indicated a net of +9,972 while the Bureau of the Census estimates of residual migration yielded a figure of nearly 2,000 net out-migrants. Other areas of uncertainty include the movement of tourists and Western Samoans as they enter and leave the country. Consequently, the component procedure used for estimating the territory in the 1960's has been abandoned until some improvement in the migration series can be obtained.

The estimating procedure used here is a means of bridging a period when no possible independent migration estimates can be developed. The 1970 and 1974 censuses provide two points in time which, in combination with reported vital statistics, can be used to yield an acceptable estimate of net migration for the period between those points. The actual migration for each year in the period is unknown, however. In the absence of any other information concerning the annual migration pattern, it has been assumed that there was a smooth annual net outmigration between 1970 and 1974 and that this net out-flow continued beyond the 1974 census at the same magnitude through mid-1976. The 1977 survey conducted by the Territorial government lends support to the assumption of a continuation of the trend.

Recent inquiries to the Office of the Governor indicate that birth and death registrations in American Samoa are complete and that they seem to be reasonably accurate. Most of the births occur in either the Lyndon B. Johnson Memorial Hospital or in dispensaries and birth certificates are prepared on all births.

For Guam, as indicated earlier, the estimates are based on a special population method, which yields point estimates of the various subcategories of the population. The test of this method for the 1960-70 period showed a high bias of about 10 percent. For the 1970's there is some possibility of understatement of population growth since there is no allowance for the net movement into the Territory of either Americans or aliens not affiliated with the Federal government. Territorial officials claim that there has been a definite net migration gain to Guam since 1970 resulting from movement of persons from the Trust Territory (especially college students) and the Philippines. Movement of Americans into and out of Guam since 1970 has been very heavy due to the effects of the Vietnamese War, and the annual changes of military personnel and dependents have often been quite large.

For the Trust Territory of the Pacific Islands (TTPI) the High Commissioner's office maintained an annual census of the Territory which was an informal reporting of the current population supplied by each of the Territorial districts. However, these counts vary both in accuracy and coverage among Districts and from one year to the next. The Trust Territory took an apportionment census in September 1973 which showed a population of 114,982 plus 269 persons with residence not specified. This number was somewhat lower than the level of the High Commissioner's series but still appreciably higher than the 1970 census would lead one to expect. From what can be determined it appears that the

1970 census of TTPI substantially undercounted the population. Consequently the 1973 Territorial apportionment census rather than the 1970 Federal census has been used as the reference point in developing the population time series for TTPI and the Northern Mariana Islands. The annual High Commissioner's census numbers have been used for the other years except for 1970 and 1972 where adjustments were made to apparent population overstatements in Truk and Ponape Districts.

Because of the deficiencies in birth and death registration in TTPI, the migration component has been suppressed in Table 1. The residual value which we would normally assume to be net migration when natural increase is subtracted from net population change includes any net understatement of natural increase, which may be considerable in TTPI. Territorial officials indicate that net migration for TTPI since 1970 should be negligible.

SOURCES OF DATA

Most of the statistics used to prepare the area estimates presented in this report were obtained from the local governments of the outlying territories. Data on births and deaths were obtained from the local governments for Puerto Rico and the outlying areas. Births were not adjusted for underregistration.

Armed Forces data are based on figures provided by the Department of Defense. The Puerto Rico Planning Board supplied figures on the balance of inductions, enlistments

and discharges in order to compute the component net lost of civilians to the Armed Forces.

School enrollment data were supplied by the Department of Education. For Puerto Rico, data on migration were supplied by the Puerto Rico Planning Board supplemented by statistics on civilians carried by military transport from the Department of Defense. The number of Federal civilian employees was obtained from the U.S. Civil Service Commission.

RELATED REPORTS

Estimates for Puerto Rico and the outlying areas for 1960 to 1969 appear in **Current Population Reports**, Series P-25, No. 603. A revised set of estimates for the Trust Territory for 1960 to 1969 which make use of the 1973 Apportionment Census is being developed. Estimates for 1950 to 1959 for these areas are contained in Series P-25, No. 336. Estimates for Puerto Rico, the Canal Zone, and the Virgin Islands for 1940 to 1949 are shown in **Current Population Reports**, Series P-25, No. 80.

ROUNDING OF ESTIMATES

Each estimate in this report has been rounded independently to the nearest thousand (Puerto Rico) or hundred (other areas) from figures computed to the last digit. Hence, the sum of the parts may differ from the total shown. Percentages are based on unrounded numbers.

Table 1. ESTIMATES OF THE COMPONENTS OF CHANGE IN THE RESIDENT AND CIVILIAN POPULATION OF PUERTO RICO AND THE OUTLYING AREAS OF THE UNITED STATES: 1970 TO 1976

(Resident population includes persons in the Armed Forces stationed in each area. Each estimate has been rounded to the nearest thousand for Puerto Rico and to the nearest hundred for the outlying areas)

Type of population and area	July 1, 1976	April 1, 1970 (census)	Net change, 1970-76		Components of change, 1970-76			
			Number	Percent ¹	Births	Deaths	Net migration	
							Number	Percent ¹
RESIDENT POPULATION								
Caribbean Areas								
Puerto Rico.....	3,205,000	2,712,033	493,000	18.2	436,000	118,000	176,000	6.5
Virgin Islands.....	94,900	62,468	32,500	52.0	17,200	3,200	18,400	29.4
Canal Zone.....	40,000	44,198	-4,200	-9.6	4,000	600	-7,600	-17.2
Pacific Areas								
American Samoa.....	30,100	27,159	2,900	10.8	6,600	900	-2,800	-10.4
Guam.....	95,900	84,996	10,900	12.8	19,300	2,500	(³)	(³)
Trust Territory of the Pacific Islands.....	² 125,500	² 100,700	24,900	24.7	23,900	3,500	(⁴)	(⁴)
Northern Mariana Islands.....	² 15,700	² 12,200	3,500	29.2	3,200	500	(⁴)	(⁴)
CIVILIAN POPULATION								
Caribbean Areas								
Puerto Rico.....	3,200,000	2,701,000	499,000	18.5	436,000	118,000	181,000	6.7
Virgin Islands.....	94,900	62,500	32,400	51.8	17,200	3,200	18,400	29.4
Canal Zone.....	29,700	29,400	300	1.0	4,000	600	-3,100	-10.5
Pacific Areas								
American Samoa.....	30,100	26,900	3,200	11.9	6,600	900	-2,500	-9.3
Guam.....	86,100	71,300	14,700	20.7	19,300	2,500	(³)	(³)
Trust Territory of the Pacific Islands.....	² 125,400	² 100,500	24,800	24.7	23,900	3,500	(⁴)	(⁴)
Northern Mariana Islands.....	² 15,700	² 12,200	3,500	29.2	3,200	500	(⁴)	(⁴)

¹Base is 1970 population.

²Estimates consistent with the Apportionment Census of September 1973. That census showed a total of 14,333 for the Marianas and 114,982 for TTPI, excluding 4,462 in Kwajalein Missile Range Facility and 269 with usual residence not specified as TTPI. The Federal census of 1970, which showed a population count of 90,940 for TTPI (plus 3,960 on Kwajalein Island) and 9,640 for the Marianas, appears to have been incomplete.

³Because data are not available for all types of migration for Guam, migration figures are not shown. See text.

⁴Because part of the residual migration reflects underregistration of vital statistics, migration figures are not shown. See text.

Table 2. ESTIMATES OF THE RESIDENT AND CIVILIAN POPULATION OF PUERTO RICO AND THE OUTLYING AREAS OF THE UNITED STATES: JULY 1, 1970 TO JULY 1, 1976

(Puerto Rico rounded to nearest thousand, all outlying areas to nearest hundred)

Type of population and area	1976	1975	1974	1973	1972	1971	1970
RESIDENT POPULATION							
Caribbean Areas							
Puerto Rico.....	3,205,000	3,105,000	3,018,000	2,943,000	2,861,000	2,771,000	2,724,000
Virgin Islands.....	94,900	91,200	86,400	81,500	73,600	67,900	63,500
Canal Zone.....	40,000	40,500	40,800	41,000	41,600	42,300	43,800
Pacific Areas							
American Samoa.....	30,100	29,600	29,100	28,600	28,200	27,700	27,300
Guam.....	95,900	96,300	96,500	101,700	94,000	90,700	86,100
Trust Territory of the Pacific Islands ¹	125,500	121,800	118,200	114,100	110,800	107,100	101,500
Northern Mariana Islands ¹	15,700	15,200	14,700	14,200	13,400	13,100	12,300
CIVILIAN POPULATION							
Caribbean Areas							
Puerto Rico.....	3,200,000	3,101,000	3,014,000	2,934,000	2,854,000	2,766,000	2,714,000
Virgin Islands.....	94,900	90,600	86,400	81,300	73,600	67,800	63,500
Canal Zone.....	29,700	30,500	29,900	30,100	30,900	31,400	30,500
Pacific Areas							
American Samoa.....	30,100	29,600	29,100	28,600	28,100	27,700	27,200
Guam.....	86,100	86,300	85,400	84,400	82,200	79,400	72,100
Trust Territory of the Pacific Islands ¹	125,400	121,300	118,000	113,800	110,600	106,800	101,200
Northern Mariana Islands ¹	15,700	15,200	14,700	14,200	13,400	13,100	12,300

¹Estimates consistent with the Apportionment Census of September 1973. That census showed a total of 14,333 for the Marianas and 114,982 for TTPI, excluding 4,462 in Kwajalein Missile Range Facility and 269 with usual residence not specified as TTPI. The Federal census of 1970, which showed a population count of 90,940 for TTPI (plus 3,960 on Kwajalein Island) and 9,640 for the Marianas, appears to have been incomplete.