

***REPUBLIC OF PALAU***

***1990 CENSUS MONOGRAPH***

***Population and Housing Characteristics***

OFFICE OF PLANNING AND STATISTICS  
KOROR, REPUBLIC OF PALAU 96940

February **1993**



## PREFACE AND ACKNOWLEDGEMENTS

This detailed monograph of the 1990 Census of the Republic of Palau will help local and U.S. federal policy makers understand current socioeconomic conditions in Palau. The monograph stands alone, although the *1990 Census of Population and Housing: Social, Economic, and Housing Characteristics, Republic of Palau* report (1990 CPH-6-P) and the summary tape files contain much more information.

In 1986 the Office of Territorial and International Affairs (OTIA) of the U.S. Department of the Interior funded a workshop on the use of census data for representatives from the U.S. Virgin Islands and the Pacific Island areas. Since Palau was negotiating a Compact of Free Association with the United States, OTIA did not include Palau in the course. One outcome of the workshop was Guam, American Samoa, and the Commonwealth of the Northern Marianas each preparing monographs examining the 1980 census data in detail. Palau did not develop a monograph.

Despite this delay, representatives from the Palau government recognized the value of a detailed study of recent census data. In 1989, two staff from the Republic of Palau Office of Planning and Statistics (OPS) visited Washington for two months to develop tables from the 1980 and 1986 Palau censuses to be used in a monograph. Unfortunately, when these individuals returned to Palau the demands of other projects prohibited their finishing the study. To complicate matters, the 1980 census data were becoming outdated, reducing the usefulness of a detailed study. Moreover, the next decennial census was imminent.

Planning for the 1990 censuses in the Pacific Islands began in the mid-1980s. U.S. Bureau of the Census (USBC) personnel took two trips to the Pacific—in 1987 to discuss questionnaire design and in 1988 to discuss processing. But once again, because of Palau's indeterminate political status during those times, USBC representatives did not include it on their planning agenda. Because the Compact was not implemented for Palau before 1990, Palau was included in the 1990 census. The census of Palau used the questionnaire developed for the other Pacific Islands. Mr. Koichi Wong, Republic of Palau National Planner, served as Census Coordinator, assisted by Mr. Alonso Joseph and Ms. Francesca Sakuma of the OPS. Data were collected in 1990, processed in 1991, and published in early 1992.

In 1991, representatives of the OPS, USBC, and OTIA decided to prepare a census monograph similar to those prepared during the late 1980s for other Pacific Island polities. Michael J. Levin, of the USBC Population Division, led this effort. Huan F. Hosei, OPS, served as the counterpart from the Republic of Palau. Finally, L.J. Gorenflo provided assistance on the project from the OTIA.

OTIA provided financial support for the preparation of this monograph under grant PAL91-45. Odessa Mitchell and Darla Knoblock of OTIA made the participation of the three authors of this study possible. Emily Lennon, USBC Population Division, provided her usual excellent support work, preparing historical tables and figures appearing in the monograph. Special thanks are due to Paula Schneider and Phil Fulton, USBC Population Division, for enabling Levin's participation in

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the project. Acknowledgements to the many individuals who helped collect, process, and present the 1990 census data for Palau appear in the 1990 census report for the Republic of Palau.

Michael J. Levin  
L.J. Gorenflo  
Huan F. Hosei

January 1993

## A MESSAGE FROM THE PRESIDENT

This book will give the Republic of Palau the kind of statistical information we need to help plan our future. As I write this, I find that we are now at an important turning point in our history. We have just approved a change in the Constitution allowing us to make a final decision about whether or not we will have the previously negotiated Compact of Free Association with the United States. Whatever direction we go, we will need the statistics we find in this book.

As a former businessman, I know the importance of statistics. In the private sector, entrepreneurs must know who the customers are, what they want, and what to charge in order to make a profit and stay in business. If you are in business you need to know who the potential employees are, and we have some of that information in this book. If you are in business, you have to have some idea of who your customers will be, what is the education of the population, what types of activities are they doing, and so forth, and we have some of that information in this book, too. You have to know their income levels, how much disposable income they have to spend on your products, and you get that here. You have to know who is living where, and how far they travel for work or to shop, and what appliances they have in their houses. All of that is in this book. So it is useful for the private sector.

And, the public sector, too. As public servants, we must provide both the government and the private sector with information for planning. I just discussed the private sector. Now, let me go to the government sector. We must think about who will be the future businessmen and social and political leaders, and to do that we need periodic information on our population, and we can only get that information through a census. We need to count all of the people and find out about their education and employment and housing conditions. So, the 1990 Census is very important for us and our planning. We can see what the educational levels of our population are, where we have gaps in terms of planning for the jobs of the future. We can look at the jobs that foreigners have that we might fill later on, with proper education and training. We can look at the conditions of our housing and how we might think about improving them for the future. All of this information, and more, is in the book.

I want to thank the Office of Planning and Statistics for all their hard work in collecting the census data and making this report. The whole Republic of Palau benefits from it.

Kuniwo Nakamura  
President, Republic of Palau

## **A MESSAGE FROM THE OFFICE OF PLANNING AND STATISTICS**

The Office of Planning and Statistics is the central agency in the Republic of Palau collecting and distributing government and private statistics. We work with agencies in the United States, the United Nations, and other governments, to collect statistical information which these agencies need, and which we need as well. We publish statistical summaries from time to time, and collect intercensal surveys, such as the 1991 Household Income and Expenditures Survey. We assisted the United Nations in collecting and processing the 1986 Palau census, and were the agency responsible for collecting the 1990 Census information.

The 1990 Census has given the government of the Republic of Palau more information than ever before in a census to help us with planning for our future needs. We now have timely data for applying for U.S. Federal grants, as well as for working with other agencies such as the United Nations, ESCAP in particular, and the South Pacific Commission. Although these data in published form are useful, we felt that a historical monograph would be even more useful. Fortunately, the Office of Territorial and International Affairs of the U.S. Department of the Interior, agreed to partial funding for this activity. Dr. Michael Levin, who has worked with us on many projects over the years, was able to work with us on this one as well. The OTIA also brought Dr. Larry Gorenflo on to the project, and assisted our office by funding part of our office's Mr. Huan Hosei, particularly his transportation and per diem.

We wanted a monograph which is easy to understand and to use, sort of a cookbook of useful demographic, social, economic, and housing data. We asked for tables and graphs to help elucidate various themes in Palau's statistics. These data include changes in the numbers of people living in Palau, what islands they were on, and the distributions by age and sex over time. We also look at current and past fertility and mortality in our population, and the current migration trends that everyone is talking about. We look at the educational attainment of our people, and what they are doing with their educations. We look at our employment — how many of us are working, what kind of jobs we have, and what our incomes are. And, we look our housing conditions. Finally, we compare the conditions in Palau with those of Palauans living on Guam and in the Commonwealth of the Northern Mariana Islands.

We feel that these data will be useful to our office, other ministries in Palau, and other international agencies for planning and policy use.

Koichi L. Wong  
National Planner

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## CHAPTER 1. INTRODUCTION

This monograph provides analyses of data from the most recent census of Palau for decision makers in the United States and Palau to understand current socioeconomic conditions<sup>1</sup>. The monograph chapters explore topics using data from the 1990 Census of Population and Housing. Chapter 1 provides background for the analyses, introducing the Republic of Palau, providing a brief history of Palau, and discussing key analytical concepts. Chapter 2 presents a brief overview of the demographic history of Palau. Chapters 3 through 16 explore particular topics, as follows:

- Chapter 3: Geographic distribution
- Chapter 4: Age and sex
- Chapter 5: Households, families, and marital status
- Chapter 6: Fertility
- Chapter 7: Mortality
- Chapter 8: Migration
- Chapter 9: Education and language
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Chapter 17 presents the conclusions. Finally, appendices present information on various technical topics. Appendix A discusses data accuracy, borrowing heavily from the main census report (U.S. Bureau of the Census, 1992c, Appendix C). Appendix B presents a facsimile of the questionnaire used in the 1990 census. Appendix C contains maps of the geographic areas used to organize 1990 census data.

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<sup>1</sup>This monograph presents a detailed analysis of the 1990 census of the Republic of Palau. The data for this analysis were collected by the Republic of Palau's Office of Planning and Statistics by Memorandum of Understanding with the U.S. Bureau of the Census in 1990, as part of the decennial census of the United States and selected U.S. territories. The main report issued by the Census Bureau provided most of the information used in this study (U.S. Bureau of the Census, 1992c). Additional data, both on topics not covered in the main published report and for geographical divisions not used in the report, are contained in Summary Tape Files 1 and 3, available from the U.S. Bureau of the Census.

## THE REPUBLIC OF PALAU

The Republic of Palau consists of six island groups found at the western edge of the Caroline archipelago in the west central Pacific Ocean (Figure 1.1) (Shinn, 1984, pp. 341-342). The approximately 200 individual islands lies along a 700 kilometer length from northeast to southwest. The main island group, called the *Palau Islands*, contains most of Palau's 461 square kilometers of land area and most of its population. Peleliu and Angaur are to the south, and Kayangel lies to the northeast. The *outer islands* — the four southwest islands of Dongosaro, Hatohobei, Melieli, and Puro — have a different culture and history (Appendix C).

### [Figure 1.1 about here]

The northern portion of the Palau Islands are volcanic in origin, characterized by deep dendritic drainage patterns and rounded hills (U.S. Department of Agriculture, 1983, pp. 1-2). Included among the volcanic islands is Babeldaob, the largest island in the republic, as well as Arakabesang, Koror, and Malakal islands. Raised coral limestone islands, known collectively as the "Rock Islands," lie scattered throughout the lagoon. Finally, the southern portion of the main island group consists of the low coral and limestone islands of Angaur and Peleliu. Soil quality and tropical climate of high humidity and warm, relatively uniform year-round temperatures, produce dense vegetation over most islands of the Palau Islands and provide a natural setting for agriculture. In contrast, the rest of the Palau Islands are low coralline islands characterized by limited land and poor soil. Vegetation on the coral islands generally is sparse and the agricultural productivity potential more limited than on the volcanic islands (Useem, 1946:61).

Kayangel is an *atoll* — an irregular ring of coral reef surrounding a lagoon, with some parts of the reef rising slightly above sea level to form dry areas called *islets* (see Wiens, 1962)

The outer islands of Palau are small and formed primarily from coral. All are raised coral islands. Dongosaro (Sonsorol), Melieli, Fanna, and Puro are the four municipalities of Sonsorol, one of Palau's states. Hatohobei is another of the 16 states. Vegetation on the outer islands generally is sparse because of porous, poor soil and high salinity both in the ground water and from ocean spray. Due in part to the fundamentally different adaptive challenges faced by outer island residents, in part to their history, and in part to geographic separation, the Southwest Islands are distinct culturally from the Palau Islands. The Southwest Islands have closer links to the outer islands of Yap, through their part of the Trukic continuum and migration patterns.

During traditional times, Palau contained chiefdoms — sociocultural systems characterized by ascribed hierarchical social ranking. Matrilineal descent determined social position, inheritance, kinship structure, residence patterns, and land tenure. A single chiefdom inhabited each smaller island unit, such as Hatohobei and Peleliu. Several chiefs resided on the large island of Babeldaob

— dividing the island into separate districts which individual chiefs controlled. Although Palau society has changed dramatically over the past 300 years of contact with people from outside Micronesia, traditional society continues to play important roles both in daily activities and in the political operation of the republic, particularly in more rural areas.

As is the case with most of Micronesia, Palau has a long history of interaction with more technologically advanced societies. In many cases this interaction has had profound effects on the native residents, leading to population change, introducing different strategies of economic development, and ultimately changing the traditional sociocultural system. A brief overview of this history provides useful background for an examination of the 1990 Census of Population and Housing.

### **A Brief History of Palau**

Early colonists from the Philippines or eastern Indonesia probably settled the Palau Islands between 2000 and 3000 B.C. (Hezel, 1983:3). Most of the outer islands, in contrast, apparently were settled sometime during the first millennium B.C. from the east, as part of a general wave of Micronesian colonization that flowed westward from the Marshall Islands and Kiribati. The islands of Oceania, including those within the current Republic of Palau, were unknown to the West until the 16th century through European "discovery". In May 1522 a Spanish ship commanded by Espinosa sighted the Sonsorol Islands as it sailed northeast from the Philippines (Hezel, 1983, pp. 3-4). About two decades later another Spanish ship, commanded by Villalobos, possibly sighted the Palau Islands (Office of the Chief of Naval Operations, 1944, pp. 22). Europeans finally made landfall in 1579 when Francis Drake, the famous English privateer, landed on one of the Palau Islands (Lessa, 1975; Hezel, 1983:32). But as occurred throughout most of Micronesia, European interest in Palau waned. Europeans would not see the islands of the republic again for nearly 150 years.

Brief contact occurred once again between Spaniards and the people of Palau in the early 1700s, when ships explored unknown islands that native informants in the Philippines had referred to as "the Pelews." A Spanish ship commanded by Padilla began this effort in 1710, landing first on Dongosaro and then on the Palau Islands. A second Spanish ship, under captain Egui, returned two years later (Krämer, 1917:71; Office of the Chief of Naval Operations 1944:22; Hezel 1983:43). But Spanish efforts to discover, explore, and Christianize these islands again were short-lived. When more prolonged contact finally began about 50 years later, it was by British ships — inspired by commercial goals and initiated primarily by the Honorable East India Company. British visits to Palau focused initially (during the 1760s) on the Southwest Islands (Hezel, 1983, pp. 60, 63). During the 1780s, British ships also began to land on the Palau Islands. The wreck of the East India Company ship *Antelope* on a reef west of Koror in 1783 provided an unlikely beginning to prolonged British trade with the people of Palau (see Peacock, 1987, pp. 24-29). Befriended by a native chief, the shipwrecked crew remained on Palau for three months while they constructed a new ship. The knowledge the crew gained on Palauan society, and the interest in Western material

culture they generated among the natives, provided a valuable foundation for future interaction. Fueled by the hope of potential trade and an increased familiarity with the natives of Palau, British and Spanish ships continued to call intermittently on various islands during the early 1800s, making Palau one of the most highly acculturated parts of Micronesia outside the Mariana Islands. By the mid-19th century, a few traders came to dominate most interaction between the residents of Palau and Europeans — including Andrew Cheyne, who hoped to establish the center of his Pacific trading empire at Koror. Unfortunately, years of overexploitation eventually depleted many of the marine resources of interest to Europeans, and trading emphasis in the western Carolines shifted to Yap. By the 1870s, most European attention on Palau focused upon scientific research — particularly that conducted by naturalist Jan Kubary, who spent several years in residence at different times during the 1870s and 1880s (Kubary, 1873, 1895, 1900a, 1900b).

As occurred elsewhere in Micronesia, Spain became more active in Palau during the second half of the nineteenth century — primarily to assert its sovereignty in the face of increasing commercial (trading) competition in the area from other European nations. To gain control of the region, German military forces occupied several main islands in the Pacific (including Palau) in 1885. Papal arbitration by Pope Leo XIII settled the dispute between Spain and Germany later that same year, preserving the sovereignty of the former but granting trading and other commercial rights to the latter (Hezel, 1983, pp. 312-313). Despite having its authority recognized internationally, Spain's activity in Micronesia continued to be minimal and its hold on the area tenuous (Force and Force, 1972:5). With the exception of dispatching a few Capuchin priests to establish a mission on Koror and the maintenance of a small military garrison nearby, little evidence exists of Spanish anywhere in the republic (Office of the Chief of Naval Operations, 1944:24). Disputes over sovereignty in Micronesia became moot in 1899 when Germany purchased the Caroline and Northern Mariana Islands following Spain's defeat in the Spanish-American War (Brown, 1977).

The Germans were much more active in administering their newly acquired Pacific islands than were their Spanish predecessors. Motivated primarily by the hope of developing the region commercially, the Germans expanded such activities as copra production (Force and Force, 1972:5). To administer its Micronesian possessions, Germany established a network of government offices on main islands throughout the Carolines and Northern Marianas, with a branch office established in Koror in 1905 and another on Angaur in 1910 (Office of the Chief of Naval Operations, 1944, pp. 24-25). Although most daily administrative functions remained in the hands of native chiefs, all decisions ultimately were subject to German supervision. In addition to their administrative role, the Germans built roads, conducted numerous studies of the area, and in general attempted to improve the lives of the native residents. On the whole, Germany succeeded in establishing various programs that led to economic development in Micronesia. However, because much of the German effort focused on Yap, the Marshall Islands, and the Northern Mariana Islands, development in Palau lagged slightly behind.

Japan had long shown an interest in Micronesia, its traders having established contact with several main islands during the late 19th century. When Germany became involved in World War I, Japan quickly occupied major islands throughout Micronesia. Japanese forces landed on Koror and Angaur in October 1914, with a garrison stationed at the latter a few months later (Office of the Chief of Naval Operations, 1944:25; Peattie, 1988:43). In 1920, the League of Nations recognized Japan's authority over the region with a Class C Mandate (Clyde, 1967). The Japanese period of administration was particularly active, as Palau's new rulers introduced economic development at a scale previously not seen (Useem, 1946:66). Palau became the administrative center of this effort, with the capital of the civilian administration established on Koror in 1922 (Office of the Chief of Naval Operations, 1944:26). Japanese development schemes varied throughout Micronesia. In Palau the emergence of an administrative center was complemented by agricultural development (mainly on Babeldaob Island), mining (on Angaur Island), and some industry. Japan actively promoted migration (some of it through "blackbirding" — capturing natives from one island group and physically moving them to another group to work). Persons were moved to certain parts of Palau, both from elsewhere in the Pacific (for instance, to provide labor in the Angaur mines) and from Okinawa and Japan. Moreover, the Japanese attempted to introduce various facets of their culture to Micronesia — including education and the Japanese language. Although Japanese efforts to develop Palau economically met with mixed success, once established as the administrative center of the Mandated Territory the town of Koror began to grow rapidly. Augmented by induced economic growth from the increased population that immigrated to support the center of government, by the mid-1930s Koror had become a busy, modern colonial town (Clyde, 1967, pp. 161-162; Peattie, 1988, pp. 174-176). The population had swelled due to the large number of immigrants. By the end of the 1930s, more than 24,000 immigrants resided in the Palau District of the Mandated Territory (Johannes, 1981:4; Quimby, 1988:125).

As the years of the Japanese administration wore on, development in Micronesia shifted from an emphasis on economic projects to military concerns. During the 1930s, the Japanese began to fortify several islands in the region, including parts of Palau. Despite having large, relatively flat areas that could have served as airfields, the main strategic value of Palau was its proximity to the Philippines (Peattie, 1988:232). Although the Japanese stationed a battalion-strength force on Palau in 1940, adding both an air flotilla and additional personnel in 1941 (Peattie, 1988, pp. 252, 344), the main military buildup occurred elsewhere in the Mandated Territory. Palau eventually became the focus of military conflict in 1944. American forces bombed Koror throughout summer of 1944, virtually destroying the town and forcing Japan to shift the Mandated Territory government to Babeldaob. U.S. Marines landed on Angaur and Peleliu islands in the fall of that same year, eventually defeating the Japanese on each after particularly costly battles (Peattie, 1988, pp. 291-297). By early 1945, Japanese forces on Palau had been defeated or successfully neutralized and bypassed by American forces on their way to the Philippines. The residents of Palau who survived, both Japanese and native, faced a different challenge — the struggle to find adequate food for the duration of the war. By the time peace was declared in August 1945, more than 2,000 Japanese soldiers and civilians and untold numbers of natives had succumbed to starvation or disease (Peattie, 1988, pp. 300, 304).

The U.S. Navy administered Japan's former Micronesian possessions immediately following World War II. In 1947, the United Nations placed these islands in a strategic trusteeship called the Trust Territory of the Pacific Islands (TTPI), with the United States named as administrating authority (Shinn, 1984, pp. 303-305). In contrast to the Japanese administration, the TTPI phase of Palau's history saw much less active interest on the part of the new administrators. Except for minor efforts to provide essential infrastructure and selected social programs (e.g., education, basic health care), most development under the TTPI administration did not begin until funding increases during the early 1960s (Quimby, 1988, pp. 127-128). By 1979, several island groups chose to modify their political status: the Northern Mariana Islands became a U.S. commonwealth in the mid-1970s. Other groups became independent nations in 1979, with the Marshall Islands forming a republic of the same name and the Yap, Truk, Ponape, and Kusaie districts of the TTPI forming the Federated States of Micronesia (FSM). In contrast, while Palau formed a "republic" and began electing a local President and Congress (OEK), it maintained its affiliation with the U.S. as the TTPI. While the Marshall Islands and the FSM chose independence with a Compact of Free Association to define their respective relationships with the United States, Palau's citizens rejected the Compact due to provisions enabling the placement of U.S. nuclear weapons in Palauan territory (Quimby, 1988:110). Six special referendums have failed to achieve the two-thirds majority necessary to ratify the Compact. As a result, the Republic of Palau remains the last island group within the TTPI, its political future currently uncertain. In November, 1992, Palau's voters approved an amendment to the Constitution to permit a simple majority vote to ratify the Compact.

## **1990 Census of Population and Housing**

### *Data Collection and Presentation*

Because of Palau's continued political affiliation with the United States, the U.S. Bureau of the Census conducted a census of the republic in 1990. The bureau conducted this census as part of the general decennial effort for the Pacific Islands, including American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands (CNMI). Data collection, processing, and presentation was consistent with the decennial census for the United States and other U.S. territories.

In accordance with normal U.S. Census Bureau practice, the 1990 census of Palau enumerated each person according to his or her *usual residence*. Usual residence is where a person lives and sleeps, not necessarily the same as legal residence or voting residence. The application of this fundamental criterion resulted in the establishment of categories for certain persons enumerated by the census.

Because details of the enumeration and residence rules employed in the 1990 census are published elsewhere (U.S. Bureau of the Census, 1992c, Appendix D), this report presents only a brief summary. The 1990 census collected data on each usual resident of the Republic of Palau, including those individuals who normally lived in the republic but were absent on Census Day. The census

excluded those persons present in Palau but with a usual residence elsewhere. Individuals who had more than one residence were counted at the place they considered their usual residence. Individuals who had no usual residence were counted where they were staying on Census Day. The census enumerated persons in the U.S. Armed Forces and on U.S. maritime ships at the places they reported for their usual residence, or (in lieu of this information) at the location of their military base or the home port of their ship. The census enumerated persons away at school or in institutions at the locations of those places.

The 1990 census of Palau employed a modified list-enumerate procedure, also known as door-to-door enumeration. Beginning in early May 1990, enumerators began visiting each housing unit and conducted personal interviews, recording the information collected on the single questionnaire that contained all census questions. Appendix B presents a facsimile of the questionnaire employed in the 1990 census of Palau. Follow-up enumerators visited all addresses for which questionnaires were missing to obtain the information required for the census.

The completed questionnaires were checked for completeness and consistency of responses, and then sent to the Census Bureau's Jeffersonville, Indiana Processing Office. After checking in the questionnaires, Processing Office personnel coded write-in responses (e.g., ethnicity or race, relationship, language). Then data entry clerks keyed all the questionnaire responses. The Processing Office sent computer tapes containing these data to the U.S. Census Bureau headquarters in Suitland, Maryland, where bureau staff edited the data using the Consistency and Correction (CONCOR) software package prior to generating tabulations using the Census Tabulation System (CENTS) package. Both packages were developed at the Census Bureau's International Statistical Programs Center (ISPC), where the Pacific Islands were processed.

### *Derived Measures*

The presentation and analysis of census data typically employ various *derived measures*, calculations and coefficients which measure certain characteristics of the data and help to isolate particularly important trends. The general derived measures which appear throughout this document, notably means, medians, and percentages, are discussed here. Other measures, such as various types of housing vacancy rates and fertility measures, are discussed in those portions of the monograph that deal with these subjects.

The *mean* is the arithmetic average of a set of values. The mean of a set of numbers is calculated by dividing the sum of all values in the set by the number of members in the set. The use of the mean as a measure of central tendency for a particular collection of data often is augmented with the standard deviation, a measure of how representative the mean is. However, for the sake of simplicity and brevity this report avoids such technical statistical concerns and focuses entirely on the mean itself.

The *median* is another measure of central tendency. For a particular set of numbers, the median is that value which divides the set into two halves: half the values are less than the median and the other half are greater than the median. This report computes medians on the basis of each distribution as tabulated. For example, median household income employs the income data presented in the published report for the 1990 census of Palau (U.S. Bureau of the Census, 1992c, Table 19); it rounds values to the nearest dollar, consistent with the presentation of the data themselves. In the case of interval data, the calculation of medians often uses *interpolation* to estimate a figure between two known values. For instance, the calculation of median age uses interpolation to estimate a representative age. Interpolation, unless otherwise stated, is linear.

Finally, this report makes frequent use of *percentages*. For a given topic, this measure helps to assess the relative position of a particular value with respect to the remaining values. One calculates percentages by dividing the value of interest (such as the number of individuals aged 4 years or less) by the sum of all observations (the total number of persons enumerated). Closely associated with percentages are *rates* and *ratios*. The former tend to measure the degree of change over time, through comparing an absolute change to the total that existed prior to the change; for instance, the rate of housing growth for one year is the number of housing units added (or lost) over the year divided by the number that existed at the beginning of the year. Ratios, in turn, often compare selected numbers to one another, with the result founded on a base of 100; as an example, the male-to-female ratio is the number of males in a population per 100 females.

## CHAPTER 2. DEMOGRAPHIC HISTORY

Chapter 1 presented a brief sketch of Palauan history. That overview emphasized the role of other countries in Palau's past — in part because much of what is known of the history of Palau concerns interaction with people from other nations, but primarily because of the broad range of contacts over the past 250 years resulting from this interaction. This chapter focuses on demographic change to place Palau's 1990 population in historic context.

Palau had the eight censuses conducted between 1920 and 1973 — four by the Japanese government (in 1920, 1925, 1930, and 1935), two conducted by the TTPI administration (in 1958 and 1973), one conducted by the Peace Corps in collaboration with the University of Hawaii School of Public Health (in 1967), and one conducted by the U.S. Bureau of Census (in 1970). The examination of each of these censuses focuses on the number of people living in Palau, their geographic distribution among those 16 areas currently comprising the states of the republic, basic age and sex composition, and the likely reasons for the changing number and geographical arrangement of people over time.

### **The Pre-contact and Early Contact Population of Palau**

The precontact population of Palau is not well documented. Estimates range from 20,000 to 50,000 inhabitants (Useem, 1946:63), but none are founded on sound data and obviously range quite widely. That stated, most researchers generally agree that the population of Palau prior to the beginning of prolonged contact with outsiders in the 1780s was substantially greater than that of the early 20th century when more reliable estimates became available (Krämer, 1919:292). The reasons for depopulation included incessant warfare between chiefdoms on Babeldaob and neighboring islands during traditional times. The most likely cause of depopulation was diseases introduced by Europeans to a population wholly unprepared biologically for such maladies. Smallpox, influenza, syphilis, and measles all probably contributed to the population decline in Palau (Hezel, 1983:291). By the 1860s the situation on Koror Island led a German resident to predict that the end was near for the entire civilization (Tetens, 1958:4).

Population figures for Palau in the late 1800s and early 1900s are more accurate, due to their foundation on systematic observations by the naturalist Kubary and attempts by the German government to develop accurate population estimates (Force and Force, 1972:4). German estimates for Palau were 3,748 in 1901, about 4,321 in 1908, and 4,543 in 1914 (including 369 migrants from Pohnpei) on the eve of the Japanese occupation (Yanaihara, 1967:42). These figures show the degree of depopulation that had occurred during the nineteenth century — the number of inhabitants in 1901 possibly less than 8 percent of the pre-contact population (taking the maximum pre-contact estimate, for the sake of argument). The massive population decline experienced earlier clearly was over by the beginning of the twentieth century. But a clear trend in population change is not

apparent — with population growth occurring between 1901 and 1908, and subsequently declining slightly between 1908 and 1914.

### The Population of Palau During the Japanese Administration: 1920-1935

The Japanese South Seas Bureau [Nan'yo-cho] conducted its first census of Palau in 1920, recording a total of more than 5,750 Pacific Islander residents (Table 2.1). The 1920 census combined the populations of many current states, recording separate figures for Angaur, Koror, and Peleliu.

Table 2.1. Population by State: Selected years.

State	Year							
	1920	1925	1930	1935	1958	1967	1970	1973
Total.....	5,754	5,957	6,009	6,230	9,344	11,365	11,210	12,673
Aimeliik.....	NA	165	200	200	412	364	366	306
Airai.....	NA	322	365	395	442	538	561	738
Angaur.....	759	798	708	751	428	429	438	277
Hatohobei.....	NA	225	180	172	103	60	64	48
Kayangel.....	NA	101	117	92	181	199	209	162
Koror.....	972	1,255	1,277	1,214	3,585	5,667	5,431	7,669
Melekeok.....	NA	357	357	304	310	356	328	315
Ngaraard.....	NA	569	578	663	773	770	622	725
Ngardmau.....	NA	110	126	124	558	227	254	206
Ngaremlengui.....	NA	196	210	217	316	436	428	387
Ngatpang.....	NA	50	50	66	88	119	103	89
Ngchesar.....	NA	329	316	344	450	449	485	341
Ngerchelung.....	NA	425	435	522	558	615	745	427
Ngiwal.....	NA	210	229	250	366	381	355	237
Peleliu.....	582	629	641	716	679	682	759	657
Sonsorol.....	NA	216	220	200	95	73	62	88

Sources: Nan'yo-cho, 1927, 1931, 1937; School of Public Health, n.d.; U.S. Bureau of the Census, 1972; Office of Census Coordinator, TTPI, 1975.

Notes: Figures for 1920-1935 are for Pacific Islanders only; figures for 1967 and 1973 may not sum precisely to totals due to exclusion of individuals whose ages were "Not Stated."

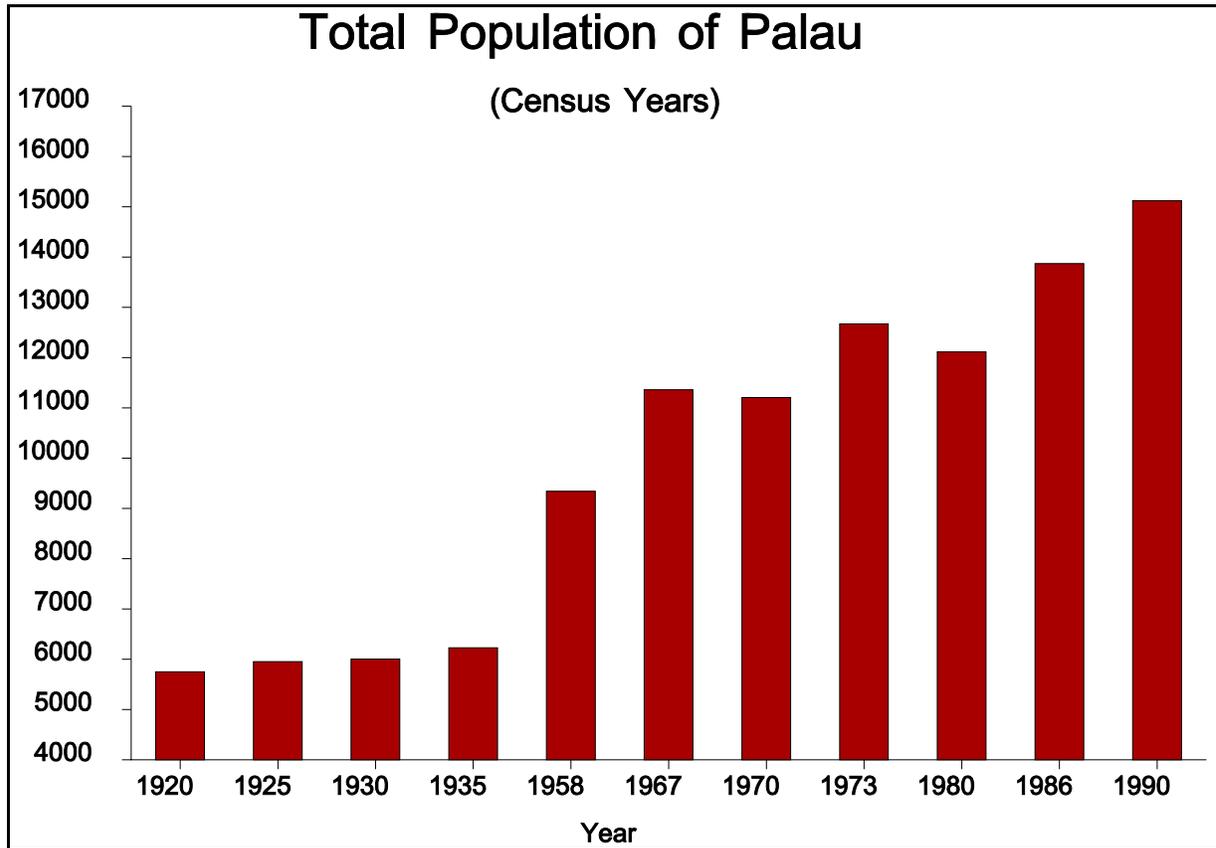


Figure 2.1. Total Population of Palau: 1920 to 1990

By 1925 the Pacific Islander population of Palau increased to almost 6,000 persons, having grown at the modest average annual rate of 0.7 percent (Table 2.2). For the first time, the 1925 census recorded the population of each state in Palau. More than 21 percent of the total Pacific Islander residents lived in Koror up from 17 percent in 1920 (Table 2.3). This state, chosen by the Japanese as the capital of the Mandated Territory, saw its population increase by more than 5 percent annually during the first half of the 1920s. In 1925, more than 13 percent of the Pacific Islanders in Palau resided in Angaur State and nearly 11 percent lived in Peleliu State.

Table 2.2. Population Change Over Time: Selected Years

Year	Number		Percent
	Population	Change from Preceding Year	Average Annual Change from Preceding Year
1920.....	5,754	...	...
1925.....	5,957	203	0.7
1930.....	6,009	52	0.2
1935.....	6,230	221	0.7
1958.....	9,344	3,114	1.8
1967.....	11,365	2,021	2.2
1973.....	12,673	1,308	1.8

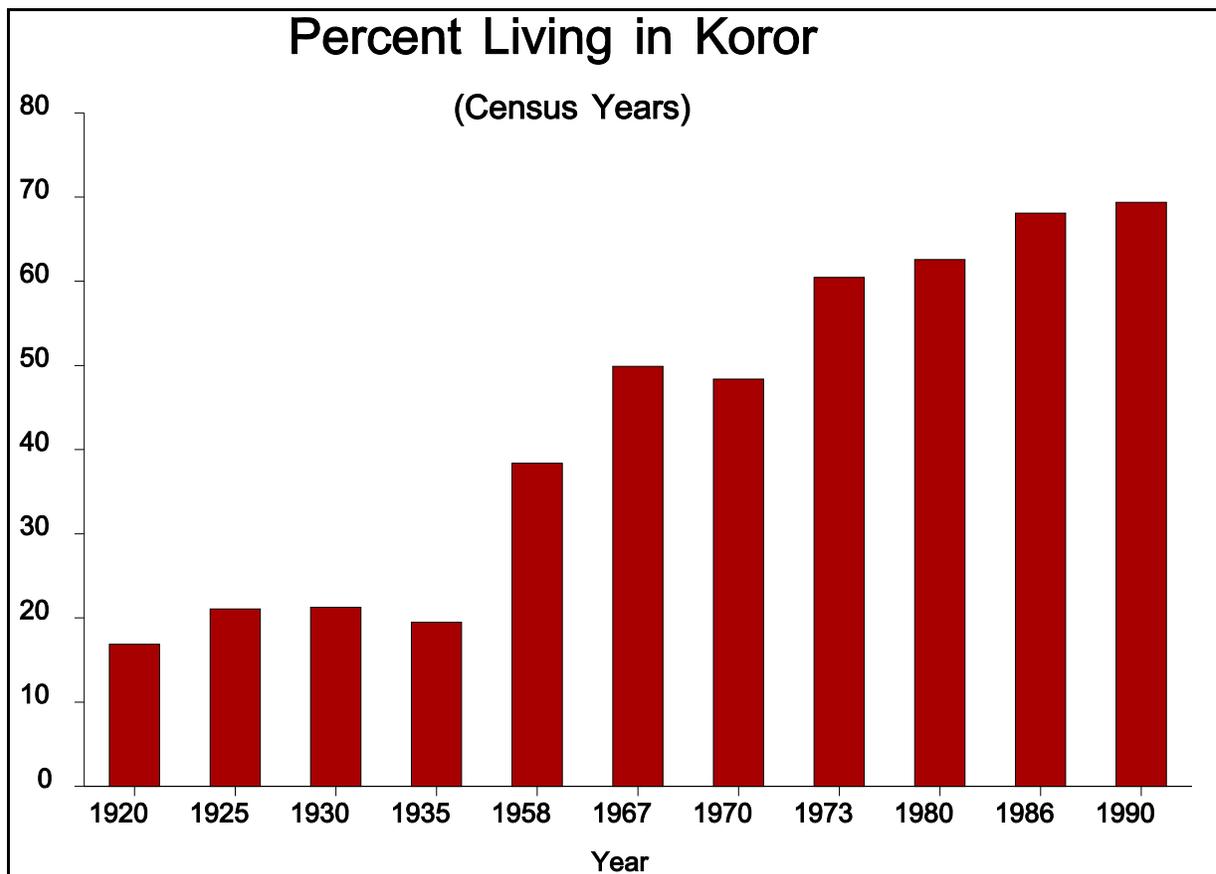
Sources: Nan'yo-cho, 1927, 1931, 1937; School of Public Health, n.d.; U.S. Bureau of the Census, 1972; Office of Census Coordinator, TTPI, 1975.

Table 2.3. Population Distribution by State (Percentages): Selected years

State	Year							
	1920	1925	1930	1935	1958	1967	1970	1973
Total.....	5,754	5,957	6,009	6,230	9,344	11,365	11,210	12,673
Percent....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Aimeliik.....	NA	2.8	3.3	3.2	4.4	3.2	3.3	2.4
Airai.....	NA	5.4	6.1	6.3	4.7	4.7	5.0	5.8
Angaur.....	13.2	13.4	11.8	12.1	4.6	3.8	3.9	2.2
Hatohebei.....	NA	3.8	3.0	2.8	1.1	0.5	0.6	0.4
Kayangel.....	NA	1.7	1.9	1.5	1.9	1.8	1.9	1.3
Koror.....	16.9	21.1	21.3	19.5	38.4	49.9	48.4	60.5
Melekeok.....	NA	6.0	5.9	4.9	3.3	3.1	2.9	2.5
Ngaraard.....	NA	9.6	9.6	10.6	8.3	6.8	5.5	5.7
Ngardmau.....	NA	1.8	2.1	2.0	6.0	2.0	2.3	1.6
Ngaremlengui...	NA	3.3	3.5	3.5	3.4	3.8	3.8	3.1
Ngatpang.....	NA	0.8	0.8	1.1	0.9	1.0	0.9	0.7
Ngchesar.....	NA	5.5	5.3	5.5	4.8	4.0	4.3	2.7
Ngerchelongs....	NA	7.1	7.2	8.4	6.0	5.4	6.6	3.4
Ngiwal.....	NA	3.5	3.8	4.0	3.9	3.4	3.2	1.9
Peleliu.....	10.1	10.6	10.7	11.5	7.3	6.0	6.8	5.2
Sonsorol.....	NA	3.6	3.7	3.2	1.0	0.6	0.6	0.7

Note: Total percentages for 1967 and 1973 may not sum precisely to 100.0 percent due to exclusion of individuals whose residence was "Not Stated."

The 1925 census provides a clearer picture of the population composition of Palau. One of the most important types of data reported is the structure of Palau's Pacific Islander population by age and sex. In 1925, the percentage of Pacific Islander males living in Palau exceeded the number of females by more than 11 percent, a substantial difference that probably resulted from immigration from other parts of the Pacific — such as the predominantly male population working the mines on Angaur or a selective enumeration of females (which frequently happened earlier in the century when males did the reporting and recording). The median age of Pacific Islander residents of Palau in 1925 was 22.8 years (Nan'yo-cho, 1927).



**Figure 2.2.** Percent Living in Koror: 1920 to 1990

The Pacific Islander population of Palau exceeded 6,000 in 1930, having grown at an average annual rate of only 0.2 percent since 1925. All but three states gained population between 1925 and 1930. Koror State once again contained the greatest number of inhabitants (Table 2.1). Population

continued to be fairly concentrated in a few places, with Koror, Angaur, and Peleliu states together accounting for nearly 44 percent of the total in 1930. The age-sex composition of Palau remained similar to that recorded in 1925, although the population pyramids for these years are not readily comparable. Once again, the census counted more males than females.

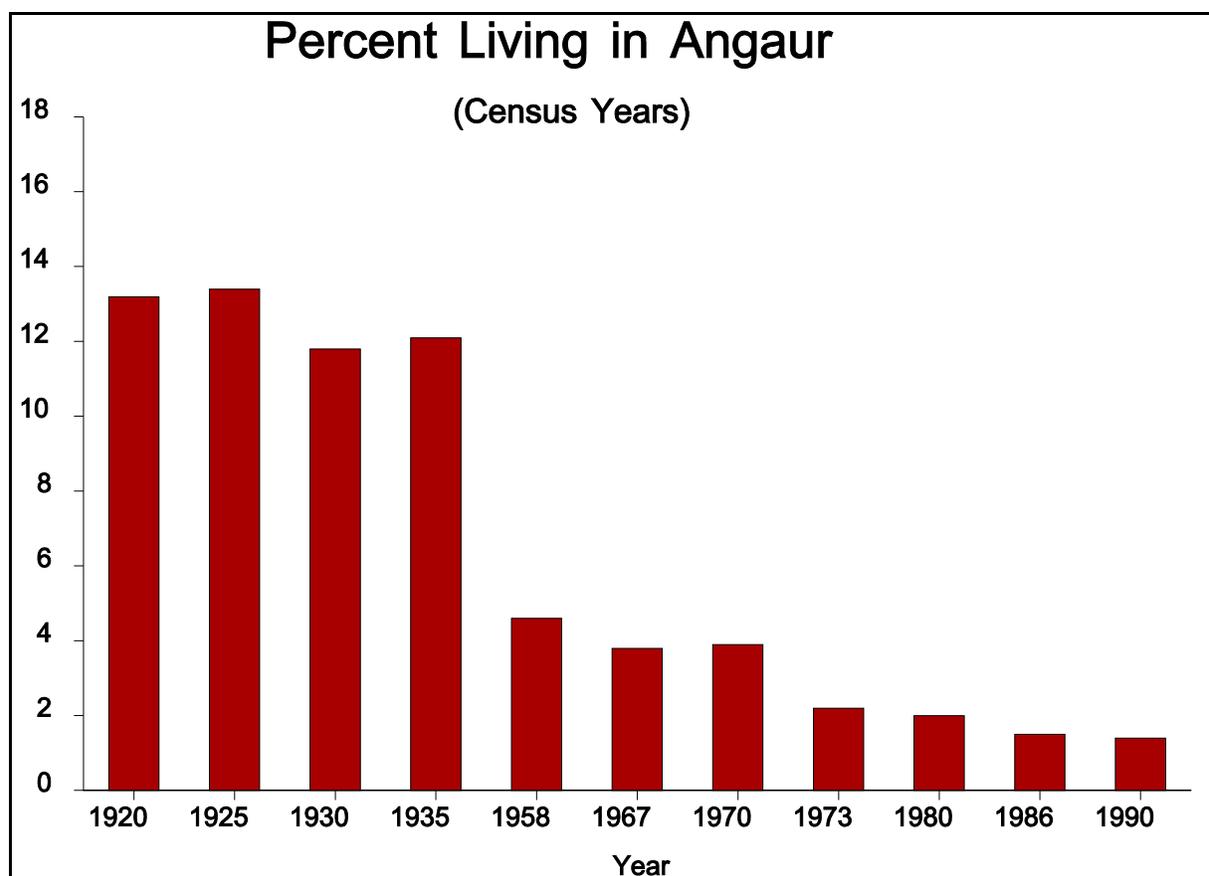


Figure 2.3. Percent Living in Angaur: 1920 to 1990

The 1930 census also presented the age-sex composition of Palau by state. Age composition varied considerably (Table 2.4). Koror, the state with the highest population, contained relatively more Pacific Islanders aged less than 25 years than did the republic as a whole — probably due to a combination of younger people migrating to the emerging Japanese town of Koror for schooling and jobs. Angaur State contained relatively few persons aged less than 15 years or more than 59 years, the population having more young and middle-aged adults, many probably working in the phosphate mines. The southwest islands contained very small percentages of persons aged 15 years or less.

Table 2.4. Population (Pacific Islanders) by State and Age: 1930

Area	Total Persons		Age Group (Percentage)			
	Persons	Percent	< 15 Years	15-24 Years	25-59 Years	60 + Years
Total.....	6,009	100.0	35.6	20.1	39.7	4.7
Aimeliik.....	200	100.0	34.0	24.0	34.5	7.5
Airai.....	365	100.0	33.7	15.9	45.8	4.7
Angaur.....	708	100.0	26.3	32.5	39.8	1.4
Hatohebei.....	180	100.0	5.6	18.3	71.1	5.0
Kayangel.....	117	100.0	37.6	19.7	36.8	6.0
Koror.....	1,277	100.0	37.0	24.7	35.3	3.0
Melekeok.....	357	100.0	45.7	13.7	35.0	5.6
Ngaraard.....	578	100.0	46.5	13.0	34.6	5.9
Ngardmau.....	126	100.0	35.7	19.0	42.1	3.2
Ngaremlengui.....	210	100.0	31.4	18.1	43.3	7.1
Ngatpang.....	50	100.0	30.0	14.0	48.0	8.0
Ngchesar.....	316	100.0	44.0	14.9	37.0	4.1
Ngerchelong.....	435	100.0	33.8	19.8	40.2	6.2
Ngiwal.....	229	100.0	36.7	18.8	38.0	6.6
Peleliu.....	641	100.0	46.2	17.0	31.4	5.5
Sonsorol.....	220	100.0	4.5	9.1	78.2	8.2

Source: Nan'yo-cho, 1931.

Part of the growth in the number of Pacific Islanders in Palau between 1925 and 1930 occurred by natural increase — that is, an excess of births over deaths (Office of the Chief of Naval Operations, 1944:36). However, data from the 1930 census show that migration also played a role in population growth in Palau. Data for place of registration provide important insights on lifetime migration (Table 2.5). Only about 57 percent of the islanders living in Palau in 1930 resided in their place of registration. The more than 31 percent who moved from elsewhere in Palau helped shape the geographic distribution of population as enumerated by the 1930 census. Finally, nearly 12 percent of the Pacific Islanders who lived in Palau in 1930 were registered elsewhere — about 10 percent in some other part of the Mandated Territory and another nearly 2 percent some place outside the Mandated Territory.

Table 2.5. Population of States by Area of Registration: 1930

Area	Total Persons		PERCENT			
	Persons	Percent	Same Locality	Same District	Other District	Other Location
Total.....	6,009	100.0	57.2	31.3	9.8	1.7
Aimeliik.....	200	100.0	51.0	42.5	4.0	2.5
Airai.....	365	100.0	65.8	25.5	6.3	2.5
Angaur.....	708	100.0	25.3	17.8	52.4	4.5
Hatohobei.....	180	100.0	99.4	0.6	-	-
Kayangel.....	117	100.0	55.6	42.7	1.7	-
Koror.....	1,277	100.0	30.5	56.3	12.1	1.0
Melekeok.....	357	100.0	66.9	32.2	0.8	-
Ngaraard.....	578	100.0	63.3	33.9	1.9	0.9
Ngardmau.....	126	100.0	65.9	31.0	2.4	0.8
Ngaremlengui...	210	100.0	61.9	33.8	4.3	-
Ngatpang.....	50	100.0	42.0	56.0	2.0	-
Ngchesar.....	316	100.0	76.9	23.1	-	-
Ngerchelongs....	435	100.0	63.2	27.8	0.5	8.5
Ngiwal.....	229	100.0	72.9	26.6	0.4	-
Peleliu.....	641	100.0	89.7	10.3	-	-
Sonsorol.....	220	100.0	84.1	15.9	-	-

Source: Nan'yo-cho, 1931.

The parts of Palau with the largest percentages of immigrant Pacific Islander populations in 1930 included Angaur, Koror, and Ngatpang States. As discussed earlier, many people migrated to Angaur from elsewhere in the Pacific, often at the request of their Japanese administrators, to work in the phosphate mines. Growth in Koror, in turn, probably reflects an early phase of rural-urban migration in Palau, with people from more remote parts of the district relocating to Koror as the Japanese developed their new capital.

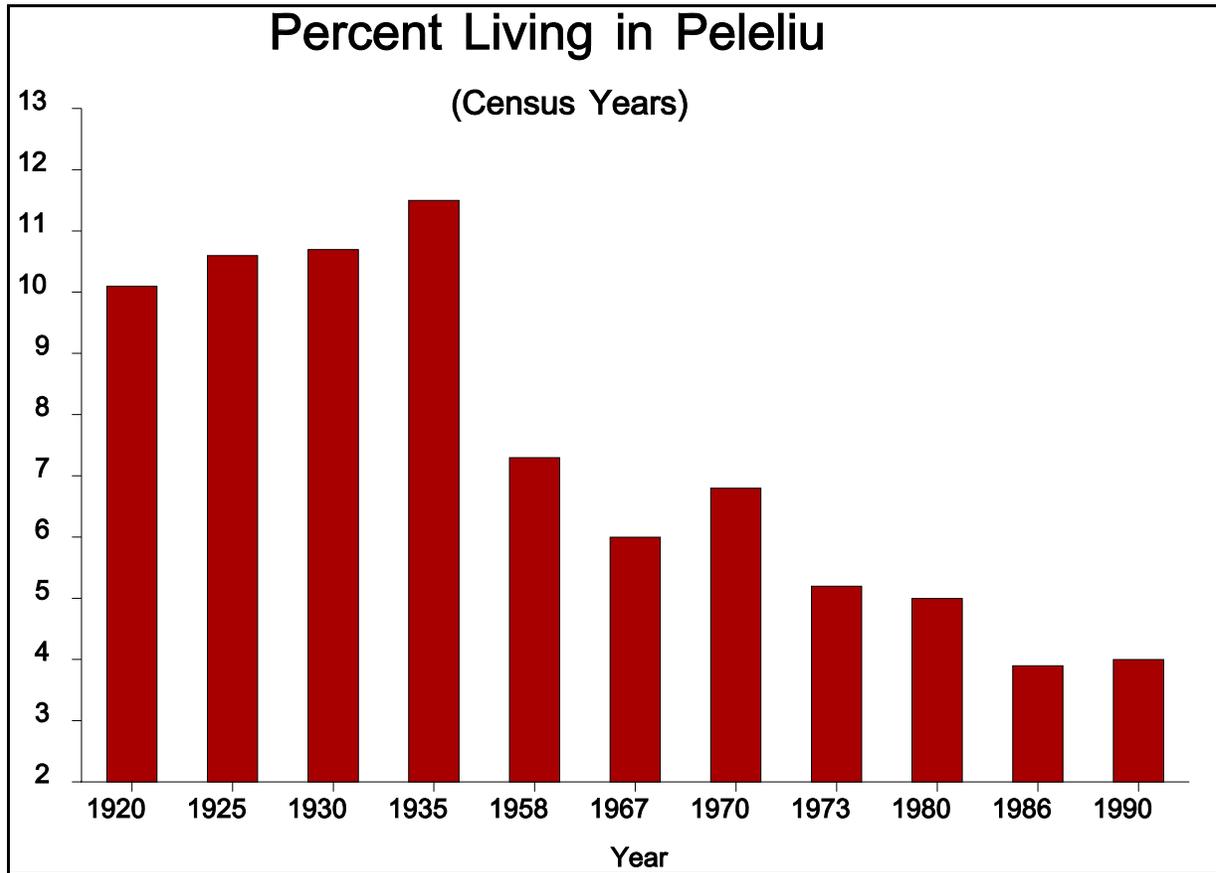


Figure 2.4. Percent Living in Peleliu: 1920 to 1990

Between 1930 and 1935 the Pacific Islander population of Palau continued to grow slowly, the 0.7 percent average annual rate of increase producing a Pacific Islander population of 6,230 (Table 2.1). The relative size importance of Koror State declined slightly over this five-year period, probably due to the influx of large numbers of Japanese nationals to the state dominating the competition for land and jobs. Nevertheless, Koror still contained nearly 20 percent of the Pacific Islander population of Palau, with about 12 percent each residing in Angaur and Peleliu states. The age and sex composition of Palau in 1935 was similar to that seen in 1930. Palau still contained more males than females, but for the second consecutive time the relative difference decreased.

Individual states in Palau continued to show considerable variability in the age composition of their Pacific Islander populations (Table 2.6). Once again, Koror State contained relatively more persons aged less than 15 years than total Palau. The trends in age composition for Angaur, Hatohobei, and Peleliu discussed for 1930 continued in 1935.

Table 2.6. Population (Pacific Islanders) by State and Age: 1935

Area	Total Persons		Age Group (Percentage)			
	Persons	Percent	< 15 Years	15-24 Years	25-59 Years	60 + Years
Total.....	6,230	100.0	33.9	22.9	38.3	4.9
Aimeliik.....	200	100.0	31.5	24.0	41.5	3.0
Airai.....	395	100.0	29.9	23.0	41.5	5.6
Angaur.....	751	100.0	25.4	33.6	39.0	2.0
Hatohobei.....	172	100.0	6.4	12.8	78.5	2.3
Kayangel.....	92	100.0	31.5	18.5	40.2	9.8
Koror.....	1,214	100.0	38.4	22.7	35.3	3.6
Melekeok.....	304	100.0	38.8	21.7	32.9	6.6
Ngaraard.....	663	100.0	43.4	19.5	31.8	5.3
Ngardmau.....	124	100.0	31.5	23.4	40.3	4.8
Ngaremlengui.....	217	100.0	30.0	24.9	37.8	7.4
Ngatpang.....	66	100.0	24.2	30.3	37.9	7.6
Ngchesar.....	344	100.0	41.3	20.6	31.1	7.0
Ngerchelong.....	522	100.0	35.4	22.2	36.4	5.9
Ngiwal.....	250	100.0	36.8	23.2	35.6	4.4
Peleliu.....	716	100.0	39.0	23.2	32.8	5.0
Sonsorol.....	200	100.0	5.0	6.0	79.0	10.0

Source: Nan'yo-cho, 1937.

The limited vital statistics available for the early 1930s show that fertility continued to exceed mortality, once more leading to natural increase in the population (Office of the Chief of Naval Operations, 1944:36). Unfortunately, data on mobility were not reported for the 1935 census.

### The Population of Palau in 1958

A military census in 1946 reported the total Pacific Islander population of Palau at 5,602 (Useem, 1946:63), although additional information concerning this census is unavailable. A detailed post-war census of Palau was not conducted until 1958, by the office of the High Commissioner of the TTPI. The total population of Palau had increased to more than 9,300 persons over the preceding 23 years (Office of the High Commissioner, TTPI, 1959), having grown at an annual rate of nearly 2 percent. Only four places in Palau lost population between 1935 and 1958 — Angaur and Peleliu,

the two states that ranked behind only Koror in total population, and Hatohobei and Sonsorol, the two remote states that together compose the Southwest Islands.

Koror continued to gain population rapidly over these two decades. In the 1958 figures are believed, Ngardmau grew more rapidly, the number of inhabitants increasing nearly five-fold from the total recorded in the 1935 census. However, this figure is unlikely given the other data for Ngardmau in Table 2.1 — the figure probably shows some enumeration problem. No other state even came close to matching the population of Koror — the nearly 3,600 residents comprising more than 38 percent of Palau's total inhabitants.

The age-sex composition of Palau's population also changed dramatically over the 23 years preceding the 1958 census. In 1958, male residents exceeded female residents by less than 2 percent. Moreover, young persons had become increasingly important demographically — the median age estimated at 17.5 years. Palau's population became increasingly youthful. Additional, detailed, reliable data on other aspects of Palau's population are unavailable from the 1958 census. From the information at hand — rapid population growth and a population containing relatively many young persons — natural growth probably accounted for much of the population growth between 1935 and 1958.

### **The Population of Palau in 1967**

The population of Palau continued to grow at the end of the 1950s and into the following decade, reaching nearly 11,400 by 1967. Overall population growth occurred at more than 2 percent annually over the nine years following the 1958 census. The population of Koror grew even more rapidly — in excess of 5 percent annually — and as a result totalled nearly 5,700 persons in 1967, about half the total population. In total, Palau continued to contain more males than females, although the difference once again decreased between census years. The median age for all residents of Palau (for whom age was known) was 15.9 years old.

Although the age composition of individual states in Palau continued to vary in 1967, this variability was considerably less than during the Japanese administration (Table 2.7). Compared to Palau as a whole, Koror contained relatively fewer individuals younger than 15 years and older than 59 years — the heavy representation of working-age persons suggesting that migration for employment possibly led to much of the population growth experienced by this state between 1958 and 1967. Heavy underrepresentation of young persons (aged 24 years or less) continued in the Southwest Islands.

Table 2.7. Population by State and Age: 1967

Area	Total Persons	Age Group (Percentage)			
		< 15 Years	15-24 Years	25-59 Years	60 + Years
Total.....	11,365	48.4	17.3	24.5	6.5
Aimeliik.....	364	47.0	19.5	24.2	9.3
Airai.....	538	51.7	14.5	24.5	8.0
Angaur.....	429	48.7	19.1	20.7	7.0
Hatohebei.....	60	28.3	3.3	38.3	30.0
Kayangel.....	199	48.7	21.1	24.6	3.5
Koror.....	5,667	46.7	17.7	26.0	4.2
Melekeok.....	356	51.1	15.2	21.9	8.7
Ngaraard.....	770	50.3	18.2	21.7	8.6
Ngardmau.....	227	50.7	17.2	23.8	6.6
Ngaremlengui.....	436	51.6	17.4	22.7	7.1
Ngatpang.....	119	49.6	19.3	20.2	10.9
Ngchesar.....	449	50.8	15.8	24.3	7.8
Ngerchelongs.....	615	50.7	15.3	23.3	10.1
Ngiwal.....	381	53.5	14.4	23.9	7.6
Peleliu.....	682	49.6	17.7	21.8	10.6
Sonsorol.....	73	34.2	11.0	23.3	24.7

Source: School of Public Health, n.d.

Available data on births show that fertility was relatively high in Palau in 1967 (Table 2.8). As with other characteristics, fertility varied considerably by state (Table 2.9).

Table 2.8. Total Reported Births and Fertility: 1967, 1970, and 1973.

Year	Total Pop.	Total Births	Crude Birth Rate	General Fertility Rate	Total Fertility Rate
1967.....	11,365	424	37.3	200.1	7,471.9
1970.....	11,210	336	30.0	145.2	5,222.9
1973.....	12,673	401	31.6	162.9	5,574.2

Sources: School of Public Health, n.d.; U.S. Bureau of the Census, 1972; Office of Census Coordinator, 1975; U.S. Department of State, 1981.

Table 2.9. Fertility by State: 1967.

State	Total Population	Total Births	Crude Birth Rate	General Fertility Rate	Total Fertility Rate
Total.....	11,365	408	35.9	176.0	6,565
Aimeliik.....	364	9	24.7	125.0	4,292
Airai.....	538	11	20.4	125.0	5,813
Angaur.....	429	20	46.6	250.0	9,729
Hatohebei.....	60	3	50.0	500.0	15,000
Kayangel.....	199	7	35.2	127.7	3,810
Koror.....	5,667	230	40.6	188.6	6,390
Melekeok.....	356	16	44.9	250.0	11,149
Ngaraard.....	770	15	19.5	85.1	4,362
Ngardmau.....	227	10	44.1	179.5	6,306
Ngaremlengui...	436	18	41.3	212.5	10,669
Ngatpang.....	119	1	8.4	55.6	2,500
Ngchesar.....	449	14	31.2	170.7	7,937
Ngerchelongs...	615	17	27.6	153.8	6,583
Ngiwal.....	381	13	34.1	191.2	9,497
Peleliu.....	682	21	30.8	150.0	6,483
Sonsorol.....	73	3	41.1	300.0	7,667

Source: School of Public Health, n.d.

Notes: "Births" based on infants in population aged one year or less, which differed from the data used in Table 2.8 (reported births) — explaining the discrepancies in the measures presented.

Mortality data for 1967 show that most Palauans died before age 5 (more than 26 percent of all reported deaths in 1967) or after the age of 69 (nearly 31 percent of the year's reported deaths) (Table 2.10). Infant mortality as well as the overall crude death rate were quite low (Table 2.11), although some caution is in order when considering these figures given the habitual underreporting of deaths throughout Micronesia. An excess of births over deaths probably accounted for most of the population growth in Palau between 1958 and 1967. Reliable data on mobility in Palau for 1967 are unavailable.

Table 2.10. Death by Age: 1967 and 1973.

Age	Year	
	1967	1973
Total Pop.....	11,365	12,673
Total Percent.....	100.0	100.0
<1.....	15.4	34.0
1-4.....	10.8	1.9
5-9.....	1.5	3.8
10-14.....	1.5	1.9
15-19.....	3.1	1.9
20-24.....	1.5	7.5
25-29.....	6.2	-
30-34.....	3.1	1.9
35-39.....	1.5	3.8
40-44.....	1.5	-
45-49.....	7.7	1.9
50-54.....	-	3.8
55-59.....	3.1	9.4
60-64.....	6.2	5.7
65-69.....	1.5	9.4
70-74.....	9.2	11.3
75 +.....	21.5	1.9

Sources: School of Public Health, n.d.; Office of Census Coordinator, TTPI, 1975; U.S. Department of State, 1981.

Table 2.11. Age-specific Death Rate: 1967 and 1973

Age	Year	
	1967	1973
Total.....	5.72	4.18
<1.....	24.27	40.45
1-4.....	4.49	0.69
5-9.....	0.54	0.99
10-14.....	0.60	0.55
15-19.....	1.52	0.65
20-24.....	1.56	3.71
25-29.....	8.30	-
30-34.....	4.71	1.80
35-39.....	2.28	3.79
40-44.....	2.43	-
45-49.....	11.52	2.29
50-54.....	-	4.78
55-59.....	8.37	13.77
60-64.....	20.00	14.22
65-69.....	5.62	24.39
70-74.....	50.42	42.86
75 +.....	57.38	3.95

Sources: School of Public Health, n.d.; U.S. Department of State, 1981.

### The Population of Palau in 1970

In 1970 the U.S. Bureau of the Census conducted a census of each district in the TTPI, including Palau. We present the basic 1970 data in this report — the population counts and percentages of total counts for the various states of Palau (see tables 2.1 and 2.3) — for the sake of completeness. However, because the data are flawed we do not examine them further. Fertility data, although not weakened themselves by a census undercount, yielded measures that are of questionable use (see Table 2.8).

### The Population of Palau in 1973

Because of the aforementioned weaknesses in the 1970 census, the TTPI administration decided to conduct another census in 1973. That census enumerated nearly 12,700 persons living in Palau, showing an average annual increase of about 2 percent over the six years between 1967 and 1973. Koror's population approached 7,700, as the percentage of the total population living there exceeded 60 percent for the first time. The predominance in the percentage of males over females increased slightly from that recorded in the 1967 census, as did the median age which increased to an estimated 18.8 years.

Data on the age composition of selected states once again show considerable variability, although much of this variation may relate to the small populations in some of the states (e.g., Hatohobei, Kayangel, and Sonsorol) (Table 2.12). Koror contained relatively large numbers of individuals aged 15-59 years.

Table 2.12. Population by State and Age: 1973.

State/Island	Total Persons		Age Group (Percentage)			
	Persons	Percent	< 15 Years	15-24 Years	25-59 Years	60 + Years
Total.....	12,673	100.0	45.2	20.7	27.3	6.4
Angaur.....	277	100.0	51.6	16.2	22.7	9.4
Babeldaob.....	3,771	100.0	51.3	14.5	25.2	8.4
Hatohobei.....	48	100.0	41.7	10.4	16.7	31.3
Kayangel.....	162	100.0	64.8	9.3	20.4	4.9
Koror.....	7,669	100.0	41.5	25.2	28.6	4.4
Peleliu.....	657	100.0	46.4	10.5	28.6	14.2
Sonsorol.....	88	100.0	46.6	13.6	22.7	17.0
N.S.....	1	100.0	100.0	-	-	-

Source: Office of Census Coordinator, TTPI, 1975.

Note: Babeldaob includes Aimeliik, Airai, Melekeok, Ngaraard, Ngardmau, Ngaremlengui, Ngatpang, Ngchesar, Ngerchelung, and Ngiwal states; age-specific data are unavailable for these individual states in 1973.

Fertility decreased from almost 7 1/2 children per woman measured by the 1967 census and births during that yrae to about 5 1/2 children in 1973, a remarkable decrease of about 2 children per woman. Admittedly, we are dealing with very small numbers here, so rates need to be looked at over a longer term to see real trends. Recorded mortality was almost certainly too low. Natural increase once again accounted for most of the population growth between 1967 and 1973.

Available evidence suggests that mobility within Palau would have contributed substantially to the geographic distribution of population in 1973 (Table 2.13). More than 34 percent of the TTPI-born residents of Palau in 1973 considered home some district other than the one they resided in at the time of the census. The vast majority of these individuals resided in Koror, suggesting that in-migration from other parts of the republic accounted for much of Koror's population increase. About 4 percent of the TTPI-born population of Palau in 1973 moved there from another part of the TTPI. Most of these individuals lived in Koror.

Table 2.13. Place of Usual Residence of TTPI-born Individuals by Home District: 1973

State or Island of Usual Residence	Total Persons	Home District (Percentage)			
		Same Munic.	Elsewhere in Palau	Elsewhere in TTPI	Outside TTPI
Total.....	12,091	61.3	34.4	4.2	0.1
Angaur.....	260	92.3	6.9	0.8	-
Babeldaob.....	3,726	92.2	5.0	2.8	-
Hatohobei.....	46	89.1	10.9	-	-
Kayangel.....	159	88.1	11.9	-	-
Koror.....	7,194	40.1	54.2	5.5	0.1
Peleliu.....	650	93.5	5.2	1.1	0.2
Sonsorol.....	55	100.0	-	-	-
N.S.....	1	-	100.0	-	-

Source: Office of Census Coordinator, TTPI, 1975.

Notes: Babeldaob includes Aimeliik, Airai, Melekeok, Ngaraard, Ngardmau, Ngaremlengui, Ngatpang, Ngchesar, Ngerchelung, and Ngiwal states; data on area of usual residence by home district are unavailable for these individual states in 1973.

Percentages may not sum precisely to 100.0 percent due to exclusion of individuals whose residence was "Not Stated."

Complementary data on mobility of Palau-born individuals still residing in the TTPI in 1973 provide evidence for migration from many parts of Palau elsewhere in the republic, almost certainly Koror (Table 2.14). In comparison, relatively few individual born in Koror lived elsewhere in Palau — and the percentage reported may be inflated due to women from another part of Palau coming to the Koror hospital to give birth and subsequently returning home (the child thus born in Koror but living in another part of Palau). A full 8 percent of Palau-born individuals lived somewhere in the TTPI other than Palau in 1973, showing emigration seen much more in the 1990 census data (see Chapter 16).

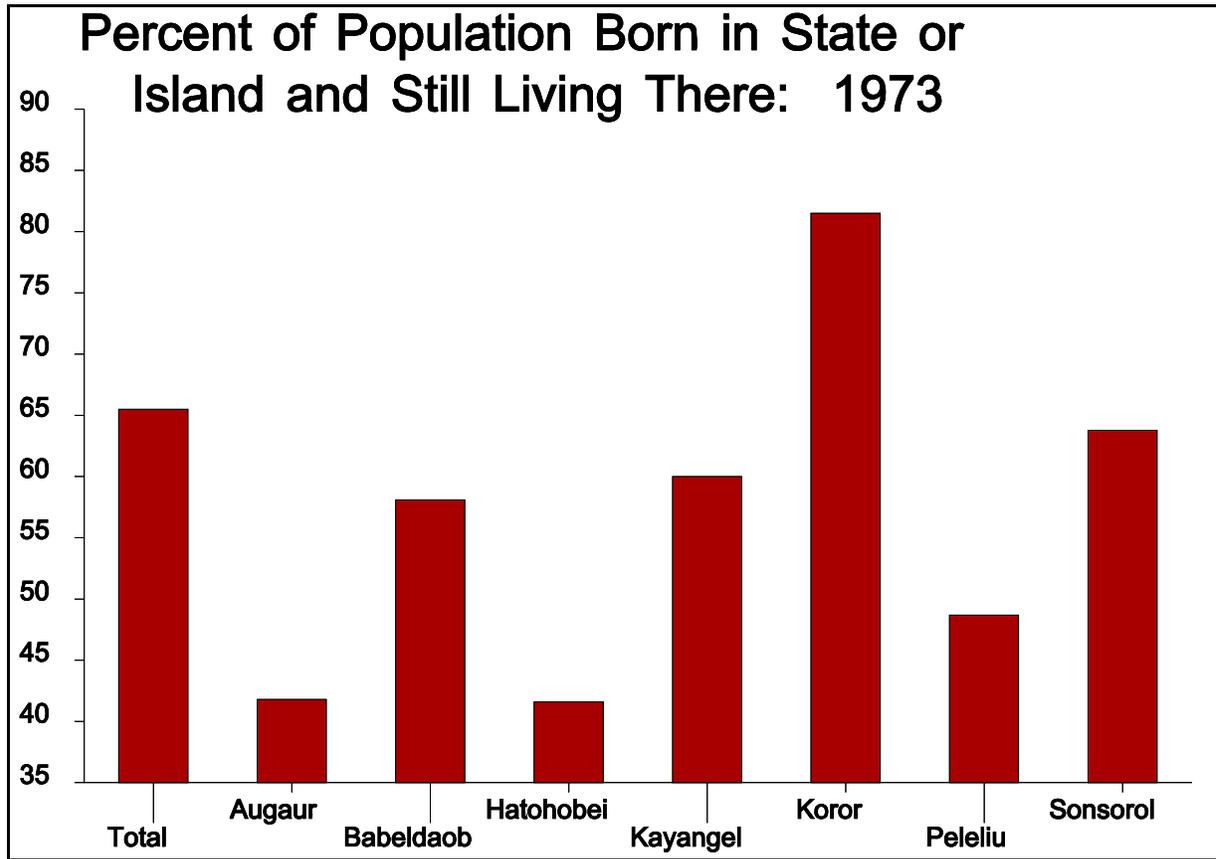


Figure 2.5. Percent of Population Born in State or Island and Still Living There: 1973

Table 2.14. Area of Birth of TTPI-born Individuals by Place of Residence: 1973.

State or Island of Birth	Residence (Percentage)				
	Total Persons	Same Munic.	Elsewhere in Palau	Elsewhere in TTPI	Outside TTPI
Total.....	12,555	65.5	26.5	8.0	-
Angaur.....	572	41.8	40.7	17.3	0.2
Babeldaob.....	5,385	58.1	36.3	5.7	-
Hatohobei.....	101	41.6	55.4	3.0	-
Kayangel.....	225	60.0	37.8	2.2	-
Koror.....	4,943	81.5	8.9	9.5	-
Peleliu.....	1,183	48.7	43.2	7.9	0.2
Sonsorol.....	116	63.8	27.6	8.6	-
N.S.....	30	-	50.0	50.0	-

Source: Office of Census Coordinator, TTPI, 1975.

Notes: Babeldaob includes Aimeliik, Airai, Melekeok, Ngaraard, Ngardmau, Ngaremlengui, Ngatpang, Ngchesar, Ngerchelung, and Ngiwal states; data on area of birth by place of residence are unavailable for these individual states in 1973.

Percentages may not sum precisely to 100.0 percent due to exclusion of individuals whose residence was "Not Stated."

## Conclusions

Population change in Palau generally has followed the same pattern seen elsewhere in the Pacific (Taeuber, 1963; see Gorenflo, 1990, 1992; Gorenflo and Levin 1991, 1992): an extended early period of depopulation following the establishment of prolonged contact with non-Micronesians, producing a population much smaller than that preceding contact; and a subsequent period of population growth, established by the present century and continuing over the decades. The main cause of depopulation was an increase in mortality, possibly accompanied by reduced fertility. The demographic growth resulted from a reversal in these trends — with the number of persons born into the population each year significantly greater than the number that died.

Population growth continued through the early 1970s, and, as we shall see in the next chapter, into 1990. But this increase occurred at a rate much less than seen in most other parts of the Pacific. The more modest population growth seen in Palau in recent years is due partly to low fertility. This low fertility was augmented by emigration — removing people and, because of the young adults involved, further reducing fertility at the same time.

## CHAPTER 3. GEOGRAPHIC DISTRIBUTION

The geographic distribution provides insights in planning for challenges facing governments. The geographic distribution of Palau's population has changed dramatically from pre-contact times, when most people lived in small hamlets and villages along the coast of Babeldaob and smaller inhabited islands. During the present century, Palau's population has become increasingly concentrated in Koror. The trends of population growth and concentration found in Palau are consistent with population trends found in other Pacific island areas (see Chapters 8 and 16). This chapter discusses recent changes in overall population and its distribution in the Republic of Palau.

### Definitions

#### *Place of Residence*

The 1990 decennial census was a modified *de jure* census, counting people and recording selected characteristics of each individual according to his or her usual place of residence as of 1 April 1990. Questionnaire item G recorded the location of residence; items A2, A3, A4, and B, in turn, recorded geographic information down to the level of specific placement on a map ("Map Spot"). The smallest geographic unit used in the 1990 census was the *block*, each denoting a small area bounded by visible features (e.g., streets, roads, streams) or invisible features (e.g., legal boundaries, property lines). Geographic levels aggregated blocks into block groups, block numbering areas, places, minor civil divisions (MCDs), first-order subdivisions (States), and the Republic of Palau itself (see U.S. Bureau of the Census, 1992c, pp. A-1 - A-3). This study focuses primarily on the population distribution of Palau's 16 states, examining three "census designated places" (CDPs) less frequently. Additional geographic detail is provided in Summary Tape Files (STFs) 1 and 3.

**Limitations.** Due to the nature of certain sectors of a population, such as the homeless and individuals whose place of residence is more transient, information on residence occasionally is meaningless. However, for the majority of most populations, including the population of Palau, residence provides important insights on the arrangement of residents on Census Day.

**Comparability.** The 1980 decennial census and the 1986 census, both modified *de jure* censuses, collected data on place of usual residence at the time of enumeration. Geographic compatibility continues to the level of individual places for those identified in the 1980 census as CDPs. Blocks and block groups were used for the first time in Palau in the 1990 census.

### Analysis of Geographic Distribution Data

The population of Palau grew over the decade preceding the 1990 census (Table 3.1). Despite a total 1990 population that was nearly 25 percent greater than that of 1980, 13 states in Palau lost population during the decade — their relative contribution to the total declining in the process.

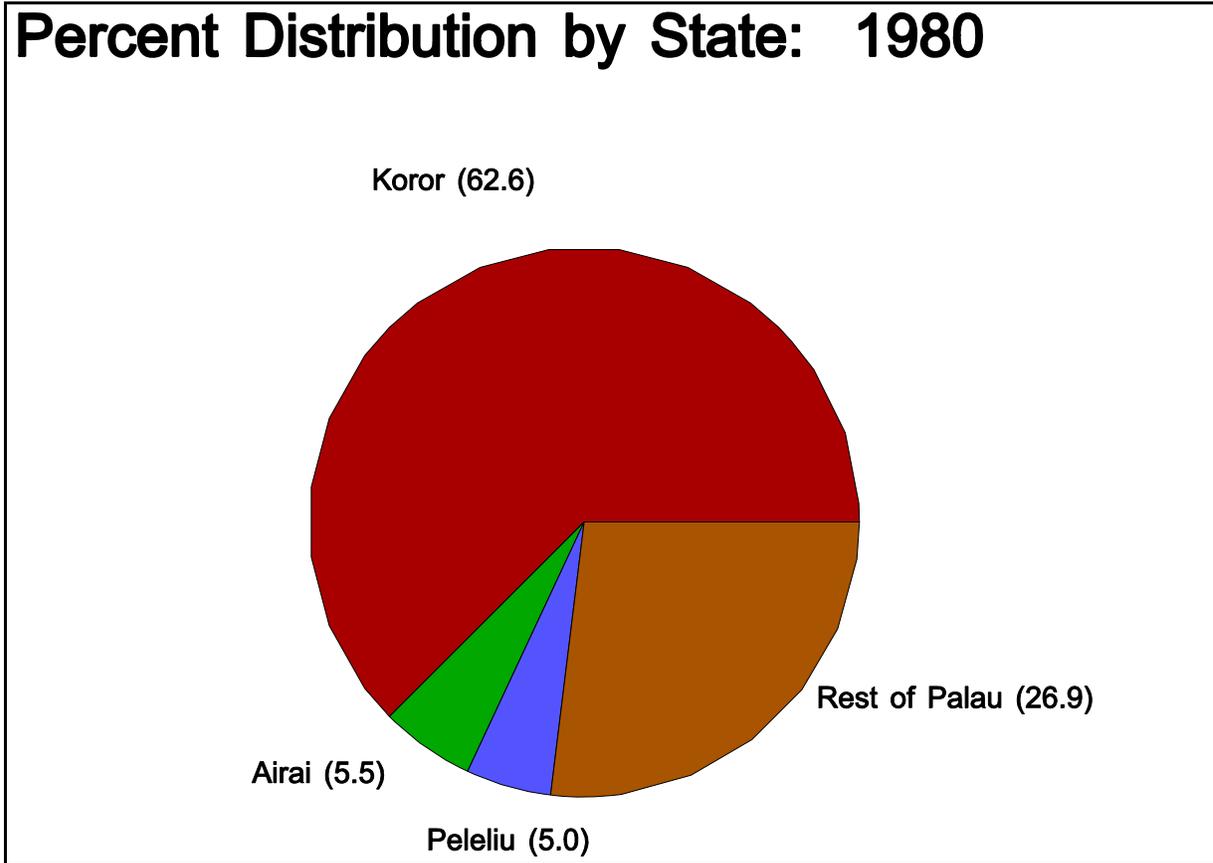


Figure 3.1. Percent Distribution by State: 1980

Table 3.1. Palau Population, by State: 1980-1990

State	Population			Percentage		
	1990	1986	1980	1990	1986	1980
Total.....	15,122	13,873	12,116	100.0	100.0	100.0
Aimeliik.....	439	283	273	2.9	2.0	2.3
Airai.....	1,234	1,021	668	8.2	7.4	5.5
Angaur.....	206	214	243	1.4	1.5	2.0
Hatohobei.....	22	35	74	0.1	0.3	0.6
Kayangel.....	137	115	140	0.9	0.8	1.2
Koror.....	10,501	9,442	7,585	69.4	68.1	62.6
Melekeok.....	244	254	261	1.6	1.8	2.2
Ngaraard.....	310	468	457	2.0	3.4	3.8
Ngardmau.....	149	157	160	1.0	1.1	1.3
Ngaremlengui.....	281	301	358	1.9	2.2	3.0
Ngatpang.....	62	219	166	0.4	1.6	1.4
Ngchesar.....	287	271	364	1.9	2.0	3.0
Ngerchelong.....	354	277	372	2.3	2.0	3.1
Ngiwal.....	234	218	267	1.5	1.6	2.2
Peleliu.....	601	545	609	4.0	3.9	5.0
Sonsorol.....	61	42	79	0.4	0.3	0.7
Unorganized.....	...	11	40	-	0.1	0.3

Sources: U.S. Bureau of the Census, 1982, Table 4; 1992c, Table 1; OPS, 1987, Table A1.

The two major exceptions to the trend for recent population decline throughout Palau are Koror and Airai states, both having experienced sustained population growth between 1980 and 1990. Koror State is the location of Koror, a CDP that represents the only urban place in Palau (with "urban" defined by the U.S. Bureau of the Census as places containing 2,500 persons or more). Airai State, north of Koror State, recently experienced similar growth — much less rapid in absolute terms but at a faster rate than its large neighbor (Table 3.2). As a result these recent trends in population growth, Airai and Koror states have come to contain increasing proportions of the total population.

Table 3.2. Population Change in Palau, by State (Percentages): 1980-1990

State	Total Change			Avg. Annual Change		
	1986-90	1980-86	1980-90	1986-90	1980-86	1980-90
Total.....	9.0	14.5	24.8	2.2	2.3	2.2
Aimeliik.....	55.1	3.7	60.8	11.6	0.6	4.9
Airai.....	20.9	52.8	84.7	4.9	7.3	6.3
Angaur.....	-3.7	-11.9	-15.2	-0.9	-2.1	-1.6
Hatohebei.....	-37.1	-52.7	-70.3	-11.0	-11.7	-11.4
Kayangel.....	19.1	-17.9	-1.2	4.5	-3.2	-2.2
Koror.....	11.2	24.5	38.4	2.7	3.7	3.3
Melekeok.....	-3.9	-2.7	-6.5	-1.0	-0.5	-6.7
Ngaraard.....	-33.8	2.4	-32.2	-9.8	0.4	-3.8
Ngardmau.....	-5.1	-1.9	-6.9	-1.3	-0.3	-7.1
Ngaremlengui.....	-6.6	-15.9	-21.5	-1.7	-2.8	-2.4
Ngatpang.....	-71.7	31.9	-62.7	-27.1	4.7	-9.4
Ngchesar.....	5.9	-25.5	-21.2	1.4	-4.8	-2.3
Ngerchelong.....	27.8	-25.5	-4.8	6.3	-4.8	-0.5
Ngiwal.....	7.3	-18.4	-12.4	1.8	-3.3	-1.3
Peleliu.....	10.3	-10.5	-1.3	2.5	-1.8	-0.1
Sonsorol.....	45.2	-46.8	-22.8	9.8	-10.0	-2.5
Unorganized.....	...	-72.5	...	...	-19.4	...

Sources: U.S. Bureau of the Census, 1982, Table 4; 1992c, Table 1; OPS, 1987, Table A1.

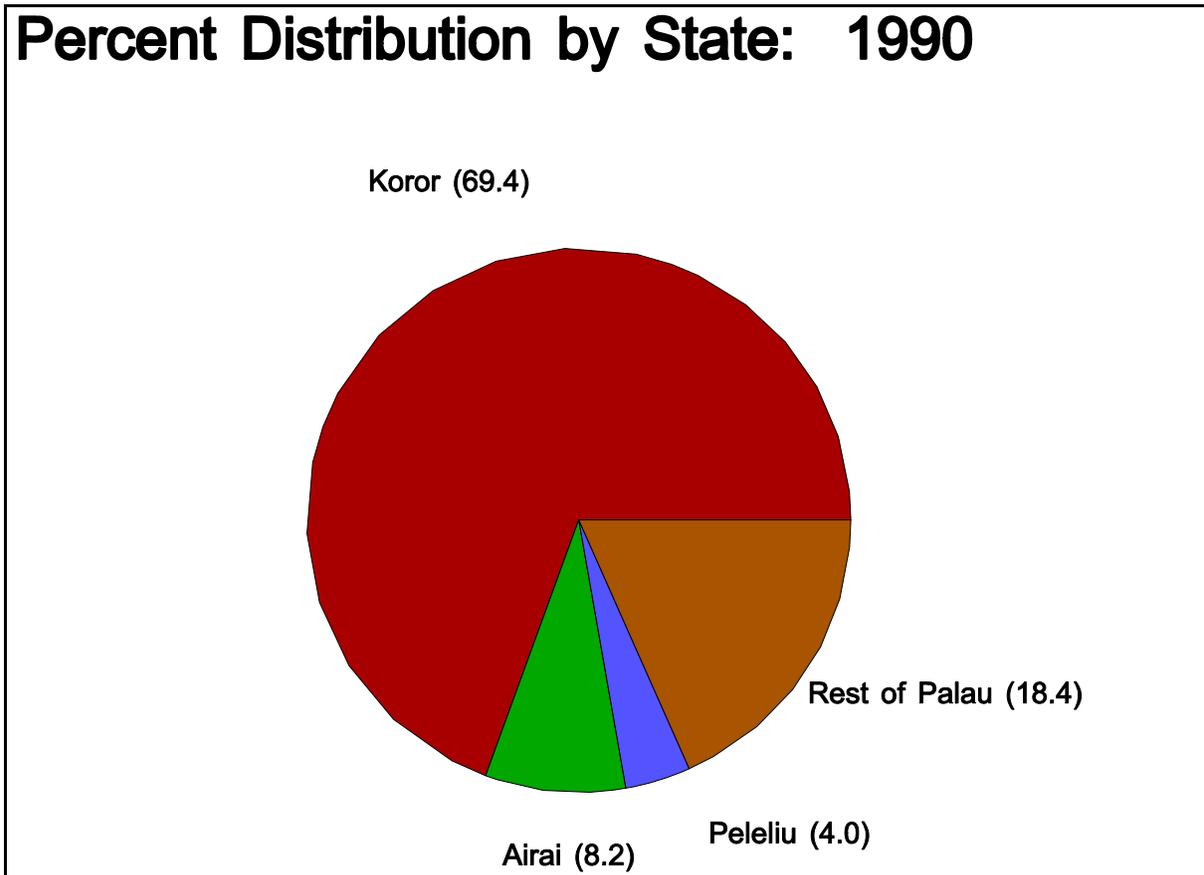


Figure 3.2. Percent Distribution by State: 1990

Rural to urban migration accounts for some of Koror and Airai states' population growth. This phenomenon is occurring in many areas in the Pacific. These states contain the airport, the national government, and most of the businesses. No other areas are showing this kind of in migration (Table 3.3).

Table 3.3. Population of Selected States and Places in Palau: 1980 and 1990

State/Place 1980-90	Population		Percent of Palau Total		Rate Total Change
	1990	1980	1990	1980	1980-90
Total.....	15,122	12,116	100.0	100.0	24.8
Airai.....	1,234	668	8.2	5.5	84.7
Koror.....	10,501	7,585	69.4	62.6	38.4
Koror CDP.....	9,018	6,222	59.6	51.4	44.9
Meyungs CDP.....	953	728	6.3	6.0	30.9
Rest of Koror State.....	530	635	3.5	5.2	-16.5
Peleliu.....	601	609	4.0	5.0	-1.3
Kloulklubed CDP.....	583	605	3.9	5.0	-3.6
Rest of Peleliu State...	18	4	0.1	-	350.0
Rest of Palau.....	2,786	3,254	18.4	26.9	-14.4

Sources: U.S. Bureau of the Census, 1982, Table 4; 1992c, Table 1.

Because of Palau's recent geographic patterns, population density in most states is quite low, including the outer islands with relatively little land area (Table 3.4). Koror is the exception, where population density approached 1,500 persons per square mile in 1990. Changes in the population densities of other states are consistent with the shifts in the distribution of Palau's population over the past two decades.

Table 3.4. Population Density in Palau, by State: 1973-1990

State	Land Area	Persons per Sq. Mile		
	Sq. Mi.	1990	1986	1980
Total.....	170.4	89	81	71
Aimeliik.....	19.8	22	14	14
Airai.....	17.5	71	58	38
Angaur.....	3.3	63	66	75
Hatohobei.....	0.6	38	61	128
Kayangel.....	0.7	199	167	203
Koror.....	7.1	1,490	1,339	1,076
Melekeok.....	10.7	23	24	24
Ngaraard.....	13.9	22	34	33
Ngardmau.....	17.9	8	9	9
Ngaremlengui.....	25.0	11	12	14
Ngatpang.....	17.6	4	12	9
Ngchesar.....	16.4	18	17	22
Ngerchelong.....	4.1	86	67	90
Ngiwal.....	10.3	23	21	26
Peleliu.....	4.7	128	116	130
Sonsorol.....	0.9	66	45	85

Sources: U.S. Bureau of the Census, 1982, Table 4; 1992c, Table 1; OPS, 1987, Table A5.

## Conclusions

Koror and Airai states continue to be the largest states, and continue to grow faster than other areas. Both states became increasingly important during the 1980s. As both the center of government activity, as well as having most modern key public services (e.g., Palau High School, Micronesia Occupational College, and the Palau National Hospital), Koror likely will continue to attract in-migrants and immigrants for the foreseeable future. The recent growth in Airai State largely because it is right next to Koror. When the capital moves to Melekeok State, the focus of population growth may change — or at least expand to include this third state. Unless the Palau government makes a concerted effort to decentralize development, these states will continue to host most government offices and private sector economic activity, and as a result continue to experience rapid growth than other parts of Palau.

## CHAPTER 4. AGE AND SEX

The age and sex composition of a population provides basic information necessary for planning, providing key insights on social and economic characteristics. Age composition helps identify populations for schooling, employment, voting, and retirement. Sex distribution is important for social characteristics, trends in community structure, and the population's economic potential.

In Chapter 2 we discussed the historical demography of Palau, including age and sex distributions. Among the most noteworthy characteristics was an historic surplus of men, although this discrepancy decreased over time, and the emergence of an increasingly youthful population. More recently, the population of Palau has been aging, partly because of reduced fertility (which we discuss in Chapter 6), partly as a result of even more drastic decreases in mortality (examined in Chapter 7), and partly because of the unusual migration patterns featuring large numbers of working age immigrants (discussed in Chapter 8). Recent fertility, mortality, and migration trends — the three main mechanisms by which a population changes over time — have shaped the age and sex composition of modern Palau.

### Data Description

#### *Age*

The 1990 census obtained information on age from answers to questionnaire item 5, asked of all persons. The age classification considered the age of each person in complete years as of 1 April 1990. Normally the census used the age response in question 5a for the person's age on the reference date. When this response was unacceptable or unavailable, the census derived a person's age from an acceptable year-of-birth response in question 5b.

The Census Bureau uses data on age to determine the applicability of other questions for a individual and to classify other characteristics in census tabulations. Because of the important role played by age data in interpreting most social and economic characteristics, the bureau tabulates age by single years and by many different groupings.

One of the most important measures derived from data on age is *median age*. This measure divides the age distribution into two equal parts, one-half of the persons younger than the median age and the other half older. In most cases, computing median age employs more detailed age intervals than are shown in census publications. A median based on less detailed data may differ slightly from a corresponding median for the same population based on a more detailed distribution.

Limitations. The 1970 and 1980 censuses substantially overstated counts for persons 100 years old and over. Improvements in questionnaire design and in allocation procedures aimed to minimize this problem for the 1990 census.

A review of detailed 1990 census information showed that respondents tended to provide their age as of the date of completion of the questionnaire, not their age as of 1 April 1990. In addition, there may have been a tendency for respondents to round their age up if they were close to having a birthday. As a result of these two tendencies, approximately 10 percent of persons in most age groups probably were one year younger than reported in the census. For most single years of age, the misstatements are largely offsetting. The problem is most pronounced at age zero — both because persons lost to age one may not have been fully offset by the inclusion of babies born after 1 April 1990 and because there possibly was more rounding up to age one to avoid reporting an age of zero years. The 1990 census did not collect age in complete months for infants less than one year old.

Note that the reporting of age one year older than actual age on 1 April 1990 possibly occurred more frequently in areas where the census collected data later than that actual date — such as Palau. The magnitude of this problem was much less in previous censuses where age was typically derived from respondent data on year of birth and quarter of birth.

Comparability. Every decennial census of the United States and its territories collected age data. Because this information is so important to a census, in cases where age was not reported, for some other reason was unknown, or clearly appeared to be incorrect the Census Bureau employed a procedure called *imputation* to assign ages. This procedure has been used for census data from Palau since 1970. The specific techniques for imputing age have differed in each census, introducing a problem of comparability between censuses (see U.S. Bureau of the Census, 1992c, Appendix B for more information on imputation).

### *Sex*

The 1990 census obtained data on sex from answers to questionnaire item 3, asked of all persons. In most cases when sex was not reported, census personnel determined it by the appropriate entry from the person's given name and household relationship. Otherwise, sex was imputed according to the relationship to the householder and the age and marital status of the person (see U.S. Bureau of the Census, 1992c, Appendix B for more information on imputation).

Comparability. Every decennial census of the United States and its territories has included a question on sex, asked of all respondents.

## Analysis of Age and Sex Data

### Age and Sex Distribution

As Palau's population increased in recent years, it also aged. The trend towards greater age began between 1967 and 1973, as discussed in Chapter 2, reversing the early post-World War II trend for an increasingly young Palau population. The three most recent censuses of Palau reveal that the resident population has continued to age. The median age in 1990 approached 26 years (Table 4.1), an increase of nearly seven years during the 1980s. The reasons for the increase in the median age of Palau's population include relatively low fertility, relatively low mortality into old age, and recent migration trends with a youthful emigrant population replaced (in part) by an older immigrant population.

Table 4.1. Population by Age: 1980-1990

Age Group	Number			Percent		
	1990	1986	1980	1990	1986	1980
Total.....	15,122	13,873	12,116	100.0	100.0	100.0
0 to 4 years.....	1,513	1,576	1,401	10.0	11.4	11.6
5 to 9 years.....	1,529	1,546	1,701	10.1	11.1	14.0
10 to 14 years.....	1,534	1,727	1,732	10.1	12.4	14.3
15 to 19 years.....	1,464	1,523	1,565	9.7	11.0	12.9
20 to 24 years.....	1,340	1,429	1,081	8.9	10.3	8.9
25 to 29 years.....	1,403	1,158	826	9.3	8.3	6.8
30 to 34 years.....	1,338	1,015	694	8.8	7.3	5.7
35 to 39 years.....	1,243	831	503	8.2	6.0	4.2
40 to 44 years.....	873	637	494	5.8	4.6	4.1
45 to 49 years.....	666	524	396	4.4	3.8	3.3
50 to 54 years.....	513	394	384	3.4	2.8	3.2
55 to 59 years.....	403	415	408	2.7	3.0	3.4
60 to 64 years.....	387	349	287	2.6	2.5	2.4
65 to 69 years.....	332	303	284	2.2	2.2	2.3
70 to 74 years.....	249	179	130	1.6	1.3	1.1
75 yrs and over.....	335	267	230	2.2	1.9	1.9
Median.....	25.6	22.0	18.8	...	...	...

Source: U.S. Bureau of the Census, 1983, Table 15; 1992c, Table 6; OPS, 1987, Table A1.

Data on the percentage of Palau's population in 5-year age groups show a steady reduction of those aged less than 15 years between 1980 and 1990. In contrast, the proportion of the republic's population in older age groups tended to increase over the same 10 years, particularly those individuals aged 25 to 54 years.

The male population showed the same change in median ages as the total population. In 1980, the median age of males was only 18.8 years, meaning that half the males were younger than 18.8 years old and half were older (Table 4.2). By 1990, the median age of males had increased to 26.1 years, exceeding the median for females by one year. The male median age probably was higher than the female median because of the selective emigration of younger Palauan males and the selective immigration of working age, often unmarried, non-Palauan males.

Table 4.2. Population by Age and Sex: 1980-1990

Age Group	Males			Females		
	1990	1986	1980	1990	1986	1980
Total.....	8,139	7,398	6,279	6,983	6,475	5,837
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0
0 to 4 years.....	9.4	11.2	11.5	10.7	11.5	11.7
5 to 9 years.....	9.7	11.1	14.1	10.5	11.2	13.9
10 to 14 years.....	9.9	12.2	14.2	10.4	12.7	14.4
15 to 19 years.....	9.8	11.4	13.6	9.6	10.4	12.1
20 to 24 years.....	9.1	11.2	10.0	8.6	9.3	7.8
25 to 29 years.....	9.8	8.5	6.6	8.6	8.2	7.0
30 to 34 years.....	9.4	7.3	6.0	8.2	7.3	5.4
35 to 39 years.....	8.8	6.3	3.9	7.5	5.6	4.5
40 to 44 years.....	6.3	4.4	4.0	5.1	4.8	4.2
45 to 49 years.....	4.6	4.0	3.2	4.2	3.5	3.3
50 to 54 years.....	3.4	2.7	3.0	3.4	3.0	3.3
55 to 59 years.....	2.6	2.7	3.0	2.8	3.4	3.7
60 to 64 years.....	2.2	2.4	2.4	3.0	2.7	2.3
65 to 69 years.....	1.9	2.1	1.9	2.5	2.3	2.8
70 to 74 years.....	1.4	1.0	0.7	1.9	1.6	1.4
75 yrs and over.....	1.5	1.5	1.8	3.0	2.4	2.0
Median.....	26.1	21.8	18.8	25.1	22.2	18.9

Source: U.S. Bureau of the Census, 1983, Table 15; 1992c, Table 6; OPS, 1987, Table A1.

The distribution of ages among males shows the same trends as for the population as a whole — that is, younger males decreased as a percentage of the total male population while the proportion of older males increased. Males aged 0 to 19 years comprised 53 percent of the total male population in 1980, decreasing to only 39 percent in 1990. Conversely, males aged 25 to 54 years increased from 27 percent to 42 percent of the total male population during the same 10 years.

The female median age increased from 18.9 years to 25.1 years between 1980 and 1990. Although the median age for females was about the same as the median for males in 1980, by 1990 the median

age for males was one year older than the median age for females — once again due primarily to selective migration. The same changes in relative importance of various age groups occurred for the females as for both the total population and for males, although the shifts were slightly less pronounced.

The age composition of various states in Palau varied substantially in 1990, in part due to various socioeconomic conditions guiding migration patterns and in part to the small populations residing in certain rural states (Table 4.3). The two states with the largest populations in 1990 showed populations with median ages similar to the median for the republic as a whole. Median ages for other states in the republic diverged, some substantially lower (e.g., Kayangel, Ngaraard, Ngaremlengui, and Sonsorol states) and some substantially higher (e.g., Ngatpang, Ngiwal, and Peleliu states).

Table 4.3. Population by State and Age: 1990

State	Total	Percent	0-14 years	15-24 years	25-44 years	45-64 years	65 yrs & over	Median Age
Total.....	15,122	100.0	30.3	18.5	32.1	13.0	6.1	25.6
Aimeliik.....	439	100.0	33.3	21.2	27.1	11.6	6.8	22.4
Airai.....	1,234	100.0	30.5	18.6	32.1	12.6	6.2	25.4
Angaur.....	206	100.0	30.1	18.0	22.8	17.5	11.7	26.0
Hatohobei.....	22	100.0	27.3	36.4	13.6	4.5	18.2	21.5
Kayangel.....	137	100.0	36.5	20.4	19.0	14.6	9.5	18.9
Koror.....	10,501	100.0	29.1	18.9	34.6	13.1	4.3	26.0
Melekeok.....	244	100.0	34.8	16.8	22.1	9.8	16.4	24.0
Ngaraard.....	310	100.0	35.8	18.4	21.3	13.9	10.6	20.7
Ngardmau.....	149	100.0	35.6	11.4	34.2	12.8	6.0	26.4
Ngaremlengui...	281	100.0	38.8	16.7	23.5	11.7	9.3	20.1
Ngatpang.....	62	100.0	29.0	8.1	40.3	12.9	9.7	28.8
Ngchesar.....	287	100.0	35.5	17.1	21.6	12.2	13.6	24.1
Ngerchelongs...	354	100.0	35.6	16.9	21.8	12.7	13.0	23.7
Ngiwal.....	234	100.0	34.2	12.8	28.6	9.8	14.5	27.0
Peleliu.....	601	100.0	29.5	17.0	26.6	14.1	12.8	27.0
Sonsorol.....	61	100.0	34.4	31.1	13.1	16.4	4.9	17.7

Source: U.S. Bureau of the Census, 1992c, Table 6.

Koror, with more than two-thirds of the Palau's population, influences the median age of the entire republic. Koror's median age of 26.0 years was slightly higher than the median for all of Palau, partially because the working-age immigrants pulling this measure up tended to live near their work in the urban center. The percentage of persons aged less than 15 years also was slightly less in Koror than in the republic as a whole. Some rural states had higher median ages than the Palau median, partially due to larger proportions of elderly residents (those aged 65 years and over). Other

rural states contained high percentages of both elderly and young persons. For example, more than 1/3rd of the Melekeok population in 1990 was younger than 15 years, while nearly 1/6th was aged 65 years or more. The situation in Melekeok was similar to a phenomenon occurring in rural settings throughout the Pacific, where very young people are left with older people while the parents of the former migrate elsewhere for work.

Characteristics of the geographic distribution of male residents of Palau were similar to those for the entire population (Table 4.4). The median ages of males residing in Airai and Koror states were similar to the median for all male residents of the republic, with the former slightly younger and the latter slightly older. The age composition of other states in Palau varied, often considerably — once again, probably in part due to the variability one would expect in the small populations present in many of the more rural states. Kayangel, Ngaremlengui, and Sonsorol states all had comparatively young male populations in 1990; in contrast, the male populations of Ngatpang and Peleliu states were relatively old by the standards found in all of Palau.

Table 4.4. Male Population by State and Age: 1990

State	Total	Percent	0-14 years	15-24 years	25-44 years	45-64 years	65 yrs & over	Median Age
Total.....	8,139	100.0	29.1	18.8	34.4	12.8	4.9	26.1
Aimeliik.....	237	100.0	31.6	20.3	32.1	10.5	5.5	24.3
Airai.....	688	100.0	29.7	19.0	35.0	11.8	4.5	25.6
Angaur.....	111	100.0	32.4	13.5	27.9	15.3	10.8	26.5
Hatohebei.....	17	100.0	29.4	41.2	5.9	5.9	17.6	21.3
Kayangel.....	82	100.0	40.2	26.8	13.4	9.8	9.8	18.2
Koror.....	5,639	100.0	27.4	19.1	36.6	13.5	3.4	26.5
Melekeok.....	129	100.0	35.7	19.4	23.3	8.5	13.2	22.3
Ngaraard.....	161	100.0	34.2	18.6	26.1	12.4	8.7	21.8
Ngardmau.....	82	100.0	35.4	12.2	36.6	11.0	4.9	26.5
Ngaremlengui...	151	100.0	42.4	13.9	25.8	11.3	6.6	18.8
Ngatpang.....	33	100.0	27.3	12.1	42.4	9.1	9.1	28.3
Ngchesar.....	154	100.0	35.7	18.8	24.0	8.4	13.0	23.0
Ngerchelong....	176	100.0	38.6	14.8	26.1	9.1	11.4	23.5
Ngiwal.....	127	100.0	29.1	17.3	32.3	7.1	14.2	26.8
Peleliu.....	314	100.0	28.7	16.9	29.6	14.6	10.2	27.8
Sonsorol.....	38	100.0	34.2	34.2	10.5	15.8	5.3	17.8

Source: U.S. Bureau of the Census, 1992c, Table 8.

Table 4.5 presents data on population by age and state of residence for females enumerated in the 1990 census. Apart from the geographic variability found in the last two tables, a relatively large proportion of females aged less than 15 years lived in rural areas in 1990. This trend primarily is a result of adult females relocating to urban areas, either to seek employment or further education or to

accompany their husbands who migrated to urban places. The presence of younger female populations in rural settings probably also reflects a greater tendency for females to remain behind while males show a greater propensity for rural-urban mobility. The median ages of females in Aimeliik, Ngaraard, and Sonsorol states were particularly young compared to the entire republic. In contrast, the median ages of females in Kayangel, Ngatpang, and Ngiwal states were older — as was the median age for female residents of Hatohobei State, although the latter influenced by the state's particularly small female population.

Table 4.5. Female Population by State and Age: 1990

State	Total	Percent	0-14 years	15-24 years	25-44 years	45-64 years	65 yrs & over	Median Age
Total.....	6,983	100.0	31.6	18.2	29.4	13.3	7.4	25.1
Aimeliik.....	202	100.0	35.1	22.3	21.3	12.9	8.4	20.5
Airai.....	546	100.0	31.5	18.1	28.4	13.7	8.2	25.2
Angaur.....	95	100.0	27.4	23.2	16.8	20.0	12.6	24.5
Hatohobei.....	5	100.0	20.0	20.0	20.0	20.0	20.0	38.5
Kayangel.....	55	100.0	30.9	10.9	27.3	21.8	9.1	29.2
Koror.....	4,862	100.0	31.0	18.6	32.2	12.7	5.5	25.2
Melekeok.....	115	100.0	33.9	13.9	20.9	11.3	20.0	26.8
Ngaraard.....	149	100.0	37.6	18.1	16.1	15.4	12.8	20.1
Ngardmau.....	67	100.0	35.8	10.4	31.3	14.9	7.5	26.3
Ngaremlengui...	130	100.0	34.6	20.0	20.8	12.3	12.3	20.7
Ngatpang.....	29	100.0	31.0	3.4	37.9	17.2	10.3	31.3
Ngchesar.....	133	100.0	35.3	15.0	18.8	16.5	14.3	24.9
Ngerchelongs...	178	100.0	32.6	19.1	17.4	16.3	14.6	24.0
Ngiwal.....	107	100.0	40.2	7.5	24.3	13.1	15.0	28.5
Peleliu.....	287	100.0	30.3	17.1	23.3	13.6	15.7	26.4
Sonsorol.....	23	100.0	34.8	26.1	17.4	17.4	4.3	16.5

Source: U.S. Bureau of the Census, 1992c, Table 8.

Table 4.6 presents data on change by age group from the three most recent censuses of Palau. The general trend was for numbers of younger persons to decrease while older persons increased. This dual tendency is particularly apparent during the final four years of the decade among individuals aged less than 25 years and individuals aged 25 and 54 years. The same general trend occurred between 1980 and 1986, with some exceptions (e.g., age groups 0 to 4 and 20 to 24). The causes of these age-specific changes during the 1980s probably were a combination of migration patterns and decreased fertility (see Levin and Retherford, 1986), as discussed further in chapters 6 and 8.

Table 4.6. Change in Population by Age: 1980-1990

Age Group	1990	1986	Change 1986-90		1980	Change 1980-86	
			Number	Percent		Number	Percent
Total.....	15,122	13,873	1,249	9.0	12,116	1,757	14.5
0 to 4 years.....	1,513	1,576	-63	-4.0	1,401	175	12.5
5 to 9 years.....	1,529	1,546	-17	-1.1	1,701	-155	-9.1
10 to 14 years....	1,534	1,727	-193	-11.2	1,732	-5	-0.3
15 to 19 years....	1,464	1,523	-59	-3.9	1,565	-42	-2.7
20 to 24 years....	1,340	1,429	-89	-6.2	1,081	348	32.2
25 to 29 years....	1,403	1,158	245	21.2	826	332	40.2
30 to 34 years....	1,338	1,015	323	31.8	694	321	46.3
35 to 39 years....	1,243	831	412	49.6	503	328	65.2
40 to 44 years....	873	637	236	37.0	494	143	28.9
45 to 49 years....	666	524	142	27.1	396	128	32.3
50 to 54 years....	513	394	119	30.2	384	10	2.6
55 to 59 years....	403	415	-12	-2.9	408	7	1.7
60 to 64 years....	387	349	38	10.9	287	62	21.6
65 to 69 years....	332	303	29	9.6	284	19	6.7
70 to 74 years....	249	179	70	39.1	130	49	37.7
75 yrs and over...	335	267	68	25.5	230	37	16.1

Sources: U.S. Bureau of the Census, 1983, Table 15; 1992c, Table 6; OPS, 1987

Table A1.

Male residents of Palau experienced changes by age during the 1980s similar to those seen in the entire population (Table 4.7). Numbers of males in age groups younger than 25 years decreased between 1986 and 1990, continuing a trend begun in most of these age groups during the first six years of the decade. With one exception — males aged 75 years and older in 1980 and 1986 — the proportion of males in older age groups increased over the decade, once again most dramatically between the ages of 25 and 54 years. The surge in growth among older males was particularly marked during the final four years of the 1980s.

Table 4.7. Male Population by Age: 1980-1990

Age Group	1990	1986	Change 1986-90		1980	Change 1980-86	
			Number	Percent		Number	Percent
Total.....	8,139	7,398	741	10.0	6,279	1,119	17.8
0 to 4 years.....	766	831	-65	-7.8	719	112	15.6
5 to 9 years.....	793	820	-27	-3.3	887	-67	-7.6
10 to 14 years....	807	902	-95	-10.5	890	12	1.3
15 to 19 years....	795	847	-52	-6.1	857	-10	-1.2
20 to 24 years....	738	828	-90	-10.9	626	202	32.3
25 to 29 years....	799	630	169	26.8	415	215	51.8
30 to 34 years....	768	542	226	41.7	379	163	43.0
35 to 39 years....	720	466	254	54.5	243	223	91.8
40 to 44 years....	514	326	188	57.7	251	75	29.9
45 to 49 years....	375	297	78	26.3	202	95	47.0
50 to 54 years....	279	199	80	40.2	189	10	5.3
55 to 59 years....	208	198	10	5.1	191	7	3.7
60 to 64 years....	181	174	7	4.0	150	24	16.0
65 to 69 years....	154	152	2	1.3	122	30	24.6
70 to 74 years....	117	76	41	53.9	47	29	61.7
75 yrs and over...	125	110	15	13.6	111	-1	-0.9

Sources: U.S. Bureau of the Census, 1983, Table 15; 1992c, Table 6; OPS, 1987 Table A1.

Although the ages of females residing in Palau did not increase as much as the ages of males during the 1980s, an overall increase still occurred (Table 4.8). Females in most of the youngest five age-groups considered in this study tended to decrease during both the earlier and later parts of the decade, but by amounts much less than those witnessed among males — in some cases gaining proportionally where their male counterparts had lost numbers (e.g., the 0-4, 5-9, and 20-24 age groups between 1986 and 1990). Similarly, although the number of females in most older age groups increased during the decade, this trend varied, with some remaining constant or even losing population.

Table 4.8. Female Population by Age: 1980-1990

Age Group	1990	1986	Change 1986-90		1980	Change 1980-86	
			Number	Percent		Number	Percent
Total.....	6,983	6,475	508	7.8	5,837	638	10.9
0 to 4 years.....	747	745	2	0.3	682	63	9.2
5 to 9 years.....	736	726	10	1.4	814	-88	-10.8
10 to 14 years....	727	825	-98	-11.9	842	-17	-2.0
15 to 19 years....	669	676	-7	-1.0	708	-32	-4.5
20 to 24 years....	602	601	1	0.2	455	146	32.1
25 to 29 years....	604	528	76	14.4	411	117	28.5
30 to 34 years....	570	473	97	20.5	315	158	50.2
35 to 39 years....	523	365	158	43.3	260	105	40.4
40 to 44 years....	359	311	48	15.4	243	68	28.0
45 to 49 years....	291	227	64	28.2	194	33	17.0
50 to 54 years....	234	195	39	20.0	195	-	-
55 to 59 years....	195	217	-22	-10.1	217	-	-
60 to 64 years....	206	175	31	17.7	137	38	27.7
65 to 69 years....	178	151	27	17.9	162	-11	-6.8
70 to 74 years....	132	103	29	28.2	83	20	24.1
75 yrs and over...	210	157	53	33.8	119	38	31.9

Sources: U.S. Bureau of the Census, 1983, Table 15; 1992c, Table 6; OPS, 1987

Table A1.

Changes in the age composition of Palau over the past decade varied both geographically and by sex (Table 4.9). The population of the republic aged markedly during the 1980s, more among males than females. In general, persons in rural states were younger than those in urban states for all three census years. This aging comes from the important role migration patterns play in shaping Palau's population distribution. Many working-age persons migrate to urban areas both from rural areas of Palau and from other countries. Peleliu State provides an interesting exception to this general trend. Peleliu shifted from a relatively young population in 1980 to a relatively old population by 1990, probably because of migration for schooling as well as Peleliu's position as neither urban nor rural (thus enabling it to retain both persons of working age and provide a comfortable setting for older, more traditional individuals).

Table 4.9. Median Age for Selected States by Sex: 1980-1990

Sex	Total	Koror	Airai	Peleliu	Other
Total Population:					
1990.....	25.6	26.0	25.4	27.0	23.1
1986.....	22.0	22.3	23.1	23.0	19.9
1980.....	18.8	19.3	18.3	17.9	16.8
Males:					
1990.....	26.1	26.7	25.7	27.5	22.7
1986.....	21.8	21.9	23.8	21.2	20.7
1980.....	18.7	19.2	18.6	18.6	16.6
Females:					
1990.....	25.1	25.2	25.2	26.4	23.8
1986.....	22.2	22.8	22.4	25.0	19.2
1980.....	18.9	19.5	17.9	16.8	17.0

Source: U.S. Bureau of the Census, 1983, Table 16; 1992c, Table 6; OPS, 1987, Table A1.

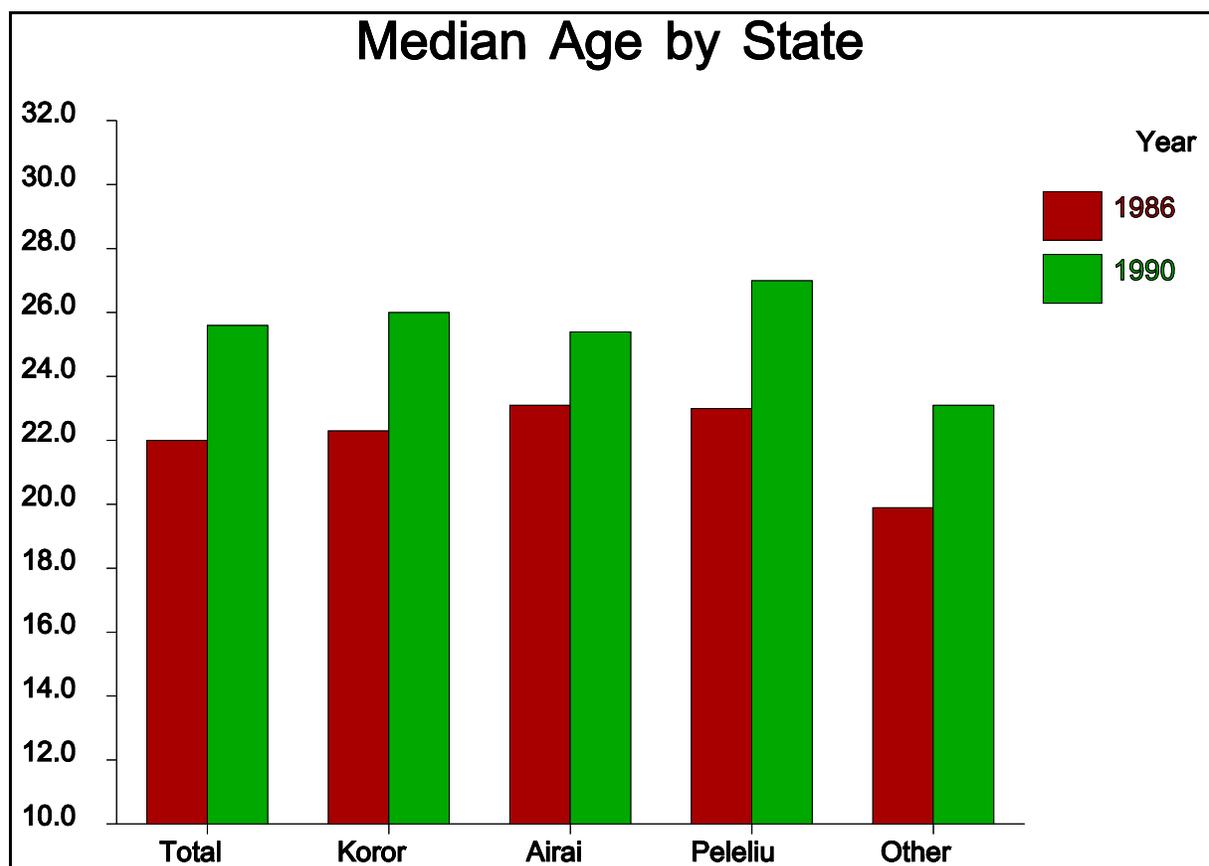


Figure 4.1. Median Age for Selected States: 1986 and 1990

In 1990, the median age of males was greater than the median age of females in Koror, Airai, and Peleliu states, representing a change over the preceding years. In 1986, the median age of females was greater than the median age of males in Palau, and in Koror and Peleliu states. The median age of females exceeded that of males in Palau and the states in Table 4.9 in 1980 as well. The change in Koror State during the 1980s from a female older population to a male older population probably was due to selective migration by age and sex, including the immigration of working age males. One may offer a similar explanation for the change documented in the other, mostly rural states — most notably as increased migration to Koror State by college and other, working age males. The change seen in Peleliu State is not so easily explained, unless young females from that state are more likely to leave for schooling and jobs than young males.

#### *Age and Sex Ratios*

Ratios permit comparisons of phenomena over time and between countries and areas. Analyses of age and sex data often require examining large data sets. We can better discuss the complexities of changing age and sex compositions by using ratios. Here we employ two measures — the *sex ratio* and the *dependency ratio*. The former measures the number of males per 100 females, the latter, the number of young (less than 15 years of age) and old (65 years of age or older) persons per 100 individuals of working age (aged 15-64 years).<sup>2</sup>

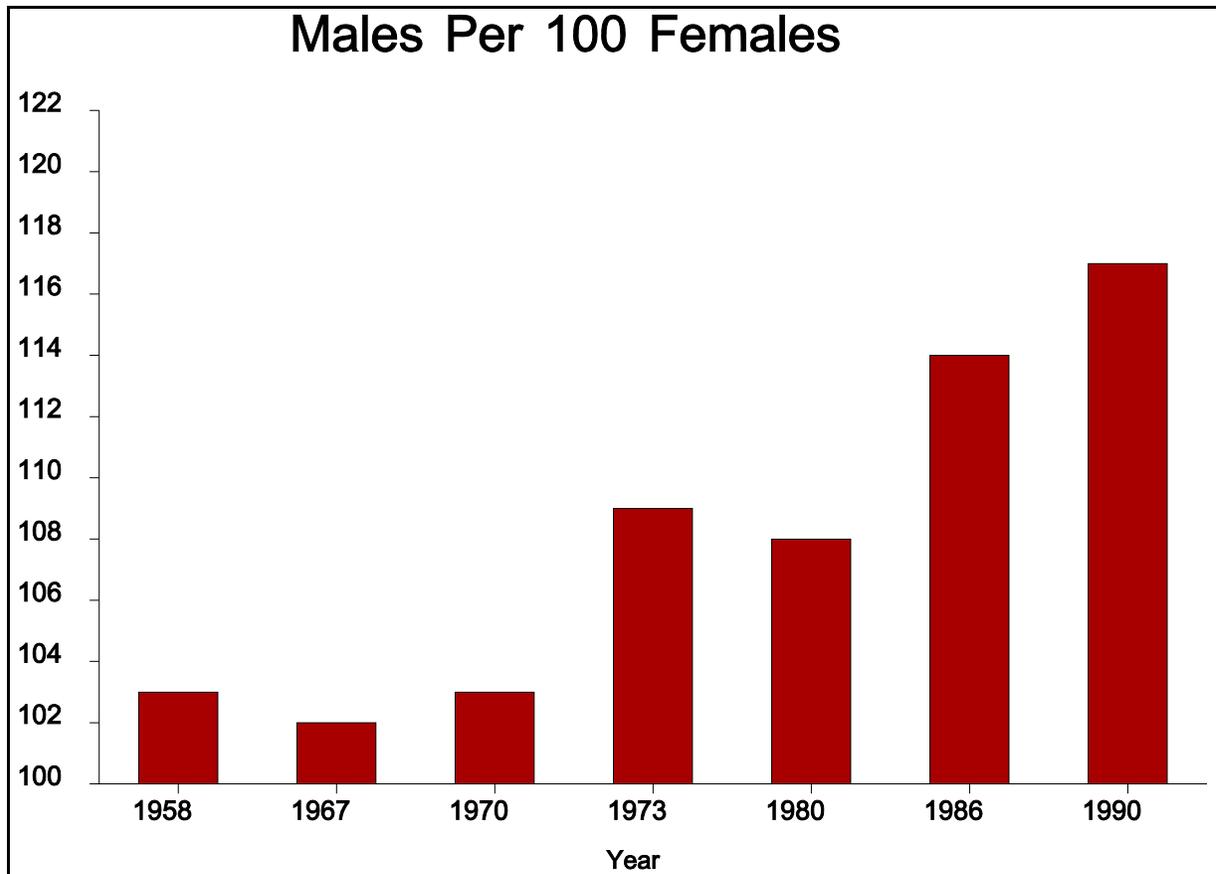


Figure 4.2. Males per 100 Females: 1958 to 1990

In most populations, more males than females are born. However, because male mortality traditionally is higher than female mortality most populations contain more females than males, particularly among older age groups. These generalities tend to hold for Palau, although the situation has changed markedly over the past decade (Table 4.10). For all three census years

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<sup>2</sup>Here we use "Males per 100 females" and "Sex ratio" interchangeably.

examined, Palau contained more males than females — the ratio increasing over time, partly due to the selective immigration of working age males from outside. Evidence for such migration appears in the 1980 data, with noteworthy excesses of males over females for individuals aged 15 through 34 years. This trend increased over time; by 1990, the age groups in which males substantially exceeded females expanded to encompass individuals between 15 and 59 years of age, with ratios among the five-year age groups between 25 and 44 years particularly high.

Table 4.10. Males per 100 Females, by Age: 1980-1990

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Age Group	1990	1986	1980
Total.....	116.6	114.3	107.6
0 to 4 years.....	102.5	111.5	105.4
5 to 9 years.....	107.7	112.9	109.0
10 to 14 years.....	111.0	109.3	105.7
15 to 19 years.....	118.8	125.3	121.0
20 to 24 years.....	122.6	137.8	137.6
25 to 29 years.....	132.3	119.3	101.0
30 to 34 years.....	134.7	114.6	120.3
35 to 39 years.....	137.7	127.7	93.5
40 to 44 years.....	143.2	104.8	103.3
45 to 49 years.....	128.9	130.8	104.1
50 to 54 years.....	119.2	102.1	96.9
55 to 59 years.....	106.7	91.2	88.0
60 to 64 years.....	87.9	99.4	109.5
65 to 69 years.....	86.5	100.7	75.3
70 to 74 years.....	88.6	73.8	56.6
75 yrs and over.....	59.5	70.1	93.3

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Source: U.S. Bureau of the Census, 1983, Table 16; 1992c, Table 6; OPS, 1987, Table A1.

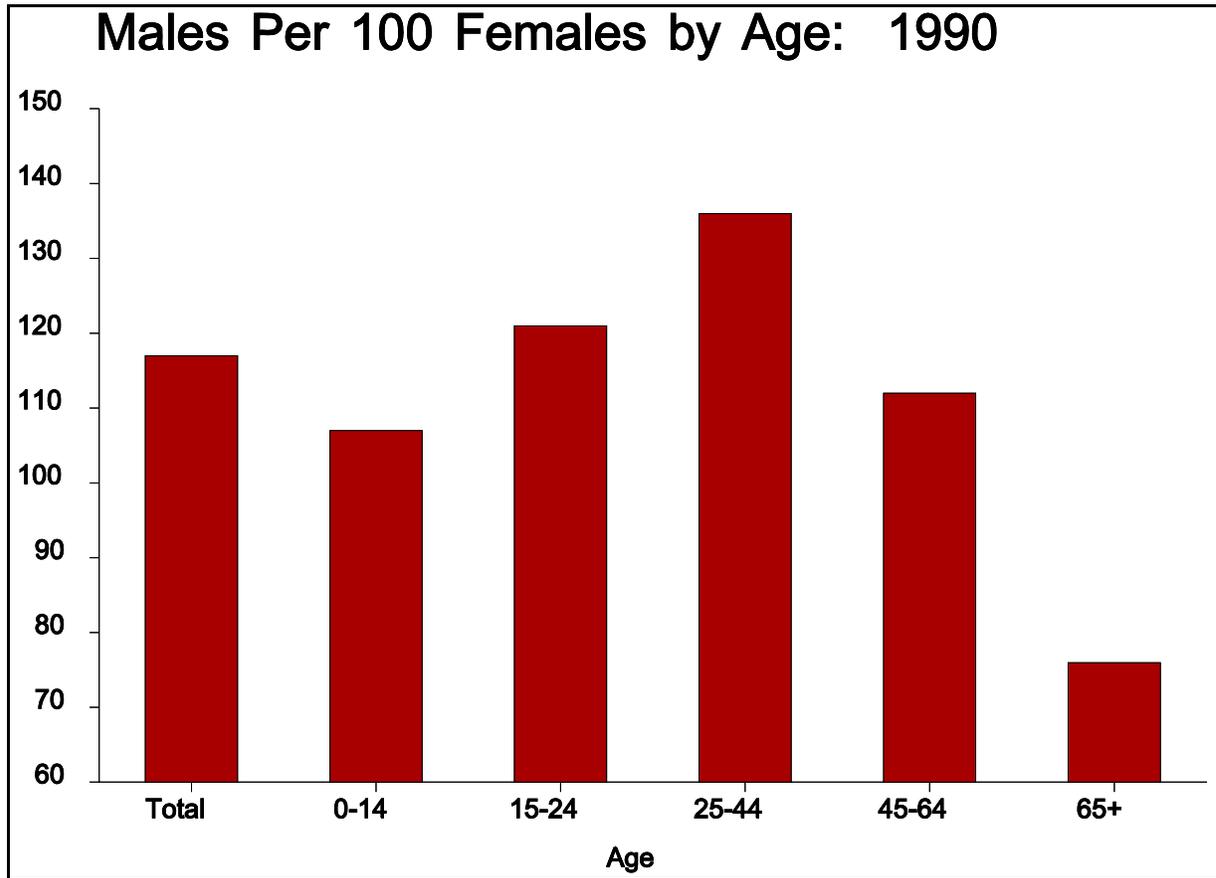


Figure 14.3. Males per 100 Females by Age: 1990

Sex ratios varied among states in Palau (Table 4.11). As with most of the demographic measures, the small populations of certain states (particularly Hatohobei and Sonsorol) give sex ratios which are not particularly informative. But for most states, sex ratios provide useful insights. With the exception of Ngerchelong State, the sex ratio of each state exceeded 100. For Palau, each age group contained more males than females except the group of persons 65 years and older. Within Palau, the geographic variability present in most demographic measures emerges in sex ratios as well. As one might expect, the relatively large population of Koror State results in generally close agreement between the age-specific sex ratios here and the whole republic. Koror State had sex ratios in excess of 119 for the three working age groups in Table 4.11, although the values for two of these groups (15-24 and 25-44 years) were lower than those for the entire republic. The sex ratios for Airai, the second most populated state, also generally are similar to those of the republic, with the youngest three age groups particularly well represented. In both Koror and Airai states, selective immigration of working-age males probably provides the best explanation of surplus males in 1990 sex ratios.

Table 4.11. Males Per 100 Females by Age and State: 1990

State	Total	0-14 years	15-24 years	25-44 years	45-64 years	65 yrs & over
Total.....	116.6	107.1	120.6	136.4	112.4	76.2
Aimeliik.....	117.3	105.6	106.7	176.7	96.2	76.5
Airai.....	126.0	118.6	132.3	155.5	108.0	68.9
Angaur.....	116.8	138.5	68.2	193.8	89.5	100.0
Hatohobei.....	340.0	500.0	700.0	200.0	-	300.0
Kayangel.....	149.1	194.1	366.7	73.3	66.7	160.0
Koror.....	116.0	102.7	119.1	131.9	122.9	70.8
Melekeok.....	112.2	117.9	156.3	125.0	84.6	73.9
Ngaraard.....	108.1	98.2	111.1	175.0	87.0	73.7
Ngardmau.....	122.4	120.8	142.9	142.9	90.0	80.0
Ngaremlengui.....	116.2	142.2	80.8	144.4	106.3	62.5
Ngatpang.....	113.8	100.0	400.0	127.3	60.0	100.0
Ngchesar.....	115.8	117.0	145.0	148.0	59.1	105.3
Ngerchelong.....	98.9	117.2	76.5	148.4	55.2	76.9
Ngiwal.....	118.7	86.0	275.0	157.7	64.3	112.5
Peleliu.....	109.4	103.4	108.2	138.8	117.9	71.1
Sonsorol.....	165.2	162.5	216.7	100.0	150.0	200.0

Source: U.S. Bureau of the Census, 1992c, Table 6.

Sex ratios for rural states in Palau were both more variable and more difficult to explain. Males younger than 15 years were overrepresented in several rural states — including those whose relatively large populations would prohibit widely fluctuating figures, such as Aimeliik and Angaur. The 15-24 year age group showed even more diversity, most overwhelming male but a few (Angaur, Ngaremlengui, and Ngerchelong states) being more female. These age groups may show emigration for schooling and entry-level labor force participation, as well as children accompanying parents who moved for work or schooling. Finally, several rural states had more older males than females.

The dependency ratio in 1990 for Palau was 57 — meaning that Palau had only 57 young and old consumers for every 100 individuals of working age (Table 4.12). The dependency ratio decreased throughout the 1980s, as the proportion of working age individuals increased. The dependency ratios for both males and females also decreased over the decade, the change for males being stronger. The dependency ratios by sex are for illustrative purposes, since males do not provide exclusively for males nor do females provide exclusively for females.

Table 4.12. Dependency Ratio by Sex: 1980-1990

	Total	Koror	Airai	Peleliu	Other
1990					
Total.....	57.0	50.2	57.8	73.2	84.5
Male.....	51.4	44.5	51.9	63.5	80.7
Female.....	64.2	57.4	66.0	85.2	89.1
1986					
Total.....	67.6	59.5	59.5	113.7	96.0
Male.....	64.1	55.8	51.8	117.8	96.1
Female.....	71.8	64.1	69.8	109.5	95.8
1980					
Total.....	82.5	72.6	92.0	101.7	104.1
Male.....	79.2	70.6	83.4	89.7	100.1
Female.....	86.2	74.9	101.9	114.4	108.7

Sources: U.S. Bureau of the Census, 1983, Table 15; 1993c, Table 6; OPS, 1987, Table A1.

Note: Dependency ratio =  $[(P_{0-14} + P_{65+})/P_{15-64}] \times 100$ , where  
 $P_{0-14}$  is the number of persons aged 0-14 years,  
 $P_{65+}$  is the number of persons aged 65 years and older, and  
 $P_{15-64}$  is the number of persons aged 15-64 years.

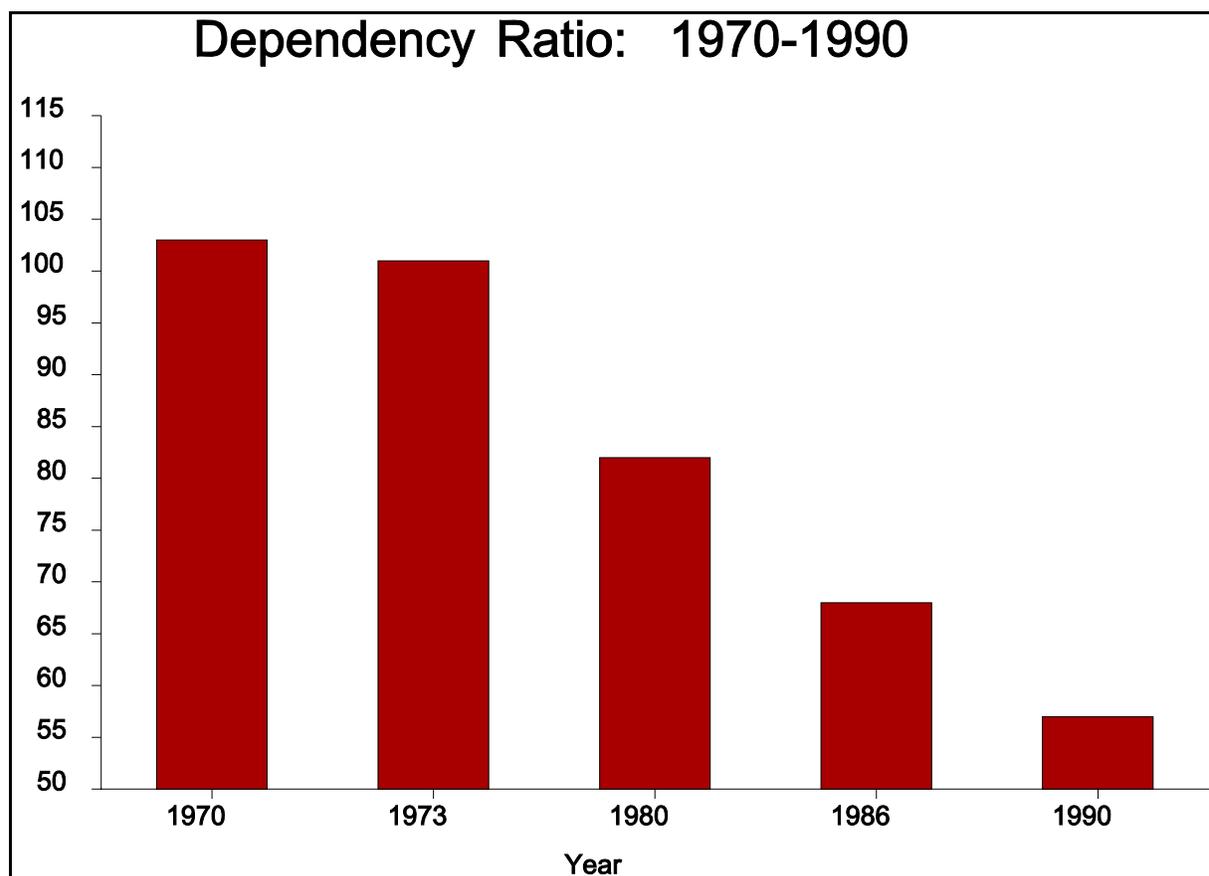


Figure 4.4. Dependency Ratio: 1970 to 1990

Most parts of Palau experienced changes in dependency similar to those for all of Palau. Reductions in total, male, and female dependency ratios were particularly pronounced in Koror State, with the ratio for males falling below 45 by 1990. Decreases in dependency ratios in Airai State similarly were dramatic, providing the greatest relative changes over the 1980s. Even the rural areas, subsumed under "other" in this table, experienced declines in dependency between 1980 and 1990. Only Peleliu strayed from decreasing dependency ratios during the 1980s, with the ratio for all residents and males increasing over the first six years of the decade before declining to lower 1990 levels.

#### *Accuracy Analysis of Age and Sex Data*

Evaluating the accuracy of age and sex data collected in a census can be tested by single years of age or multi-year age groups. Single years were used to determine whether the age reporting was affected by digit preference. In some populations, more people are reported than expected in ages

ending on zero and five because of a greater tendency for people to use these digits — in effect rounding to the nearest five or 10 years. Whipple, Myers, Bachi, Carrier, and Ramachandran have developed indices for analyzing preference for certain digits (U.S. Bureau of the Census, 1971). We used the USBC's Center for International Research's (CIR) spreadsheet called SINGAGE to calculate Whipple's, Myer's, and Bachi's indices, all of which measure preference in digit reporting.

Whipple's index detects a preference for ages ending in zero, five, or both. If age reporting is consistent, this index should fluctuate slightly around one. The higher the value of the index, the higher the preference for digits zero and five. The Whipple Index for both sexes in 1990 was 1.10, indicating accurate reporting; according to this measure, males reported their ages more accurately than females (Table 4.13). Whipple's Index calculations for 1980 show a slightly greater accuracy in age reporting for all persons and females, and only slightly less accuracy for males. An explanation to the changes in index values during the 1980s is not obvious, although it is possible that some of the large number of immigrants to Palau during that decade did not know their ages precisely — as a result rounding their ages to five or 10.

Table 4.13. Whipple's Method of Digit Preference: 1980 and 1990

Census year	Total	Males	Females
1990.....	1.10	1.07	1.15
1980.....	1.06	1.08	1.04

Sources: U.S. Bureau of the Census, 1983, Table 16; 1993b, Table 8.

Note: Whipple's method uses ages 23 to 62 only.

The Myers (1940) and Bachi (1951, 1953) indices are similar to one another, although the magnitude of the former is almost double that of the latter. Both indices measure the excess or deficit of persons reporting ages ending in any of the 10 digits, expressing these deviations as percentages. The larger the value of either index, the greater the preference for certain digits. Values close to zero show accurate age reporting in censuses. Both indices show that age one is most aberrant (in a negative direction), followed by age five (positive) and age nine (negative), the last two especially for females (Table 4.14).

Table 4.14. Myers and Bachi Methods of Measuring Digit Preference: 1990

Terminal digit	Myers Method			Bachi Method		
	Total	Males	Females	Total	Males	Females
Index.....	6.8	5.5	9.3	3.5	3.3	5.0
0.....	0.8	0.8	0.7	1.4	1.0	1.8
1.....	-1.9	-1.7	-2.2	-1.8	-1.5	-2.1
2.....	0.3	0.6	-	0.6	1.0	0.2
3.....	0.2	-0.4	0.9	-0.1	-0.4	0.4
4.....	-0.1	-0.2	-0.1	-0.6	-0.6	-0.6
5.....	0.9	0.3	1.6	0.9	0.2	1.8
6.....	0.5	0.5	0.4	-	0.3	-0.4
7.....	-0.6	-0.5	-0.8	-0.8	-0.8	-0.8
8.....	0.7	0.5	1.0	0.5	0.3	0.9
9.....	-0.7	-	-1.5	-0.2	0.4	-0.9

Source: Unpublished tabulations from the 1990 census.

Notes: The index for Myers method is the sum of the absolute values of the deviations; for the Bachi Method, the index is the sum of the positive deviations (one-half the sum of the absolute deviations).

In evaluating the quality of age and sex data from the 1990 census, we also calculated United Nations age-sex ratio scores, sex ratio scores, and age-sex accuracy indices (United Nations, 1952). All of these measures are very low, indicating accurate age and sex reporting. United Nations scores are compared to a large group of nations — hence, these values are "very low" compared to this large group of countries.

Table 4.15. Population, by Age and Sex, and United Nations Age-Sex Accuracy: 1990

Age	Population		Age ratio		Age ratio deviation		Sex ratio
	Male	Female	Male	Female	Male	Female	(Males per 100 Females)
All ages.....	8,139	6,983	...	...	...	...	116.6
0-4.....	766	747	...	...	...	...	102.5
5-9.....	793	736	100.8	99.9	0.8	-0.1	107.7
10-14.....	807	727	101.6	103.5	1.6	3.5	111.0
15-19.....	795	669	102.9	100.7	2.9	0.7	118.8
20-24.....	738	602	92.6	94.6	-7.4	-5.4	122.6
25-29.....	799	604	106.1	103.1	6.1	3.1	132.3
30-34.....	768	570	101.1	101.2	1.1	1.2	134.7
35-39.....	720	523	112.3	112.6	12.3	12.6	137.7
40-44.....	514	359	93.9	88.2	-6.1	-11.8	143.2
45-49.....	375	291	94.6	98.1	-5.4	-1.9	128.9
50-54.....	279	234	95.7	96.3	-4.3	-3.7	119.2
55-59.....	208	195	90.4	88.6	-9.6	-11.4	106.7
60-64.....	181	206	100.0	110.5	-	10.5	87.9
65-69.....	154	178	103.4	105.3	3.4	5.3	86.5
70-74.....	117	132	NA	NA	-	-	88.6
75+.....	125	210	NA	NA	NA	NA	59.5
Scores.....	...	...	4.7	5.5	...	...	7.1

Age-sex accuracy index = 31.5

Corrected for population (sample) size of 15,122 = 6.5

Source: U.S Bureau of the Census, 1992c, Table 8.

As a final check on the accuracy of age-sex reporting in the 1990 census of Palau, we present five different indices which smooth the age distributions. For the sake of brevity, we exclude technical discussions of these methods, instead referring interested readers to appropriate publications (Carrier and Farrag, 1959 [for Carrier-Farrag, Karup-King-Newton, and United Nations indices]; Arriaga, 1968 [for the Arriaga and Strong indices]).

Table 4.16. Summary of Indices Measuring the Accuracy of Data

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Index	Smoothed					
	Reported	Carrier Farrag	K.-King Newton	Arriaga	United Nations	Strong
Sex ratio score.....	8.08	7.73	7.54	7.60	7.32	6.62
Male age ratio score.....	5.53	4.37	4.62	4.38	3.81	2.56
Female age ratio score....	6.21	4.63	4.77	4.54	4.18	1.93
Accuracy index.....	35.96	32.18	32.02	31.72	29.96	24.35

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Note: The accuracy index is the sum of the male and female age ratio scores plus three times the sex ratio score, all calculated using data for ages 10-14 through 65-69.

## Conclusions

The age and sex composition of Palau changed substantially between 1980 and 1990. Shifts in the age and sex structure of the Palau population have important implications for future planning, as well as for the future population structure of Palau.

Palau's population during the 1980s aged, the median age approached 26 years in 1990, an increase of 36 percent in only 10 years. This increase almost certainly came from the combination of decreased fertility, continued low mortality, and selective mortality. Lower fertility reduced births, the low mortality increased the number of older persons surviving, and the migration introduced more working age residents from other countries (primarily Asia). These trends were particularly marked in Koror State, the main destination for the immigrants as well as from rural states in Palau. Conversely, the populations of rural states tended to be younger than all Palau.

As the population of Palau has become older, it has also become increasingly male. This trend ostarted earlier in the century, although the increases seen during the 1980s countered the growing numerical importance of females through the late 1960s. As with the aging of Palau's population, the relative importance of males was seen in the increased sex ratio, reaching nearly 117 in 1990. The most obvious explanation for these changes is selective immigration, with male immigrants looking for jobs influencing both the sex ratio and the age structure. Internal differences in sex composition roughly paralleled differences in age composition, with the populations of rural states tending to be younger than those of urban states.

## CHAPTER 5. HOUSEHOLDS, FAMILIES, AND MARITAL STATUS

For many years, extended family households consisting of a householder, perhaps a spouse, children, parents, grandparents, grandchildren, siblings, and other relatives were the norm in the Republic of Palau. By 1990, extended families had become somewhat less common, as fertility and family sizes decreased, more people became employed in the cash (rather than subsistence) economy, and increasing numbers of immigrants arrived with different family structure. Demographic changes and socioeconomic shifts affect changes in household and family structure.

Marriage patterns, for example, influence other sociocultural patterns. As a society becomes less traditional through prolonged acculturation, marriage patterns change — frequently leading to later marriage. Later marriage affects fertility. A strong relationship exists between age at first marriage and the number of children a woman has, partly because earlier marriage gives more time for births, partly because younger women are more fertile than older women.

### Definitions

#### *HOUSEHOLD TYPE AND RELATIONSHIP*

A *Household* includes all the persons who occupy a housing unit. A housing unit is a house, apartment, mobile home, group of rooms, or single room that is occupied (or, if vacant, intended for occupancy) as a separate living quarters. Separate living quarters are those in which the occupants live and eat separately from any other persons in the building and who have direct access from the outside of the building or through a common hall. 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. The count of households or householders always equals the count of occupied housing units.

*Persons per household* is obtained by dividing the number of persons in households by the number of households (or householders). In cases where persons in households are cross-classified by ethnic origin or race, persons in the household are classified by the ethnic origin or race of the householder rather than the ethnic origin or race of each individual.

*Relationship to householder* data were derived from questionnaire item 2, asked of all persons.

·Householder -- the person (or one of the persons) in whose name the home is owned, being bought, or rented and who is listed as person 1 on the census questionnaire. If there is no such person in the household, any adult household member 15 years old and over can be designated as the householder. Households are classified by type according to the sex of the householder and the presence of relatives to the householder. The census distinguished two types of householders: a

"family householder" and a "nonfamily householder." A family householder is a householder living with one or more persons related to the householder 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.

- Spouse -- a person married to and living with a householder. This category includes persons in formal marriages, as well as persons in common-law marriages. The number of spouses is equal to the number of "married-couple families" or "married-couple households." The number of spouses, however, generally is less than half the number of married persons with spouse present, since more than one married couple can live in a household but only spouses of householders are specifically identified as spouse. The number of married persons with spouse present includes married-couple subfamilies and married-couple families.
- Child -- sons or daughters by birth, stepchildren, or adopted children 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. This category also includes sons or daughters of the householder by legal adoption, regardless of the age of the child. If a householder has legally adopted a stepson or stepdaughter, the child still is 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 householder has legally adopted a stepson or stepdaughter, 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 by definition are 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 -- 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*

- 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 -- 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; housemate or roommate; unmarried partner; and other nonrelatives.

When relationship was not reported for an individual, it was 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 A.

*Unrelated individuals* can comprise a householder living alone or with nonrelatives only, a household member who is not related to the householder, or a person living in group quarters who is not an inmate of an institution.

*Family type* classifies each family — 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 comprise 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.

- 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* is a measure obtained by dividing the number of persons in families by the total number of families (or family householders). In cases where the measure "persons in family" or "persons per family" are cross-tabulated by ethnic origin or race, the ethnic origin or race refers to the householder rather than the ethnic origin or race of each individual.

*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 were defined during processing of sample data. In selected tabulations, subfamilies were 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-couple household* is a household 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* 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 years old).

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

**Limitations.** There are no systematic errors apparent in the data collected by the 1990 census of Palau on household type and relationship.

**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." The 1980 nonrelative category "paid employee" has been dropped.

### *GROUP QUARTERS*

The Census Bureau classifies all persons not living in households as living in group quarters. The Bureau recognizes two general categories of persons in group quarters: (1) institutionalized persons and (2) other persons in group quarters (also referred to as "noninstitutional group quarters"). Group quarters do not yet play a particularly important role in Palau.

Institutionalized persons include 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, length of stay, or number of persons in the institution. Generally, institutionalized persons are restricted to the institution buildings or grounds (or must have passes or escorts to leave) and thus have limited interaction with the surrounding community. Also, institutionalized persons generally are under the care of trained staff who have responsibility for their safekeeping and supervision. Details on various types of institutions appear in the main 1990 census volume for Palau (U.S. Bureau of the Census, 1992c, pp. B-7 - B-9).

Other persons in group quarters include those who live in group quarters other than institutions. Persons who live in rooming houses, group homes (homes for the mentally ill, mentally retarded, physically handicapped, abusers of drug or alcohol, and other group homes), and religious group quarters are classified as other persons in group quarters when there are 10 or more unrelated persons living in the unit; otherwise, these living quarters are classified as housing units. Persons living in college dormitories, agricultural workers' dormitories, other workers' dormitories, and emergency shelters for homeless persons are classified as living in group quarters regardless of the number of inhabitants, as are crews of maritime vessels and staff residents of institutions. Finally, noninstitutional group quarters include individuals living in other nonhousehold living situations (e.g., YMCAs, youth hostels) and in living quarters for victims of natural disasters. Details on various types of noninstitutional group quarters appear in the main 1990 census volume for Palau (U.S. Bureau of the Census, 1992c, pp. B-9 - B-10).

Limitations. Two types of errors can occur in the classification of types of group quarters: misclassification or no classification. During the 1990 Special Place operation, enumerators determined the type of group quarters associated with each special place in their assignment. Census Bureau personnel subsequently edited unacceptable group quarter codes, as described in greater detail in the main 1990 census volume for Palau (U.S. Bureau of the Census, 1992c, Appendix C).

Comparability. For the 1990 census, the Census Bureau revised the definition of institutionalized persons so that *care* only included persons under organized medical or formally-authorized,

supervised care or custody. As a result of this change to the institutional definition, maternity homes were treated as noninstitutional rather than institutional group quarters (as in previous censuses). The 1990 census classified the following types of other group quarters 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. 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 criterion was six or more unrelated persons.

Several changes also occurred in the identification of specific types of group quarters. For the first time, the 1990 census identified separately the following types of correctional institutions: halfway houses (operated for correctional purposes), military stockades and jails, and police lockups. In 1990, tuberculosis hospitals or wards were included with hospitals for the chronically ill; in 1980, they were shown separately. For 1990, the noninstitutional group quarters category "group homes" was further classified as group homes for drug or 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 were classified with other group homes only if 10 or more unrelated persons shared the unit — otherwise they were classified as housing units.

The 1990 census classified workers' dormitories 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 group quarters. In 1960, data on persons in military barracks were shown only for men; in subsequent censuses, they included 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 or alcohol abuse and military hospitals for the chronically ill. The noninstitutional group quarters categories added include emergency shelters for homeless persons and shelters for abused women.

### *MARITAL STATUS*

The 1990 census collected information on marital status with questionnaire item 6, asked of all persons. The marital status classification refers to the status at the time of enumeration. The Census

Bureau tabulated data on marital status only for persons aged 15 years and older. All persons were asked whether they were "now married," "widowed," "divorced," "separated," or "never married." Couples who live together (unmarried persons, persons in common-law marriages) were allowed to report the marital status they considered the most appropriate.

- Never married -- includes all persons who never have been married, including persons whose only marriages were annulled.
- Ever married -- includes persons married at the time of enumeration (including those separated), widowed, or divorced.
- Now married, except separated -- includes persons whose current marriage has not ended through widowhood, divorce, or separation (regardless of previous marital history). The category also may include couples who live together or persons in common-law marriages, if they consider this category the most appropriate. In certain tabulations, currently married persons are further classified as "spouse present" or "spouse absent."
- Separated -- includes persons legally separated or otherwise absent from their spouse because of marital discord. Included are persons who have been deserted or who have parted because they no longer want to live together but who have not obtained a divorce.
- Widowed -- includes widows and widowers who have not remarried.
- Divorced -- includes persons who are legally divorced and who have not remarried.
- Now married -- includes all persons whose current marriage has not ended by widowhood or divorce. This category includes persons defined above as "separated."
- Spouse present -- includes married persons whose wife or husband was enumerated as a member of the same household, including those whose spouse may temporarily have been absent for such reasons as travel or hospitalization.
- Spouse absent -- includes married persons whose wife or husband was not enumerated as a member of the same household. This category also includes all married persons living in group quarters.
- Separated -- defined above.
- Spouse absent, other -- includes married persons whose wife or husband was not enumerated as a member of the same household, excluding separated persons. Included is any individual whose

spouse was employed and living away from home or in an institution or absent in the Armed Forces.

When a subject did not report marital status, Census Bureau personnel imputed this information according to the relationship to the householder and sex and age of the subject. For more information on imputation, see Appendix A).

**Limitations.** There are no obvious limitations in the 1990 census data on marital status.

**Comparability.** The 1990 marital status definitions are the same as those used in 1980 with the exception of the term "never married," which replaced the term "single" in tabulations. Also, the category "consensually married" was dropped in the 1990 census.

### **Analysis of Data on Households, Families, and Marital Status**

#### *Households and Families*

Persons in households decreased from 97.5 percent to 95.5 percent of the total Palau population between 1980 and 1990 (Table 5.1). This reduction probably was due to increased immigration from the Philippines and other places, with many of the migrants living in group quarters rather than in households. Increased enrollments at the MOC probably increased the population living in the dormitories on campus. The decline in proportion of persons residing in households during the 1980s reversed the slight increase in this category observed during the 1970s.

Table 5.1. Household Characteristics: 1970, 1980, and 1990

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Characteristics	1990	1980	1970
Total persons.....	15,122	12,116	11,210
In households.....	14,440	11,813	10,769
Percent.....	95.5	97.5	96.1
In group quarters.....	682	303	441
Percent.....	100.0	100.0	100.0
Inmate of institution.....	9.8	-	4.8
Other.....	90.2	100.0	95.2
Persons per household.....	5.01	5.79	6.15
Persons per family.....	5.34	6.10	NA

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Sources: U.S. Bureau of the Census, 1972, Table 5; 1983, Table 15; 1992c, Table 7.

The number of individuals residing in group quarters in Palau more than doubled between 1980 and 1990, in contrast to the slight decline documented during the 1970s. Much of this increase during

the past decade apparently occurred in the form of inmates of institutions. According to the 1980 census data, the population of Palau included no inmates in institutions. Conversely, in 1990 the inmate population was about 10 percent of the total group quarters population, about 65 persons in all. Usually this category comprises inmates in jail.

The number of persons per household declined substantially between 1970 and 1990, the figure for the latter year nearly a 19 percent reduction from the former. The greatest reduction in persons per household occurred during the 1980s. The number of persons per family also decreased during the 1980s, by about the same amount as the decline in persons per household. Data on the number of persons per family are unavailable for 1970.

The composition of households in Palau also changed between 1970 and 1990 in terms of relationship to the householder (Table 5.2). In 1990, 20 percent of the total household members were householders, an increase of nearly 3 percentage points over the preceding decade. This increase continued a trend found between 1970 and 1980 and is consistent with the decreasing family and household size noted above. The tendency for family size to decrease as fertility decreases emerges in the declining percentage of children. The percentage of other relatives and nonrelatives in Palau households both increased substantially between 1970 and 1990. The increases in these two categories over the most recent decade were partly due to changing migration patterns. Growth in the percentage of other relatives probably reflects the increased presence of Palauan migrants residing in the home of a relative. Growth in the percentage of nonrelatives, partly involves immigrants from other countries residing with Palauans or with persons from their own country.

Table 5.2. Relationship to Householder: 1970, 1980, 1990

Characteristics	1990	1980	1970
In households.....	14,440	11,813	10,769
Percent.....	100.0	100.0	100.0
Householder.....	20.0	17.3	16.3
Spouse.....	12.8	12.1	11.5
Child.....	36.6	49.0	57.9
Other relative.....	24.1	20.7	13.0
Nonrelative.....	6.5	0.9	1.3

Sources: U.S. Bureau of the Census, 1972, Table 5; 1983, Table 15; 1992c, Table 7.

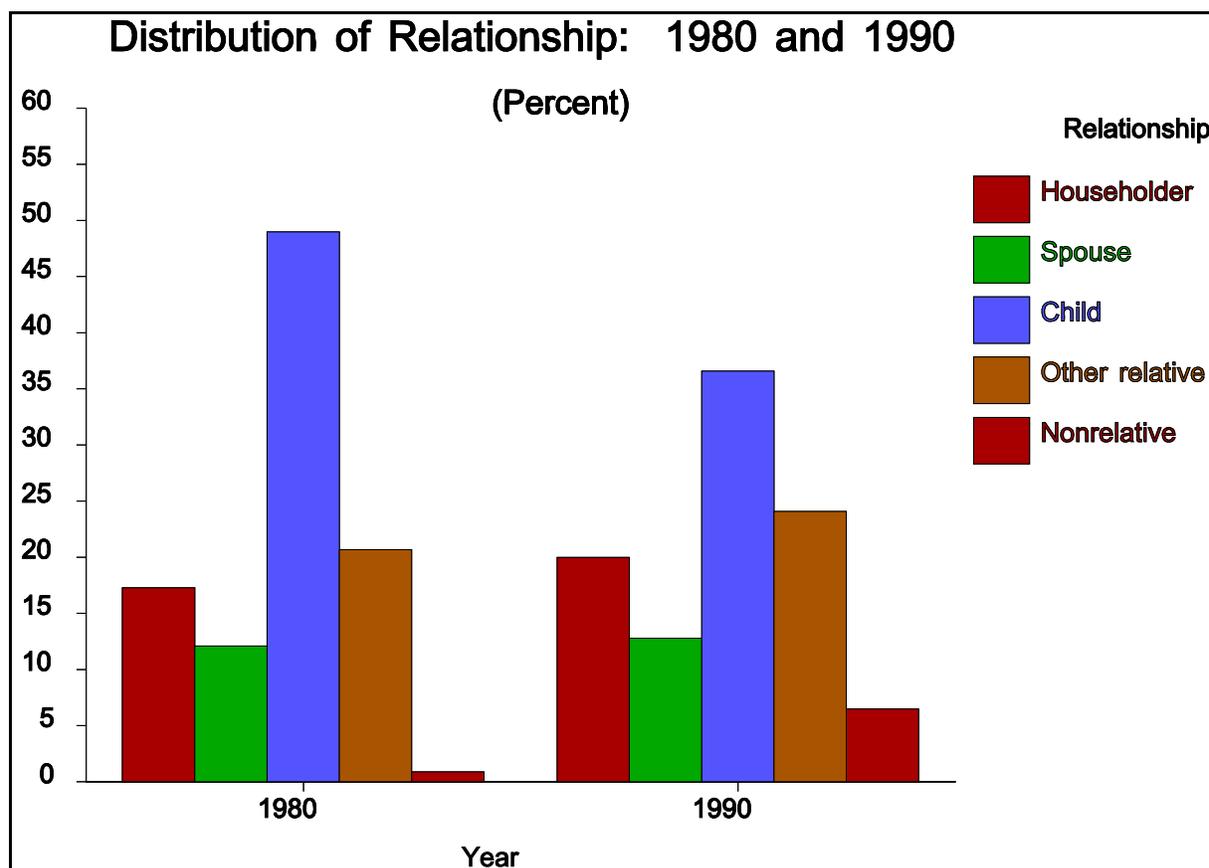


Figure 5.1. Percent Distribution of Relationship: 1980 and 1990

Koror and Airai states, by virtue of their population sizes, once again greatly influenced the distribution of relationship by state (Table 5.3). However, in 1990, whereas the number of persons per household and per family were greater in Koror State than all Palau, both measures for Airai State were less than those for Palau. Average household and family sizes for other states varied around the figures for these two states. More dramatic deviations, such as seen for Hatohobei and Ngatpang states, are an artifact of small population sizes rather than true differences in the size of households or families in either place.

Table 5.3. Household Characteristics, by State: 1990

State	Total	Percent							Persons per:	
		Total	House- holder	Spouse	Child	Other	Non-	Hhold	Family	
Total.....	14,440	100.0	20.0	12.8	36.6	24.1	6.5	5.01	5.34	
Aimeliik.....	439	100.0	18.5	12.5	34.4	27.3	7.3	5.42	5.79	
Airai.....	1,234	100.0	20.7	13.9	37.7	19.9	7.8	4.82	5.12	
Angaur.....	206	100.0	24.3	11.7	35.4	27.7	1.0	4.12	4.85	
Hatohobei.....	22	100.0	18.2	4.5	31.8	40.9	4.5	5.50	6.67	
Kayangel.....	137	100.0	22.6	12.4	40.1	24.8	-	4.42	5.42	
Koror.....	9,819	100.0	19.5	12.4	36.6	23.7	7.9	5.14	5.46	
Melekeok.....	244	100.0	20.1	13.9	40.6	24.6	0.8	4.98	5.11	
Ngaraard.....	310	100.0	22.9	15.5	39.4	21.6	0.6	4.37	5.09	
Ngerchelongs....	354	100.0	22.0	14.1	34.2	29.1	0.6	4.54	4.97	
Ngardmau.....	149	100.0	19.5	14.1	36.9	29.5	-	5.14	5.44	
Ngatpang.....	62	100.0	22.6	14.5	29.0	24.2	9.7	4.43	4.23	
Ngchesar.....	287	100.0	21.3	13.9	34.1	28.6	2.1	4.70	5.07	
Ngaremlengui...	281	100.0	19.6	14.6	43.8	21.7	0.4	5.11	5.25	
Ngiwal.....	234	100.0	22.2	15.8	29.5	31.6	0.9	4.50	4.91	
Peleliu.....	601	100.0	21.8	13.0	33.1	30.0	2.2	4.59	4.84	
Sonsorol.....	61	100.0	18.0	6.6	59.0	13.1	3.3	5.55	5.80	

Source: U.S. Bureau of the Census, 1992c, Table 7.

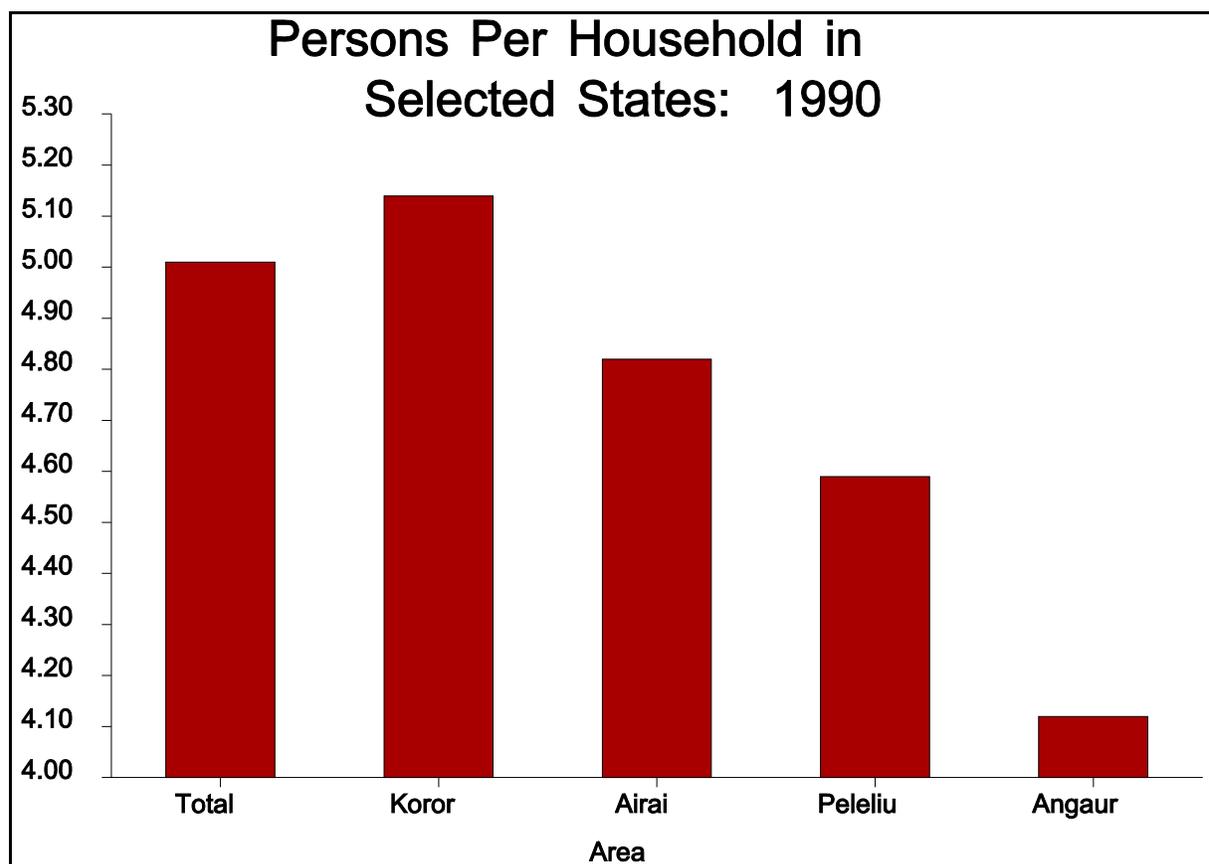


Figure 5.2. Persons per Household in Selected States: 1990

Differences between states in Palau also existed in household composition. The percentage of each household represented by the householder varied little geographically. However, the percentages of other household members differed considerably between states — the data once again dominated by Koror and Airai states. The percentages of household residents who were related to the householder (spouses, children, or other relatives) tended to be greater in most rural states than in the urbanized state of Koror. In contrast, both Airai and Koror states had households with larger percentages of non-relatives — probably a consequence of the large foreign immigrant populations residing in each of these jurisdictions. Certain percentages in Table 5.3, such as the small percentages of spouses in Hatothobei and Sonsorol states and the absence of non-relatives in Kayangel and Ngatpang states, almost certainly are consequences of each jurisdiction's small resident population rather than indicative of some trend.

#### *Marital Status*

Although information on marital status rarely is used for planning or policy use, it often is of interest to the general public. Data on marital status also are important in connection with fertility. When females delay marriage — for schooling, to enter the work force, or for some other reason — they decrease both their period of exposure to fertility and their total fertility. Reduced fertility, of course, has important direct implications for population structure, and hence important indirect implications for planning and policy issues.

Married males in Palau approached 53 percent of all adult males in 1990, having increased by more than 5 percentage points over the preceding decade (Table 5.4). The proportion of married males in 1980, represented a decline since 1970. The percentage of males aged 15 years or more who were divorced or separated from their spouses grew during the 1980s, having generally increased over the preceding two decades — likely a social byproduct of increased Westernization.

Table 5.4. Marital Status for Males Aged 15 Years and Older: 1970, 1973, 1980, and 1990

Marital Status	1990	1980	1973	1970
Males, 15 yrs. and over.....	5,773	3,783	3,340	3,210
Percent.....	100.0	100.0	100.0	100.0
Single.....	41.8	47.5	45.3	44.6
Married.....	52.8	47.7	50.2	50.6
Separated and divorced.....	4.0	3.1	2.3	3.3
Widowed.....	1.4	1.6	2.1	1.5

Sources: U.S. Bureau of the Census, 1972, Table 6; 1983, Table 15; 1992c, Table 7; Office of Census Coordinator, TTPI, 1975, special tabulation.

Notes: Figures for 1970 consider only persons aged 14 years and over; figures for 1973 consider only TTPI-born persons.

The percentage of females in Palau aged 15 years or more and married also increased between 1980 and 1990, although not to the degree that the percentage of their male counterparts increased (Table 5.5). The percentage of married females decreased by nearly 3 percentage points over the final seven years of the 1970s after experiencing a substantial increase during the first three years of that decade.<sup>3</sup> Interestingly, the percentage of married males exceeded the percentage of married females in 1990. This reverses the trend found in 1970, 1973, and 1980 and runs counter to the general tendency for greater proportions of females to be married than males (due to the propensity for the former to marry at earlier ages). This shift in marriage patterns during the 1990s likely is a

<sup>3</sup>It is important to note that the data for 1973 are unlikely. As is often the case when comparing census data obtained from different sources, collected for different reasons, and processed differently, it is impossible to tell exactly why the data are anomalous.

consequence of the large number of adult male immigrants who moved to Palau, many of whom left their families behind in their home country while working for a time in Palau.

Table 5.5. Marital Status for Females Aged 15 Years and Older: 1970, 1973, 1980, and 1990

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Marital Status	1990	1980	1973	1970
Females, 15 yrs. and over.....	4,773	3,499	3,195	3,155
Percent.....	100.0	100.0	100.0	100.0
Single.....	32.4	34.0	33.1	39.3
Married.....	52.6	51.5	54.3	48.1
Separated and divorced.....	5.4	6.1	5.0	7.4
Widowed.....	9.5	8.4	7.5	5.1

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Sources: U.S. Bureau of the Census, 1972, Table 6; 1983, Table 15; 1992c, Table 7; Office of Census Coordinator, TTPI, 1975, special tabulation.

Notes: Figures for 1970 consider only persons aged 14 years and over; figures for 1973 consider only TTPI-born persons.

The proportion of females in Palau separated or divorced from their spouses exceeded 5 percent in 1990, although this represents a decline from figures for 1980 and 1970. The percentage of widows in Palau greatly exceeded the percentage of widowed males for all four census years examined in tables 5.4 and 5.5, a consequence of females tending to live longer than males. Data in these two tables also show a substantial increase in the percentage of widowed females over the 20 years covered, while the proportion of widowed males remained relatively constant.

The most populated states in Palau, Koror and Airai, tend to contain larger percentages of married males than did more rural states (Table 5.6). The percentages of males in these states who never married, in contrast, varied — with the percentage in Koror State lower than the republic total and the percentage in Airai State higher than the total. Rural states were more likely than urban states to contain widowed males in 1990.

Table 5.6. Marital Status for Males, by State: 1990

State	Total	Percent	Now Married	Widowed	Div- orced	Separ- ated	Never Married
Males.....	5,773	100.0	52.8	1.4	1.9	2.1	41.8
Aimeliik.....	162	100.0	55.6	0.6	-	3.7	40.1
Airai.....	484	100.0	53.1	1.0	1.2	1.2	43.4
Angaur.....	75	100.0	37.3	8.0	1.3	5.3	48.0
Hatohobei.....	12	100.0	8.3	8.3	-	-	83.3
Kayangel.....	49	100.0	42.9	-	2.0	4.1	51.0
Koror.....	4,092	100.0	53.9	1.1	2.0	1.9	41.1
Melekeok.....	83	100.0	51.8	2.4	1.2	-	44.6
Ngaraard.....	106	100.0	50.0	0.9	3.8	-	45.3
Ngardmau.....	53	100.0	47.2	-	1.9	3.8	47.2
Ngaremlengui.....	28	100.0	53.6	-	14.3	7.1	25.0
Ngatpang.....	94	100.0	48.9	3.2	-	1.1	46.8
Ngchesar.....	88	100.0	58.0	1.1	5.7	3.4	31.8
Ngerchelong.....	108	100.0	59.3	0.9	0.9	2.8	36.1
Ngiwal.....	90	100.0	51.1	3.3	-	3.3	42.2
Peleliu.....	224	100.0	44.6	2.7	2.7	3.6	46.4
Sonsorol.....	25	100.0	24.0	4.0	-	4.0	68.0

Source: U.S. Bureau of the Census, 1992c, Table 7.

Considerable geographic variability also existed in the marital status of females among the states in Palau in 1990 (Table 5.7). The percentage of married women in Koror State was less than that found in the republic as a whole — possibly due to migration patterns, possibly to more Westernized urban females to marry later than females living elsewhere. Similarly, the percentage of divorced females also was greater in Koror than in most other states. The two most modern, populated states in Palau had, with few exceptions, much lower percentages of widows than more rural states, reflecting differences in access to modern medical treatment coupled with the comparatively more difficult life led outside the more urban areas and return to own village from Koror later in life. Problems with small numbers limit many of the insights on female marriage patterns for individual states.

Table 5.7. Marital Status for Females, by State: 1990

State	Total	Percent	Now Married	Now Widowed	Divorced	Separated	Never Married
Females.....	4,773	100.0	52.6	9.5	3.0	2.5	32.4
Aimeliik.....	131	100.0	55.7	10.7	1.5	2.3	29.8
Airai.....	374	100.0	58.6	8.0	0.8	2.7	29.9
Angaur.....	69	100.0	39.1	18.8	-	1.4	40.6
Hatohebei.....	4	100.0	50.0	-	-	25.0	25.0
Kayangel.....	38	100.0	55.3	5.3	-	10.5	28.9
Koror.....	3,355	100.0	51.2	8.1	3.6	2.6	34.5
Melekeok.....	76	100.0	57.9	15.8	-	3.9	22.4
Ngaraard.....	93	100.0	57.0	10.8	1.1	-	31.2
Ngardmau.....	43	100.0	58.1	27.9	2.3	-	11.6
Ngaremlengui.....	20	100.0	60.0	25.0	-	-	15.0
Ngatpang.....	86	100.0	54.7	19.8	1.2	-	24.4
Ngchesar.....	85	100.0	58.8	10.6	2.4	1.2	27.1
Ngerchelong.....	120	100.0	55.0	15.8	1.7	2.5	25.0
Ngiwal.....	64	100.0	70.3	12.5	1.6	1.6	14.1
Peleliu.....	200	100.0	52.5	14.5	4.0	2.5	26.5
Sonsorol.....	15	100.0	33.3	13.3	-	-	53.3

Source: U.S. Bureau of the Census, 1992, Table 7.

Changing marriage patterns also emerge in the *singulate mean age at marriage* (Table 5.8), the average age at first marriage for a group of people (Hajnal, 1953). In 1990 the singulate mean of age at marriage for the population of Palau was nearly 28 years, having increased steadily over the preceding 17 years. The singulate mean age at marriage increased for both males and females between 1973 and 1990, with the mean age of the former exceeding that of the latter in each of the three census years. Since most females in Palau still give birth within marriage, this increase in age at first marriage tends to increase the age when their first child is born — in the process decreasing total fertility.

Table 5.8. Singulate Mean Age at Marriage: 1973, 1980, and 1990

	1990	1980	1973
Total.....	27.7	26.9	25.5
Males.....	29.2	28.3	26.6
Females.....	27.2	25.1	24.8

Sources: Office of Census Coordinator, TTPI, 1975, Table 5; U.S. Bureau of the Census, 1983, Table 19; 1992c, Table 35.

## Conclusions

Both household composition and marital status have changed in Palau over the past two decades. As immigration to the republic continued, dominated at least in the last decade by working age males, the percentage of the total population living in households has decreased. Barring any major change in migration patterns, this trend for the percentage in households to decline likely will continue. Within Palau, increased evidence exists of relatives moving from rural areas to urban areas for schooling and jobs — changing the composition of the households and families in both the urban and rural areas. The selective outmigration of other Palauans for schooling and jobs on Guam, in the CNMI, in Hawaii, and on the U.S. mainland also affects the composition of the families and households remaining in Palau.

Marital patterns also have evolved in Palau over the last 20 years. In general, the percentage of married individuals increased between 1970 and 1990 among both males and females. The proportion of males separated or divorced increased substantially, as did the percentage of widowed females — the latter showing increased life expectancy more than change in marital behavior. Both males and females tended to be older when marrying for the first time in 1990. As with household composition and many other topics covered in this monograph, these changes in marital patterns are in part a consequence of recent migration flows, such as the selective emigration of single individuals and the selective immigration of married males unaccompanied by their families.

## CHAPTER 6. FERTILITY

Fertility plays a vital role in giving shape to the age-sex structure and in producing the change in population size. The age distribution of a population is more sensitive to changes in fertility than to changes in mortality. The proportion of a population that is young or old depends mainly on the birth rate and not on the death rate, because as people live longer, the population structure, as a whole, becomes older rather than younger. A population has an increasing proportion of older people when the birth rates fall and not because the death rates fall. Any decline in mortality makes the age distribution younger as more children survive. The decline in mortality has very little effect at middle ages. On the other hand, any decline in fertility necessarily makes the population older since it reduces the proportion of children.

Measures of fertility quantify the birth performance over time. These measures can be used to compare the fertility levels of a number of populations during a particular time interval to exhibit a time trend in fertility. Fertility measures include crude birth rate, gross fertility rate, general fertility rate, and rate of reproduction. Analysis of fertility trends in the Pacific is not abundant, and Palau is no exception. Although Palau has had regular censuses, and a great deal of information has been collected, no one looked systematic at fertility trends until recently (Levin and Retherford 1986).

Like mortality, fertility has begun to decline in many developing countries in recent decades, and in Palau, the fertility decline in recent years has been striking. However, in spite of significant reductions, birth rates (the number of births per 1,000 population) in Palau remain substantially higher than in the United States and over economically "developed" countries.

### Definitions

Census data on fertility (also referred to as 'children ever born') were derived from answers to questionnaire item 20, which was asked of women 15 years old and over regardless of marital status. Stillbirths, stepchildren, 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 '15 or more' children is assigned a value of 15.

**Comparability.** — The wording of the question on children ever born was the same in 1990 as in 1980. In 1970, however, the terminal category was '12 or more' children ever born. In virtually all of the tables in 1970 census volume, data presented on children ever born to all women 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 are not comparable between 1980 reports and previous census reports. Data presented for children ever born between 1980 and 1990 reports are comparable as well as all tables for all census years which show data for ever-married women.

## **Analysis of Fertility Data**

### *Fertility by Age*

Table 6.1 shows the number of children ever born per 1,000 women in the 1973, 1980, and 1990 censuses. The number of children ever born per 1,000 women is a standard measure used in large countries to give several significant digits. However, in small areas like Palau, an easier measure to use might be "children per woman". For example, in 1990, each 1,000 women 45 to 49 years old in Palau had 4,416 children. Since there were only 291 women in this age group in Palau, the last digits in the rate are not significant, and the number is not particularly easy to use. We can think of the rate as 4.4 children per woman, meaning that the average woman 45 to 49 years old in Palau in 1990 had had 4.4 children up to that age. In most cases, fertility is over by that age, so this value gives a pretty good estimate of the total fertility rate for these women — the total number of children these women would have during their reproductive periods.

Table 6.1. Children Ever Born by Age of Woman: 1973, 1980 and 1990

Age Group	Children Per 1000 Women			Women			Children		
	1990	1980	1973	1990	1980	1973	1990	1980	1973
Total.....	2,790	3,286	3,674	4,773	3,499	3,172	13,315	11,499	11,653
15 to 19 years...	87	155	164	669	708	714	58	110	117
20 to 24 years...	666	930	1,284	602	455	443	401	423	569
25 to 29 years...	1,306	2,114	2,845	604	411	284	789	869	808
30 to 34 years...	2,044	3,521	4,327	570	315	257	1,165	1109	1112
35 to 39 years...	3,057	4,907	5,379	523	503	243	1,599	2468	1307
40 to 44 years...	3,613	(**)	7,684	359	(**)	209	1,297	(**)	1606
45 to 49 years...	4,416	6,674	7,711	291	389	228	1,285	2596	1758
50 to 54 years...	5,265	(**)	6,600	234	(**)	185	1232	(**)	1221
55 to 59 years...	6,200	6,235	6,144	195	217	187	1209	1353	1149
60 to 64 years...	6,553	5,657	(**)	206	137	(**)	1350	775	(**)
65 to 69 years...	6,601	4,934	4,869	178	364	291	1175	1796	1417
70 to 74 years...	5,508	(**)	(**)	132	(**)	(**)	727	(**)	(**)
75 + years.....	4,895	(**)	4,496	210	(**)	131	1028	(**)	589

Sources: Office of Census Coordinator, TTPI, 1975, Table 25; U.S. Bureau of the Census, 1984, Table 19; 1992c, Table 35.

Notes: For 1980, 35 to 44 shown in 35 to 39, 45 to 54 shown in 45 to 49, and 65 and over shown in 65 to 69; for 1973, 60 to 74 shown in 65 to 69. The symbol (\*\*) signifies these ranges in the table.

So, the average woman 45 to 49 years old in Palau had 4.4 children. If the average woman has about 2.1 children, the population would remain steady, neither increasing nor decreasing (this value might be exactly 2 to replace the mother and the father, but some people die before reproducing, so we factor that in.) At the rate of 4.4 children per woman, the population would be doubling fairly rapidly. However, the number of children per woman is decreasing over time. For example, in the 1980 census, the average woman in this age group -- 45 to 49 years old -- had had 6.7 children, and in 1973 the value was 7.7. Therefore, while the total fertility rate was almost 8 children per woman in the early 1970s, the value declined rapidly during the 1970s and 1980s.

We see that the values above and below the 45 to 49 year group tend to be lower. For the younger ages, many women have not completed their fertility, so the values would be lower. Many of these women are controlling their fertility — delaying starting families, waiting longer before having more children, and having fewer children over all. Some of the older women forget children they had, especially those who died young. Others had fewer children because health care wasn't as good in the past, so fewer children were born.

Table 6.1 also shows the total children ever born for all women 15 years and over. These values decreased from 3.7 children per woman in 1973 to 3.3 in 1980, and then on down to 2.8 in 1990. Since much of the decline was in the youngest age groups, it is likely that this decline will continue.

In many societies around the world, children ever born in censuses is only collected from ever married women, but if we did that in Palau, we would lose information about the fertility of the population. While the average woman in 1990 had 2.8 children, the average ever-married woman had 3.9 children, an average of one child more (Table 6.2). What this means is that women who have never married have fewer children than those who do marry, a not unreasonable finding. Women are more likely to have children within marriage than before marriage since the period of time is longer. Table 6.2 shows that at every age the children per 1,000 ever married women in 1990 was greater than the number of children ever born for all women.

Table 6.2. Children Ever Born by Age of Woman: 1990

Age Group	All Women			Ever Married Women		
	Women	Ever Born	Children per 1,000 Women	Women	Ever Born	Children per 1,000 Women
Total.....	4,773	13,315	2,790	3,227	12,537	3,885
15 to 19 years.....	669	58	87	28	19	679
20 to 24 years.....	602	401	666	218	257	1,179
25 to 29 years.....	604	789	1,306	358	637	1,779
30 to 34 years.....	570	1,165	2,044	443	1,046	2,361
35 to 39 years.....	523	1,599	3,057	462	1,502	3,251
40 to 44 years.....	359	1,297	3,613	336	1,246	3,708
45 to 49 years.....	291	1,285	4,416	269	1,235	4,591
50 to 54 years.....	234	1,232	5,265	219	1,191	5,438
55 to 59 years.....	195	1,209	6,200	183	1,165	6,366
60 to 64 years.....	206	1,350	6,553	200	1,333	6,665
65 to 69 years.....	178	1,175	6,601	176	1,166	6,625
70 to 74 years.....	132	727	5,508	128	721	5,633
75 years and over..	210	1,028	4,895	207	1,019	4,923

Source: U.S. Bureau of the Census, 1992, Table 35.

### *Fertility by Birthplace of Mother*

Mothers born on Palau tended to have higher fertility than immigrant women in both 1980 and 1990 (Table 6.3 and Figure 6.1). The average mother aged 15 to 44 years in 1990 had 1.6 children, down from 2.1 in 1980, a decrease of about half a child. The decrease for Palau-born women was about the same, from 2.1 to 1.7 children per woman, but the decrease for immigrants, while less -- from 1.5

to 1.2 -- still left migrant women with lower fertility than the "native" born women. Some of this difference can be explained by young, single immigrant women not having married (particularly Filipino maids). Also, a general self-selection for migrants without children is likely.

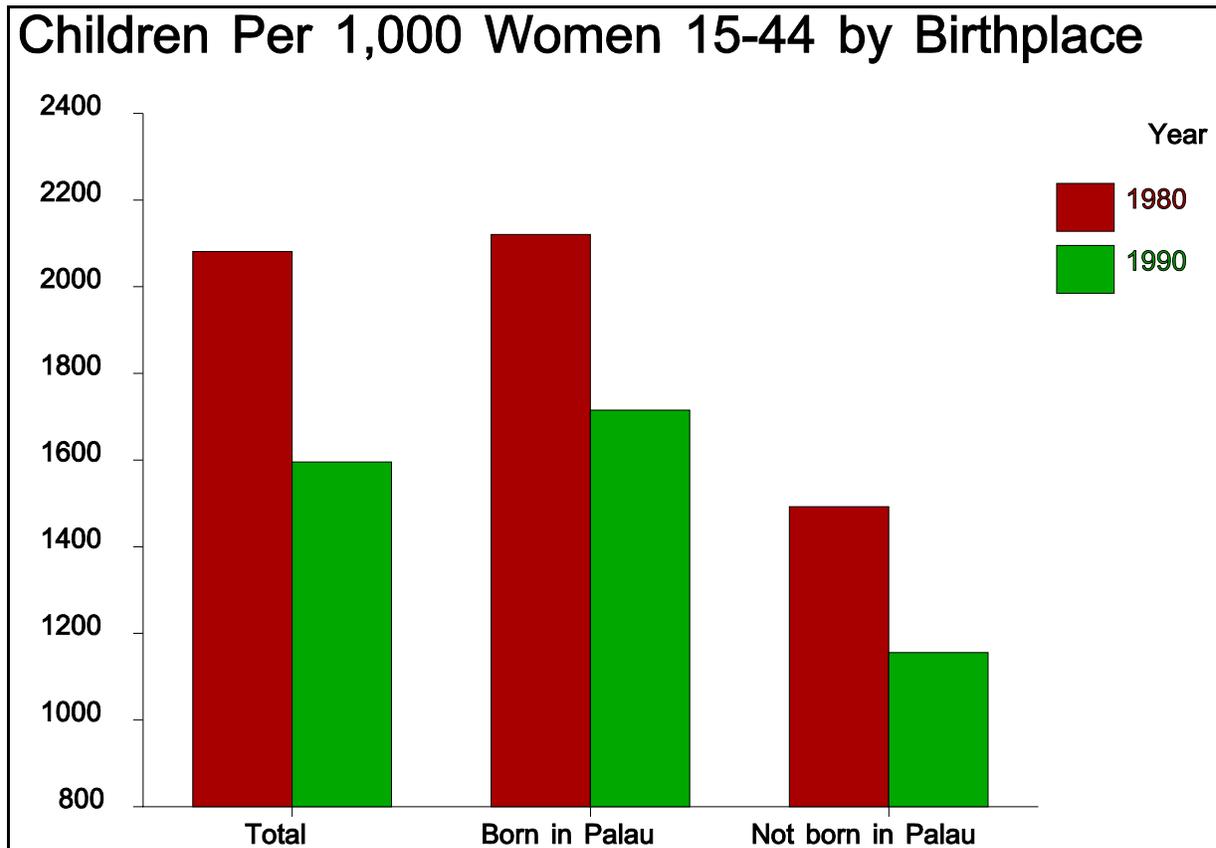


Figure 6.1. Children per 1,000 Women 15 to 44 Years by Birthplace: 1980 and 1990

Table 6.3. Children by Birthplace Born to Mothers Aged 15-44: 1980 and 1990

Children Ever Born	Number			Per 1000 Women		
	Total	Born on	Not Born	Total	Born on	Not Born
		Palau	Palau		Palau	Palau
1990.....	5,309	4,485	824	1,596	1,716	1,156
1980.....	4,979	4,752	227	2,082	2,121	1,493

Source: U.S. Bureau of the Census, 1984, Table 24; 1992c, Table 46.

In 1990, Palau-born women had higher fertility than women born outside Palau (Table 6.4). The average Palau-born woman had had almost 2.0 children compared to about 1.8 for all women in Palau. So, women born elsewhere had lowered fertility. Palau-born females at each age had higher fertility than their immigrant counterparts.

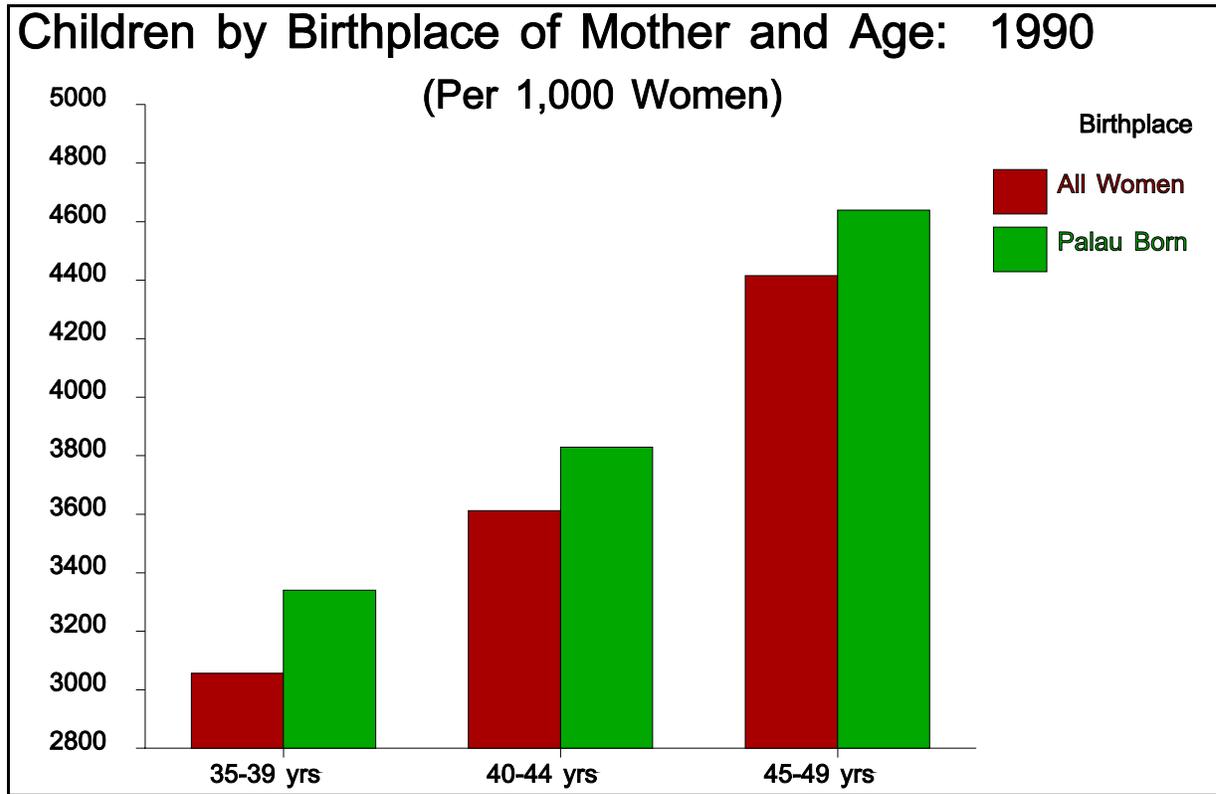


Figure 6.2. Children Ever Born to All Women and Palau-born Women by Age of Mother: 1990

Table 6.4. Children Ever Born to All Women and Palau-born Women, by Age of Woman: 1990

Age Group	All Women			Palau-Born Women		
	Women Ever Born	Children per 1,000 Women Ever Born	Children per 1,000 Women	Women Ever Born	Children per 1,000 Women Ever Born	Children per 1,000 Women
Total.....	3,618	6,594	1,823	2,864	5,645	1,971
15 to 19 years.....	669	58	87	620	55	89
20 to 24 years.....	602	401	666	434	355	818
25 to 29 years.....	604	789	1,306	449	705	1,570
30 to 34 years.....	570	1,165	2,044	430	954	2,219
35 to 39 years.....	523	1,599	3,057	393	1,313	3,341
40 to 44 years.....	359	1,297	3,613	288	1,103	3,830
45 to 49 years.....	291	1,285	4,416	250	1,160	4,640

Source: U.S. Bureau of the Census, 1992, Table 46.

Generally a curvilinear relationship existed between fertility and educational attainment, a phenomena seen in many countries, and usually attributed to lack of knowledge about health and sanitation being related to lack of formal education. The total figures in table 6.5 do not show this relationship, but may be obscured by small numbers (although women with completed fertility are present in even smaller numbers.) Nonetheless, while the average female in Palau aged 45 to 49 in 1990 had 4.4 children, women who had only finished elementary school had had 4.6 children, those with some high school education had 5.1 children, high school graduates had 4.3 children, those with some college 3.9, and those with college degrees, 3.3. This curve was seen for most of the age groups of women. In general, except for the lowest educational attainment, the higher the educational attainment, the lower the fertility. If Palau wants to reduce its fertility, one good method is to encourage women to stay in school longer!

Table 6.5. Children Ever Born Per 1,000 Women, by Age and Educational Attainment: 1990

Age Group	Total	Educational Attainment				
		Elementary	High School	High School Graduate	Some College (inc AS)	College Graduate
Total.....	1,823	2,519	1,455	1,985	1,655	1,838
15 to 19 years.....	87	210	56	139	133	-
20 to 24 years.....	666	949	946	684	448	192
25 to 29 years.....	1,306	1,860	1,757	1,345	1,216	424
30 to 34 years.....	2,044	2,209	2,674	2,200	1,808	1,341

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35 to 39 years.....	3,057	3,941	3,692	3,176	2,613	2,288
40 to 44 years.....	3,613	4,508	3,984	3,433	3,195	3,190
45 to 49 years.....	4,416	4,588	5,118	4,300	3,882	3,364

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Source: U.S. Bureau of the Census, 1992, Table 66.

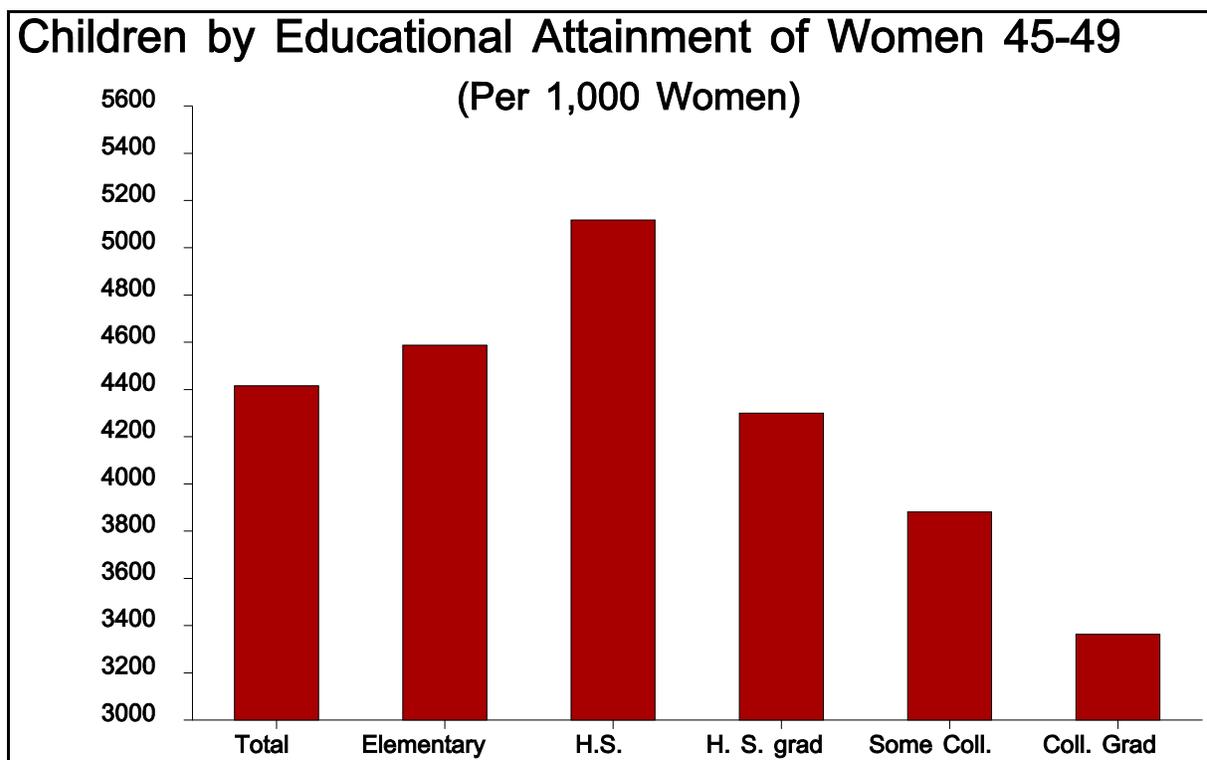


Figure 6.3. Children Ever Born per 1,000 Women 45 to 49 by Educational Attainment: 1990

Finally, in this section, we show children ever born by labor force participation of women. It is important to remember that the labor force participation is "current" labor force participation. While women moved in and out of the labor force as they had their children, we only have information for the time of the 1990 census. In 1990, the average woman between 16 and 49 years old had an average of 2.0 children (note that this value is lower than that used above because women aged 50 and over are excluded from this table)(Table 6.6).

Table 6.6. Children Ever Born Per 1,000 Women by Age and Labor Force Participation: 1990

Age Group	Total	In Labor Force				Not in labor force
		Total	Employed		Unem- ployed	
			Total	35+ hrs		
Total.....	1,995	2,039	2,048	2,036	1,919	1,702
16 to 19 years.....	106	258	302	263	158	85
20 to 24 years.....	626	586	568	582	706	774
25 to 29 years.....	1,197	1,167	1,090	1,069	1,800	1,625
30 to 34 years.....	1,956	1,894	1,873	1,901	1,929	2,383
35 to 39 years.....	2,950	2,903	2,855	2,828	3,640	3,475
40 to 44 years.....	3,453	3,369	3,336	3,285	5,333	4,212
45 to 49 years.....	4,174	4,033	3,954	3,885	5,889	5,075

Source: U.S. Bureau of the Census, 1992, Table 71.

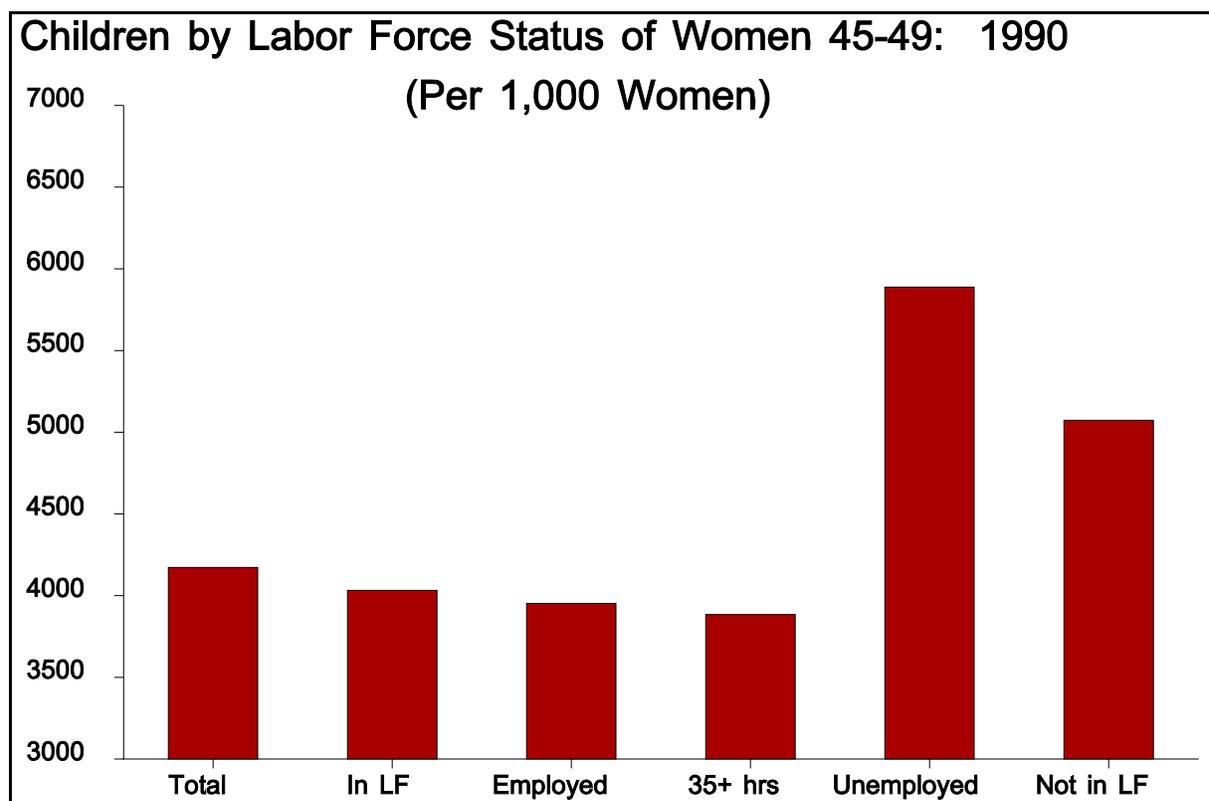


Figure 6.4. Children Ever Born per 1,000 Women 45 to 49 by Labor Force Status: 1990

The average woman 45 to 49 years old in this table had had 4.2 children, with those in the labor force having fewer children than those "not in the labor" force. Women of this age in the labor force had had 4.0 children, while those who were not in the labor force had had 5.1 children, more than one additional child. Women who were employed and at work had about 4.0 children, while those who were unemployed had 5.9 children. Hence, Palau could reduce its fertility by making sure that jobs are available to its women.

#### Direct Estimation of Fertility

Several indices can be calculated based on information on births and population for measuring fertility and reproduction. Such information, which is not always free of errors, is provided by vital registers, censuses, and surveys. One of the most frequently used indices is the crude birth rate, which is directly related to natality and population growth. Other indices, such as the general fertility rate, age-specific fertility rates, and the total fertility rate, are used for measuring fertility

levels and reproduction. Indices less frequently used or analyzed are the gross reproduction rate and the net reproduction rate; both of these are closely related to the concept of reproduction, or "replacement" of the population.

### Crude birth rate (CBR)

The crude birth rate, or the number of infants born in a year per 1,000 persons in a population, is calculated as the number of births occurring in a year divided by the population at midyear, times 1,000. Table 6.7 gives crude birth rates for recent years in Palau.

Table 6.7. Total Number of Live Births; Total, Infant, and Fetal Deaths; Crude Birth and Death Rates, and Infant and Fetal Mortality Rates, Palau: 1980 to 1990

	Popu- lation	Live Births	Crude Birth Rate	Crude Deaths	Crude Death Rate	Infant Deaths	Infant Mort. Rate	Fetal Deaths	Fetal Mort. Rate
1990...	15,100	326	22	117	7.7	8	25	8	25
1989...	14,800	309	21	101	6.8	5	16	5	16
1988...	14,500	292	20	112	7.7	8	27	8	27
1987...	14,200	311	22	96	6.8	6	19	6	19
1986...	13,900	347	25	87	6.3	9	26	50	144
1985...	13,600	337	25	95	7.0	9	27	71	211
1984...	13,300	337	25	84	6.3	11	33	51	151
1983...	13,000	306	24	84	6.5	7	23	43	141
1982...	12,700	315	25	91	7.2	7	22	52	165
1981...	12,400	281	23	77	6.2	4	14	41	146
1980...	12,100	296	24	94	7.8	8	27	8	...

Source: Bureau of Health Services, Republic of Palau, unpublished data.

Notes: Populations are estimated using 1980 and 1990 censuses as base. Crude birth and death rates are per 1,000 persons. Infant and fetal mortality rates per 1,000 live births.

The crude birth rate is the most frequently used measure of fertility, not only because it is easy to understand, but also because it requires the least amount information. It shows the growth of population without considering loss through mortality or migration.

The crude birth rate includes men, children, and women outside reproductive ages in its base. Hence, the level of crude birth rate depends not only on the number of births, but also on the proportion of persons who are not subject to having children. Because it is affected by the sex and age structure of the population, this index is considered a "crude" measure. The crude death rate,

another crude measure, will be discussed in the next chapter. Although the crude birth rate properly reveals the number of births per 1,000 population in reproductive ages.

#### General fertility rate (GFR)

The simplest measure that limits the number of births to women of childbearing age is the general fertility rate, or the number of births in a year per 1,000 women ages 15 to 49 years. Although the general fertility rate represents a refinement over the crude birth rate, it still has its limitations. The frequency of births varies by age of woman within the span of reproductive ages, and so populations in which women have the same frequency of births at each age may have different general fertility rates due to differing age structures of women within the reproductive ages. We discuss the general fertility rate for Palau in 1990 later in this chapter.

#### Age-specific fertility rates (ASFR)

An age-specific fertility rate is calculated as the number of births in a year to mothers of a specified age per woman (or per 1,000 women) of the same age at midyear. ASFR's are usually calculated for women in each 5-year age group for ages 15 to 49 years. Although ASFR's properly measure the fertility of women in each age group it is difficult to use them to make comparisons over time. In addition, they do not easily portray the overall level of fertility. For this, a summary index was developed, called the total fertility rate.

#### Total fertility rate (TFR)

The total fertility rate is a summary measure independent of the age and sex composition of a population. It represents the average number of children a group of women would have by the end of their reproductive years if they had children according to a set of age-specific fertility rates pertaining to a particular year. In other words, if a group of women have been exposed to a given set of ASFR's from age 15 to age 50, the average number of children they would have by age 50 is the total fertility rate.

The TFR is derived by cumulating the age-specific fertility rates for all ages of women. When rates are calculated for the seven conventional 5-year age groups, the TFR is the sum of the rates for each age group, multiplied by five (the width of the age-group interval). The TFR can also be interpreted as the number of children that, on average, will replace each woman by age 50 if none of the children die.

#### Gross reproduction rate (GRR)

The gross reproduction rate is a measure analogous to the total fertility rate, but it refers only to female births. Thus, it is derived in the same manner as the TFR but uses a set of age-specific

fertility rates calculated based on female births only. As an acceptable approximation, it can also be derived by multiplying the TFR by the proportion of all births that are female. The GRR is usually interpreted as the average number of daughters that would replace each woman in the absence of female mortality from birth through childbearing years, based on a given set of age-specific fertility rates. We discuss the gross fertility rate for Palau in 1990 later in this chapter.

As a fertility measure, the gross reproduction rate has no particular advantage over the total fertility rate. It gives an index of generational replacement: it shows the extent to which a group of women would be "replaced" by female children if the women had children according to a given set of age-specific fertility rates. It is a "gross" measure of replacement because it assumes that none of the girls die before they reach the age of their mothers in the reproductive years. In actual populations, some daughters do die before reaching childbearing ages.

Table 6.8 shows numbers of live births by half-year for the 1983 to 1990 period. Half years are given to assist in making estimates, since mid-year populations are usually used for this purpose. The number of births has jumped around somewhat, partly attributable to the small numbers of total births.

Table 6.8. Registered Live Births by Half Year: 1983-1990

Month	Total	1990	1987	1986	1985	1984	1983
Total.....	1,953	326	311	347	337	337	295
January to June.....	944	163	144	170	158	174	135
July to December.....	1,009	163	167	177	179	163	160

Source: Bureau of Health Services, Republic of Palau, unpublished data.

During the 1983 to 1990 period, 1,326 males and 1,151 females were born (a ratio of 115 males per 100 females.) In 1990, the 176 males and 150 females made a ratio of 117 males per 100 females, not very different from the rest of the period. Some frequent measures of fertility depend on births in the year before the census. In the case of the 1990 Census of Palau, we need the births occurring between April 1, 1989 and March 31, 1990 to get this information. For this period, 165 males and 141 females were born (306 total), a ratio of 117 males per 100 females.

Table 6.9 shows births by age of mother, data which can be used to obtain rough age specific fertility rates. (No women over 44 years had births in 1990.) These data can also be summed to obtain a rough total fertility rate.

Table 6.9. Deliveries by Age of Mother and Type of Attendant: 1990

Age of Mother	Type of Attendant			
	Total	Physician	Medex or RN or GN	Other
Total.....	326	189	134	3
Under 15.....	6	3	1	2
15 to 19.....	48	27	21	-
20 to 24.....	102	57	44	1
25 to 29.....	77	45	32	-
30 to 34.....	54	33	21	-
35 to 39.....	32	18	14	-
40 to 44.....	7	6	1	-

Source: Bureau of Health Services, Republic of Palau, unpublished data.

### *Own Children Fertility Estimates*

The own-children method has been described in earlier publications and needs only to be recapitulated briefly here. (For more detailed accounts, see, for example, Cho 1973 and Retherford and Cho 1978.) The method is a census- or survey-based reverse-survival technique for estimating age-specific birth rates for years before a census or household survey. In most applications, enumerated children are first matched to mothers within households using information on age, sex, marital status, relation to head of household (or householder), and number of children still living. (For the 1973 and 1980 censuses of Palau, matching was based on a special question on mother's line number or person number in the household schedule, if mother was present.) These matched (i.e., own) children, classified by child's age and mother's age, are reverse-survived to estimate numbers of births by age of mother in previous years. Reverse-survival is also used to estimate numbers of women in previous years. After adjustments are made for incorrect enumeration and unmatched (non-own) children, age-specific birth rates are calculated by dividing the number of births by the number of women.

Estimates are computed for each previous year or group of years back to fifteen years before the census. Estimates are not computed further back than fifteen years because births must then be based on children at ages 15 or older at enumeration, a large proportion of whom do not reside in the same household as their mother, and hence cannot be matched. All calculations are done initially by single years of age and time (years before the census). We obtain estimates for groups of ages or groups of calendar years by aggregating numerators and denominators of single-year rates and then dividing the aggregated numerator by the aggregated denominator. For reasons of economy, the method is usually applied to census samples rather than complete counts, but because of Palau's relatively small population, the applications were to the complete counts.

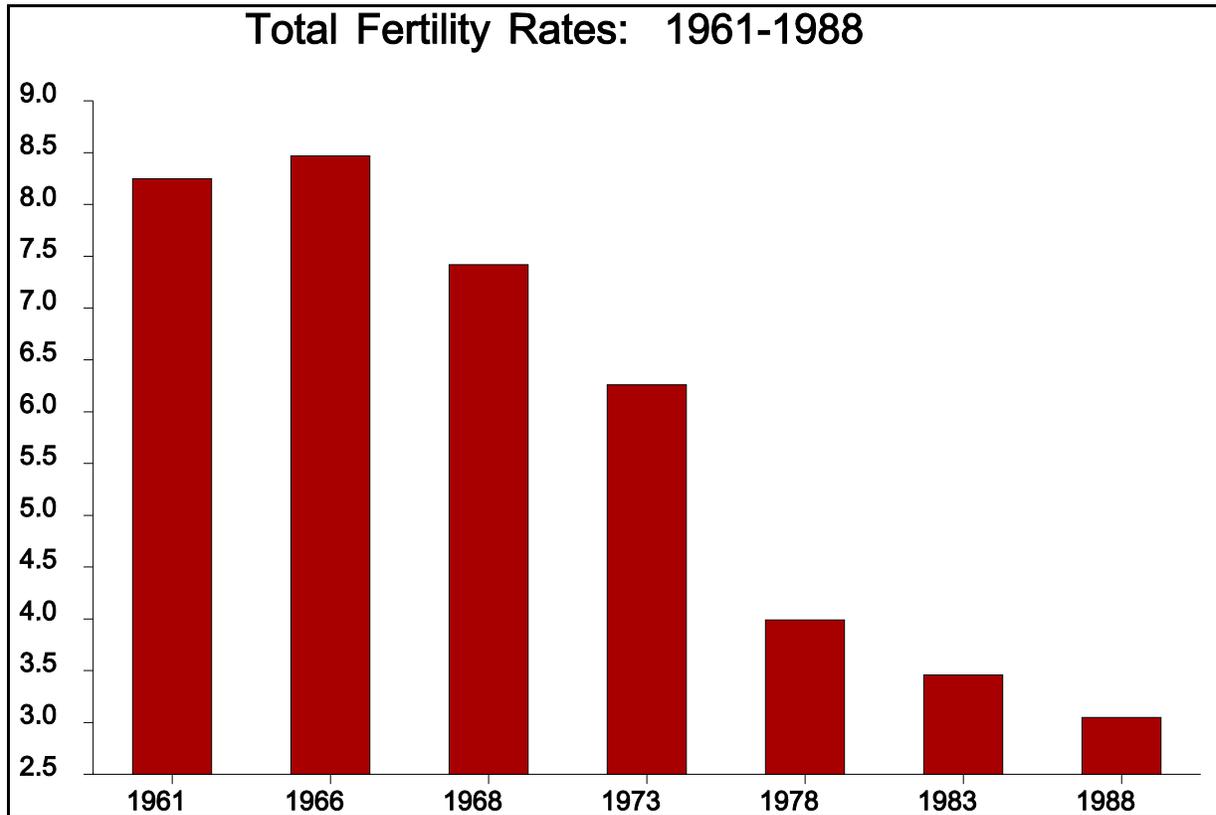


Figure 6.5. Central 5-Year Total Fertility Rates Derived by Own Children Method for Central Year: 1961 to 1988

We allocate non-own (unmatched) children to mothers by multiplying each age-specific category of own (matched) children, specified by mother's age, by the corresponding age-specific ratio of all children to own children. Thus the number of own children at a given age is adjusted upward by the same factor regardless of mother's age, thereby introducing some error in the fertility estimates. The proportionate distribution of non-own children by age of mother generally differs somewhat from the proportionate distribution of own children by age of mother.

We cannot specify non-own adjustment factors by age of mother since the mother of an unmatched child is by definition not in the household. Since older women are usually in more stable households than younger women, the nature of the error from not specifying non-own adjustment factors by mother's age is usually to reallocate erroneously a certain proportion of non-own children of a given age from younger mothers to older mothers. This error, if present, usually has little effect on the total fertility rate, but it produces an age pattern of fertility that is too low at the younger ages and

too high at the older ages. The error is minor if the adjustment factors for non-own children are low, but sometimes these factors can be quite high.

Table 6.10 shows own children fertility estimates from the last three censuses. The data mesh well with what we discussed in earlier sections of this chapter. The own children tabulations were made at the East-West Population Institute (EWPI) for the 1973 data, and at the Bureau of the Census for the 1980 and 1990 data. The new Microcomputer package developed by the EWPI greatly facilitated the processing for the 1990 data — in fact, all four Pacific Islands areas were run in one afternoon. The total fertility rates decreased precipitously throughout this period, roughly from 1960 to 1990, from almost 9 children per woman at the beginning to about 3 per woman in 1990. That is, the average woman in Palau in 1960 had about 9 children during her reproductive period, but this average decreased to 3 by 1980, a decrease of about two-thirds.

Table 6.10. Total fertility Rates and Age-Specific Birth Rates, Derived by Own-children Method, Palau: 1973, 1980 and 1990

Period of Estimate	TFR	Age-Specific Fertility Rates						
		15-19	20-24	25-29	30-34	35-39	40-44	45-49
1973:								
1959-63.....	8.25	91	271	376	368	326	140	76
1964-68.....	8.47	73	285	357	360	325	208	86
1969-73.....	6.62	81	258	294	270	223	144	54
1980:								
1966-70.....	7.42	68	267	328	299	283	152	86
1971-75.....	6.26	83	232	287	244	193	136	76
1976-80.....	4.23	53	185	211	155	100	79	63
1990:								
1976-80.....	3.99	54	161	206	166	109	79	23
1981-85.....	3.46	48	134	159	153	102	64	32
1986-90.....	3.05	38	105	138	146	105	56	21

Sources: Levin and Retherford, 1986, and unpublished data, US Bureau of the Census

Notes: Rate per woman for TFRs, per 1000 women for Age-Specific Rates

The age specific fertility rates decreased for all ages between the 1960s and 1980. For example, while females 30 to 34 in the early 1960s were having about 360 births per 1000 females in a year, by the late 1970s, this value decreased to 155 births per 1000, less than half of the early figure. However, these women experienced little more decline during the 1980s.

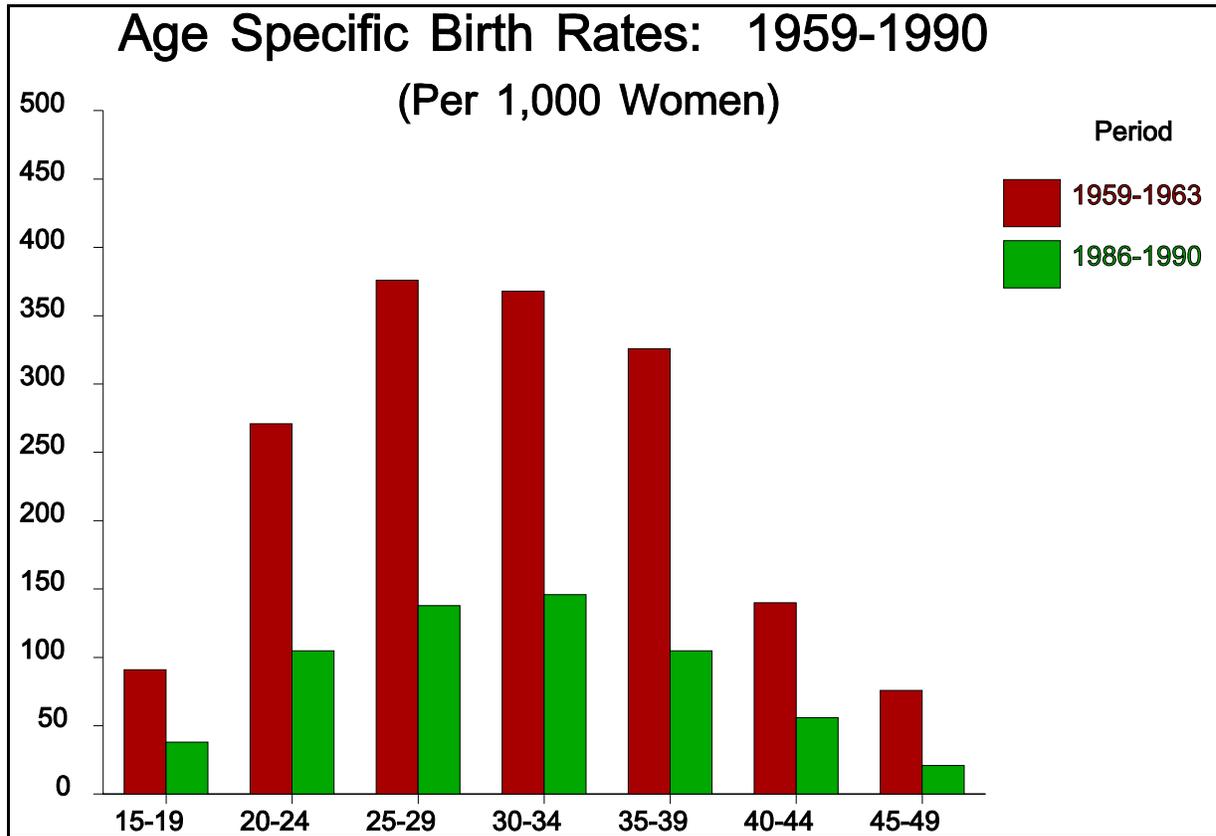


Figure 6.6. Age Specific Fertility Rates Derived by Own Children Method: 1959 to 1963 and 1986 to 1990

The 1990 census data show that while the total fertility rate continued to decrease in the 1980s, the decrease was much less than in earlier decades. The TFR decreased from about 9 to 7 during the 1960s and from 7 to about 4 during the 1970s, but only from about 4 to 3 during the 1980s. Age specific rates for all ages continued to decrease.

Table 6.11 shows total fertility rates for married females only, based on the 1973 and 1980 censuses. The married fertility rates also decreased rapidly during the two decades, from about 10 children per married woman in the early and mid-1960s, to less than 7 children per married woman in the late 1970s. Later on, when OPS runs further own children estimates for the 1990 census, we will see if this trend continued into the late 1980s.

Table 6.11. Marital Total Fertility Rates and Age-Specific Marital Birth Rates Derived by Own-children Method, Palau: 1973 and 1980

Period of Estimate	MTFR	Marital Age-Specific Birth Rates						
		15-19	20-24	25-29	30-34	35-39	40-44	45-49
1973:								
1959-63.....	10.07	729	406	465	531	386	145	82
1964-68.....	10.88	661	486	468	505	392	226	98
1969-73.....	8.99	839	514	412	369	275	165	64
1980:								
1966-70.....	9.76	649	484	442	415	344	168	99
1971-75.....	8.64	913	496	413	329	240	158	92
1976-80.....	6.57	699	481	326	203	127	97	80

Source: Levin and Retherford, 1986, and unpublished data, U.S. Bureau of the Census

Notes: Rate per woman for TFRs, per 1000 women for Age-Specific Rates

The own children method is useful for estimating fertility over time since the numerators (the births) and the denominators (the mothers) come from the same source, in this case the 1973 and 1980 censuses, and later the 1989 census.

### *Other Fertility Estimates*

Although we now have own children fertility estimates for 1990, we also used the Population Analysis Spreadsheets (PAS) package, developed by the Center for International Research (CIR), at the Bureau of the Census, to obtain other fertility estimates. Table 6.12 shows the results of one of the spreadsheets which estimated the total fertility rate and general fertility rate using the total population, the female population in childbearing ages by 5-year age groups, the crude birth rate, and empirical patterns of age-specific fertility. The crude birth rate were derived from births recorded at the vital statistics office at the Department of Public Health and the census data for females by age. The crude birth rate for these calculations was 22 per 1000, a fairly low rate for Pacific areas. However, as noted before, the rate is based on the total population, which is affected by the migration patterns.

Table 6.12. Estimation of the Total and General Fertility Rate Based on the Total Population, Female Population in Childbearing Ages, and the Crude Birth Rate: 1990

Item	Value	Item	Value
Total pop.	15,122	TFR	2.8466
CBR	22.00	GFR	0.0920
Age	Female population	Total births	ASFR
15-19	669	30	0.0447
20-24	602	91	0.1516
25-29	604	112	0.1859
30-34	570	63	0.1110
35-39	523	28	0.0536
40-44	359	7	0.0202
45-49	291	1	0.0023
Total	3,618	333	0.5693

CBR Crude birth rate (per 1,000 population)

TFR Total fertility rate

GFR General fertility rate

ASFR Age-specific fertility rate

Sources: Population Analysis Spreadsheets (PAS), Center for International Research (CIR), U.S. Bureau of the Census (USBC)

The data show a total fertility rate of 2.8, that is, 2.8 children per female over the reproductive span. This figure is close to the own children estimates, and is a decrease of more than one child per woman over the decade of the 1980s, but is still somewhat above replacement. Still, this rate is one of the lowest in the Pacific.

The age specific rates were also very low. The age specific fertility rates continued to decrease. Continuing the example of the 30 to 34 year old women we discussed above, the rate of 360 per 1000 in the early 1960s decreased to 155 births per 1000 in the late 1970s, and then to 111 in 1990 (somewhat lower than the own children estimates). The other age groups also continue to decrease.

Will the total fertility rate continue to decrease? On the assumption that it will, we have used another of the PAS package spreadsheets and the actual information obtained for from the own children runs on the 1973 and 1980 censuses (see above and Levin and Retherford, 1986) to interpolate and extrapolate total fertility rates. The program fits a logistic function using 2 to 17 total fertility rates, given the values of the upper and lower asymptotes. Here we use 4 TFRs obtained

from Table 6.10 above, and the values of 9 children per woman for the upper boundary (about 1960), and 2 children per woman for the lower boundary.

Table 6.13. Interpolation and Extrapolation of the Total Fertility Rate Using a Logistic Function: 1960 to 2020

Item/ year	Value	Year	TFR	Year	TFR
Asymptotes:		1980.75	4.42	1980.75	4.42
		1981.75	4.19	1985.75	3.41
Lower	2.00	1982.75	3.97	1990.75	2.75
Upper	9.00	1983.75	3.77	1995.75	2.38
		1984.75	3.58	2000.75	2.18
Initial TFR's		1985.75	3.41	2005.75	2.09
		1986.75	3.25	2010.75	2.04
1961.75	8.25	1987.75	3.10	2015.75	2.02
1968.75	7.42	1988.75	2.97	2020.75	2.01
1973.75	6.26	1989.75	2.85	2025.75	2.00
1978.75	4.80	1990.75	2.75	2030.75	2.00
		1991.75	2.65	2035.75	2.00
		1992.75	2.57	2040.75	2.00
		1993.75	2.50	2045.75	2.00
		1994.75	2.43	2050.75	2.00
		1995.75	2.38	2055.75	2.00
		1996.75	2.33	2060.75	2.00
		1997.75	2.28	2065.75	2.00
		1998.75	2.25	2070.75	2.00
		1999.75	2.21	2075.75	2.00
		2000.75	2.18	2080.75	2.00
		2001.75	2.16	2085.75	2.00
		2002.75	2.14	2090.75	2.00
		2003.75	2.12	2095.75	2.00
		2004.75	2.10	2100.75	2.00
		2005.75	2.09	2105.75	2.00
		2006.75	2.08	2110.75	2.00
		2007.75	2.07	2115.75	2.00
Beginning date for results:	1980.75	2008.75	2.06	2120.75	2.00
		2009.75	2.05	2125.75	2.00

TFR - Total fertility rate.

Sources: Population Analysis Spreadsheets (PAS), Center for International Research (CIR), U.S. Bureau of the Census (USBC)

The value for 1990 is about 2.8, the value obtained from other methods. The TFRs continue to decrease to about 2.4 in 1995, 2.2 in 2000, and 2.1 in 2005. Since we used 2.0 as the asymptote, the value could not decrease below that figure.

## CONCLUSIONS

In this chapter we have looked at the fertility of Palau's population. Both the direct information on children ever born and the indirect information obtained from the various demographic methods of analysis show dramatic fertility decrease in the recent past. This decrease is apparently continuing as females move into the labor force and either delay onset of fertility or increase the time between adjacent children, or both. The total fertility rate of 2.8 children per woman is already among the lowest in the Pacific, and is likely to decrease even more as older women with larger families leave the reproductive years to be replaced with younger women with smaller families.

## CHAPTER 7. MORTALITY

Some censuses ask questions to obtain direct information on mortality. For example, a question will ask "Did anyone die in this household during the last 12 months? If so, who?" However, in the 1990 Palau census, no direct questions on mortality were asked.

Also, some censuses or surveys ask questions to obtain indirect information on mortality. Questions on children ever born and children surviving by age of mother can be used to obtain various indirect measures of mortality. The 1973 and 1980 censuses of Palau asked these questions. However, these questions were not asked on the 1990 census because most of the Pacific Islands areas have complete vital registration, with almost all deaths recorded. Since the deaths are recorded by age and sex, these data are used to obtain age specific death rates, and other measures derived from them. In this chapter we look at some of these measures.

### MORTALITY

The most important demographic event in this century has been the great decline in mortality. Palau has experienced that decline. Mortality levels became more independent of economic development than before. In Palau, this decline was partly because of the intervention of the American administration with its emphasis of health.

When reliable information on deaths and population is available from registers and censuses, direct calculations of mortality can be made. The crude death rate is the most common and the easiest to calculate. Often more complicated measures are needed because they provide additional information. Infant mortality, in particular, is an important indicator of a country's development. Age-specific death rates for other ages are also important in deciding which areas to target for particular programs. Life expectancy is a useful measure because it takes into account the mortality at each age yet expresses the result in a single figure.

Reliable information on population and registered deaths is used to measure the level of mortality in a population. The indices for this measure are:

- (1) crude death rates (with possibilities for direct or indirect standardization); and,
- (2) construction of life tables to obtain life expectancies at birth and other useful mortality functions.

### Crude death rate (CDR)

The most common direct measure of mortality is the crude death rate, or the number of deaths per 1,000 population. It is calculated as the number of deaths occurring in a year divided by the population at midyear, times 1,000. Crude death rates over time are shown in Table 6.7.

Table 7.1 shows deaths by broad age group and sex from the years 1981 to 1990. These age groups are very broad, and, so, difficult to work with. Palau began summarizing deaths by five year age group in 1987.

Table 7.1. Deaths by Age and Sex, Palau: 1981 to 1990

Age at Death	Year									
	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981
Total.....	117	101	112	96	88	95	84	84	91	78
Less than 1 yr.....	8	5	8	6	10	8	11	7	7	4
1 to 14 yr.....	7	3	5	4	4	2	3	8	3	2
15 to 24 yr.....	7	3	5	6	6	9	10	3	6	6
25 to 44 yr.....	23	18	15	15	14	13	17	12	14	14
45 to 64 yr.....	23	19	16	22	20	25	15	16	19	21
65 yrs or more.....	49	52	63	43	34	38	28	37	41	31
Unknown.....	-	1	-	-	-	-	-	1	1	-
Males.....	74	69	77	64	59	60	59	54	59	50
Less than 1 yr.....	5	4	7	4	5	6	7	2	3	3
1 to 14 yr.....	5	1	4	1	1	1	2	5	1	1
15 to 24 yr.....	5	2	5	6	5	7	7	3	6	4
25 to 44 yr.....	21	14	12	15	12	11	14	11	11	12
45 to 64 yr.....	16	14	13	14	13	15	12	8	12	17
65 yrs or more.....	22	33	36	24	23	20	17	25	26	13
Unknown.....	-	1	-	-	-	-	-	-	-	-
Females.....	43	32	35	32	29	35	25	30	32	28
Less than 1 yr.....	3	1	1	2	5	2	4	5	4	1
1 to 14 yr.....	2	2	1	3	3	1	1	3	2	1
15 to 24 yr.....	2	1	-	-	1	2	3	-	-	2
25 to 44 yr.....	2	4	3	-	2	2	3	1	3	2
45 to 64 yr.....	7	5	3	8	7	10	3	8	7	4
65 yrs or more.....	27	19	27	19	11	18	11	12	15	18
Unknown.....	-	-	-	-	-	-	-	1	1	-

Source: Bureau of Health Services, Republic of Palau, unpublished data.

Table 7.2 shows deaths by 5 year age group, but only for the last 5 years — from 1987 to 1991. By taking the 5 year average (107 deaths) and dividing by the 1990 population (15,122), and

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multiplying by 1,000, we arrive at a crude death rate of 7.1. So, there were about 7 deaths per 1,000 population in Palau around 1990.

Table 7.2. Deaths by 5-Year Age Group: 1987 to 1991

Age Group	Total	Average	Percent	1991	1990	1989	1988	1987
Total.....	533	106.6	100.0	102	117	101	113	100
Less than 5 years....	42	8.4	7.9	4	13	8	10	7
Less than 1 year...	30	6.0	5.6	3	8	5	8	6
1 to 4 years.....	12	2.4	2.3	1	5	3	2	1
5 to 9 years.....	4	0.8	0.8	-	2	-	1	1
10 to 14 years.....	3	0.6	0.6	-	-	-	1	2
15 to 19 years.....	9	1.8	1.7	3	3	-	2	1
20 to 24 years.....	20	4.0	3.8	5	4	3	3	5
25 to 29 years.....	27	5.4	5.1	3	8	7	5	4
30 to 34 years.....	22	4.4	4.1	6	5	3	4	4
35 to 39 years.....	16	3.2	3.0	4	4	4	1	3
40 to 44 years.....	22	4.4	4.1	3	6	4	5	4
45 to 49 years.....	14	2.8	2.6	5	-	5	1	3
50 to 54 years.....	28	5.6	5.3	9	5	3	5	6
55 to 59 years.....	28	5.6	5.3	6	6	5	6	5
60 to 64 years.....	45	9.0	8.4	11	12	6	8	8
65 to 69 years.....	45	9.0	8.4	9	5	14	11	6
70 to 74 years.....	61	12.2	11.4	12	13	14	15	7
75 to 79 years.....	45	9.0	8.4	4	9	12	8	12
80 to 84 years.....	54	10.8	10.1	11	11	6	11	15
85 to 89 years.....	24	4.8	4.5	4	5	5	6	4
90 to 94 years.....	12	2.4	2.3	2	2	2	5	1
95 to 99 years.....	6	1.2	1.1	1	3	-	1	1
100 or more years....	6	1.2	1.1	-	1	-	4	1

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Source: Bureau of Health Services, Republic of Palau, unpublished data.

### Infant mortality rate (IMR)

When vital registration data are available, the infant mortality rate is usually calculated as the ratio of the number of deaths of infants under 1 year of age to the number of live births occurring that year, times 1,000. A more refined rate would take into account a process for relating infant deaths to their actual birth cohort because in reality some of the deaths occurring each year correspond to infants born during the previous year, just as some infants born in the current year will die the following year before reaching their first birthday. For practical purposes, however, the calculation based on one chronological year is a good approximation of the IMR based on a given year's vital registration data or on average of data for several consecutive years.

Table 6.7 showed the Infant Mortality Rate for calendar years 1980 to 1990. The 8 deaths in 1990 for the 326 births made an infant mortality rate of 25 per 1,000, slightly more than the average for the decade.

### Age-specific death rates

While mortality is very high at the early moments of life, it declines rapidly thereafter, reaching its lowest levels between 10 and 15 years of age. In subsequent years, the older the age, the higher the mortality. The age specific death rates are calculated as the number of deaths in a particular age group per 1,000 population in the same group. Table 7.3 shows age specific death rates for Palau based deaths over the 1987 to 1991 period, and the 1990 age distribution.

**\*\*\* Put age specific death rate table here \*\*\***

### Life Expectancy at Birth

One of the most useful summary measures of the overall level of mortality of a population is the life expectancy at birth. It is a more accurate reflection of mortality than the crude death rate because it is independent of the population's age structure, and it is not influenced by extraneous factors such as the selection of a standard population.

Calculation of the life expectancy at birth begins with a set of age-specific death rates, from which probabilities of surviving from one age to the next can be estimated. These survival probabilities are applied to an assumed cohort of births that occurred in the same year, following the survivors as they reach successive ages until all have eventually died. As a result of this procedure, a count can be obtained of the total number of years that the birth cohort as a whole would live under the observed mortality conditions. The ratio of all years lived by the total number of people in the cohort to the original number of births represents the average number of years to be lived by persons born in the same year under the particular mortality conditions of that year. This ratio is the life expectancy at birth. These steps calculate the life expectancy at birth and are also the steps required to construct a life table. We pass to that now.

### Life Tables

Table 7.4 shows an abridged life table based on deaths and population. A PAS spreadsheet computes a life table from deaths and population by age and has an option for using an independently calculated or estimated infant mortality rate.

A life table serves useful purposes both within the demographic community and in the world at large. For example, the life table is the source of estimates of the life expectancy at birth. In

addition, it provides survival ratios for each age or age group that are used in making population projections.

A life table follows a hypothetical cohort of 100,000 persons born at the same time (called the "radix" of the life table) as they progress through successive ages, with the cohort reduced from one age to the next according to a set of actual death rates by age, until all persons eventually die. A complete, or unabridged, life table is constructed by single years of age, while an abridged life table is constructed by 5-year age groups. A life table can be constructed for both sexes together or, more commonly, for each sex separately.

The construction of a life table consists of calculating various interdependent "functions," using as a base the available age-specific death rates. The first function calculated in the life table is the probability of dying between two exact ages, for example, the probability that a person of exact age 30 will die before reaching his or her 35th birthday. This function is symbolized as  ${}_nq_x$ , where  $x$  represents exact age  $x$  and  $n$  is the age interval. In the above example, the symbol would be  ${}_5q_{30}$ . In applied demography, the only  ${}_nq_x$  function that is frequently used is  ${}_1q_0$  representing the probability of dying between birth and age 1; this is usually called the infant mortality rate.

The next life table function is the number of persons surviving to each exact age. As the life table usually starts with a radix of 100,000 births (at exact age 0), the number of survivors from birth to each exact age is obtained using the probabilities estimated. The number of survivors at each exact age is represented by the symbol  $l_x$ .

The value for survivors at exact age  $x$  ( $l_x$ ) is shown in symbols as

$$l_{x+n} = l_x (1 - {}_nq_x) \text{ where } {}_nq_x \text{ is defined as above and the}$$

first  $l_x$  is  $l_0$  and usually is defined as 100,000.

Since  $l_x$  represents the number of persons alive at each exact age  $x$ , the difference between two consecutive values represents the number of deaths between the corresponding ages. This number of deaths between two exact ages is symbolized by  ${}_nd_x$  in the life table.

In symbols, this is shown:  ${}_nd_x = l_x - l_{x+n}$  where  $l_x$  is as defined above.

Actual populations are usually enumerated in a census or survey as the number of persons alive between two ages, for example, the population at age 23 (that is, persons between their 23rd and 24th birthdays) or the population in the age group 15 to 19 years (persons who have reached their 15th birthday but not yet their 20th). A life table includes an analogous population, represented by the  ${}_nL_x$  function, referred to as the "life table population" between exact age  $x$  and  $x+n$ , or the

number of survivors between exact age  $x$  and  $x+n$ . For example, the symbol  ${}_5L_{55}$  refers to the life table population at ages 55 to 59 years.

This life table population may be interpreted in three ways, following through time a cohort of births under mortality conditions observed during a year: (1) a "stationary" population with 100,000 annual births and deaths, the number of persons in each age group not changing; (2) persons in a particular age group as the survivors of 500,000 births occurring during a 5-year period (at 100,000 per year); and (3) the total life table distribution may be interpreted as the survivorship pattern of a single cohort of 100,000 births as it passes through all ages. The  ${}_nL_x$  function is calculated as the average of two consecutive  $l_x$  values that represent persons alive at two specified exact ages. This value is obtained:

$${}_nL_x = {}_nk_x l_x + (n - {}_nk_x) l_{x+n} \text{ where } {}_nk_x \text{ and } l_x \text{ are defined above.}$$

The next function refers to the age-specific death rates of the life table population, which are also called central death rates. These rates are derived by dividing the life table number of deaths between two specific ages by the life table population between the same ages. Central death rates are shown as

$${}_nm_x = {}_nd_x / {}_nL_x \text{ where } {}_nd_x \text{ and } {}_nL_x \text{ are as defined above.}$$

Next, the total population of the life table is calculated by summing all the  ${}_xL_x$  values. When the life table is seen as the following of a single cohort through time, the  ${}_nL_x$  values represent the total number of years to be lived by the original birth cohort of 100,000 until all persons have eventually died. A cumulative summation of the  ${}_nL_x$  values from the oldest ages to the youngest one represents, at any given age  $x$ , the total number of years remaining to be lived by all persons who are still alive at age  $x$ . It also represents the population age  $x$  years and over. The cumulative values for each age are represented by the symbol  $T_x$ , the sum of these values.

At this point, the life expectancy can be derived. The ratio of the number of years that the life table population will live from age  $x$  up to the point when all have died, to the number of persons alive at exact age  $x$ , represents the average number of years remaining to be lived by those who are alive at each age  $x$ . These values are the life expectancy at any given age, symbolized by  $e_x$ . For example,  $e_{35}$  represents the number of years of life remaining for a person age 35, while  $e_0$  represents the life expectancy at birth. The life expectancy at age  $x$  is:

$$e_x = T_x / l_x \text{ where } T_x \text{ and } l_x \text{ are as defined above.}$$

Finally, an optional life table function exists, used in making population projections, known as the survival ratio. Since the  ${}_5L_x$  function is the number of persons alive between ages  $x$  and  $x + 5$ , the ratio of two consecutive  ${}_5L_x$  values represents the survival between the two age groups. For

example, at the end of the 5 year period, persons in the group  ${}_5L_{30}$  are the survivors of the group  ${}_5L_{25}$ , and hence the ratio of  ${}_5L_{30}$  divided by  ${}_5L_{25}$  represents the average chance that a person in the age group 25 to 29 has of surviving 5 years to ages 30 to 34. This ratio is symbolized by  ${}_5P_{25}$  and is called the 5 year survival ratio for ages 25 to 29. The survival ratio is shown:

$${}_5P_x = {}_5L_{x+5} / {}_5L_x \text{ where } {}_5L_x \text{ is as defined above.}$$

The ratio is used for projecting population by multiplying the population times the survival ratio for any particular population by year. Special attention must be paid to the youngest and oldest groups, but we are not covering that here. Table 7.4 gives the life table for Palau in 1990.

Table 7.4. Abridged Life Table Based on Deaths and Population: 1990

Age	${}_nM_x$	${}_na_x$	${}_nq_x$	$l_x$	${}_nd_x$	${}_nL_x$	${}_5P_x$	$T_x$	$e_x$
0	0.02556	0.125	0.02500	100,000	2,500	97,813	0.97266	6,918,424	69.18
1-4	0.00152	1.483	0.00604	97,500	589	388,517	0.99472	6,820,611	69.95
5-9	0.00065	2.500	0.00326	96,911	316	483,763	0.99674	6,432,094	66.37
10-14	0.00065	2.500	0.00325	96,594	314	482,187	0.99497	5,948,331	61.58
15-19	0.00137	2.500	0.00681	96,280	655	479,762	0.98920	5,466,144	56.77
20-24	0.00299	2.500	0.01481	95,625	1,417	474,582	0.98377	4,986,382	52.15
25-29	0.00356	2.500	0.01766	94,208	1,664	466,881	0.98374	4,511,800	47.89
30-34	0.00299	2.500	0.01484	92,544	1,373	459,288	0.98657	4,044,919	43.71
35-39	0.00241	2.500	0.01200	91,171	1,094	453,122	0.98271	3,585,630	39.33
40-44	0.00458	2.500	0.02265	90,078	2,040	445,287	0.97754	3,132,508	34.78
45-49	0.00450	2.500	0.02227	88,037	1,961	435,285	0.96065	2,687,221	30.52
50-54	0.01170	2.500	0.05682	86,077	4,891	418,156	0.93592	2,251,937	26.16
55-59	0.01489	2.500	0.07177	81,186	5,827	391,362	0.90988	1,833,781	22.59
60-64	0.02326	2.500	0.10989	75,359	8,281	356,092	0.88208	1,442,419	19.14
65-69	0.02711	2.500	0.12694	67,078	8,515	314,102	0.83199	1,086,326	16.19
70-74	0.04819	2.500	0.21505	58,563	12,594	261,330	0.76345	772,224	13.19
75-79	0.06081	2.500	0.26393	45,969	12,133	199,513	0.65445	510,894	11.11
80-84	0.11828	2.500	0.45643	33,836	15,444	130,572	0.57387	311,381	9.20
85-89	0.09091	2.500	0.37037	18,392	6,812	74,932	0.61818	180,809	9.83
90-94	0.10000	2.500	0.40000	11,580	4,632	46,321	0.64286	105,878	9.14
95-99	0.06667	2.500	0.28571	6,948	1,985	29,778	0.50000	59,556	8.57
100+	0.16667	6.000	1.00000	4,963	4,963	29,778	...	29,778	6.00

Source: Population Analysis Spreadsheets (PAS), Center for International Research (CIR), **U.S. Bureau of the Census (USBC)**

Notes:  ${}_nM_x$  = Age-specific central death rate.

${}_na_x$  = Average person-years lived by those who die between ages x and x+n.

${}_nq_x$  = Probability of dying between exact ages x and x+n (age-specific mortality rate).

${}_nl_x$  = Number of survivors at age x.

${}_nd_x$  = Number of deaths occurring between ages x and x+n.

${}_nL_x$  = Number of person-years lived between ages x and x+n.

${}_5P_x$  = Survival ratio for persons aged x to x+5 surviving 5 years to ages x+5 to x+10 =  ${}_5L_{x+5}/{}_5L_x$  (first  ${}_5P_x = {}_5L_0/{}_5l_0$ , second  ${}_5P_x = {}_5L_5/{}_5L_0$ , last  ${}_5P_x = T_{x+5}/T_x$ ).

$T_x$  = Number of person-years lived after age x.

$e_x$  = Life expectancy at age x.

Table 7.5 shows a smoothed abridged life table based on deaths and population.

Table 7.5. Smoothed Abridged Life Table Based on Deaths and Population: 1990

Age	${}_nM_x$	${}_na_x$	${}_nq_x$	$l_x$	${}_nd_x$	${}_nL_x$	${}_5P_x$	$T_x$	$e_x$
0-1	0.02556	0.125	0.02500	100,000	2,500	97,813	0.97266	6,800,282	68.00
1-4	0.00152	1.483	0.00604	97,500	589	388,517	0.99472	6,702,470	68.74
5-9	0.00065	2.500	0.00326	96,911	316	483,763	0.99674	6,313,952	65.15
10-15	0.00065	2.500	0.00325	96,594	314	482,187	0.99451	5,830,189	60.36
15-19	0.00155	2.500	0.00773	96,280	744	479,540	0.98936	5,348,002	55.55
20-25	0.00273	2.500	0.01358	95,536	1,297	474,436	0.98443	4,868,462	50.96
25-29	0.00355	2.500	0.01759	94,239	1,658	467,047	0.98300	4,394,027	46.63
30-35	0.00331	2.500	0.01640	92,580	1,518	459,106	0.98290	3,926,979	42.42
35-39	0.00360	2.500	0.01782	91,062	1,623	451,253	0.98090	3,467,873	38.08
40-45	0.00412	2.500	0.02040	89,439	1,825	442,634	0.97273	3,016,619	33.73
45-49	0.00698	2.500	0.03429	87,614	3,004	430,562	0.95781	2,573,985	29.38
50-55	0.01033	2.500	0.05037	84,610	4,262	412,398	0.93253	2,143,423	25.33
55-59	0.01786	2.500	0.08548	80,349	6,868	384,573	0.90205	1,731,024	21.54
60-65	0.02364	2.500	0.11159	73,480	8,199	346,904	0.86528	1,346,451	18.32
65-69	0.03496	2.500	0.16077	65,281	10,495	300,168	0.81451	999,548	15.31
70-75	0.04817	2.500	0.21496	54,786	11,777	244,488	0.73495	699,380	12.77
75-79	0.07871	2.500	0.32885	43,009	14,143	179,688	0.64613	454,892	10.58
80-85	0.09725	2.500	0.39117	28,866	11,291	116,101	0.58809	275,204	9.53
85-89	0.11479	2.500	0.44598	17,575	7,838	68,278	0.57638	159,103	9.05
90-95	0.09482	2.500	0.38326	9,737	3,732	39,354	0.65395	90,825	9.33
95-99	0.06667	2.500	0.28571	6,005	1,716	25,736	0.50000	51,471	8.57
100+	0.16667	6.000	1.00000	4,289	4,289	25,736	...	25,736	6.00

Source: Population Analysis Spreadsheets (PAS), Center for International Research (CIR), **U.S. Bureau of the Census (USBC)**

Notes:  ${}_nM_x$  values were smoothed for ages 15+ based on a moving average of the logs:

$$\text{smoothed } \log({}_5M_x) = 1/3 [\log({}_5M_{x-5}) + \log({}_5M_x) + \log({}_5M_{x+5})]$$

${}_nM_x$  = Age-specific central death rate.

${}_na_x$  = Average person-years lived by those who die between ages x and x+n.

${}_nq_x$  = Probability of dying between exact ages x and x+n (age-specific mortality rate).

${}_nl_x$  = Number of survivors at age x.

${}_d_x$  = Number of deaths occurring between ages x and x+n.

${}_nL_x$  = Number of person-years lived between ages x and x+n.

${}_5P_x$  = Survival ratio for persons aged x to x+5 surviving 5 years to ages x+5 to x+10 =  ${}_5L_{x+5}/{}_5L_x$  (first  ${}_5P_x$  =  ${}_5L_0/{}_5l_0$ , second  ${}_5P_x$  =  ${}_5L_5/{}_5L_0$ , last  ${}_5P_x$  =  $T_{x+5}/T_x$ ).

$T_x$  = Number of person-years lived after age x.

$e_x$  = Life expectancy at age x.

Table 7.6 shows summary demographic indicators based on population by age and sex and total deaths. This spreadsheet computes the Coale-Demeny West region model life tables, by sex,

consistent with the population, by age and sex, and the crude death rates. In 1990, the life expectancy for females was 69 years and for males has 65 years.

Table 7.6. Summary Demographic Indicators using Coale-Demeny West Region Model Life Tables Based on Population by Age and Sex and Total Deaths: 1990

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Item	Total	Male	Female
Life expectancy.....	66.97	65.07	69.05
Infant mortality rate.....	0.03980	0.04487	0.03424
Crude birth rate.....	13.31	12.93	13.76
Crude death rate.....	7.00	7.00	7.00
Rate of natural increase (%).....	0.631	0.593	0.676
Total deaths.....	106	57	49

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Source: Population Analysis Spreadsheets (PAS), Center for International Research (CIR), **U.S. Bureau of the Census (USBC)**

## CONCLUSIONS

Palau is experiencing continued low mortality, and, therefore, high life expectancy at birth. Female life expectancy at birth was 69 years, based on the 1990 census. Both age specific mortality and infant mortality rates are low. Health care on island is very good, with both access and attention very high.

## CHAPTER 8. MIGRATION

While chapters 6 and 7 examined two basic components of population change — fertility and mortality — here we look at the other main component — migration. Measurement of migration is more complex than measurement of fertility or mortality. Mortality is purely a biological phenomenon; a favorable socioeconomic climate and medical care can postpone death, but cannot stop it. Fertility also is biological, although it can be controlled. Levels of fertility often reflect levels of material well being of a population, affected by individual and societal needs, levels of scientific knowledge, and economic status. The problems of measurement of fertility and mortality arise basically because of lack of reliable vital statistics.

Migration, on the other hand, is a socioeconomic phenomenon affected by many complex mechanisms involving social, psychological, economic, political, institutional, and other determinants. Migration affects the size, structure, and growth of populations. Migration also affects the size of the labor force, the distribution of labor force by skill, education, industry, and occupation, employment status, savings, investment, and productivity. In the process, migration leads to social and psychological impacts on both origins and destinations.

Migration involves movement from one residence to another. Migration can be internal (within national or territorial boundaries) or international (across international borders). A migrant who travels from an origin to a destination is an immigrant or in-migrant with respect to the area of destination, and an emigrant or out-migrant with respect to the place of origin — although in each case researchers tend to use the former term for international migration and the latter for internal migration.

Over the past two decades, migration has emerged as an extremely important factor shaping the demography of the Pacific (see Connell, 1990). Palau is no exception to this trend, although the mobility patterns affecting Palau often differ from those found elsewhere in the region (see Gorenflo and Levin, 1992a). The pattern that dominated Palau throughout the 1980s is the emigration of Palauans — particularly to the CNMI, Guam, and the U.S. — countered in part by the immigration of southeast Asians. These migration flows have had a major impact on the demography of Palau, the most obvious consequence being the minimal population growth in the republic during the 1980s as native Palauans relocated outside the republic. In comparison, other mobility patterns, such as the movement from rural to urban areas within Palau, apparently played lesser roles.

This chapter examines migration data from the 1990 census. These data include place of birth and parents' place of birth, citizenship, year of entry to Palau, residence in 1985, and ethnic origin or race. The types of information discussed complement each other, providing a reasonably complete picture of contemporary migration patterns in the republic.

## **Definitions**

### *Place of Birth and Parents' Place of Birth*

Question 7 on the 1990 census questionnaire concerned an individual's place of birth. Questions 12a and 12b, in turn, focused on father's place of birth and mother's place of birth, respectively. Each place of birth question requested the name of the island, the U.S. state, or the foreign country where a person or a person's parents were born, according to current political boundaries.

Census staff responsible for data edits assigned a place of birth to those individuals who did not report this information — assigning the birthplace of another family member, or the birthplace of another person or parent with similar characteristics. Instead of allocating a specific foreign country to persons allocated as born outside the area of current residence, editors classified these individuals as "Born abroad, country or area not specified." The places of birth published in the 1990 census report were those most frequently mentioned by respondents.

**Limitations.** Because numerous changes in the boundaries of foreign countries have occurred over the past several decades, some persons may have reported their place of birth or their parents' place of birth in terms of boundaries that existed at the time of the birth or emigration, or in accordance with their own national preference. Apart from this minor problem, there are no obvious limitations in the 1990 census for place of birth data categories.

**Comparability.** Data on birthplace in the 1990 census are comparable to birthplace data collected in the 1980 census. Similar data appeared in tabulations for the 1980 census. However, the last decennial census did not allocate non-response. Instead, the 1980 census reported such persons separately in the tables as "Place of birth not reported."

### *Citizenship*

Census questionnaire item 8 dealt with citizenship, a question asked of all persons in the Republic of Palau. The question for Palau differed from the other Pacific Outlying Areas. For American Samoa, Guam, and the CNMI, "Citizens or nationals" were persons who responded in one of the following four categories of citizenship: (1) born in this area, (2) born in the United States or another U.S. Territory or Commonwealth, (3) born elsewhere of U.S. parent or parents, or (4) U.S. citizen by naturalization. "Naturalized citizens" were 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. Persons "Not a citizen or national" in the other three Pacific Outlying Areas were foreign-born persons who were not citizens, including persons who had begun but not completed the naturalization process at the time of the census. These individuals included persons who resided permanently in the area as well as those who resided temporarily in the area.

Because of Palau's political status, the 1990 census called persons born on Palau as "citizens of Palau." "U.S. citizens" were persons who responded that they were U.S. born, born in a U.S. Territory or Commonwealth, or foreign-born persons who were naturalized. The three categories of U.S. citizenship were: (1) born in the United States or a U.S. Territory or Commonwealth, (2) born elsewhere of U.S. parent or parents, and (3) U.S. citizen by naturalization. Persons "Not born in Palau and not a U.S. citizen" were foreign-born persons who were neither born in Palau nor citizens of the U.S.—including persons who had begun but had not completed the naturalization process at the time of the census.

Limitations. There are no apparent problems with data from the 1990 census on citizenship. Studies of previous censuses indicated that some persons undergoing naturalization reported themselves as citizens before attaining naturalized status, although this shortcoming not evident in the 1990 data for Palau.

Comparability. The 1990 data cannot be compared with 1980 because citizenship was not asked in the earlier Palau census.

#### *Year of Entry*

Questionnaire item 9 dealt with year of entry, asked of all persons who were born or resided outside Palau. These persons included U.S. citizens by birth (persons born in the U.S., Puerto Rico, another U.S. commonwealth or territory, or born abroad of American parents) as well as citizens of other nations. To avoid possible confusion concerning the date of entry of U.S. citizens by birth, this report uses the year a person came to Palau to stay rather than year of immigration. The 1990 census questions, tabulations, and census data products about citizenship and year of entry make no reference to immigration.

Limitations. The main limitation of 1990 census data on year of entry concerns the duration of residence in Palau. The census used the phrase "to stay" to obtain the year in which a person became a resident of the republic. Although the questionnaire directed respondents to record the year they entered the area, it was difficult to ensure that respondents interpreted these guidelines correctly.

Comparability. The 1990 and 1980 censuses generally are comparable concerning data on year of entry. Instead of asking the actual year of entry, the 1980 census provided nine arrival times to be answered by the non-Palau born population.

### *Residence in 1985*

For individuals who responded that they lived in a different house on Census Day 1990 than on 1 April 1985 (question 14a), the 1990 census asked for the island, U.S. state, or foreign country of residence on this earlier date (question 14b). The census also asked persons living in Palau on 1 April 1985 (but in a different house than 1 April 1990) the name of the village in which they resided.

When an individual provided no information on residence in 1985, data editors employed responses of other family members, if available, to assign a residence in 1985. Editors allocated individuals who did not respond or provided an incomplete response and had no obvious family members associated to the previous residence of other persons with similar characteristics who provided complete information.

The tabulation category "Same house" in the 1990 census included all persons aged five years or more who did not move during the previous five years, as well as those who moved but returned to their 1985 residence by census day 1990. The category "Different house" in the census included persons who lived in Palau in April 1985 but in a different housing unit than they occupied on census day 1990. The census then further subdivided these movers according to whether they previously lived elsewhere in Palau or outside Palau in 1985. The tables in this chapter present selected countries for persons who lived outside Palau in 1985, combining into the "Elsewhere" category individuals who resided in countries not listed.

**Limitations.** For the purpose of studying migration, the data category "Residence in 1985" provides inadequate data on multiple moves over the five-year period in question. In some cases, individuals who lived in the same house in April 1985 and April 1990 had moved in the interim. Similarly, persons who in 1990 lived in a different house than in 1985 made one or more intermediate moves.

**Comparability.** The 1980 census asked similar questions about previous residence five years earlier, but did not allocate previous residence in the case of a non-response -- recording these individuals in the category "Residence in 1975 not reported."

### *Ethnic Origin or Race*

Item 4 on the 1990 census questionnaire concerned ethnic origin or race. The question relied on self-identification and was open-ended. Ethnic origin or race refers to a person's origin or descent, including an individual's heritage or the place of birth of an individual's ancestors. Persons reported their ethnic group regardless of the number of generations removed from their place of ancestral origin. Responses to the ethnic origin question reflected the ethnic group with which persons identified and not necessarily the degree of attachment or association the persons had with a particular group.

Ethnic origin or race differs from other population characteristics often considered to show ethnicity, namely country of birth and language spoken at home. Most respondents reported their ethnic origin or race by specifying a single ethnic group, but some reported two, three, or more groups. Census staff identified and coded the first two responses reported.

In published tabulations, the 1990 census designated multiple groups as general open-ended categories—such as "Palauan and other group(s)"—rather than specific multiple ethnic groups such as "Palauan-Filipino." Thus the census would include a person who reported "Filipino-Carolinian" ethnicity in the "Asian and other group(s)" category under "Multiple ethnic group." In data collection and organization, the census considered a few responses consisting of two terms, such as "French Canadian," as a single group and coded them accordingly. It treated certain combinations of ethnic groups where one group is part of another, such as "German-Bavarian," as a single ancestry using the smaller group (in this case "Bavarian"). In addition, it treated responses such as "Polish-American" and "Italian-American" as a single entry—"Polish" or "Italian," respectively. Finally, the 1990 census accepted "American" as a unique ethnicity if given alone, with an ambiguous response, or with state names; if the respondent listed any other ethnic identity such as "Palauan-American," generally the census did not code the "American" portion of the response.

**Limitations.** The ethnicity category incorporates the strengths and weaknesses of any open-ended question—the advantages of removing possibly undesirable constraints countered by the likelihood of receiving answers which are difficult to deal with or which do not make sense. Census staff made every effort to impose a systematic coding scheme on the open-ended ethnicity data.

Although information on religion often provides important clues to ethnicity, the Bureau of the Census cannot report such data. Thus the 1990 census did not code separately entries on religious affiliation, instead including this information in the category "Ethnic group not specified."

**Comparability.** The 1980 census was the first to contain an open-ended question on ethnic origin or race. Although the 1990 census allowed respondents to report more than two ethnic groups, it coded only the first two. Although the 1980 census did not impute ethnic origin information, the 1990 census did through the use of related data — parental birthplace and language, other members of the housing unit, or other persons in nearby housing units. Additional information on imputation appears in Appendix A).

## **Analysis of Migration Data**

### *Birthplace*

Migration patterns in Palau changed during the 1980s, with increasing Palauan emigration countered in part by immigration to the republic from other nations. Data on the birthplace of Palau residents show lifetime migration (Table 8.1). Although most residents of the republic in 1990 were born in

Palau, this group declined both in absolute and in relative terms during the 1980s. The influx of non-Palauans increased as the decade progressed, yielding a Palau-born resident population in 1990 that was 12 percentage points lower in 1990 than 1980. Despite migration from the CNMI, U.S., and other Pacific islands during the 1980s, the greatest absolute increase in foreign-born individuals came from Asia. Persons born in the Philippines comprised the majority of foreign-born residents of Palau, their continued increase during the 1980s yielding a Philippine-born population in 1990 that was nearly 10 percent of the total. The "Other Asia" heading in Table 8.1 includes China, Indonesia, and Taiwan. In 1990 Palau contained relatively large numbers of people born in China (180 individuals) and Taiwan (62 individuals). The table combines these three places and others in the "Other Asia" category because data are unavailable for all three census years. As is the case with the Koreans and Filipinos, most of these other Asians migrated to Palau for employment — primarily as blue collar workers.

Table 8.1. Birthplace of Palau Residents: 1980, 1986 and 1990

Birthplace	Numbers		Percent Change		Percent Change		Percent	
	1990	1986	1980	1990	1986	1990	1986	to
Total.....	15,122	13,873	12,116	9.0	14.5	100.0	100.0	
Palau.....	12,321	12,323	11,352	-	8.6	81.5	88.8	
Marshall Islands.....	48	88	50	-45.5	76.0	0.3	0.6	
Fed. States of Micro..	307	357	233	-14.0	53.2	2.0	2.6	
Northern Mariana Is...	117	18	32	550.0	-43.8	0.8	0.1	
United States.....	266	291	56	-8.6	419.6	1.8	2.1	
Asia.....	1,889	760	154	148.6	393.5	12.5	5.5	
Japan and Okinawa...	89	81	22	9.9	268.2	0.6	0.6	
Korea.....	58	32	1	81.3	3100.0	0.4	0.2	-
Philippines.....	1,459	517	126	182.2	310.3	9.6	3.7	
Other Asia.....	283	130	5	117.7	2500.0	1.9	0.9	-
Other Pacific Islands.	144	6	41	2300.0	-85.4	1.0	-	
Elsewhere.....	30	30	19	-	57.9	0.2	0.2	
Not stated.....	-	-	179	-	-100.0	-	-	

Sources: U.S. Bureau of the Census, 1984b, Table 20; 1992c, Table 36; OPS, 1987, Table A5.

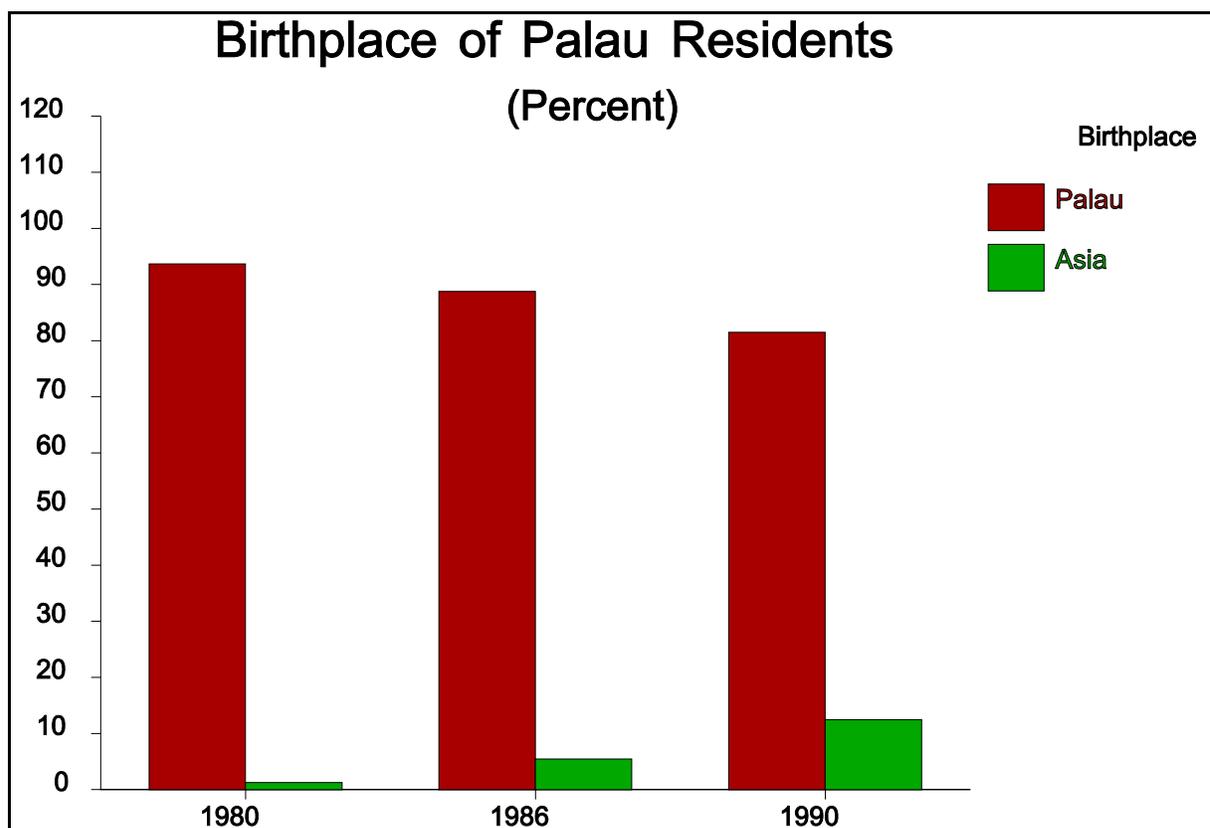


Figure 8.1. Percent of Residents Born in Palau and in the Philippines: 1980, 1986 and 1990

Since the 1990 census was not full *de jure* census, it does not provide data on the emigration of Palauans, the other half of the mobility equation. Palau-born individuals were probably leaving the republic, based on the number of persons remaining. Data in Table 8.1 show that Palau-born persons increased slightly between 1980 and 1986, and subsequently remained constant between 1986 and 1990. Given the current natural increase found throughout most of Micronesia, including Palau (see Chapters 6 and 7), the growth during the early 1980s was nominal and the constant population during the late 1980s showed that many Palauans were emigrating. Two likely destinations are Guam, where 1,233 Palau-born individuals resided in 1990, and the CNMI, with 1,407 Palau-born persons (U.S. Bureau of the Census, 1992a; 1992b; see Chapter 16). Another probable destination is the U.S., although numbers of Palau-born residents in 1990 are not yet available. Ironically, Palauans leave their home islands for the same reasons that others migrate there: to get better employment or further education. Another reason for growing emigration is

marriage to non-Palauans, a phenomenon that has accompanied growing interaction with individuals from other countries over the past few decades.

Migration patterns differed by sex (Table 8.2). With few exceptions, men were more mobile both in 1990 and in 1986. Of the Palau-born residents of Palau, a greater proportion of women than men resided in the republic in both census years. For example, in 1990 about 78 percent of the male residents of Palau were born in the republic, compared to nearly 86 percent of the females. The decline between 1986 and 1990 in the percentage of resident Palau-born males and females is consistent with the growing immigration of foreign-born persons and the growing emigration of native Palauans. With few exceptions, the data in Table 8.2 show that most immigrants to Palau are males — particularly from Japan, Korea, and the Philippines (as well as China and Taiwan, once again included in the "Other Asia" category). These differences between sexes ultimately may have important implications for the population composition of Palau, particularly if the emigration of Palauans and the immigration of persons from other nations continues to increase.

Table 8.2. Birthplace of Palau Residents, by Sex: 1986-1990

Males	1990			Males			1986	
	/ 100			/ 100		/ 100		
Birthplace	Total	Males	Fmles	Fmles	Total	Males	Fmles	
Total.....	15,122	8,139	6,983	117	13,873	7,398	6,475	
Palau.....	12,321	6,339	5,982	106	12,323	6,409	5,914	
Non-Palau.....	2,801	1,800	1,001	180	1,550	989	561	
Marshall Islands.....	48	34	14	243	88	54	34	
Fed. States Micronesia..	307	186	121	154	357	229	128	
Northern Mariana Is....	117	55	62	89	18	10	8	
United States.....	266	153	113	135	291	174	117	
Asia.....	1,889	1,276	613	208	760	501	259	
Japan.....	89	69	20	345	81	64	17	
Korea.....	58	47	11	427	32	26	6	
Philippines.....	1,459	912	547	167	517	296	221	
Other Asia.....	283	248	35	709	130	115	15	
Other Pacific Islands..	144	79	65	122	6	4	2	
Elsewhere.....	30	17	13	131	30	17	13	

Sources: OPS, 1987, Tables A1, A2, and A15; U.S. Bureau of the Census, 1992c, Table 36.

Because of their increasing numerical importance, we differentiate Filipinos from other foreign-born persons to examine their demographic composition a bit more closely. Although Philippines born comprised nearly 10 percent of the 1990 population of Palau, their contribution was by no means

equal for all age groups. For example, whereas Filipinos comprised less than 1 percent of the 1990 population aged 14 years or less, they represented more than 20 percent of the Palau population aged 25 to 44 years (Table 8.3). Both males and females had similar percentage distributions, the former represented in slightly greater numbers.

Table 8.3. Age of Palau Residents, by Birthplace (Palau and Philippines) and Sex: 1990

Age Group	Total			Males			Females		
	Total	Palau	Philippines	Total	Palau	Philippines	Total	Palau	Philippines
Total...	15,122	81.5	9.6	8,139	77.9	11.2	6,983	85.7	7.8
0 to 14....	4,576	90.8	0.8	2,366	90.6	0.8	2,210	91.1	0.7
15 to 24...	2,804	81.2	7.2	1,533	79.7	6.4	1,271	82.9	8.1
25 to 34...	2,741	70.1	20.8	1,567	66.6	22.1	1,174	74.9	19.1
35 to 44...	2,116	69.5	20.1	1,234	64.0	22.1	882	77.2	17.3
45 to 64...	1,969	81.9	11.0	1,043	73.8	15.8	926	91.0	5.6
65 & over..	916	96.3	1.0	396	93.4	2.3	520	98.5	-

Source: U.S. Bureau of the Census, 1992c, Table 36.

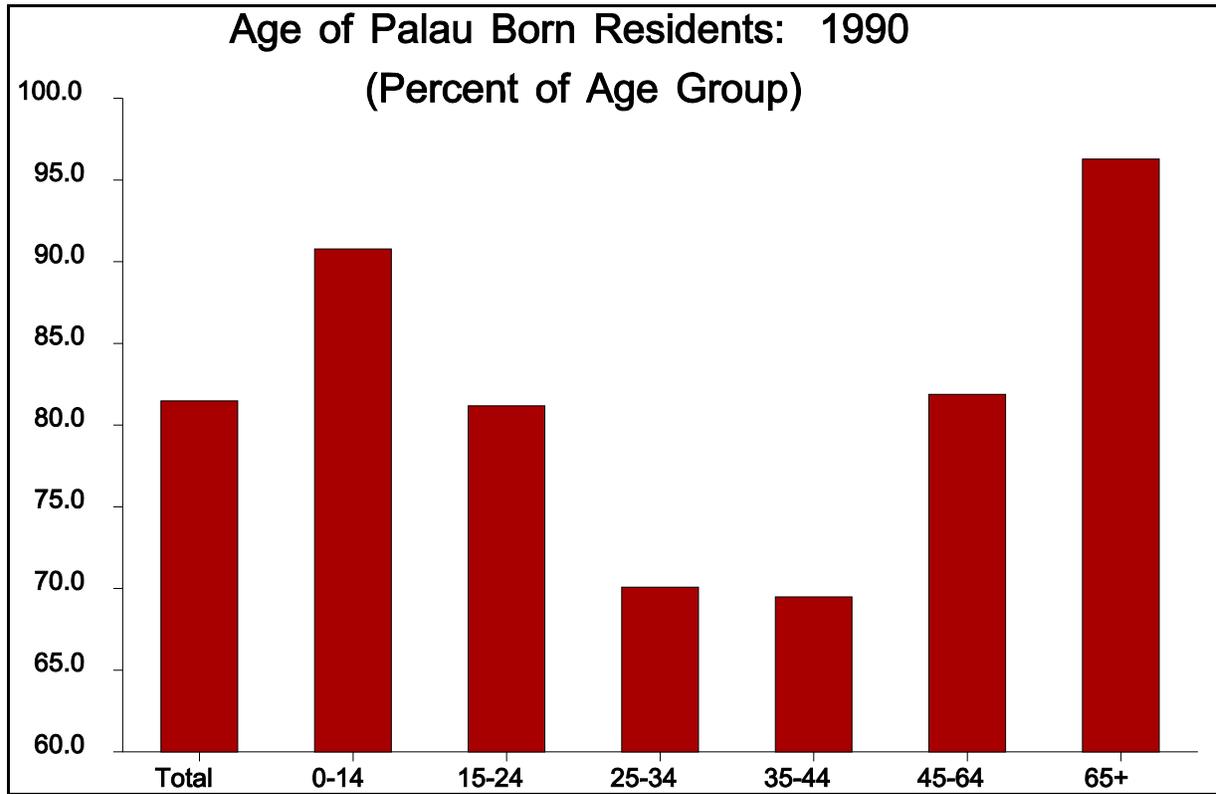


Figure 8.2. Percent of Age Group for Palau Born in Palau: 1990

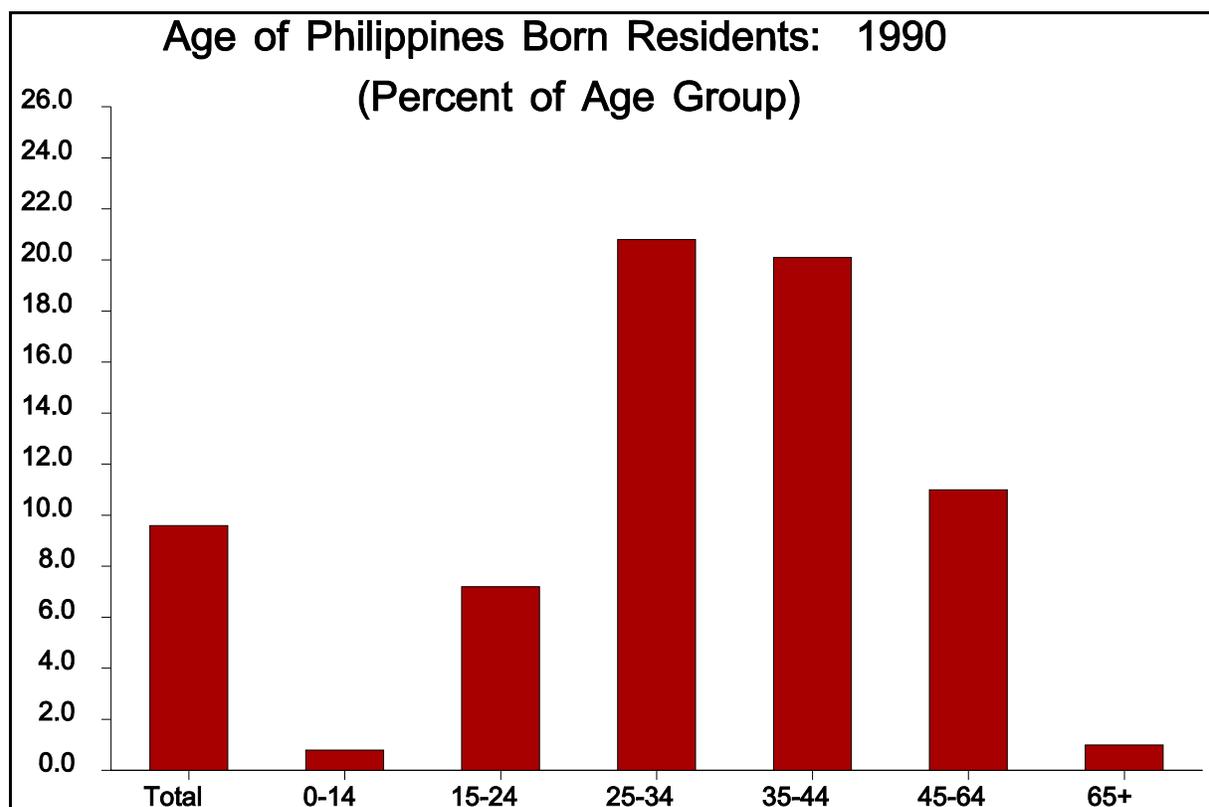


Figure 8.3. Percent of Age Group of Philippines Born in Palau: 1990

The ages of immigrants often provide clues to their reasons for relocation. As in Table 8.3, a comparison of age distributions of the total Palau population, Palau-born residents, and Philippines-born residents shows a disproportionately heavy representation of individuals aged 25 to 44 years for the last group (Table 8.4). The heavy Filipino working age population supports the assumption that many of these immigrants move to Palau to work.

Table 8.4. Birthplace of Palau Residents (Palau and Philippines), by Age and Sex: 1990

Age Group	Total			Males			Females		
	Total	Palau	Philippines	Total	Palau	Philippines	Total	Palau	Philippines
Total...	15,122	12,321	1,459	8,139	6,339	912	6,983	5,982	547
Percent									
Total...	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
0 to 14....	30.3	33.7	2.4	29.1	33.8	2.2	31.6	33.7	2.7
15 to 24...	18.5	18.5	13.8	18.8	19.3	10.7	18.2	17.6	18.8
25 to 34...	18.1	15.6	39.1	19.3	16.5	38.0	16.8	14.7	41.0
34 to 44...	14.0	11.9	29.2	15.2	12.5	29.9	12.6	11.4	28.0
45 to 64...	13.0	13.1	14.9	12.8	12.1	18.1	13.3	14.1	9.5
65 & over..	6.1	7.2	0.6	4.9	5.8	1.0	7.4	8.6	-

Source: U.S. Bureau of the Census, 1992c, Table 36.

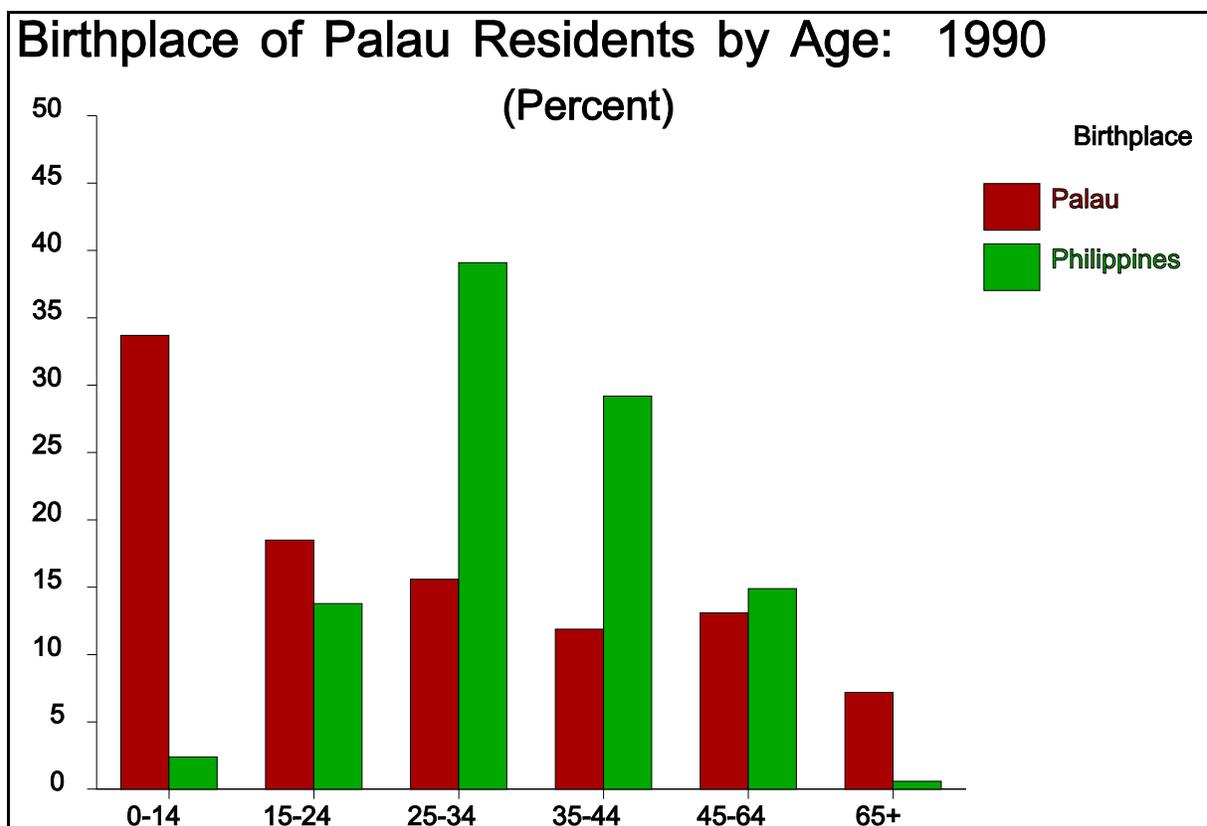


Figure 8.5. Percent for Birthplace of Palau Born and Philippines Born by Age: 1990

Migration to Palau varied substantially by geographic area (Table 8.5). Of the 16 states in the republic, two contained the vast majority of persons born elsewhere in 1990, namely Koror and Airai. In addition to containing nearly 70 percent of Palau's total 1990 population, Koror State also provided the greatest employment in the republic—both private sector and government. Moreover, the majority of housing, educational institutions and most modern amenities were located in this state. Nearly 88 percent of Philippines-born individuals residing in Palau in 1990 lived in Koror, along with the majority of individuals born in the U.S. or a U.S. Territory (about 79 percent of all such individuals in Palau) and most persons born "Elsewhere" (roughly 81 percent of the total). Airai, the second most populated state in Palau in 1990, contained the second greatest number of residents born outside. The remaining states in Palau contained relatively few individuals born outside.

Table 8.5. Birthplace of Palau Residents, by State: 1990

State	Total	Palau	US or Terr.	Phili- ppines	Else- where
Total.....	15,122	12,321	401	1,459	941
Aimeliik.....	439	370	12	24	33
Airai.....	1,234	1,010	35	119	70
Angaur.....	206	187	11	1	7
Hatohobei.....	22	22	-	-	-
Kayangel.....	137	131	-	-	6
Koror.....	10,501	8,139	317	1,280	765
Melekeok.....	244	230	5	1	8
Ngaraard.....	310	289	7	2	12
Ngardmau.....	149	148	1	-	-
Ngaremlengui.....	281	273	2	1	5
Ngatpang.....	62	50	-	6	6
Ngchesar.....	287	277	-	7	3
Ngerchelung.....	354	333	7	-	14
Ngiwal.....	234	225	2	4	3
Peleliu.....	601	580	2	14	5
Sonsorol.....	61	57	-	-	4

Source: U.S. Bureau of the Census, 1992c, Table 9.

Data on father's birthplace by state in general agreed with the data on individual's birthplace by state. Of the residents of Palau in 1990, more than 80 percent were born to fathers also from Palau (Table 8.6). Nearly 11 percent had fathers born in the Philippines, with the remainder born in the U.S. or a U.S. Territory, or elsewhere (probably somewhere in Asia). Once again, Koror State contained the greatest number of residents with fathers born elsewhere, primarily the Philippines. Airai was a

distant second to Koror State in the number of fathers born outside Palau, with the other states accounting for the relatively few remaining foreign-born fathers.

Table 8.6. Father's Birthplace for Palau Residents, by State: 1990

State	Total	Father's Birthplace			
		Palau	U.S. or Terr.	Philippines	Elsewhere
Total.....	15,122	12,153	366	1,636	967
Aimeliik.....	439	384	1	27	27
Airai.....	1,234	1,008	24	126	76
Angaur.....	206	175	21	2	8
Hatohobei.....	22	21	-	-	1
Kayangel.....	137	135	-	-	2
Koror.....	10,501	7,986	285	1,439	791
Melekeok.....	244	237	3	2	2
Ngaraard.....	310	290	10	2	8
Ngardmau.....	149	146	2	-	1
Ngaremlengui.....	281	272	1	1	7
Ngatpang.....	62	50	-	6	6
Ngchesar.....	287	277	-	7	3
Ngerchelong.....	354	330	12	3	9
Ngiwal.....	234	219	1	8	6
Peleliu.....	601	567	4	13	17
Sonsorol.....	61	56	2	-	3

Source: U.S. Bureau of the Census, 1992c, Table 10.

Nearly 83 percent of the residents of Palau in 1990 had mothers born somewhere in the republic (Table 8.7). Of those mothers born elsewhere, more than half came from the Philippines (slightly more than 10 percent of the total). However, compared to the birthplaces of fathers, fewer mothers of Palau residents in 1990 came from the Philippines, the U.S. or one of its territories, or elsewhere (see Figure 8.1). As discussed above, in 1990 more male residents of Palau were born outside the republic than female residents. This difference between father's and mother's birthplace probably is due to a larger number of non-Palauan males immigrating to the republic and fathering children with Palauan women.

Table 8.7. Mother's Birthplace for Palau Residents, by State: 1990

State	Total	Mother's Birthplace			
		Palau	U.S. or Terr.	Phili- ppines	Else- where
Total.....	15,122	12,541	188	1,580	813
Aimeliik.....	439	377	6	25	31
Airai.....	1,234	1,021	19	124	70
Angaur.....	206	200	3	1	2
Hatohobei.....	22	22	-	-	-
Kayangel.....	137	133	-	-	4
Koror.....	10,501	8,302	142	1,394	663
Melekeok.....	244	239	3	1	1
Ngaraard.....	310	295	4	2	9
Ngardmau.....	149	149	-	-	-
Ngaremlengui.....	281	276	1	1	3
Ngatpang.....	62	45	-	6	11
Ngchesar.....	287	279	1	7	-
Ngerchelong.....	354	343	5	-	6
Ngiwal.....	234	227	-	4	3
Peleliu.....	601	575	4	15	7
Sonsorol.....	61	58	-	-	3

Source: U.S. Bureau of the Census, 1992c, Table 10.

### *Citizenship*

Data on the citizenship of Palau's population in 1990 are consistent with the general migration patterns seen in place of birth. For the republic as a whole, more than 81 percent of the 1990 residents were born in Palau and hence were designated citizens of the republic (Table 8.8). The majority of the remainder, born neither in the U.S. nor Palau, mostly comprised the Asian community that increased in Palau over the past decade. At the level of individual states, with the exceptions of Airai and Koror most residents were citizens of Palau. These two states contained the greatest numbers of persons born in the U.S. or its territories, as well as those who were citizens of some country other than the U.S. or Palau. Once again, the large numbers of foreigners in Airai and Koror states reflect primarily the greater economic and educational attraction of these two jurisdictions, as well as the presence of modern amenities (particularly in Koror State). The presence of national government offices in Koror provides an additional attraction to non-Palauans, particularly persons from the U.S. who provide an interface between the American government and the government of Palau.

Table 8.8. Citizenship of Palau Residents, by State: 1990

State	Total	Born in Palau	Born in U.S. or its Terr.	U.S. Parents	Natur- alized U.S.	Born Neither Palau or U.S.
Total.....	15,122	12,321	518	6	30	2,247
Aimeliik.....	439	370	14	-	-	55
Airai.....	1,234	1,010	35	-	1	188
Angaur.....	206	187	17	-	-	2
Hatohobei.....	22	22	-	-	-	-
Kayangel.....	137	131	2	-	-	4
Koror.....	10,501	8,139	402	5	28	1,927
Melekeok.....	244	230	12	-	-	2
Ngaraard.....	310	289	9	1	-	11
Ngardmau.....	149	148	1	-	-	-
Ngaremlengui.....	281	273	2	-	-	6
Ngatpang.....	62	50	-	-	-	12
Ngchesar.....	287	277	3	-	-	7
Ngerchelongs.....	354	333	15	-	-	6
Ngiwal.....	234	225	3	-	-	6
Peleliu.....	601	580	3	-	1	17
Sonsorol.....	61	57	-	-	-	4

Source: U.S. Bureau of the Census, 1992c, Table 9.

### *Year of Entry*

Immigration to Palau has increased dramatically in recent years. Of those individuals residing in Palau in 1990 who were born outside the republic, more than 81 percent came to Palau during the preceding five years (Table 8.9). Fewer moved to Palau during the first half of the 1980s, with fewer still immigrating during the 1970s, the 1960s, or before.

Table 8.9. Year of Immigration to Palau, by Age: 1990

Age Group	Total	Palau Born	Year of Immigration for Non-Palau Born					
			Total	1985-1990	1980-1984	1970-1979	1960-1969	Before 1960
1990:								
All persons....	15,122	12,321	2,801	2,270	286	192	37	16
Less than 5 years...	1,513	1,391	122	122	-	-	-	-
5 to 9 years.....	1,529	1,355	174	92	82	-	-	-
10 to 14 years.....	1,534	1,411	123	50	43	30	-	-
15 to 19 years.....	1,464	1,342	122	70	9	43	-	-
20 to 24 years.....	1,340	934	406	378	10	11	7	-
25 to 29 years.....	1,403	1,002	401	376	14	4	7	-
30 to 34 years.....	1,338	920	418	377	26	10	4	1
35 to 44 years.....	2,116	1,471	645	549	52	36	3	5
45 to 54 years.....	1,179	907	272	198	30	31	10	3
55 to 59 years.....	403	348	55	29	13	12	1	-
60 to 64 years.....	387	358	29	13	4	9	2	1
65 years and over...	916	882	34	16	3	6	3	6

Source: U.S. Bureau of the Census, 1992c, Table 36.

Table 8.9 also presents information on year of immigration by age. These data once again show that much of the recent immigration to Palau has been for purposes of employment. Most individuals who moved to the republic were between 19 and 55 years old in 1990, yielding an age distribution that contrasts dramatically with that of Palau born. The natural aging process requires focussing specifically on the most recent immigrants when examining the age of migrants. Those who migrated many years prior to the 1990 census would have aged between the year they moved and the year of the census, resulting in an older age composition—an effect partially reduced in cases when people return to their home countries as they grow too old to work. Although recent immigrants to Palau included several individuals younger than 20 years of age, most of these individuals probably were offspring of those who came for employment. Some of the non-Palau born residents aged 15 to 24 years were students at the Micronesian Occupational College in Koror. Some of the non-Palau born persons belonging to older working age groups could be Peace Corps volunteers, Civil Action Team members, and businessmen. Many of this age group also may have been Asian (and non-Asian) contract workers who married Palauans and began families, with many of the remainder employed by the Palau national government.

For purposes of comparison, Table 8.10 presents data on year of immigration by age for 1980. The most obvious difference between tables 8.9 and 8.10 is the increase in immigration in the late 1980s — nearly 13 times that during the late 1970s. Nevertheless, as during the 1980s the majority of immigrants during the 1970s were working age.

Table 8.10. Year of Immigration to Palau, by Age: 1980

Age Group	Total	Palau Born	Year of Immigration for Non-Palau-Born					
			Total	1975- 1980	1970- 1974	1960- 1969	1950- 1959	Before 1950
All persons...	12,116	11,635	302	176	84	31	9	2
Less than 5 years..	1,401	1,350	36	26	8	2	-	-
5 to 9 years.....	1,701	1,663	26	14	10	2	-	-
10 to 14 years.....	1,732	1,690	32	13	15	4	-	-
15 to 19 years.....	1,565	1,519	12	8	1	3	-	-
20 to 24 years.....	1,081	1,036	17	14	3	-	-	-
25 to 29 years.....	826	782	27	23	3	1	-	-
30 to 34 years.....	694	651	28	21	7	-	-	-
35 to 44 years.....	997	901	73	39	20	11	3	-
45 to 54 years.....	780	736	38	13	17	5	2	1
55 to 59 years.....	408	396	9	5	-	2	2	-
60 to 64 years.....	287	283	-	-	-	-	-	-
65 years and over..	644	628	4	-	-	1	2	1

Source: U.S. Bureau of the Census, 1983b, Table 22.

Note: Total includes persons not reporting place of birth.

Increased immigration over time also held for most states in Palau (Table 8.11). Immigration grew within the decade of the 1980s, with nearly 52 percent of the total 1990 residents born outside Palau having moved after 1987. This immigration was seen for Koror and Airai, the states with the largest number of non-Palau-born residents. The numbers of immigrants to other states were too small to say much.

Table 8.11. When Palau Residents Came to Palau to Stay, by State: 1990

State	Total	Born in Palau		Born Outside Palau	Total	Percent Entered:		
		Number	Prcnt			1988-1990	1985-1987	Before 1985
Total.....	15,122	12,321	81.5	2,801	100.0	51.7	29.4	18.9
Aimeliik.....	439	370	84.3	69	100.0	68.1	20.3	11.6
Airai.....	1,234	1,010	81.8	224	100.0	53.6	28.1	18.3
Angaur.....	206	187	90.8	19	100.0	31.6	36.8	31.6
Hatohobei.....	22	22	100.0	-	...	...	...	...
Kayangel.....	137	131	95.6	6	100.0	-	33.3	66.7
Koror.....	10,501	8,139	77.5	2,362	100.0	52.6	29.5	17.9
Melekeok.....	244	230	94.3	14	100.0	14.3	57.1	28.6
Ngaraard.....	310	289	93.2	21	100.0	9.5	47.6	42.9
Ngardmau.....	149	148	99.3	1	100.0	-	100.0	-
Ngaremlengui...	281	273	97.2	8	100.0	12.5	37.5	50.0
Ngatpang.....	62	50	80.6	12	100.0	41.7	8.3	50.0
Ngchesar.....	287	277	96.5	10	100.0	70.0	20.0	10.0
Ngerchelong....	354	333	94.1	21	100.0	9.5	28.6	61.9
Ngiwal.....	234	225	96.2	9	100.0	44.4	11.1	44.4
Peleliu.....	601	580	96.5	21	100.0	33.3	38.1	28.6
Sonsorol.....	61	57	93.4	4	100.0	75.0	25.0	-

Source: U.S. Bureau of the Census, 1992c, Table 9.

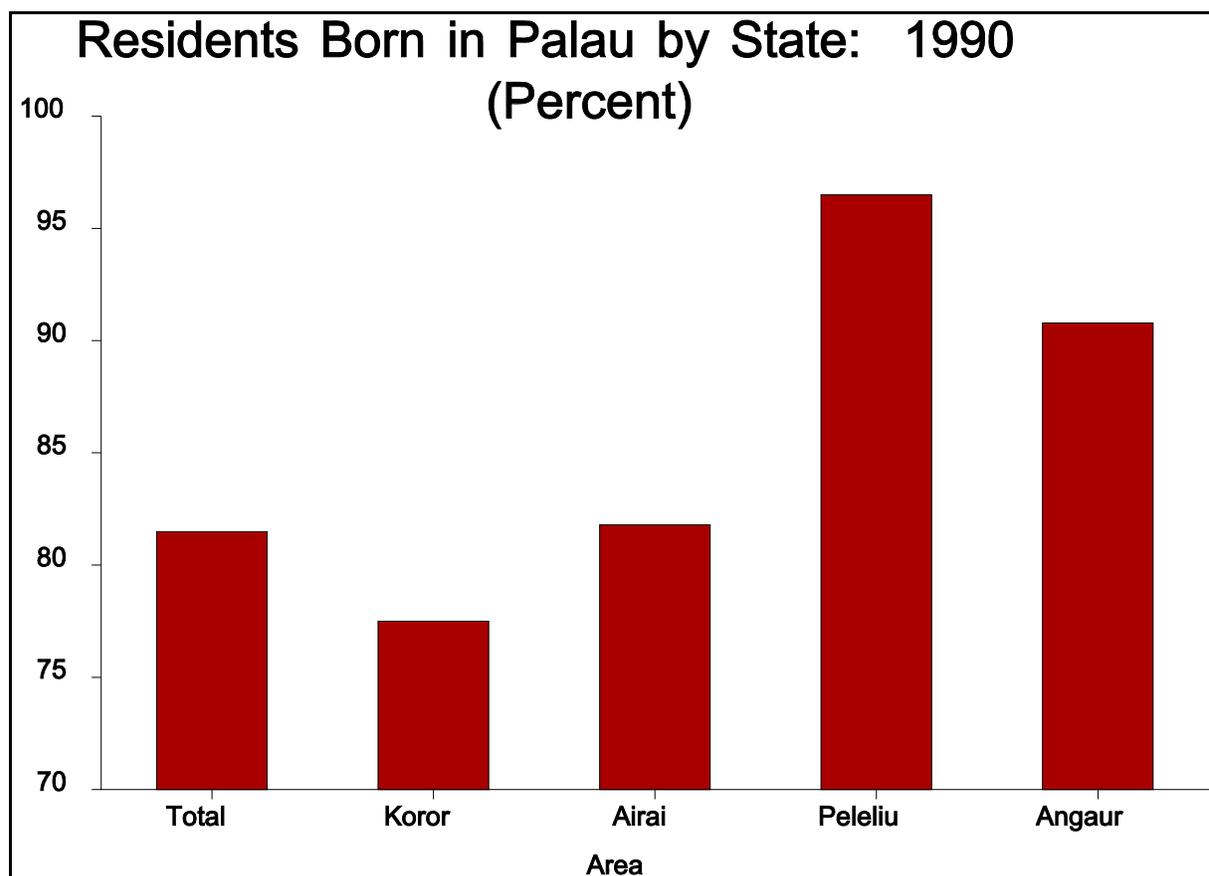


Figure 8.5. Percent of Residents Born in Palau for Selected States: 1990

### *Residence in 1985*

Although data on birthplace focus on long term, or lifetime, mobility patterns, the 1990 census also collected data on short term mobility. Table 8.12 presents the data on Palau residents by place of residence in 1985, necessarily excluding those individuals aged less than five years. Of the remaining 1990 residents, more than 34 percent lived elsewhere in 1985. Many of these individuals resided in a different house within the same state, or in a different part of Palau. Others resided outside the republic, primarily somewhere other than the Philippines (the latter delineated in the table). In 1990, Koror State contained the majority of the individuals who in 1985 lived somewhere other than the same house—about 80 percent of all such persons in Palau. Although these individuals included persons who migrated from other countries, they also included persons who migrated to Koror from more rural portions of Palau.

Table 8.12. Residence of Palau Residents in 1985, by State: 1990

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State	Total	Residence in 1985				
		Same House	Dif. House	U.S. or Terr.	Philippines	Elsewhere
Total.....	13,609	8,962	2,355	425	1,205	662
Aimeliik.....	393	294	40	7	23	29
Airai.....	1,096	756	163	34	102	41
Angaur.....	189	133	45	9	1	1
Hatohobei.....	21	15	6	-	-	-
Kayangel.....	124	104	17	3	-	-
Koror.....	9,455	5,732	1,760	333	1,049	581
Melekeok.....	222	173	44	3	1	1
Ngaraard.....	276	228	43	3	2	-
Ngardmau.....	128	91	32	5	-	-
Ngaremlengui.....	253	217	31	2	-	3
Ngatpang.....	52	33	14	-	5	-
Ngchesar.....	263	231	20	6	6	-
Ngerchelong.....	308	264	35	8	-	1
Ngiwal.....	217	184	29	-	4	-
Peleliu.....	557	471	59	11	12	4
Sonsorol.....	55	36	17	1	-	1

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Source: U.S. Bureau of the Census, 1992c, Table 11.

### *Ethnic Origin or Race*

Data on ethnicity support the other information on mobility discussed in this chapter. Most of the residents in Palau in 1990 considered themselves Palauan (Table 8.13). Of the remainder, most were Filipino, followed by "Other" which included the large non-Filipino Asian population that migrated to Palau during the 1980s. Relatively few residents of Palau in 1990 considered themselves non-Palauan Micronesian, while fewer still considered themselves "White." Most persons of non-Palauan ethnicity resided in Koror and Airai states, with Filipinos again largest (Figure 8.3).

Table 8.13. Ethnic Origin of Palau Residents, by State: 1990

State	Total	Ethnic Origin				
		Palauan	Other Mic- ronesian	Fili- pino	White	Other
Total.....	15,122	12,575	269	1,477	120	681
Aimeliik.....	439	375	19	23	-	22
Airai.....	1,234	1,025	11	119	15	64
Angaur.....	206	183	-	1	1	21
Hatohobei.....	22	22	-	-	-	-
Kayangel.....	137	133	2	-	-	2
Koror.....	10,501	8,355	211	1,300	97	538
Melekeok.....	244	235	-	1	2	6
Ngaraard.....	310	297	1	2	1	9
Ngardmau.....	149	145	1	-	-	3
Ngaremlengui.....	281	278	1	1	1	-
Ngatpang.....	62	47	3	6	-	6
Ngchesar.....	287	276	3	7	1	-
Ngerchelong.....	354	339	11	-	2	2
Ngiwal.....	234	229	1	4	-	-
Peleliu.....	601	580	1	13	-	7
Sonsorol.....	61	56	4	-	-	1

Source: U.S. Bureau of the Census, 1992c, Table 11.

Data on ethnicity by age in 1990 reveal differences between Palauans and non-Palauans (Table 8.14). Since the population was overwhelmingly Palau, the total population and the Palauans were younger than the immigrants. Generally, each older 5 year age group was smaller than the preceding one. However, the non-Palauans showed the type of distribution usually seen among newly arrived immigrant groups — the five-year age groups between 19 and 50 years were larger than the younger and older groups. Also, the median age of the non-Palauans was more than 9 years older than that of the Palauans.

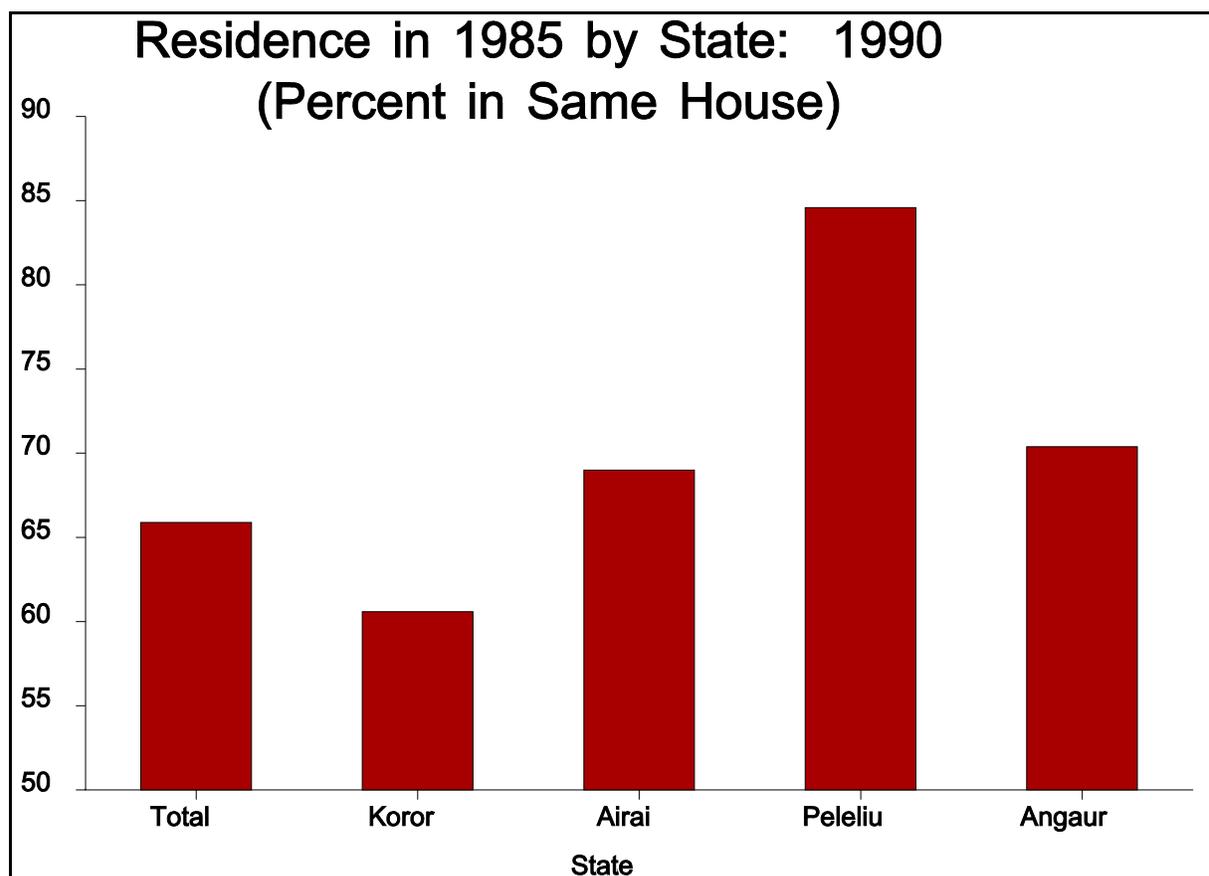


Figure 8.6. Percent Living in Same House in 1985 and 1990 for Selected States: 1990

Table 8.14. Population by Age and Ethnicity: 1990

Age Group	Numbers			Percent			
	Total	Palau	Non-Palau	Total	Palau	Non-Palau	Percent Palauan
Total.....	15,122	12,575	2,547	100.0	100.0	100.0	83.2
0 to 4 yrs.....	1,513	1,420	93	10.0	11.3	3.7	93.9
5 to 9 yrs.....	1,529	1,441	88	10.1	11.5	3.5	94.2
10 to 14 yrs...	1,534	1,457	77	10.1	11.6	3.0	95.0
15 to 19 yrs...	1,464	1,390	74	9.7	11.1	2.9	94.9
20 to 24 yrs...	1,340	955	385	8.9	7.6	15.1	71.3
25 to 29 yrs...	1,403	1,016	387	9.3	8.1	15.2	72.4
30 to 34 yrs...	1,338	930	408	8.8	7.4	16.0	69.5
35 to 39 yrs...	1,243	853	390	8.2	6.8	15.3	68.6
40 to 44 yrs...	873	626	247	5.8	5.0	9.7	71.7
45 to 49 yrs...	666	500	166	4.4	4.0	6.5	75.1
50 to 54 yrs...	513	410	103	3.4	3.3	4.0	79.9
55 to 59 yrs...	403	344	59	2.7	2.7	2.3	85.4
60 to 64 yrs...	387	353	34	2.6	2.8	1.3	91.2
65 to 69 yrs...	332	312	20	2.2	2.5	0.8	94.0
70 to 74 yrs...	249	240	9	1.6	1.9	0.4	96.4
75 + yrs .....	335	328	7	2.2	2.6	0.3	97.9
Median.....	25.6	23.0	32.1	...	...	...	...

Source: U.S. Bureau of the Census, 1992c, Table 38.

Note: Non-Palauans include individuals of dual ethnicity, including Palauan and another ethnic origin.

The percentages of non-Palauans by age seen in Table 8.14 began earlier in the decade and were established at least by 1986 (Table 8.15). But although same general age composition existed in the mid-1980s, fewer ethnic non-Palauans resided in the republic. Comparisons between categories such as median age of ethnic Palauans versus non-Palauans further support the growing differences found between 1986 and 1990.

Table 8.15. Population by Age and Ethnicity: 1986

Age Group	Numbers			Percent			Percent Palauan
	Total	Palau	Non-Palau	Total	Palau	Non-Palau	
Total.....	13,873	12,323	1,550	100.0	100.0	100.0	88.8
0 to 4 yrs.....	1,576	1,499	77	11.4	12.2	5.0	95.1
5 to 9 yrs.....	1,546	1,484	62	11.1	12.0	4.0	96.0
10 to 14 yrs...	1,727	1,674	53	12.4	13.6	3.4	96.9
15 to 19 yrs...	1,523	1,320	203	11.0	10.7	13.1	86.7
20 to 24 yrs...	1,429	1,141	288	10.3	9.3	18.6	79.8
25 to 29 yrs...	1,158	985	173	8.3	8.0	11.2	85.1
30 to 34 yrs...	1,015	832	183	7.3	6.8	11.8	82.0
35 to 39 yrs...	831	691	140	6.0	5.6	9.0	83.2
40 to 44 yrs...	637	505	132	4.6	4.1	8.5	79.3
45 to 49 yrs...	524	435	89	3.8	3.5	5.7	83.0
50 to 54 yrs...	394	337	57	2.8	2.7	3.7	85.5
55 to 59 yrs...	415	381	34	3.0	3.1	2.2	91.8
60 to 64 yrs...	349	319	30	2.5	2.6	1.9	91.4
65 to 69 yrs...	303	289	14	2.2	2.3	0.9	95.4
70 to 74 yrs...	179	169	10	1.3	1.4	0.6	94.4
75 + yrs.....	267	262	5	1.9	2.1	0.3	98.1
Median.....	22.0	20.8	27.7	...	...	...	...

Source: OPS, 1987, Tables A2 and A3.

## Conclusions

The 1990 Census data describe a population increasingly affected by both immigration and emigration. Most information in the recent census deals with the former topic. Although this chapter employs several means of assessing immigration, much of the story is told by place of birth of republic residents. Nearly 19 percent of the 1990 population of Palau were born elsewhere, mainly in the Philippines or another country in Asia (primarily China, Japan, Korea, or Taiwan). This immigration nearly triples the percentage of non-Palau-born residents in 1980, with the influx of foreigners growing throughout the 1980s. In general, more men than women moved to Palau during the 1980s, both sexes having large numbers aged 25 to 44 years. The main reasons for this immigration apparently was the search for employment, as Filipinos and other Asians moved to Palau for work — often taking menial jobs.

In addition to place of birth, this chapter also discussed citizenship, year of entry, residence in 1985, and ethnic origin or race as means of assessing migration in Palau. In all cases, substantial recent migration of working age persons from Asia, particularly the Philippines, is evident. Evidence for short-term migration is particularly noteworthy; in contrast to other parts of Micronesia where large

scale immigration decreased in recent years (see Gorenflo, 1990), mobility remains a substantial force even over the short term in the Republic of Palau.

[MIKE:TO DO]

Since the 1990 census was modified *de jure*, data on emigration from Palau were not collected. However, in Chapter 16 we look at many of the emigrants - those in Gaum and the CNMI in 1990. When we look at birthplace of Palau residents, and their fertility and mortality, we find that the sustained growth of native Palauans that *should* have characterized the 1980s did not occur. Palauans migrated elsewhere. Data from the 1990 censuses of the CNMI and Guam show relatively many residents born in Palau, probably accounting for most of the emigrants from the republic. The United States is the other likely destination for these emigrants, but data from the 1990 U.S. census are presently unavailable.

## CHAPTER 9. EDUCATION AND LANGUAGE

Educational statistics from decennial censuses yield information on the school enrollment and levels of educational attainment. Also, census data on language use provide information for use in bilingual programs in schools and the work place. Generally, a population's levels of formal schooling and language use are good indicators both of social conditions and potential for economic success. For Palau, which is moving from a more traditional economic system to a more Westernized system, data on education and language serve the additional purpose of providing means to evaluate overall cultural change. Moreover, given the important role that education has come to play in various sectors of Palau's economy, and the role of language use in the work place, the study of these two subjects should provide insights on the direction of acculturation and the changing economic potential of the republic.

The 1990 census had two items for education: school enrollment and level of educational attainment. The Palau Department of Education collects statistical data annually to obtain information about school enrollment and to assess needs for special programs in bilingual education and special education. The decennial census allows more in-depth analysis of the school population's ethnicity, birthplace, class of worker, income, and language spoken at home. Here we examine education and language data from the 1990 census.

### **Data Description**

#### *SCHOOL ENROLLMENT AND TYPE OF SCHOOL*

The 1990 census obtained data on school enrollment from answers to questionnaire item 10. Persons were classified as enrolled in school if they reported attending a "regular" public or private school or college at any time between 1 February 1990 and enumeration. The question included instructions to "include only pre-kindergarten, kindergarten, elementary school, and schooling which would lead to a high school diploma or a college degree" as regular school. Census Bureau personnel instructed enumerators not to include enrollment in a trade or business school, company training, or tutoring unless the course would be accepted for credit at a regular elementary school, high school, or college. Persons who did not answer the enrollment question were assigned the enrollment status and type of school of a person with the same age, ethnic origin or race, and at older ages, sex, whose residence was in the same or a nearby area.

*Public and Private School.* This category included persons who attended school in the reference period and reported they were enrolled by marking one of the questionnaire categories for either "public school, public college" or "private school, private college." The enumerator instructions defined a "public" school as "any school or college controlled and supported by a local or Federal

Government." The census defined "schools supported and controlled primarily by religious organizations or other private groups" as "private."

*Level of School in Which Enrolled.* The 1990 census classified persons enrolled in school at the time of the 1990 census as enrolled in "preprimary school," "elementary school," "high school," or "college" according to their response to question 11a (years of school completed or highest degree received). Persons who were enrolled and reported completing pre-kindergarten school or less were classified as enrolled in "preprimary school," which included kindergarten. Similarly, enrolled persons who had completed at least kindergarten, but not eighth grade, were classified as enrolled in elementary or high school. Persons who completed at least the eighth grade, but who were not high school graduates, were classified as enrolled in high school. Enrolled persons who reported completing high school or some college or having received a post-secondary degree were classified as enrolled in "college." Enrolled persons who reported completing the twelfth grade but receiving "No Diploma" were classified as "enrolled in high school." For more information on level of school, see the discussion for *Educational Attainment*.

*Limitations.* There are no obvious limitations of the school enrollment and type of school data collected in the 1990 census of Palau.

*Comparability.* School enrollment questions have been included in the decennial censuses of Palau since 1970. The pertinent question in the censuses referred to attendance "since February 1" (except in 1980, when the census was conducted on September 15, 1980 and the reference used was "Since September 1, 1980...").

The age range for which enrollment data have been obtained and published has varied between censuses. Information on enrollment was recorded for persons aged 3 years and over in 1980 and 1990. In the 1980 and 1990 censuses, college students were enumerated where they lived while attending college.

Type of school was first introduced in the 1970 census in Palau, where a separate question asked the enrolled persons whether they were in a "public" or "private" school. Since the 1970 census, the type of school was incorporated into the response categories for the enrollment question and the terms were changed to "public," "parochial," and "other private." In the 1980 census, "private, church related" and "private, not church related" replaced "parochial" and "other private."

Grade of enrollment was first available in Palau's 1970 census where it was obtained from responses to the question on highest grade of school completed. Enumerators were instructed that "for a person still in school, the last grade completed will be the grade preceding the one in which he or she was now enrolled." In 1970 and 1980, grade of enrollment was obtained from the highest grade attended in the two-part question used to measure educational attainment. For more information grade of enrollment, see the discussion under *Educational Attainment* below.

Data on school enrollment are also collected and published by other federal and local government agencies. Where these data are obtained from administrative records of school systems and institutions of higher learning, they are only roughly comparable with data from population censuses and household surveys because of differences in definitions and concepts, subject matter covered, time references, and enumeration methods. At the local level, the difference between the location of the institution and the residence of the student may affect the comparability of census and administrative data. Differences between the boundaries of school districts and census geographic units also may affect these comparisons.

### *SCHOOL ENROLLMENT AND LABOR FORCE STATUS*

The tabulation of 1990 census data on enrollment, educational attainment, and labor force status for the population 16 to 19 years old allows for calculation of the proportion of the age group who were not enrolled in school and not high school graduates or "dropouts" and an unemployment rate for the "dropout" population. Definitions of the three topics and descriptions of the census items from which they were derived are presented under the headings *Educational Attainment*, *Employment Status*, and *School Enrollment and Type of School*. The tabulations published in the main 1990 census report for Palau include both the civilian and Armed Forces populations, but labor force status is provided for the civilian population only (see U.S. Bureau of the Census, 1992c). Therefore, the labor force statuses may not add to the total lines high school graduate and not high school graduate; the difference is Armed Forces.

**Limitations.** There are no obvious limitations of the school enrollment and labor force data collected in the 1990 census of Palau.

**Comparability.** The tabulation of school enrollment by labor force status prepared for the main report of the 1990 census of Palau is similar to that published in 1980 census reports (see U.S. Bureau of the Census, 1984; 1992c). The 1980 census tabulation included a single data line for Armed Forces. However, enrollment, attainment, and labor force status data were shown for the civilian population only.

### *EDUCATIONAL ATTAINMENT*

The 1990 census of Palau obtained data on educational attainment from answers to questionnaire item 11a. Data were tabulated for persons 15 years old and over. Persons were classified according to the highest grade of school completed or the highest degree received. For persons currently enrolled in school, the question included instructions to report the level of the previous grade attended or the highest degree received. The question included response categories which allowed persons to report completing the twelfth grade without receiving a high school diploma. Respondents were to report as "high school graduate(s)" those persons who received either a high

school diploma or the equivalent—including, for example, individuals who passed the Test of General Educational Development (G.E.D.) and did not attend college.

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 medicine, 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 degree category.

Census personnel assigned persons who did not report educational attainment the attainment of a person of the same age, ethnic origin, and sex who resided in the same or a nearby area.

*High School Graduate or Higher.* This category included 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 twelfth grade but not receiving a diploma were not included.

*Not Enrolled, Not High School Graduate.* This category included 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.

"Percent high school graduate or higher" and "Percent bachelor's degree or higher" are summary measures which can be calculated from the present data and offer quite readily interpretable measures of differences between population subgroups. To make comparisons with data from previous censuses, one can calculate "Percent high school graduate or higher" and approximate "Percent bachelor's degree or higher."

**Limitations.** There are no obvious limitations of the educational attainment data collected in the 1990 census of Palau.

**Comparability.** Beginning in 1970, censuses of Palau included educational attainment questions on years of school completed. In the censuses of 1970 and 1980, 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 had not attended college, the response categories in the 1990 educational attainment question should have produced data comparable to data on highest grade completed from earlier censuses.

The response categories for persons who 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.

### *LITERACY*

The 1990 census of Palau obtained data on literacy — ability to read and write — from responses to questionnaire item 15a, asked of persons 5 years old and over. In published reports based on the 1990 data, results generally are shown only for persons 10 years old and over. Persons less 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. Respondents were asked if they could read and write in any language. They could report being literate in English or any other language. The enumerators were instructed that a literate person would be able to read a letter from someone else and to write a letter. A person was not literate if he or she could read but not write, or if the writing ability was limited to writing the person's own name.

Limitations. There are no obvious limitations of the literacy data collected in the 1990 census of Palau.

Comparability. Palau's 1980 census included a question on literacy.

### *VOCATIONAL TRAINING*

The 1990 census obtained data on vocational training from responses to questionnaire item 11b. "Vocational training" denotes a school program designed to prepare a person for work in a specific occupational field. Persons were counted as having completed vocational training if they completed the requirements for a vocational training program at a trade school, business school, hospital, some other kind of school for occupational training, or place of work.

Enumerator instructions differentiated vocational training from academic training and on-the-job training. The vocational training could be in such vocational fields as carpentry, electronics, nursing, or accounting if a bachelor's degree would not be granted for the training. Training at place of work included programs designed to teach new skills. Instruction could be provided by a company teacher or other vocational teacher, at the company or at another location. On-the-job

training was not to be included as vocational training since its purpose is to provide instruction for specific job duties. Vocational training in high school was included if it was in an organized program of study and was intended to provide a marketable skill upon graduation. Individual courses for personal enrichment, such as a single typing course, were not considered vocational training. Job Corps training and correspondence courses were included. Also, among training not included were college courses applicable towards a bachelor's degree, single courses not part of an organized program, on-the-job training, and Armed Forces basic training. Persons who completed a program were asked to report whether the training was in Palau or outside Palau. This portion of the question was new in 1990.

**Limitations.** There are no obvious limitations of the vocational training data collected in the 1990 census of Palau.

**Comparability.** The vocational training question was first asked in the 1980 decennial census. In 1980, an additional question asked about the specific type of school. In 1990, the census asked each respondent the location where the course was taken.

#### *LANGUAGE SPOKEN AT HOME AND FREQUENCY OF LANGUAGE USAGE*

Data on language spoken at home came from answers to questionnaire items 15b, 15c, and 15d. These questions obtained the range of languages other than English spoken at home and how frequently they were spoken relative to English. The questions were asked only of persons 5 years old and over.

*Language Spoken at Home.* Persons were asked in questionnaire item 15b whether they spoke a language other than English at home. Respondents were not to include languages spoken only at school or languages for which the ability was limited to a few words or slang. Persons who spoke only English at home were instructed to answer "No" and to skip the remainder of the language questions.

Those persons who reported speaking a language other than English were asked in question 15c to report the non-English language spoken at home. If more than one non-English language was spoken, the person was asked which language was spoken most often. If it could not be determined which was spoken most often, the first language the person learned to speak was to be recorded. The response was written on the form by the enumerator and later given a three-digit code in a separate operation. Answers were coded using a detailed list of languages which distinguished more than 380 languages or language groups. If more than one language was written on the form only the first non-English language was coded.

*Frequency of Language Usage.* Persons who reported in 15b that they spoke a language other than English at home were asked to report in item 15d the frequency with which they spoke the other

language relative to English in one of the following categories: "more frequently than English," "both equally often," "less frequently than English," or "does not speak English."

The imputation procedure for persons who failed to report language spoken involved attributing the language of other household members. If that was not possible, the language of a person of like ethnic origin and other demographic characteristics was imputed. Unreported frequency of use was allocated in a similar manner.

**Limitations.** There are no obvious limitations of the language spoken at home and frequency of language usage data collected in the 1990 census of Palau.

**Comparability.** Questions concerning language spoken at home and frequency of language usage were asked for the first time in the 1980 census. The language categories included in the main report for the 1990 census of Palau were slightly different those published in 1980.

### **Analysis of Education and Language Data**

Although the population of Palau increased from less than 12,000 in 1970 to more than 15,000 in 1990, the number of persons attending school in the republic remained virtually constant over these two decades (Table 9.1). In part these contrasting trends were due to selective migration, with families and individuals moving out of Palau being replaced primarily by single adults (without children) migrating into the republic, in part to decreasing fertility, and in part to parents sending their children out of Palau for schooling. Enrollment increased between 1970 and 1980 before declining to the levels recorded for 1990. Much of the initial increase in enrollment probably was due to historic circumstances—the return of many administrators with school age children as the TTPI government closed down in Saipan, increased fertility, and selective migration patterns. Some of these same trends began to reverse in the 1980s, with the flow from Saipan stopping, fertility declining, and Palauan families and individuals emigrating.

Table 9.1. School Attendance by Type and Level: 1970, 1980, and 1990

Type and Level	Numbers			Prct Change		Percent		
	1990	1980	1970	80/90	70/80	1990	1980	1970
Persons 3 + yrs & enrolled in school...	4,119	4,563	4,001	-9.7	14.0	...	...	...
Preprimary.....	97	241	51	-59.8	372.5	100.0	100.0	100.0
Public.....	65	124	38	-47.6	226.3	67.0	51.5	74.5
Private.....	32	117	13	-72.6	-	33.0	48.5	25.5
Elementary (1 to 8).....	2,365	2,737	2,880	-13.6	-5.0	100.0	100.0	100.0
Public.....	1,974	2,426	2,576	-18.6	-5.8	83.5	88.6	89.4
Private.....	391	311	304	25.7	2.3	16.5	11.4	10.6
High school (1 to 4).....	1,275	1,183	968	7.8	22.2	100.0	100.0	100.0
Public.....	976	943	769	3.5	22.6	76.5	79.7	79.4
Private.....	299	240	199	24.6	20.6	23.5	20.3	20.6
College.....	382	402	102	-5.0	294.1	...	...	...

Sources: U.S. Bureau of the Census, 1972, Table 10; 1984, Table 22; 1992c, Table 40.

Notes: Data for 1970 are for persons 3 to 34 years old.

Preprimary includes prekindergarten and kindergarten.

The elementary school population declined slightly between 1970 and 1980, prior to a considerable decrease between 1980 and 1990, reflecting the decline in fertility. On the other hand, high school enrollment increased in both decades. This increase in high school enrollment was due in part to an increased number of schools, and hence increased access to these schools, and partly because of increased interest in formal schooling associated with increased educational expectations throughout Palau society.

The percentages of students in private schools, both at the elementary and high school levels, increased between 1970 and 1990, particularly during the 1980s. Although private schools served about 11 percent of the elementary students in 1970, these institutions contained more than 16 percent of the elementary school student population in 1990. Similarly, the percentage in private high schools increased from nearly 21 percent to about 24 percent during the 20-year period.

Although males students outnumbered female students in 1990—both in total and for most levels of education — the numbers of male and female high school students were balanced (Table 9.2). In 1990, females were slightly more likely to be enrolled in preprimary school than males, the latter were more likely to be in elementary school and college. Females were more likely to be in private elementary schools than males, although at the high school level the percentages of each sex were about the same.

Table 9.2. School Attendance by Type, Level, and Sex: 1980-1990

Type and Level	1990 Number			Percent of Fmles	1990 Percent			Males/ 100 Fmles
	Total	Males	Fmles		Total	Males	Fmles	
Persons 3 + yrs & enrolled in school..	4,119	2,164	1,955	47.5	...	...	...	110.7
Preprimary.....	97	47	50	51.5	100.0	100.0	100.0	94.0
Public.....	65	30	35	53.8	67.0	63.8	70.0	85.7
Private.....	32	17	15	46.9	33.0	36.2	30.0	113.3
Elementary (1 to 8)...	2,365	1,249	1,116	47.2	100.0	100.0	100.0	111.9
Public.....	1,974	1,064	910	46.1	83.5	85.2	81.5	116.9
Private.....	391	185	206	52.7	16.5	14.8	18.5	89.8
High school (1 to 4)...	1,275	637	638	50.0	100.0	100.0	100.0	99.8
Public.....	976	489	487	49.9	76.5	76.8	76.3	100.4
Private.....	299	148	151	50.5	23.5	23.2	23.7	98.0
College.....	382	231	151	39.5	...	...	...	153.0

Source: U.S. Bureau of the Census, 1992c, Table 40.

The data on educational attainment for individuals aged 25 years and over showed increases at virtually all levels of schooling between 1967 and 1990 (Table 9.3). The only exceptions were elementary school and early high school education between 1967 and 1970, both of which declined slightly — although these decreases may be a consequence of weaknesses in the 1970 census coupled with different methods used in 1967 and 1970. As of 1990, nearly 58 percent of the persons in Palau aged 25 years and over had attended four years of high school. About 31 percent of Palau residents had attended college, with more than 10 percent having at least four years of college.

Table 9.3. Educational Attainment: 1967, 1970, 1973, 1980, 1986, and 1990

Educational Attainment	1990	1986	1980	1973	1970	1967
Total, 25 yrs and over..	7,742	6,009	4,636	3,940	3,776	2,419
Percent:						
No school.....	100.0	100.0	100.0	100.0	100.0	100.0
Elementary: 1 to 8 yrs.....	98.2	98.0	92.7	91.6	85.8	100.0
High school: 1 to 3 yrs.....	70.9	61.1	46.4	30.1	22.6	27.4
4 years.....	57.6	47.4	33.9	16.9	10.7	8.0
College: 1 to 3 yrs.....	31.0	24.2	16.8	7.9	4.6	3.1
4 + yrs.....	10.3	9.2	5.4	4.5	2.0	0.7

Sources: U.S. Bureau of the Census, 1972, Table 10; 1984, Table 35; 1992, Table 40; Office of Census Coordinator, TTPI, 1975, Table 13; OPS, 1987, Table C6; School of Public Health, n.d., Table 6.

Notes: Individuals for which level of educational attainment was "Not stated" in 1986 excluded. Percents are cumulative.

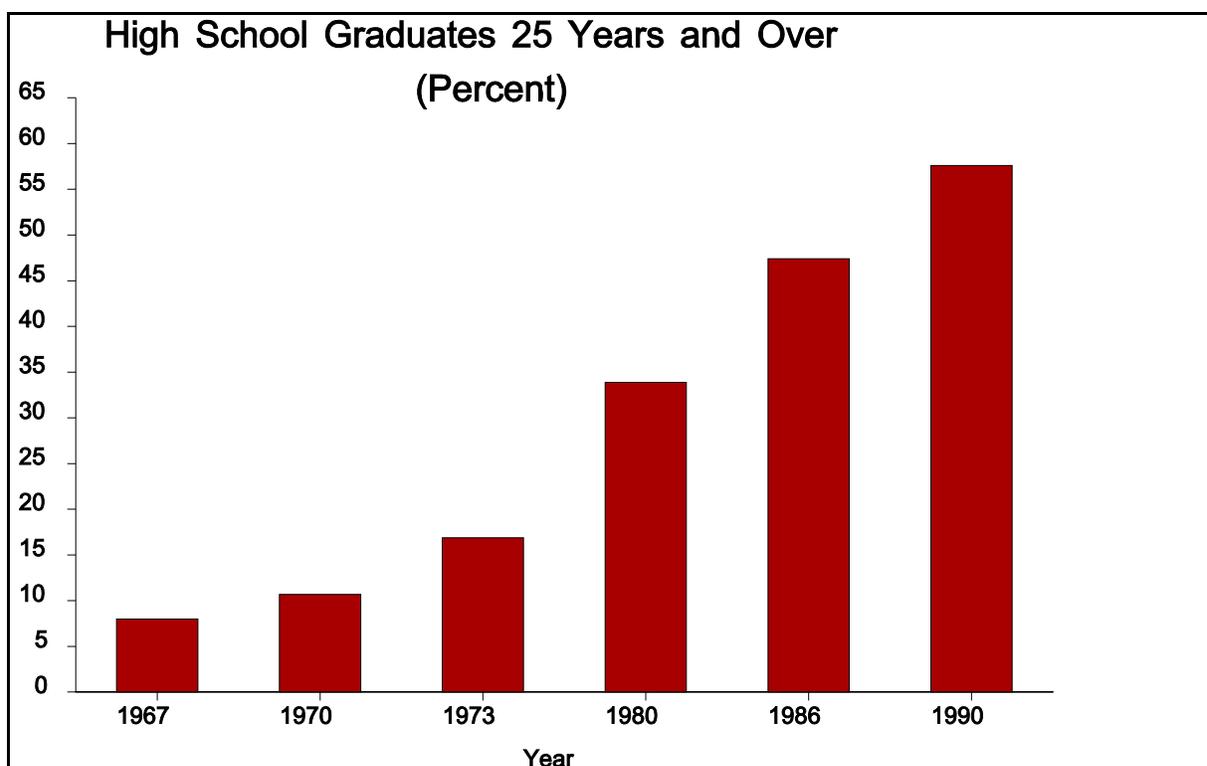


Figure 9.1. Percent of Persons 25 Years and over Being High School Graduates: 1967 to 1990

In general, educational attainment for males also increased consistently between 1967 and 1990, with a slight decline in the proportion with four or more years of college between 1986 and 1990 added to the declines between 1967 and 1970 (Table 9.4). The decline of males with college educations between 1986 and 1990 possibly resulted from the heavy influx of working age male migrants during the second half of the 1980s, many of whom immigrated to take jobs as laborers and may not have had as much formal education. For the six census years, males generally had higher levels of educational attainment than all persons aged 25 years and over.

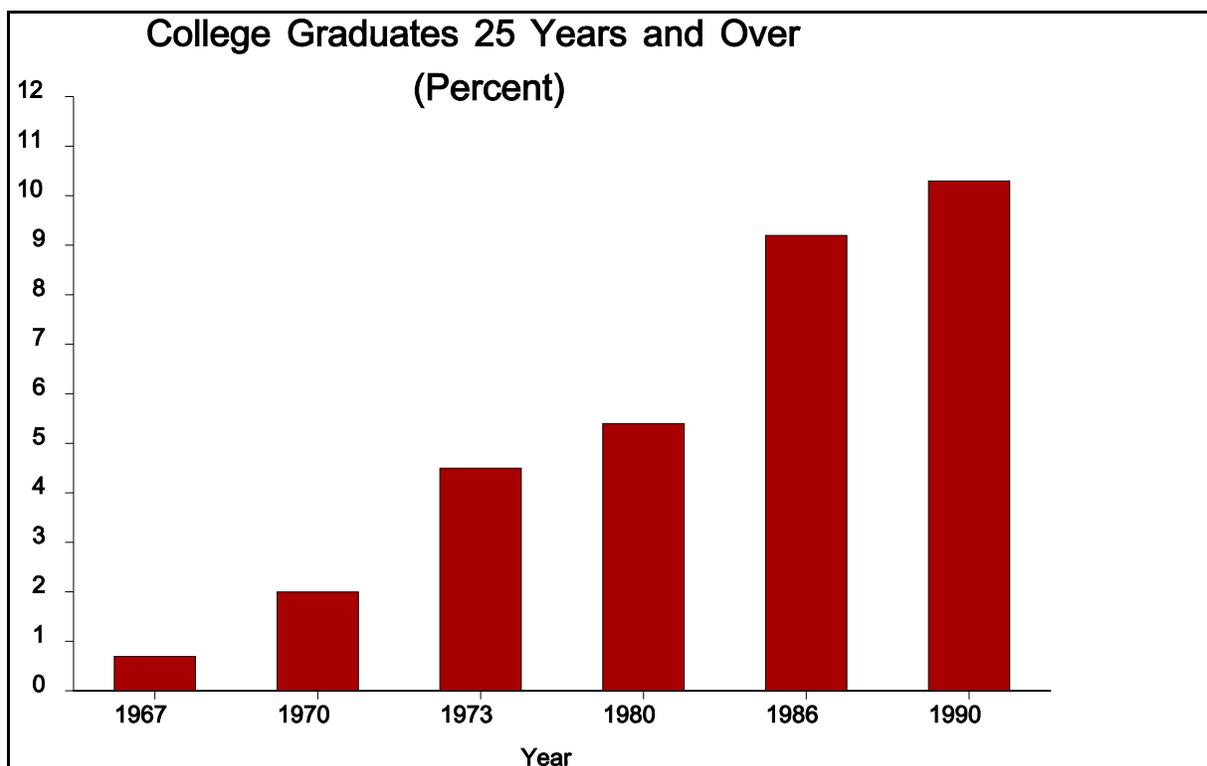


Figure 9.2. Percent of Persons 25 Years and over Being College Graduates: 1967 to 1990

Table 9.4. Educational Attainment for Males: 1967, 1970, 1973, 1980, 1986, and 1990.

Educational Attainment	1990	1986	1980	1973	1970	1967
Males, 25 yrs and over..	4,240	3,132	2,300	1,968	1,882	1,164
Percent:						
No school.....	100.0	100.0	100.0	100.0	100.0	100.0
Elementary: 1 to 8 yrs.....	98.5	98.5	94.4	93.6	87.8	100.0
High school: 1 to 3 yrs.....	75.8	66.0	53.0	36.3	26.2	32.7
4 years.....	62.1	52.3	39.3	22.2	13.8	11.8
College: 1 to 3 yrs.....	34.2	27.6	20.4	10.2	6.5	5.1
4 + yrs.....	10.6	10.8	6.8	5.6	3.1	1.2

Sources: U.S. Bureau of the Census, 1972, Table 10; 1984, Table 35; 1992, Table 40; Office of Census Coordinator, TTPI, 1975, Table 13; OPS, 1987, Table C6; School of Public Health, n.d., Table 6.

Notes: Individuals for which level of educational attainment was "Not stated" in 1986 excluded. Percents are cumulative.

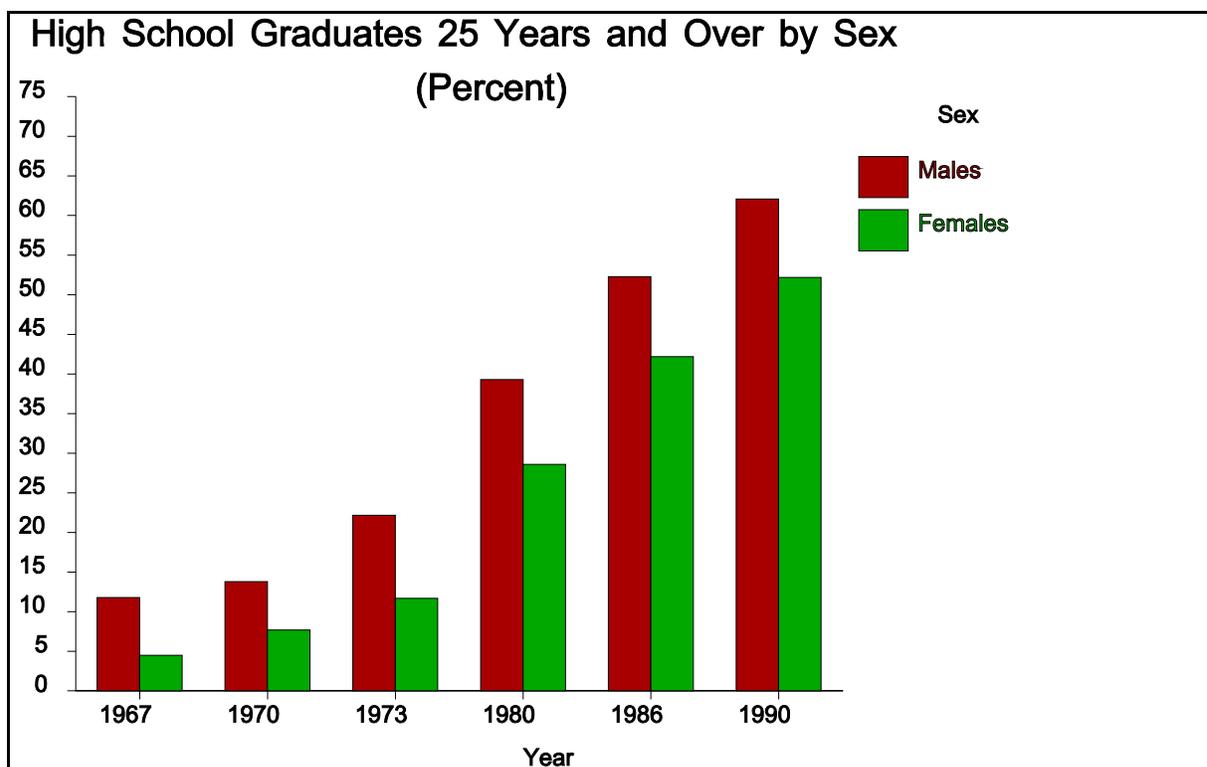


Figure 9.3. Percent High School Graduates 25 Years and over by Sex: 1967 to 1990

Trends in educational attainment for females in Palau resembled the males: attainment generally increased over time, at least between the late 1960s and 1990 (Table 9.5). Slight declines in attainment occurred between 1967 and 1970 for persons with elementary and 1 to 3 years of high school education.

Table 9.5. Educational Attainment for Females: 1967, 1970, 1973, 1980, 1986, and 1990

Educational Attainment	1990	1986	1980	1973	1970	1967
Females, 25 yrs and over..	3,502	2,880	2,336	1,972	1,894	1,255
Percent:						
No school.....	100.0	100.0	100.0	100.0	100.0	100.0
Elementary: 1 to 8 yrs.....	97.9	97.5	91.0	89.7	83.7	100.0
High school: 1 to 3 yrs.....	64.9	55.7	40.0	23.8	19.1	22.5
4 years.....	52.2	42.2	28.6	11.7	7.7	4.5
College: 1 to 3 yrs.....	27.1	20.6	13.3	5.6	2.7	1.3
4 + yrs.....	10.1	7.5	4.0	3.3	1.0	0.2

Sources: U.S. Bureau of the Census, 1972, Table 10; 1984, Table 35; 1992, Table 40; Office of Census Coordinator, TTPI, 1975, Table 13; OPS, 1987, Table C6; School of Public Health, n.d., Table 6.

Notes: Individuals for which level of educational attainment was "Not stated" in 1986 excluded. Percents are cumulative.

Because Koror is the capital of Palau with the majority of private and government activities, persons living there were better educated than those living elsewhere in 1990 (Table 9.6). Koror State attracted more educated persons than other states in Palau, primarily because of the presence of high paying jobs requiring skilled persons. Koror also contained more educational institutions than other states in Palau, providing both more opportunity for formal schooling and (at least for college education) introducing the greater likelihood that respondents actually were in Koror to pursue higher education. Rural states, in contrast, provided fewer educational opportunities as well as fewer economic and social attractions to those with formal educations elsewhere. Many persons with college degrees in 1990 living in rural parts of Palau were school teachers, government employees or Peace Corps volunteers.

Table 9.6. Educational Attainment by State: 1990

State	Total	Elementary or less	Some High School	High School Grad.	Some College	College Graduate
Total Aged 25+...	7,742	100.0	70.9	57.6	31.0	10.3
Aimeliik.....	200	100.0	64.5	44.0	24.0	7.5
Airai.....	628	100.0	69.4	54.8	25.2	7.5
Angaur.....	107	100.0	50.5	33.6	21.5	5.6
Hatohobei.....	8	100.0	25.0	12.5	12.5	-
Kayangel.....	59	100.0	50.8	33.9	13.6	1.7
Koror.....	5,466	100.0	76.5	64.6	36.0	12.5
Melekeok.....	118	100.0	51.7	34.7	19.5	1.7
Ngaraard.....	142	100.0	53.5	34.5	16.2	8.5
Ngardmau.....	79	100.0	55.7	30.4	16.5	1.3
Ngaremlengui.....	39	100.0	56.4	33.3	12.8	5.1
Ngatpang.....	136	100.0	48.5	36.8	14.7	3.7
Ngchesar.....	125	100.0	54.4	34.4	12.8	5.6
Ngerchelongs.....	168	100.0	50.0	39.9	19.0	4.2
Ngiwal.....	124	100.0	49.2	29.8	12.9	3.2
Peleliu.....	322	100.0	52.5	34.5	14.3	2.5
Sonsorol.....	21	100.0	28.6	19.0	14.3	-

Source: U.S. Bureau of the Census, 1992c, Table 13.

Note: Percents are cumulative.

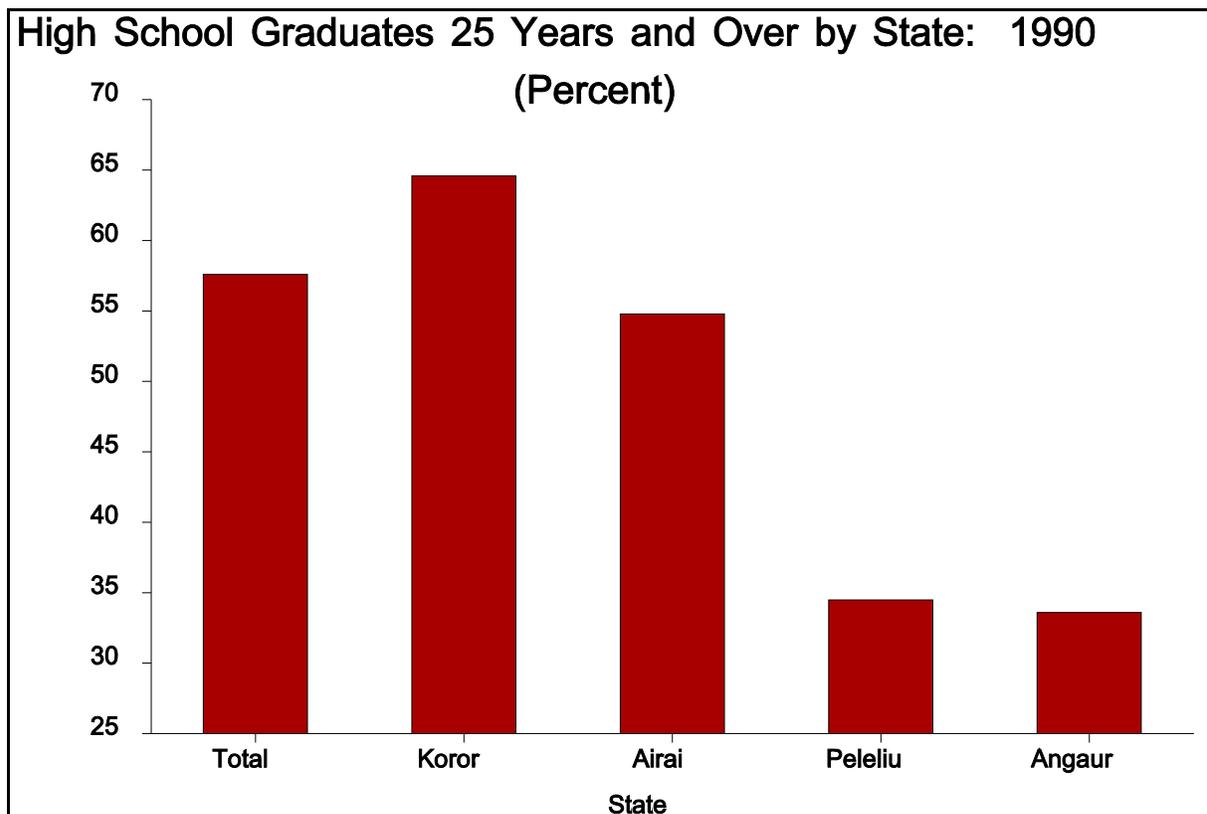


Figure 9.4. Percent High School Graduates 25 Years and Over by State: 1990

In 1990, nearly 71 percent of the persons living in Palau and aged 25 years or older had attended some high school. As level of educational attainment increased, the percentage of all individuals claiming a particular level declined (Table 9.7). Less than 2 percent of all residents in Palau aged 25 years or more had education beyond that of a Bachelor's degree.

Table 9.7. Educational Attainment by Age: 1990

Educational Attainment	Total	25-29 Years	30-34 Years	35-44 Years	45-54 Years	55-64 Years	65 Yrs & over
Total, 25 + years....	7,742	1,403	1,338	2,116	1,179	790	916
Elementary School.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
High School, no diploma...	70.9	87.5	90.3	89.1	75.1	30.6	4.5
High School graduate.....	57.6	73.3	74.6	76.3	52.0	22.2	3.4
Some college.....	31.0	35.2	38.3	42.2	31.9	13.7	2.0
Associate degree.....	19.9	19.5	24.1	27.1	23.2	10.5	1.6
Bachelor's degree.....	10.3	8.6	12.0	14.6	13.3	5.7	1.0
Higher degree.....	1.8	0.4	1.5	2.6	3.6	1.4	0.4

Source: U.S. Bureau of the Census, 1992c, Table 63.

Note: Percents are cumulative.

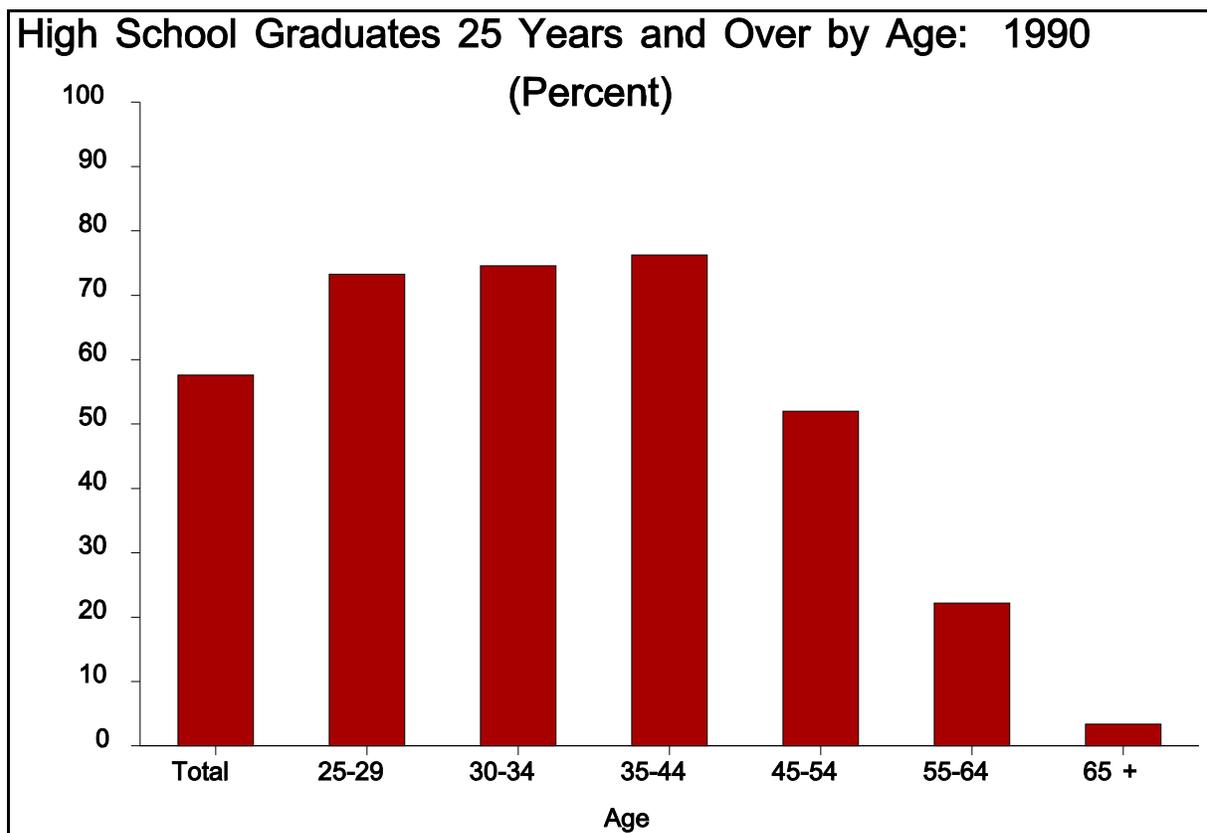


Figure 9.5. Percent High School Graduates 25 Years and Over by Age: 1990

Educational attainment varied considerably with age. For all levels of attainment except elementary school, the percentages increased by age to the 35 to 44 year age group, and then decreased, showing increasing access for younger persons during the 1970s, and persons choosing not to avail themselves of this access in the 1980s. The percentage of high school graduates peaked among the 35 to 44 year olds, with more than 3 of every 4 having at least a high school diploma. Similarly about 15 percent of those in this age group had at least a Bachelor's degree, but this figure may have been influenced both by persons being away to go to school, taking longer than in the past to finish schooling, and the effects of the immigrants on the education statistics.

Recent immigration of less educated individuals to Palau, coupled with the emigration of better educated Palauans to Guam, the CNMI, and the U.S., probably has led to declining levels of educational attainment, particularly among youngest age groups. Migration could explain some of the decline in the proportion of individuals with Bachelor's degrees between those aged 30 to 34 years and those aged 25 to 29 years.

Educational attainment in 1990 for males in Palau exceeded the attainment of all persons at all levels of schooling (Table 9.8). The patterns for all persons aged 25 years and older held for males as well. The decline in the proportions of males with Bachelor's degrees between age groups 25 to 29 and 30 to 34 years is particularly noticeable. Immigration of working age males to Palau was particularly heavy during the 1980s accounted for some of the decline in the proportion of males with Bachelor's degrees in the youngest two age groups.

Table 9.8. Educational Attainment for Males by Age: 1990

Educational Attainment	Total	25-29	30-34	35-44	45-54	55-64	65 Yrs
		Years	Years	Years	Years	Years	& over
Males 25 + years.....	4,240	799	768	1,234	654	389	396
Elementary School.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
High School, no diploma...	75.8	85.1	88.7	90.3	82.0	44.5	8.1
High School graduate.....	62.1	69.0	72.5	78.5	61.9	31.9	6.3
Some college.....	34.2	33.3	36.6	45.5	39.3	18.5	3.8
Associate degree.....	21.0	16.8	21.2	28.3	27.2	13.9	3.0
Bachelor's degree.....	10.6	6.8	9.8	14.4	15.0	9.3	1.8
Higher degree.....	2.3	0.4	1.7	2.9	4.9	2.8	1.0

Source: U.S. Bureau of the Census, 1992c, Table 63.

Note: Percents are cumulative.

In contrast to males and all individuals, educational attainment among females in Palau was slightly lower in 1990 at all levels (Table 9.9). Male and female patterns were similar. In addition, differences in the level of educational attainment seen by sex were particularly evident for

individuals in the three oldest age groups — evidence of the differing roles of the sexes even in the recent past, with males much more educated than females.

Table 9.9. Educational Attainment for Females by Age: 1990

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Educational Attainment	Total	25-29 Years	30-34 Years	35-44 Years	45-54 Years	55-64 Years	65 Yrs & over
Females, 25 + years..	3,502	604	570	882	525	401	520
Elementary School.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
High School, no diploma...	64.9	90.6	92.5	87.5	66.7	17.2	1.7
High School graduate.....	52.2	79.0	77.4	73.2	39.6	12.7	1.2
Some college.....	27.1	37.7	40.5	37.6	22.7	9.0	0.6
Associate degree.....	18.6	23.0	27.9	25.4	18.3	7.2	0.6
Bachelor's degree.....	10.1	10.9	14.9	14.9	11.2	2.2	0.4
Higher degree.....	1.1	0.5	1.2	2.2	1.9	-	-

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Source: U.S. Bureau of the Census, 1992c, Table 63.

Note: Percents are cumulative.

Two of the processes influencing the declining educational attainment in Palau are the emigration of Palau born and the immigration of non-Palau born. Many of these differences emerge in the comparison between persons born in Palau and those born in the Philippines, the latter representing the main source of immigrants to Palau (Table 9.10). Each level of educational attainment contained proportionally more individuals born in the Philippines—thus depicting a relatively well-educated immigrant population. The most dramatic cases of Philippine-born individuals having more education than Palau-born persons concern those with at least 4 years of high school. For example, although slightly less than 16 percent of Palau's adult population was born in the Philippines, nearly 28 percent of all individuals with 4 years of high school and no diploma came from this country. The only individuals with more than 4 years of high school underrepresented among Philippines-born persons were those with associate degrees and those with graduate or professional degrees. In contrast, the only Palau-born persons represented in a level of educational attainment in excess of their proportion of the republic's population are those with 2 years of high school or less and those with an associate occupational degree.

Table 9.10. Educational Attainment by Place of Birth: 1990

Educational Attainment	Cumulative Percents			Horizontal Percents			
	Total	Palau- Born	Phili- ppines	Total	Prct	Palau- Born	Phili- ppines
Total, 25 + years....	7,742	5,888	1,223	7,742	100.0	76.1	15.8
None.....	100.0	100.0	100.0	140	100.0	93.6	5.0
Elem: 1 to 4 years.....	98.2	97.8	99.4	678	100.0	93.4	4.9
5 and 6 years.....	89.4	87.0	96.7	919	100.0	90.8	7.5
7 years.....	77.6	72.9	91.1	88	100.0	89.8	8.0
8 years.....	76.4	71.5	90.5	427	100.0	92.0	4.7
H.S.: 1 year.....	70.9	64.8	88.9	457	100.0	92.3	5.7
2 years.....	65.0	57.7	86.8	187	100.0	77.5	17.1
3 years.....	62.6	55.2	84.1	216	100.0	75.9	7.9
4 yrs, no diploma...	59.8	52.4	82.7	170	100.0	65.9	27.6
H.S. graduate.....	57.6	50.5	78.9	2,059	100.0	67.2	25.0
Some college.....	31.0	27.0	36.8	861	100.0	64.5	20.4
Asso. degree, occup.....	19.9	17.6	22.4	452	100.0	77.2	15.3
Asso. degree, academic....	14.1	11.7	16.8	288	100.0	75.3	11.1
Bachelor's degree.....	10.3	8.0	14.1	662	100.0	59.2	23.4
Grad or prof. degree.....	1.8	1.3	1.5	138	100.0	56.5	13.0

Source: U.S. Bureau of the Census, 1992c, Table 51.

Note: Percents are cumulative.

More than 74 percent of all employed persons aged 25 years and over were high school graduates, with nearly 14 percent having at least a B.S. or B.A. degree (Table 9.11). Levels of educational attainment varied among occupations. For instance, relatively high percentages of all individuals with managerial and professional occupations had at least a high school education. Also, high proportions of persons with these occupations had Bachelor's degrees or more. Although the individuals employed in technical, sales, and administrative support were more likely to have a high school education than the population as a whole, they were less likely to have at least a Bachelor's degree. For the remaining four occupations, persons were less likely to claim either level of educational attainment than found in the entire employed population.

Table 9.11. Educational Attainment of Employed Persons by Occupation: 1990

Educational Attainment	Total	Man- gerial, Profes- sional	Tech., Sales, Admin. Supp.	Ser- vice	Farm., Fish., For- est	Prec. Prod., Craft, Repair	Oper., Fabric, La- borers
Total, 25+ Years....	5,599	1,346	1,208	1,107	359	942	637
H. School grad & above...	74.3	90.6	85.1	66.8	63.8	66.1	50.5
BA/BS degree and above...	13.8	40.2	10.8	4.4	3.6	3.6	1.3
Males, 25+ Years....	3,542	775	472	463	332	907	593
H. School grad & above...	71.2	88.5	83.3	68.9	66.9	66.2	51.1
BA/BS degree and above...	12.1	38.6	13.8	2.4	3.9	3.6	1.2
Females, 25+ Years..	2,057	571	736	644	27	35	44
H. School grad & above...	79.6	93.5	86.3	65.2	25.9	65.7	43.2
BA/BS degree and above...	16.9	42.4	8.8	5.9	-	2.9	2.3

Source: U.S. Bureau of the Census, 1992c, Table 68.

Employed males in Palau were less likely to have either a high school education or a Bachelor's degree than the total population. However, these differences did not hold for all occupations. For instance, proportionally more males employed in technical, sales, and administrative support positions had a Bachelor's degree than the total population. In general, proportionally more males in most occupations had at least a high school diploma than in those occupations for all employed persons. Males employed in managerial and professional occupations, as well as those employed in technical, sales, and administrative support occupations, tended to have higher levels of educational attainment than all males.

Employed females in Palau had proportionally higher educational attainment in 1990, both at the high school and college levels, than employed males. However, comparisons of formal education varied among occupations. Female managers and professionals were more likely than their male counterparts to be high school or college graduates. But although female technicians, sales, and administrative support workers were more likely to be high school graduates, males in these occupations were more likely to be college graduates. Females in the remaining occupations tended to have less formal education than their male counterparts.

In 1990, government employees were more likely to be high school and college graduates than private sector employees (Table 9.12) — although part of this difference probably relates to the contrasting work in the public and private sectors. Employed adults aged working for the federal government were more likely to have high school diplomas than other workers. The highest proportions of individuals with Bachelor's degrees were unpaid family members (although only 10 individuals) and employees of non-profit organizations. Self-employed persons had proportionally

fewer high school graduates than other classes of worker, and had proportionally fewer college graduates than any class except individuals employed by for-profit organizations.

Table 9.12. Educational Attainment by Class of Worker: 1990

Educational Attainment	Total	Private Wage and Salary		Government		Self-Employed	Unpaid Family
		Profit	Not	Local, Terr.	Federal		
Total, 25+ Years....	5,599	3,198	125	1,982	133	151	10
High School graduate.....	74.3	72.6	84.0	77.2	84.2	56.3	80.0
Bachelor's degree.....	13.8	8.7	35.2	20.6	20.3	9.3	50.0
Males, 25+ Years....	3,542	2,604	61	1,220	75	117	5
High School graduate.....	71.2	70.4	86.9	72.0	90.7	56.4	80.0
Bachelor's degree.....	12.1	7.8	45.9	17.3	21.3	9.4	40.0
Females, 25+ Years..	2,057	1,134	64	762	58	34	5
High School graduate.....	79.6	76.5	81.3	85.4	75.9	55.9	80.0
Bachelor's degree.....	16.9	10.3	25.0	25.9	19.0	8.8	60.0

Source: U.S. Bureau of the Census, 1992c, Table 68.

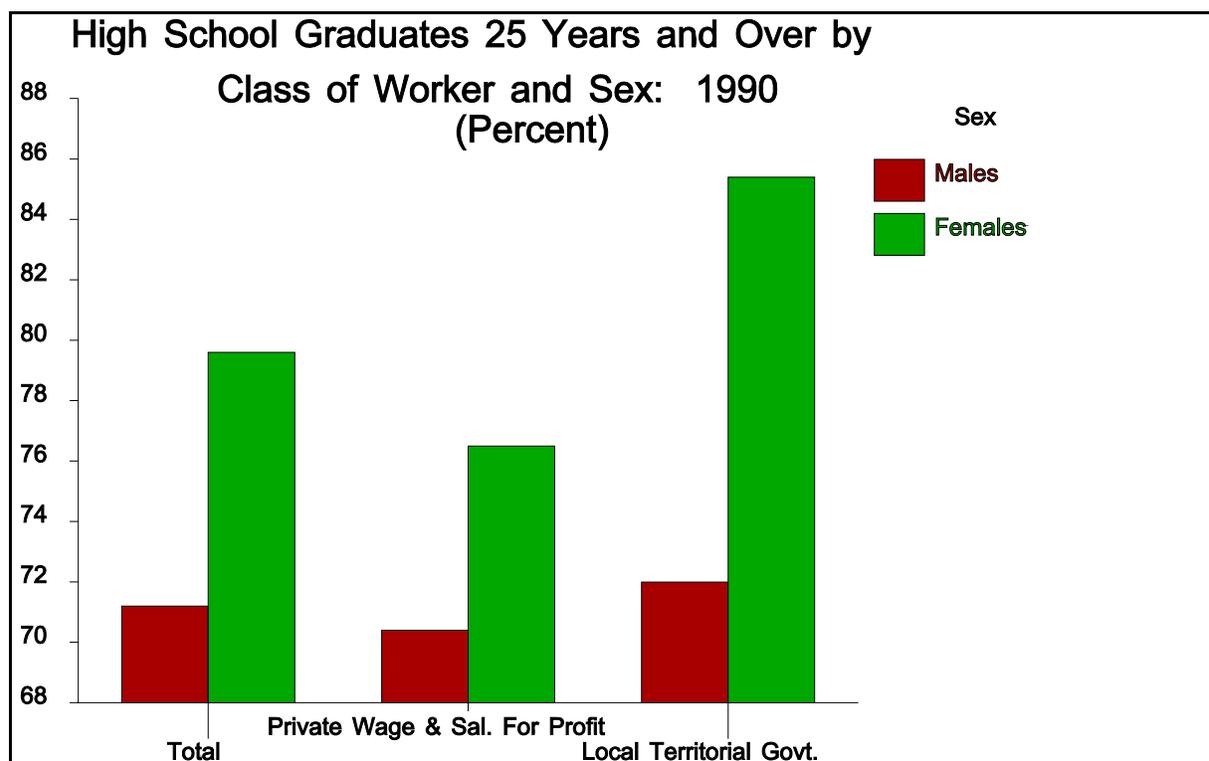


Figure 9.6. Percent High School Graduates by Class of Worker and Sex: 1990

Differences in educational attainment by class of worker also were found among employed males in Palau. Once again, the highest proportion of high school graduates worked for the federal government. Non-profit organizations employed proportionally more males with college educations than any other class of worker. Self-employed males comprised a lower percentage of high school graduates than other class of worker, while for-profit organizations employed the smallest percentage of males with Bachelor's degrees.

Although females in Palau tended to have higher levels of educational attainment in 1990 than males or all workers, their pattern of schooling by class of worker generally resembled that of all workers and male workers. The highest proportions of female workers with high school and college educations were local government employees and unpaid family members, respectively, though the latter included only five individuals. Self-employed females had the lowest proportions of both high school and college graduates.

A direct relationship existed in 1990 between personal income and educational attainment. Higher incomes tended to be earned by individuals with higher levels of educational attainment (Table 9.13). The proportion of high school graduates in each income category increased from \$1,000

through \$24,999. This same pattern held both for male and female workers aged 25 years and over. All except the highest and lowest income categories contained proportionally more females with high school educations than males with similar schooling.

Table 9.13. Percent High School and College Graduates by Income  
in 1989: 1990

Person's Income	Number			H.S. Grads (Pcts)			Col. Grads (Pcts)		
	Total	Males	Fmles	Total	Male	Fmle	Total	Male	Fmle
Persons 25+ yrs..	7,742	4,240	3,502	57.6	62.1	52.2	10.3	10.5	10.1
Persons with income...	5,783	3,613	2,170	63.9	63.4	64.8	12.9	11.6	15.1
\$1 to \$999 or loss..	571	287	284	49.6	60.7	38.4	3.3	2.7	3.9
\$1,000 to \$2,499....	1,181	639	542	42.5	40.5	44.8	4.7	2.7	7.0
\$2,500 to \$4,999....	1,576	1,089	487	59.3	57.5	63.4	5.3	4.1	8.0
\$5,000 to \$7,499....	1,019	652	367	68.5	62.0	80.1	9.6	5.3	17.2
\$7,500 to \$9,999....	571	331	240	82.3	75.5	91.7	22.4	17.5	29.2
\$10,000 to \$14,999..	471	290	181	87.5	84.5	92.3	34.2	30.4	40.3
\$15,000 to \$19,999..	175	133	42	92.0	91.0	95.2	43.4	43.6	42.9
\$20,000 to \$24,999..	68	61	7	94.1	93.4	100.0	47.1	46.0	57.1
\$25,000 to \$34,999..	73	62	11	89.0	88.7	90.9	57.5	54.8	72.7
\$35,000 or more.....	78	69	9	91.0	92.7	77.8	62.8	66.7	33.0

Source: U.S. Bureau of the Census, 1992c, Table 93.

The correlation between education and income in 1989 holds for college graduates in Palau as well. For the total working population (and for males) with college degrees, the proportion included increases as the income category increased — including the two highest income categories. The proportion of females increased in each income category except for the highest. All income categories for college graduates except two (\$15,000 to \$19,999 and \$35,000 or more) contained proportionally more females than males.

Few persons in Palau were illiterate in 1990, with females slightly more likely to be illiterate than males (Table 9.14). Most illiterate persons in Palau at the time of the most recent decennial census were aged 65 years or older, presumably representing more traditional persons who had never learned to read or write. Older males were less likely to be illiterate than older females. In contrast, young males were proportionally more unlikely to read and write than older males.

Table 9.14. Illiterate Population by Age and Sex: 1980 and 1990

Age Group	1990			1980		
	Total	Male	Fmle	Total	Male	Fmle
Total, 10 yrs and over...	291	119	172	803	367	436
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0
10 to 14 years.....	11.3	19.3	5.8	25.8	31.3	21.1
15 to 19 years.....	3.4	4.2	2.9	9.7	14.2	6.0
20 to 24 years.....	2.4	2.5	2.3	4.9	6.5	3.4
25 to 29 years.....	3.1	6.7	0.6	3.7	4.4	3.2
30 to 34 years.....	3.1	4.2	2.3	3.7	3.5	3.9
35 to 44 years.....	4.1	6.7	2.3	5.9	4.9	6.7
45 to 54 years.....	5.2	3.4	6.4	9.1	7.4	10.6
55 to 59 years.....	5.8	2.5	8.1	5.0	3.5	6.2
60 to 64 years.....	8.6	11.8	6.4	5.5	3.8	6.9
65 to 74 years.....	23.7	19.3	26.7	14.3	9.8	18.1
75 years and over.....	29.2	19.3	36.0	12.5	10.6	14.0

Sources: U.S. Bureau of Census, 1983b, Table 30; 1992c, Table 40.

Both the number of illiterate residents of Palau and their distribution by age changed considerably during the 1980s. At the beginning of that decade, Palau contained nearly three times as many illiterate persons as in 1990, including more than three times as many illiterate males as at the time of the latest census. Roughly equal proportions of illiterate persons were aged younger than 15 years and older than 64 years, the greater representation among the former presumably due to more restricted access to formal education in 1980 than 1990.

Of the roughly 13,600 persons in Palau aged 5 years and older in 1990, more than 82 percent spoke Palauan at home (Table 9.15). Another 9 percent spoke a Philippines language at home, providing additional evidence for the importance of Filipino immigrants in Palau. In 1990, 3 percent of the residents of Palau spoke English at home, while only about 1 percent spoke some Micronesian language other than Palauan.

Table 9.15. Language Spoken at Home by State, Palau: 1990

State	Language Spoken at Home						
	Total	Total Percent	Palauan	English	Other Micro.	Phil. langs.	Other langs.
Total, 5+ yrs....	13,609	100.0	82.2	3.0	1.4	9.4	4.0
Aimeliik.....	393	100.0	85.8	0.3	5.6	5.9	2.5
Airai.....	1,096	100.0	82.0	4.4	-	9.1	4.5
Angaur.....	189	100.0	99.5	0.5	-	-	-
Hatohobei.....	21	100.0	19.0	-	-	-	81.0
Kayangel.....	124	100.0	97.6	0.8	1.6	-	-
Koror.....	9,455	100.0	78.2	3.7	1.7	11.9	4.5
Melekeok.....	222	100.0	99.5	0.5	-	-	-
Ngaraard.....	276	100.0	97.5	2.2	-	0.4	-
Ngardmau.....	128	100.0	100.0	-	-	-	-
Ngaremlengui.....	253	100.0	99.2	0.8	-	-	-
Ngatpang.....	52	100.0	90.4	1.9	-	7.7	-
Ngchesar.....	263	100.0	96.6	0.4	-	1.9	1.1
Ngerchelongs.....	308	100.0	99.4	-	-	-	0.6
Ngiwal.....	217	100.0	98.2	-	-	1.8	-
Peleliu.....	557	100.0	96.4	0.7	0.2	1.6	1.1
Sonsorol.....	55	100.0	30.9	-	-	-	69.1

Source: U.S. Bureau of the Census, 1992c, Table 12.

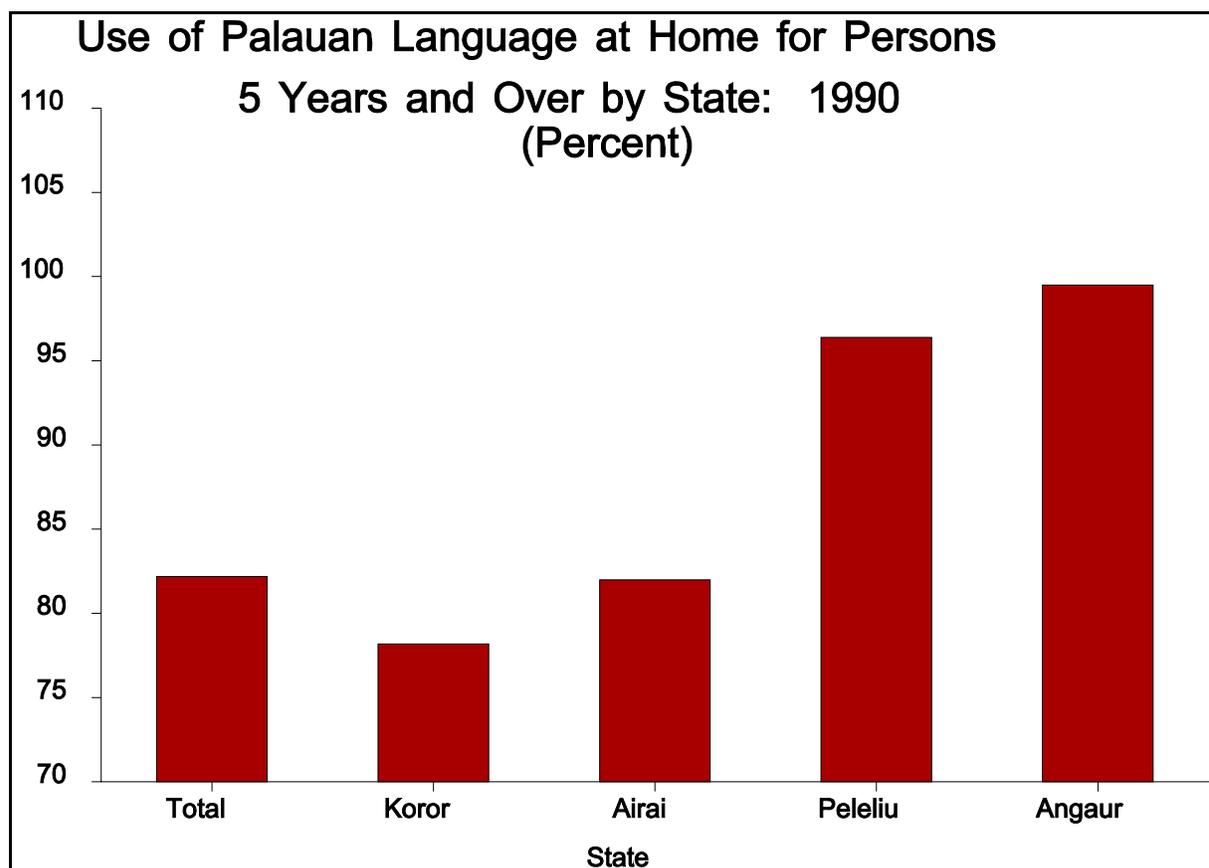


Figure 9.7. Use of Palau at Home for Persons 5 Years and over by State: 1990

The language characteristics of the Republic of Palau varied geographically in 1990. Proportionally fewer individuals in Koror State spoke Palauan at home, but proportionally more spoke a language of the Philippines or English. Relatively high percentages of Airai State residents also spoke a Philippines language or English, a consequence of the large immigrant populations in the more urban states. High percentages of the residents living in most rural states in Palau spoke Palauan at home. The exceptions to this latter trend were the Southwest Islands, Hatohobei and Sonsorol states, where high percentages of residents spoke some "other" language — presumably the Carolinian languages traditionally spoken on those islands, but also possibly Indonesian languages spoken by migrants from the nearby islands.

The language characteristics of Palau residents in 1990 also varied according to age (Table 9.16). Relatively high percentages of persons aged less than 15 years or 65 years and older spoke Palauan — that is, the young persons who had yet to learn other languages and the old persons whose behavior (and linguistic abilities) were more traditional. Higher percentages of individuals in the

middle age groups spoke English or some other language, most probably some language from the Philippines. The higher proportions of non-Palauan speakers in the middle age groups probably comprised mostly immigrants, working age persons who came to Palau from other countries primarily for jobs.

Table 9.16. Language Spoken At Home by Age and Sex: 1990

Age Group	Percent Speak			Percent Speak			Percent Speak		
	Total	English	Pal- auan	Total Males	English	Pal- auan	Total Females	English	Pal- auan
Total...	13,609	3.0	82.2	7,373	2.6	78.1	6,236	3.6	87.1
5 to 14....	3,063	2.1	94.9	1,600	1.8	94.6	1,463	2.5	95.4
15 to 24...	2,804	2.4	83.8	1,533	2.0	81.9	1,271	2.9	86.2
25 to 34...	2,741	4.5	71.1	1,567	3.1	67.2	1,174	6.3	76.3
35 to 44...	2,116	4.2	70.3	1,234	2.8	64.7	882	6.1	78.0
45 to 64...	1,969	3.1	82.2	1,043	3.9	73.5	926	2.2	91.9
65 & over..	916	1.0	95.4	396	1.8	92.9	520	0.4	97.3

Source: U.S. Bureau of the Census, 1992c, Table 39.

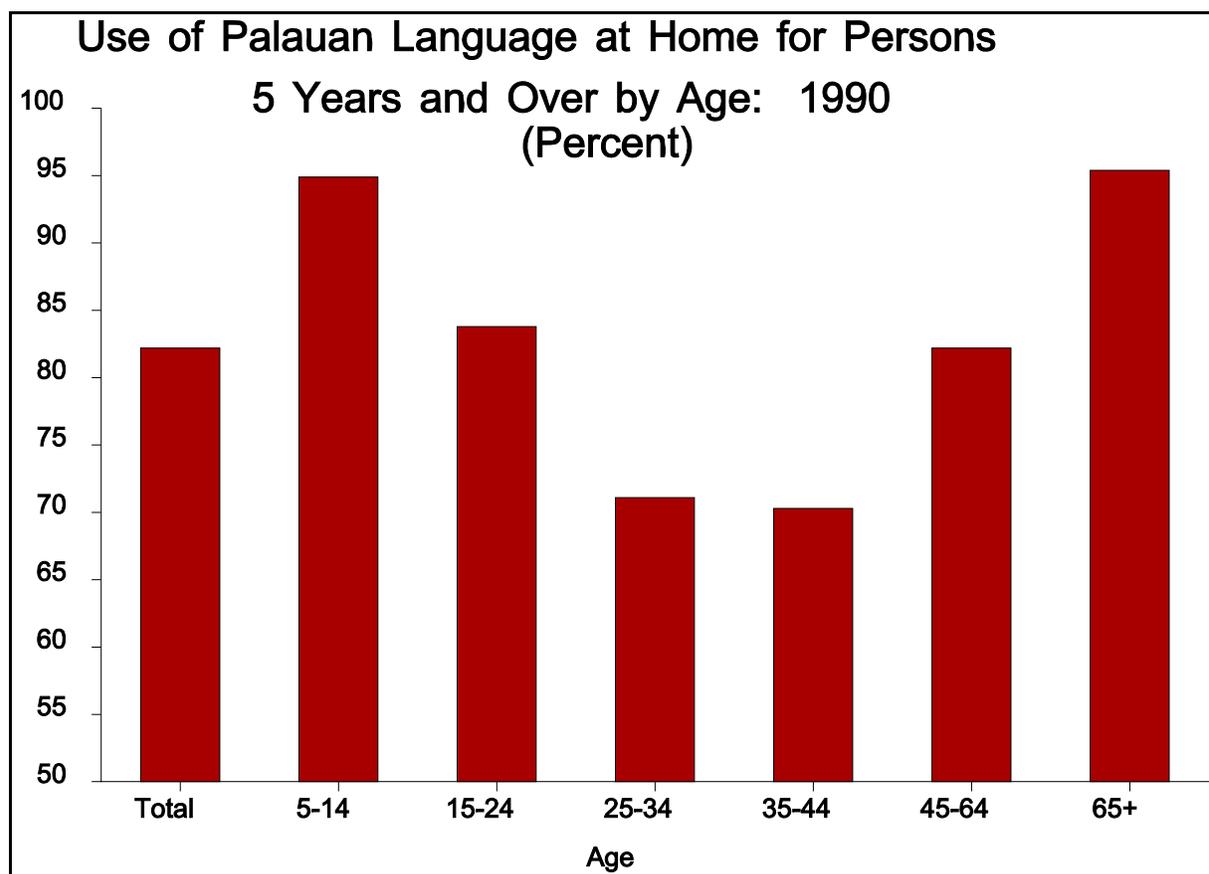


Figure 9.8. Percent Speaking Palauan at Home for Persons 5 Years and over by Age: 1990

The age-specific patterns of language spoken at home by males and females resembled those for all residents of Palau. The male population of Palau had relatively more non-Palauan speakers in all age groups than did the total population, many presumably migrants from places that spoke other languages. The female population of Palau had relatively fewer non-Palauan speakers than either the male residents or all residents.

Data on frequency of language use provides valuable information to planners on English use among non-English speakers. Because only 3 percent of Palau's population spoke English in 1990, understanding the linguistic characteristics of those who spoke languages is crucial to understanding of language patterns in the republic. About 94 percent of the non-English speakers in 1990 spoke another language — in most cases, Palauan — more frequently than they spoke English at home (Table 9.17). Only about 4 percent of the non-English speakers spoke English and another language equally often, nearly 2 percent spoke English more often, and less than 1 percent did not speak English at all.

Table 9.17. Frequency of English Use by State, Palau: 1990

State	Total 5 and over	Percent Non-English Speakers, Speak Other Language: Speaking -----						
		Only English at home	Total	Prcnt	More than Engl.	Both Equally Often	Less than Engl.	Doesn't Speak Engl.
Total....	13,609	3.0	13,195	100.0	93.8	3.7	1.9	0.6
Aimeliik.....	393	0.3	392	100.0	99.5	-	0.5	-
Airai.....	1,096	4.4	1,048	100.0	95.1	3.1	1.4	0.4
Angaur.....	189	0.5	188	100.0	97.9	1.6	0.5	-
Hatohobei.....	21	-	21	100.0	100.0	-	-	-
Kayangel.....	124	0.8	123	100.0	100.0	-	-	-
Koror.....	9,455	3.7	9,107	100.0	92.2	4.8	2.4	0.6
Melekeok.....	222	0.5	221	100.0	97.7	0.9	0.5	0.9
Ngaraard.....	276	2.2	270	100.0	100.0	-	-	-
Ngardmau.....	128	-	128	100.0	100.0	-	-	-
Ngaremlengui..	52	1.9	51	100.0	100.0	-	-	-
Ngatpang.....	263	0.4	262	100.0	98.9	1.1	-	-
Ngchesar.....	253	0.8	251	100.0	92.4	0.4	0.4	6.8
Ngerchelong...	308	-	308	100.0	98.4	1.0	0.6	-
Ngiwal.....	217	-	217	100.0	97.7	0.9	0.5	0.9
Peleliu.....	557	0.7	553	100.0	97.8	2.0	0.2	-
Sonsorol.....	55	-	55	100.0	100.0	-	-	-

Source: U.S. Bureau of the Census, 1992c, Table 12.

In many states in Palau, everyone spoke another language more often than English. These rural states included Hatohobei, Kayangel, Ngaraard, Ngardmau, Ngaremlengui, and Sonsorol. In most of the other states, nearly everyone spoke another language more often than they spoke English. The greatest proportions of residents who spoke English equally often or less often than another language lived in Airai and Koror states. These two states had the greatest exposure to English speakers and the greatest opportunity to speak English at the same time as another language.

## Conclusions

The education and language characteristics of Palau in 1990 showed the influences of mobility the republic — both in the emigration of Palauans and the immigration of foreigners, primarily Filipinos. School enrollment changed little over the past two decades despite a 25 percent increase in population. Educational attainment, on the other hand, has changed considerably, with the residents of Palau better educated in 1990 than before. Moreover, over time increasing numbers of young persons and females have gained access to formal education, yielding growing educational attainment, increasing proportions of individuals with formal education, and declining illiteracy. As

one of the first components of Western society systematically introduced by the U.S. administration, the impact of educational change appeared throughout the Republic of Palau. Today many educated Palauans emigrate, often for jobs. Ironically, much of the change in educational attainment has come not from a system of schooling, but rather as persons educated in their home country before moving to Palau.

Despite the influence of other countries for decades — either as colonial powers, administrative authorities, or sources of immigrants — Palau remains largely a Palauan speaking country. The minor inroads of other languages in part relate to changes in the education system, but they more certainly reflect the recent immigrants. Language varies geographically. In places like Koror and Airai states, more Westernized economies and social development make use of English desirable and provide frequent opportunities to do so. Similarly, most immigrants, mainly from the Philippines, resided in these two states, providing a greater opportunity to speak those languages. But outside Palau's two "developed", English and other languages are secondary to Palauan. Language thus provides one measure of the transition from the "traditional" to the "modern" world.

## CHAPTER 10. DISABILITY, VETERAN STATUS, AND MILITARY DEPENDENCY

The 1990 census of Palau contained questions on disability, veteran status, and military dependency to identify and get characteristics on these subpopulation. The questions on disability and veteran status were identical to those used in the 1990 census of the U.S. The question on military dependency was included at the request of Guam but obtained benchmark data for Palau.

### Definitions

#### *DISABILITY*

##### *Mobility Limitation Status*

The 1990 census derived mobility limitation status from answers to questionnaire item 19a, asked of persons 15 years old and over. Persons identified as having a mobility limitation comprised those with a health condition which had lasted six or more months and which made it difficult to go outside the home alone to shop or visit a doctor's office. The term "health condition" referred to both physical and mental conditions. A temporary health problem, such as a broken bone that was expected to heal normally, was not considered a health condition.

Limitations. There are no obvious problems with the 1990 census data on mobility limitation.

Comparability. The 1990 decennial census was the first to include a question on mobility limitation.

##### *Self-care Limitation Status*

The 1990 census obtained data on self-care limitation status from answers to questionnaire item 19b, asked of all persons 15 years old and over. The census identified persons as having a self-care limitation if they had a health condition which had lasted for six or more months and which made it difficult to take care of their own personal needs, such as dressing, bathing, or getting around inside the home. The term "health condition" referred to both physical and mental conditions. A temporary health problem, such as a broken bone that was expected to heal normally, was not considered a health condition.

Limitations. There are no obvious problems with the 1990 census data on self-care limitation.

Comparability. The 1990 decennial census was the first to include a question on self-care limitation.

##### *Work Disability Status*

The 1990 census obtained data on work disability from answers to questionnaire item 18, asked of all persons 15 years old and over. Persons having a work disability were those with a health condition which had lasted six or more months and which limited the kind or amount of work they could do at a job or business. A person was limited in the kind of work he or she could do if the person had a health condition which restricted his or her choice of jobs. A person was limited in the amount of work possible if he or she was unable to work full-time. The census further classified persons with a work disability as "Prevented from working" or "Not prevented from working." Note that the term "health condition" referred to both physical and mental conditions. A temporary health problem, such as a broken bone that was expected to heal normally, would not be considered a health condition.

**Limitations.** There are no obvious limitations of the 1990 census data on work disability.

**Comparability.** The 1990 decennial census was the first to include a question on work disability.

#### *VETERAN STATUS*

The 1990 census obtained information on veteran status, period of military service, and years of military service from questionnaire item 17, asked of all persons 16 years and older.

*Veteran Status.* The census derived data on veteran status from responses to questions 17a and 17b. The term "active duty" referred to active service in the U.S. Armed Forces in the Army, Navy, Air Force, Marine Corps, or Coast Guard as well as to service as a Merchant Marine Seaman during World War II. It did not include active duty in the military Reserves or National Guard for the four-to-six months of initial training or yearly summer camps. In census data products, a "civilian veteran" is a person 16 years old or over who served (even for a short time) but was not serving in 1990 on active duty in the U.S. Army, Navy, Air Force, Marine Corps, or the Coast Guard, or who served as a Merchant Marine seaman during World War II. The 1990 census classified persons who served in the National Guard or military Reserves as veterans only if they ever were called up for active duty—excluding the four-to-six months duty for initial training or yearly summer camps. All other civilians 16 years old and over were classified as nonveterans. The military Reserves consisted of the reserve branches of the U.S. Army, Navy, Air Force, Marine Corps, and Coast Guard.

*Period of Military Service.* Persons who recorded in question 17a that they had served on active duty, or were then on active duty, were asked in question 17c the period or periods in which they served. Persons serving in at least one wartime period were classified in their most recent wartime period. For example, persons who served both during the Korean conflict and during the post-Korean peacetime era between February 1955 and July 1964 were classified in one of the two "Korean conflict" categories. If the same person also had served during the Vietnam era, he or she would instead be included in the "Vietnam era and Korean conflict" category. Census personnel

edited responses to eliminate inconsistencies between reported period(s) of service and the age of the person and to cancel out reported combinations of periods containing unreasonable gaps. For example, a person could not serve during World War I and the Korean conflict without serving during World War II. The period of service categories shown in 1990 census report for Palau were mutually exclusive.

*Years of Military Service.* Persons who reported in question 17a that they had served on active duty, or were on active duty in 1990, were asked to report the total number of years of active-duty military service in question 17d. Census personnel edited the data for consistency with responses to question 17c (Period of Military Service) and with the age of the person.

Limitations. The following types of persons occasionally reported erroneously that they served on active duty in the Armed Forces: persons who served in the National Guard or military Reserves but never were called to active duty; civilian employees or volunteers for the USO, Red Cross, or the Department of Defense (or its predecessor departments, War and Navy); and employees of the Merchant Marine or Public Health Service. Respondents also may have rounded up months to the next year in question 17d — for example, persons with 1 year 8 months of active duty military service may have reported "2 years."

Comparability. Since census data on veterans are based on self-reported responses, they may differ from data in other sources such as administrative records of the Department of Defense. Census data may also differ from Veterans Administration data on the benefits-eligible population, since factors determining eligibility for veterans benefits differ from rules for veteran status classification in the census. The 1990 census was the first census to collect data on veteran status for the Pacific Islands Areas.

### *MILITARY DEPENDENCY*

The 1990 census obtained data on military dependency from answers to questionnaire item 13, asked only in the Pacific Islands. Questionnaire items 17a and 17b determined whether anyone in the housing unit was a current or past member of the U.S. Armed Forces. Information from item 13 was used to determine whether other persons in the housing unit were dependent on an active-duty member of the Armed Forces, a retired member of the Armed Forces, or an active-duty or retired member of the full-time National Guard or Armed Forces Reserve. All other persons were to report in the "No, not a dependent" category.

Limitations. There are no obvious limitations of the 1990 census data on military dependency.

Comparability. The 1990 decennial census was the first to include a question on military dependency.

### Analysis of Disability, Veteran Status, and Military Dependency Data

In 1990, the Bureau of the Census tabulated disability data only for civilian (non-military), noninstitutional persons 16 to 64 years old. Only 152 persons in Palau between these ages had a mobility or self-care limitation in 1990 (Table 10.1). Slightly more males than females claimed such limitations. The census reported 94 persons with a mobility limitation and 108 with a self-care limitation, so some individuals had both kinds of limitations (since the total number with at least one of these limitations was more than 152). Of the 94 persons with a mobility limitation, 16 were nonetheless in the labor force. The percentages for males and females were similar for all categories of mobility and self-care limitations.

Table 10.1. Disability by Sex: 1990

Disability	Number			Percent		
	Total	Males	Fmles	Total	Males	Fmles
Civilian noninstitutionalized persons aged 16 to 64 years....	9,254	5,151	4,103	100.0	100.0	100.0
With mobility/self-care limitation...	152	83	69	1.6	1.6	1.7
With a mobility limitation.....	94	54	40	1.0	1.0	1.0
In labor force.....	16	10	6	0.2	0.2	0.1
With a self-care limitation.....	108	59	49	1.2	1.1	1.2
With a work disability.....	330	176	154	3.6	3.4	3.8
In labor force.....	109	69	40	1.2	1.3	1.0
Prevented from work.....	177	90	87	1.9	1.7	2.1
No work disability.....	8,924	4,975	3,949	96.4	96.6	96.2
In labor force.....	5,267	3,089	2,178	56.9	60.0	53.1

Source: U.S. Bureau of the Census, 1992c, Table 41.

The 1990 census reported 330 persons in Palau with a work disability, roughly one-third of whom were in the labor force. Nearly 180 individuals had a work disability preventing them from working. Females were slightly more likely than males both to have a work disability and to be prevented from working by a disability. In contrast, females were slightly less likely than males to have a work disability and remain in the labor force. In 1990, the vast majority of individuals aged 16 to 64 years in Palau had no work disability.

In 1990, Palau had almost no veterans (Table 10.2). As of the most recent census, only 2 residents of Palau were on active duty and living in Palau, presumably on some sort of leave. Another 49 Palauans claimed active duty in the past. Only 9 individuals enumerated in the census were in the

Reserves or National Guard, 2 in 1990 and 7 sometime in the past. These numbers are so small that all individuals enumerated with some present or past veteran status could have been non-Palauan.

Table 10.2. Veteran Status for Persons 16 Years and Over By State: 1990

State	Total	Now on Active Duty	Past Active Duty	Total	Never on Active Duty		
					Res./Nat. Guard		Never Served
					Now	Past	
Total.....	10,238	2	49	10,187	2	7	10,178
Aimeliik.....	280	-	-	280	-	1	279
Airai.....	840	1	3	836	-	1	835
Angaur.....	139	-	3	136	-	-	136
Hatohobei.....	15	-	-	15	-	-	15
Kayangel.....	81	-	-	81	-	-	81
Koror.....	7,251	1	42	7,208	2	5	7,201
Melekeok.....	152	-	-	152	-	-	152
Ngaraard.....	187	-	1	186	-	-	186
Ngardmau.....	95	-	-	95	-	-	95
Ngaremlengui...	166	-	-	166	-	-	166
Ngatpang.....	44	-	-	44	-	-	44
Ngchesar.....	179	-	-	179	-	-	179
Ngerchelong....	222	-	-	222	-	-	222
Ngiwal.....	150	-	-	150	-	-	150
Peleliu.....	402	-	-	402	-	-	402
Sonsorol.....	35	-	-	35	-	-	35

Source: U.S. Bureau of the Census, 1992c, Table 14.

Most states in Palau had no veterans in 1990. Only four states had residents who were veterans, with the majority residing in Koror.

Similarly, Palau had virtually no military dependents in 1990 (Table 10.3). As noted above, only 2 residents (both male) of Palau in 1990 were in the U.S. Armed Forces and living in Palau. Another 16 persons were military dependents. Five of these individuals were dependents of active duty members, with the remaining 11 dependents of retired Armed Forces personnel, or of active or retired full-time National Guard or Armed Forces Reserves personnel.

Table 10.3. Military Dependency by Sex: 1990

Military Dependency	Numbers			Percent		
	Total	Males	Fmles	Total	Males	Fmles
Persons 16 years and over...	10,238	5,615	4,623	100.0	100.0	100.0
In Armed Forces.....	2	2	-	-	-	-
Military dependent.....	16	8	8	0.2	0.1	0.2
Of active-duty member.....	5	3	2	-	0.1	-
Other dependent.....	11	5	6	0.1	0.1	0.1
Other civilians.....	10,220	5,605	4,615	99.8	99.8	99.8

Source: U.S. Bureau of the Census, 1992c, Table 41.

## Conclusions

Data on disability, veteran status, and military dependency appeared in Palau's decennial census for the first time in 1990. As a result, information on change over time will have to wait until the next census, or until an intercensal survey focusing specifically on these issues. Few residents in Palau had a disability in 1990, with even fewer being either a veteran or military dependent.

Data on disability play an important role as Palau becomes increasingly Westernized and plans for its future. Although disabled persons can play important roles in the economic development of Palau, the government must know the characteristics of the disabled, both to know the numbers involved, but also to determine best use of these resources. These data need to be more detailed to be useful, perhaps providing information on type of disability. The Palauan government can obtain additional information through intercensal surveys. Data on both veteran status and military dependency show that few persons had either been in the military or were dependent on someone in the military. Both the FSM and the Republic of the Marshall Islands have provisions in their Compacts of Free Association enabling their citizens to join the U.S. Armed Forces. When the Republic of Palau has persons joining the military, both veteran status and military dependency will become much more important.

## CHAPTER 11. LABOR FORCE PARTICIPATION

As Palau continues to develop economically, census-defined labor force participation data provide measures of government and private sector success in providing jobs. The government of Palau can acquire some data on labor force participation from periodic surveys and registration. Data for the whole population can only be obtained from periodic censuses. However, the value of censuses as systematic sources of data is tempered by time between enumerations — a problem for economic data, which can fluctuate rapidly over relatively short periods. The currently unsettled status of Palau concerning the Compact of Free Association makes economic fluctuations even more dramatic.

Here we examine the labor force participation data from the 1990 census of Palau, and occasionally compare them to earlier data. We focus on basic topics — age, sex, birthplace, language, and educational attainment for labor force status in the week before the census, and age and sex for work in 1989, the year before the census, and transportation to work. The goal in examining these topics is to emphasize some of the most important, fundamental aspects of labor force participation in Palau, to provide insights on the Palauan economy.

### Definitions

#### *EMPLOYMENT STATUS*

The 1990 census obtained data on employment status from answers to questionnaire items 21, 25, and 26, asked of persons 15 years and over. The series of questions on employment status was designed to identify several types of individuals in Palau: persons who worked at a job or business or farm at any time during the reference week; persons who did not do such work during the reference week, but who had jobs or businesses from which they were temporarily absent (excluding layoff); persons on layoff; and persons who did not work during the reference week, but who were looking for work to earn money during the previous four weeks and were available for work during the reference week.

The employment status data shown in the 1990 census report are for persons 16 years old and over. Some tables showing employment status, however, include 15 year olds. By definition, 15 year olds are classified as "Not in labor force." A change in the labor force 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.* Employed persons included all civilians 16 years old and over who were either "At work" (those who did any work at all during the reference week as paid employees or in their own business or profession, or on their own farm, or who worked 15 or more hours as unpaid workers on a family farm or in a family business) or were "With a job but not at work" (those who did not work during the reference week, but who 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 category were: persons without jobs or businesses whose only activity consisted of work around the house or unpaid volunteer work for religious, charitable, and similar organizations; persons without jobs or businesses who did subsistence activity only during the reference week; and persons on active duty in the U.S. Armed Forces.

*Unemployed.* The category of unemployed persons included all civilians 16 years old and over who were neither "At work" nor "With a job but not at work" during the reference week, or who did subsistence activity only; were looking for work to earn money during the previous four weeks; and were available to accept a job. Examples of job seeking activities include:

- 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

Also included in the unemployed category were civilians 16 years old and over who did not work at a job or business during the reference week and were waiting to be called back to a job from which they had been laid off.

*Experienced Unemployed.* Experienced unemployed persons were unemployed individuals who worked at any time in the past.

*Civilian Labor Force.* The civilian labor force consisted of persons classified as employed or unemployed in accordance with the criteria described above.

*Experienced Civilian Labor Force.* The experienced civilian labor force consisted of the employed and the experienced unemployed.

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

*Not in Labor Force.* The individuals not in the labor force consisted of all persons 16 years old and over who were not classified as members of the labor force. This category consisted mainly of persons engaged in subsistence activity only, 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).

*Subsistence Activity.* A person engaged in subsistence activities if he or she mainly produced goods for his or her own or family's use and needs, such as growing or gathering food, fishing, cutting copra for home use, raising livestock, making handicrafts for home use, and other productive activities not primarily conducted for commercial purposes. When subsistence activity categories are shown with the "Employed" and the "Not in labor force" categories of the employment status concept, they relate to activities engaged in during the census reference week. Persons who did subsistence activity only during the reference week were not classified as "Employed," unless they were "With a job but not at work" (see definition of "Employed").

*Worker.* This term appears in connection with several subjects—for example, commuting categories, class of worker, weeks worked in 1989, and 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 at a job or business or farm during the reference week were asked to report in questionnaire item 21b the number of hours that they worked, excluding any time doing a subsistence activity. The statistics on hours worked for "Employed, at work" persons 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 worked," described below. The number of persons who worked only a small number of hours probably is 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.

*Limitations.* The census may understate the number of employed persons because persons who had irregular, casual, or unstructured jobs sometimes reported themselves as not working. The number of employed persons "At work" probably is 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 report themselves as working. This problem has no effect on the total number of employed persons. The reference week for the employment data was not the same for all persons. This lack of a uniform reference week may mean that the employment data do not reflect the employment any given week. For additional, related information, see the discussion below under *Reference Week*.

Comparability. The questionnaire items and employment status concepts for the 1990 census were essentially the same as those used in the 1980 census. However, these concepts differed in many respects from those in earlier 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, other non-census data series may exclude private household workers, unpaid family workers, and self-employed persons, but may include workers less than 16 years old.

An additional difference in the data arises because persons who had a job but were not at work are included with the employed in the statistics shown in the 1990 census report, whereas many of these persons are likely to be excluded from employment figures based on establishment payroll reports. Furthermore, the employment status data in the 1990 census report included persons on the basis of place of residence regardless of where they worked, whereas establishment data report persons at their place of work regardless of where they live. Census data on 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.

#### *REFERENCE WEEK*

The data on labor force status and commuting characteristics were related to the reference week — that is, the calendar week preceding the date on which the respondents were interviewed by enumerators. This week was not the same for all respondents since the enumeration was not completed in one week. The occurrence of holidays during the enumeration period could affect the data on actual hours worked during the reference week, but probably had no effect on overall measurement of employment status.

Limitations. There are no systematic limitations associated with the collection of labor force data during a reference week.

Comparability. For Palau, the 1980 census enumeration began in September 1980, so the reference weeks for the 1990 and 1980 censuses differed in that Passover and Good Friday occurred in the second week of April 1990. Many workers presumably took time off for those observances. The differing occurrence of these holidays could affect the comparability of the 1990 and 1980 data on actual hours worked for some areas if the respective weeks were the reference weeks for a significant number of persons. The holidays probably did not affect the overall measurement of

employment status since this information was based on work activity during the entire reference week.

### *WORK STATUS IN 1989*

The 1990 census obtained data on work status in 1989 from answers to questionnaire item 31.

*Work Status in 1989.* Persons 16 years old and over who worked one or more weeks according to the criteria described below were classified as "Worked in 1989"; all other persons 16 years old and over were classified as "Did not work in 1989." Some tabulations showing work status in 1989 include 15 years olds. These persons were classified as "Did not work in 1989" by definition.

*Weeks Worked in 1989.* The census obtained data on weeks worked in 1989 from answers to questionnaire item 31b. Question 31b ("Weeks worked in 1989") was asked of persons who reported in Question 31a that they worked in 1989. The data on this topic pertain to the number of weeks during 1989 in which a person did any work for pay or profit (including paid vacation and paid sick leave, but excluding subsistence activity) or worked without pay on a family farm or in a family business. Weeks of active service in the Armed Forces also were included.

*Usual Hours Worked per Week Worked in 1989.* The 1990 census obtained data on usual hours worked per week worked in 1989 from responses to questionnaire item 31c, a question asked of persons 16 years and over who reported that they worked in 1989. The respondent was to report the number of hours worked per week in the majority of the weeks he or she worked in 1989. If the hours worked per week varied considerably during 1989, the respondent was to report an approximate average of the hours worked per week. The statistics on usual hours worked per week worked in 1989 are not necessarily related to the data on actual hours worked during the census reference week (question 21b). Persons 16 years old and over who reported that they usually worked 35 or more hours each week during the weeks they worked were classified as "Usually worked full time". Persons who reported that they usually worked 1 to 34 hours are classified as "Usually worked part time."

*Year-Round Full-Time Workers.* The category of "Year-round full time workers" included all persons 16 years old and over who usually worked 35 hours or more per week for 50 to 52 weeks in 1989.

*Number of Workers in Family in 1989.* The number of workers per family was the number of individuals in each family who met the requirements of "Worker," as described above under "Work Status in 1989."

Limitations. The number of persons who worked in 1989 and the number of weeks worked may have been understated since some respondents forget intermittent or short periods of employment or

exclude weeks worked without pay. Also, some persons may not include weeks of paid vacation among their weeks worked. One result is that the census figures possibly understate the number of persons who worked "50 to 52 weeks."

Comparability. The data on weeks worked collected in the 1990 census are comparable with data from the 1980 and 1970 censuses. Since the 1970 census in Palau, two separate questions have been used to obtain this information. The first identified persons with any work experience during the year and, thus, reported those persons for whom the questions on number of weeks worked applied. In 1970, persons responded to the question on weeks worked by selecting one of six weeks-worked intervals. In 1980 and 1990, persons were asked to provide the specific number of weeks they worked.

### *COMMUTING CHARACTERISTICS*

#### *Means of Transportation to Work*

The 1990 census obtained data on means of transportation to work from answers to questionnaire item 23a, asked of persons who reported in question 21 that they worked at some time during the reference week. Means of transportation to work referred included the principal mode of travel or type of conveyance that the person usually used to travel from home to work during the reference week.

Persons who used different means of transportation on different days of the week were asked to specify the one they used most often—that is, the means used the greatest number of days. Persons who used more than one means of transportation to get to work each day were asked to report the one used for the longest distance during the work trip. The category "Car, truck, or private van/bus" included workers using a car (including company cars but excluding taxicabs), a truck of one-ton capacity or less, or a privately-owned van or bus. The category "Public transportation" included workers who used a boat, public van/bus, or taxicab even if each mode was not shown separately in the published census tabulation. The category "Other method" included workers who used a mode of travel that was not identified separately. The category "Other method" may vary from table to table, depending on the amount of detail shown in a particular distribution.

The means of transportation data for some areas may show workers using modes of public transportation not available in Palau. This result is due largely to persons who worked during the reference week at a location that was different from their usual place of work and persons who used more than one means of transportation each day but whose principal means was unavailable where they lived.

In distributions classified by industry, Armed Forces personnel are included in the totals by industry but are not shown separately.

### Analysis of Labor Force Participation Data

About 59 percent of the population 16 years and over in Palau in 1990 was in the labor force (Table 11.1). The nearly 6,100 individuals in the labor force were either employed or unemployed—remembering that a person had to fulfill the definition of "unemployed" to be unemployed. Persons who were only doing subsistence were considered "not in the labor force". Employed individuals composed 92 percent of the labor force, yielding an unemployment rate of 8 percent. Because of the role of subsistence in Palau, the unemployment rate for the republic probably is something of a combination between a Western-style unemployment rate and self-reported unemployment based on other criteria.

Table 11.1. Labor Force Status by State: 1990

State	Persons 16 Years and Over	In Labor Force					Not in Labor Force
		Total	Percent	Civilian Labor Force			
				Em- ployed	Unem- ployed	Percent	
Total.....	10,238	6,072	59.3	5,599	471	7.8	4,166
Aimeliik.....	280	119	42.5	115	4	3.4	161
Airai.....	840	503	59.9	463	39	7.8	337
Angaur.....	139	37	26.6	37	-	-	102
Hatohobei.....	15	12	80.0	12	-	-	3
Kayangel.....	81	23	28.4	18	5	21.7	58
Koror.....	7,251	4,779	65.9	4,533	245	5.1	2,472
Melekeok.....	152	63	41.4	57	6	9.5	89
Ngaraard.....	187	70	37.4	46	24	34.3	117
Ngardmau.....	95	35	36.8	29	6	17.1	60
Ngaremlengui....	166	60	36.1	43	17	28.3	106
Ngatpang.....	44	19	43.2	19	-	-	25
Ngchesar.....	179	66	36.9	57	9	13.6	113
Ngerchelongs....	222	43	19.4	38	5	11.6	179
Ngiwal.....	150	82	54.7	33	49	59.8	68
Peleliu.....	402	145	36.1	83	62	42.8	257
Sonsorol.....	35	16	45.7	16	-	-	19

Source: U.S. Bureau of the Census, 1992c, Table 15.

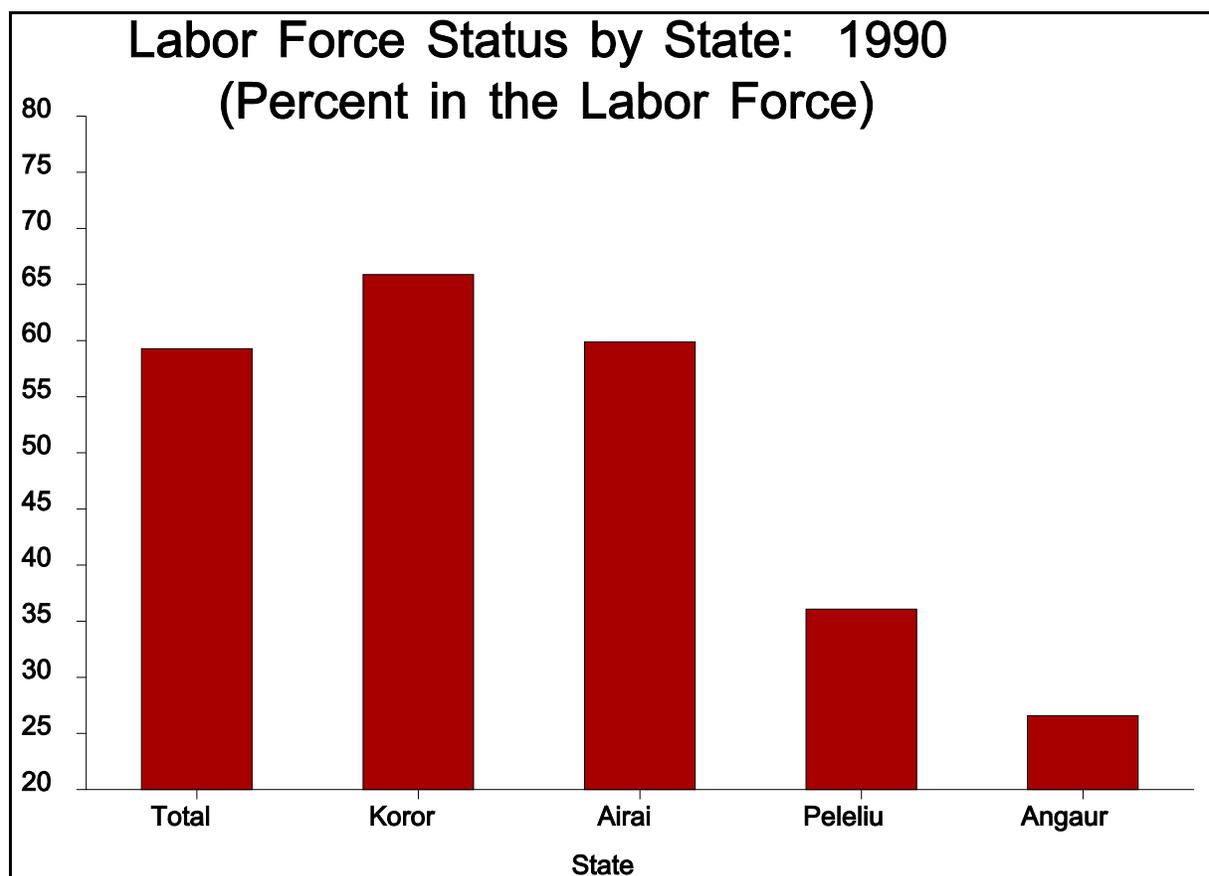


Figure 11.1. Percent in the Labor Force for Selected States: 1990

Although the unemployment rate for all of Palau in 1990 was 8 percent, some states—such as Angaur, Hatothobei, Ngatpang, and Sonsorol—had no unemployment according to the census. Because places like Hatothobei and Sonsorol have few paying jobs, such absence of unemployment tends to obscure what really is occurring. On the other hand, the 59.8 percent unemployment rate for Ngiwal also is unlikely, for although this state had few jobs many of the "unemployed" probably should be placed in the "not in the labor force" category.

In general, labor force participation rates also varied considerably between states. About 66 percent of Koror State's adult population participated in the labor force, as did nearly 60 percent of Airai's adult population. Most of the other states, being more rural, had much smaller labor force participation percentages.

Male labor force participation in Palau was higher than total labor force participation in 1990 (Table 11.2). More than 68 percent of the males aged 16 years and over were in the labor force, with an unemployment rate of 7.5 percent. Koror State, with nearly 74 percent of its adult males in the labor force, and Airai State at almost 73 percent, provided two of the three highest labor force participation rates—the highest rate, in Hatohobei, probably an artifact of the small number of adult males residing there. Although several other states had relatively high percentages of male labor force participation, much of this participation represents state government workers. The private sector, except for small retail stores and fishing enterprises, is little developed outside Koror and Airai.

Table 11.2. Labor Force Status for Males by State: 1990

State	Males 16 Years and Over	In Labor Force					Not in Labor Force
		Total	Percent	Civilian Labor Force			
				Em- ployed	Unem- ployed	Percent	
Total.....	5,615	3,833	68.3	3,542	289	7.5	1,782
Aimeliik.....	157	85	54.1	82	3	3.5	72
Airai.....	474	344	72.6	316	27	7.9	130
Angaur.....	73	24	32.9	24	-	-	49
Hatohobei.....	11	9	81.8	9	-	-	2
Kayangel.....	45	14	31.1	10	4	28.6	31
Koror.....	3,994	2,949	73.8	2,808	140	4.7	1,045
Melekeok.....	78	42	53.8	40	2	4.8	36
Ngaraard.....	98	44	44.9	30	14	31.8	54
Ngardmau.....	52	24	46.2	22	2	8.3	28
Ngaremlengui....	84	40	47.6	24	16	40.0	44
Ngatpang.....	24	15	62.5	15	-	-	9
Ngchesar.....	97	47	48.5	40	7	14.9	50
Ngerchelong.....	107	29	27.1	28	1	3.4	78
Ngiwal.....	86	59	68.6	23	36	61.0	27
Peleliu.....	212	94	44.3	57	37	39.4	118
Sonsorol.....	23	14	60.9	14	-	-	9

Source: U.S. Bureau of the Census, 1992c, Table 15.

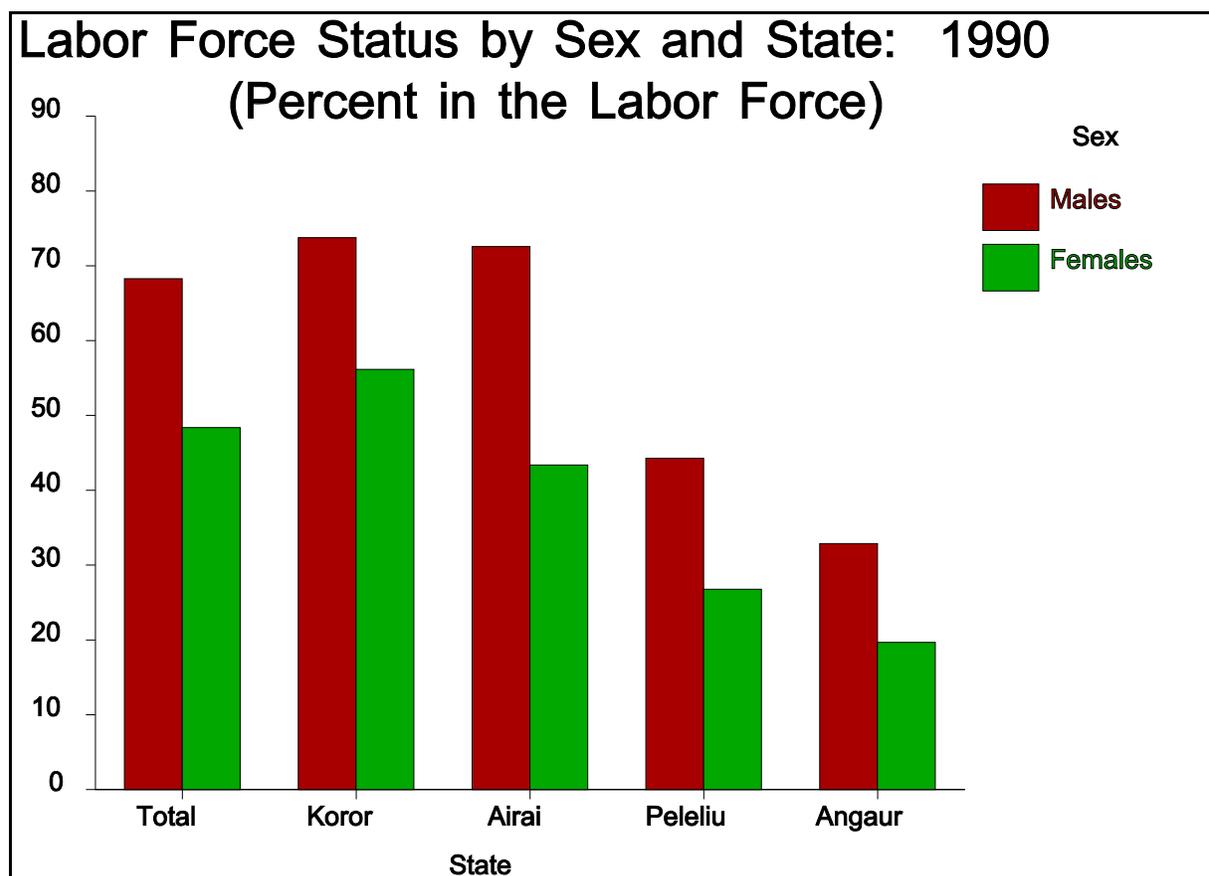


Figure 11.2. Percent in the Labor Force by Sex for Selected States: 1990

The 7.5 percent republic-wide unemployment rate for males in 1990 was slightly lower than the rate for all persons. The caveats discussed for state-specific unemployment rates in general apply for the males as well. The same four states had no male unemployment, while the rates of unemployment for the other states varied considerably, reaching 61 percent for Ngiwal. Because the definition of "unemployment" varies depending on context, it is doubtful that these data will be very useful for planning in Palau.

In contrast to male employment figures, only about 48 percent of the adult females in Palau were employed in 1990 (Table 11.3). More than half the females in Koror were in the labor force, the only state except Hatohobei with a female labor participation rate in excess of 50 percent.

Table 11.3. Labor Force Status for Females by State: 1990

State	Females 16 Years and Over	In Labor Force					Not in Labor Force
					Civilian Labor Force		
		Total	Percent	Em- ployed	Unem- ployed	Percent	
Total.....	4,623	2,239	48.4	2,057	182	8.1	2,384
Aimeliik.....	123	34	27.6	33	1	2.9	89
Airai.....	366	159	43.4	147	12	7.5	207
Angaur.....	66	13	19.7	13	-	-	53
Hatohobei.....	4	3	75.0	3	-	-	1
Kayangel.....	36	9	25.0	8	1	11.1	27
Koror.....	3,257	1,830	56.2	1,725	105	5.7	1,427
Melekeok.....	74	21	28.4	17	4	19.0	53
Ngaraard.....	89	26	29.2	16	10	38.5	63
Ngardmau.....	43	11	25.6	7	4	36.4	32
Ngaremlengui....	82	20	24.4	19	1	5.0	62
Ngatpang.....	20	4	20.0	4	-	-	16
Ngchesar.....	82	19	23.2	17	2	10.5	63
Ngerchelongs....	115	14	12.2	10	4	28.6	101
Ngiwal.....	64	23	35.9	10	13	56.5	41
Peleliu.....	190	51	26.8	26	25	49.0	139
Sonsorol.....	12	2	16.7	2	-	-	10

Source: U.S Bureau of the Census, 1992c, Table 15.

The unemployment rate for females in Palau was slightly higher than either the total or male unemployment rates in 1990. Hatohobei, Kayangel, Ngatpang, and Sonsorol states once more registered no unemployed females, in stark contrast to Ngiwal State which showed a female unemployment rate of nearly 57 percent. Once again, the excessively high unemployment rates for certain states probably are overstated if one strictly follows U.S. definitions.

Labor force participation in Palau varied considerably by age (Table 11.4). Although about 59 percent of all persons aged 16 years and over were in the labor force in 1990, only 18 percent of the individuals aged 16 to 19 years and 10 percent of persons aged 65 years and older were included—many of the young persons having yet to begin working and many of the older persons having already retired. In contrast, more than 81 percent of the residents in Palau aged 35 to 44 years were in the labor force, with slightly younger and older age groups registering similarly high participation rates.

Table 11.4. Labor Force Status by Age: 1990

Age Group	Total	Civilian Labor Force				
		In Labor Force		Employed	Unemployed	
		Number	Percent		Number	Percent
Total 16 + yrs....	10,238	6,072	59.3	5,599	471	7.8
16 to 19 years.....	1,156	210	18.2	143	67	31.9
20 to 24 years.....	1,340	801	59.8	691	109	13.6
25 to 34 years.....	2,741	2,081	75.9	1,898	183	8.8
35 to 44 years.....	2,116	1,720	81.3	1,652	67	3.9
45 to 54 years.....	1,179	849	72.0	821	28	3.3
55 to 64 years.....	790	317	40.1	305	12	3.8
65 years and over...	916	94	10.3	89	5	5.3

Source: U.S. Bureau of the Census, 1992c, Table 71.

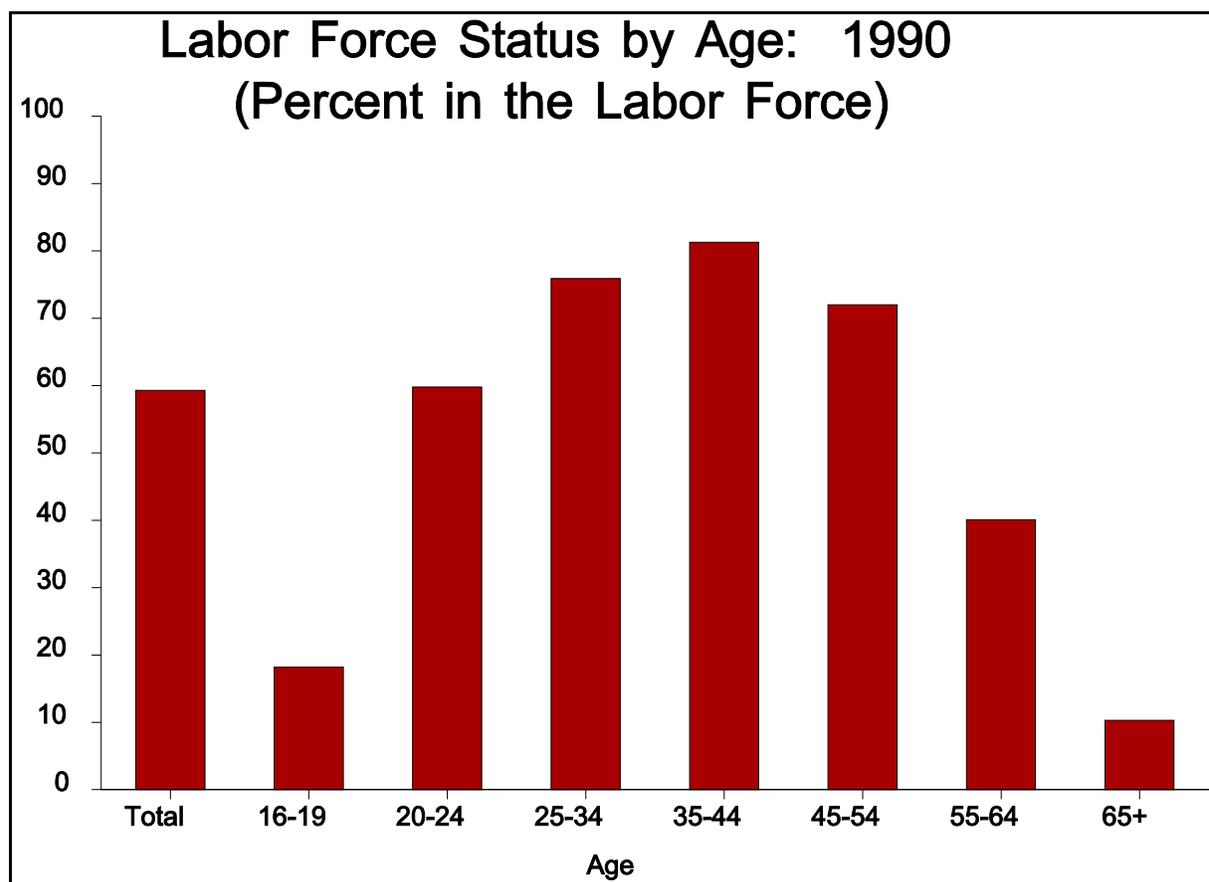


Figure 11.3. Percent in the Labor Force by Age: 1990

Unemployment rates tended to decrease as age increased. Persons aged 16 to 19 years were the most likely to be unemployed, either because they could not find work or because they had trouble keeping their jobs (one consequence of being the least experienced in the work force). None of the age groups ranging between 35 and 64 years, on the other hand, had an unemployment rate in excess of 4.0 percent. Once again, due to the nature of Palau's economy it is unclear how many of the unemployed should be classified as "not in the labor force" instead—reducing the reliability of these figures.

Male labor force participation also varied with age (Table 11.5), paralleling the general pattern noted above for all residents of Palau. Each male age group had higher percentages in the labor force than for the total population, with the three age groups between 25 and 54 years having labor force participation rates in excess of 80 percent. About 23 percent of the males aged 16 to 19 years were

in the labor force, while slightly more than 18 percent of the males aged 65 years or more were similarly classified.

Table 11.5. Labor Force Status for Males by Age: 1990

Age Group	Total	Civilian Labor Force				
		In Labor Force		Employed	Unemployed	
		Number	Percent		Number	Percent
Males 16 + yrs....	5,615	3,831	68.2	3,542	289	7.5
16 to 19 years.....	637	148	23.2	100	48	32.4
20 to 24 years.....	738	456	61.8	397	58	12.7
25 to 34 years.....	1,567	1,266	80.8	1,146	120	9.5
35 to 44 years.....	1,234	1,083	87.8	1,046	36	3.3
45 to 54 years.....	654	567	86.7	552	17	3.0
55 to 64 years.....	389	238	61.2	231	7	2.9
65 years and over...	396	73	18.4	70	3	4.1

Source: U.S. Bureau of the Census, 1992c, Table 71.

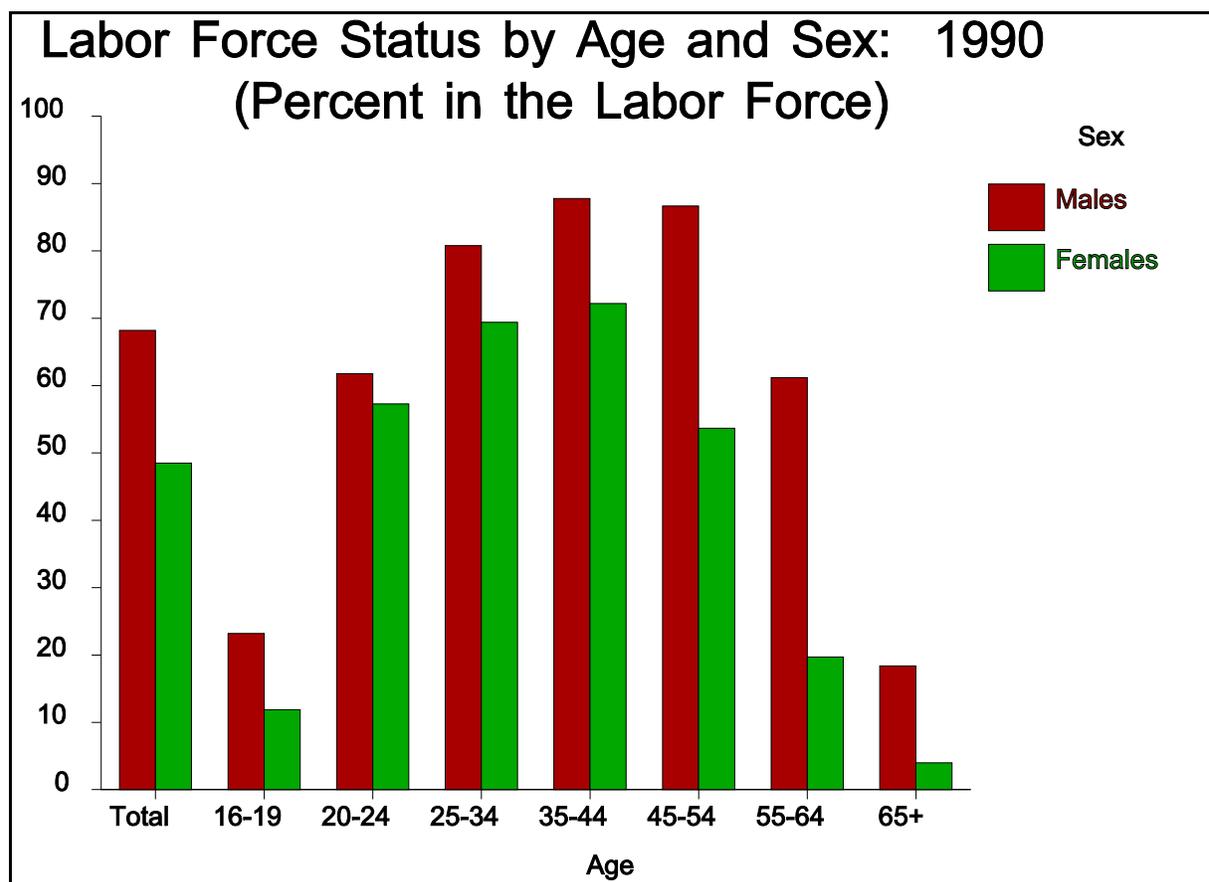


Figure 11.4. Percent in Labor Force by Age and Sex: 1990

Unemployment for males in Palau also varied with age, the pattern seen once again paralleling that described for the entire population. The unemployment rates for males aged 16 to 19 years and for males aged 25 to 34 years both exceeded the rates documented for all adult workers. Unemployment rates for males in the remaining five age groups all were lower than those for the whole population.

Female labor force participation characteristics resembled those documented for all adult residents of Palau and for adult males, although the participation rates were lower for all age groups (Table 11.6). The percentages of females in each age group within the labor force once again peaked near the middle of the age distribution, with figures in excess of 69 percent recorded for females in the two age groups between 25 and 44 years. Participation in the labor force once again was substantially lower for females in the youngest and oldest age groups than for females in the remaining age groups, with only 4 percent of those aged 65 years and older participating. The data

presented show a greater likelihood for younger women to participate in the labor force—probably due both to increased education and training as well as to differences in the behavior of younger and older generations.

Table 11.6. Labor Force Status for Females by Age: 1990

Age Group	Total	Civilian Labor Force				
		In Labor Force		Employed	Unemployed	
		Number	Percent		Number	Percent
Females 16+ yrs...	4,623	2,241	48.5	2,057	182	8.1
16 to 19 years.....	519	62	11.9	43	19	30.6
20 to 24 years.....	602	345	57.3	294	51	14.8
25 to 34 years.....	1,174	815	69.4	752	63	7.7
35 to 44 years.....	882	637	72.2	606	31	4.9
45 to 54 years.....	525	282	53.7	269	11	3.9
55 to 64 years.....	401	79	19.7	74	5	6.3
65 years and over...	520	21	4.0	19	2	9.5

Source: U.S. Bureau of the Census, 1992c, Table 71.

Unemployment rates for adult females in Palau varied according to age similarly to those for all adults and adult males. Overall unemployment for females exceeded that for males, as noted above. Unemployment rates for females in each age group similarly exceeded the rates for males in the same age groups with two exceptions, 16 to 19 and 25 to 34 years.

Persons born in Palau were less likely than immigrants to be in the labor force, partially because some Palauans were doing subsistence and other traditional activities and partially because many immigrants came specifically to work (Table 11.7). About 84 percent of those born outside Palau (and also outside the U.S.) were in the labor force, including almost 95 percent of those born in the Philippines and nearly 96 percent of those born in China. The figure for the Federated States of Micronesia (FSM) was much lower because most were students at the Micronesian Occupational College. Although slightly more than 70 percent of the residents of Palau born in the U.S. were in the labor force, this figure probably includes wives and children of contract and other workers.

Table 11.7. Labor Force Status by Birthplace: 1990

Birthplace	Total	In Labor Force		Civilian Labor Force		
		Number	Percent	Employed	Unemployed	Percent
Total 16 + yrs.....	10,238	6,072	59.3	5,599	471	7.8
Palau.....	7,874	4,161	52.8	3,711	448	10.8
Other places.....	2,013	1,693	84.1	1,676	17	1.0
Philippines.....	1,421	1,345	94.7	1,341	4	0.3
FSM.....	271	77	28.4	64	13	16.9
China.....	180	172	95.6	172	-	-
United States.....	141	99	70.2	99	-	-

Source: U.S. Bureau of the Census, 1992c, Table 53.

Note: Because this table does not include all "Other places", the total for the three places listed does not equal the sum.

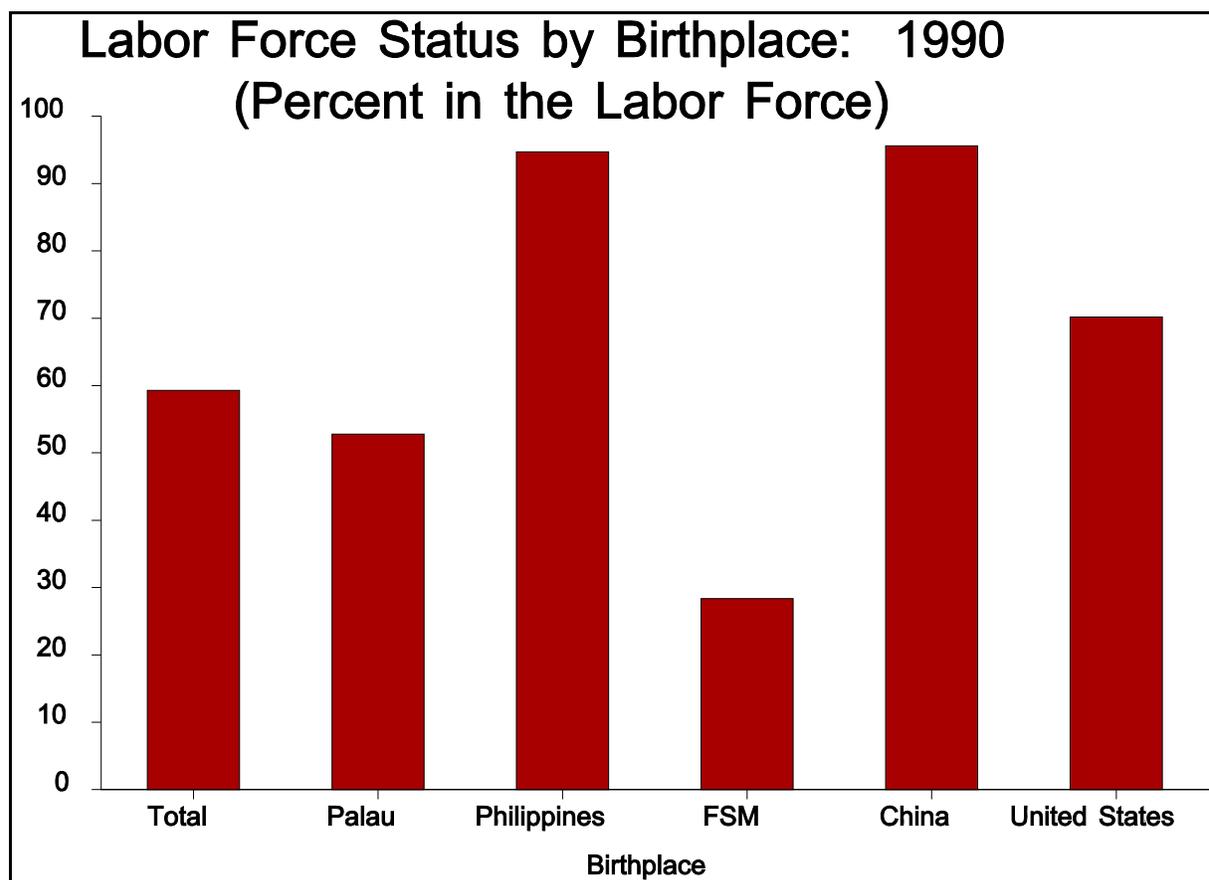


Figure 11.5. Percent in the Labor Force by Birthplace: 1990

About 11 percent of the Palau-born adults residing in Palau were unemployed in 1990, 3 percentage points higher than the rate for all workers. In contrast, only 1 percent of the adult residents of Palau who were born elsewhere (excluding the U.S.) were unemployed, including fewer than 1 percent of the adult residents born in the Philippines and none of the adults residents born in China. Such low unemployment rates for most non-Palau born are understandable. Foreign workers in Palau must work to serve their purpose for being there. If they do not work, they will have to return home. Nearly 17 percent of the FSM born were unemployed, providing additional evidence that many were students. No adult resident of Palau born in the U.S. was unemployed.

Persons who spoke English at home were more likely to be in the labor force than those who spoke some other language (Table 11.8). Although 83 percent of those who spoke English at home were in the labor force, this was true for only 59 percent of those who spoke another language. As discussed in Chapter 9, very few people in Palau spoke English at home and most of them were not Palauans.

The majority of adult residents of Palau in 1990 spoke another language at home more often than English. As the frequency of English increased, so did labor force participation. More than 65 percent of those who spoke English and another language equally often at home were in the labor force. Nearly 81 percent of those who spoke English at home more often than another language were in the labor force. Similarly, individuals who did not speak English at home were less likely to be in the labor force.

Table 11.8. Labor Force Status by Language and Ability: 1990

Language and Ability	Total	Civilian Labor Force				
		In Labor Force		Employed	Unemployed	
		Number	Percent		Number	Percent
Total 16 + yrs.....	10,238	6,072	59.3	5,599	471	7.8
Speak Only English.....	347	287	82.7	284	3	1.0
Speak Other Language....	9,891	5,785	58.5	5,315	468	8.1
More than English.....	9,196	5,314	57.8	4,849	463	8.7
Both Equally often....	418	273	65.3	271	2	0.7
Less than English....	217	175	80.6	172	3	1.7
Doesn't speak English.	60	23	38.3	23	-	-

Source: U.S. Bureau of the Census, 1992c, Table 74.

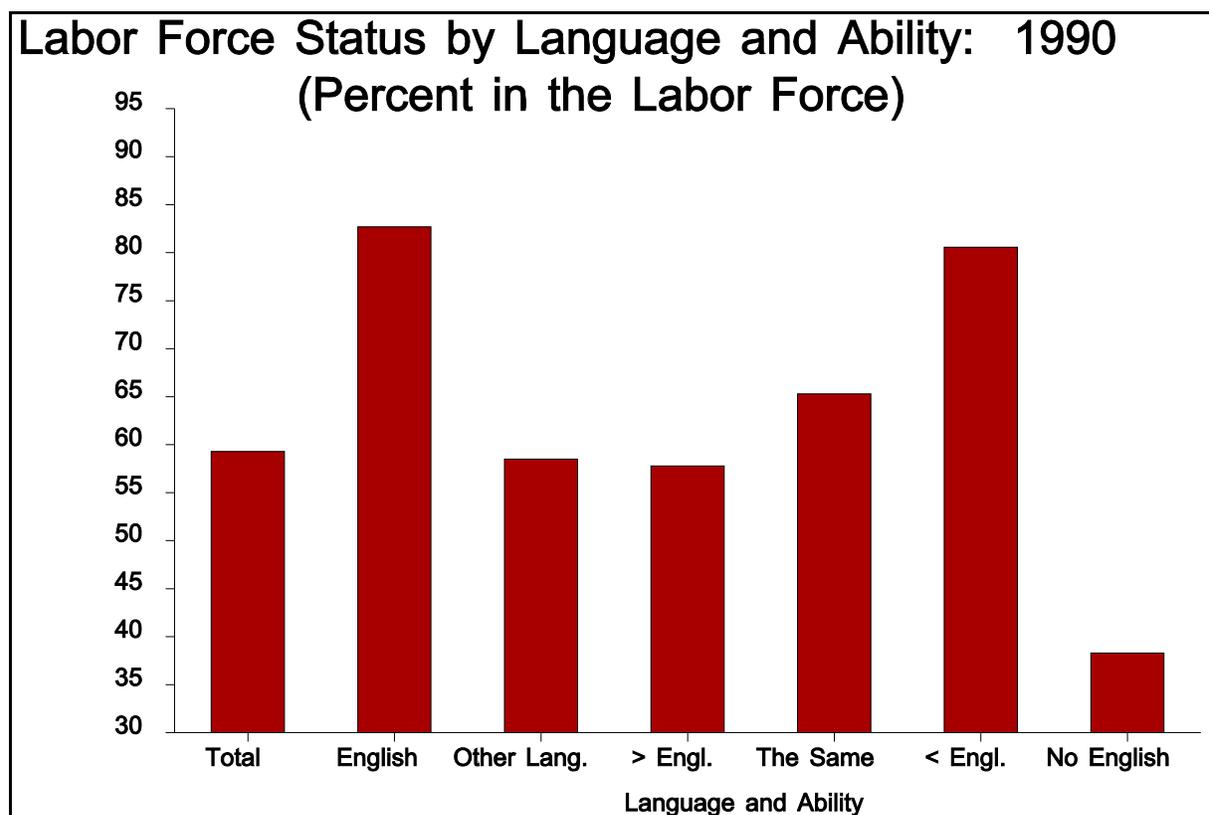


Figure 11.6. Percent in Labor Force by Language and Ability to Speak English: 1990

Unemployment also varied with language spoken at home, with increasing frequency of English spoken tending to correlate with decreased unemployment. Individuals who spoke English only had a 1 percent unemployment rate. Those who spoke English as often as or more than another language had unemployment rates of less than 1 and less than 2 percent, respectively. In contrast, nearly 9 percent of the workers who spoke another language more often than English were unemployed.

A close relationship also existed between educational attainment and employment (Table 11.9). The likelihood of participating in the labor force depends on the level of education obtained. Although figures fluctuated for the lowest levels of education, starting with two years of high school a direct correlation emerged between level of schooling and labor force participation. For example, about 74 percent of the high school graduates in Palau were in the labor force, increasing to more than 92 percent of those with bachelor's degrees and 95 percent with higher degrees.

Table 11.9. Labor Force Status by Educational Attainment: 1990

Educational Attainment	Total	Civilian Labor Force				
		In Labor Force		Unemployed		
		Number	Percent	Employed	Number	Percent
Total 16 + yrs.....	10,238	6,072	59.3	5,599	471	7.8
Elem: 0 to 7 years.....	1,948	500	25.7	466	34	6.8
8 years.....	621	302	48.6	236	65	21.6
H.S.: 1 year.....	657	315	47.9	277	38	12.1
2 years.....	484	171	35.3	144	27	15.8
3 years.....	562	210	37.4	166	44	21.0
4 years.....	375	172	45.9	149	23	13.4
High school graduate....	2,717	2,013	74.1	1,864	148	7.4
Some college.....	1,188	898	75.6	836	62	6.9
A.S., occupational.....	525	429	81.7	408	21	4.9
A.S., academic.....	318	281	88.4	278	3	1.1
Bachelor's degree.....	704	649	92.2	643	6	0.9
Higher degree.....	139	132	95.0	132	-	-

Source: U.S Bureau of the Census, 1992c, Table 67.

Unemployment, in contrast, tended to decrease as level of educational attainment increased. Once again, persons with lower levels of education experienced considerable fluctuation in unemployment. However, beginning with persons having three or more years of high school, unemployment rates decreased as level of education increased, reaching no unemployment for individuals with "higher degrees".

Until now, this chapter has examined labor force characteristics during the week preceding the 1990 census. The 1990 census of Palau also collected information about work during all of 1989. Whereas the data on work in the week before the census provide current labor force participation, the data on work the year before the census provide longer term work patterns.

The total working population in Palau nearly doubled during the decade of the 1980s, a consequence of general population growth and a disproportional increase (through immigration) in persons of working age (Table 11.10). During this period, the number of persons who worked the entire year increased somewhat less than the total working population, but the number of persons working part of the year more than doubled — probably due to immigration during the year. The percentage of persons who worked 50 to 52 weeks decreased from 73 percent in 1979 (for the 1980 census) to 68 percent in 1989 (for the 1990 census). However, because the percentage working 40 to 49 weeks

increased from about 8 percent to more than 10 percent the overall decrease for those working 40 weeks or more was not excessive. The percentages of workers represented in both periods of work below 40 weeks increased slightly between 1979 and 1989.

Table 11.10. Persons Who Worked in Year Before Census by Hours Worked and Weeks Worked: 1980 and 1990

Hours and Weeks Worked	Number		Percent Change	Percent	
	1990	1980		1990	1980
Total, 16 + yrs.....	6,030	3,029	99.1	100.0	100.0
50 to 52 weeks.....	4,095	2,199	86.2	67.9	72.6
40 to 49 weeks.....	636	226	181.4	10.5	7.5
27 to 39 weeks.....	246	104	136.5	4.1	3.4
1 to 26 weeks.....	1,053	500	110.6	17.5	16.5
Usually worked 35+ hr/wk....	5,602	2,568	118.1	92.9	84.8
50 to 52 weeks.....	3,946	2,109	87.1	65.4	69.6
40 to 49 weeks.....	571	171	233.9	9.5	5.6
27 to 39 weeks.....	204	71	187.3	3.4	2.3
1 to 26 weeks.....	881	217	306.0	14.6	7.2
Usually worked 1-34 hr/wk....	428	461	-7.2	7.1	15.2
50 to 52 weeks.....	149	90	65.6	2.5	3.0
40 to 49 weeks.....	65	55	18.2	1.1	1.8
27 to 39 weeks.....	42	33	27.3	0.7	1.1
1 to 26 weeks.....	172	283	-39.2	2.9	9.3

Sources: U.S. Bureau of the Census, 1982b, Table 59; 1992c, Table 15.

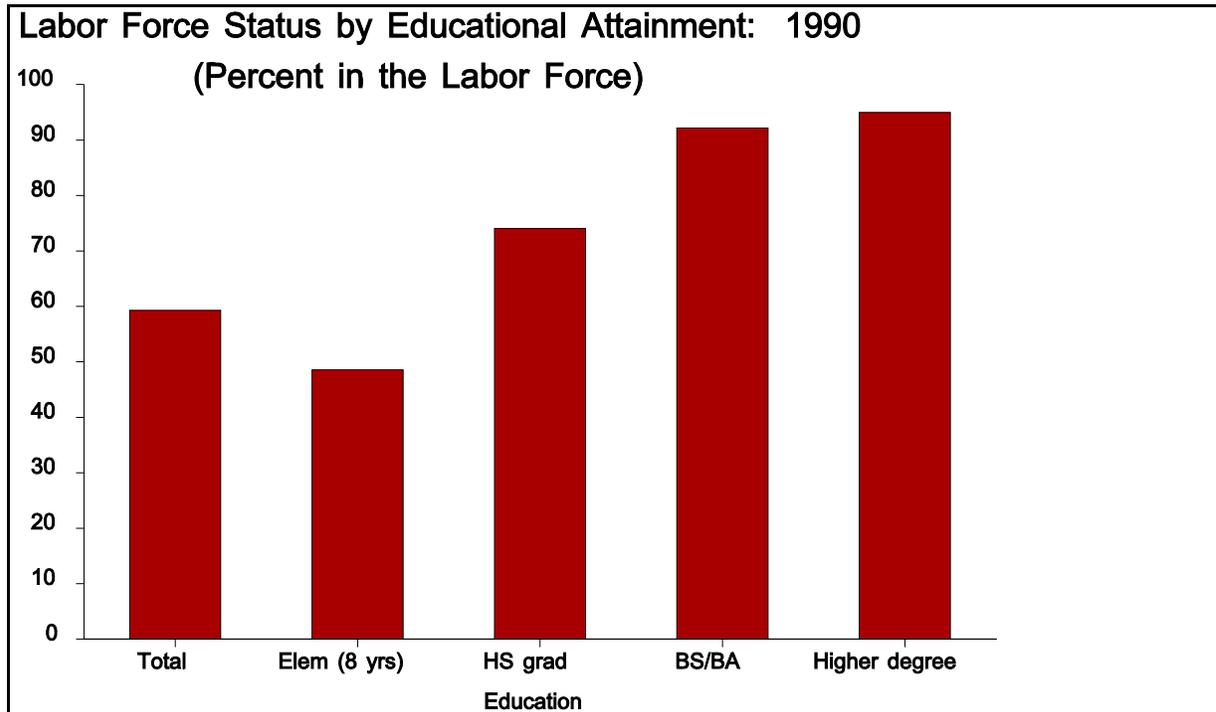


Figure 11.7. Percent in the Labor Force by Educational Attainment: 1990

The percentage of full-time workers—those working 35 hours or more per week—increased by 118 percent between 1979 and 1989, from about 85 percent of workers to nearly 93 percent. Thus, even those persons who started working sometime during the year (probably having migrating) tended to work full-time once employed in Palau. The percentage of full-time workers who worked 50 to 52 weeks increased by about 87 percent during the 1980s, but decreased from nearly 70 percent of the working population to roughly 65 percent. On the other hand, the percentage who worked full-time but for less than half the year increased by more than 300 percent, and grew from 7 percent of the workers in 1979 to nearly 15 percent in 1989.

Part-time workers decreased by more than 7 percent between 1979 and 1989, from about 15 percent of the workers in 1979 to slightly more than 7 percent in 1989. The largest decrease in part-time workers occurred among those who worked less than half the year—declining by 39 percent during the decade and from more than 9 percent of all part-time workers to about 3 percent. Apparently, in the aggregate, persons who worked part-time in 1979 worked full-time in 1989.

About twice as many males in Palau worked in 1989 as in 1979, an increase slightly less than that of the entire population (Table 11.11). The greatest relative increases occurred among males who worked 40 to 49 and 27 to 39 weeks the year preceding each census, growing by roughly 199 and

128 percent, respectively. These large increases probably were due to the immigration of male workers who arrived sometime after the beginning of 1989. The proportions of males who worked these numbers of weeks the year before the census both grew, at the expense of individuals who worked 50 weeks or more and 26 weeks or fewer.

Table 11.11. Males Who Worked in Year Before Census by Hours Worked and Weeks Worked: 1980 and 1990

Hours and Weeks Worked	Number		Percent Change	Percent	
	1990	1980		1990	1980
Males, 16 + yrs.....	3,813	1,986	92.0	100.0	100.0
50 to 52 weeks.....	2,640	1,445	82.7	69.2	72.8
40 to 49 weeks.....	404	135	199.3	10.6	6.8
27 to 39 weeks.....	148	65	127.7	3.9	3.3
1 to 26 weeks.....	621	341	82.1	16.3	17.2
Usually worked 35+ hr/wk.....	3,612	1,703	112.1	94.7	85.8
50 to 52 weeks.....	2,551	1,387	83.9	66.9	69.8
40 to 49 weeks.....	367	108	239.8	9.6	5.4
27 to 39 weeks.....	131	51	156.9	3.4	2.6
1 to 26 weeks.....	563	157	258.6	14.8	7.9
Usually worked 1-34 hr/wk.....	201	283	-29.0	5.3	14.2
50 to 52 weeks.....	89	58	53.4	2.3	2.9
40 to 49 weeks.....	37	27	37.0	1.0	1.4
27 to 39 weeks.....	17	14	21.4	0.4	0.7
1 to 26 weeks.....	58	184	-68.5	1.5	9.3

Sources: U.S. Bureau of the Census, 1982b, Table 59; 1992c, Table 15.

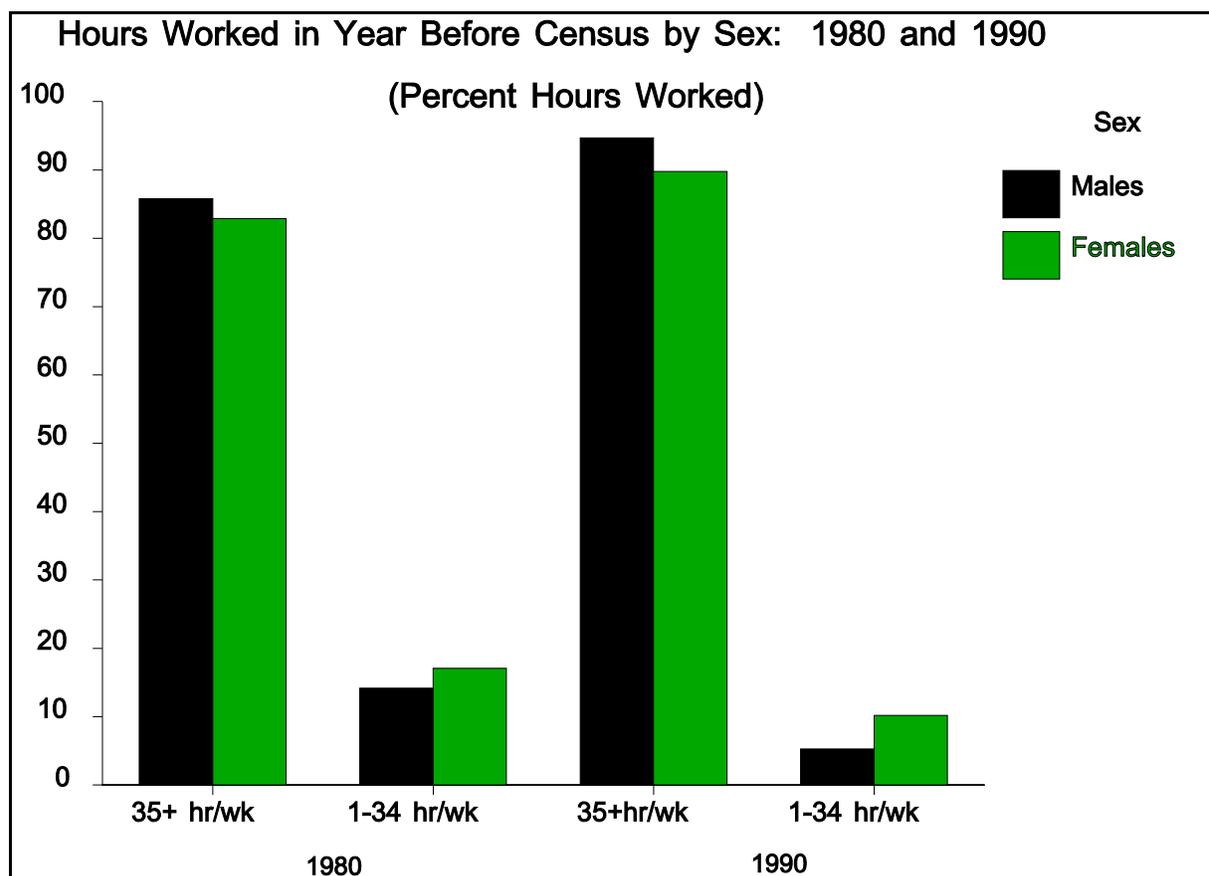


Figure 11.8. Percent Full-time and Part-time Work in Year Before Census by Sex: 1980 and 1990

The number of males who worked 35 hours or more per week grew by about 112 percent between 1979 and 1989, with the number who worked the entire year increasing by nearly 84 percent over the same period. Among the males in Palau who tended to work full-time the year preceding either of the last two decennial censuses, only those who worked 50 weeks or more experienced a decline in their proportional role—once again suggesting the importance played by migrants who began to work in Palau sometime after the beginning of 1989.

In contrast to full-time male workers, the number of males in Palau who worked part-time decreased by 29 percent between 1979 and 1989. All of this decrease occurred among those part-time workers who worked less than half the year preceding either of the last two decennial censuses, their proportion of the male work force declining from more than 9 percent to less than 2 percent during the 1980s.

The number of females working in Palau more than doubled between 1979 and 1989 (Table 11.12), a larger increase in relative terms than that experienced by their male counterparts. Females who worked part of 1989 experienced the greatest relative growth, with those working 50 weeks or more increasing by 93 percent. Females who worked the entire year preceding the census experienced a slight decline in their share of all female workers, from more than 73 percent to about 66 percent of the total.

Table 11.12. Females Who Worked in Year Before Census by Hours Worked and Weeks Worked: 1980 and 1990

Hours and Weeks Worked	Number		Percent Change	Percent	
	1990	1980		1990	1980
Females, 16 + yrs.....	2,217	1,043	112.6	100.0	100.0
50 to 52 weeks.....	1,455	754	93.0	65.6	72.3
40 to 49 weeks.....	232	91	154.9	10.5	8.7
27 to 39 weeks.....	98	39	151.3	4.4	3.7
1 to 26 weeks.....	432	159	171.7	19.5	15.2
Usually worked 35+ hr/wk.....	1,990	865	130.1	89.8	82.9
50 to 52 weeks.....	1,395	722	93.2	62.9	69.2
40 to 49 weeks.....	204	63	223.8	9.2	6.0
27 to 39 weeks.....	73	20	265.0	3.3	1.9
1 to 26 weeks.....	318	60	430.0	14.3	5.8
Usually worked 1-34 hr/wk.....	227	178	27.5	10.2	17.1
50 to 52 weeks.....	60	32	87.5	2.7	3.1
40 to 49 weeks.....	28	28	-	1.3	2.7
27 to 39 weeks.....	25	19	31.6	1.1	1.8
1 to 26 weeks.....	114	99	15.2	5.1	9.5

Source: U.S. Bureau of the Census, 1982b, Table 59; 1992c, Table 15.

The number of females in Palau who worked full-time during the year before the census also more than doubled, their relative increase once again greater than that experienced by full-time male workers. The percentage of growth among full-time female workers increased with decreasing duration of work—with those working full-time 50 weeks or more increasing by about 93 percent compared to a 430 percent increase experienced by those who worked full-time for one to 26 weeks. Only the females who worked full-time for 50 weeks or more experienced a decline in their share of the total female work force, from more than 69 percent to about 63 percent.

The number of females in Palau who worked part-time the year before either of the last two decennial censuses grew slightly during the 1980s compared to the males who saw their numbers reduced. All females classified as part-time workers except for those who worked 40 to 49 weeks experienced numerical increases between 1979 and 1989. The proportion of all female workers

decreased for those who worked part-time during the year preceding the census, regardless of the number of weeks worked.

Nearly 93 percent of the workers in Palau aged 16 years and over worked full-time in 1989 (Table 11.13). Proportionally fewer of those born in Palau worked full-time in 1989 than those born in the Philippines or elsewhere. In contrast, 6 percent of Palau-born workers in Palau worked part-time in 1989, more than the proportion of workers born in the Philippines or elsewhere.

Table 11.13. Work Status in 1989 by Birthplace: 1990

Work Status in 1989	Total	Palau	Phili- ppines	Elsewhere
Persons 16 years & over.....	10,238	7,874	1,421	943
Worked in 1989.....	6,030	4,326	1,139	565
Percent.....	58.9	54.9	80.2	59.9
Usually worked 35+ hrs/wk.....	5,602	3,964	1,111	527
Percent.....	92.9	91.6	97.5	93.3
Usually worked 15-34 hrs/wk.....	306	259	20	27
Percent.....	5.1	6.0	1.8	5.1
Did not work in 1989.....	4,208	3,548	282	378

Source: U.S. Bureau of the Census, 1992c, Table 53.

Although about two of every three workers in Palau worked 50 to 52 weeks in 1989, the number of weeks worked varied with age (Table 11.14). For example, only about 37 percent of the 16 to 19 year olds worked the entire year, compared to more than 75 percent of workers aged 35 to 54 years. About 42 percent of workers in the youngest age group worked 13 weeks or less in 1989, a duration represented by 12 percent or less of any other age group considered.

Table 11.14. Weeks Worked in 1989 by Age: 1990

Weeks Worked in 1989	Total	16-19 years	20-25 years	25-34 years	35-54 years	55-64 years	65 yrs & over
Worked in 1989.....	6,030	177	675	1,995	2,575	418	190
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
50 to 52 weeks.....	67.9	37.3	53.9	66.5	75.2	70.3	56.8
40 to 49 years.....	10.5	5.1	13.2	11.9	9.7	8.6	8.4
27 to 29 weeks.....	4.1	3.4	5.8	4.5	3.6	4.3	-
14 to 26 weeks.....	8.6	12.4	13.0	9.4	5.4	8.9	23.2
1 to 13 weeks.....	8.9	41.8	14.1	7.8	6.1	7.9	11.6

Source: U.S. Bureau of the Census, 1992c, Table 42.

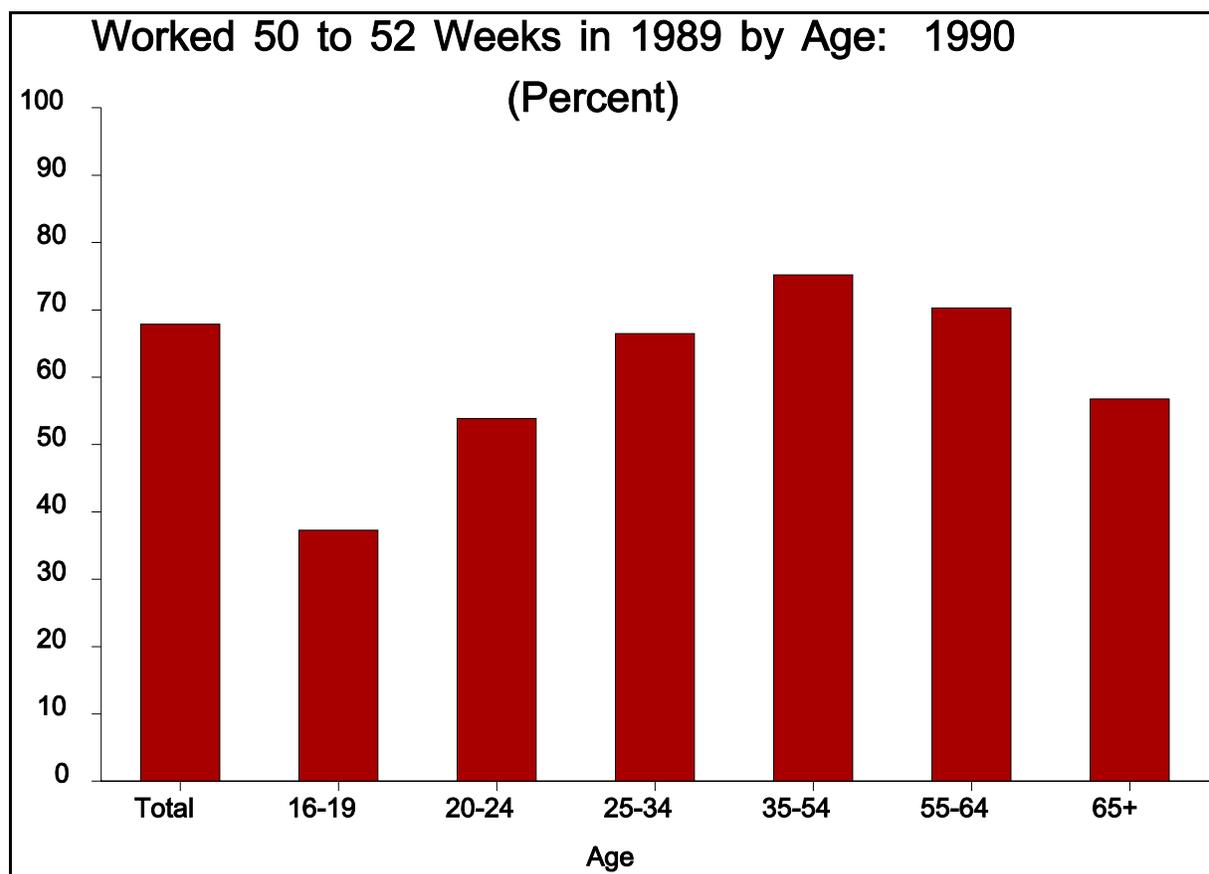


Figure 11.9. Percent Who Worked 50 to 52 Weeks in 1989 by Age: 1990

Palau born were more likely to have worked all of 1989 than resident workers born in the Philippines or elsewhere (Table 11.15). Although nearly 68 percent of all workers in Palau worked 50 to 52 weeks, this was true for almost 72 percent of those born in Palau. In contrast, only 7 percent of the Palau-born workers fell within the one to 13 week category in 1989, compared to nearly 15 percent of the workers born in the Philippines and almost 11 percent of those born elsewhere. In general, workers born outside Palau continued to show a greater tendency to have worked less than the entire year of 1989.

Table 11.15. Work Status of Employed Persons in 1989 by Place of Birth: 1990

Work Status in 1989	Total	Palau	Philippines	Elsewhere
Worked in 1989.....	6,030	4,326	1,139	565
Percent.....	100.0	100.0	100.0	100.0
50 to 52 weeks.....	67.9	71.9	55.7	61.9
40 to 49 years.....	10.5	9.3	12.5	16.5
27 to 29 weeks.....	4.1	3.7	5.1	4.8
14 to 26 weeks.....	8.6	8.0	12.2	6.0
1 to 13 weeks.....	8.9	7.1	14.6	10.8

Source: U.S. Bureau of the Census, 1992c, Table 53.

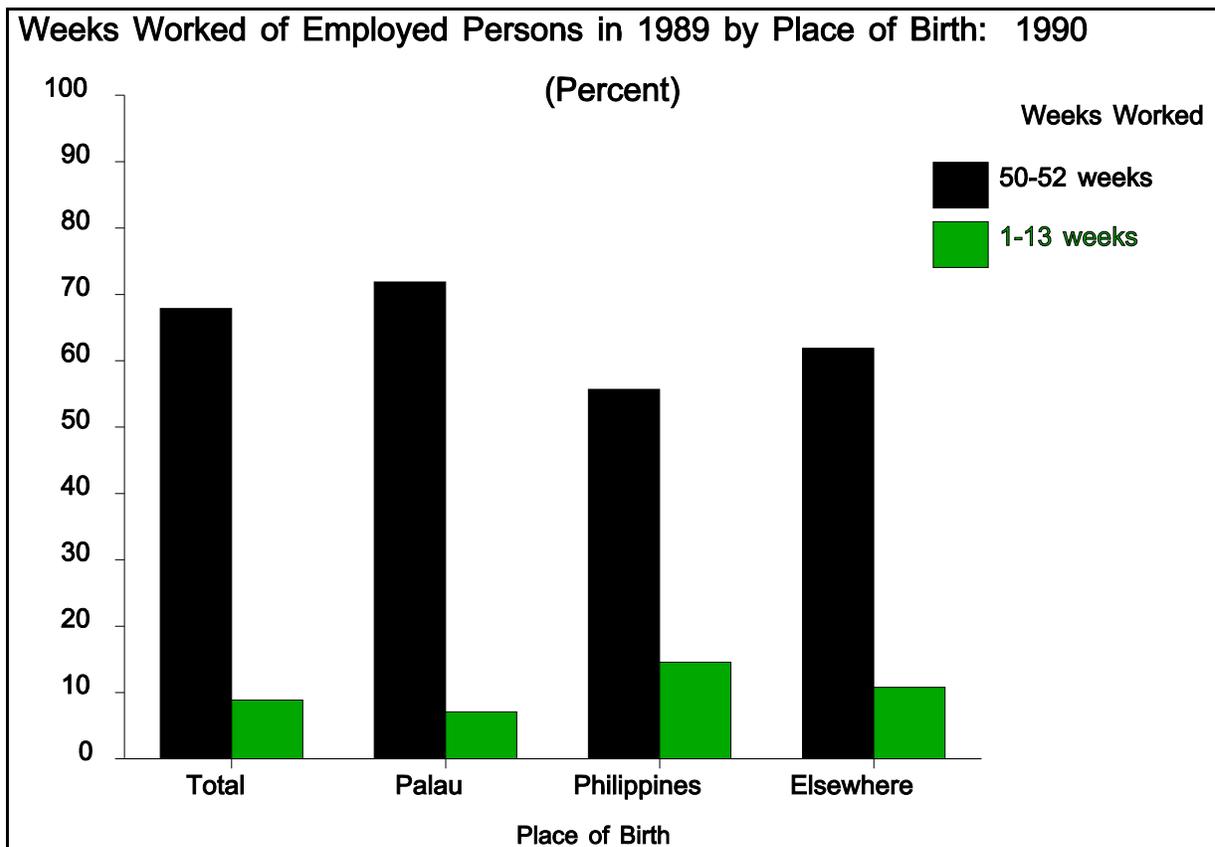


Figure 11.10. Percent Worked 50 to 52 Weeks and 1 to 13 Weeks in 1989 by Birthplace: 1990

About 70 percent of the full-time workers in Palau worked 50 weeks or more in 1989 (Table 11.16). This proportion was smaller than for the Palau-born full-time workers who worked 50 weeks or more the year preceding the last decennial census, but greater than the percentage of those born in the Philippines or elsewhere who worked the entire year. More than three-fourths of Palau-born workers living in the republic in 1990 who worked full-time in 1989 also worked the entire year (50 to 52 weeks) (Table 11.16). Only about 56 percent of the Philippines full-time workers were in this category, as were 64 percent of those born elsewhere.

Table 11.16. Work Status of Full-time Employees in 1989 by Birthplace: 1990

Work Status in 1989	Total	Palau	Philippines	Elsewhere
Usually worked 35+ hrs/wk...	5,602	3,964	1,111	527
Percent.....	100.0	100.0	100.0	100.0
50 to 52 weeks.....	70.4	75.3	56.3	64.1
40 to 49 years.....	10.2	8.8	12.3	16.5
27 to 29 weeks.....	3.6	3.2	5.0	3.8
14 to 26 weeks.....	7.8	6.9	12.3	5.5
1 to 13 weeks.....	7.9	5.9	14.0	10.1

Source: U.S. Bureau of the Census, 1992c, Table 53.

The largest group of workers in 1989 were aged 35 to 54 years, followed by those aged 25 to 34 years (Table 11.17). More than 72 percent of the adult populations in both of these age groups worked in 1989, with nearly 95 percent of the workers in each group working full-time. The proportions of workers in each age group who worked less than 35 hours per week fell below 10 percent for all but the two oldest groups.

Table 11.17. Work Status in 1989 by Age: 1990

Work Status in 1989	Total	16-19 years	20-24 years	25-34 years	35-54 years	55-64 years	65 yrs & over
Persons 16+.....	10,238	1,156	1,340	2,741	3,295	790	916
Worked in 1989.....	6,030	177	675	1,995	2,575	418	190
Percent.....	58.9	15.3	50.4	72.8	78.1	52.9	20.7
Usually worked 35+ hrs/wk....	5,602	153	635	1,888	2,437	351	138
Percent.....	92.9	86.4	94.1	94.6	94.6	84.0	72.6
Usually worked 15-34 hrs/wk..	306	16	31	81	83	51	44
Percent.....	5.1	9.0	4.6	4.1	3.2	12.2	23.2
Did not work in 1989.....	4,208	979	665	746	720	372	726

Source: U.S. Bureau of the Census, 1992c, Table 42.

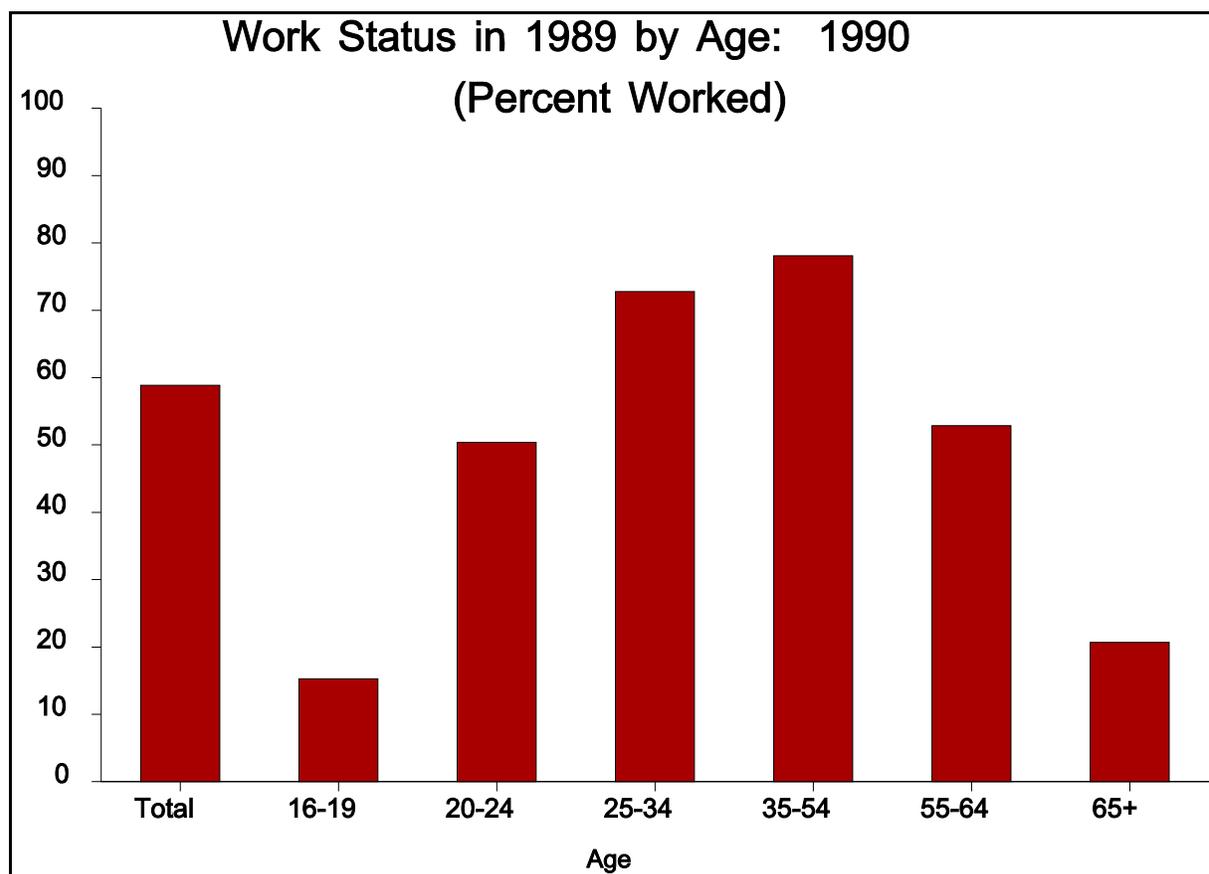


Figure 11.11. Percent Worked in 1989 by Age: 1990

Of the workers in Palau who worked full-time in 1989, more than 70 percent worked that entire year (Table 11.18). However, once again the number of weeks worked full-time the year before the 1990 census varied considerably by age. Proportionally as many full-time workers aged 16 to 19 years worked 50 weeks or more as worked 13 weeks or less — about 40 percent. On the other hand, more than 3/4ths of the full-time workers in the age groups of 35 to 54 and 55 to 64 years worked 50 weeks or more, with more than half the full-time workers in the remaining three age groups similarly working the entire year.

Table 11.18. Work Status of Full-time Workers in 1989 by Age: 1990

Work Status in 1989	16-19 20-24 25-34 35-54 55-64 65 yrs						
	Total	years	years	years	years	years	& over
Usually worked 35+ hrs/wk...	5,602	153	635	1,888	2,437	351	138
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
50 to 52 weeks.....	70.4	39.9	55.0	68.1	77.4	76.1	69.6
40 to 49 years.....	10.2	4.6	12.9	11.4	9.3	8.0	8.0
27 to 29 weeks.....	3.6	2.6	5.0	4.1	3.0	4.6	0.0
14 to 26 weeks.....	7.8	13.1	13.1	9.3	5.4	4.8	8.7
1 to 13 weeks.....	7.9	39.9	14.0	7.0	4.8	6.6	13.8

Source: U.S. Bureau of the Census, 1992c, Table 42.

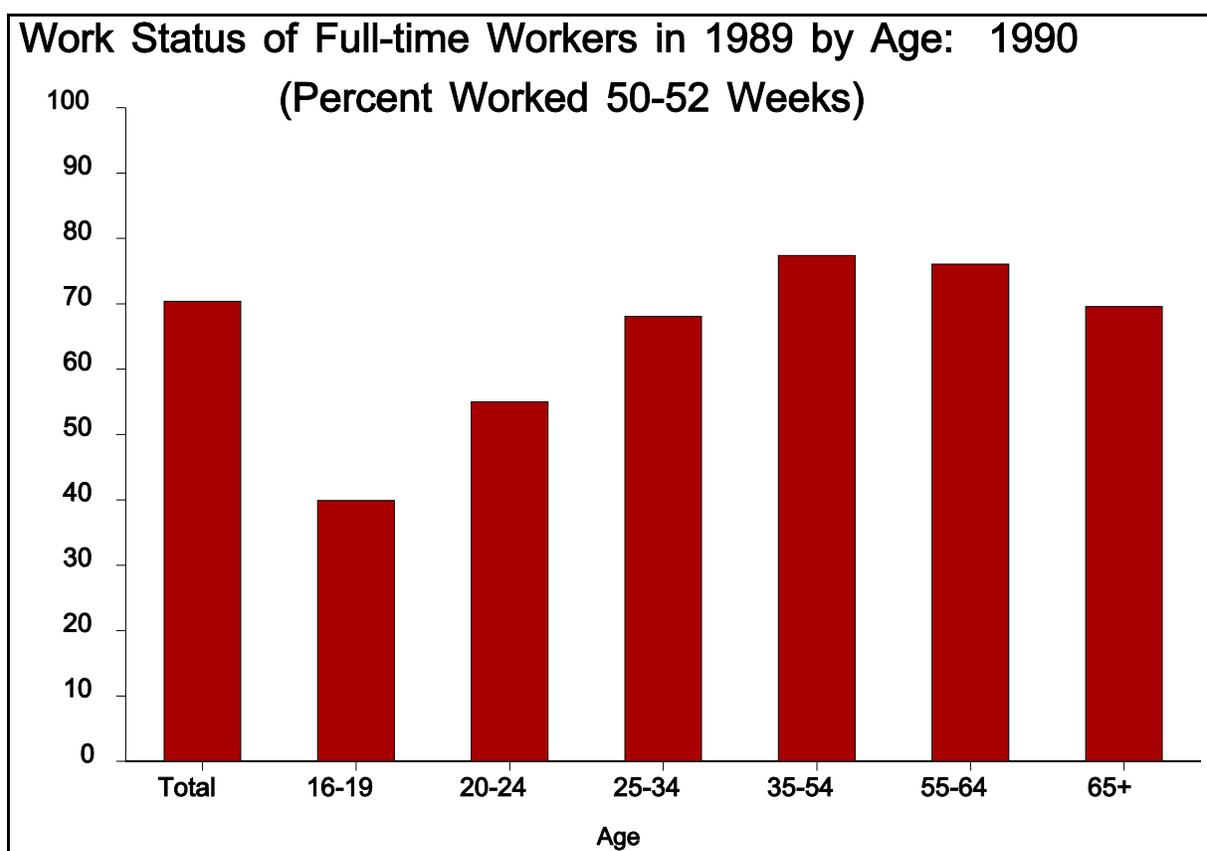


Figure 11.12. Percent Worked 50 to 52 Weeks in 1989 by Age: 1990

The proportion of inhabitants aged 16 years and over who worked in 1989 varied substantially among the states of Palau, ranging from a high of 80 percent in Hatohobei to a low of less than 33 percent in Peleliu (Table 11.19). The percentages of adult residents of Airai and Koror who worked in 1989 were about 58 and 63 percent, respectively, the former slightly lower than the figure for the entire republic and the latter slightly higher. Rural states tended to have proportionally fewer adult residents who worked in 1989, the usefulness of the values for many states (including Hatohobei) limited due to the small numbers of persons involved.

Table 11.19. Work Status in 1989 by State: 1990

State	Worked in 1989			Worked 50 to 52 Weeks		Usually Worked 35 + hrs/week	
	Total	Number	Percent	Number	Percent	Number	Percent
Total 16+ yr..	10,238	6,030	58.9	4,095	67.9	5,602	92.9
Aimeliik.....	280	125	44.6	71	56.8	119	95.2
Airai.....	840	483	57.5	347	71.8	444	91.9
Angaur.....	139	54	38.8	27	50.0	52	96.3
Hatohobei.....	15	12	80.0	6	50.0	9	75.0
Kayangel.....	81	46	56.8	19	41.3	32	69.6
Koror.....	7,251	4,557	62.8	3,207	70.4	4,333	95.1
Melekeok.....	152	61	40.1	47	77.0	43	70.5
Ngaraard.....	187	114	61.0	65	57.0	91	79.8
Ngardmau.....	95	58	61.1	21	36.2	52	89.7
Ngaremlengui.....	166	72	43.4	46	63.9	66	91.7
Ngatpang.....	44	19	43.2	15	78.9	18	94.7
Ngchesar.....	179	105	58.7	60	57.1	82	78.1
Ngerchelong.....	222	86	38.7	52	60.5	74	86.0
Ngiwal.....	150	90	60.0	20	22.2	59	65.6
Peleliu.....	402	131	32.6	83	63.4	117	89.3
Sonsorol.....	35	17	48.6	9	52.9	11	64.7

Source: U.S. Bureau of the Census, 1992c, Table 15.

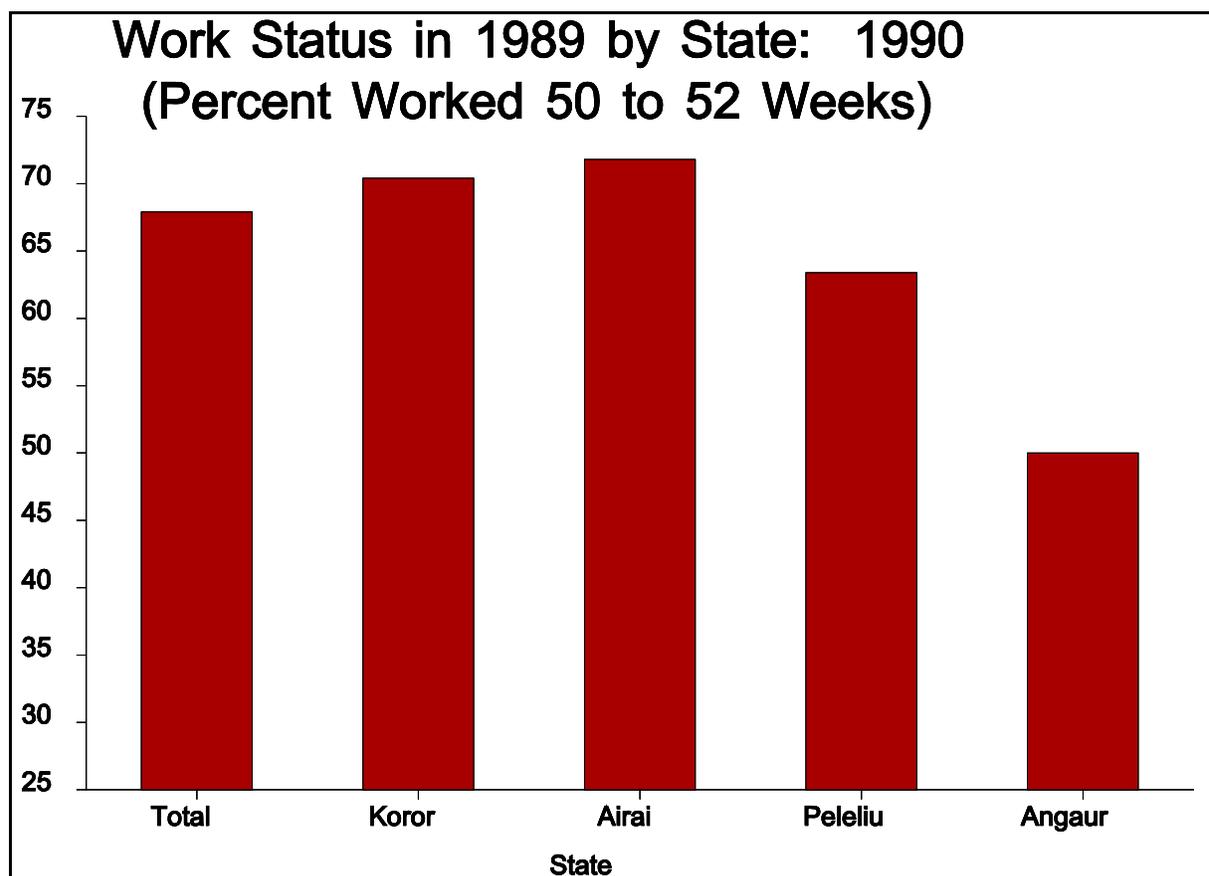


Figure 11.13. Percent Worked 50 to 52 Weeks in 1989 for Selected States: 1990

The majority of workers in all but Kayangel, Ngardmau, and Ngiwal states worked 50 to 52 weeks in 1989. More than 70 percent of the workers in Koror and nearly 72 percent of the workers in Airai worked all of 1989.

Similarly, the majority of workers in all states of Palau worked full-time in 1989. Included were more than 95 percent of the workers living in Koror and nearly 92 percent of those residing in Airai. Lower percentages of full-time workers occurred in more rural states, but in no case did the proportion of full-time workers fall below 64 percent of all workers.

Slightly more than 52 percent of all workers in Palau traveled to work by car, truck, or private van in 1990 (Table 11.20). Nearly two-thirds of these individuals car-pooled, the remainder driving alone. About 24 percent of the work force walked to work. The remaining workers in Palau, more than 1,350, traveled to work by some other means, including boats and public transportation (mostly taxis).

Table 11.20. Means of Transportation to Work by State: 1990

State	Car, Truck, or Private Van				Walked		Other Means	
	Total	Number	Percent	Drove alone	Car-pooled	Number		Percent
Workers 16+ yrs..	5,548	2,890	52.1	985	1,905	1,303	23.5	1,355
Aimeliik.....	113	50	44.2	10	40	45	39.8	18
Airai.....	458	293	64.0	100	193	72	15.7	93
Angaur.....	37	12	32.4	8	4	23	62.2	2
Hatohobei.....	12	-	-	-	-	8	66.7	4
Kayangel.....	18	-	-	-	-	16	88.9	2
Koror.....	4,496	2,475	55.0	845	1,630	902	20.1	1,119
Melekeok.....	57	11	19.3	1	10	22	38.6	24
Ngaraard.....	46	2	4.3	-	2	38	82.6	6
Ngardmau.....	29	1	3.4	1	-	28	96.6	-
Ngaremlengui.....	38	4	10.5	3	1	26	68.4	8
Ngatpang.....	19	4	21.1	2	2	12	63.2	3
Ngchesar.....	56	5	8.9	1	4	33	58.9	18
Ngerchelong.....	38	14	36.8	2	12	19	50.0	5
Ngiwal.....	32	3	9.4	-	3	19	59.4	10
Peleliu.....	83	15	18.1	12	3	31	37.3	37
Sonsorol.....	16	1	6.3	-	1	9	56.3	6

Source: U.S. Bureau of the Census, 1992c, Table 18.

The means of transportation used to travel to work in Palau varied widely among the states. As expected, workers in the most modern, Westernized states of Airai and Koror showed the greatest tendency to use more modern transportation, namely some type of motorized vehicle. Most workers in other states walked to work or used some other, presumably some traditional mode of transportation.

## Conclusions

Insights about Palau's economy from census data are inherently limited by the relatively long periods between census. To complicate matters, Palau which is evolving economically, from a more traditional, subsistence-based economy to a more market-based economy. Many of the statistics collected by conventional censused are of limited use. Nevertheless, examining systematically collected data on economic topics provides a basic understanding of Palau's economy. In this chapter, we focussed on labor force participation and associated issues.

A number of trends emerge from data collected by the 1990 census. More than half the residents of Palau in 1990 were part of the labor force at some time in 1989. With few exceptions, labor force

participation was stronger among males than among females. Similarly, the greatest labor force participation in both absolute and relative terms occurred among individuals in middle age groups, those aged 20 to 64 years old. Foreign-born residents of Palau tended to have higher rates of labor force participation than Palau-born persons — in part because most foreigners must work in order to stay in Palau and in part because most foreigners migrate to Palau specifically for jobs. Labor force participation tended to increase with the amount of English spoken at home and with level of educational attainment. Proportionally fewer workers living in Palau in 1990 than in 1980 had worked during all of 1989, but proportionally more worked full-time. Workers within the middle age groups and immigrants tended to work full-time in 1989; the former also usually worked the entire year of 1989, a tendency that did not hold for the latter.

In this chapter we looked at several facets of the Palauan economy. One of the most important, recurring themes is the growing role played by workers from other countries. The tendency for immigrants to work full-time emerged time and again, as did their tendency to work for less than an entire year prior to the most recent census — testimony both to their interest in working and to their impermanence. A second theme concerns the importance of education in the Palau's increasingly Westernized coupled with the importance of some facility in speaking English. As Palau's economic foundation continues to evolve, educational attainment and ability to communicate in English will probably continue to grow in economic importance.

## CHAPTER 12. OCCUPATION, INDUSTRY, AND CLASS OF WORKER

Although labor force participation — whether people have jobs is important — the type of work gives a more complete understanding of an area's economy. Now we examine occupation, industry, and class of worker to explore issues related to Palau's workforce.

### Definitions

#### *INDUSTRY, OCCUPATION, AND CLASS OF WORKER*

Industry, occupation, and class of worker data were derived from answers to questionnaire items 28, 29, and 30. Industry is a worker's kind of business or government agency and occupation is the kind of work a person does.

For employed persons, data on industry, occupation, and class of worker refer to the respondent's job during the reference week. For individuals who worked at two or more jobs, the data refer to the job at which the person worked the greatest number of hours. For unemployed persons, the data concerning work type refer to their last job. The industry and occupation statistics are based on the detailed classification systems developed for the 1990 census. The *Classified Index of Industries and Occupations* provides additional information on the industry and occupation classification systems.

Respondents provided data for census tabulations by reporting information on their industry and occupation. The descriptions obtained were referred to clerical staff in the U.S. Census Bureau's Jeffersonville, Indiana processing office for coding. The clerical staff converted the written questionnaire descriptions to codes by comparing these descriptions to entries in the *Alphabetical Index of Industries and Occupations*.

#### *Industry*

The industry classification system developed for the 1990 census consisted of 235 categories for employed persons, organized in 13 major industry groups. Since 1940, the industrial classification was based on the *Standard Industrial Classification Manual* (SIC). The 1990 census classification was developed from the 1987 SIC published by the Office of Management and Budget, Executive Office of the President.

The SIC was designed primarily to classify establishments by the type of industrial activity in which they were engaged. However, census data, which were collected from households, differ in detail and nature from those obtained from establishment surveys. As a result of this difference, the census

classification systems (although defined in SIC terms) cannot reflect the full detail of all categories. There are several levels of industrial classification found in census products.

### *Occupation*

The occupational classification system developed for the 1990 census consisted of 500 specific occupational categories for employed persons arranged into 6 summary and 13 major occupational groups. This classification was developed to be consistent with the *Standard Occupational Classification (SOC) Manual: 1980*, published by the Office of Federal Statistical Policy and Standards, U.S. Department of Commerce. Tabulations with occupation as the primary characteristic present several levels of occupational detail.

Some occupation groups are related closely to certain industries. Operators of transportation equipment, farm operators and workers, and private household workers account for major portions of their respective industries of transportation, agriculture, and private households. However, the industry categories include persons in other occupations. For example, persons employed in agriculture include truck drivers and bookkeepers; persons employed in the transportation industry include mechanics, freight handlers, and payroll clerks; and persons employed in the private household industry include occupations such as chauffeur, gardener, and secretary.

### *Class of Worker*

The 1990 census obtained data on class of worker from answers to questionnaire item 30. The information on class of worker referred to the same job as a respondent's industry and occupation and categorizes persons according to the type of ownership of the employing organization. The Bureau of the Census defined class of worker categories as follows:

*Private Wage and Salary Workers* — Included persons who worked for wages, salary, commission, tips, pay-in-kind, or piece rates for a private for profit employer or a private not-for-profit, tax-exempt, or charitable organization. Self-employed persons whose business was incorporated were included with private wage and salary workers because they were paid employees of their own companies. Some tabulations presented data separately for the following subcategories: "For profit," "Not for profit," and "Own business incorporated." Employees of foreign governments, the United Nations, or other formal international organizations were classified as "Private-not-for-profit."

*Government Workers* — Included persons who were employees of any local, territorial, or Federal governmental unit, regardless of the activity of the particular agency. For some tabulations, the data were presented separately for the three levels of government.

*Self-Employed Workers* — Included persons who worked for profit or fees in their own unincorporated business, profession, or trade, or who operated a farm.

*Unpaid Family Workers* — Included persons who worked 15 hours or more without pay in a business or on a farm operated by a relative.

*Salaried/Self-Employed* — In tabulations that categorized persons as either "Salaried" or "Self-employed," the salaried category included private and government wage and salary workers. "Self-employed" included self-employed persons and unpaid family workers.

The industry category "Public administration" was limited to regular government functions such as legislative, judicial, administrative, and regulatory activities of governments. Other government organizations such as schools, hospitals, liquor stores, and bus lines were classified by industry according to the activity in which they were engaged. On the other hand, the class of worker "Government categories" included all government workers.

Occasionally respondents supplied industry, occupation, or class of worker descriptions which were not sufficiently specific for precise classification or did not report on these items at all. Some of these cases were corrected through the field editing process and during coding and tabulation operations. In the coding operation, certain types of incomplete entries were corrected using the *Alphabetical Index of Industries and Occupations*. For example, it was possible in certain situations to assign an industry code based on the occupation reported.

Following the coding operations, a computer edit first determined whether a respondent was in the universe which required an industry and occupation code. The codes for the three items (industry, occupation, and class of worker) were checked to ensure they were valid and were edited for their relation to each other. Invalid and inconsistent codes were either blanked or changed to a consistent code. If one or more of the three codes were blank after the edit, a code was assigned from a similar person based on other items such as age, sex, education, farm or nonfarm residence, and weeks worked. If all the labor force and income data also were blank, all these economic items were assigned from one other person who provided all the necessary data.

Limitations. There are no obvious limitations of the data on industry, occupation, and class of worker collected in the 1990 census.

Comparability. Comparability of industry and occupation data was affected by a number of factors, primarily the systems used to classify the questionnaire responses. Changes in the 1970 Census for Palau were needed to recognize the birth of new industries and occupations, the death of others, and the growth and decline in existing industries and occupations, as well as the desire of analysts and other users for more detail in the presentation of the data. Probably the greatest cause of incomparability is the movement of a segment of one category to a different category in a subsequent census. Unfortunately, changes in the nature of jobs and respondent terminology, and refinement of category composition, made these movements necessary.

The U.S. Bureau of the Census made minor revisions to the industry classification used in the 1990 census to reflect recent changes to the SIC. The 1990 occupational classification system essentially is the same as that for the 1980 census. However, the conversion of the census classification to the SOC in 1980 meant that the 1990 classification system was less comparable to the classifications used prior to the 1980 census.

Other factors that affected data comparability included the universe to which the data referred (in 1970, the age cutoff for labor force was changed from 14 years to 16 years), how the industry and occupation questions were worded on the questionnaire, improvements in the coding procedures, and the handling of "Not reported" cases. In 1970, an allocation process was introduced that assigned these cases to major groups. In 1990, as in 1980, the "Not reported" cases were assigned to individual categories. Therefore, the 1980 and 1990 data for individual categories included some numbers of persons who were tabulated in a "Not reported" in 1970.

Selected publications contain information on the various factors affecting comparability and are particularly useful for understanding differences in the occupation and industry information from earlier censuses (U.S. Bureau of the Census, 1968, 1972b, 1988). For citations for earlier census years, see the 1980 Census of Population report, PC80-1-C/D, *Detailed Population Characteristics* (1984).

The 1990 census introduced an additional class of worker category for "Private not-for-profit" employers. This category is a subset of the 1980 category "Employee of private employer," so no comparable data exist before 1990. Also, the 1990 census classified employees of foreign governments, the United Nations, etc., as "Private not-for-profit," rather than "Federal Government" as in 1970 and 1980. Although in theory change in comparability took place, in practice the small number of U.S. residents working for foreign governments made this change negligible.

Comparability between the statistics on industry and occupation from the 1990 census and statistics from other sources was affected by many of the factors described in the section on "Employment status." These factors primarily were geographic differences between residence and place of work, different dates of reference, and differences in counts because of dual job holding. Industry data from population censuses covered all industries and all kinds of workers, whereas, data from establishments often excluded private household workers, government workers, and the self-employed. Also, the replies from household respondents may have differed in detail and nature from those obtained from establishments.

Occupation data from the census and data from government licensing agencies, professional associations, trade unions, etc., may not be as comparable as expected. Organizational listings often include persons not in the labor force or persons devoting all or most of their time to another occupation. Similarly, the same person may be included in two or more different listings. In

addition, relatively few organizations, except for those requiring licensing, attained complete coverage of membership in a particular occupational field.

### Analysis of Occupation, Industry, and Class of Worker Data

The number of employed persons aged 16 years and over in Palau increased by about half between 1970 and 1980, and then more than doubled between 1980 and 1990 (Table 12.1). The latter increase in particular was much greater than general population growth, an indication that the expansion of employment and the creation of new jobs both occurred at a substantial pace during the 1980s.

Table 12.1. Industry for Palau: 1970, 1980, 1990

Industry	Number			Percent		
	1990	1980	1970	1990	1980	1970
Employed 16 yrs. and over...	5,599	2,745	1,842	100.0	100.0	100.0
Agriculture, fish, mining.....	446	81	309	8.0	3.0	16.8
Construction.....	861	476	270	15.4	17.3	14.7
Manufacturing.....	93	79	92	1.7	2.9	5.0
Nondurables.....	35	60	41	0.6	2.2	2.2
Durables.....	58	19	51	1.0	0.7	2.8
Transportation.....	335	164	72	6.0	6.0	3.9
Communication, other pub. util...	142	64	60	2.5	2.3	3.3
Wholesale trade.....	130	115	64	2.3	4.2	3.5
Retail trade.....	670	221	164	12.0	8.1	8.9
Finance, ins. and real estate...	119	45	16	2.1	1.6	0.9
Business and repair.....	178	62	9	3.2	2.3	0.5
Personal entertainment and recreation services.....	750	77	69	13.4	2.8	3.7
Professional and related serv....	1,045	812	384	18.7	29.6	20.8
Health.....	201	146	83	3.6	5.3	4.5
Education services.....	632	575	175	11.3	20.9	9.5
Other professional service....	212	91	126	3.8	3.3	6.8
Public administration.....	830	469	333	14.8	17.1	18.1
Primarily subsistence activity...	NA	80	-	NA	2.9	-

Sources: U.S. Bureau of the Census, 1972, Table 14; 1984, Table 23; 1992c, Table 17.

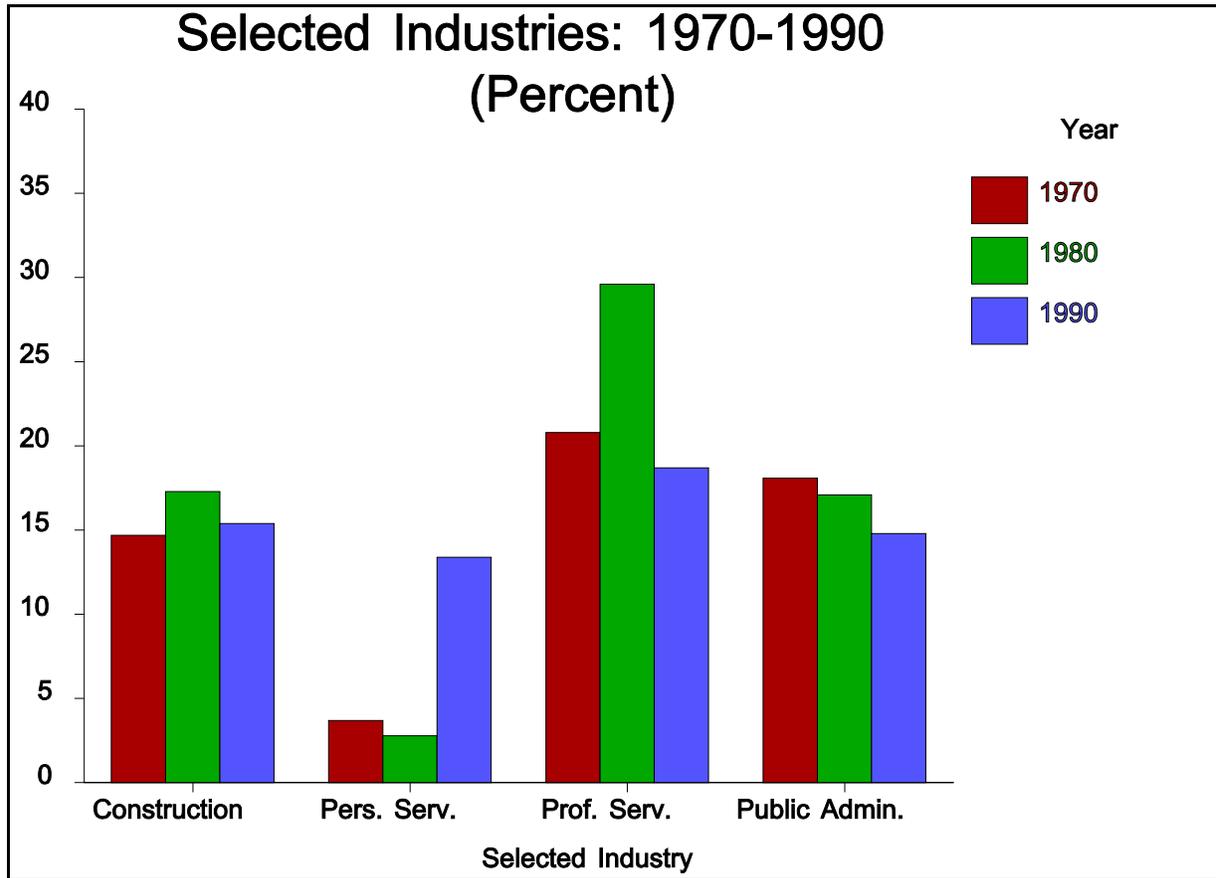


Figure 12.1. Percent in Selected Industries: 1970 to 1990

The distribution of jobs in Palau by industry also changed considerably during the past two decades. Although the combined industry of agriculture, forestry, fishing, and mining comprised 17 percent of the work force in 1970, this percentage decreased to 8 percent in 1990—though there may have been some definitional problems associated with the placement of subsistence agriculture. Manufacturing jobs decreased from 5 percent to less than 2 percent, although the number of workers in manufacturing remained about the same. The percentage in retail trade increased slightly. The biggest relative increase was in personal entertainment and recreational services—the tourism industry—which increased from less than 4 percent of the work force in 1970 to more than 13 percent in 1990.

The work force grew by 104 percent<sup>4</sup> between 1980 and 1990 (Table 12.2). In both absolute and relative terms, the greatest increases occurred in personal entertainment and recreational services, which grew by 874 percent due to the recent growth in Palau's tourist industry. The number of persons employed in agriculture, forestry, fisheries, and mining grew by nearly 451 percent. In contrast, number of individuals employed in other industrial categories increased much more slowly. Manufacturing grew by less than 18 percent during the 1980s, and wholesale trade by 13 percent. In general, the industry data show a booming economy, as the number of persons employed in Palau grew rapidly.

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<sup>4</sup>If a figure doubles between 1980 and 1990, it increases by 100 percent. So, when the number of employed persons 16 years and older increased from 2,745 to 5,599, it more than doubled — in fact, the number increased by 104 percent. Similarly, while only 77 people worked at personal entertainment and recreation services in 1980, after tourism came to Palau, the number of people working in this industry increased to 750. If the number had increased from 77 to 154, it would have doubled, or increased by 100 percent. Since it increased to 750, the increase was much more — it was a 874 percent increase.

Table 12.2. Industry: 1980 and 1990

Industry	Number		Percent Change	Percent	
	1990	1980		1990	1980
Employed 16 yrs. and over....	5,599	2,745	104.0	100.0	100.0
Agr., forest., fish, mining.....	446	81	450.6	8.0	3.0
Construction.....	861	476	80.9	15.4	17.3
Manufacturing.....	93	79	17.7	1.7	2.9
Nondurables.....	35	60	-41.7	0.6	2.2
Durables.....	58	19	205.3	1.0	0.7
Transportation.....	335	164	104.3	6.0	6.0
Communication & other pub. util...	142	64	121.9	2.5	2.3
Wholesale trade.....	130	115	13.0	2.3	4.2
Retail trade.....	670	221	203.2	12.0	8.1
Finance, ins. and real estate....	119	45	164.4	2.1	1.6
Business and repair.....	178	62	187.1	3.2	2.3
Personal entertainment and recreation services.....	750	77	874.0	13.4	2.8
Professional and related serv....	1,045	812	28.7	18.7	29.6
Health.....	201	146	37.7	3.6	5.3
Education services.....	632	575	9.9	11.3	20.9
Other professional service....	212	91	133.0	3.8	3.3
Public administration.....	830	469	77.0	14.8	17.1
Primarily subsistence activity....	...	80	...	...	2.9

Sources: U.S. Bureau of the Census, 1984, Table 23; 1992c, Table 17.

The composition of the work force by industry also changed during the 1980s. Personal entertainment and recreation services experienced the greatest relative gain, growing from less than 3 percent of the work force in 1980 to more than 13 percent. The proportion of workers employed in retail trade also increased rapidly, growing from about 8 percent to 12 percent. The greatest relative loss occurred in professional and related services, declining from nearly 30 percent to about 19 percent.

The total number of employed males 16 years and over also increased substantially between 1980 and 1990 (Table 12.3). However, although employed males comprised the majority of the work force growth during the decade, they grew at a slightly slower pace than the total work force. The number of employed males increased in the agriculture, forestry, fisheries, and mining industry by nearly 508 percent and those in personal entertainment and recreation services by slightly more than 697 percent. In contrast, male employment in manufacturing nondurable goods and education services declined during the 1980s.

Table 12.3. Industry for Males: 1980 and 1990

Industry	Number		Percent Change	Percent	
	1990	1980		1990	1980
Employed Males 16 + yrs.....	3,542	1,810	95.7	100.0	100.0
Agr., forest., fish, mining.....	401	66	507.6	11.3	3.6
Construction.....	824	413	99.5	23.3	22.8
Manufacturing.....	76	71	7.0	2.1	3.9
Nondurables.....	25	53	-52.8	0.7	2.9
Durables.....	51	18	183.3	1.4	1.0
Transportation.....	268	150	78.7	7.6	8.3
Communication & other pub. util...	121	54	124.1	3.4	3.0
Wholesale trade.....	88	61	44.3	2.5	3.4
Retail trade.....	290	79	267.1	8.2	4.4
Finance, ins. and real estate.....	48	18	166.7	1.4	1.0
Business and repair.....	160	51	213.7	4.5	2.8
Personal entertainment and recreation services.....	271	34	697.1	7.7	1.9
Professional and related serv.....	404	398	1.5	11.4	22.0
Health.....	55	44	25.0	1.6	2.4
Education services.....	253	318	-20.4	7.1	17.6
Other professional service.....	96	36	166.7	2.7	2.0
Public administration.....	591	384	53.9	16.7	21.2
Primarily subsistence activity....	...	31	...	...	1.7

Sources: U.S. Bureau of the Census, 1984, Table 23; 1992c, Table 17.

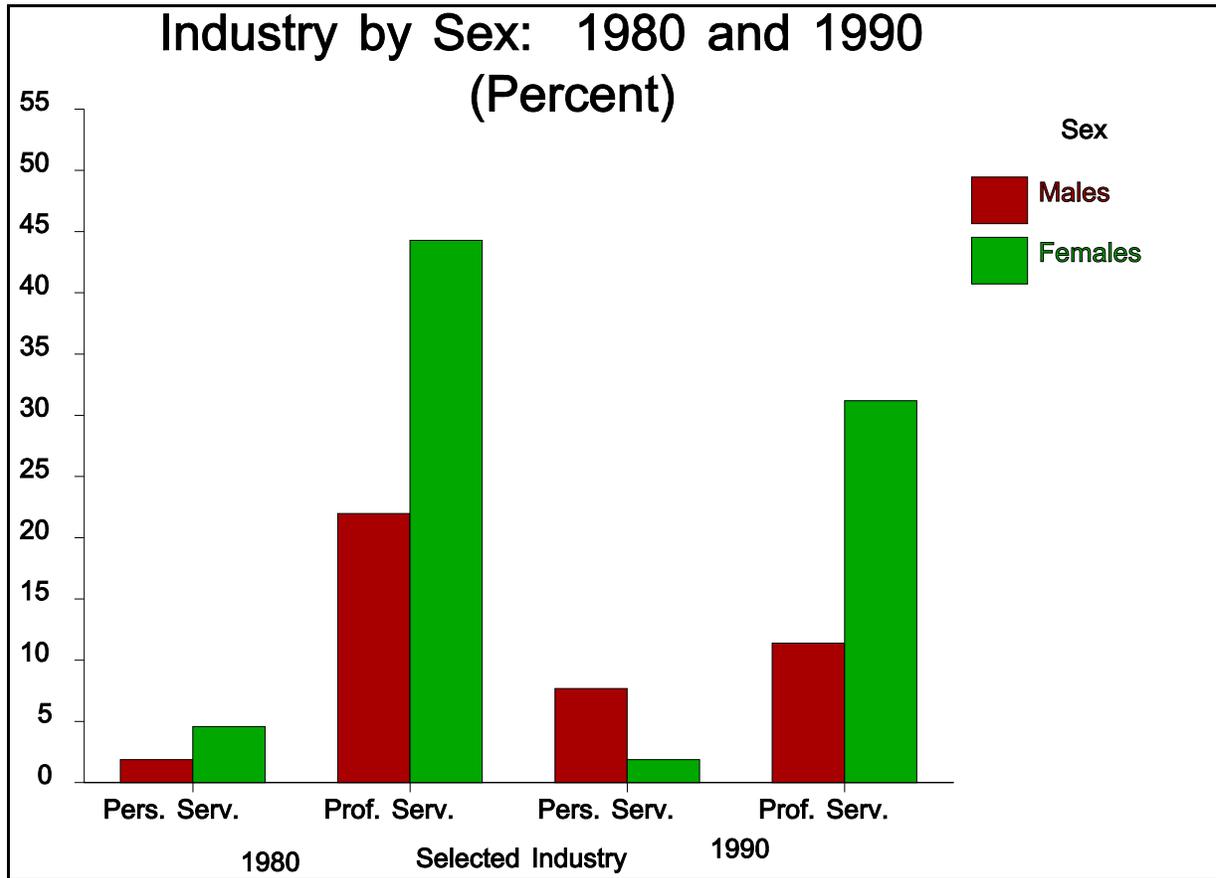


Figure 12.2. Percent in Selected Industries by Sex: 1980 and 1990

The percentage of males in professional and related service industries decreased from 22 percent of the work force in 1980 to about 11 percent in 1990, although the number of these male workers remained about the same. Most of the decline was in education, with a loss of roughly 11 percentage points, presumably as more female teachers moved into the classroom at the expense of the males. The percentage of males in public administration also decreased markedly, from 21 percent to 17 percent of the male work force—in part no doubt due to development in the private sector.

As noted above, a substantial increase in the number of males working in agricultural, forestry, fishing, and mining occurred during the 1980s. Because of this growth, this industry's share of the male work force grew from less than 4 percent in 1980 to more than 11 percent in 1990. The percentage of the male work force involved in personal entertainment and recreational services increased from less than 2 percent in 1980 to nearly 8 percent a decade later. These figures show

increased importance of the private sector in general, and tourism and other retail activities in particular.

In relative terms, the growth in the female work force in Palau during the 1980s was even more pronounced than that experienced by the males, the total in 1990 more than double that recorded in 1980 (Table 12.4). Much of this increase occurred among females in personal entertainment and recreational services, which increased by more than 1,000 percent over the decade. Other industries also showed enormous relative growth, though many started with very small numbers. For example, although the number of females working in the transportation industry increased by nearly 379 percent, from only 14 to 67 individuals. Similarly, despite a 181 percent increase during the 1980s, public administration still employed fewer than 250 females at the end of the decade.

Table 12.4. Industry for Females: 1980 and 1990

Industry	Number		Percent Change	Percent	
	1990	1980		1990	1980
Employed Females 16 + yrs....	2,057	935	120.0	100.0	100.0
Agr., forest., fish, mining.....	45	15	200.0	2.2	1.6
Construction.....	37	63	-41.3	1.8	6.7
Manufacturing.....	17	8	112.5	0.8	0.9
Nondurables.....	10	7	42.9	0.5	0.7
Durables.....	7	1	600.0	0.3	0.1
Transportation.....	67	14	378.6	3.3	1.5
Communication & other pub. util...	21	10	110.0	1.0	1.1
Wholesale trade.....	42	54	-22.2	2.0	5.8
Retail trade.....	380	142	167.6	18.5	15.2
Finance, ins. and real estate.....	71	27	163.0	3.5	2.9
Business and repair.....	18	11	63.6	0.9	1.2
Personal entertainment and recreation services.....	479	43	1,014.0	23.3	4.6
Professional and related serv.....	641	414	54.8	31.2	44.3
Health.....	146	102	43.1	7.1	10.9
Education services.....	379	257	47.5	18.4	27.5
Other professional service.....	116	55	110.9	5.6	5.9
Public administration.....	239	85	181.2	11.6	9.1
Primarily subsistence activity....	...	49	...	...	5.2

Sources: U.S. Bureau of the Census, 1984, Table 23; 1992c, Table 17.

Other industries had more substantial increases in the female work force. The number of females in educational services, for instance, increased from 257 to 379, growth of nearly 48 percent. This increase partly offset the decrease in males in education—and although greater than the increase in

the total population, shows that the school system did not expand as rapidly as other parts of the government. Educational services decreased from 28 percent of all female workers to 18 percent.

In all, females employed in professional and related services in 1990 represented only about 31 percent of the female work force, compared to the 44 percent employed by this industry in 1980. On the other hand, the percentage of females employed in personal entertainment and recreational services grew from less than 5 percent of the work force in 1980 to more than 23 percent a decade later. Growth in the percentage of females employed in other industries was more modest. The proportion working in retail trade increased by more than 3 percentage points during the 1980s, while the proportion employed in public administration grew by more than 2 percentage points.

The number of employed persons with vocational training grew from fewer than 700 in 1980 to about 1,450 in 1990, an increase of about 110 percent (Table 12.5). Despite this large increase, the percentage of all workers with vocational training stayed about the same in the two censuses, increasing by less than 1 percentage point overall.

Table 12.5. Industry by Persons Completing Vocational Training: 1980 and 1990

Industry	With Vocational Training		Percent of all Trained		Percent of this Industry	
	1990	1980	1990	1980	1990	1980
Employed 16 to 64 years old....	1,451	691	100.0	100.0	26.3	25.7
Agriculture, fish, forestry.....	167	17	11.5	2.5	39.2	23.6
Construction and mining.....	144	92	9.9	13.3	16.6	19.4
Manufacturing.....	17	17	1.2	2.5	18.7	22.1
Communications, transportation.....	102	45	7.0	6.5	21.7	20.3
Wholesale trade.....	18	17	1.2	2.5	14.5	15.0
Retail trade.....	139	25	9.6	3.6	21.3	11.7
Finance, ins. and real estate.....	30	7	2.1	1.0	25.4	15.6
Business and repair services.....	52	10	3.6	1.4	29.4	16.1
Personal entertainment, recreation..	157	7	10.8	1.0	21.1	9.3
Professional and related services...	363	333	25.0	48.2	35.1	41.2
Public administration.....	262	110	18.1	15.9	32.5	24.1
Primarily subsistence activity.....	...	11	...	1.6	...	14.9

Sources: U.S. Bureau of the Census, 1984, Table 44; 1992c, Table 86.

In 1990, more than 39 percent of all workers in agriculture, fishing, and forestry had vocational training, compared to about 24 percent in 1980. Similarly, workers in this combined industry comprised more than 11 percent of all workers in Palau with vocational training during the most

recent decennial census. The industry contributing the greatest number of workers with vocational training to the Palau work force in 1990 was professional and related services, which accounted for about 25 percent of the trained work force in 1990. Nevertheless, this industry's share of the work force with vocational training decreased, having accounted for more than 48 percent of the total in 1980. Although 41 percent of the persons employed in professional and related services received vocational training by 1980, only about 35 percent of this industry in 1990 had training.

The number of employed Palau born exceeded 3,700 in 1990, an increase of more than 56 percent from 1980 (Table 12.6). The greatest increase, both in absolute and relative terms, involved personal recreation and entertainment services, which grew by nearly 385 percent. The presence of Palau born in most other industries also grew, in many cases by more than 100 percent. The number of Palau-born workers decreased in the manufacturing of non-durable goods and construction. Both of the latter two industries experienced large influxes of immigrant workers during the 1980s—a point supported by the declining percentages of Palau-born workers found in each.

Table 12.6. Industry for Palau-born Persons: 1980 and 1990

Industry	Number		Pct. Change	Percent		Percent Palau-born	
	1990	1980		1990	1980	1990	1980
Employed Palau Born 16+ yrs..	3,711	2,372	56.5	100.0	100.0	66.3	86.4
Agr., forest., fish, mining....	127	72	76.4	3.4	3.0	28.5	88.9
Construction.....	351	378	-7.1	9.5	15.9	40.8	79.4
Manufacturing.....	60	71	-15.5	1.6	3.0	64.5	89.9
Nondurables.....	26	53	-50.9	0.7	2.2	74.3	88.3
Durables.....	34	18	88.9	0.9	0.8	58.6	94.7
Transportation.....	281	130	116.2	7.6	5.5	83.9	79.3
Communication & other pub. util.	119	61	95.1	3.2	2.6	83.8	95.3
Wholesale trade.....	111	106	4.7	3.0	4.5	85.4	92.2
Retail trade.....	459	199	130.7	12.4	8.4	68.5	90.0
Finance, ins. and real estate...	101	41	146.3	2.7	1.7	84.9	91.1
Business and repair.....	82	52	57.7	2.2	2.2	46.1	83.9
Personal entertainment and recreation services.....	344	71	384.5	9.3	3.0	45.9	92.2
Professional and related serv...	895	664	34.8	24.1	28.0	85.6	81.8
Health.....	178	140	27.1	4.8	5.9	88.6	95.9
Education services.....	538	438	22.8	14.5	18.5	85.1	76.2
Other professional service....	179	86	108.1	4.8	3.6	84.4	94.5
Public administration.....	781	452	72.8	21.0	19.1	94.1	96.4
Primarily subsistence activity..	...	75	...	...	3.2	...	93.8

Sources: U.S. Bureau of the Census, 1984, Table 28; 1992c, Table 55.

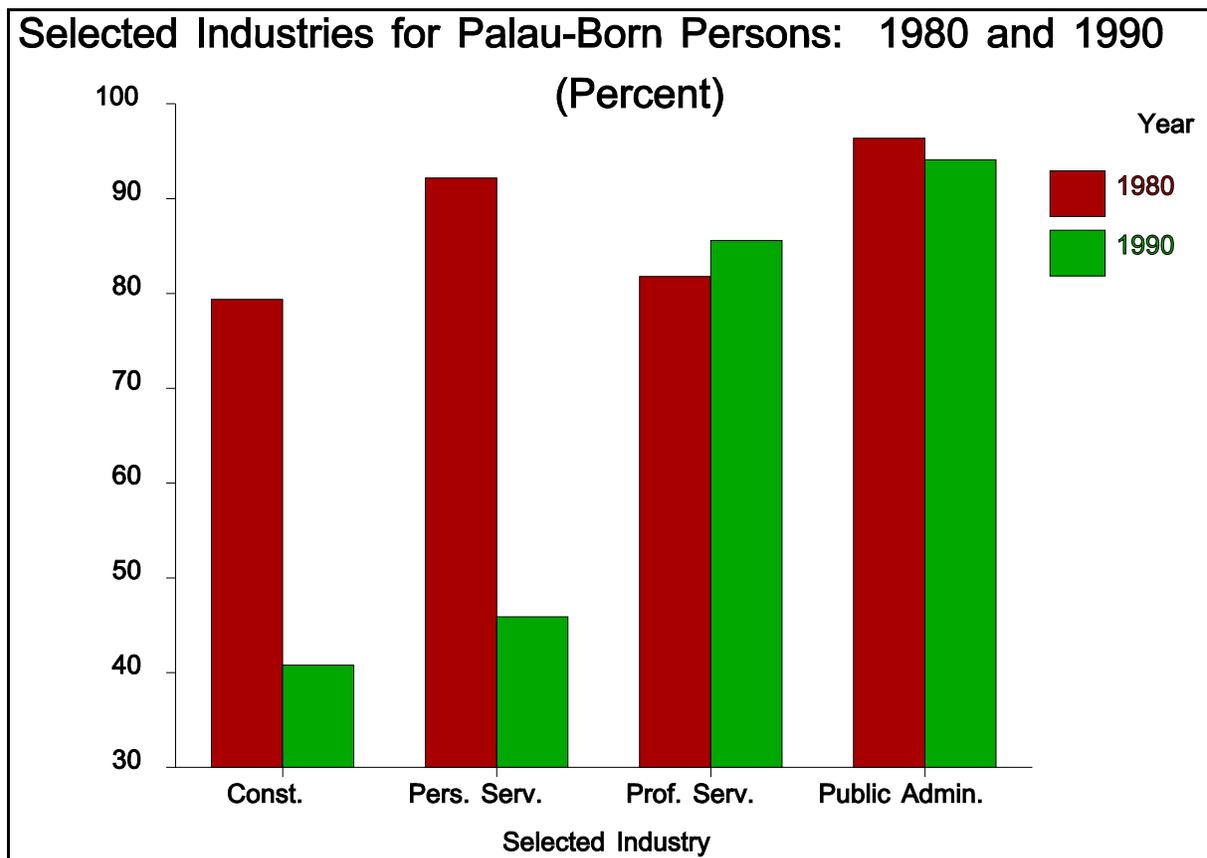


Figure 12.3. Percent of Palau Born in Selected Industries: 1980 and 1990

Due to its large increase during the 1980s, personal entertainment and recreation services contained more than 9 percent of the Palau-born workers by the end of the decade — a substantial gain from the 3 percent share in 1980. Growth in the proportions of Palau-born workers employed in other industries generally was more moderate, if they grew at all, with only retail trade experiencing an increase in excess of 2 percent. The percentage of Palau-born workers involved in other industries declined between 1980 and 1990, with a decrease in excess of 6 percentage points for construction.

The number of non-Palau-born workers in Palau increased more than 406 percent from fewer than 400 to nearly 1,900 between 1980 and 1990 (Table 12.7). The percentage changes within most of the industries similarly were enormous. For example, the number of non-Palau-born individuals working in personal entertainment and recreational services increased from 6 in 1980 to 406 in 1990. Similarly, rapid growth occurred in agriculture, forestry, fishing, and mining as well as durable goods manufacturing — although in each the growth began with very few workers in 1980 (9 and 1, respectively). The only decline for non-Palau-born workers was in education services, which fell by more than 31 percent over the decade.

Table 12.7. Industry for Non-Palau-born: 1980 and 1990

Industry	Number		Percent Change	Percent	
	1990	1980		1990	1980
Employed Non Palau Born 16+....	1,888	373	406.2	100.0	100.0
Agr., forest., fish, mining.....	319	9	3,444.4	16.9	2.4
Construction.....	510	98	420.4	27.0	26.3
Manufacturing.....	33	8	312.5	1.7	2.1
Nondurables.....	9	7	28.6	0.5	1.9
Durables.....	24	1	2,300.0	1.3	0.3
Transportation.....	54	34	58.8	2.9	9.1
Communication & other pub. util...	23	3	666.7	1.2	0.8
Wholesale trade.....	19	9	111.1	1.0	2.4
Retail trade.....	211	22	859.1	11.2	5.9
Finance, ins. and real estate....	18	4	350.0	1.0	1.1
Business and repair.....	96	10	860.0	5.1	2.7
Personal entertainment and recreation services.....	406	6	6,666.7	21.5	1.6
Professional and related serv....	150	148	1.4	7.9	39.7
Health.....	23	6	283.3	1.2	1.6
Education services.....	94	137	-31.4	5.0	36.7
Other professional service.....	33	5	560.0	1.7	1.3
Public administration.....	49	17	188.2	2.6	4.6
Primarily subsistence activity....	...	5	...	...	1.3

Sources: U.S. Bureau of the Census, 1984, Table 28; 1992c, Table 55.

The percentage of non-Palau-born workers employed in various industries also changed considerably between 1980 and 1990. As expected, the roles of the industries that grew by substantial amounts over the decade grew in importance. For instance, professional and related services increased from less than 2 percent of the non-Palau-born workers in 1980 to nearly 22 percent by 1990. The role of agriculture, forestry, fishing, and mining also increased substantially, from about 2 percent to nearly 17 percent of the non-Palau-born work force.

Certain other industries decreased in importance. The percentage of non-Palau-born workers employed in professional and related services declined from nearly 40 percent in 1980 to about 8 percent in 1990. Although some industries saw their numbers of non-Palau-born workers increase substantially over the decade, because these workers in general grew in number their relative roles often changed little. For instance, despite an increase of more than 400 construction workers between 1980 and 1990, the percentage grew by less than 1 percentage point.

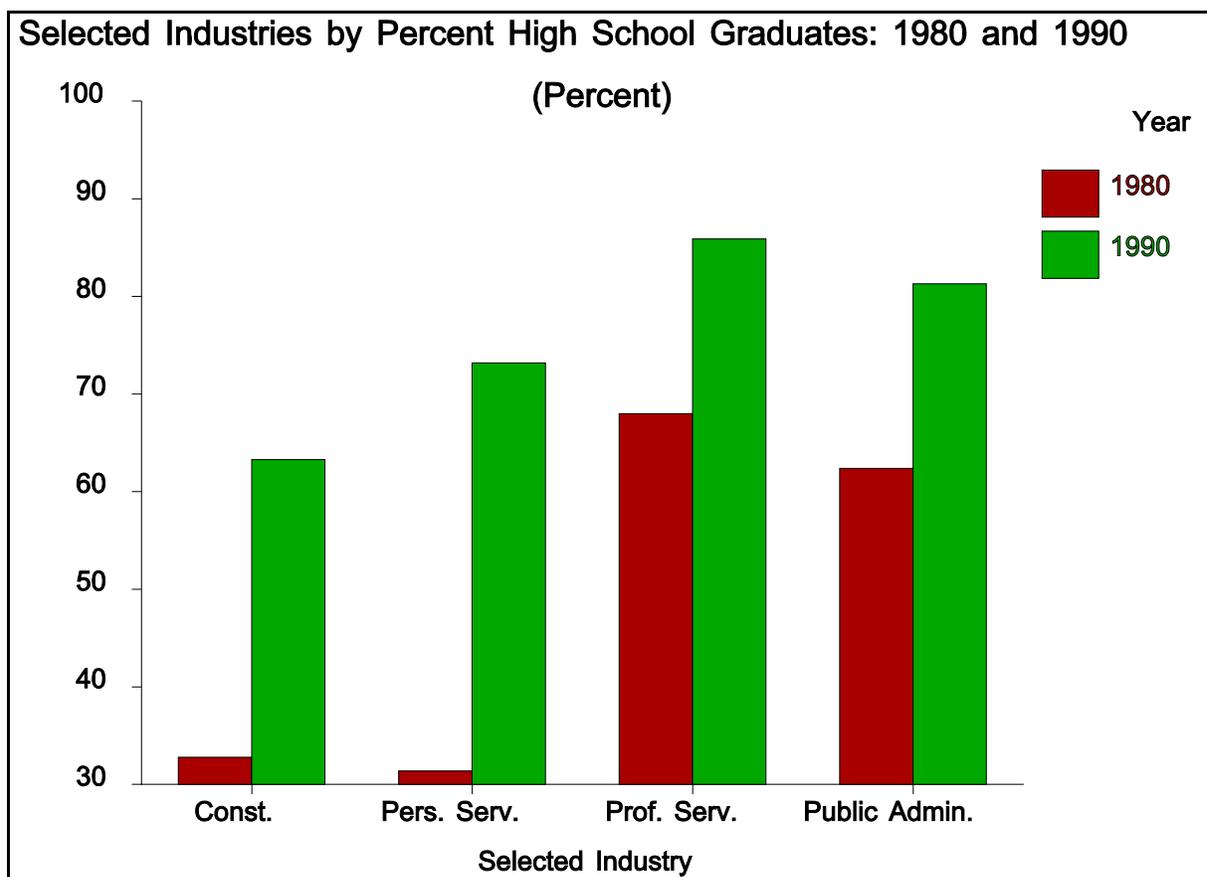


Figure 12.4. Percent High School Graduates in Selected Industries: 1980 and 1990

As noted in Chapters 9 and 11, educational attainment has come to play an increasingly important role in employment in the Republic of Palau. Indeed, the percentage of employed persons in Palau who were high school graduates exceeded 74 percent in 1990, having increased from about 53 percent a decade earlier (Table 12.8). Employed females were more likely to be high school

graduates than employed males in both 1980 and 1990, the former increasing their lead in this category to almost 80 percent.

Table 12.8. Industry by Percent High School Graduates by Sex: 1980 and 1990

Industry	1990			1980		
	Total	Male	Fmle	Total	Male	Fmle
Employed 16 yrs and over.....	74.3	71.2	79.6	52.6	50.3	56.9
Agriculture, fish, forestry.....	69.1	70.6	55.6	46.3	48.1	40.0
Construction and mining.....	63.3	62.5	81.1	32.8	32.8	32.6
Manufacturing.....	71.0	68.5	82.4	32.8	33.3	28.6
Communications and transportation...	65.8	60.9	87.5	46.1	44.9	61.5
Wholesale trade.....	66.2	62.6	73.8	66.2	69.2	62.5
Retail trade.....	73.9	75.6	72.6	35.3	54.5	22.2
Finance, ins. and real estate.....	88.2	79.0	94.4	73.5	61.5	81.0
Business and repair services.....	68.0	66.9	77.8	47.6	51.4	28.6
Personal entertainment, recreation...	73.2	73.9	72.8	31.4	30.4	32.1
Professional and related services....	85.9	89.1	83.9	68.0	66.1	69.3
Public administration.....	81.3	77.5	90.8	62.4	60.0	75.4
Primarily subsistence activity.....	...	...	...	25.0	38.1	17.1

Source: U.S. Bureau of the Census, 1984, Table 44; 1992c, Table 69.

The highest percentage of high school graduates within an industry in 1990 was the 88 percent in finance, insurance, and real estate, with 94 percent of the females employed in this industry having high school diplomas. Nearly 86 percent of those employed in professional and related services had high school educations, the percentage of males exceeding the percentage of females. In contrast, only about 63 percent of the individuals employed in construction and mining had high school educations, with the percentage of females again greater than the percentage of males. Despite the relatively low percentages of high school graduates in certain industries, all showed substantial increases in this level of education over the decade.

In 1990, the largest occupational category in Palau was managers and professionals, containing nearly 1,350 workers (Table 12.9). The largest industrial category was professional and related services with nearly 1,050 workers—making the best represented occupation by industry cell the combination of these two categories (668 workers, or 12 percent of the total).

Table 12.9. Industry by Occupation: 1990

Industry	Total	Man- gerial & Prof- ssional	Tech., sales & admin. support	Ser- vice	Farm, forest., and fishing	Prec. prod., craft, repair	Oper., fabric., and laborers
Total.....	5,599	1,346	1,208	1,107	359	942	637
Ag., forest, fish.....	433	25	24	15	308	34	27
Mining.....	13	2	-	-	-	2	9
Construction.....	861	57	54	28	3	583	136
Manufacturing.....	93	6	11	1	1	33	41
Trans., commun., util..	477	62	108	51	4	80	172
Wholesale trade.....	130	8	71	7	-	8	36
Retail trade.....	670	48	325	164	2	54	77
Finance, insurance.....	119	31	69	6	1	3	9
Business services.....	57	11	9	18	2	8	9
Repair services.....	121	8	11	-	-	72	30
Personal services.....	698	47	51	540	17	27	16
Entertain, recreation..	52	25	14	6	4	2	1
Prof. and related.....	1,045	668	165	160	7	16	29
Public admin.....	830	348	296	111	10	20	45

Source: U.S. Bureau of the Census, 1992c, Table 82.

Nearly 19 percent of all employed persons in Palau in 1990 worked in professional and related service industries (Table 12.10). About half of all managers and professionals were in this category. Other occupations had different dominant industries—such as the nearly 49 percent of service occupations found in the personal services industry and nearly 86 percent of the farming, forestry, and fishing occupations found (as one would expect) in the agriculture, forestry, and fishing industry.

Table 12.10. Occupation by Industry: 1990

Industry	Total	Man- gerial & Prof- ssional	Tech., sales & admin. support	Ser- vice	Farm, forest., and fishing	Prec. prod., craft, repair	Oper., fabric., and laborers
Total.....	5,599	1,346	1,208	1,107	359	942	637
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Ag., forest, and fish..	7.7	1.9	2.0	1.4	85.8	3.6	4.2
Mining.....	0.2	0.1	-	-	-	0.2	1.4
Construction.....	15.4	4.2	4.5	2.5	0.8	61.9	21.4
Manufacturing.....	1.7	0.4	0.9	0.1	0.3	3.5	6.4
Trans., commun., util..	8.5	4.6	8.9	4.6	1.1	8.5	27.0
Wholesale trade.....	2.3	0.6	5.9	0.6	-	0.8	5.7
Retail trade.....	12.0	3.6	26.9	14.8	0.6	5.7	12.1
Finance, insurance.....	2.1	2.3	5.7	0.5	0.3	0.3	1.4
Business services.....	1.0	0.8	0.7	1.6	0.6	0.8	1.4
Repair services.....	2.2	0.6	0.9	-	-	7.6	4.7
Personal services.....	12.5	3.5	4.2	48.8	4.7	2.9	2.5
Entertain, recreation..	0.9	1.9	1.2	0.5	1.1	0.2	0.2
Prof. and related.....	18.7	49.6	13.7	14.5	1.9	1.7	4.6
Public admin.....	14.8	25.9	24.5	10.0	2.8	2.1	7.1

Source: U.S. Bureau of the Census, 1992c, Table 82.

Industry classified by occupation provides a slightly different picture of employment in Palau (Table 12.11). Managerial and professional workers, which employed the greatest percentage of all workers in 1990, also dominated several separate industries—including finance and insurance, entertainment and recreation, professional and related services, and public administration. In other industries different occupations were prominent, in many cases as expected. In general, industries varied both in terms of the occupations represented and in terms of one occupation's prominence (e.g., construction, repair services, and professional and related services) compared to more even distributions.

Table 12.11. Industry by Occupation: 1990

Industry	Total	Man- gerial & Prof- ssional	Tech., sales & admin. support	Ser- vice	Farm, forest., and fishing	Prec. prod., craft, repair	Oper., fabric., and laborers
Total.....	100.0	24.0	21.6	19.8	6.4	16.8	11.4
Ag., forest, and fish..	100.0	5.8	5.5	3.5	71.1	7.9	6.2
Mining.....	100.0	15.4	-	-	-	15.4	69.2
Construction.....	100.0	6.6	6.3	3.3	0.3	67.7	15.8
Manufacturing.....	100.0	6.5	11.8	1.1	1.1	35.5	44.1
Trans., commun., util..	100.0	13.0	22.6	10.7	0.8	16.8	36.1
Wholesale trade.....	100.0	6.2	54.6	5.4	-	6.2	27.7
Retail trade.....	100.0	7.2	48.5	24.5	0.3	8.1	11.5
Finance, insurance.....	100.0	26.1	58.0	5.0	0.8	2.5	7.6
Business services.....	100.0	19.3	15.8	31.6	3.5	14.0	15.8
Repair services.....	100.0	6.6	9.1	-	-	59.5	24.8
Personal services.....	100.0	6.7	7.3	77.4	2.4	3.9	2.3
Entertain, recreation..	100.0	48.1	26.9	11.5	7.7	3.8	1.9
Prof. and related.....	100.0	63.9	15.8	15.3	0.7	1.5	2.8
Public admin.....	100.0	41.9	35.7	13.4	1.2	2.4	5.4

Source: U.S. Bureau of the Census, 1992c, Table 82.

The occupation distribution also changed substantially between 1980 and 1990 (Table 12.12). In relative terms, the occupations that experienced the greatest increases during the 1980s included private household services (more than 1,735 percent growth); farming, forestry, and fishing (more than 452 percent growth); and, executive administrative managerial occupations (about 239 percent growth). The increases for other occupations were modest by comparison. No occupations experienced declines in their number of employees between 1980 and 1990.

Table 12.12. Occupation: 1980 and 1990

Occupation	Number		Percent Change	Percent	
	1990	1980		1990	1980
Employed 16 yrs and over.....	5,599	2,745	104.0	100.0	100.0
Managerial and professional.....	1,346	653	106.1	24.0	23.8
Executive, administrative.....	641	189	239.2	11.4	6.9
Professional.....	705	464	51.9	12.6	16.9
Technical, sales, admin. support....	1,208	653	85.0	21.6	23.8
Technicians.....	168	123	36.6	3.0	4.5
Sales.....	402	185	117.3	7.2	6.7
Administrative support.....	638	345	84.9	11.4	12.6
Service.....	1,107	430	157.4	19.8	15.7
Private households.....	312	17	1,735.3	5.6	0.6
Protective service.....	185	91	103.3	3.3	3.3
Other service.....	610	322	89.4	10.9	11.7
Farming, forestry, and fishing.....	359	65	452.3	6.4	2.4
Precision production craft.....	942	423	122.7	16.8	15.4
Operators, fabricators, laborers....	637	441	44.4	11.4	16.1
Machine operator, assembler.....	113	43	162.8	2.0	1.6
Transportation, material move....	297	181	64.1	5.3	6.6
Handlers, equip. cleaners, labor...	227	217	4.6	4.1	7.9
Subsistence activity.....	...	80	...	...	2.9

Sources: U.S. Bureau of the Census, 1984, Table 28; 1992c, Table 16.

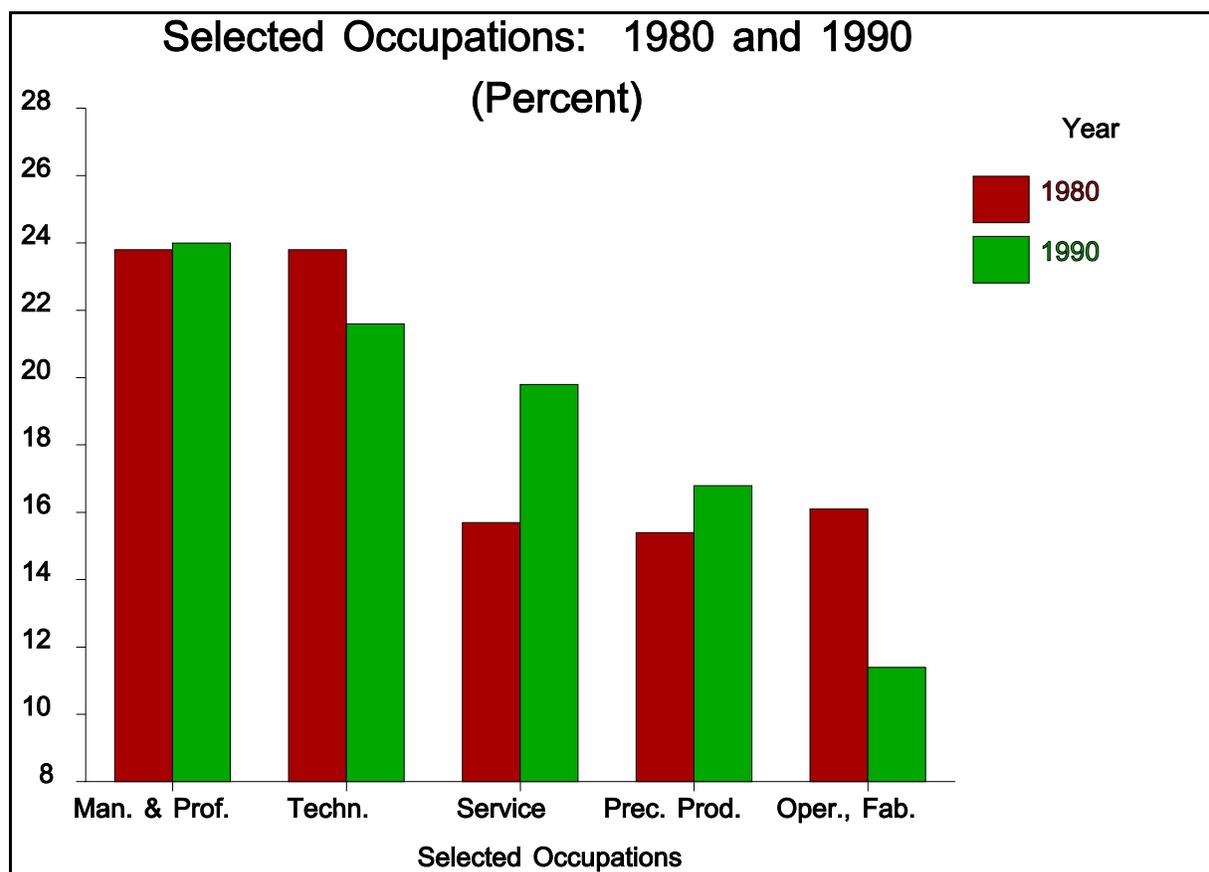


Figure 12.5. Percent in Selected Occupations: 1980 and 1990

The percentage contributions for many occupations changed between 1980 and 1990. For example, the percentage of persons working in service occupations increased from 16 percent to 20 percent, while the percentage who were operators, fabricators, and laborers decreased from 16 percent to 11 percent. Nevertheless, because of the rapid growth in all employees even substantial growth in many occupations contributed little to their relative roles in the work force. For example, although the number of workers in managerial and professional occupations more than doubled between 1980 and 1990 and experienced the greatest absolute increase of any occupation, the percentage of all workers represented by this occupation was about the same.

The number of males employed in each occupational category increased between 1980 and 1990 (Table 12.13). Most of the relative increases were substantial, often in excess of 100 percent, with service occupations in private households and farming, forestry, and fishing seeing the greatest growth. The number of males in every occupational category increased during the 1980s. Nevertheless, the relative roles of different occupations changed little over the decade, with precision production, managerial and professional, and operators, fabricators, and laborers having the greatest percentages of all male workers in 1990. The farming, forestry, and fishing occupation had the greatest growth in terms of its relative importance to the male work force, increasing from 3 percent of the total in 1980 to more than 9 percent in 1990.

Table 12.13. Occupation for Males: 1980 and 1990

Occupation	Number		Percent Change	Percent	
	1990	1980		1990	1980
Employed Males 16 yrs & over...	3,542	1,810	95.7	100.0	100.0
Managerial and professional.....	775	410	89.0	21.9	22.7
Executive, administrative.....	438	158	177.2	12.4	8.7
Professional.....	337	252	33.7	9.5	13.9
Technical, sales, admin. support....	472	278	69.8	13.3	15.4
Technicians.....	124	94	31.9	3.5	5.2
Sales.....	152	58	162.1	4.3	3.2
Administrative support.....	196	126	55.6	5.5	7.0
Service.....	463	242	91.3	13.1	13.4
Private households.....	46	5	820.0	1.3	0.3
Protective service.....	180	90	100.0	5.1	5.0
Other service.....	237	147	61.2	6.7	8.1
Farming, forestry, and fishing.....	332	55	503.6	9.4	3.0
Precision production craft.....	907	408	122.3	25.6	22.5
Operators, fabricators, laborers....	593	386	53.6	16.7	21.3
Machine operator, assembler.....	95	34	179.4	2.7	1.9
Transportation, material move....	291	180	61.7	8.2	9.9
Handlers, equip cleaners, labor...	207	172	20.3	5.8	9.5
Subsistence activity.....	...	31	...	...	1.7

Sources: U.S. Bureau of the Census, 1984, Table 28; 1992c, Table 16.

The number of females in Palau employed by occupation increased between 1980 and 1990 except for handlers and laborers (Table 12.14). The greatest increases over the decade involved service occupations in private households (2117 percent increase<sup>5</sup>), and executive and administrative managerial and professional occupations (555 percent). As with changes in the number of female workers employed in various industries, many of the largest relative changes in female occupations mask very small absolute growth, such as transportation (growing from 1 to 6 employees) and protective service (growing from 1 to 5 employees). The number of females employed as operators, fabricators, and laborers declined between 1980 and 1990.

<sup>5</sup>Once again, because only 12 people were working at service jobs in private households (private housekeepers) in 1980, when the 1990 Census counted 266 persons, the increase was more than 2000 percent. If the number went from 12 to 24, it would have been only a 100 percent increase, from 12 to 120 would be a 1000 percent increase.

Table 12.14. Occupation for Females: 1980 and 1990

Occupation	Number		Percent Change	Percent	
	1990	1980		1990	1980
Employed Females 16 yrs & over..	2,057	935	120.0	100.0	100.0
Managerial and professional.....	571	243	135.0	27.8	26.0
Executive, administrative.....	203	31	554.8	9.9	3.3
Professional.....	368	212	73.6	17.9	22.7
Technical, sales, admin. support....	736	375	96.3	35.8	40.1
Technicians.....	44	29	51.7	2.1	3.1
Sales.....	250	127	96.9	12.2	13.6
Administrative support.....	442	219	101.8	21.5	23.4
Service.....	644	188	242.6	31.3	20.1
Private households.....	266	12	2,116.7	12.9	1.3
Protective service.....	5	1	400.0	0.2	0.1
Other service.....	373	175	113.1	18.1	18.7
Farming, forestry, and fishing.....	27	10	170.0	1.3	1.1
Precision production craft.....	35	15	133.3	1.7	1.6
Operators, fabricators, laborers....	44	55	-20.0	2.1	5.9
Machine operator, assembler.....	18	9	100.0	0.9	1.0
Transportation, material move....	6	1	500.0	0.3	0.1
Handlers, equip cleaners, labor...	20	45	-55.6	1.0	4.8
Subsistence activity.....	...	49	...	...	5.2

Sources: U.S. Bureau of the Census, 1984, Table 28; 1992c, Table 16.

The percentages of employed females in various occupations changed more between 1980 and 1990 than did the percentages for males or all employed persons. The greatest increase in terms of percentage points occurred among females employed in the service occupations, which grew from about 20 percent of all employed females in 1980 to more than 31 percent in 1990. The proportion of employed females in managerial and professional occupations, another well-represented category, also grew over the decade, approaching 28 percent of the total. In contrast, the percentage of females working in technical, sales, and administrative support occupations declined from more than 40 percent to about 36 percent.

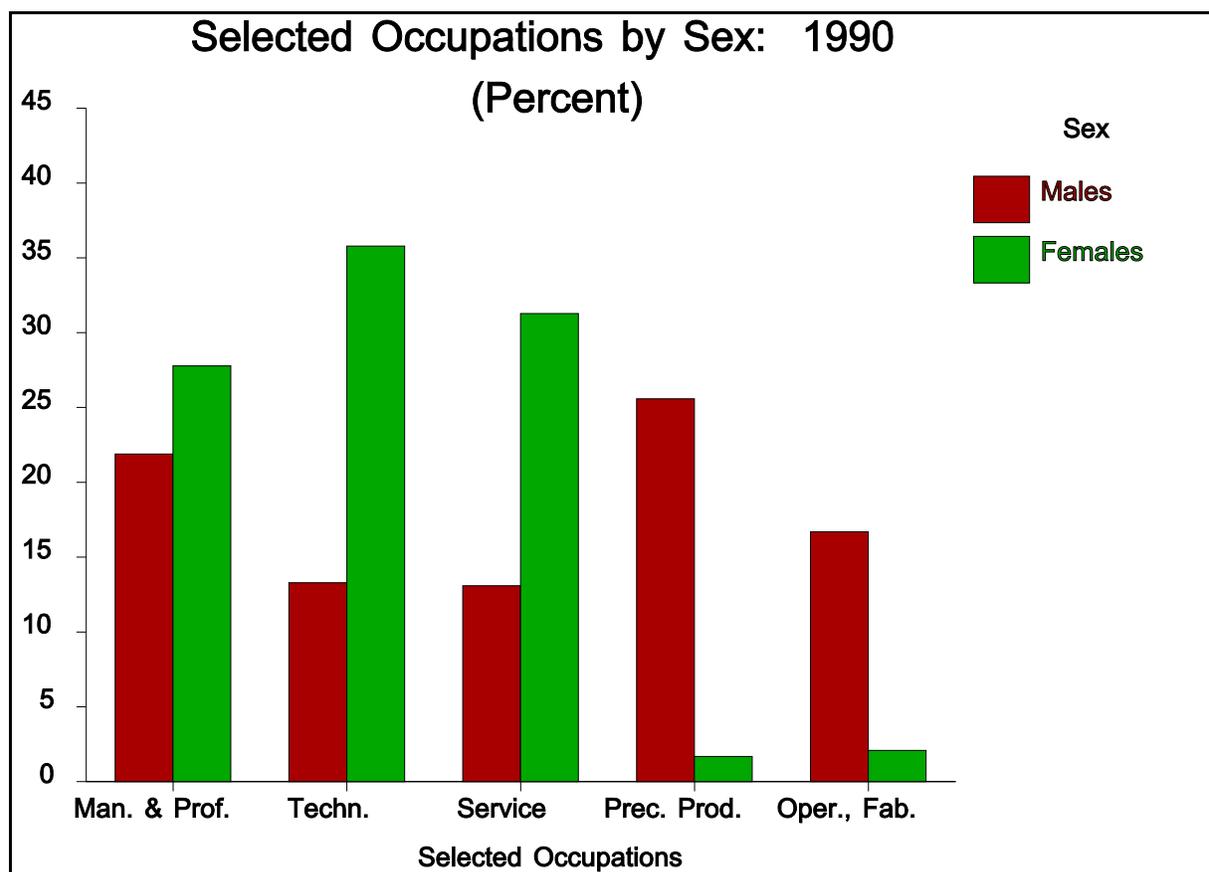


Figure 12.6. Percent in Selected Occupations by Sex: 1990

Compared to all employed persons in Palau, those working as managers and professionals were under-represented in the young age categories — as expected, since it usually takes time to work up to managerial ranks (Table 12.15). Young persons were relatively over-represented in technical, sales, and administrative occupations and among those working in farming, forestry, and fishing. Older persons were more heavily represented in the managerial and professional occupations.

Table 12.15. Age by Occupation: 1990

Occupation	Total	Prct	16-24 years	25-34 years	35-44 years	45-64 years	65 yrs & over
Employed 16 + yrs.....	5,599	100.0	14.9	33.9	29.5	20.1	1.6
Managerial and professional....	1,346	100.0	5.5	25.3	38.4	28.3	2.5
Technical, sales, and admin....	1,208	100.0	21.7	39.1	24.3	13.4	1.5
Service.....	1,107	100.0	18.2	38.4	24.8	17.3	1.3
Farm., forestry, and fishing...	359	100.0	20.3	38.7	25.9	13.1	1.9
Precision prod, craft, repair..	942	100.0	7.7	31.4	35.6	24.8	0.4
Oper., fabricators, laborers...	637	100.0	23.5	35.3	21.8	17.3	2.0

Source: U.S. Bureau of the Census, 1992c, Table 43.

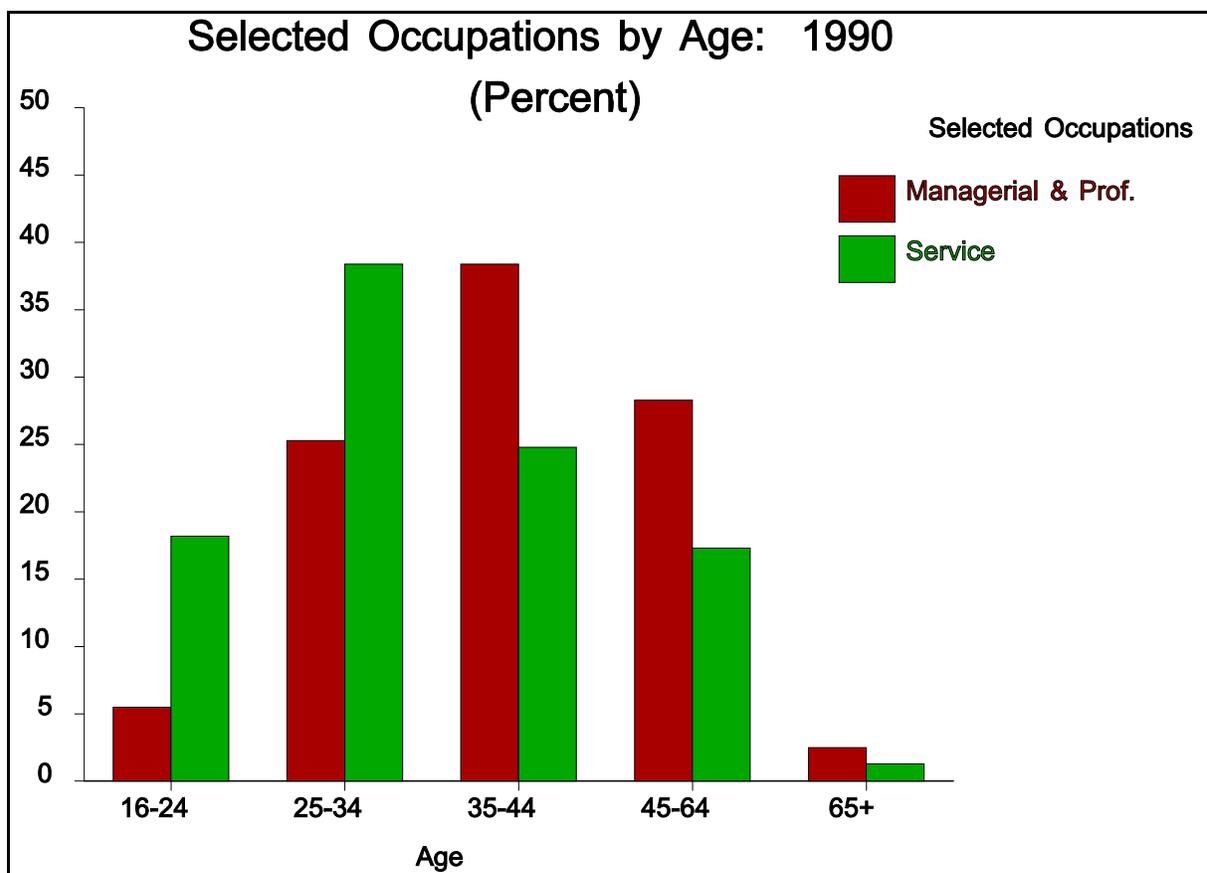


Figure 12.7. Percent in Selected Occupations by Age: 1990

The greatest percentages of persons aged 16 to 25 years in Palau worked in service and technical, sales, and administrative occupations in 1990 (Table 12.16). The highest percentages of individuals

in the three oldest age groups were in the managerial and professional occupation categories. The representation of other occupations in Palau varied substantially among the age groups.

Table 12.16. Occupation by Age: 1990

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Occupation	Total	Prcnt	16-24 years	25-34 years	35-44 years	45-64 years	65 yrs & over
Employed 16 + yrs.....	5,599	...	834	1,898	1,652	1,126	89
Percent.....	...	100.0	100.0	100.0	100.0	100.0	100.0
Managerial and professional....	1,346	24.0	8.9	18.0	31.3	33.8	37.1
Technical, sales, and admin....	1,208	21.6	31.4	24.9	17.8	14.4	20.2
Service.....	1,107	19.8	24.2	22.4	16.6	17.1	15.7
Farm., forestry, and fishing...	359	6.4	8.8	7.3	5.6	4.2	7.9
Precision prod, craft, repair..	942	16.8	8.8	15.6	20.3	20.8	4.5
Oper., fabricators, laborers...	637	11.4	18.0	11.9	8.4	9.8	14.6

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Source: U.S. Bureau of the Census, 1992c, Table 43.

As with industry (see tables 12.6 and 12.7 above), occupation varied between individuals born in Palau and those born elsewhere. For workers born in Palau, some occupations showed greater growth than others—with the greatest relative increases between 1980 and 1990 occurring in farming, forestry, and fishing (nearly 112 percent increase) and managerial and professional (nearly 94 percent increase) occupations. Only the combined occupation of handlers, equipment cleaners, and laborers showed a decrease among Palau-born workers over the decade.

Table 12.17. Occupation for Palau-born: 1980 and 1990

Occupation	Number		Pct. Change	Percent		Percent Palau-born	
	1990	1980		1990	1980	1990	1980
Employed Palau-born 16 + yrs..	3,711	2,372	56.5	100.0	100.0	66.3	86.4
Managerial and professional.....	1,078	557	93.5	29.0	23.5	80.1	85.3
Executive, administrative.....	518	163	217.8	14.0	6.9	80.8	86.2
Professional.....	560	394	42.1	15.1	16.6	79.4	84.9
Technical, sales, admin. support...	1,052	608	73.0	28.3	25.6	87.1	93.1
Technicians.....	137	115	19.1	3.7	4.8	81.5	93.5
Sales.....	351	175	100.6	9.5	7.4	87.3	94.6
Administrative support.....	564	318	77.4	15.2	13.4	88.4	92.2
Service.....	628	395	59.0	16.9	16.7	56.7	91.9
Private households.....	15	14	7.1	0.4	0.6	4.8	82.4
Protective service.....	169	87	94.3	4.6	3.7	91.4	95.6
Other service.....	444	294	51.0	12.0	12.4	72.8	91.3
Farming, forestry, and fishing....	125	59	111.9	3.4	2.5	34.8	90.8
Precision production craft.....	328	288	13.9	8.8	12.1	34.8	68.1
Operators, fabricators, laborers...	500	390	28.2	13.5	16.4	78.5	88.4
Machine operator, assembler.....	58	31	87.1	1.6	1.3	51.3	72.1
Transportation, material move....	269	154	74.7	7.2	6.5	90.6	85.1
Handlers, equip cleaners, labor..	173	205	-15.6	4.7	8.6	76.2	94.5
Subsistence activity.....	...	75	...	...	3.2	...	93.8

Sources: U.S. Bureau of the Census, 1984, Table 28; 1992c, Table 54.

As a consequence of the various changes seen between 1980 and 1990, the proportions of certain occupations filled by Palau-born individuals changed — although the percentage for all Palau-born workers declined over the decade. The greatest declines in Palau-born workers involved farming, forestry, and fishing occupations, declining by 56 percentage points, and service occupations, which declined by more than 35 percentage points. The proportional decreases of Palau-born workers in other major occupation categories during the 1980s were less than those in these two occupations.

Given the magnitude of the shifts, the percentage of all Palau-born persons employed in various occupations experienced comparatively small changes during the 1980s. The greatest growth occurred in the managerial and professional and technical, sales, and administrative support occupations, the former increasing by nearly 6 percentage points and the latter by nearly 3 percentage points. These increases occurred at the expense of other occupations which saw declines in the percentages of all Palau-born workers, including precision production crafts and operators, fabricators, and laborers.

All occupations in Palau had increases in non-Palau-born workers between 1980 and 1990 (Table 12.18). The largest relative increases occurred in farming, forestry, and fishing, which increased by 3,800 percent over the decade, and service occupations, which grew by nearly 1,269 percent. Part of the latter group — non-Palau born working in service occupations within private households — increased by 9,800 percent during the 1980s. Although relative increases among non-Palau born employed in occupations other than these three were modest by comparison, none of the major occupation categories grew by less than 168 percent over the past decade. That stated, many of the increases in occupations were relatively small in absolute terms. The growth in private household services occupation, for instance, represented an increase from 3 persons in 1980 to 297 in 1990.

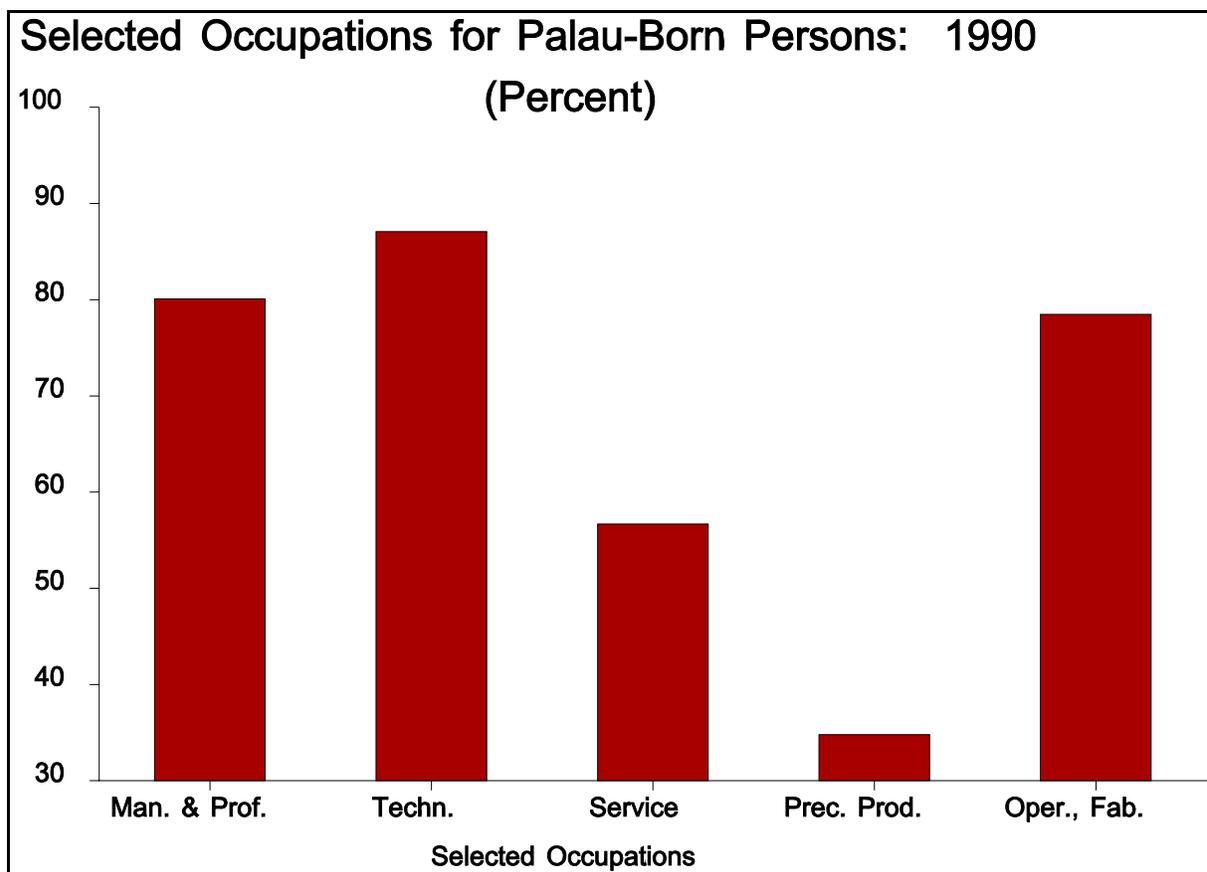
Table 12.18. Occupation for Non-Palau Born: 1980 and 1990

Occupation	Number		Percent Change	Percent	
	1990	1980		1990	1980
Employed Non-Palau-born 16 +....	1,888	373	406.2	100.0	100.0
Managerial and professional.....	268	96	179.2	14.2	25.7
Executive, administrative.....	123	26	373.1	6.5	7.0
Professional.....	145	70	107.1	7.7	18.8
Technical, sales, admin. support....	156	45	246.7	8.3	12.1
Technicians.....	31	8	287.5	1.6	2.1
Sales.....	51	10	410.0	2.7	2.7
Administrative support.....	74	27	174.1	3.9	7.2
Service.....	479	35	1,268.6	25.4	9.4
Private households.....	297	3	9,800.0	15.7	0.8
Protective service.....	16	4	300.0	0.8	1.1
Other service.....	166	28	492.9	8.8	7.5
Farming, forestry, and fishing.....	234	6	3,800.0	12.4	1.6
Precision production craft.....	614	135	354.8	32.5	36.2
Operators, fabricators, laborers....	137	51	168.6	7.3	13.7
Machine operator, assembler.....	55	12	358.3	2.9	3.2
Transportation, material move....	28	27	3.7	1.5	7.2
Handlers, equip cleaners, labor...	54	12	350.0	2.9	3.2
Subsistence activity.....	...	5	...	...	1.3

Sources: U.S. Bureau of the Census, 1984, Table 28; 1992c, Table 54.

The percentage of non-Palau born in service occupations increased from slightly more than 9 percent in 1980 to more than 25 percent in 1990. Most of this increase was among persons working in private households. The percentage of non-Palau-born workers employed in farming, forestry, and fishing occupations increased from less than 2 percent to more than 12 percent of all such workers. On the other hand, the proportion of workers born outside Palau employed as managers and professionals decreased from nearly 26 percent to about 14 percent, while those in technical, sales,

and administrative support occupations declined from about 12 percent to roughly 8 percent of the total.



**Figure 54.8.** Percent for Selected Occupations for Palau-Born Persons: 1990

Occupation by state in Palau varied considerably in 1990 (Table 12.19). With their numerical advantage, the patterns in Koror and Airai states greatly influenced the patterns for all Palau, with managerial and professional occupations the most frequently found in the former and technical, sales, and administrative occupations more prevalent in the latter. Other states showed greater variation in proportional distributions of major occupations, the magnitude of the fluctuations often an artifact of the small numbers of total workers involved.

Table 12.19. Occupation by State: 1990

State	Total	Per- cent	Mana- gerial, Profes- sional	Tech., Sales, Admin. Supp.	Ser- vice	Farm., Fish., For- est	Precis. Prod., Craft, Repair	Oper., Fabric, La- borers
Total.....	5,599	100.0	24.0	21.6	19.8	6.4	16.8	11.4
Aimeliik.....	115	100.0	23.5	12.2	19.1	17.4	14.8	13.0
Airai.....	463	100.0	19.2	20.3	17.5	9.7	18.8	14.5
Angaur.....	37	100.0	43.2	18.9	13.5	2.7	16.2	5.4
Hatohobei.....	12	100.0	-	-	16.7	83.3	-	-
Kayangel.....	18	100.0	50.0	11.1	22.2	-	-	16.7
Koror.....	4,533	100.0	23.3	22.7	20.3	5.5	17.2	11.1
Melekeok.....	57	100.0	33.3	5.3	14.0	19.3	22.8	5.3
Ngaraard.....	46	100.0	43.5	17.4	19.6	2.2	4.3	13.0
Ngardmau.....	29	100.0	27.6	6.9	24.1	24.1	3.4	13.8
Ngaremlengui...	19	100.0	10.5	5.3	26.3	10.5	21.1	26.3
Ngatpang.....	57	100.0	22.8	28.1	7.0	15.8	10.5	15.8
Ngchesar.....	43	100.0	51.2	18.6	9.3	-	9.3	11.6
Ngerchelongs...	38	100.0	52.6	7.9	13.2	2.6	15.8	7.9
Ngiwal.....	33	100.0	48.5	12.1	24.2	3.0	6.1	6.1
Peleliu.....	83	100.0	33.7	18.1	22.9	2.4	14.5	8.4
Sonsorol.....	16	100.0	18.8	12.5	12.5	6.3	18.8	31.3

Source: U.S. Bureau of the Census, 1992c, Table 16.

Changes in the proportions of different classes of workers over time reflected the major changes experienced by Palau's economy (Table 12.20). Although statistics from the five census years are not strictly comparable due both to changing definitions and to the unavailability of certain types of data for certain years, major trends nevertheless emerge. In 1967, most workers were doing unpaid family labor — probably the last vestiges of a traditional Micronesian economy in Palau. A second phase occurred for 1970, 1973, and 1980, when government workers comprised the majority of workers in Palau. The heavy representation of government employees has been a characteristic of many economies in Micronesia over the past several decades. The final phase, which appears to be beginning in 1990, sees an increase in the proportion of private wage and salary employees at the expense of government employment, the two categories essentially changing places between 1980 and 1990. An increase in work outside the government, as represented in the surge of private wage and salary workers in the last census, is obviously crucial to the development of a healthy, self-sufficient economy in the Republic of Palau.

Table 12.20. Class of Worker: 1967, 1970, 1973, 1980, and 1990

Class of Worker	1990	1980	1973	1970	1967
Total 16 yrs and over.....	5,599	2,745	2,258	1,842	7,010
Percent.....	100.0	100.0	100.0	100.0	100.0
Private wage and salary.....	59.3	37.0	38.4	41.0	6.8
Government worker.....	37.8	56.9	52.2	50.1	8.8
Self-employed.....	2.7	3.1	8.9	7.2	12.5
Unpaid family.....	0.2	-	0.1	1.7	71.9
Subsistence.....	...	2.9	NA	NA	NA
Not reported.....	...	...	-	NA	NA

Sources: U.S. Bureau of the Census, 1972, Table 15; 1984, Table 23; 1992c, Table 16; School of Public Health, n.d., Table 7; Office of Census Coordinator, TTPI, 1975, Table 20.

Note: Data for 1973 are for individuals aged 15 years and over.

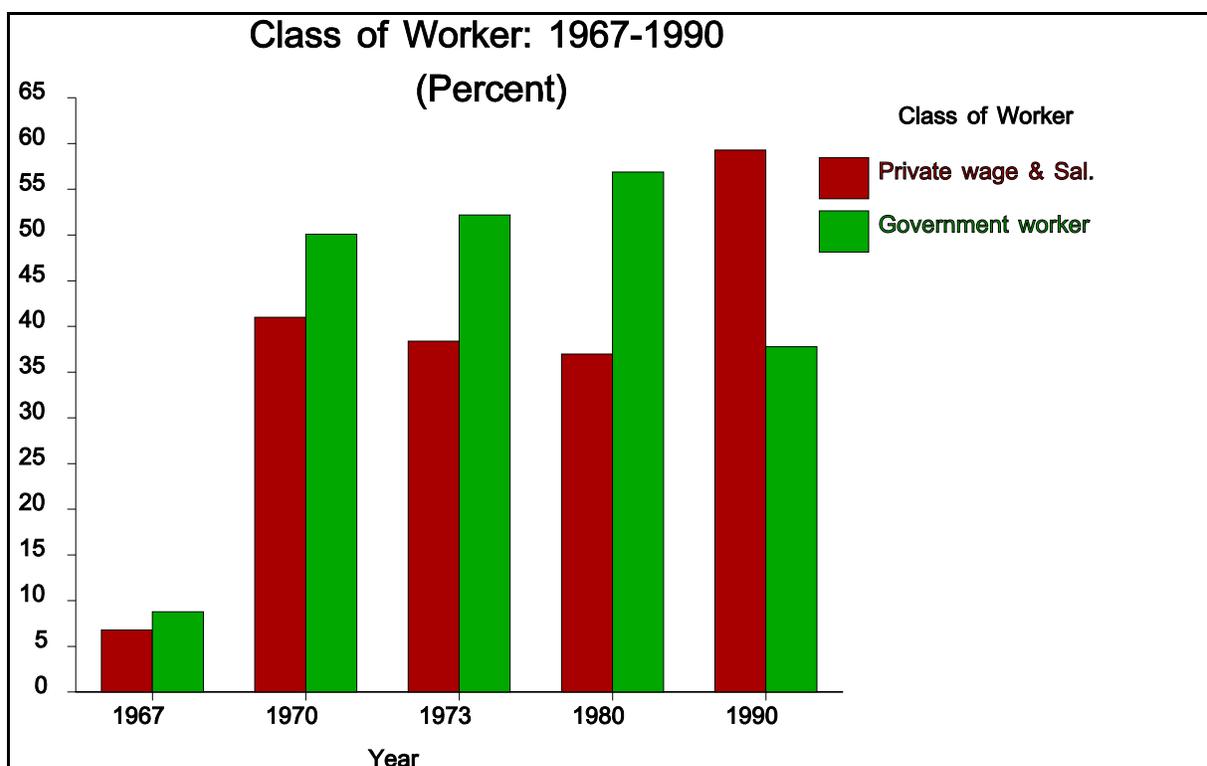


Figure 12.9. Percent Private Wage and Salary and Government Workers: 1967 to 1990

Similar changes in class of worker over time documented above for all workers in Palau also occurred for male and female workers (Table 12.21), although we examine only private wage and salary versus government workers. The 1967 data by sex were similar to the total, but with females represented in much lower proportions for both private and government occupations than males. Both sexes saw a surge in wage employment in the 1970s, particularly in government jobs — with the proportions of workers from each sex employed in the private and public sector varying between 1970 and 1980. Finally, both male and female workers employed in the private sector exceeded the number employed in government jobs in 1990.

Table 12.21. Class of Worker by Sex: 1967, 1970, 1973, 1980, and 1990

Class of Worker	1990	1980	1973	1970	1967
Males 16 yrs and over....	3,542	1,810	1,619	1,324	3,428
Percent.....	100.0	100.0	100.0	100.0	100.0
Private wage and salary.....	60.0	35.0	36.8	43.0	9.9
Government worker.....	36.6	59.1	52.4	48.5	14.4
Females 16 yrs and over..	2,057	935	639	518	3,582
Percent.....	100.0	100.0	100.0	100.0	100.0
Private wage and salary.....	58.2	41.0	42.4	36.1	3.9
Government worker.....	39.9	52.7	51.6	54.1	3.4

Sources: U.S. Bureau of the Census, 1972, Table 15; 1984, Table 23; 1992c, Table 16; School of Public Health, n.d., Table 7; Office of Census Coordinator, TTPI, 1975, Table 20.

Note: Data for 1973 are for individuals aged 15 years and over.

The majority of private sector workers in 1990 fell within the ages of 25 to 44 years (Table 12.22). Employees of the federal government tended to fall within the former age group, while persons employed by local or territorial governments tended to fall within the latter. The proportional distributions of self-employed and unpaid family workers in Palau differed from the distributions of private and public sector workers — in part due to the relatively small numbers of workers involved.

Table 12.22. Class of Worker by Age: 1990

Class of Worker	Total	Prcnt	16-24 years	25-34 years	35-44 years	45-64 years	65 yrs & over
Employed 16 + yrs.....	5,599	100.0	14.9	33.9	29.5	20.1	1.6
Private wage and salary:							
For profit.....	3,198	100.0	20.7	38.6	25.9	13.7	1.1
Not-for-profit.....	125	100.0	10.4	31.2	29.6	26.4	2.4
Local or territorial gvmnt...	1,982	100.0	7.3	27.0	35.7	28.1	1.9
Federal government.....	133	100.0	9.0	39.8	25.6	24.1	1.5
Self-employed.....	151	100.0	1.3	18.5	29.1	42.4	8.6
Unpaid family.....	10	100.0	-	60.0	20.0	20.0	-

Source: U.S. Bureau of the Census, 1992c, Table 43.

Different classes of workers dominated the age groups of workers in Palau in 1990 (Table 12.23). More than 79 percent of the employed persons aged 16 to 24 years worked in private for-profit wage and salary employment compared to 57 percent of the total employed population. As age increased, the proportion of an age group employed in this class of employment declined, only slightly exceeding 38 percent for workers aged 65 years and over. The percentage of local and territorial government workers by age group, in contrast, generally increased with age (as did the proportion of self-employed workers per age group). By the 45 to 64 year age group, the proportion of workers for local or territorial governments exceeded any other category.

Table 12.23. Class of Worker by Age: 1990

Class of Worker	Total	Prcnt	16-24 years	25-34 years	35-44 years	45-64 years	65 yrs & over
Employed 16 + yrs.....	5,599	...	834	1,898	1,652	1,126	89
Percent.....	...	100.0	100.0	100.0	100.0	100.0	100.0
Private wage and salary:							
For profit.....	3,198	57.1	79.4	65.1	50.1	39.0	38.2
Not-for-profit.....	125	2.2	1.6	2.1	2.2	2.9	3.4
Local or territorial gvmnt...	1,982	35.4	17.4	28.2	42.9	49.4	41.6
Federal government.....	133	2.4	1.4	2.8	2.1	2.8	2.2
Self-employed.....	151	2.7	0.2	1.5	2.7	5.7	14.6
Unpaid family.....	10	0.2	-	0.3	0.1	0.2	-

Source: U.S. Bureau of the Census, 1992c, Table 43.

Employment among different classes of workers varied among the states in Palau in 1990 (Table 12.24), in part according to the availability of different types of employment. Both Airai and Koror had larger percentages of private sector for-profit workers in 1990 than all of Palau, in part because

most of these types of jobs were available in these two most Westernized states. Koror State also contained a higher percentage of federal employees, largely due to its role as the center of the republic's government. More rural states, in contrast, had work forces composed of proportionally large amounts of local and territorial government employees, with these occupational classes in most cases representing the majority of the resident labor forces.

Table 12.24. Class of Worker by State: 1990

State	Total	Per- cent	Private Wage and Salary		Government		Self- Em- ployed	Unpaid Family
			Profit	Not	Local., Terr.	Fed- eral		
Employed....	5,599	100.0	57.1	2.2	35.4	2.4	2.7	0.2
Aimeliik.....	115	100.0	23.5	12.2	52.2	3.5	8.7	-
Airai.....	463	100.0	62.0	1.7	32.0	2.4	1.9	-
Angaur.....	37	100.0	10.8	2.7	81.1	5.4	-	-
Hatohobei.....	12	100.0	75.0	8.3	16.7	-	-	-
Kayangel.....	18	100.0	-	-	100.0	-	-	-
Koror.....	4,533	100.0	60.9	2.1	32.2	2.5	2.2	0.1
Melekeok.....	57	100.0	28.1	-	47.4	-	21.1	3.5
Ngaraard.....	46	100.0	23.9	10.9	56.5	2.2	4.3	2.2
Ngardmau.....	29	100.0	20.7	-	75.9	3.4	-	-
Ngaremlengui....	19	100.0	68.4	-	26.3	-	5.3	-
Ngatpang.....	57	100.0	19.3	-	56.1	-	24.6	-
Ngchesar.....	43	100.0	25.6	-	74.4	-	-	-
Ngerchelongs....	38	100.0	13.2	-	84.2	-	2.6	-
Ngiwal.....	33	100.0	15.2	-	78.8	-	6.1	-
Peleliu.....	83	100.0	34.9	1.2	59.0	2.4	-	2.4
Sonsorol.....	16	100.0	18.8	-	81.3	-	-	-

Source: U.S. Bureau of the Census, 1992c, Table 16.

## Conclusions

Census data on occupation, industry, and class of worker provide valuable insights on the economy of Palau, in some cases adding new perspectives on the republic's economy and in other cases supporting ideas developed elsewhere in this monograph. Most occupations and industries gained workers during the 1980s—primarily a consequence of the generally rapid growth in the total work force of Palau over the decade, with much of this growth attributable to immigrants. Particularly rapid growth occurred in personal entertainment and recreation services, primarily due to the rapidly expanding tourism industry. Differences existed between occupational patterns based on sex (employment of males, for instance, increasing more rapidly than that of females in construction) and place of birth (non-Palau-born occupation in agriculture, forestry, and fishing growing markedly compared to Palau-born individuals). Increased formal training was evident in most occupations,

whether measured by vocational training or by high school education. Finally, Palau began to shift from majority public sector employment to majority private sector.

Perhaps the most valuable message concerns the changes in the Palau's economy. Many of these changes are not particularly positive, as the economy fights the transition from a traditional base to a market foundation. Palau's work force grew substantially during the 1980s. However, much of this growth was due to the addition of labor from other countries, primarily Asia. Moreover, the economy still does not produce much — rather it provides services, with the greatest growth occurring among the tourism industry. But in contrast to many economies in Micronesia, during the 1980s the economy of Palau shifted from a majority of reliance on government employment to employment in the private sector. The latter shift was not dramatic, and government employment remains a major player in the overall economic system. Nevertheless, in achieving economic independence by supporting itself, Palau's public-private sector shift in economic emphasis will be well-received.

## CHAPTER 13. INCOME AND POVERTY

The finances of individuals and households provide important information for planning and policy decisions. Two categories of financial data are particularly important: *income* — information on the amount of money acquired from various sources for some fixed period of time (usually one year) — and *poverty*, focusing on individuals and families whose income falls below a specified level. Earnings of Palau's residents give one means of determining the health of the republic's economy. Moreover, this information helps to define the part of the population that the government will have to assist — a crucial concern in the fiscal and organizational planning of an administrative body.

This chapter looks at the distribution of individual and household income in Palau. In addition to describing income and poverty data, we also explore the relationships between sex, education, occupation and income levels, both for income recorded in the 1990 census and as income has changed over time. These data provide insights on Palau's economy as it continues a transition begun several decades ago from an emphasis on subsistence to an emphasis on wage labor and markets.

### Definitions

#### *INCOME IN 1989*

The 1990 census obtained data on income in 1989 from answers to questionnaire items 32 and 33. The census requested information on money income received in the calendar year 1989 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 and 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; remittance income; and all other income. The category *Earnings* denotes 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, and so on.

The census excluded receipts from the following sources 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; and gifts and lump-sum inheritances, insurance payments, and other types of lump-sum receipts.

### *Income Type in 1989*

The 1990 census reported eight types of income, as follows:

- Wage or salary income — included total money earnings received for work performed as an employee during calendar year 1989. This income type 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.
- Self-employment income — included several types of income. Nonfarm self-employment income comprised net money income (gross receipts minus expenses) from one's own business, professional enterprise, or partnership. Gross receipts included the value of all goods sold and services rendered. Expenses included costs of goods purchased, rent, heat, light, power, depreciation charges, wages and salaries paid, business taxes (not personal income taxes), etc. Farm self-employment income included 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 included 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 included cost of feed, fertilizer, seed, and other farming supplies, cash wages paid to farm hands, depreciation charges, cash rent, interest on farm mortgages, farm building repairs, farm taxes (not personal income taxes), etc. The census did not include the value of fuel, food, or other farm products used for family living as part of net income.
- Interest, dividend, or net rental income — included 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.
- Social Security income — included Social Security pensions and survivors' benefits; 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. This income type did not include Medicare reimbursements.
- Public assistance income — included supplementary security income payments made by federal or state welfare agencies to low income persons aged 65 years old or over, blind, or disabled; aid to families with dependent children; and general assistance. This type of income excluded separate payments received for hospital or other medical care (vendor payments).
- Retirement or disability income — included retirement pensions and survivor benefits from a former employer, labor union, or federal, state, county, or other governmental agency; disability

income from sources such as worker's compensation, a particular company or union federal, state, or local government, and the U.S. military; periodic receipts from annuities and insurance; and regular income from IRA and KEOGH plans.

- Remittance income — included money received from relatives who were civilians living outside the household or in the military outside the household.
- All other income — included 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.* Household income included 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 comprised only one person, average household income usually was less than average family income.

*Income of Families and Persons.* In compiling statistics on family income, the 1990 census summed and treated as a single amount the incomes of all members 15 years old and over in each family. However, for persons 15 years old and over the total amounts of their own incomes were used. Although the income statistics covered the calendar year 1989, the characteristics of persons and the composition of families referred to the time of enumeration (for Palau, April 1990). Thus, the income of the family did 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. 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 were 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 census computed medians for persons based on persons with income. The census computed median income values for all households, families, and persons on the basis of more detailed income intervals than shown in most published tabulations. Median income calculations employed linear interpolation.

*Mean Income.* Mean income represents the total income of a particular statistical universe divided by the number of units in that universe. Thus, mean household income is total household income divided 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. The census bureau derived per capita income by dividing the total income of a particular group by the total population in that group.

Be careful in interpreting mean income values for small subgroups of the population. Because extreme values in a distribution strongly influence the mean, this measure of central tendency is especially susceptible to the effects of misreporting and processing errors. The median is not affected by extreme values and thus serves as a better measure of central tendency than the mean when the population base is small. Its inherent problems notwithstanding, the mean 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 obtain summary measures for areas and groups other than those shown in census tabulations.

Limitations. Since questionnaire entries for income frequently are based on memory and not on records, many persons forget minor or irregular sources of income, leading them to underreport. Underreporting tends to be more pronounced for income sources that are not derived from earnings, such as Social Security, public assistance, interest, dividends, and net rental income.

Errors in reporting income also occur due to the misunderstanding of certain census questions such as reporting gross rather than net dollar amounts for the question on net self-employment income, yielding an overstatement of this item. Another common error is the reporting of identical dollar amounts in two of the eight types of income items where a respondent with only one source of income assumed that the second amount should be entered to represent total income.

The Census Bureau used extensive computer editing procedures to process data from the 1990 census, both to reduce 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 that 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 self-employment income. Also, if a respondent reported total income only, Census Bureau personnel generally assigned the amount to one type of income according to responses to the work experience and class-of-worker questions. Another 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.

In income tabulations for households and families, the lowest income group (for example, less than \$2,500) includes units classified as having no 1989 income. Many of these persons lived on income in kind, savings, or gifts, were newly created families, or represented families in which the sole breadwinner recently had died or left the household. Many of the households and families who reported no income in fact probably had some money income which was not recorded in the census. In Palau, some of these families did subsistence activities only.

The income data presented in the 1990 census tabulations covered money income only. Thus, for example, the large portion of income to farm families in the form of free housing and goods produced and consumed on the farm rather than in money influenced the income of farm and nonfarm residents. Of course, some nonfarm residents also received nonmoney income in the form of business expense accounts, use of business transportation and facilities, or partial compensation by business for medical and educational expenses. Many low income families also received nonmoney in kind income from public welfare programs. Finally, when comparing income data for 1989 with earlier years it is important to remember that an increase or decrease in money income does not necessarily represent a comparable change in real income unless adjusted for inflation.

**Comparability.** Although the income data collected in the 1980 and 1970 censuses were similar to the 1990 census data, there were variations in the detail of the questions. For example, in comparison to the information presented above for the 1990 census under income type, the 1980 census required each person to report the following seven types of income: 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; and income from all other sources.

In addition, between the 1980 and 1990 censuses minor differences existed in the processing of income data. In both censuses, Census Bureau personnel designated all persons with missing values in one or more of the detailed types of income items and total income as allocated. Each missing entry was imputed either as a "no" or as a dollar amount. If a respondent reported total income but did not answer one or more type of income fields, census personnel generally assigned total income to one of the income types according to the socioeconomic characteristics of the income recipient, designating this person as unallocated. In 1980 and 1990, all nonrespondents with income not reported (whether householders or other persons) were assigned the reported income of persons with similar characteristics.

In the last two decennial censuses, the Census Bureau used different methods of deriving aggregate income from individual amounts. In 1980, census personnel coded income amounts less than \$100,000 in tens of dollars, and amounts of \$100,000 or more 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 1990, census personnel keyed income amounts less than \$999,999 in dollars, while treating amounts of \$999,999 or more as \$999,999 and losses of \$9,999 or more as minus \$9,999 in all of the computer derivations of aggregate income.

If a person reported a dollar amount in wage or salary, net nonfarm self-employment income, or net farm self-employment income, the 1990 census considered this person as unallocated only if it imputed no further dollar amounts for any additional missing entries.

### *POVERTY STATUS IN 1989*

The 1990 census obtained data on poverty status from answers to the same questions as the income data, questionnaire items 32 and 33. Poverty statistics presented in census publications employed a definition of poverty devised originally by the Social Security Administration in 1964 and subsequently modified by federal interagency committees in 1969 and 1980. Office of Management and Budget Directive 14 has designated this modified definition as the standard to be used by federal agencies for statistical purposes. At the core of the definition was the 1961 economy food plan, the least costly of four nutritionally adequate food plans designed by the U.S. Department of Agriculture. The 1955 survey of food consumption by the Department of Agriculture determined that families of three or more persons spend approximately one-third of their income on food. Hence, the poverty level for these families was set at three times the cost of the economy food plan. For smaller families and persons living alone, the cost of the economy food plan was multiplied by factors that were slightly higher to compensate for the relatively larger fixed expenses for these smaller households.

The income cutoffs used by the Census Bureau to determine the poverty status of families and unrelated individuals included a set of 48 thresholds arranged in a two-dimensional matrix consisting of family size (from one person to nine or more persons) cross-classified by presence and number of family members under 18 years old (from no children present to eight or more children present). The Census Bureau further differentiated unrelated individuals and two-person families by age of the householder (under 65 years old and 65 years old and over). The total income of each family or unrelated individual in the sample was tested against the appropriate poverty threshold to determine the poverty status of that family or unrelated individual. If the total income was less than the corresponding cutoff, the census classified that family or unrelated individual as "below the poverty level." The number of persons below the poverty level was the sum of the number of persons in families with incomes below the poverty level and the number of unrelated individuals with incomes below the poverty level.

The poverty thresholds are revised annually to allow for changes in the cost of living, as reflected in the Consumer Price Index. The average poverty threshold for a family of four persons was \$12,674 in 1989 (Table 13.1). The Census Bureau applied poverty thresholds on a national basis for the U.S. and did not make adjustments to account for regional, state, or local variations in the cost of living.

Table 13.1. Poverty Thresholds in 1989 by Size of Family and Number of Related Children Under 18 Years, in tens of dollars: 1990

Family Size	Weighted Unit +	Related children under 18 years							
		of holds	None	One	Two	Three	Four	Five	average three-Six
One.....	\$631								
< 65 yrs.	645	\$645							
65+ yrs..	595	595							
Two.....	808								
< 65 yrs.	834	830	\$855						
65 + yrs.	750	750	851						
Three.....	989	970	998	\$999					
Four.....	1,268	1,279	1,300	1,258	\$1,262				
Five.....	1,499	1,542	1,565	1,517	1,480	\$1,457			
Six.....	1,692	1,774	1,781	1,744	1,709	1,657	\$1,626		
Seven.....	1,916	2,041	2,054	2,010	1,979	1,922	1,856	\$1,783	
Eight.....	2,133	2,283	2,303	2,262	2,225	2,174	2,108	2,040	\$2,023
Nine +....	2,548	2,746	2,760	2,723	2,692	2,641	2,572	2,509	2,493
									\$2,397

Source: U.S. Bureau of the Census, 1992c, Table A.

Notes: One person includes the category "Unrelated individuals".

Ages listed under size of family unit refer to age of householder.

*Persons for Whom Poverty Status is Determined.* Poverty status was determined for all individuals except institutionalized persons, persons in military group quarters and in college dormitories, and unrelated individuals aged less than 15 years. These groups also were excluded from the denominator when calculating poverty rates.

*Specified Poverty Levels.* Since the poverty levels currently in use by the federal government did not meet all the needs of data users, the census bureau presented some of the data for alternate levels. These specified poverty levels were obtained by multiplying the income cutoffs at the poverty level by the appropriate factor. For example, the average income cutoff at 125 percent of poverty level was \$15,843 (\$12,674 x 1.25) in 1989 for a family of four persons.

*Weighted Average Thresholds at the Poverty Level.* The average thresholds shown in the first column of Table 13.1 are weighted by the presence and number of children. For example, the weighted average threshold for a given family size is obtained by multiplying the threshold for each

presence and number of children category within the given family size by the number of families in that category. These products then are aggregated across the entire range of presence and number of children categories, and the aggregate is divided by the total number of families in the group to yield the weighted average threshold at the poverty level for that family size.

Since the basic thresholds used to determine the poverty status of families and unrelated individuals are applied to all families and unrelated individuals, the weighted average poverty thresholds are derived using all families and unrelated individuals rather than just those classified as below the poverty level. To obtain the weighted poverty thresholds for families and unrelated individuals below alternate poverty levels, the weighted thresholds shown in Table 13.1 may be multiplied directly by the appropriate factor. The weighted average thresholds presented in the table are based on the *March 1990 Current Population Survey*. However, these thresholds would not differ significantly from those based on the 1990 census.

*Income Deficit.* Income deficit represents the difference between the total income of families and unrelated individuals below the poverty level and their respective poverty thresholds. In computing the income deficit, families reporting a net income loss were assigned zero dollars and for such cases the deficit was equal to the poverty threshold.

This measure provided an estimate of the amount which would be required to raise the incomes of all poor families and unrelated individuals to their respective poverty thresholds. The income deficit thus is a measure of the degree of impoverishment of a family or unrelated individual. However, one must use caution when comparing the average deficits of families with different characteristics. Apparent differences in average income deficits may, to some extent, be a function of differences in family size.

*Mean Income Deficit.* This measure represents the amount obtained by dividing the total income deficit of a group below the poverty level by the number of families (or unrelated individuals) in that group.

Limitations. The most fundamental limitation in the census data on poverty status for 1989 concerns the lack of adjustment for regional, state, or local variation. This limitation is particularly problematic for a place like Palau, which is a separate country with cultural and income characteristics that differ considerably with those of the U.S. Criteria for poverty status defined for the U.S. thus have limited value for the Republic of Palau.

Comparability. The poverty definition used in the 1980 and 1990 censuses differed slightly from the one used in the 1970 census. The Census Bureau made three technical modifications to the definition used in the 1970 census. These changes resulted in a minimal increase in the number of poor at the national level:

- The Census Bureau eliminated separate thresholds for families with a female householder with no husband present and all other families. For the 1980 and 1990 censuses, the Bureau applied the weighted average of the poverty thresholds for these two types of families to all families, regardless of the sex of the householder.
- The Census Bureau no longer used poverty thresholds for farm families and farm unrelated individuals that were lower than the thresholds applied to nonfarm families and unrelated individuals. The farm thresholds were 85 percent of the corresponding levels for nonfarm families in the 1970 census. In 1980 and 1990, the bureau used the same thresholds for all families and unrelated individuals, regardless of residence.
- The Census Bureau extended thresholds by size of family from seven or more persons in 1970 to nine or more persons in 1980 and 1990.

The population covered in the poverty statistics derived from the 1980 and 1990 censuses was essentially the same as in the 1970 census. The only difference was that in 1980 and 1990 the Census Bureau excluded unrelated individuals under 15 years old from the poverty universe; in 1970, the bureau excluded only individuals under 14 years old.

## Analysis of Income and Poverty Data

### *Household and Family Income*

The median household income in 1989 for the 2,885 households in Palau was \$8,882 (Table 13.2). In other words, half the households in Palau in 1989 had incomes above \$8,882 and half below. The mean income for these same households was \$13,395 — higher than the median because some of the households had comparatively high incomes, increasing both the total income and the mean calculated from it.

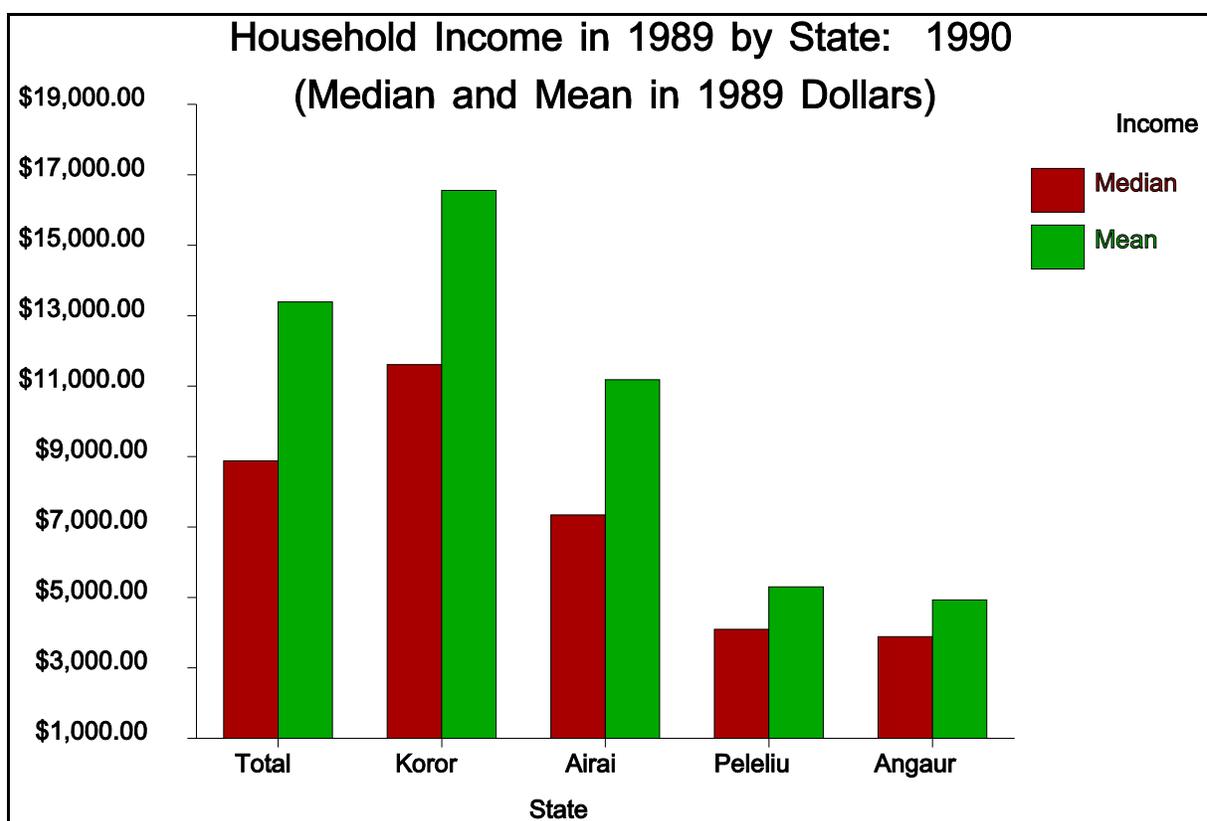


Figure 13.1. Median and Mean Household Income for Selected States: 1990

Table 13.2. Household and Family Income in 1989 by State: 1990

State	Households			Families		
	Total	Median Income	Mean Income	Total	Median Income	Mean Income
Total.....	2,885	\$8,882	\$13,395	2,445	\$9,380	\$13,351
Aimeliik.....	81	6,384	7,931	68	6,600	8,635
Airai.....	256	7,350	11,189	214	8,269	11,620
Angaur.....	50	3,889	4,933	40	5,000	5,597
Hatohebei.....	4	8,750	8,073	3	11,250	10,123
Kayangel.....	31	3,542	4,428	24	4,583	5,199
Koror.....	1,912	11,618	16,564	1,600	12,224	16,453
Melekeok.....	49	4,479	6,081	47	4,432	6,158
Ngaraard.....	71	4,485	5,923	58	5,000	6,636
Ngardmau.....	29	4,750	6,375	27	5,313	6,780
Ngaremlengui.....	55	4,271	7,414	53	4,432	7,699
Ngatpang.....	14	5,000	4,888	13	3,750	4,111
Ngchesar.....	61	4,188	5,030	54	4,474	5,310
Ngerchelongs.....	78	3,500	4,741	69	3,952	5,078
Ngiwal.....	52	3,269	4,833	46	3,654	5,219
Peleliu.....	131	4,102	5,305	119	4,234	5,287
Sonsorol.....	11	3,125	4,576	10	2,500	4,274

Source: U.S Bureau of the Census, 1992c, Table 19.

Note: Medians and means in 1989 dollars.

The median family income in 1989 for the 2,445 families in Palau was nearly \$9,400, somewhat higher than the household median. As was the case for households, the mean income for families was greater than the median income for families. However, this mean was slightly less than the mean household income for the Republic of Palau.

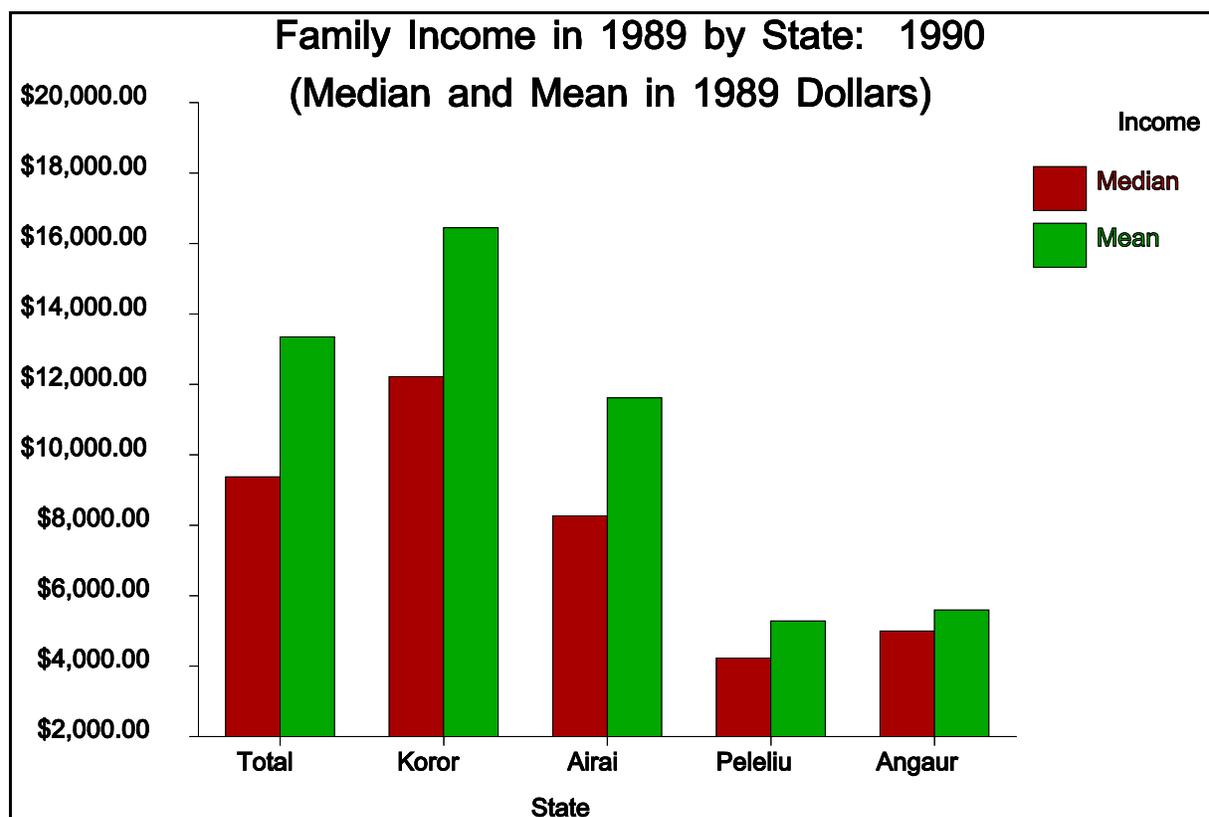


Figure 13.2. Median and Mean Family Income for Selected States: 1990

Household incomes varied geographically throughout Palau. Koror State had the highest median household income in 1989, exceeding \$11,600. This is not surprising, as Koror State had the best and highest paying jobs. Koror's mean household income also was the highest of all states in Palau. In contrast, rural states tended to report low 1989 household incomes. Sonsorol, Ngiwal, Ngerchelong, and Kayangel states all had median household incomes less than \$3,550 and mean household incomes below \$4,850. Lack of access to better paying jobs, in Koror State helps account for the comparatively low income levels in more rural states. Small numbers of cases affect these data. The small number of households present helps to explain the relatively high income levels for Hatohobei State, the incomes possibly also augmented by transfers and remittances from Koror.

Family incomes similarly varied considerably between states in Palau. Koror State once again had the highest income, with the median family income exceeding \$12,200 and the mean nearly \$16,500. On the other hand, the median family incomes for Ngiwal, Ngatpang, and Sonsorol states all fell at or below \$3,750 for 1989; the mean family incomes for the latter two states were less than

\$4,275 in the same year. Many family income discrepancies in Palau come from differential access to jobs in the more Westernized, urban Koror and Airai states.

Married couple families had higher median incomes in 1989 than families with female householders with no spouse present (Table 13.3). This discrepancy is not surprising: families headed by females without spouses usually have fewer workers earning money. Moreover, females alone often have more trouble finding both full-time jobs and better jobs. The median income for married couple families in 1989 was nearly \$10,400, almost \$4,000 more than the median income for households with female householders with no husband present.

Table 13.3. Median Family Income in 1989 by Type of Family and State: 1990

State	Families			Median Income		
	Total	Married- couple	Female Hhlder, no husb. present	Total	Married- couple	Female Hhlder, no husb. present
Total.....	2,445	1,847	442	\$9,380	\$10,394	\$6,587
Aimeliik.....	68	55	10	6,600	6,726	5,000
Airai.....	214	172	32	8,269	9,474	4,792
Angaur.....	40	24	12	5,000	7,000	1,750
Hatohobei.....	3	1	2	11,250	13,750	8,750
Kayangel.....	24	17	7	4,583	5,625	3,125
Koror.....	1,600	1,216	285	12,224	13,385	9,243
Melekeok.....	47	34	10	4,432	4,688	2,500
Ngaraard.....	58	48	8	5,000	5,556	3,750
Ngardmau.....	27	21	4	5,313	5,417	5,000
Ngaremlengui.....	53	41	7	4,432	4,844	2,125
Ngatpang.....	13	9	2	3,750	5,417	5,000
Ngchesar.....	54	40	10	4,474	5,000	2,500
Ngerchelong.....	69	50	15	3,952	4,615	2,125
Ngiwal.....	46	37	6	3,654	3,438	5,000
Peleliu.....	119	78	29	4,234	4,674	2,813
Sonsorol.....	10	4	3	2,500	7,500	1,750

Source: U.S. Bureau of the Census, 1992c, Tables 7 and 19.

Note: Median incomes in 1989 dollars.

Family incomes varied considerably between the states in Palau, both for married couples and for female householders with no husband present. Hatohobei had the highest household income for married couple families, but only one household was in this category.<sup>6</sup> In the states with sufficient families present, Koror once again had families with the highest mean incomes — for total, married couple, and "female householder with no husband" families. Rural-urban differences account for

<sup>6</sup>The U.S. Bureau of the Census used a method called "blank and impute" to disguise possible breaches of confidentiality. In the case here, since only one married couple had household income, the information for the original family was deleted and information for a similar family elsewhere in Palau was substituted. As a result, the income level is a guess and not the income for a single household on Hatohobei. The Census Bureau made similar changes in other cases where an individual or family could be identified to ensure the confidentiality of all individuals, families, and households.

most differences in family income between states, regardless of the type of family. Median family incomes for families having female householders with no husband present were particularly low in many rural states, showing the financial constraints placed upon such families in much of Palau.

Of the more than 10,500 persons aged 15 years and over in Palau in 1990, more than 6,700 had money income in 1989 (Table 13.4). The median personal income of the average adult in 1989 was \$3,930, with the median for males exceeding the median for females by about \$650. The mean income of persons with income in 1989 was nearly \$6,000; the mean income for males was about \$2,000 more than the mean for females.

Table 13.4. Income of Persons in 1989 Aged 15 Years and Older, by Sex: 1990

Income	Number			Percent		
	Total	Male	Fmle	Total	Male	Fmle
Total.....	10,546	5,773	4,773	...	...	...
Total with income.....	6,739	4,201	2,538	100.0	100.0	100.0
\$1 to \$999 or loss.....	850	464	386	12.6	11.0	15.2
\$1,000 to \$2,499.....	1,446	800	646	21.5	19.0	25.5
\$2,500 to \$4,999.....	1,877	1,278	599	27.9	30.4	23.6
\$5,000 to \$7,499.....	1,100	697	403	16.3	16.6	15.9
\$7,500 to \$9,999.....	588	342	246	8.7	8.1	9.7
\$10,000 to \$14,999.....	478	294	184	7.1	7.0	7.2
\$15,000 to \$19,999.....	179	133	46	2.7	3.2	1.8
\$20,000 to \$24,999.....	68	61	7	1.0	1.5	0.3
\$25,000 to \$34,999.....	73	62	11	1.1	1.5	0.4
\$35,000 or more.....	80	70	10	1.2	1.7	0.4
Median.....	\$3,930	\$4,136	\$3,489	...	...	...
Mean.....	\$5,959	\$6,717	\$4,704	...	...	...

Source: U.S. Bureau of the Census, 1992c, Table 89.

Note: Medians and means in 1989 dollars.

About 6 percent of persons aged 15 years or more in Palau made \$15,000 or more in 1989, including roughly 8 percent of the males but fewer than 3 percent of the females. On the other hand, slightly more than 15 percent of the females made less than \$1,000 in 1989 compared to only 11 percent of the males. In fact, relatively more females than males were in the low income groups, and relatively more males were in the upper income groups (\$15,000 or more in 1989).

Table 13.5 shows the change in income between 1979 and 1989, both in contemporary dollars and in 1989 dollars (adjusting the 1979 figures to account for inflation). The data show a decrease in personal income between 1979 and 1989. The adjusted median annual income for individuals in

Palau aged 15 years and more decreased from nearly \$4,800 in 1979 to about \$3,900 in 1989, a decline of 18 percent. Mean income also fell between 1979 and 1989, from more than \$6,300 to slightly less than \$6,000. Regardless of the measure, the average person had less buying power in 1989 than in 1979 — nearly 18 percent less in the case of the median.

Table 13.5. Income of Persons in 1979 and 1989 Aged 15 Years and Older, by Sex: 1980 and 1990

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Income	In Contemporary Dollars			In 1989 Dollars		
	Total	Male	Female	Total	Male	Female
1990:						
Median.....	\$3,930	\$4,136	\$3,489	\$3,930	\$4,136	\$3,489
Mean.....	\$5,959	\$6,717	\$4,704	\$5,959	\$6,717	\$4,704
1980:						
Median.....	\$2,850	\$3,101	\$2,368	\$4,777	\$5,197	\$3,969
Mean.....	\$3,775	\$4,120	\$3,126	\$6,327	\$6,905	\$5,239

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Source: U.S. Bureau of the Census, 1984, Table 46; 1992c, Table 89.

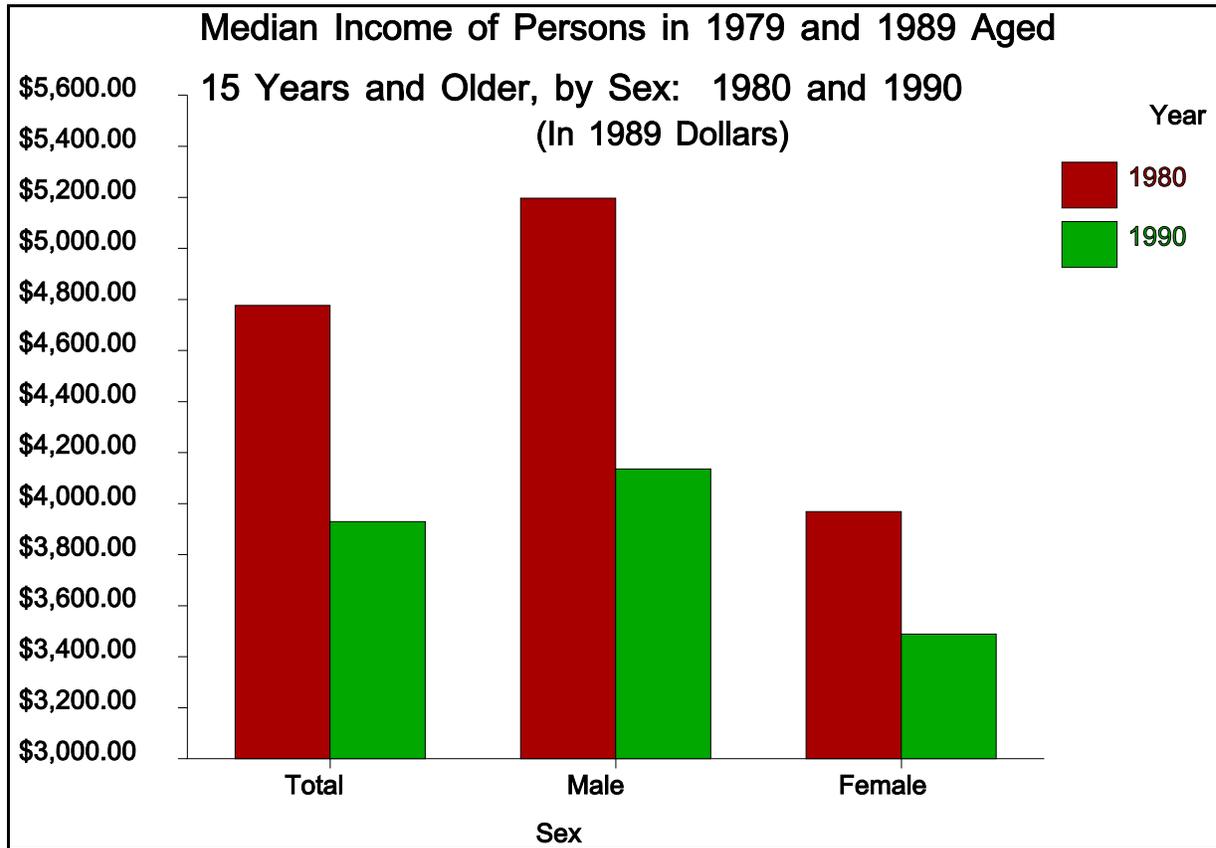


Figure 13.3. Median Income of Persons in 1979 and 1989 Aged 15 Years and Older by Sex: 1980 and 1990

The decline in income between 1979 and 1989 was more dramatic for males than for females. The median 1989 male income was more than \$1,000 less than the median male income in 1979, a reduction of 20 percent. The mean male income similarly declined over the same decade, but by less than \$200. Both median and mean female incomes, in contrast, decreased by less than \$500 between 1979 and 1989, about 12 percent for the median.

In comparing income for 1979 and 1989, remember that Palau was still part of the Trust Territory of the Pacific Islands in 1979 — the salaries of non-Palauan administrators possibly increasing both the median and (especially) the mean income for 1979. Nevertheless, the effect of such administrators probably was relatively small in the long run, their numbers very small compared to the remainder of the population aged 15 years and over. Once again, because of extreme values affecting the means, the medians are more indicative of the income changes.

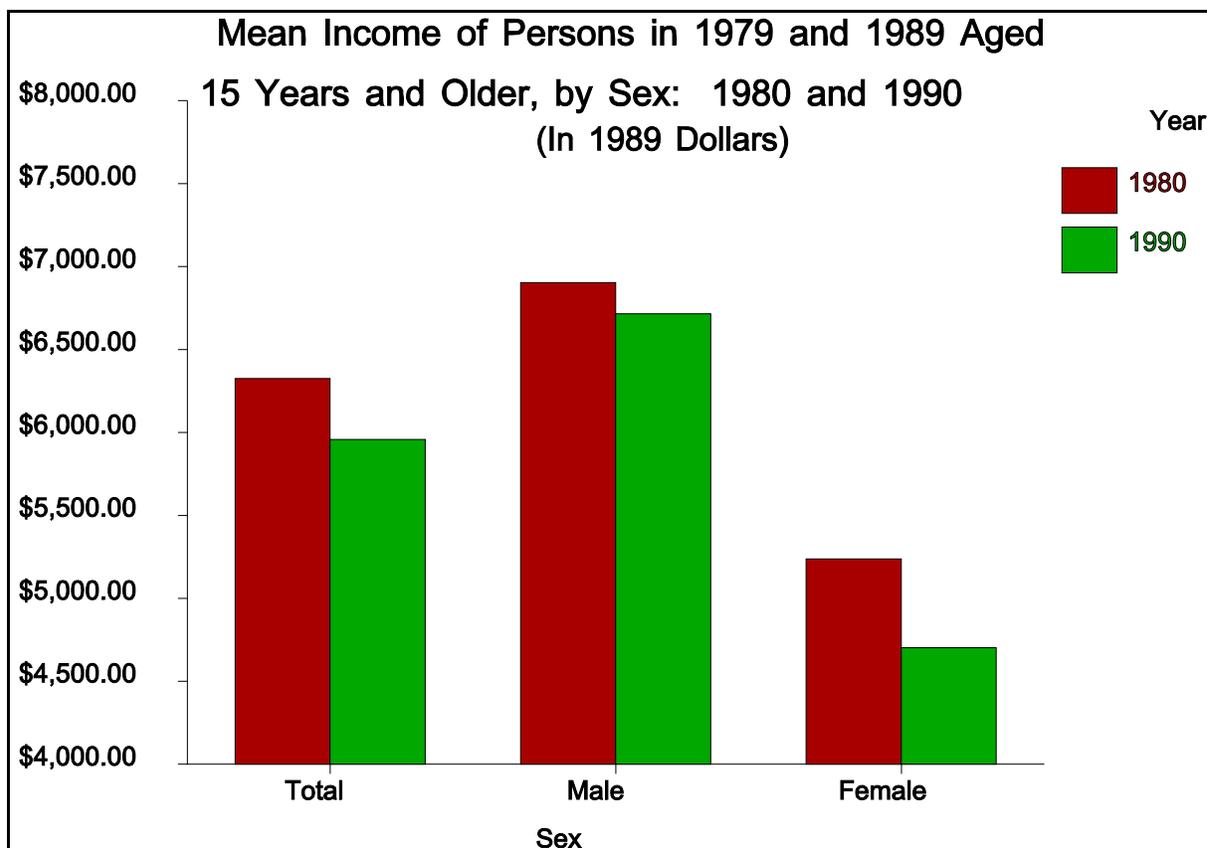


Figure 13.4. Mean Income of Persons in 1979 and 1989 Aged 15 Years and Older by Sex: 1980 and 1990

As expected, median income for individuals 15 years and older generally increased with age through 40 to 44 years, then decreased with age for most of the remaining age groups (Table 13.6). Median income for females followed a similar pattern.

Table 13.6. Personal Income in 1989 by Age: 1990

Age	Number			Median		Mean		
	Total	Males	Fmles	Total	Fmles	Total	Males	Fmles
Total.....	10,546	5,773	4,773	\$3,930	\$3,489	\$5,959	\$6,997	\$4,704
15 to 19 years...	1,464	795	669	957	865	1,591	1,445	1,765
20 to 24 years...	1,340	738	602	2,433	2,394	2,950	2,771	3,169
25 to 29 years...	1,403	799	604	3,337	3,368	3,883	3,912	3,845
30 to 34 years...	1,338	768	570	4,095	4,293	5,316	5,375	5,237
35 to 39 years...	1,243	720	523	4,954	5,350	6,662	7,011	6,182
40 to 44 years...	873	514	359	6,099	6,017	8,171	9,069	6,886
45 to 49 years...	666	375	291	5,895	5,643	9,093	10,958	6,690
50 to 54 years...	513	279	234	5,821	4,102	12,225	18,160	5,149
55 to 59 years...	403	208	195	5,266	2,453	7,578	10,936	3,996
60 to 64 years...	387	181	206	3,629	1,968	6,058	9,344	3,171
65 to 69 years...	332	154	178	2,379	1,750	4,512	7,153	2,227
70 to 74 years...	249	117	132	2,431	1,983	5,521	8,657	2,741
75 to 79 years...	148	62	86	2,250	1,519	3,033	4,175	2,210
80 to 84 years...	93	36	57	2,096	1,300	2,486	3,153	2,065
85 years & over..	94	27	67	2,159	1,375	3,063	4,135	2,631

Source: U.S. Bureau of the Census, 1992c, Table 89.

Notes: Medians and means in 1989 dollars.

Median income by age unavailable for males.

Mean 1989 income figures for five-year age groups was similar to that documented for median income. For all persons, mean income increased through 50-54 years when it exceeded \$12,200, subsequently declining for all but two of remaining seven age groups. Mean income by age followed a similar pattern for males, also reaching a maximum for individuals aged 50-54 years before declining. In contrast, the mean 1989 income for females increased through ages 40-44 years before declining.

The median income for Palau-born individuals in 1989 exceeded the median for those born outside Palau (Table 13.7). With the exception of females born in the FSM, the median 1989 income for all individuals exceeded that of females — males had higher incomes than females both for individuals born in Palau and for individuals born elsewhere.

Table 13.7. Person's Income in 1989 by Birthplace: 1990

Birthplace	Numbers			Median		Mean		
	Total	Males	Fmles	Total	Fmles	Total	Males	Fmles
Total.....	10,546	5,773	4,773	\$3,930	\$3,489	\$5,959	\$6,997	\$4,704
Palau.....	8,164	4,195	3,969	4,357	4,001	6,241	7,350	5,069
FSM.....	273	173	100	1,234	1,844	3,092	3,094	3,088
Asia.....	1,824	1,233	591	2,633	1,891	4,159	4,905	2,602
Philippines...	1,424	892	532	2,377	1,824	2,929	3,342	2,237

Source: U.S. Bureau of the Census, 1992c, Table 90.

Note: Medians and means in 1989 dollars.

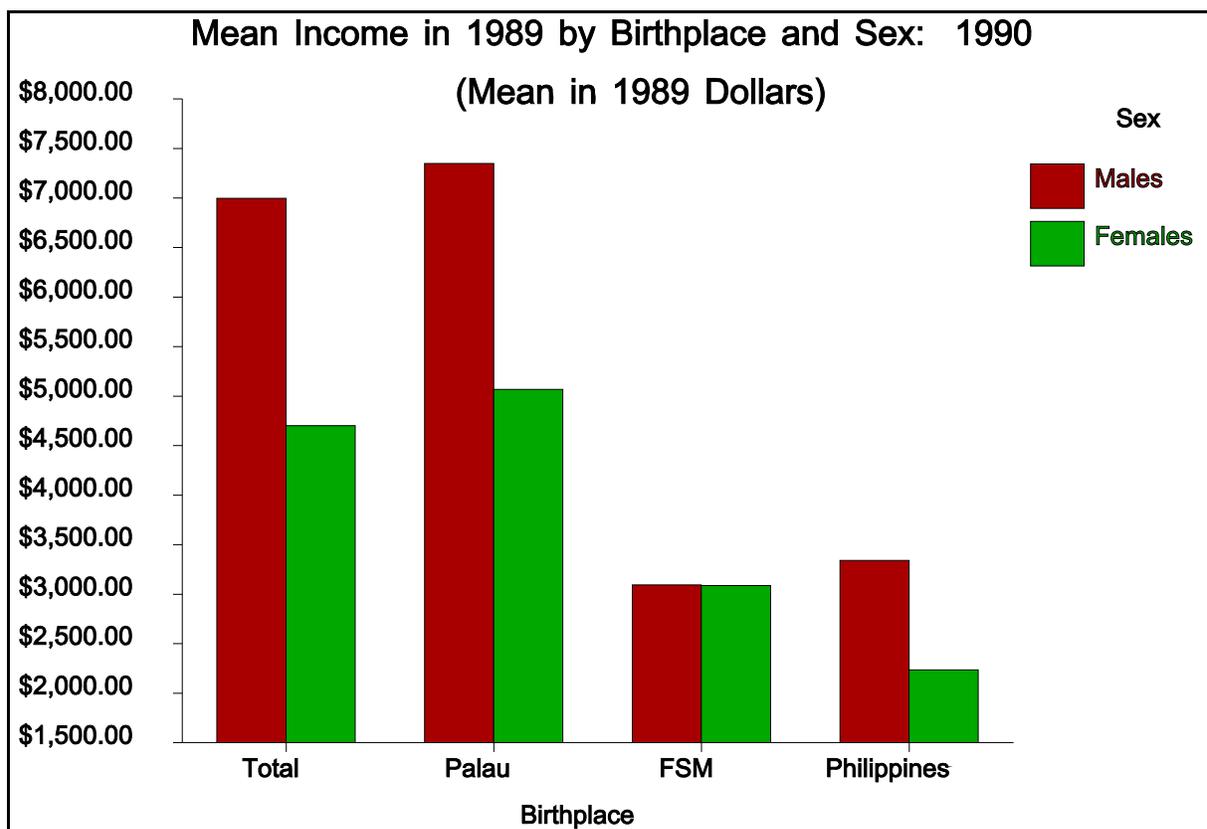


Figure 13.5. Mean Income in 1989 by Birthplace and Sex: 1990

Mean 1989 income similarly was higher for Palau-born persons than for those born elsewhere, the differences once again substantial. The mean income of males exceeded that of females for all birthplaces, although the values for FSM-born males and females were virtually identical.

The median income in 1989 for persons who spoke English at home was about \$900 less than the median for those who spoke another language (usually Palauan) at home (Table 13.8). Those speaking Palauan had a median income of nearly \$4,400, about \$400 more than for all adults in Palau. The 1989 median income for persons speaking a Filipino language at home was less than \$2,600.

Table 13.8. Person's Income in 1989 by Language and English Use: 1990

Language Spoken At Home	Numbers			Median		Mean		
	Total	Males	Fmles	Total	Fmles	Total	Males	Fmles
Total, 15+....	10,546	5,773	4,773	\$3,930	\$3,489	\$5,959	\$6,997	\$4,704
Only English.....	349	162	187	3,065	1,977	9,124	15,372	3,711
Other languages..	10,197	5,611	4,586	3,944	3,615	5,828	6,700	4,761
Palauan.....	8,278	4,242	4,036	4,369	4,014	6,286	7,418	5,096
Filipino.....	1,235	839	396	2,584	1,936	3,113	3,402	2,500
Speak other language:								
Less than Engl...	218	96	122	\$2,000	\$1,677	\$5,802	\$9,781	\$2,671
Equally often....	424	255	169	3,313	2,885	5,351	5,822	4,641
More than Engl...	9,495	5,228	4,267	4,033	3,711	5,871	6,699	4,856
Does not speak								
English.....	60	32	28	\$2,020	\$2,500	\$2,694	\$2,476	\$2,943

Source: U.S. Bureau of the Census, 1992c, Table 92.

Notes: Medians and means in 1989 dollars.

Filipino includes any language spoken in the Philippines.

People who spoke no English at all made about the same amount as those who spoke another language less frequently than English. Those who spoke English and another language equally often had a 1989 median income of roughly \$3,300, about \$600 less than the median for all adults. Individuals who spoke another language more than English had the highest median income at about \$4,000.

Mean 1989 incomes exceeded median 1989 incomes for language use, with individuals speaking English having higher mean incomes than persons speaking other languages. Persons speaking other languages had mean incomes much lower than English speakers — a substantial difference from the data on median income by language.

The mean 1989 incomes for males was particularly for English-speakers individuals—in excess of \$15,300 and more than twice that of individuals speaking any of the other languages in Table 13.8. This excess was also seen among males who spoke some other language, with individuals speaking predominantly English having substantially higher mean incomes than those speaking another language about as often or less often than they spoke English. Mean 1989 incomes for females, on the other hand, were higher among individuals speaking Palauan than among individuals speaking any other language, including English. The highest mean incomes for females who spoke another language was among those who spoke that language more often than English—with females who spoke predominantly English having lower 1989 mean incomes than females who spoke any other combination of languages.

In general, a direct relationship existed between educational attainment and personal income for individuals who at least had high school degrees: the greater a person education, the greater his or her income (Table 13.9). The median income for high school graduates was more than \$4,000 in 1989, increasing steadily for other levels of educational attainment to more than \$18,200 for persons with more than a Bachelor's degree. The same general patterns held for mean 1989 income, with the mean reaching more than \$27,200 for individuals with education in excess of a Bachelor's degree. Median incomes for individuals without a high school diploma tended to fluctuate when compared with educational attainment, exceeding \$4,050 for individuals with one year of high school before declining once again. Mean incomes similarly fluctuated for individuals who had not obtained a high school degree.

Table 13.9. Person's Income in 1989 by Educational Attainment: 1990

Educational Attainment	Numbers			Median		Mean		
	Total	Males	Fmles	Total	Fmles	Total	Males	Fmles
Total, 25+ yrs...	7,742	4,240	3,502	\$4,308	\$3,830	\$6,512	\$7,746	\$5,018
None.....	140	65	75	2,432	1,682	3,063	4,648	1,689
Elem: 1 to 4 yrs...	678	217	461	2,082	1,673	2,837	4,435	2,085
5 and 6 yrs...	919	457	462	2,992	2,000	3,908	5,049	2,779
7 years.....	88	55	33	3,869	2,313	4,408	5,508	2,575
8 years.....	427	230	197	2,882	1,981	3,800	4,940	2,469
H.S.: 1 year.....	457	236	221	4,056	3,594	5,036	5,346	4,705
2 years.....	187	112	75	2,880	2,446	3,876	4,677	2,680
3 years.....	216	135	81	2,408	2,018	3,053	3,579	2,177
4, no diploma.	170	102	68	3,559	2,500	3,962	4,219	3,576
H.S. graduate.....	2,059	1,179	880	4,020	3,851	4,898	5,129	4,589
Some college.....	861	562	299	4,850	5,402	7,909	8,982	5,892
A.S., occupational..	452	293	159	5,960	5,800	7,196	7,451	6,726
A.S., academic.....	288	149	139	7,960	7,458	10,295	12,910	7,492
Bachelor's degree...	662	349	313	8,932	7,500	11,920	15,495	7,934
Higher degree.....	138	99	39	18,182	13,750	27,213	32,017	15,017

Source: U.S. Bureau of the Census, 1992c, Table 93.

Note: Medians and means in 1989 dollars.

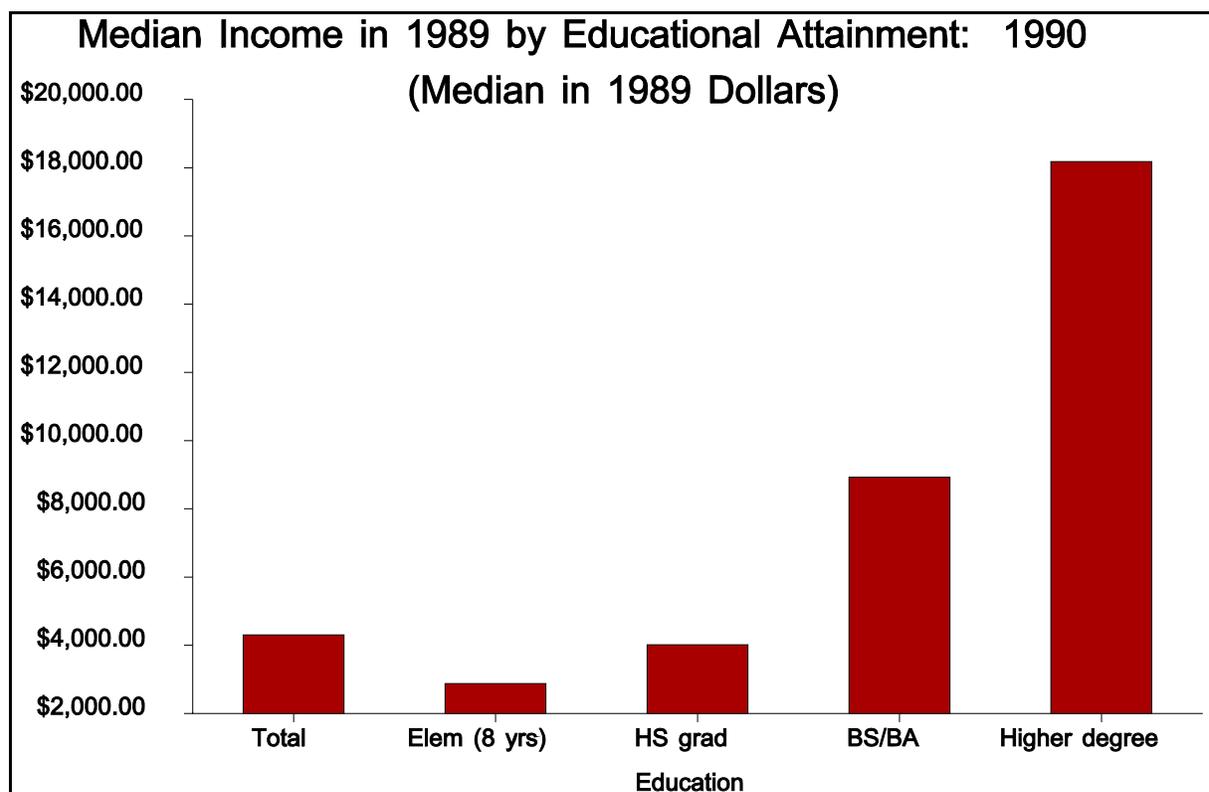


Figure 13.6. Median Income in 1989 by Educational Attainment: 1990

Median incomes in 1989 for females were similar to median incomes for all persons by educational attainment — that is, considerable income fluctuation for levels of education below a high school diploma, and increasing income as educational attainment increased for females with a high school diploma or more education. Median incomes of females were lower than those of the total population for all levels of educational attainment except one ("Some college"), showing that the median income for males exceeded female income in nearly all educational categories. Mean 1989 incomes fluctuated for both males and females with less than a high school diploma, and then generally increased with education for individuals who had completed high school or had additional formal schooling. Mean 1989 income of males exceeded that of females for all levels of education.

Of all the occupations show here, persons in managerial and professional positions had the highest incomes in 1989, with a median in excess of \$8,500 (Table 13.10). The median income for persons with technical, sales, and administrative support jobs also was relatively high, exceeding the total

median by \$500. Median income was less for females in each occupational category than for males, although the median for all females was only \$90 less than the median for all persons.

Table 13.10. Person's Income in 1989 by Occupation: 1990

Occupation Fmles	Numbers			Median		Mean	
	Total	Males	Fmles	Total	Fmles	Total	Males
Total.....	5,838	3,717	2,121	\$4,417	\$4,327	\$6,567	\$7,253
\$5,364 Managerial & professional.....	1,368	791	577	8,531	7,908	11,412	13,661
8,329 Technical, sales, and admin. support.....	1,261	503	758	4,917	4,714	7,561	10,812
5,404 Service.....	1,156	487	669	2,918	2,125	3,610	4,861
2,699 Farm, fish, forestry...	376	347	29	2,846	2,500	3,639	3,702
2,888 Prec. prod, craft.....	976	938	38	3,521	2,159	4,166	4,189
3,588 Oper, fabric, laborers.	701	651	50	3,687	2,895	3,920	3,994
2,962							

Source: U.S. Bureau of the Census, 1992c, Table 96.

Note: Medians and means in 1989 dollars; base is experienced civilian labor force 16 years and over (See labor force definitions).

Mean 1989 income by occupation showed a pattern similar to that for median income—that is, higher figures for "managerial ..." and "technical, ..." occupations than the mean for the total population. Similarly, mean male income for 1989 exceeded the mean female income for all occupational categories. As with other topics in this chapter, mean incomes were higher than median incomes.

As is the case for most of Micronesia, an extremely high percentage of employed individuals worked for some government agency. Much of the explanation for this situation lies in the income levels available for government jobs compared to private sector and self employment. In 1989, the median income for private sector jobs (for profit and not for profit jobs) were substantially less than the

medians for government jobs (Table 13.11). Positions in the local or territorial government paid nearly twice what private sector jobs paid in 1989. Positions in the federal government paid even more. Median incomes for self-employed individuals fell between the medians for private sector and government jobs. The median income for unpaid family members in 1989 was slightly higher than the median for private sector jobs. In all classes of workers, the median 1989 income for females was below the median for males except for local and territorial government employees.

Table 13.11. Person's Income in 1989 by Class of Worker: 1990

Class of Worker	Numbers			Median		Mean		
	Total	Males	Fmles	Total	Fmles	Total	Males	Fmles
Total.....	5,838	3,717	2,121	\$4,417	\$4,327	\$6,567	\$7,253	\$5,364
Private Wage/Salary:								
For profit.....	3,353	2,174	1,179	3,356	2,869	5,057	5,785	3,714
Not for profit.....	127	62	65	3,723	3,261	4,779	5,801	3,804
Government:								
Local/territorial...	2,053	1,275	778	6,687	6,838	8,025	8,382	7,440
Federal.....	138	79	59	7,150	6,667	10,847	13,410	7,415
Self-employed.....	155	120	35	5,188	3,958	14,331	16,338	7,450
Unpaid family.....	12	7	5	3,750	1,500	9,126	14,223	1,990

Source: U.S. Bureau of the Census, 1992c, Table 96.

Note: Medians and means in 1989 dollars.

Mean 1989 incomes by class of worker were similar to the median incomes just discussed in that government jobs paid much better than private sector jobs. However, in contrast to the median incomes, self-employed individuals had higher mean incomes than any other class of worker. Unpaid family members had mean incomes that were higher than local or territorial government employees and nearly as high as federal government employees. For all classes of workers, the mean incomes of males exceeded the mean incomes of females in 1989, in many cases by substantial amounts.

Most families in Palau contained two or more workers in 1990, with less than 9 percent containing no workers (Table 13.12). The number of workers per family varied among states, although most families in most states also contained two or more workers. The percentage of families with no workers ranged from 0 (Hatohobei and Ngchesar states) to nearly 35 percent (Peleliu State). The proportion of families containing a single worker varied from a minimum of 0 percent to a maximum of nearly 51 percent (Ngerchelong State). Finally, the proportion of families in a given state with two or more workers ranged from about 22 percent (Peleliu State) to a maximum of 100 percent (Hatohobei State). Extreme values in state-level statistics often reflect the small populations living in certain jurisdictions — Hatohobei contained only 3 families in 1990.

Table 13.12. Workers in Family by State: 1990

State	Workers in Families				Percents			
	Total	None	One	Two or more	Total	None	One	Two or more
Total.....	2,445	206	752	1,487	100.0	8.4	30.8	60.8
Aimeliik.....	68	8	30	30	100.0	11.8	44.1	44.1
Airai.....	214	16	81	117	100.0	7.5	37.9	54.7
Angaur.....	40	12	14	14	100.0	30.0	35.0	35.0
Hatohebei.....	3	-	-	3	100.0	-	-	100.0
Kayangel.....	24	2	6	16	100.0	8.3	25.0	66.7
Koror.....	1,600	73	425	1,102	100.0	4.6	26.6	68.9
Melekeok.....	47	9	22	16	100.0	19.1	46.8	34.0
Ngaraard.....	58	5	15	38	100.0	8.6	25.9	65.5
Ngardmau.....	27	3	4	20	100.0	11.1	14.8	74.1
Ngaremlengui....	53	10	26	17	100.0	18.9	49.1	32.1
Ngatpang.....	13	4	6	3	100.0	30.8	46.2	23.1
Ngchesar.....	54	-	22	32	100.0	-	40.7	59.3
Ngerchelung....	69	15	35	19	100.0	21.7	50.7	27.5
Ngiwal.....	46	5	12	29	100.0	10.9	26.1	63.0
Peleliu.....	119	41	52	26	100.0	34.5	43.7	21.8
Sonsorol.....	10	3	2	5	100.0	30.0	20.0	50.0

Source: U.S. Bureau of the Census, 1992c, Table 15.

So, most families in Palau had two or more workers in 1990. As expected, the number of workers in a family influenced family income — with more workers generating higher median incomes (Table 13.13). Families with no workers had particularly low median incomes, their finances determined primarily by government funds, such as welfare, and financial contributions by relatives.

Table 13.13. Median Income in 1989 by Workers in Family and State: 1990

State	Workers in Families				Median Income by Family Size			
	Total	None	One	Two or more	Total	None	One	Two or more
Total.....	2,445	206	752	1,487	\$9,380	\$1,523	\$5,686	\$12,313
Aimeliik.....	68	8	30	30	6,600	1,000	6,154	11,250
Airai.....	214	16	81	117	8,269	2,917	4,962	11,042
Angaur.....	40	12	14	14	5,000	1,750	4,167	7,500
Hatohobei.....	3	-	-	3	11,250	-	-	8,750
Kayangel.....	24	2	6	16	4,583	625	5,000	3,750
Koror.....	1,600	73	425	1,102	12,224	2,578	6,826	14,505
Melekeok.....	47	9	22	16	4,432	2,250	3,750	7,500
Ngaraard.....	58	5	15	38	5,000	2,125	4,063	5,250
Ngardmau.....	27	3	4	20	5,313	***	2,500	6,250
Ngaremlengui....	53	10	26	17	4,432	***	3,929	12,500
Ngatpang.....	13	4	6	3	3,750	1,500	5,000	7,500
Ngchesar.....	54	-	22	32	4,474	-	3,333	5,833
Ngerchelongs....	69	15	35	19	3,952	719	3,942	5,750
Ngiwal.....	46	5	12	29	3,654	1,375	3,750	4,063
Peleliu.....	119	41	52	26	4,234	938	4,231	10,357
Sonsorol.....	10	3	2	5	2,500	1,750	2,500	3,750

Source: U.S. Bureau of the Census, 1992c, Tables 15 and 19.

Notes: Median incomes in 1989 dollars; \*\*\* signifies "less than \$250".

As discussed earlier in this chapter, 1989 median family income was highest in Koror State — with rural states tending to have much lower median family incomes. For all states, families with more workers had higher median 1989 incomes. However, these incomes varied considerably by state. The median income with one worker was highest in Koror State, followed closely by Aimeliik. In contrast, both Ngardmau andonsorol states had very low median incomes for one-worker families in 1989. Koror State also had the highest median family incomes for families with two or more workers, followed closely by Aimeliik, Airai, and Peleliu states. Families in Kayangel andonsorol states with two or more workers had comparatively low median incomes. The median incomes for families with no workers were not very high, with the medians for Ngardmau and Ngaremlengui states both falling below \$250. As always, the small numbers of families affect medians.

## Poverty

The U.S. poverty definition does not work very well in Palau, where the minimum wage is much lower, many people live at least partially by subsistence, and housing conditions differ considerably from those found in the U.S. Nevertheless, we use this definition to evaluate income in Palau to

provide comparable statistics. By the U.S. definition, more than 70 percent of the families and nearly 74 percent of the persons living in Palau in 1990 were in poverty in 1989 (Table 13.14).

Table 13.14. Families and Persons in Poverty in 1989: 1990

State	Families			Persons		
	Total	In Poverty		Total	In Poverty	
		Number	Percent		Number	Percent
Total.....	2,445	1,719	70.3	14,841	10,972	73.9
Aimeliik.....	68	59	86.8	439	390	88.8
Airai.....	214	161	75.2	1,234	976	79.1
Angaur.....	40	37	92.5	206	199	96.6
Hatohobei.....	3	3	100.0	22	21	95.5
Kayangel.....	24	23	95.8	137	132	96.4
Koror.....	1,600	971	60.7	10,222	6,791	66.4
Melekeok.....	47	44	93.6	244	233	95.5
Ngaraard.....	58	53	91.4	310	288	92.9
Ngardmau.....	27	27	100.0	149	149	100.0
Ngaremlengui.....	13	13	100.0	62	61	98.4
Ngatpang.....	54	52	96.3	287	282	98.3
Ngchesar.....	53	48	90.6	281	259	92.2
Ngerchelong.....	69	65	94.2	354	340	96.0
Ngiwal.....	46	44	95.7	234	224	95.7
Peleliu.....	119	109	91.6	599	567	94.7
Sonsorol.....	10	10	100.0	61	60	98.4

Source: U.S. Bureau of the Census, 1992c, Table 20.

Note: "Persons" denotes persons for whom poverty status is determined.

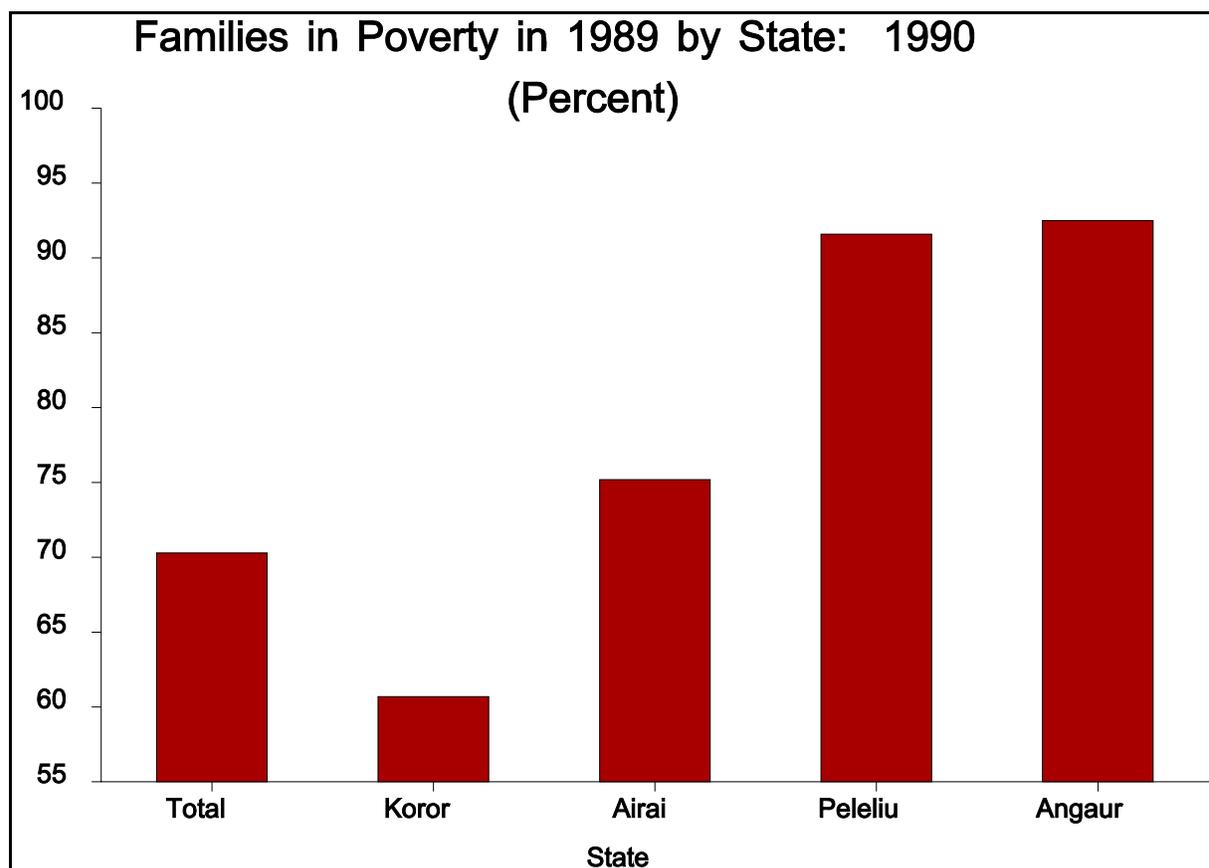


Figure 13.7. Families in Poverty in 1989 for Selected States: 1990

The state income levels discussed earlier for families and individuals obviously influence the geographic patterns of poverty. Koror State, with the highest family income, also had the lowest percentage of families below the poverty line (nearly 61 percent). States with lower income levels had higher percentages of persons in poverty. All families living in Hatothobei, Ngardmau, Ngaremlengui, and Sonsorol states had incomes below the U.S. poverty line. More than 90 percent of the families living in all but three states (Koror, Aimeliik, and Airai) in Palau were living in poverty in 1989.

State poverty levels were similar to those for families. Nearly two-thirds of the persons living in Koror State in 1990 fell below the poverty line in 1989. More than 90 percent of the residents in all but three states were living in poverty, with all individuals in Ngardmau below the poverty line.

Table 13.15 shows poverty ratios, once again based on the U.S. definition of poverty. The values in the 100% columns are the same as those shown for persons in poverty in Table 13.14. Some U.S. Federal programs require numbers and characteristics of persons living at different levels of poverty. For example, if an administrator needs to have the percentage of persons living at 50 percent of the poverty level, he or she should look at the columns in Table 13.15 with 50% at the top. The 50 percent level is obtained by dividing the values in the cells in Table 13.1 by 2 and then determining how many persons or families fall below these new levels. Both the number and the percent of individuals in each state living at 50 percent of poverty is obviously going to be much less than those living at 100 percent of poverty -- these persons may be considered the really poor. On the other hand, some researchers and administrators may want to use these lower levels for analysis to partly account for the role of subsistence in the economy. If the 125 and 185 percent are used, more people are included, so the numbers and percents of persons at these levels increase. That is, for a program which requires numbers of persons at 185 percent of poverty or below -- that is, if the poverty level was set at \$10,000, then we would be looking at persons or families making \$18,500 or less -- then, obviously more people are included.

Table 13.15. Ratio of Income to Poverty Level in 1989 by State: 1990

State	Total	Persons Below Percent of Poverty Level -- Number				Persons Below Percent of Poverty Level -- Percent			
		50%	100%	125%	185%	50%	100%	125%	185%
Total.....	14,841	6,483	10,972	12,251	13,807	43.7	73.9	82.5	93.0
Aimeliik.....	439	281	390	416	427	64.0	88.8	94.8	97.3
Airai.....	1,234	588	976	1,063	1,197	47.6	79.1	86.1	97.0
Angaur.....	206	149	199	202	204	72.3	96.6	98.1	99.0
Hatohobei.....	22	1	21	21	21	4.5	95.5	95.5	95.5
Kayangel.....	137	108	132	137	137	78.8	96.4	100.0	100.0
Koror.....	10,222	3,456	6,791	7,975	9,257	33.8	66.4	78.0	90.6
Melekeok.....	244	171	233	237	244	70.1	95.5	97.1	100.0
Ngaraard.....	310	212	288	300	306	68.4	92.9	96.8	98.7
Ngardmau.....	149	100	149	149	149	67.1	100.0	100.0	100.0
Ngaremlengui...	281	169	259	277	277	60.1	92.2	98.6	98.6
Ngatpang.....	62	46	61	61	62	74.2	98.4	98.4	100.0
Ngchesar.....	287	231	282	287	287	80.5	98.3	100.0	100.0
Ngerchelong....	354	277	340	249	352	78.2	96.0	70.3	99.4
Ngiwal.....	234	180	224	232	232	76.9	95.7	99.1	99.1
Peleliu.....	599	466	567	584	594	77.8	94.7	97.5	99.2
Sonsorol.....	61	48	60	61	61	78.7	98.4	100.0	100.0

Source: U.S. Bureau of the Census, 1992c, Table 20.

Note: "Persons" denotes persons for whom poverty status is determined.

## Conclusions

As Palau's economy changes from subsistence based to market based, financial accumulation and dispersion of money are becoming increasingly important. This transition rarely occurs smoothly at the national level and Palau is no exception. Income dropped in real terms between 1979 and 1989. Annual incomes Palau's residents in 1990 laced nearly three-fourths below the U.S. defined poverty line.

Palau's economic base is developing, and the data here show many of the characteristics of that development. The data show, for example, a direct relationship between the level of educational attainment and income. Development programs which enable higher education attainment and increased skills should promote Palau's economic development. The important economic role of government employment, on the other hand, could delay development. Government employment still pays much better than most private sector jobs. Because of this discrepancy, individuals will continue to search most actively for government jobs, increasing the pressure on this sector of the economy with more difficult economic times. In attracting many of the best and brightest in Palau, government employment removes people with important skills from other sectors of the economy — delaying the development of a more broadly based, self-sufficient economy.

## CHAPTER 14. POPULATION PROJECTIONS

Population and housing censuses, the crucial sources of data on the size, structure, and distribution of population and housing, are taken periodically. Censuses require tremendous expenditures of money and human energy at all phases — planning, enumeration, compilation, analysis, and publication. Because the Government of Palau needs information about the size and structure of the republic's population between censuses to address its needs, estimates of the population between censuses and projections are important planning tools. Data from recent censuses, surveys, and other sources of statistical data can be used to prepare estimates between complete population counts. Data from recent censuses and compilations of vital statistics, in turn, can be used to prepare population projections — providing information on likely future challenges to the republic and its government.

In this chapter we discuss post-censal estimates and projections for the years following the 1990 census. Estimates and projections use census, survey, and administrative records and assumptions for their foundations. Obviously, the accuracy of these calculations depends on the quality of the data and assumptions used to prepare them. The initial data used as the base from which to make post-censal population estimates and projections should have no errors. The components of population change — fertility, mortality, and migration — are likely to follow certain courses. Assumptions which deviate from the actual courses of these components will reduce the accuracy of the estimate or projection. Furthermore, as the period of a post-censal population estimate or projection increases, the likelihood of error similarly increases, for the assumptions on which the calculations are based may not hold for long periods. Ultimately, the accuracy of population estimates or projections tends to depend more on the extent to which underlying assumptions prove correct than the level of sophistication of the method used to compute the figures. The estimates and projections presented here the information in this monograph, particularly the information for fertility and mortality. Migration estimates are derived from data on residence in 1985, as described below.

### Projection Method

The Center for International Research at the U.S. Bureau of the Census has developed a LOTUS-based program called *Rural Urban Projections* (RUP) to project populations for countries around the world. The RUP program employs a cohort component method which projects each age and sex group over time based on the three main components of population change. Annual births and deaths and migration create new numbers — either increasing or decreasing cohort size — depending on the contribution of each component.

Certain features of the RUP program enable considerable flexibility for specifying projected trends in fertility, mortality, and migration. The program also permits a range of output options giving a detailed examination of the results. We use only some of the program features here because of the small size of Palau's population, uncertainties about current fertility and migration trends, and the fact that the present monograph primarily is a report on the 1990 census. The OPS plans in the near future to publish a detailed projection series, using different levels of fertility, mortality, and migration.

The features of the RUP program used for the population projections in this chapter include the following:

- The program produces projections by single years of age. This feature allows use of special age groups that are not conventional five-year age groups. It also allows tracking population cohorts that may be smaller or larger than surrounding cohorts due to past demographic events. In the projections prepared here, we use data on single years of age by sex collected by the 1990 census (see U.S. Bureau of the Census, 1992c, Table 8).
- The program produces annual projections. This feature enables inputting information on demographic events for a particular year (e.g., excess mortality due to a typhoon or tidal wave) without spreading the effect over a five-year period. It also provides planners with projections for each year rather than requiring interpolations between projections for surrounding years.
- In addition to accepting mortality and fertility rates as input (as do most programs), the RUP program also allows the input of numbers of births, deaths, or migrants. This feature enables updating a base population with recent actual data on vital events. For instance, because in addition to the 1990 census data we have available information on registered births and deaths for years before the census, we can include these vital statistics in the projection without having to estimate associated fertility and mortality rates. We project the 1990 census population by age and sex using life tables consistent with the numbers of deaths (by age and sex) and mortality patterns for surrounding years, age-specific fertility rates consistent with numbers of births (by age of mother), and the known number of migrants between 1985 and 1990. For subsequent years, the program uses the projected trends of these components to calculate future populations.
- The program provides output of a wide variety of demographic measures for any specified year of the projection. These outputs include:

- Population by age and sex (single years, five-year age groups, special groups) and summary measures of age (e.g., percentages, sex ratios, median ages, dependency ratios);
- Summary rates (e.g., crude birth rates, life expectancy, infant mortality rates, and total fertility rates);
- Life tables;
- Net numbers of migrants or migration rates by age and sex;
- Number of deaths, by age and sex; and
- Number of births, by age of mother, and age-specific fertility rates.

The flexibility of the RUP package allows a researcher to create a projection model that accurately reflects what is known about the demographic situation in a particular country, making maximum use of available data in a form as close as possible to the original. However, "this flexibility comes at a price as it places a burden on [the] user (1) to decide on the best way to model the situation (since the program does not limit the options) and (2) to provide accurate data for all the inputs required to run the program" (CIR, ms, no page numbering).

### **Analysis of Population Projections**

As discussed in the chapters of this monograph dealing with various demographic topics, the population dynamics of Palau recently have been quite volatile, particularly in the area of migration. Although the population remained around 12,000 persons for more than a decade, immigration has caused fairly rapid growth in recent years — to more than 13,000 in 1986 and more than 15,000 in 1990. Almost all of the population increase was due to net immigration. Although Palauans continued to leave Palau, these emigrants were more than offset by other people — primarily Asians, mostly from the Philippines — moving to the republic to live and work. It is not known whether this rapid immigration will continue.

Similarly, as discussed in Chapter 6, fertility continues to decrease, although the exact extent of the continued decrease is unknown. The current total fertility rate (**TFR**) of 2.8 children is one of the lowest in the Pacific.<sup>7</sup> It is not clear whether the Asian immigrants have lower or higher fertility than the Palauans, nor is it clear whether the current level of fertility for the immigrants would continue after arriving in Palau.

We have made certain, simple assumptions for the projections presented for this monograph — namely that 1990 fertility, mortality, and migration trends in Palau will continue. We continue the

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<sup>7</sup>The own children runs were made after these projections, so the 3.0 TFR obtained there is not reflected here. The Office of Planning and Statistics will release more detailed projections later incorporating differential fertility estimates.

current rates for fertility and mortality over time and continue the current numbers for net immigration, all by age and sex.

Chapters 6 and 7 examine birth and death rates for Palau in detail; Table 14.1 summarizes these measures as derived from the RUP program. The crude birth rate of 22 per 1,000 persons reflects the current low fertility in Palau, and the death rate of 7 per 1,000 persons also is low. These levels of fertility and mortality produce a natural growth rate of 1.5 percent in 1990, a doubling time of around 50 years. In conjunction with the effects of net immigration — 19 per 1000 persons — the actual growth rate was 3.3 percent in 1990.

Table 14.1. Vital Rates Summary for Population Projections

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Item	Rate
Crude Birth Rate (CBR) (per 1,000).....	22.02
Crude Death Rate (CDR) (per 1,000).....	7.14
Rate of Natural Increase (Percent).....	1.488
Net Migration Rate (per 1,000).....	18.52
Growth Rate (Percent).....	3.34

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Sources: Chapters 6, 7, and 8 of this monograph.

The age-specific fertility rates used in the projections were derived from the vital registration data (for the numerators) and the 1990 census results (for denominators), as discussed in Chapter 6. Table 14.2 presents these measures again, for reference purposes. Because the birth rates already are low, the projections assumed unchanging fertility (though we speculated about continued fertility decline in Chapter 6).

Table 14.2. Age-specific and Total Fertility Rates for Projections

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Age Group	Age-specific Fertility Rate	Births
15 to 19 years.....	45.0	30
20 to 24 years.....	151.8	91
25 to 29 years.....	185.8	113
30 to 34 years.....	110.9	63
35 to 39 years.....	53.9	28
40 to 44 years.....	20.0	7
45 to 49 years.....	2.0	1
Total Fertility Rate.....	2.847	...

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Source: Chapter 6 of this monograph.

Age-specific death rates used in the population projections were derived from registered deaths by age (for the numerators) and the 1990 census results (for denominators). Through the use of the Population Analysis Software, as described in Chapter 7, we estimated life expectancy at birth at about 69 years for both sexes combined. This level probably is higher than the actual life expectancy in the republic, but it is important to remember that the majority of Palau's population lives close to the hospital and receives free medical (out-patient) attention and medicine. Moreover, it is unlikely that registered deaths include all deaths of Palauans, particularly those leaving the republic for medical attention and dying elsewhere.

Infant mortality for the purposes of the RUP program was measured at 25 per 1,000 live births — 2.5 percent of live babies dying before the end of their first year of life — with about 5 deaths per 1,000 persons in the first year of life. We held this rate constant throughout the RUP runs.

We estimated migration indirectly, since the Republic of Palau does not collect data on immigrants and emigrants. Obtaining information on immigrants was fairly straightforward. We chose to use the number of persons not living in Palau in 1985, but enumerated in the census in 1990. For example, Table 14.3 shows 1,486 males who lived outside Palau in 1985 but in Palau in 1990. Some of these individuals might have been Palau-born persons who left Palau and were outside the republic in 1985, but had returned by 1990. On the other hand, we assumed about an equal number of non-Palauans to have been in Palau in 1985, but left Palau by 1990.

Table 14.3. Migration Between 1985 and 1990 of Palau Born to Guam and CNMI and from Outside to Palau: 1990

Age Group	Net Migrants			Outmigrants		
	Total	Per yr.	In-Migrants	Total	Guam	CNMI
Males.....	1,025	205	1,486	461	181	280
5 to 9 years.....	6	1	39	33	10	23
10 to 14 years.....	-12	-2	28	40	8	32
15 to 19 years.....	-25	-5	48	73	28	45
20 to 24 years.....	137	27	255	118	55	63
25 to 29 years.....	170	34	249	79	36	43
30 to 34 years.....	234	47	269	35	8	27
35 to 39 years.....	223	45	251	28	12	16
40 to 44 years.....	136	27	161	25	8	17
45 to 49 years.....	75	15	91	16	8	8
50 to 54 years.....	50	10	53	3	-	3
55 to 59 years.....	23	5	24	1	1	-
60 to 64 years.....	6	1	10	4	3	1
65 to 69 years.....	1	-	3	2	2	-
70 to 74 years.....	3	1	3	-	-	-
75 years & over.....	-2	-	2	4	2	2

Sources: U.S. Bureau of the Census, 1992a, Table 38; 1992b, Table 38; 1992c, Table 38.

For emigrants from Palau, we used tables similar to Table 14.3 from the 1990 Censuses of Guam and the CNMI — thus assuming that all outmigration of Palauans was to these two areas. This assumption admittedly is inaccurate; as discussed in Chapter 8, many Palauans also migrated to the U.S. and other places when, for example, they join the Armed Forces. Unfortunately, we had no information on destinations other than Guam and the CNMI of Palauan emigrants when preparing these projections. We found 461 males living in Palau in 1985, but living in either Guam (181) or the CNMI (280) in 1990. These figures do not represent the total Palauans living in the Marianas, which would be much higher. For example, if a male moved from Palau to Guam before 1985 he would not be included here despite being an emigrant to one of the two destinations of interest. In all, about 1,000 more males migrated to Palau between 1985 and 1990 than migrated to Guam or the CNMI, making immigration roughly 1,000. Since the period from 1985 to 1990 was five years, the average annual immigration of males for the last half of the 1980s was about 200.

About the same number of females as males moved from Palau to Guam or the CNMI between 1985 and 1990 (Table 14.4). However, many fewer females than males migrated to Palau — about 800 during the five-year period. Combining immigration and emigration figures for females yielded a net immigration of about 365 between 1985 and 1990, or about 73 per year. Net in-migration of

males and females combined during the last half of the 1980s averaged about 280 persons during the last half of the 1980s, the value used for the projections.

Table 14.4. Migration Between 1985 and 1990 of Palau Born to Guam and CNMI and from Outside to Palau: 1990

Age Group	Net Migrants			Outmigrants		
	Total	Per yr.	In-Migrants	Total	Guam	CNMI
Females.....	365	73	806	441	173	268
5 to 9 years.....	5	1	27	22	12	10
10 to 14 years.....	-9	-2	28	37	4	33
15 to 19 years.....	-48	-10	41	89	39	50
20 to 24 years.....	51	10	168	117	58	59
25 to 29 years.....	107	21	171	64	17	47
30 to 34 years.....	108	22	139	31	11	20
35 to 39 years.....	79	16	109	30	9	21
40 to 44 years.....	40	8	57	17	8	9
45 to 49 years.....	20	4	33	13	6	7
50 to 54 years.....	12	2	16	4	-	4
55 to 59 years.....	4	1	7	3	1	2
60 to 64 years.....	-3	-1	3	6	4	2
65 to 69 years.....	3	1	3	-	-	-
70 to 74 years.....	1	-	4	3	1	2
75 years & over.....	-5	-1	-	5	3	2

Sources: U.S. Bureau of the Census, 1992a, Table 38; 1992b, Table 38; 1992c, Table 38.

Table 14.5 presents the main components of population change used for the initial years of our population projections. On the basis of the vital registration, in the first year of the projections we used a natural increase of 225 persons — the difference between 333 births and 108 deaths. In conjunction with the 280 annual migrants, the total increase exceeds 500 persons in the first year of the projection.

Table 14.5. Components of Population Change by Sex for Population Projections

Item	Total	Males	Females
Births.....	333	171	162
Deaths.....	108	52	56
Natural Increase (Births - Deaths).....	225	119	106
Net Migrants.....	280	207	73
Population Change (Nat. Inc. + Migrants)...	505	326	179

Source: Chapters 6, 7, and 8 of this monograph.

The estimated population for Palau in 1991 was 15,625 persons (Table 14.6). In addition to presenting total populations, the projection table also shows the 333 births, 108 deaths, 280 net in-migrants, and the rates associated with each of these components of population change based on the mid-year populations. As the population changes with time, fertility and mortality also change — the former decreasing slightly and the latter increasing as the population ages. The rate of in-migration decreases considerably over time because net migration was fixed at 280 persons per year.

Table 14.6. Population Projections to 2020

International YEAR	Midyear Popu- lation	Expo- nential	C a l e n d a r   Y e a r   D a t a						
		Growth	Growth	Births		Deaths		Net	
		Rate (%)	Rate (%)	No.	CDR	No.	CDR	Migrants	Rate
1990...	15,122	3.272	3.340	333	22.02	108	7.14	280	18.52
1991...	15,625	3.181	3.213	344	22.02	122	7.81	280	17.92
1992...	16,130	3.125	3.156	355	22.01	126	7.81	280	17.36
1993...	16,642	3.053	3.089	365	21.93	131	7.87	280	16.82
1994...	17,158	2.991	3.025	374	21.80	135	7.87	280	16.32
1995...	17,679	2.915	2.953	382	21.61	140	7.92	280	15.84
1996...	18,202	2.849	2.884	390	21.43	145	7.97	280	15.38
1997...	18,728	2.780	2.814	396	21.14	149	7.96	280	14.95
1998...	19,256	2.710	2.742	403	20.93	155	8.05	280	14.54
1999...	19,785	2.639	2.674	409	20.67	160	8.09	280	14.15
2000...	20,314	2.571	2.609	414	20.38	164	8.07	280	13.78
2001...	20,843	2.506	2.538	419	20.10	170	8.16	280	13.43
2002...	21,372	2.436	2.471	424	19.84	176	8.24	280	13.10
2003...	21,899	2.374	2.411	429	19.59	181	8.27	280	12.79
2004...	22,425	2.301	2.341	432	19.26	187	8.34	280	12.49
2005...	22,947	2.232	2.262	433	18.87	194	8.45	280	12.20
2006...	23,465	2.179	2.208	437	18.62	199	8.48	280	11.93
2007...	23,982	2.125	2.156	443	18.47	206	8.59	280	11.68
2008...	24,497	2.069	2.098	447	18.25	213	8.69	280	11.43
2009...	25,009	1.995	2.031	450	17.99	222	8.88	280	11.20
2010...	25,513	1.929	1.952	447	17.52	229	8.98	280	10.97
2011...	26,010	1.881	1.907	452	17.38	236	9.07	280	10.77
2012...	26,504	1.836	1.860	458	17.28	245	9.24	280	10.56
2013...	26,995	1.795	1.815	463	17.15	253	9.37	280	10.37
2014...	27,484	1.742	1.768	469	17.06	263	9.57	280	10.19
2015...	27,967	1.698	1.720	473	16.91	272	9.73	280	10.01
2016...	28,446	1.656	1.680	479	16.84	281	9.88	280	9.84
2017...	28,921	1.615	1.635	484	16.74	291	10.06	280	9.68
2018...	29,392	1.576	1.592	490	16.67	302	10.27	280	9.53
2019...	29,859	1.552	1.564	499	16.71	312	10.45	280	9.38
2020...	30,326	...	1.543	511	16.85	323	10.65	280	9.23

Source: Rural-urban Projection program, Center for International Research, U.S. Bureau of the Census.

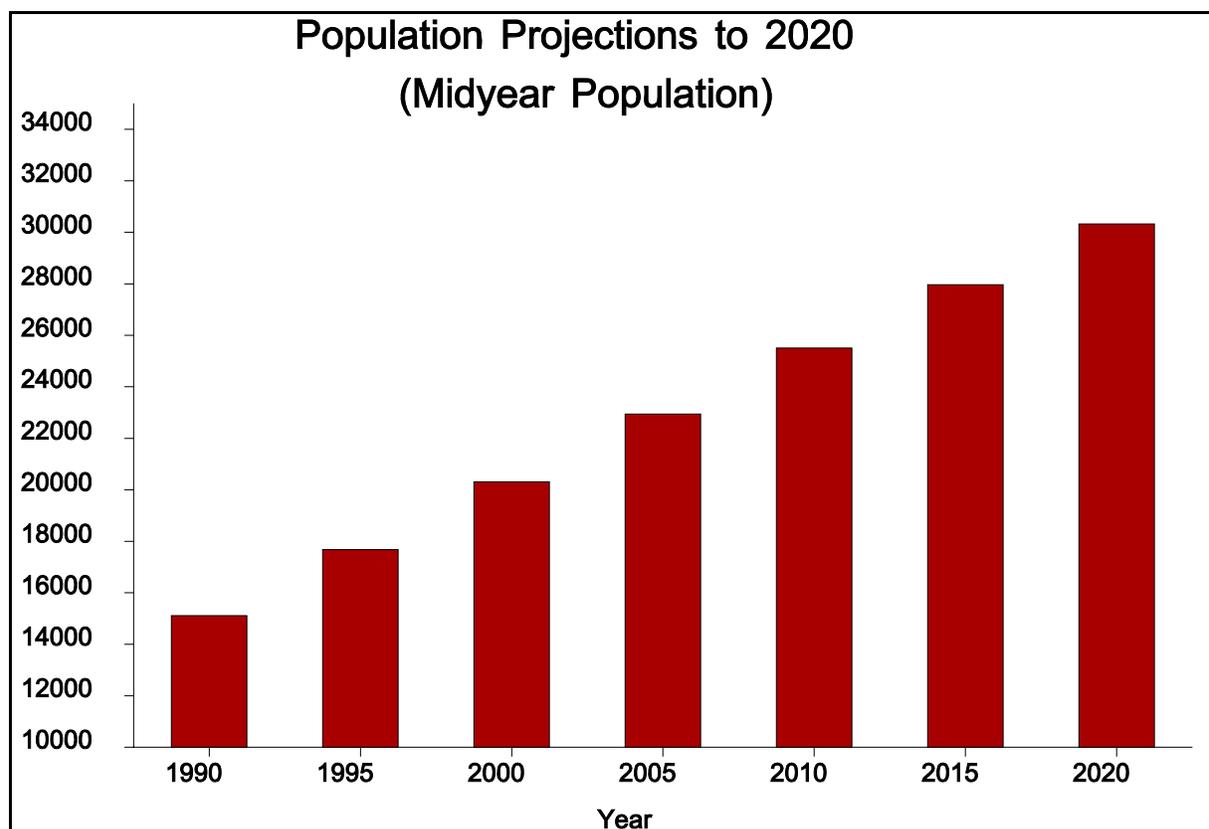


Figure 14.1. Mid-year Population Projections: 1990 to 2020

Using these birth, death, and migration rates, the population of Palau doubles during the 30-year projection period to about 30,300 persons in 2020. Births increase to more than 500 per year, although the rate drops to 17 per 1,000 persons. Deaths increase to more than 320 per year, the crude death rate increasing slightly to about 11 per 1,000 persons. Holding migration at 280 per year causes the rate of in-migration to decrease to roughly 9 immigrants per 1,000 inhabitants in the republic by 2020. The population growth rate decreases to about 1.5 percent per year at the end of the 30-year projection series.

Table 14.7 shows the population distribution for the base year of the population projection (1990), a distribution already discussed in Chapter 4. About 10 percent of the population was aged less than five years and slightly more than 30 percent was aged less than 15 years. At the other end of the age distribution, about 6 percent of the population was 65 years and over. Finally, about 117 males resided in Palau in 1990 for every 100 females.

Table 14.7. Initial Population by Age and Sex: 1990

Age Group	Numbers			Percents			Males
	Total	Males	Females	Total	Males	Females	Per 100 Females
Total.....	15,122	8,139	6,983	100.0	100.0	100.0	116.6
Less than 5 yrs...	1,513	766	747	10.0	9.4	10.7	102.5
5 to 9 years.....	1,529	793	736	10.1	9.7	10.5	107.7
10 to 14 years....	1,534	807	727	10.1	9.9	10.4	111.0
15 to 19 years....	1,464	795	669	9.7	9.8	9.6	118.8
20 to 24 years....	1,340	738	602	8.9	9.1	8.6	122.6
25 to 29 years....	1,403	799	604	9.3	9.8	8.6	132.3
30 to 34 years....	1,338	768	570	8.8	9.4	8.2	134.7
35 to 39 years....	1,243	720	523	8.2	8.8	7.5	137.7
40 to 44 years....	873	514	359	5.8	6.3	5.1	143.2
45 to 49 years....	666	375	291	4.4	4.6	4.2	128.9
50 to 54 years....	513	279	234	3.4	3.4	3.4	119.2
55 to 59 years....	403	208	195	2.7	2.6	2.8	106.7
60 to 64 years....	387	181	206	2.6	2.2	3.0	87.9
65 to 69 years....	332	154	178	2.2	1.9	2.5	86.5
70 to 74 years....	249	117	132	1.6	1.4	1.9	88.6
75 years & over...	335	125	210	2.2	1.5	3.0	59.5
Median Age.....	25.7	26.1	25.1	...	...	...	...

Source: U.S. Bureau of the Census, 1992c, Table 8.

Although the portion of Palau's population aged less than five years is projected to remain at about 10 percent in 1995, the percentage of the population younger than 15 years decreases to about 27 percent (Table 14.8). The percentage of individuals older than 65 years similarly decreased slightly to less than 6 percent. The median age of the population projected for 1995 increases by 3 years to 28.5 years. Much of the increase in population occurs in the middle aged years. The male-female ratio increases to 123 males for every 100 females. These increases are the result of selective immigration of males in the middle age groups, as occurred throughout the 1980s.

Table 14.8. Projected Population by Age and Sex: 1995

Age Group	Numbers			Percents			Males
	Total	Males	Females	Total	Males	Females	Per 100 Females
Total.....	17,679	9,750	7,929	100.0	100.0	100.0	123.0
Less than 5 yrs...	1,748	894	854	9.9	9.2	10.8	104.7
5 to 9 years.....	1,515	767	748	8.6	7.9	9.4	102.5
10 to 14 years....	1,515	785	730	8.6	8.1	9.2	107.5
15 to 19 years....	1,480	784	696	8.4	8.0	8.8	112.6
20 to 24 years....	1,501	839	662	8.5	8.6	8.3	126.7
25 to 29 years....	1,545	875	670	8.7	9.0	8.4	130.6
30 to 34 years....	1,684	982	702	9.5	10.1	8.9	139.9
35 to 39 years....	1,636	980	656	9.3	10.1	8.3	149.4
40 to 44 years....	1,453	880	573	8.2	9.0	7.2	153.6
45 to 49 years....	979	600	379	5.5	6.2	4.8	158.3
50 to 54 years....	713	418	295	4.0	4.3	3.7	141.7
55 to 59 years....	517	293	224	2.9	3.0	2.8	130.8
60 to 64 years....	378	200	178	2.1	2.1	2.2	112.4
65 to 69 years....	337	158	179	1.9	1.6	2.3	88.3
70 to 74 years....	272	125	147	1.5	1.3	1.9	85.0
75 years & over...	406	170	236	2.3	1.7	3.0	72.0
Median Age.....	28.5	29.6	27.1	...	...	...	...

Source: Rural-urban Projection program, Center for International Research, U.S. Bureau of the Census.

The demographic changes projected for the first half of the 1990s are expected to continue to 2000 — becoming less pronounced as the population grows through natural increase while the number of annual in-migrants remains constant (Table 14.9). The percentages of individuals aged less than five years, less than 15 years, and greater than 64 years all decline compared to the proportions projected in each of these age groups in 1995. By 2000, the median age of Palau's population is projected to increase to 30.8, more than 2 years older than the 1995 median. The male-female ratio increases further, exceeding 127 males per 100 females, but the increase is not as great as during the first five years of the projection.

Table 14.9. Projected Population by Age and Sex: 2000

Age Group	Numbers			Percents			Males
	Total	Males	Females	Total	Males	Females	Per 100 Females
Total.....	20,314	11,376	8,938	100.0	100.0	100.0	127.3
Less than 5 yrs...	1,943	994	949	9.6	8.7	10.6	104.7
5 to 9 years.....	1,745	891	854	8.6	7.8	9.6	104.3
10 to 14 years....	1,504	760	744	7.4	6.7	8.3	102.2
15 to 19 years....	1,461	764	697	7.2	6.7	7.8	109.6
20 to 24 years....	1,515	827	688	7.5	7.3	7.7	120.2
25 to 29 years....	1,704	972	732	8.4	8.5	8.2	132.8
30 to 34 years....	1,823	1,057	766	9.0	9.3	8.6	138.0
35 to 39 years....	1,973	1,188	785	9.7	10.4	8.8	151.3
40 to 44 years....	1,836	1,132	704	9.0	10.0	7.9	160.8
45 to 49 years....	1,543	955	588	7.6	8.4	6.6	162.4
50 to 54 years....	1,009	631	378	5.0	5.5	4.2	166.9
55 to 59 years....	706	422	284	3.5	3.7	3.2	148.6
60 to 64 years....	479	277	202	2.4	2.4	2.3	137.1
65 to 69 years....	328	173	155	1.6	1.5	1.7	111.6
70 to 74 years....	277	128	149	1.4	1.1	1.7	85.9
75 years & over...	468	205	263	2.3	1.8	2.9	77.9
Median Age.....	30.8	32.3	28.7	...	...	...	...

Source: Rural-urban Projection program, Center for International Research, U.S. Bureau of the Census.

These two tables contain a great deal of information — such as age distributions for males and females — that we do not discuss here. Similarly, we do not present age and sex distributions for the remaining years in the 30-year projection series. The trends in changing demographic structure documented for 1995 and 2000 are anticipated to continue, with selective migration of working age males continuing the increase of males in middle age groups (compared to the very young and old) and further increasing the male-female ratio.

## Conclusions

Here we present one set of population projections for the Republic of Palau, beginning with the 1990 census and continuing for three decades. The projections yield decreasing birth and migration rates, increasing death rates, and growth in the total population of the republic — the total number of inhabitants nearly doubling in the 30-year period. Key characteristics of the population are likely to change, with increasing numbers of working age persons, growth in the overall age of the population, and an increasing male-female ratio. The growing age of Palau's population with time, coupled with the relative increase in males over females, help to explain the projected changes in fertility and mortality.

The discussion population projections is necessarily brief. Since the OPS intends to prepare additional projections (as well as post-censal estimates) based on differing series of fertility and migration assumptions, the projections here are illustrative, providing an example of likely population increase in Palau over the coming decades if current trends in fertility, mortality, and migration continue.

## CHAPTER 15. HOUSING CHARACTERISTICS

The study of housing characteristics is important in virtually all settings involving human beings. Because everyone must live somewhere, the topic is universal, enabling comparisons between populations. Moreover, studying various aspects of housing provides important insights to development — often illuminating the interface between a traditional cultural system and the modernization that has affected most of the Pacific during the late twentieth century. The 1990 census of Palau implicitly acknowledges the important role played by housing, collecting and presenting a vast array of data on various aspects of the republic's housing stock.

Before beginning an examination of housing in Palau, a brief warning is in order — particularly to those readers unfamiliar with the data from housing censuses. Housing data typically are complex, usually organized in several special categories such as total units, year-round units, occupied units, owner-occupied units, renter-occupied units, and so on. The data presented from housing censuses often include information on each of these categories. Moreover, housing categories often are not consistent across census years, making diachronic comparisons difficult. Because of the complicated, often confusing nature of housing data, the report on the 1990 Census of Population and Housing for Palau contains 14 pages of definitions pertaining to housing and its various characteristics (U.S. Bureau of the Census, 1992c, pp. B-26 - B-39). This chapter focuses on a subset of these definitions.

Of the several topics that one might cover in an analysis of housing characteristics, this report emphasizes those which provide an overall appreciation of the housing stock in Palau and the variation of housing over space and time. A focus on geographic variation is essential, as many fundamental differences in housing exist between the states of the republic. A temporal focus similarly is crucial, for many of the characteristics of housing in Palau have changed dramatically over the past few years. We have organized this examination of housing characteristics into four major sections:

- general housing characteristics (total counts of various unit types, tenure, vacancy characteristics, and age);
- structural characteristics (number of housing units per structure, rooms per housing unit, and bedrooms per housing unit; material used for the construction of roofs, outer walls, and foundations);
- utilities (electricity, water, and sewer); and
- equipment (general plumbing; toilet, bathing, and kitchen facilities).

We present definitions and the related considerations of data limitations and comparability, necessary for a complete understanding of any description and analysis of housing characteristics,

immediately below. These definitions draw heavily on the information presented in the report on the 1990 census of population and housing of Palau. The most pervasive data limitation concerns comparisons between census years; housing data presented for 1980 typically concern year-round housing units, while data presented for 1986 consider only occupied units and those presented for 1990 concern total housing units (and occasionally occupied housing units by tenure). Because the 1986 census report does not contain detailed definitions for housing characteristics (see OPS, 1987, pp. 10-12), compatibility discussions emphasize the 1980 and 1990 censuses. *In general*, we present data for total housing units -- occasionally deviating from this trend for comparisons between 1990 and an earlier census. We avoid calculating changes in housing characteristics between census years when different types of units were recorded — with the exception of comparisons between year-round units (1980) and total housing units (1990), two categories that in essence are commensurate for Palau.

## Data Description

### *General Housing Characteristics*

A *housing unit* is a house, apartment, mobile home or trailer, or group of rooms or single room occupied as separate living quarters — or, if vacant, intended for occupancy as a separate living quarters. Separate living quarters are those in which the occupants live and eat apart from any other persons in the building and which have direct access only from outside the building or through a common hall. If living quarters contained nine or more persons unrelated to the householder or person in charge — thus containing 10 or more unrelated persons — the 1990 census classified them as *group quarters*. If living quarters contained eight or fewer persons unrelated to the householder or person in charge, the census recorded them as a housing unit. This chapter deals exclusively with housing units.

The 1990 census included both occupied and vacant housing units as part of the housing inventory. It included recreational vehicles, boats, vans, tents, etc. only if employed as someone's usual place of residence on Census Day 1990. The census classified a housing unit as *occupied* if it was the usual residence of the person or group of persons inhabiting it at the time of enumeration, or if the occupants were only temporarily absent. The census included vacant mobile homes provided that they were intended for occupancy on the site where they stood.

A *vacant* housing unit was one which contained no residents at the time of enumeration, unless its occupants were only temporarily absent. The census also considered vacant those units temporarily occupied at the time of enumeration by persons who usually resided elsewhere. A new unit not yet occupied was classified as vacant if construction had reached the point where all exterior windows and doors, and final usable floors, were in place. The census did not consider unoccupied units open to the elements as vacant. Also excluded from vacant units were quarters used entirely for non-residential purposes, such as a store, office, or storage facility.

The 1990 census distinguished between owner-occupied and renter-occupied housing units, a characteristic referred to as *tenure*. Questionnaire item H22, asked at all occupied housing units, dealt with tenure.

The census classified a housing unit as *owner-occupied* if the owner or co-owner resided in the unit on census day, even if the unit was mortgaged or not fully paid for. The remaining occupied housing units were classified as *renter-occupied*, regardless if cash or some other means of remittance was used. The census recorded a housing unit as "Rented for cash rent" if any money rent was paid or contracted for; this rent could come from individuals either living in the unit or elsewhere, or from an organization. Rental units classified under "No cash rent" generally were those provided free by friends or relatives, or in exchange for services such as those provided by a resident manager or tenant farmer.

The 1990 census defined the *homeowner vacancy rate* as the percentage of the total homeowner inventory vacant and for sale. *Rental vacancy rate*, in turn, is the percentage of the total rental inventory vacant and for rent.

Questionnaire item H7 concerned the year a structure was built. Census personnel attempted to determine year of construction for both occupied and vacant housing units. Data on the year a structure was built refer to when the building was first constructed, not when it was remodeled, added to, or converted. Recently built structures that met the housing unit definitional requirements (all exterior windows, doors, and final usable floors installed) were assigned to the "1989 to March 1990" category.

**Limitations.** For present purposes, the 1990 census data concerning housing unit definitions, tenure, and occupancy status contain no particular limitations. Data on the year a structure was built are more susceptible to errors of response and non-reporting than the other general housing characteristics considered in this chapter, as respondents must rely on their memory or on estimates of other persons familiar with their housing unit. Available evidence shows that respondents often underreport the year of construction of older units, especially those built before 1940.

**Comparability.** There was no change in the definition of housing units or occupancy status between the 1980 and 1990 censuses. The U.S. Census Bureau began collecting data on tenure for housing in Palau in 1970. However, through 1980 decennial censuses reported tenure only for year-round housing units — units intended for year-round use — a category no longer employed. In addition, the 1990 census expanded response categories to allow respondents to report whether a housing unit was owned with a mortgage or free and clear. Although the intention of this change was to improve the count of owner-occupied units (based on studies of U.S. respondents to earlier censuses), the possible change in count decreases the compatibility between this and previous censuses. The U.S. Census Bureau similarly began collecting data on vacancy status for housing in Palau in 1970.

Census reports through 1980 once again presented these data only for year-round housing units. For 1990, the category "Seasonal/recreational/occasional use" combined unoccupied units classified in 1980 under "Seasonal or migratory" and "Held for occasional use" categories. Finally, decennial censuses began collecting information on the year a structure was built for housing in Palau in 1970, although these data were shown only for year-round housing units through 1980. The 1990 census report presented these data for all housing units, in the process adding appropriate response categories to accommodate units built during the 10-year period between 1980 and 1990. The most recent census added the category "Don't know" in an effort to minimize the response error on year of construction, as discussed above.

### *Structural Characteristics*

The 1990 census obtained information on the number of housing units in a structure from questionnaire item H2, which it recorded for all housing units. In the Republic of Palau (as well as Guam and the CNMI), a structure comprised a separate building that either had open space on all four sides or was separated from other structures by dividing walls that extended from ground to roof. The statistics presented in the 1990 census report which refer to the number of housing units in separate structures of specified type and size consider the following categories.

- One-unit, detached -- a single-unit structure detached from any other structure (except a shed or garage). A one-family house which contained a business was considered detached as long as the building had open space on all four sides. Mobile homes or trailers to which one or more permanent rooms have been added or built also were classified under this category.
- One-unit, attached -- a one-unit structure which had one or more walls extending from ground to roof separating it from adjoining structures. In row houses and townhouses, double houses, and houses attached to non-residential structures, each housing unit was an individual attached structure if the dividing or common wall extended from ground to roof.
- Two or more units -- housing units in structures containing two or more housing units, further categorized as units in structures with two, three or four, five to nine, 10 to 19, 20 to 49, and 50 or more units.
- Mobile home or trailer -- mobile homes to which no permanent rooms have been added. The 1990 census excluded from this category mobile homes or trailers used only for business purposes or for extra sleeping space, and mobile homes or trailers for sale on a dealer's lot or in storage.
- Other -- any housing unit that did not fit the previous categories, such as abandoned cars, campers, vans, and shacks.

The 1990 census obtained information on the number of rooms per housing unit from questionnaire item H8, with resulting information recorded both for occupied and vacant housing units. The intent of this question was to count the number of whole rooms used for living purposes. For each unit, whole rooms included living rooms, dining rooms, kitchens, bedrooms, finished recreation rooms, enclosed porches suitable for year-round use, and lodger's rooms. Excluded were kitchenettes, strip or pullman kitchens, bathrooms, open porches, balconies, halls or foyers, utility rooms, unfinished attics or basements, and other unfinished space used for storage.

Data on bedrooms were obtained from questionnaire item H9, with resulting information recorded for both occupied and vacant housing units. The number of bedrooms refers to the count of rooms designed to be used as bedrooms — the number of rooms that one would count as bedrooms when listing a housing unit for sale or for rent. The 1990 census included as bedrooms all rooms *intended* for use as bedrooms even if residents were using them for some other purpose on Census Day. Housing units comprising a single room, such as an efficiency apartment, by definition were classified as having no bedroom.

The census collected data on the material used for the roofs of housing units with questionnaire item H5, the results recorded both for occupied and vacant housing units. The census classified each housing unit according to the type of material used most in the construction of its roof. The material categories employed were "Poured concrete," "Metal" (including zinc, steel, tin, etc.), "Wood" (including woodboard, plywood, etc.), "Thatch" (including sugar cane leaves, palm or pandanus thatch, palm leaves, straw, etc.), and "Other" — the last category accounting for all materials not covered by the previous four categories.

Information on the material used for the outside walls of housing units was obtained from questionnaire item H4, once again both for occupied and vacant housing units. The census classified each unit according to the type of material used most in the construction of its outside walls and included as separate categories "Poured concrete," "Concrete blocks" (including those where plaster cement covered the wall), "Metal" (including zinc, steel, tin, etc.), "Wood" (including woodboard, plywood, etc.), and "Other" — the latter once more accounting for all construction materials not covered by the four specific categories.

The 1990 census collected data on type of material used for the foundation of housing units with questionnaire item H6, both for occupied and vacant housing units. Census personnel classified each housing unit according to the type of material used most in its foundation. The categories employed were "Concrete," "Wood pier or pilings," and "Other" — the latter comprising units with foundations built with materials which could not be described by the first two categories as well as units with no foundation.

Limitations. No apparent limitations affect any of the structural characteristics considered in this report.

Comparability. The U.S. Census Bureau first collected information on the number of units per structure in Palau in 1970 — reporting the results only for year-round housing units through 1980, in contrast to the total units reported in 1990. Data on the number of rooms per unit, similarly collected in Palau for the first time in 1970, were shown for year-round housing units through 1980 and for all housing units in 1990. Data on the number of bedrooms were first collected for Palau in 1980. The 1980 definition of a bedroom *excluded* rooms designed for use as a bedroom but employed for some other purpose (though tests conducted with data from the U.S. revealed virtually no differences in the information obtained with these different questions). As with data on all rooms, bedroom statistics were shown only for year-round units in 1980 and for all housing units in 1990. Information on the material used for roofs and outside walls were collected for the first time in 1980 and shown only for year-round units — as opposed to data on all housing units presented in the 1990 census report. Data on the material used for foundations were collected for the first time in 1990.

### *Utilities*

The 1990 census collected data on electric power with questionnaire item H11, recorded both for occupied and vacant housing units. The census considered units to have electric power if they were so equipped — even if the current was shut off for some reason.

Data on source of water were obtained from questionnaire item H16, also recorded for occupied and vacant housing units. In Palau (as well as Guam and the CNMI), a common source supplying water through underground pipes to five or more units was classified as "Public (government) system only;" this included water supplied by a municipal water system, water district, or water company as well as water from a well which supplied five or more housing units. A water source classified as "Public (government) system and catchment," in turn, described those instances where running water came from a public (government) system *and* some type of catchment system. Housing units receiving water from a well located on the same property or nearby that serves four or fewer housing units were classified under the "Individual well" category. Included in this last type were units receiving well water that was hand drawn, wind drawn, or engine drawn; piped or not piped; and stored in tanks or used directly from the well. A housing unit was classified under "Catchment, tanks, or drums only" if the sole source of water was rainwater collected in the named equipment. Housing units whose source of water was a "Public standpipe or street hydrant" comprised those receiving water from an elevated tank, vertical storage cylinder, or street hydrant which was connected to a public system. Finally, residential units receiving water privately from springs, rivers, irrigation canals, creeks, or other sources not included in the preceding six categories were classified under "Some other source...."

Data on water supply, also referred to as "Piped water" and closely associated with source of water, were obtained from questionnaire items H10a and H10b — recorded both for occupied and unoccupied housing units. Piped water signified a housing unit where water was available at a sink,

wash basin, bathtub, or shower. The piped water may have been located within a housing unit, in a hallway associated with the unit, or in a room used by several other households in the building containing the unit (even if occupants had to go outdoors to reach that part of the building). If both hot and cold water were available, the census recorded the type of energy used by the water heater ("Electricity," "Gas," "Solar," or "Other fuels"). The census did not categorize as hot water that supplied by an electric faucet attachment at the kitchen sink, an electric shower attachment, or other similar equipment.

The census obtained data on sewage disposal from questionnaire item H17, recorded both for occupied and vacant housing units. Housing units were classified as connected to a "Public sewer," connected to a "Septic tank or cesspool," or disposing of sewage by "Other means." A public sewer may be operated by a government body or by a private organization. A housing unit was considered connected to a septic tank or cesspool when it had an underground pit or tank for sewage disposal. The *other* category included housing units which disposed of sewage in any manner not covered by the other two specific categories.

**Limitations.** No apparent limitations affect any of the utility characteristics considered in this report.

**Comparability.** The 1980 census asked a question on electrical power, supplier, and source, but reported these data only for year-round housing units; the 1990 census recorded these data for all housing units. Data on source of water similarly were collected beginning in 1980, but reported for year-round units in that year instead of the total units used in 1990. Data on water supply and sewage disposal were collected and reported similarly for year-round units in 1980 and total units in 1990.

### *Equipment*

The 1990 census obtained information on plumbing facilities from questionnaire items H10a, H10c, and H10d for occupied and unoccupied housing units. In Palau (as well as American Samoa and the CNMI), a unit was considered to have complete plumbing facilities when it had piped water, a flush toilet, and a bathtub or shower — regardless if these facilities were located in the unit being enumerated or inside the building which contained that unit.

Data on sinks with piped water were obtained from questionnaire item H18d, recorded for both occupied and vacant housing units. For classification as a housing unit possessing a sink with piped water, such a sink must be in the unit itself or inside the building containing the housing unit enumerated.

Questionnaire items H10d and H10e addressed the type of toilet facilities both in occupied and vacant housing units. A flush toilet consisted of any toilet connected to piped water and emptied into a public sewer, septic tank, or cesspool. If the unit did not have a flush toilet, the census asked a

respondent to identify the type of toilet facility in his or her housing unit — categorized as "Outhouse or privy" or "Other or none."

The 1990 census collected data on bathtub or shower with questionnaire item H10c both for occupied and vacant housing units. A bathtub or shower was counted only if connected permanently to piped running water — thus excluding equipment such as portable bathtubs.

Questionnaire items H18a and H18b concerned cooking facilities and were asked at both occupied and vacant housing units. Main cooking facilities were those used most often for the preparation of meals; they could be located either "Inside" or "Outside" the housing unit enumerated or in the building containing that housing unit. The 1990 census classified units with cooking facilities according to the energy used to power them, although the present study does not consider this information. A housing unit with "No cooking facilities" comprised a unit with no cooking facilities available either inside or outside the building containing it.

Finally, the census obtained data on refrigerators from questionnaire item H18c, recorded for occupied and vacant housing units. A refrigerator could be located in the housing unit enumerated or in a kitchen elsewhere in the building containing the unit. Housing units with "No refrigerator" were those utilizing any type of cooling system other than an electric or gas refrigerator, as well units that did not possess this appliance.

Limitations. No apparent limitations affect any of the equipment characteristics considered in this report.

Comparability. In Palau, the U.S. Bureau of the Census first collected data on plumbing facilities in 1970, reporting these data together to designate those housing units with "Complete plumbing." The 1980 census reported separately data on sink with running water and bathtub or shower, but combined toilet facility with the other two types of equipment under the "Complete plumbing" category. All data related to plumbing were reported for year-round housing units in 1980 and for total housing units in 1990. Information on cooking facilities in Palau similarly was collected first in 1980; data were reported for year-round housing units in 1980 and all housing units in 1990. The Census Bureau collected data on refrigerators in Palau beginning in 1970. The 1980 census distinguished between mechanical and ice refrigerators, which it reported for year-round housing units. In 1990, the census distinguished between electric and gas refrigerators, classifying units with ice refrigerators under "No refrigerator" and reporting the results for total housing units.

## **Analysis of Housing Characteristics Data**

### *General Housing Characteristics*

The 1990 decennial census recorded more than 3,300 total housing units in the Republic of Palau, an increase of more than 44 percent over the nearly 2,300 units reported in the 1980 census (Table 15.1). The number of occupied units, as well as owner- and renter-occupied units, increased during the 1980s. The rental inventory grew the greatest in relative terms over the decade, its share of the 1990 occupied units nearly twice that ten years earlier.

Table 15.1. Total Housing Units, Occupied Housing Units, Tenure of Occupied Units, and Rent: 1980, 1986 and 1990

Tenure	Number			Percent Change		Percent of Occupied Units		
	1990	1986	1980	1986-1990	1980-1996	1990	1986	1980
Total HU.....	3,312	NA	2,294	...	...	...	...	...
Occupied HU.....	2,885	2,501	2,039	15.4	22.7	100.0	100.0	100.0
Owner-occupied.....	2,204	1,823	1,766	20.9	3.2	76.4	72.9	86.6
Renter-occupied.....	681	618	273	10.2	126.4	23.6	24.7	13.4
Cash-rent.....	263	190	48	38.4	295.8	9.1	7.6	2.4
No cash rent.....	418	428	225	-2.3	90.2	14.5	17.1	11.0
Tenure Not Stated...	-	60	-	...	...	-	2.4	-

Sources: U.S. Bureau of the Census, 1983, Table 2; 1992c, Tables 99, 100; OPS, 1987, Table B6.

Note: Palau contained 2,265 year-round housing units in 1980, the unit type for which the 1980 census reported most housing statistics.

Vacancy rates also changed markedly between the most recent two decennial censuses. In 1980, the home owner vacancy rate in Palau was 3.6 percent, while the renter vacancy rate was 6.2 percent (U.S. Bureau of the Census, 1983, p. 6). By 1990, the former had decreased to zero while latter increased to 10.6 percent (U.S. Bureau of the Census, 1992c, p. 131). The increase in rental vacancy rate during the 1980s probably was a result of this portion of the housing inventory developing very rapidly over the decade and having relatively little time to adjust to evolving market demands — particularly in light of the large influx of immigrants who use such housing. Moreover, although the number of renter-occupied units in Palau grew by nearly two-and-one-half times between 1980 and 1990, it still totalled fewer than 700 units at the end of the decade. A vacancy rate of 10 percent thus translates into a small absolute number of vacant units which could disappear very quickly with slight changes in market conditions. Explaining the decrease in home owner vacancy rate is more difficult. The relatively slow growth in owner-occupied units during the 1980s, coupled with a reduction in extended family residential patterns, probably accounts for much of the change.

In 1990 Koror State contained the majority of all housing units as well as each type of occupied unit in Palau (Table 15.2). Housing inventories typically respond to market demand. Much of this demand in Koror probably resulted from the increase in the state's immigrant population during the

1980s — individuals who legally cannot own real estate in Palau and therefore must rent. In addition, as the center for government and economic activity in the republic, Koror State hosts people temporarily in residence on official activities or business, providing another source of demand for rental housing. The amount of housing in Airai State was a distant second to that of Koror, with the remaining states containing relatively small numbers of each type of housing unit considered.

Table 15.2. Total Housing Units, Occupied Housing Units, and Tenure, by State: 1990

State	Number				Percent			
	Total Housing Units	Occupied			Total Housing Units	Occupied		
		Total	Owner	Renter		Total	Owner	Renter
Total.....	3,312	2,885	2,204	681	100.0	100.0	100.0	100.0
Aimeliik.....	100	81	64	17	3.0	2.8	2.9	2.5
Airai.....	283	256	209	47	8.5	8.9	9.5	6.9
Angaur.....	63	50	48	2	1.9	1.7	2.2	0.3
Hatohobei.....	16	4	4	-	0.5	0.1	0.2	-
Kayangel.....	42	31	30	1	1.3	1.1	1.4	0.1
Koror.....	2,096	1,912	1,335	577	63.3	66.3	60.6	84.7
Melekeok.....	71	49	48	1	2.1	1.7	2.2	0.1
Ngaraard.....	108	71	69	2	3.3	2.5	3.1	0.3
Ngardmau.....	34	29	29	-	1.0	1.0	1.3	-
Ngaremlengui...	64	55	51	4	1.9	1.9	2.3	0.6
Ngatpang.....	21	14	13	1	0.6	0.5	0.6	0.1
Ngchesar.....	81	61	54	7	2.4	2.1	2.5	1.0
Ngerchelong....	100	78	77	1	3.0	2.7	3.5	0.1
Ngiwal.....	59	52	45	7	1.8	1.8	2.0	1.0
Peleliu.....	156	131	121	10	4.7	4.5	5.5	1.5
Sonsorol.....	18	11	7	4	0.5	0.4	0.3	0.6

Source: U.S. Bureau of the Census, 1992c, Table 100.

Most houses in Palau were constructed relatively recently. As of Census Day 1990, nearly 45 percent of the total housing units had been constructed during the preceding decade, with more than 75 percent built sometime over the preceding 20 years (Table 15.3). Once again, due to its numerical dominance of Palau's housing inventory Koror State influenced much of the republic-wide residential construction trends. Airai State, with its recent growth in population and housing, contained a relatively large proportion of units constructed in 1985 or later. Housing located in more remote parts of Palau generally had relatively larger percentages of housing built in the 1970s or before.

Table 15.3. Year of Construction of All Housing Units, by State: 1990

Before State 1970	Numbers					Percents			
	Total	1985-	1980-	1970-	Before	Total	1985-	1980-	1970-
		1990	1984	1979	1970		1990	1984	1979
Total HU...	3,312	793	681	1,014	824	100.0	23.9	20.6	30.6
24.9 Aimeliik.....	100	18	36	32	14	100.0	18.0	36.0	32.0
14.0 Airai.....	283	108	62	75	38	100.0	38.2	21.9	26.5
13.4 Angaur.....	63	17	12	8	26	100.0	27.0	19.0	12.7
41.3 Hatohebei....	16	1	5	5	5	100.0	6.3	31.3	31.3
31.3 Kayangel.....	42	10	6	19	7	100.0	23.8	14.3	45.2
16.7 Koror.....	2,096	500	410	667	519	100.0	23.9	19.6	31.8
24.8 Melekeok.....	71	11	16	23	21	100.0	15.5	22.5	32.4
29.6 Ngaraard.....	108	29	23	30	26	100.0	26.9	21.3	27.8
24.1 Ngerchelong..	100	14	21	27	38	100.0	14.0	21.0	27.0
38.0 Ngardmau.....	34	5	12	7	10	100.0	14.7	35.3	20.6
29.4 Ngaremlengui.	64	19	9	27	9	100.0	29.7	14.1	42.2
14.1 Ngatpang.....	21	5	5	10	1	100.0	23.8	23.8	47.6
4.8 Ngchesar.....	81	12	16	12	41	100.0	14.8	19.8	14.8
50.6 Ngiwal.....	59	13	8	11	27	100.0	22.0	13.6	18.6
45.8 Peleliu.....	156	24	34	59	39	100.0	15.4	21.8	37.8
25.0 Sonsorol.....	18	7	6	2	3	100.0	38.9	33.3	11.1

Source: U.S. Bureau of the Census, 1992c, Table 101.

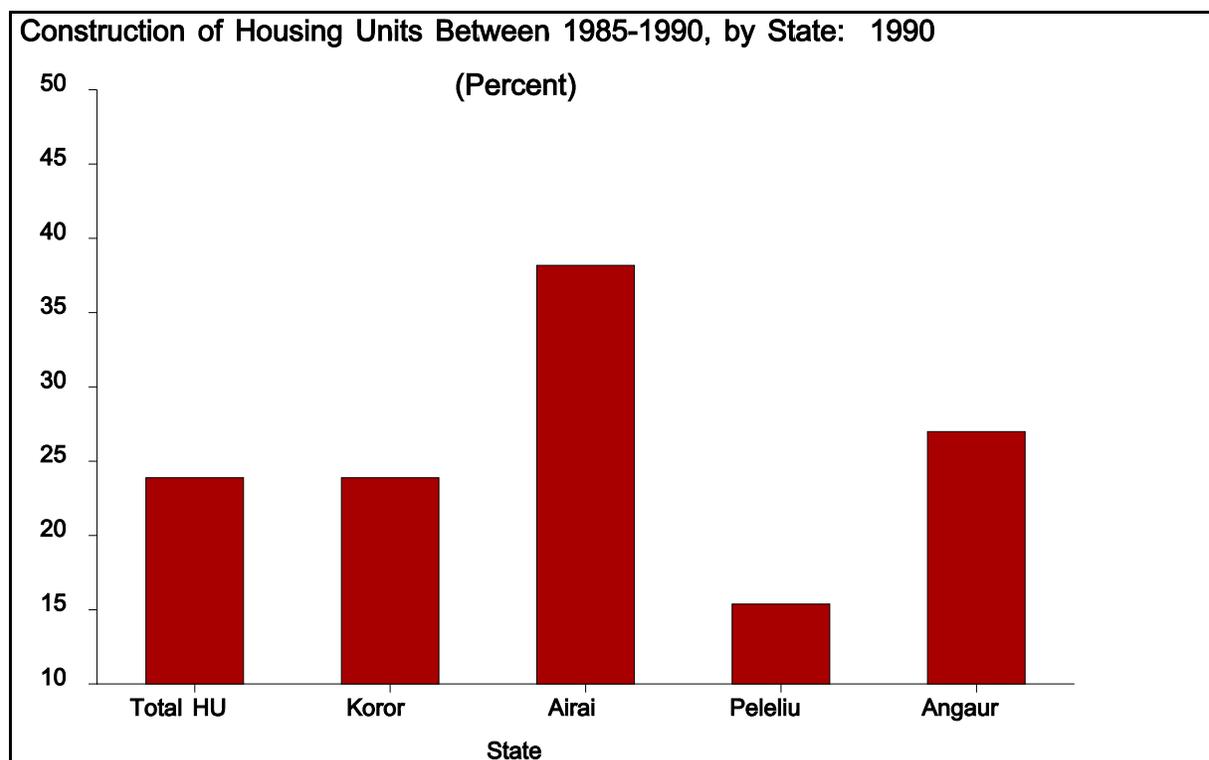


Figure 15.1. Percent of Housing Units Constructed After 1984 for Selected States: 1990

### Structural Characteristics

The majority of housing units recorded in the 1990 census of Palau were single, detached structures — about 82 percent of all occupied units (Table 15.4). Most of the remaining units were in single attached structures, with multiple-unit structures accounting for all but a few of those remaining. A clear distinction between owner- and renter-occupied units is apparent, the latter comprising a much smaller percentage of single structures and a much larger percentage of multi-unit structures. This distinction reflects the presence of multi-unit rental apartment buildings, further evidence of increasing Western influence in the republic. The 1990 census counted a few units classified as "other," such as campers, vans, and shacks. Palau contained only four mobile homes. (Actually, no mobile homes as normally defined existed in Palau in 1990.)

Table 15.4. Occupied Housing Units by Number of Units per Structure and Tenure: 1980 and 1990

Units in Structure	Number				Percent			
	1990		1980		1990		1980	
	Owner	Renter	Owner	Renter	Owner	Renter	Owner	Renter
Occupied HU.....	2,204	681	1,766	273	100.0	100.0	100.0	100.0
100.0 One, detached.....	2,029	326	1,500	176	92.1	47.9	84.9	64.5
One, attached.....	146	116	157	71	6.6	17.0	8.9	26.0
Two.....	7	26	23	1	0.3	3.8	1.3	0.4
Three or Four.....	4	51	45	10	0.2	7.5	2.5	3.7
Five or more.....	5	127	41	15	0.2	18.6	2.3	5.5
Mobile home/trailer...	2	2	-	-	0.1	0.3	-	-
Other.....	11	33	...	...	0.5	4.8	...	...

Sources: U.S. Bureau of the Census, 1983, Table 3; 1992c, Table 101.

Note: 1980 figures refer to occupied year-round housing units.

The distribution of housing in Palau by number of units was similar to the distribution reported for 1980. The most evident changes over the decade were relative increases in owner-occupied and a relative decrease in renter-occupied single detached units. The former trend no doubt resulted from the construction boom during the 1980s. Despite increasing Western influence and changes in the types of housing available, Palauans continue to live in single, detached units — a unit type particularly suitable for the larger families and fluid residential patterns. The relative decrease in renter-occupied single detached housing units, conversely, was a consequence of the more rapid growth in multi-unit rental property during the 1980s.

In 1990, all states in Palau had single, detached occupied housing units — the traditional type of residential structure found in the republic (Table 15.5). Other unit types were much less universal,

with most located in Koror, Peleliu, and Airai states. With very few exceptions, Koror State contained all multi-unit residential structures. Airai and Koror states together accounted for all but four of the units classified under "Other" — non-traditional housing options chosen by individuals residing in the two most rapidly growing states in the republic.

Table 15.5. Occupied Housing Units by Number of Units per Structure, by State: 1990

State	Occupied Housing Units	One, Detached	One, Attached	Two	Three-Four	Five or More	Mobile Home/Trailer	Other
Total.....	2,885	2,355	262	33	55	132	4	44
Aimeliik.....	81	72	6	-	-	-	-	3
Airai.....	256	227	16	-	-	3	-	-
10								
Angaur.....	50	49	-	-	-	-	1	-
Hatohebei.....	4	4	-	-	-	-	-	-
Kayangel.....	31	31	-	-	-	-	-	-
Koror.....	1,912	1,474	193	31	52	129	3	30
Melekeok.....	49	48	-	-	-	1	-	-
Ngaraard.....	71	69	-	2	-	-	-	-
Ngardmau.....	29	25	3	-	-	-	-	1
Ngaremlengui...	55	55	-	-	-	-	-	-
Ngatpang.....	14	14	-	-	-	-	-	-
Ngchesar.....	61	61	-	-	-	-	-	-
Ngerchelong....	78	67	11	-	-	-	-	-
Ngiwal.....	52	52	-	-	-	-	-	-
Peleliu.....	131	98	31	-	-	2	-	-
Sonsorol.....	11	9	2	-	-	-	-	-

Source: U.S. Bureau of the Census, 1992c, Table 101.

In addition to growth in the total number of housing units in Palau and changes in their types of structures, the size of the structures also changed. In 1980 the median number of rooms per occupied housing unit was only 2.7. Over the decade this measure increased to 3.2 rooms by 1986 and 3.7 by 1990 (Table 15.6). The number of residential units with three or fewer rooms decreased, declining from 58.3 percent of the occupied units in 1980 to 31.9 percent in 1990. Over the same time period, the number of housing units containing six or more rooms increased from 7.2 percent of all occupied units in 1980 to 17.5 percent 10 years later. Although many of these changes in Palau's housing stock no doubt were due to new construction, the modification of existing units through building additions to existing small structures produces the same result. Whatever the means used to change size, homes had more rooms during the 1980s.

Table 15.6. Rooms per Occupied Housing Unit: 1980, 1986, and 1990

Rooms	Number			Percent Change		Percent		
	-----			-----		-----		
	1990	1986	1980	1986- 1990	1980- 1986	1990	1986	1980
Occupied HU.....	2,885	2,501	2,039	15.4	22.7	100.0	100.0	100.0
1 room.....	143	217	230	-34.1	-5.7	5.0	8.7	11.3
2 rooms.....	267	385	430	-30.6	-10.5	9.3	15.4	21.1
3 rooms.....	508	544	531	-6.6	2.4	17.6	21.8	26.0
4 rooms.....	796	601	430	32.4	39.8	27.6	24.0	21.1
5 rooms.....	666	400	270	66.5	48.1	23.1	16.0	13.2
6 rooms.....	294	186	106	58.1	75.5	10.2	7.4	5.2
7 rooms.....	121	61	31	98.4	96.8	4.2	2.4	1.5
8 or more rooms....	90	46	11	95.7	318.2	3.1	1.8	0.5
Not stated.....	...	61	...	...	...	...	2.4	...
Median.....	3.7	3.2	2.7	...	...	...	...	...

Sources: U.S. Bureau of the Census, 1983, Table 3; 1992c, Table 102; OPS, 1987, Table B6.

Note: 1980 figures refer to occupied year-round housing units.

Slight differences in unit size by tenure also emerged over the 1980s. In both 1980 and 1990, owner-occupied housing units tended to contain more rooms than renter-occupied units — the difference increasing over the decade (Table 15.7).

The changes in unit size among owner-occupied units were due to the same trends as for all occupied units — that is, a reduction in units containing few rooms and an increase in units containing many rooms. But the changes in rental units were different. All unit sizes increased over the decade, but the inventory of larger units grew more rapidly than the smaller units.

Table 15.7. Rooms per Occupied Housing Unit, by Tenure: 1980 and 1990

Rooms	Number				Percent			
	1990		1980		1990		1980	
	Owner	Renter	Owner	Renter	Owner	Renter	Owner	Renter
Occupied HU....	2,204	681	1,766	273	100.0	100.0	100.0	100.0
1 room.....	67	76	186	44	3.0	11.2	10.5	16.1
2 rooms.....	160	107	370	60	7.3	15.7	21.0	22.0
3 rooms.....	377	131	455	76	17.1	19.2	25.8	27.8
4 rooms.....	623	173	373	57	28.3	25.4	21.1	20.9
5 rooms.....	568	98	242	28	25.8	14.4	13.7	10.3
6 rooms.....	245	49	100	6	11.1	7.2	5.7	2.2
7 rooms.....	102	19	30	1	4.6	2.8	1.7	0.4
8 or more rooms...	62	28	10	1	2.8	4.1	0.6	0.4
Median.....	3.8	3.2	2.7	2.4	...	...	...	...

Sources: U.S. Bureau of the Census, 1983, Table 3; 1992c, Table 102.  
 Note: 1980 figures refer to occupied year-round housing units.

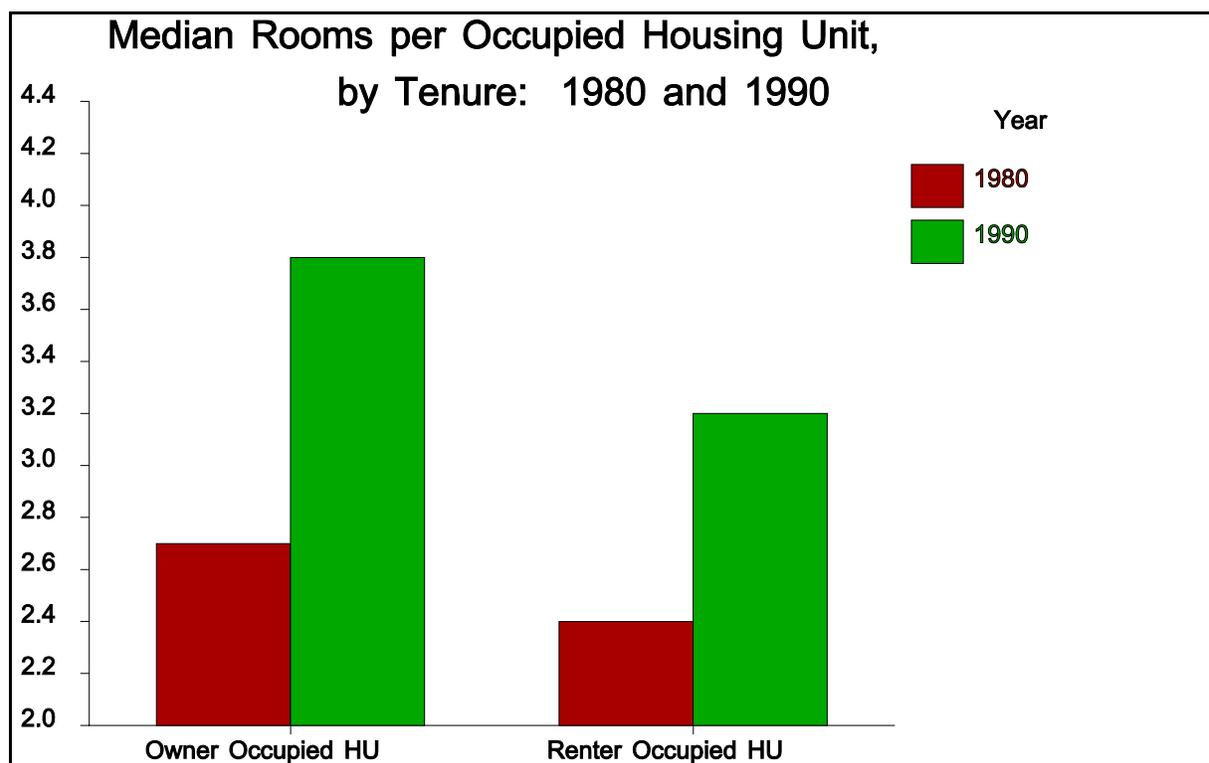


Figure 15.2. Median Rooms per Occupied Housing Unit by Tenure: 1980 and 1990

The number of rooms per occupied housing unit varied among Palau's states in 1990 (Table 15.8). Koror State, which contained nearly two-thirds of the republic's occupied housing units, also contained units with the largest number of rooms. The median number of rooms in the occupied housing of all other states was less. Housing units with many rooms generally reflect Western influence, helping to account for the difference between Koror, the most Westernized state in Palau, and the remaining states in the republic — many of the latter, such as Hatohobei and Sonsorol, maintaining much of their traditional way of life.

Table 15.8. Number of Rooms per Occupied Housing Unit, by State: 1990

State Median	Occupied Housing Units	Number of Rooms per Occupied Unit								
		1	2	3	4	5	6	7	8	9+
Total.....	2,885	143	267	508	796	666	294	121	39	51
3.7										
Aimeliik.....	81	-	8	18	31	11	7	3	1	2
3.5										
Airai.....	256	19	25	64	75	45	17	4	2	5
3.3										
Angaur.....	50	-	8	17	17	7	1	-	-	-
3.0										
Hatohobei....	4	2	-	-	-	2	-	-	-	-
1.0										
Kayangel.....	31	4	4	11	5	6	1	-	-	-
2.7										
Koror.....	1,912	77	167	260	492	493	242	103	34	44
3.9										
Melekeok.....	49	2	5	14	18	9	-	1	-	-
3.2										
Ngaraard.....	71	11	7	15	20	11	4	3	-	-
3.1										
Ngardmau.....	29	-	8	8	10	2	1	-	-	-
2.8										
Ngaremlengui.	55	5	5	10	16	9	6	3	1	-
3.5										
Ngatpang.....	14	-	-	5	3	4	2	-	-	-
3.7										
Ngchesar.....	61	13	7	26	9	5	1	-	-	-
2.4										
Ngerchelong..	78	5	8	14	34	13	2	1	1	-
3.4										
Ngiwal.....	52	-	2	13	17	19	1	-	-	-
3.6										
Peleliu.....	131	1	11	30	48	29	9	3	-	-
3.5										
Sonsorol.....	11	4	2	3	1	1	-	-	-	-
1.7										

Source: U.S. Bureau of the Census, 1992c, Table 104.

Another measure of housing unit structure is number of bedrooms per unit. As was the case with the number of total rooms per unit, the median number of bedrooms per unit increased during the 1980s (Table 15.9). The number of units with no formal bedrooms — traditional Palauan residential structures — declined over the decade while the number of units with one or more bedrooms increased. The biggest percentage increases occurred in housing units with three or more bedrooms, once again probably representing the growing influence of Western culture.

Table 15.9. Number of Bedrooms per Housing Unit, All Units: 1980 and 1990

Number of Bedrooms	Number		Percent Change		
	1990	1980	1980- 1990	Percent	
				1990	1980
Total HU.....	3,312	2,265	46.2	100.0	100.0
No bedrooms.....	252	362	-30.4	7.6	16.0
1 bedroom.....	634	573	10.6	19.1	25.3
2 bedrooms.....	1,126	721	56.2	34.0	31.8
3 bedrooms.....	898	424	111.8	27.1	18.7
4 bedrooms.....	257	149	72.5	7.8	6.6
5 or more bedrooms.....	145	36	302.8	4.4	1.6
Median.....	1.7	1.3	...	...	...

Sources: U.S. Bureau of the Census, 1984a, Table 9; 1992c, Table 100.

Note: 1980 figures refer to total year-round housing units.

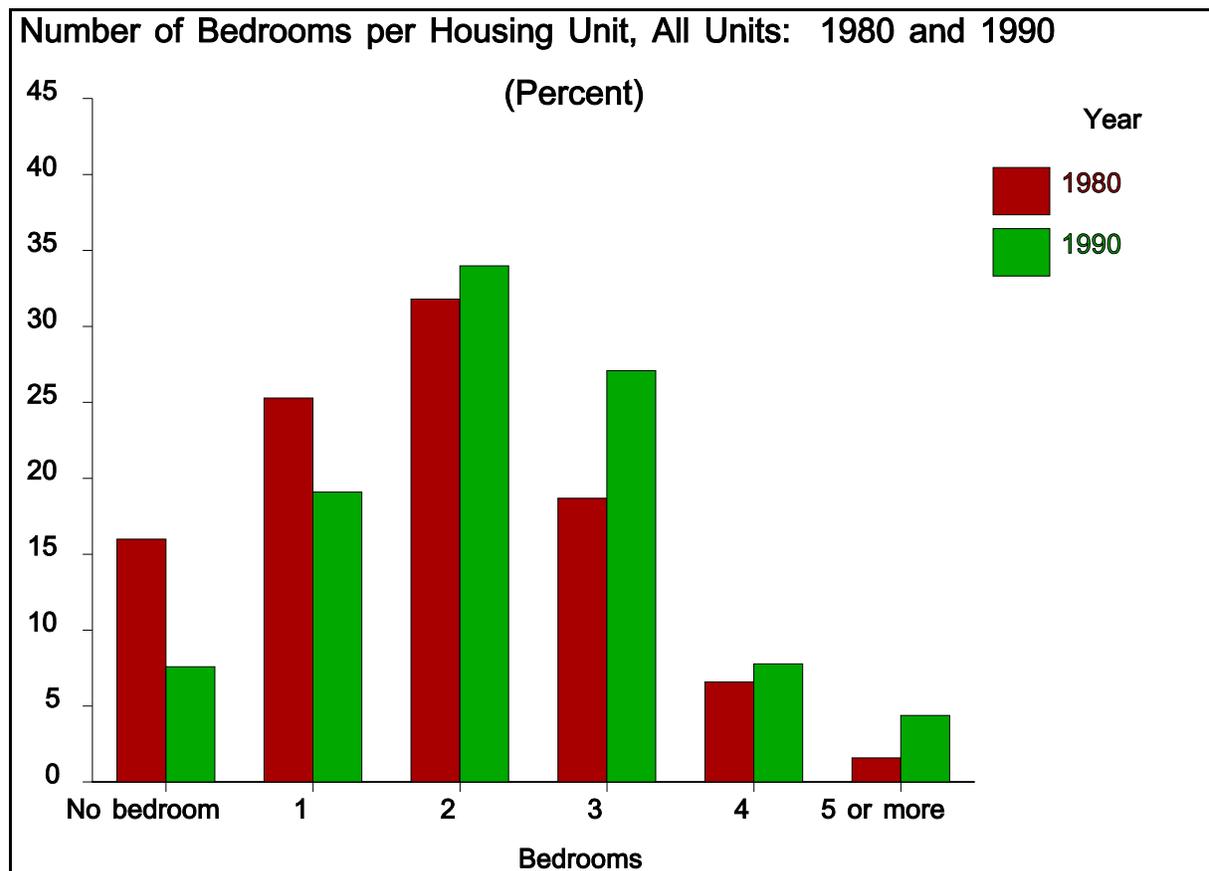


Figure 13.4. Number of Bedrooms per Housing Unit: 1980 and 1990

In addition to containing the most housing units in Palau, the state of Koror contained a disproportionate number of units with three or more bedrooms (Table 15.10). This state contained virtually all residential units with four or more bedrooms — and relatively few units with zero or one bedroom. More remote places in Palau, probably by virtue of less exposure to Western influence, less accessibility, and generally lower income (making the construction of larger housing units more difficult), had larger proportions of housing units with few or no bedrooms.

Table 15.10. Number of Bedrooms, All Housing Units, by State: 1990

State	Total Housing Units	Number of Bedrooms					
		None	1	2	3	4	5 or more
Total.....	3,312	252	634	1,126	898	257	145
Aimeliik.....	100	-	26	43	23	6	2
Airai.....	283	30	71	107	48	20	7
Angaur.....	63	-	18	27	18	-	-
Hatohobei.....	16	10	2	1	3	-	-
Kayangel.....	42	6	15	11	9	1	-
Koror.....	2,096	117	336	660	651	207	125
Melekeok.....	71	4	19	37	9	1	1
Ngaraard.....	108	27	21	40	16	1	3
Ngardmau.....	34	-	15	13	6	-	-
Ngaremlengui....	64	6	14	20	15	6	3
Ngatpang.....	21	-	8	10	2	1	-
Ngchesar.....	81	25	29	17	10	-	-
Ngerchelong....	100	12	22	40	20	5	1
Ngiwal.....	59	1	13	26	18	1	-
Peleliu.....	156	6	22	69	48	8	3
Sonsorol.....	18	8	3	5	2	-	-

Source: U.S. Bureau of the Census, 1992c, Table 100.

In contrast to recent changes in the composition of housing, the materials used to construct housing units in Palau changed relatively little over the decade. Here we focus on three parts of a residential structure — the roof, outside walls, and foundation. In 1980, most roofs of housing units in Palau were metal, a trend that continued throughout the 1980s (Table 15.11). The portion of housing units with concrete roofs doubled slightly during the decade, accompanying the introduction of new construction methods and the increase of multiple unit structures (most of the latter being built with concrete roofs). The units with wood or thatch roofs, in contrast, decreased during the 1980s. Their decline in absolute numbers of units implies the replacement of roofs that no longer serve their purpose or the replacement of entire older units. Wood and thatch are more traditional construction materials, with concrete and metal obviously more recent, imported materials. Most of the new housing built between 1980 and 1990 had roofs constructed from the latter two materials — the persistence of metal due in part to its much lower cost compared to concrete.

Table 15.11. Material Used for Roof, Housing Units: 1980, 1986 and 1990

Type of Material	Number			Percent		
	1990	1986	1980	1990	1986	1980
Housing Units.....	3,312	2,501	2,265	100.0	100.0	100.0
Poured Concrete.....	348	185	114	10.5	7.4	5.0
Metal.....	2,874	2,200	1,986	86.8	88.0	87.7
Wood.....	43	36	124	1.3	1.4	5.5
Thatch.....	22	21	29	0.7	0.8	1.3
Other.....	25	6	12	0.8	0.2	0.5
Unknown.....	...	53	...	...	2.1	...

Sources: U.S. Bureau of the Census, 1984a, Table 9; 1992c, Table 105; OPS, 1987, Table B4.

Notes: 1990 data for all housing units, 1986 data for occupied housing units, and 1980 data for year-round housing units.

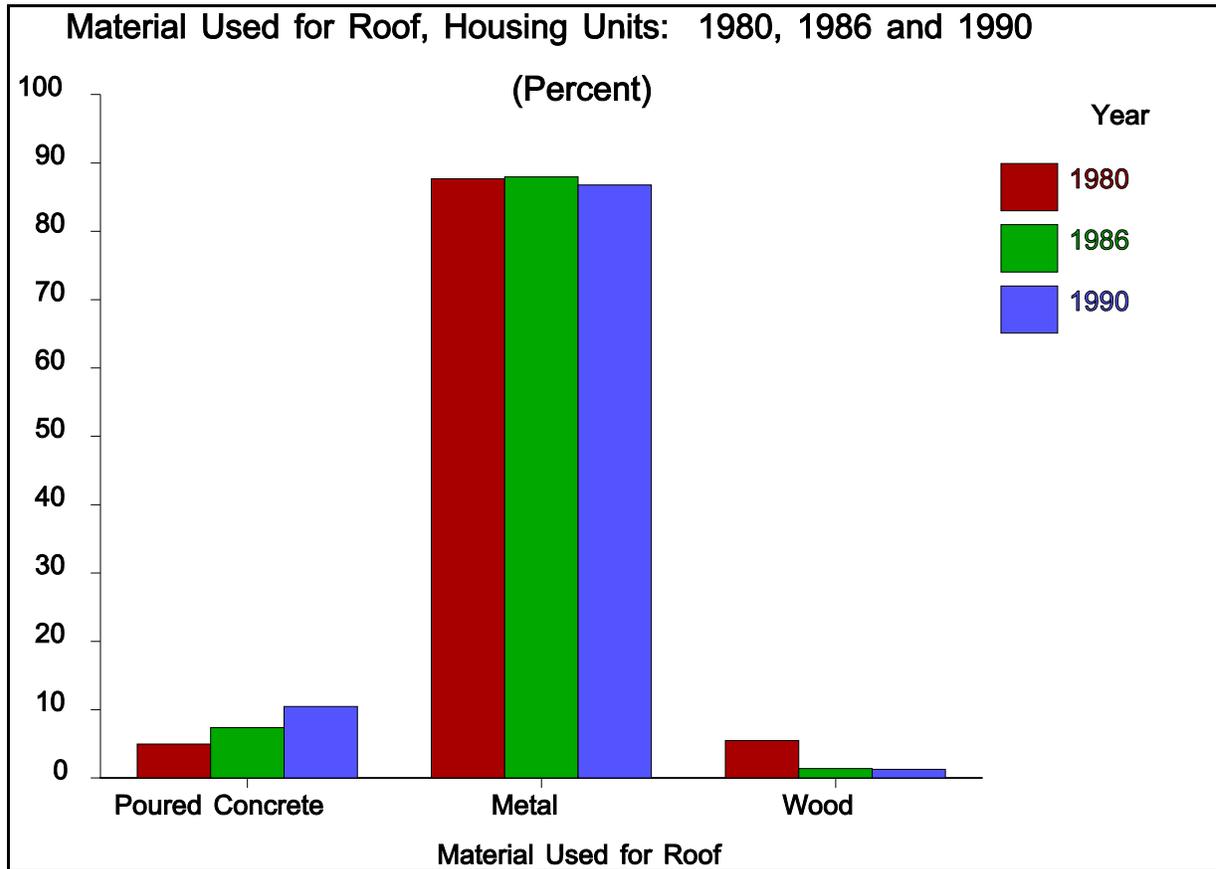


Figure 15.4. Material Used for Roof: 1980, 1986 and 1990

The tendency for Koror State to have more modern housing is seen in the material used for roofs. More than 97 percent of the total residential units in this state had roofs of metal or poured concrete (Table 15.12). Virtually all cases of the latter, an indication of modern construction and often a feature of multiple unit residential structures, were found in Koror and Airai states. More remote, rural states contained greater percentages of housing with roofs built from traditional materials — with both wood and thatch recorded under "Other" in Table 15.12. A large percentage of rural housing units had metal roofs.

Table 15.12. Material Used for Roof, All Housing Units, by State: 1990

State	Number				Percent			
	Total	Poured Con- crete	Metal	Other	Total	Poured Con- crete	Metal	Other
Housing Units...	3,312	348	2,874	90	100.0	10.5	86.8	2.7
Aimeliik.....	100	-	100	-	100.0	-	100.0	-
Airai.....	283	34	245	4	100.0	12.0	86.6	1.4
Angaur.....	63	-	63	-	100.0	-	100.0	-
Hatohobei.....	16	-	6	10	100.0	-	37.5	62.5
Kayangel.....	42	1	41	-	100.0	2.4	97.6	-
Koror.....	2,096	303	1,731	62	100.0	14.5	82.6	3.0
Melekeok.....	71	3	65	3	100.0	4.2	91.5	4.2
Ngaraard.....	108	2	105	1	100.0	1.9	97.2	0.9
Ngardmau.....	34	-	34	-	100.0	-	100.0	-
Ngaremlengui.....	64	-	61	3	100.0	-	95.3	4.7
Ngatpang.....	21	-	21	-	100.0	-	100.0	-
Ngchesar.....	81	-	80	1	100.0	-	98.8	1.2
Ngerchelong.....	100	-	100	-	100.0	-	100.0	-
Ngiwal.....	59	-	58	1	100.0	-	98.3	1.7
Peleliu.....	156	5	149	2	100.0	3.2	95.5	1.3
Sonsorol.....	18	-	15	3	100.0	-	83.3	16.7

Source: U.S. Bureau of the Census, 1992c, Table 105.

The material used for outside walls of residential units also changed during the 1980s — a move towards increasingly modern construction. The use of concrete increased between 1980 and 1990, with both larger numbers and percentages of housing units with poured concrete and concrete block walls (Table 15.13). The number and percentage of housing units with walls constructed from wood similarly increased during the decade. Conversely, the frequency of units with walls of metal or "Other" (primarily thatch) materials decreased during the 1980s. Although metal is not a traditional construction material, its use for residential construction has a long precedent in Micronesia. Concrete and wood are replacing metal walls because they are sturdier. They are also more expensive. The slight discrepancies in trends for wall construction in the 1986 data probably are due to differences in definitions and data collection procedures used by the 1980, 1986, and 1990 censuses.

Table 15.13. Material Used for Outside Walls, Housing Units: 1980, 1986 and 1990

Type of Material	Number			Percent		
	1990	1986	1980	1990	1986	1980
Housing Units.....	3,312	2,501	2,265	100.0	100.0	100.0
Concrete.....	879	594	378	26.5	23.8	16.7
Poured concrete.....	136	214	71	4.1	8.6	3.1
Concrete blocks.....	743	380	307	22.4	15.2	13.6
Metal.....	1,495	1,330	1,347	45.1	53.2	59.5
Wood.....	924	485	523	27.9	19.4	23.1
Other.....	14	38	17	0.4	1.5	0.8
Unknown.....	...	54	...	...	2.2	...

Sources: U.S. Bureau of the Census, 1984a, Table 9; 1992c, Table 105; OPS, 1987, Table B4.

Notes: 1990 data for all housing units, 1986 data for occupied housing units, and 1980 data for year-round housing units.

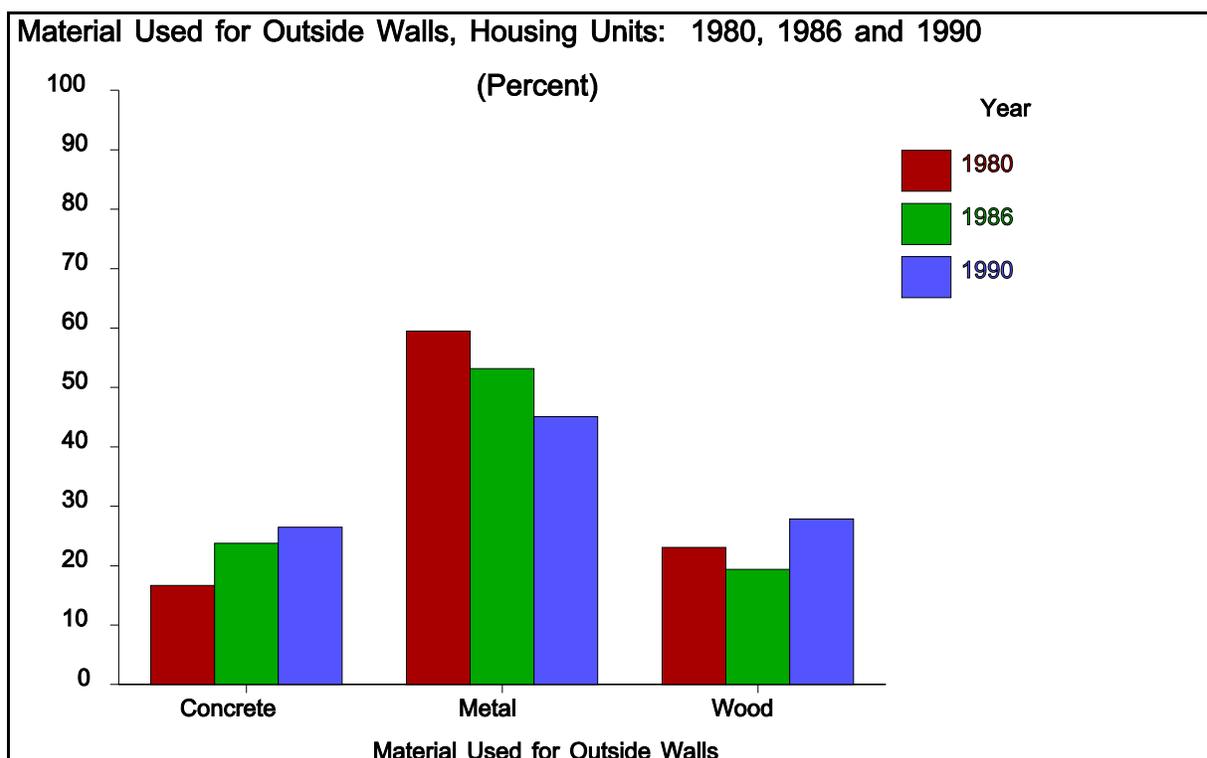


Figure 15.5. Material Used for Outside Walls: 1980, 1986, and 1990

In 1990, most of the housing units in Palau with concrete walls were found in Koror, Airai, and Peleliu states (Table 15.14). Because the first two states have experienced the greatest recent growth in population and housing, it is not unreasonable to expect their residential construction to feature more modern, expensive material. Peleliu State, on the other hand, lost population between 1980 and 1990. Relatively few housing units in the other rural states of Palau had concrete walls, with the most remote states of Hatohobei and Sonsorol having none at all. The walls of housing units in most rural states were metal, a relatively inexpensive, available, and easily transported alternative to the thatch used in traditional times and the concrete of more modern construction.

Table 15.14. Material Used for Outside Walls, All Housing Units, by State: 1990

State	Number				Percent			
	Housing Units	Concrete	Metal	Wood & Other	Total	Concrete	Metal	Wood & Other
Total.....	3,312	879	1,495	938	100.0	26.5	45.1	28.3
Aimeliik.....	100	14	77	9	100.0	14.0	77.0	9.0
Airai.....	283	66	138	79	100.0	23.3	48.8	27.9
Angaur.....	63	7	31	25	100.0	11.1	49.2	39.7
Hatohobei.....	16	-	10	6	100.0	-	62.5	37.5
Kayangel.....	42	3	30	9	100.0	7.1	71.4	21.4
Koror.....	2,096	668	786	642	100.0	31.9	37.5	30.6
Melekeok.....	71	7	41	23	100.0	9.9	57.7	32.4
Ngaraard.....	108	10	73	25	100.0	9.2	67.6	25.9
Ngardmau.....	34	1	28	5	100.0	2.9	82.4	14.7
Ngaremlengui....	64	14	41	9	100.0	21.9	64.1	14.1
Ngatpang.....	21	2	17	2	100.0	9.5	81.0	9.5
Ngchesar.....	81	3	57	21	100.0	3.7	70.4	25.9
Ngerchelong.....	100	7	71	22	100.0	7.0	71.0	22.0
Ngiwal.....	59	7	38	14	100.0	11.9	64.4	23.7
Peleliu.....	156	70	50	36	100.0	44.9	32.1	23.1
Sonsorol.....	18	-	7	11	100.0	-	38.9	61.1

Source: U.S. Bureau of the Census, 1992c, Table 105.

The foundations of most housing units in Palau in 1990 were constructed of concrete, with most of the remainder built from wood (Table 15.15). As with other portions of a housing unit, concrete represents a more expensive, modern alternative to traditional materials. However, concrete foundations are much more prevalent throughout most of the republic — probably in part due to their long-established dominance among materials used to construct Western-style housing. Most of the units with concrete foundations in 1990 were located in Koror, Airai, and Peleliu states, although

Ngaremlengui contained a relatively large percentage of such units. Concrete foundations were much scarcer in the other rural states, with few or none found in Hatohobei and Sonsorol states.

Table 15.15. Material Used for Foundation, All Housing Units, by State: 1990

State	Number				Percent			
	Housing Units	Concrete	Wood	Other	Total	Concrete	Wood	Other
Total.....	3,312	1,738	1,556	18	100.0	52.5	47.0	0.5
Aimeliik.....	100	19	81	-	100.0	19.0	81.0	-
Airai.....	283	97	186	-	100.0	34.3	65.7	-
Angaur.....	63	16	47	-	100.0	25.4	74.6	-
Hatohobei.....	16	-	16	-	100.0	-	100.0	-
Kayangel.....	42	7	35	-	100.0	16.7	83.3	-
Koror.....	2,096	1,339	740	17	100.0	63.9	35.3	0.8
Melekeok.....	71	18	53	-	100.0	25.4	74.6	-
Ngaraard.....	108	33	74	1	100.0	30.6	68.5	0.9
Ngardmau.....	34	2	32	-	100.0	5.9	94.1	-
Ngaremlengui.....	64	40	24	-	100.0	62.5	37.5	-
Ngatpang.....	21	7	14	-	100.0	33.3	66.7	-
Ngchesar.....	81	41	40	-	100.0	50.6	49.4	-
Ngerchelong.....	100	15	85	-	100.0	15.0	85.0	-
Ngiwal.....	59	13	46	-	100.0	22.0	78.0	-
Peleliu.....	156	88	68	-	100.0	56.4	43.6	-
Sonsorol.....	18	3	15	-	100.0	16.7	83.3	-

Source: U.S. Bureau of the Census, 1992c, Table 105.

## Utilities

Electrification long has been a sign of modern development throughout the Pacific in general and Palau in particular. More than 87 percent of all housing units in Palau had electricity by 1990, this percentage having grown substantially since 1980 (Table 15.16). Because the housing stock also increased rapidly over the same decade, the growing proportion of residential units with electricity shows that most new units had electric power and many units without in 1980 were connected over the 10 years (Figure 15.4).

Table 15.16. Electric Power for Housing Units: 1980, 1986, and 1990

Electric Power	Number			Percent		
	1990	1986	1980	1990	1986	1980
Housing Units.....	3,312	2,501	2,265	100.0	100.0	100.0
With electricity.....	2,898	2,137	1,715	87.5	85.4	75.7
Public utility.....	NA	2,011	1,624	...	80.4	71.7
Private generator.....	NA	126	91	...	5.0	4.0
No electricity.....	414	312	550	12.5	12.5	24.3
Not stated.....	NA	52	...	...	2.1	...

Sources: U.S. Bureau of the Census, 1984a, Table 10; 1992c, Table 104; OPS, 1987, Table B5.

Notes: 1990 data for all housing units, 1986 data for occupied housing units, and 1980 data for year-round housing units.

Nearly all housing units in Koror State had electricity in 1990 (Table 15.17). Electrification was widespread on Babeldaob Island as well, although relatively few units in Melekeok, Ngaraard, and Ngardmau states had electric power in 1990. More populated states outside the Palau Islands, such as Angaur and Peleliu, also had widespread electrification. In contrast, few residential units in Sonsorol State (and those were solar powered). No units in Hatohobei State had electricity (although the island did have unreported solar panels for electricity). To complement data on electric power, Table 15.17 also presents data on housing units with air conditioning. A much more recent and expensive addition to the material culture of Palau, air conditioning remains relatively rare despite the presence of electricity throughout most of the republic.

Table 15.17. Electricity and Air Conditioning, All Housing Units, by State:  
1990

State	Number			Percent of Units	
	Total Units	Electricity	Air Conditioning	Electricity	Air Conditioning
Total.....	3,312	2,898	450	87.5	13.6
Aimeliik.....	100	90	2	90.0	2.0
Airai.....	283	271	18	95.8	6.4
Angaur.....	63	57	-	90.5	-
Hatohobei.....	16	-	-	-	-
Kayangel.....	42	4	-	9.5	-
Koror.....	2,096	2,043	427	97.5	20.4
Melekeok.....	71	16	-	22.5	-
Ngaraard.....	108	21	-	19.4	-
Ngardmau.....	34	7	-	20.6	-
Ngaremlengui.....	64	59	-	92.2	-
Ngatpang.....	21	18	2	85.7	9.5
Ngchesar.....	81	65	-	80.2	-
Ngerchelong.....	100	50	-	50.0	-
Ngiwal.....	59	53	-	89.8	-
Peleliu.....	156	143	1	91.7	0.6
Sonsorol.....	18	1	-	5.6	-

Source: U.S. Bureau of the Census, 1992c, Table 104.

Another important indicator of modern development is water supply. The number of housing units in Palau with piped water more than doubled between 1980 and 1990 (Table 15.18). Although the majority of these units had cold water only, the number of units with both hot and cold piped water nearly tripled over the decade. In 1990, only 401 housing units (about 12 percent of the total units) in Palau had no piped water, less than half the number without piped water in 1980 (see Figure 15.4).

Table 15.18. Piped Water, All Housing Units: 1980 and 1990

	Number		Percent Change		
	1990	1980	1980- 1990	Percent	
				1990	1980
Piped Water					
Total Housing Units.....	3,312	2,265	46.2	100.0	100.0
Piped Water.....	2,911	1,427	104.0	87.9	63.0
Hot & Cold piped water.....	402	141	185.1	12.1	6.2
Cold water only.....	2,509	1,286	95.1	75.8	56.8
No piped water.....	401	838	-52.1	12.1	37.0

Source: U.S. Bureau of the Census, 1983, Table 2; 1992c, Table 103.

Note: 1980 figures refer to total year-round housing units.

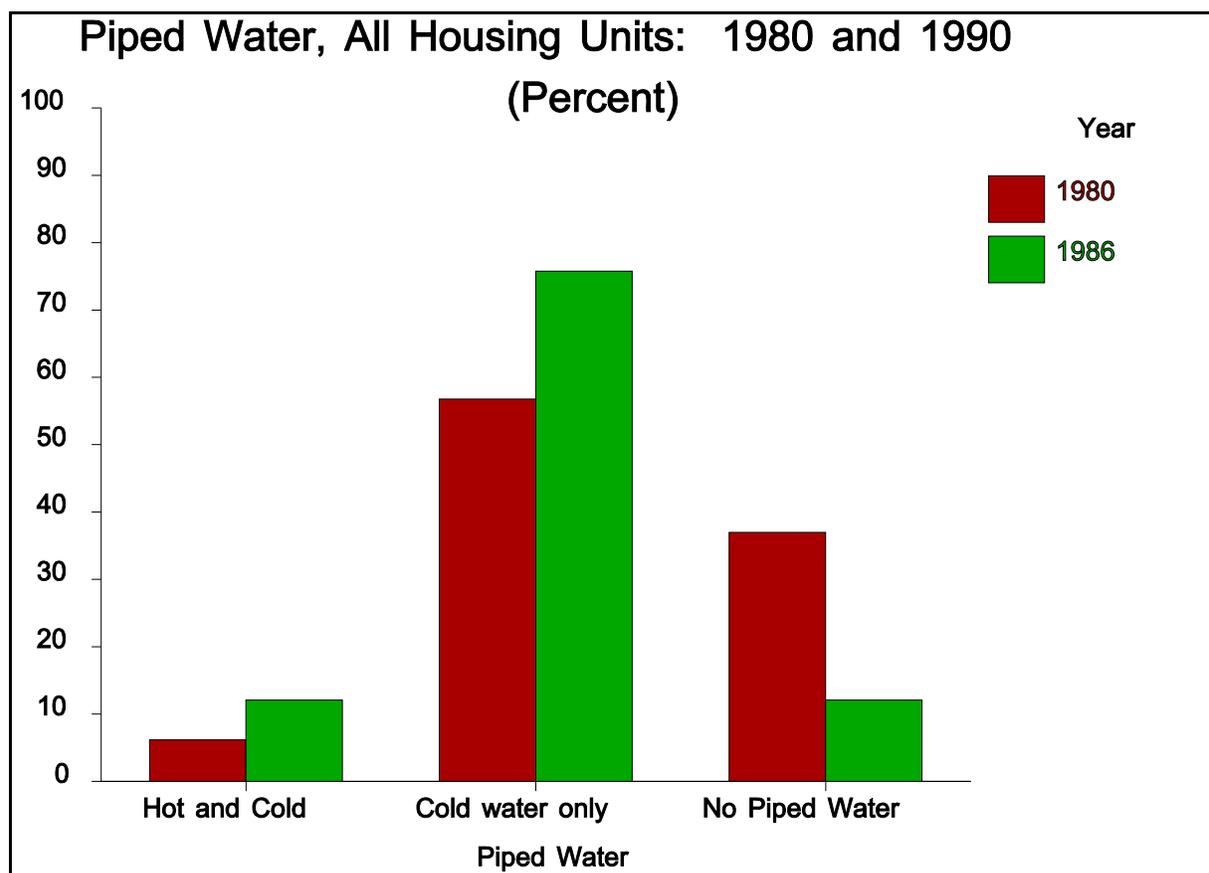


Figure 15.6. Piped Water: 1980 and 1990

In 1990, most of the housing units with piped water were located in Koror State (Table 15.19). Included were virtually all the units with hot piped water. Only about 4 percent of the total housing units in Koror had no piped water at all. In contrast, the states of Hatohobei, Kayangel, and Sonsorol contained no housing units in 1990 with piped water, and most of the units in Ngatpang State had no piped water. Remaining states in the republic fell somewhere between the extremes of Koror State and the latter four, with most units usually possessing cold piped water but relatively few with hot water as well.

Table 15.19. Water Supply, All Housing Units, by State: 1990

State	Number				Percent			
	Total Housing Units	Hot and Cold	Cold Only	No Piped Water	Total	Hot and Cold	Cold Only	No Piped Water
Total.....	3,312	402	2,509	401	100.0	12.1	75.8	12.1
Aimeliik.....	100	1	68	31	100.0	1.0	68.0	31.0
Airai.....	283	19	238	26	100.0	6.7	84.1	9.2
Angaur.....	63	4	59	-	100.0	6.3	93.7	-
Hatohobei.....	16	-	-	16	100.0	-	-	100.0
Kayangel.....	42	-	-	42	100.0	-	-	100.0
Koror.....	2,096	373	1,636	87	100.0	17.8	78.1	4.2
Melekeok.....	71	-	67	4	100.0	-	94.4	5.6
Ngaraard.....	108	3	39	66	100.0	2.8	36.1	61.1
Ngardmau.....	34	-	32	3	100.0	-	91.2	8.8
Ngaremlengui.....	64	1	57	6	100.0	1.6	89.1	9.4
Ngatpang.....	21	-	2	19	100.0	-	9.5	90.5
Ngchesar.....	81	1	77	3	100.0	1.2	95.1	3.7
Ngerchelung.....	100	-	84	16	100.0	-	84.0	16.0
Ngiwal.....	59	-	54	5	100.0	-	91.5	8.5
Peleliu.....	156	-	97	59	100.0	-	62.2	37.8
Sonsorol.....	18	-	-	18	100.0	-	-	100.0

Source: U.S. Bureau of the Census, 1992c, Table 103.

Most housing units in Palau received water through a public utility system (often also supplemented by a catchment system) in 1990 (Table 15.20), the culmination of a steady increase in public water access over the preceding decade. Alternative sources of water, both less modern and less reliable than a public system, declined over the same 10 year period.

Table 15.20. Source of Water, Housing Units: 1980, 1986 and 1990

Source of Water	Number			Percent		
	1990	1986	1980	1990	1986	1980
Total Housing Units.....	3,312	2,501	2,265	100.0	100.0	100.0
Public system and catch.....	2,875	1,964	1,493	86.8	78.5	65.9
Individual system.....	45	155	90	1.4	6.2	4.0
Catchment, tanks, drums.....	325	295	560	9.8	11.8	24.7
Other source.....	67	87	122	2.0	3.5	5.4

Sources: U.S. Bureau of the Census 1984a, Table 10; 1992c, Table 104; OPS, Table B5.

Notes: 1990 data for all housing units, 1986 data for occupied housing units, and 1980 data for year-round housing units.

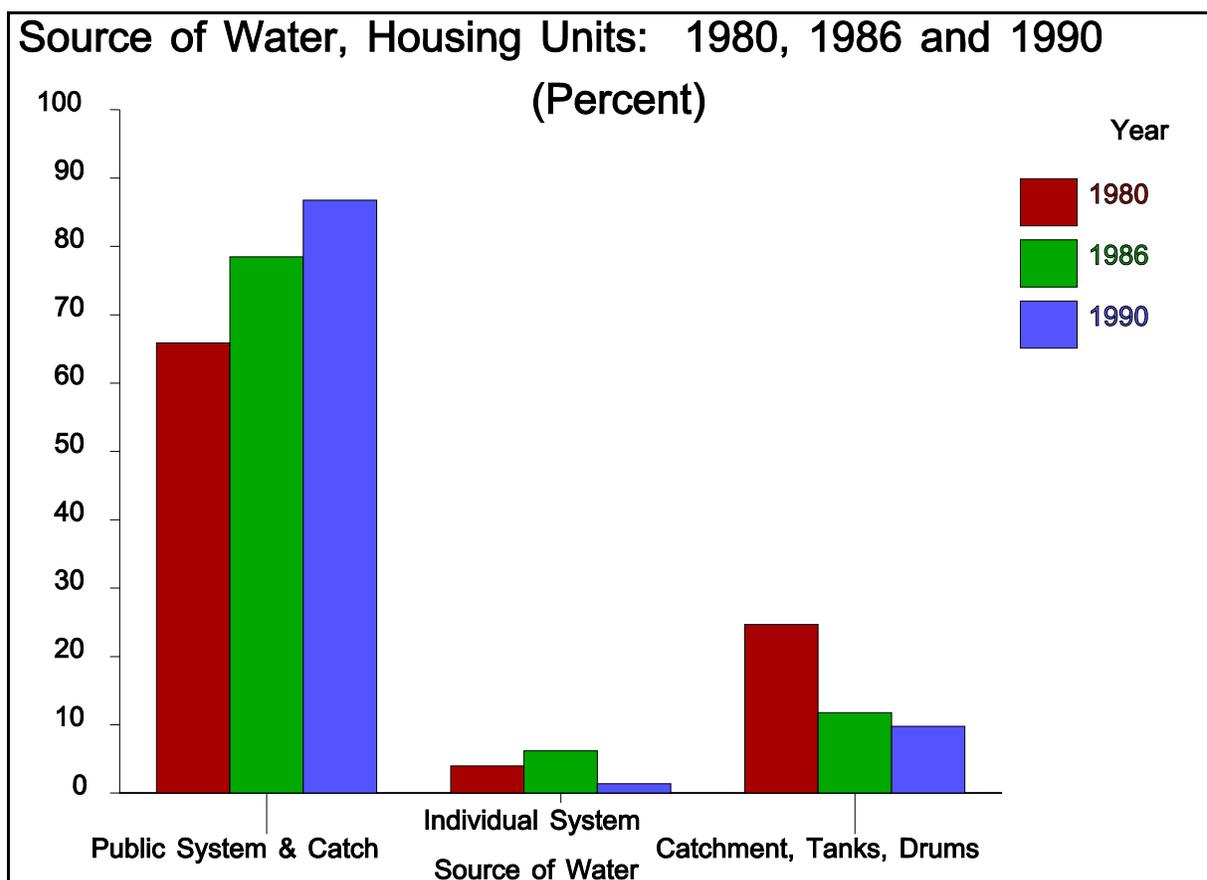


Figure 15.7. Source of Water: 1980, 1986, and 1990

The vast majority of households receiving water from a public system in 1990 were in Koror and Airai states (Table 15.21). Even in the relatively modern setting of Koror State, many units had access both to the public water system and a catchment, should the former fail for some reason. The same states that had little or no piped water — namely Hatohobei, Kayangel, Ngatpang, and Sonsorol — also had little or no access to public water systems. Remaining rural states often had "Other" water sources, usually catchment systems occasionally complemented by tanks.

Table 15.21. Source of Water, All Housing Units, by State: 1990

State	Number				Percent			
	Total Units	Public System			Total	Public System		
		Only	And Catchmt	Other		Only	And Catchmt	Other
Total....	3,312	1,983	892	437	100.0	59.9	26.9	13.2
Aimeliik.....	100	55	10	35	100.0	55.0	10.0	35.0
Airai.....	283	154	105	24	100.0	54.4	37.1	8.5
Angaur.....	63	22	41	-	100.0	34.9	65.1	-
Hatohobei.....	16	-	-	16	100.0	-	-	100.0
Kayangel.....	42	-	-	42	100.0	-	-	100.0
Koror.....	2,096	1,489	523	84	100.0	71.0	25.0	4.0
Melekeok.....	71	65	2	4	100.0	91.5	2.8	5.6
Ngaraard.....	108	2	30	76	100.0	1.9	27.8	70.4
Ngardmau.....	34	31	-	3	100.0	91.2	-	8.8
Ngaremlengui..	64	34	20	10	100.0	53.1	31.3	15.6
Ngatpang.....	21	2	-	19	100.0	9.5	-	90.5
Ngchesar.....	81	75	5	1	100.0	92.6	6.2	1.2
Ngerchelongs...	100	45	40	15	100.0	45.0	40.0	15.0
Ngiwal.....	59	6	49	4	100.0	10.2	83.1	6.8
Peleliu.....	156	3	67	86	100.0	1.9	42.9	55.1
Sonsorol.....	18	-	-	18	100.0	-	-	100.0

Source: U.S. Bureau of the Census, 1992c, Table 104.

Data on sewage disposal for housing units in Palau show that the number of units using a septic tank or cesspool, or some other means, increased slightly between 1980 and 1990 (Table 15.22). However, the number of units connected to a public sewer system grew to nearly 15 times the number recorded in 1980. As a result of the growth in the last category, nearly 30 percent of the total housing units in the Republic of Palau used a public sewer system in 1990 (see Figure 15.4).

Table 15.22. Sewage Disposal, All Housing Units: 1980 and 1990

Sewage Disposal	Number		Percent	
	1990	1980	1990	1980
Total Housing Units.....	3,312	2,265	100.0	100.0
Public Sewer.....	978	66	29.5	2.9
Septic Tank-Cesspool.....	490	378	14.8	16.7
Other.....	1,844	1,821	55.7	80.4

Sources: U.S. Bureau of the Census, 1984a, Table 10; 1992c, Table 104.  
 Note: 1980 figures refer to total year-round housing units.

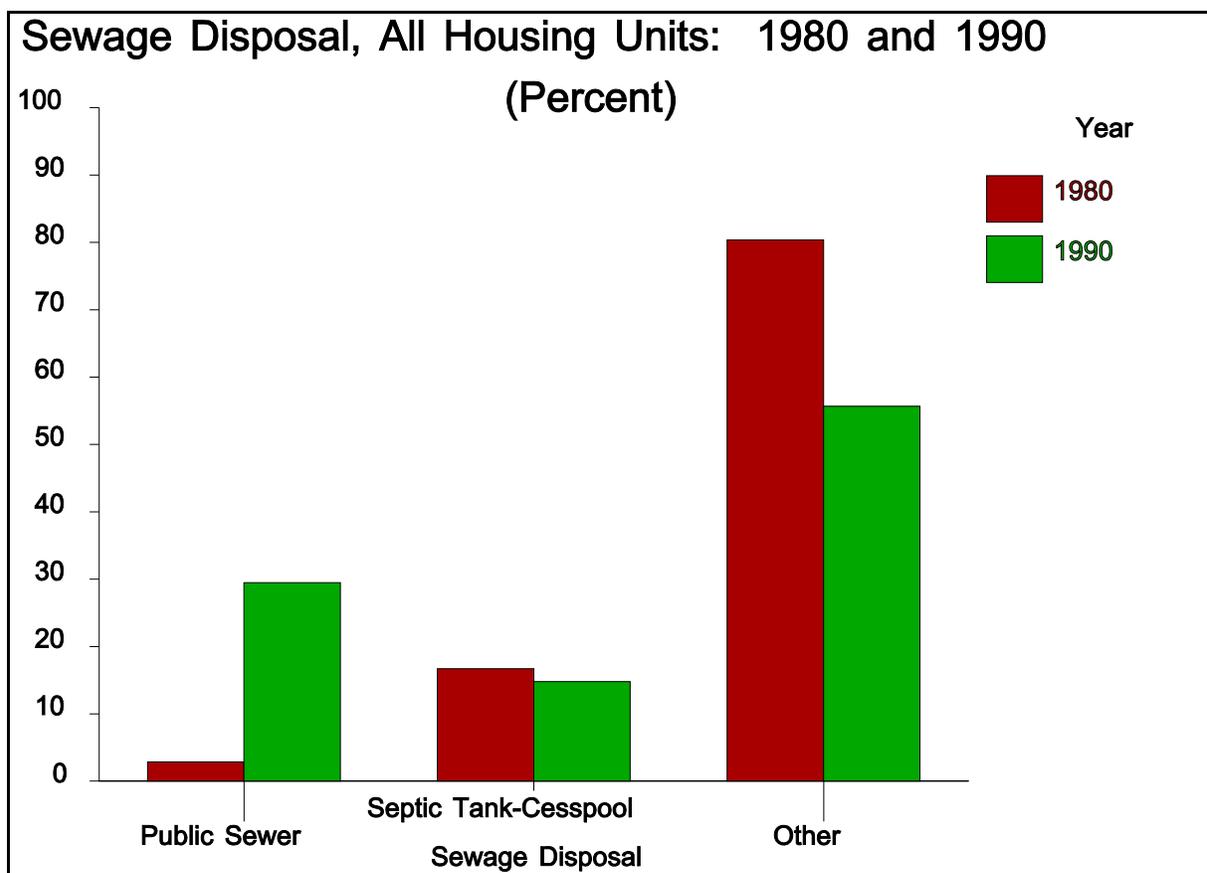


Figure 15.8. Sewage Disposal: 1980 and 1990

State-level data on sewage disposal in 1990 show that public sewer connections were in Koror State (Table 15.23) — making use of the sewage treatment plant there. Septic tanks and cesspools,

modern alternatives to public systems, existed primarily in Koror and Airai states — with a few scattered elsewhere. However, with the exception of Koror, housing units in Palau tended to use other methods of sewage disposal. The widespread use of "other" disposal shows how far the government needs to go to reduce the health risks that often accompany less modern means of sewage disposal and treatment.

Table 15.23. Sewage Disposal, All Housing Units, by State: 1990

State	Number			Percentage		
	Public Sewer	Septic Tank or Cesspool	Other	Public Sewer	Septic Tank or Cesspool	Other
Housing Units...	978	490	1,844	100.0	100.0	100.0
Aimeliik.....	-	25	75	-	5.1	4.1
Airai.....	1	111	171	0.1	22.7	9.3
Angaur.....	-	7	56	-	1.4	3.0
Hatohobei.....	-	-	16	-	-	0.9
Kayangel.....	-	-	42	-	-	2.3
Koror.....	974	303	819	99.6	61.8	44.4
Melekeok.....	1	11	59	0.1	2.2	3.2
Ngaraard.....	-	1	107	-	0.2	5.8
Ngardmau.....	-	-	34	-	-	1.8
Ngaremlengui.....	-	7	57	-	1.4	3.1
Ngatpang.....	-	1	20	-	0.2	1.1
Ngchesar.....	-	4	77	-	0.8	4.2
Ngerchelong.....	-	5	95	-	1.0	5.2
Ngiwal.....	-	6	53	-	1.2	2.9
Peleliu.....	2	9	145	0.2	1.8	7.9
Sonsorol.....	-	-	18	-	-	1.0

Source: U.S. Bureau of the Census, 1992c, Table 104.

## Equipment

Between 1980 and 1990 the number of housing units in Palau with complete plumbing more than quadrupled, increasing from about 12 to nearly 33 percent of all units (Table 15.24). The number of residential units with hot and cold running water and the units with just cold running water both grew during the decade, the latter increasing at a much faster pace. The housing units without complete plumbing increased slowly during the 1980s, resulting in a much smaller share of the total in 1990 than in 1980. Nevertheless, most housing units in Palau still lacked complete plumbing facilities in 1990. The 1986 census of Palau also collected information on plumbing facilities (for occupied units) in the republic. However, due to different definitions for "Complete plumbing" the 1986 data are not comparable with those from the 1980 and 1990 censuses — giving a huge increase

in the number of units with complete plumbing between 1980 and 1986 which subsequently declined between 1986 and 1990.

Table 15.24. Plumbing Facilities, All Housing Units: 1980 and 1990

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Plumbing Facilities	Number		Percent Change		Percent	
	1990	1980	1980- 1990	1990	1980	
Total Housing Units.....	3,312	2,265	46.2	100.0	100.0	
With Complete Plumbing.....	1,087	270	302.6	32.8	11.9	
With Hot and Cold.....	357	132	170.5	10.8	5.8	
With Cold Only.....	730	138	429.0	22.0	6.1	
Lack Complete Plumbing.....	2,225	1,995	11.5	67.2	88.1	

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Sources: U.S. Bureau of the Census, 1984a, Table 10; 1992c, Table 103.

Note: 1980 figures refer to year-round units.

In 1990 Koror State contained nearly 90 percent of the housing units in Palau with complete plumbing facilities and nearly 94 percent of the units with hot water (Table 15.25). Airai State contained most of the remaining occupied residences with plumbing. Although most housing units in more rural states lacked complete plumbing in 1990, so did most units in Koror State.

Table 15.25. Plumbing Facilities, Occupied Housing Units, by State: 1990

State	Total Housing Units	Complete Plumbing			Lacking Complete Plumbing
		Total	Hot and Cold Water	Cold Water	
Total.....	3,312	1,087	357	730	2,225
Aimeliik.....	100	20	1	19	80
Airai.....	283	58	17	41	225
Angaur.....	63	5	3	2	58
Hatohobei.....	16	-	-	-	16
Kayangel.....	42	-	-	-	42
Koror.....	2,096	976	335	641	1,120
Melekeok.....	71	7	-	7	64
Ngaraard.....	108	3	-	3	105
Ngardmau.....	34	-	-	-	34
Ngaremlengui.....	64	5	-	5	59
Ngatpang.....	21	1	-	1	20
Ngchesar.....	81	1	1	-	80
Ngerchelong.....	100	4	-	4	96
Ngiwal.....	59	4	-	4	55
Peleliu.....	156	3	-	3	153
Sonsorol.....	18	-	-	-	18

Source: U.S. Bureau of the Census, 1992c, Table 103.

The number of housing units in Palau with flush toilets increased dramatically during the 1980s. As a result, more than 46 percent of the total units had flush toilets in 1990 (Table 15.26). The number of housing units with an outhouse or privy also increased between 1980 and 1990, but at a much slower rate. Nevertheless, more than 52 percent of the housing units in the republic had one of the latter two types of toilets in 1990. Very few units had toilet facilities classified under "Other or none" in 1990.

Table 15.26. Toilet Facilities, All Housing Units: 1980 and 1990

Toilet facilities	Number		Percent Change		Percent	
	1990	1980	1980-1990	1990	1980	
Total Housing Units.....	3,312	2,265	46.2	100.0	100.0	
Flush Toilet Inside.....	1,147	321	257.3	34.6	14.2	
Flush Toilet Outside.....	386	161	139.8	11.7	7.1	
Outhouse or Privy.....	1,725	1,599	7.9	52.1	70.6	
Other or None.....	54	184	-70.7	1.6	8.1	

Sources: U.S. Bureau of the Census, 1983, Table 2; 1992c, Table 103.  
 Note: 1980 figures refer to year-round units.

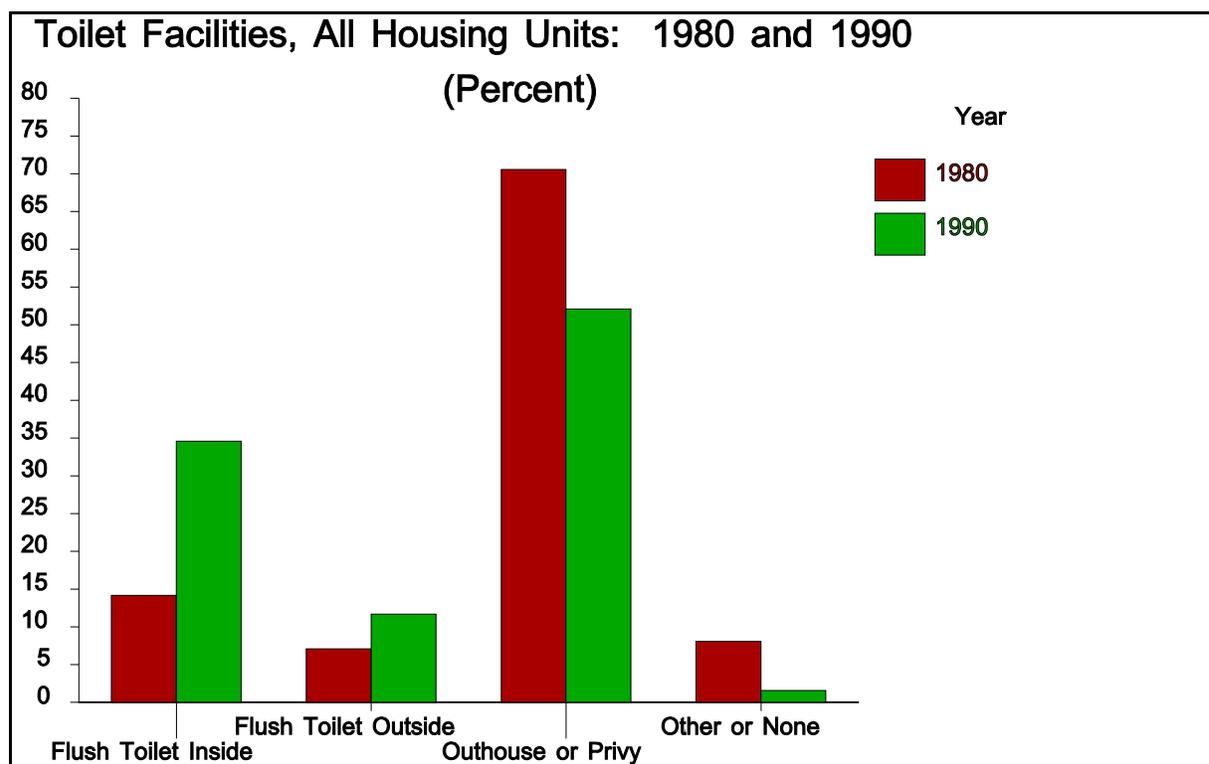


Figure 15.9. Toilet Facilities: 1980 and 1990

Koror State contained most of the modern toilets in the Republic of Palau in 1990, with most of the remainder located in Airai State (Table 15.27). Koror State was the only state in the republic with more than half its housing units having a flush toilet. In contrast, a large proportion of the residential

units located elsewhere in Palau had no flush toilet — including states generally associated with more traditional housing facilities, such as Hatohobei and Sonsorol, as well as more developed states such as Airai, Angaur, and Peleliu.

Table 15.27. Toilet Facilities, All Housing Units, by State: 1990

State	Number				Percent			
	Total	Flush Toilet		No	Total	Flush Toilet		No
	Housing Units	Inside	Outside	Flush Toilet	Total	Inside	Outside	Flush Toilet
Total.....	3,312	1,147	386	1,779	100.0	34.6	11.7	53.7
Aimeliik.....	100	20	8	72	100.0	20.0	8.0	72.0
Airai.....	283	62	63	158	100.0	21.9	22.3	55.8
Hatohobei.....	16	-	-	16	100.0	-	-	100.0
Angaur.....	63	6	3	54	100.0	9.5	4.8	85.7
Kayangel.....	42	-	8	34	100.0	-	19.0	81.0
Koror.....	2,096	1,028	267	801	100.0	49.0	12.7	38.2
Melekeok.....	71	7	6	58	100.0	9.9	8.5	81.7
Ngaraard.....	108	3	6	99	100.0	2.8	5.6	91.7
Ngardmau.....	34	-	-	34	100.0	-	-	100.0
Ngaremlengui...	64	5	2	57	100.0	7.8	3.1	89.1
Ngatpang.....	21	1	-	20	100.0	4.8	-	95.2
Ngchesar.....	81	2	4	75	100.0	2.5	4.9	92.6
Ngerchelongs...	100	5	4	91	100.0	5.0	4.0	91.0
Ngiwal.....	59	5	3	51	100.0	8.5	5.1	86.4
Peleliu.....	156	3	12	141	100.0	1.9	7.7	90.4
Sonsorol.....	18	-	-	18	100.0	-	-	100.0

Source: U.S. Bureau of the Census, 1992c, Table 103.

Of all the changes in Palau's housing characteristics during the 1980s, one of the greatest occurred in the number of units with bathtubs or showers. In 1980 only about 15 percent of the year-round housing units contained a tub or shower. By 1990 more than 93 percent of the residences in Palau had a shower or bathtub, the total more than nine times the number recorded a decade earlier (Table 15.28). The number of housing units lacking these bathing facilities decreased accordingly.

Table 15.28. Bathtub or Shower Facilities, All Housing Units: 1980 and 1990

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	Number		Percent Change		Percent	
	1990	1980	1980- 1990		1990	1980
Bathtub or Shower						
Total Housing Units....	3,312	2,265	46.2		100.0	100.0
Bathtub or Shower.....	3,086	339	810.3		93.2	15.0
No Bathtub or Shower.....	226	1,926	-88.3		6.8	85.0

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Sources: U.S. Bureau of the Census, 1983, Table 2; 1992c, Table 103.

Note: 1980 figures refer to year-round units.

Only the most rural states in Palau generally lacked modern bathing facilities in 1990 (Table 15.29). Although Koror State contained relatively few housing units that lacked such equipment, several other states had a greater percentage of units with a bathtub or shower. The trait distinguishing rural and urban housing units appears to be the location of bathing facilities. In contrast to most states in the republic where bathtubs and showers were located outside housing units, nearly half the Koror State units had these features located inside the residence.

Table 15.29. Bathtub or Shower Facilities, All Housing Units,  
by State: 1990

State	Number				Percent			
	Housing Units	Bathtub or Shower			Housing Units	Bathtub or Shower		
		Inside	Outside	None		Inside	Outside	None
Total.....	3,312	1,172	1,914	226	100.0	35.4	57.8	6.8
Aimeliik.....	100	23	72	5	100.0	23.0	72.0	5.0
Airai.....	283	65	210	8	100.0	23.0	74.2	2.8
Angaur.....	63	5	53	5	100.0	7.9	84.1	7.9
Hatohobei.....	16	-	1	15	100.0	-	6.3	93.8
Kayangel.....	42	-	37	5	100.0	-	88.1	11.9
Koror.....	2,096	1,043	946	107	100.0	49.8	45.1	5.1
Melekeok.....	71	9	59	3	100.0	12.7	83.1	4.2
Ngaraard.....	108	3	84	21	100.0	2.8	77.8	19.4
Ngardmau.....	34	-	30	4	100.0	-	88.2	11.8
Ngaremlengui....	64	7	56	1	100.0	10.9	87.5	1.6
Ngatpang.....	21	1	19	1	100.0	4.8	90.5	4.8
Ngchesar.....	81	2	68	11	100.0	2.5	84.0	13.6
Ngerchelongs....	100	4	84	12	100.0	4.0	84.0	12.0
Ngiwal.....	59	5	52	2	100.0	8.5	88.1	3.4
Peleliu.....	156	5	137	14	100.0	3.2	87.8	9.0
Sonsorol.....	18	-	6	12	100.0	-	33.3	66.7

Source: U.S. Bureau of the Census, 1992c, Table 103.

The final type of residential equipment is kitchen facilities. One of the most important pieces of kitchen equipment is a refrigerator. Although the 1980 and 1990 data on refrigerators are not strictly comparable, either in the housing unit types considered or in the data on refrigerators themselves, an increase in the percentage of housing with this item is apparent (Table 15.30).

Table 15.30. Refrigerator, Housing Units: 1980 and 1990

Refrigerator	Number		Percent	
	1990	1980	1990	1980
Housing Units.....	3,312	2,039	100.0	100.0
All Refrigerator Types.....	2,212	817	66.8	40.1
Mechanical.....	...	532	...	26.1
Ice.....	...	285	...	14.0
None.....	1,100	937	33.2	46.0

Sources: U.S. Bureau of the Census, 1984a, Table 10; 1992c, Table 104.

Notes: 1990 data for all housing units; 1980 data for occupied year-round housing units.

Most of the housing units in Palau with refrigerators in 1990 were located in Koror State. More than 87 percent of the total housing units in this state, and nearly all the occupied units, had a refrigerator in 1990 (Table 15.31). Airai and Peleliu states contained most of the remaining housing units with refrigerators in the republic. This equipment was much more scarce in the rural states in Palau, with many states containing few units with refrigerators and Hatohobei and Ngardmau states having none.

Table 15.31. Kitchen-related Characteristics of Housing Units, by State: 1990

State	Total Housing Units	Occupied Housing Units	Refrigerator	Cooking Facilities		
				Inside Building	Outside Building	None
Total.....	3,312	2,885	2,212	2,789	345	178
Aimeliik.....	100	81	26	65	18	17
Airai.....	283	256	216	247	28	8
Angaur.....	63	50	22	27	31	5
Hatohobei.....	16	4	-	3	10	3
Kayangel.....	42	31	3	18	18	6
Koror.....	2,096	1,912	1,824	1,910	106	80
Melekeok.....	71	49	2	61	5	5
Ngaraard.....	108	71	8	73	19	16
Ngardmau.....	34	29	-	27	7	0
Ngaremlengui.....	64	55	8	51	11	2
Ngatpang.....	21	14	8	18	1	2
Ngchesar.....	81	61	3	73	6	2
Ngerchelong.....	100	78	4	81	9	10
Ngiwal.....	59	52	11	34	19	6
Peleliu.....	156	131	76	97	46	13
Sonsorol.....	18	11	1	4	11	3

Source: U.S. Bureau of the Census, 1992c, Table 104.

More than 94 percent of the housing units in Palau had some type of cooking facilities in 1990. As was the case with bathtubs and showers, the main distinction was location — with more Westernized states such as Koror and Airai having cooking facilities inside the unit and more traditional states having cooking facilities outside the unit.

## Conclusions

The data on housing characteristics collected by the 1990 census of Palau were extensive, providing a remarkably detailed picture of the housing stock in the republic. Due to limitations of time and space, this chapter has focused on a small portion of these data — to illuminate some aspects of housing of interest to planners and other government officials interested in development.

Most characteristics of the housing in Palau are dominated by the residential inventory in Koror State. In addition to containing most of the total housing units and occupied units, this state also contained the majority of modern innovations in Palau associated with housing — multiple unit structures, residential units with many total rooms and bedrooms, units constructed by new techniques and with more expensive materials, housing with the greatest access to public utilities

and modern equipment, etc. Although the analysis of virtually every characteristic of housing in Palau inevitably begins by focusing on Koror, the characteristics of this state can be compared to the other states. In contrast to Koror State, the most rural, remote states of Hatohobei and Sonsorol feature housing stocks dominated by traditional construction and with few modern amenities.

The housing data described in the 1990 census show that rapid development occurring over the decade, partially in response to the demand of a growing population with large numbers of immigrants, and partially as an outgrowth of continued Western influence. The analysis presented in this chapter suggests that housing change likely will continue into the present decade — adjusting to shifts in population and the demands of that population, within the financial constraints of Palau's diverse residents.

## CHAPTER 16. PALAUANS OUTSIDE PALAU

The 1990 census of Palau took place at the same time as censuses in Guam, the CNMI<sup>8</sup> and the U.S. — the three main destinations of emigrants from Palau. The census reports for Guam and CNMI provide information on the Palau-born residents in each place, including age, marital status, fertility, citizenship, year of relocation, birthplace of parents, ethnic origin, residence in 1985, language spoken at home, educational characteristics, labor force characteristics, occupation, and commuting characteristics (see U.S. Bureau of the Census, 1992a, Tables 46-56; 1992b, Tables 46-56). As of December 1992, data for Palauans in the U.S. are unavailable from the 1990 census, so these data will be discussed in a later publication.

The American administration of the TTPI encouraged, and in many ways the government of Palau continues to encourage, emigration for schooling and jobs. Higher education and improved training in selected skills have long been seen as the means of building strong foundations for future economic and political self-reliance. Many Palauans leave Palau, primarily in search of education or employment, and many of these individuals have yet to return to Palau. Some will not return. Emigration has reached levels affecting the population structure of those remaining in Palau.

This chapter examines data on Palauans residing in Guam or the CNMI on 1 April 1990, the date of the most recent census in each place, to better understand both the reasons for emigration and the activities of Palau emigrants while living in these two places. As such, the chapter provides useful complementary information to Chapter 8 — presenting data on the other half of the migration equation.

### **Data Description**

The topics discussed in this chapter already have received attention in this monograph, in the various chapters that dealt with similar topics for Palau itself. Rather than repeat a series of definitions, and comments on limitations and comparability with previous censuses, refer to the appropriate chapter for the topics.

### **Analysis of Data on Palauans Outside Palau**

#### *Age and Sex*

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<sup>8</sup>For this chapter, we use the term "the Marianas" for Guam and the Commonwealth of the Northern Mariana Islands together.

Of the 15,122 persons in Palau in 1990, 12,575 (83.2 percent) were born in Palau (Table 16.1). The 1990 census of Guam recorded another 1,858 Palau-born individuals, and the CNMI census for the same year recorded 1,620 Palau-born residents — yielding a total of 16,053 Palau-born persons living in these three areas in April 1990.

Table 16.1. Palau-born Individuals in Palau, Guam, and the CNMI, by Age: 1990

Age Group	Number					Percent				
	Total	Guam and CNMI				Total	Guam and CNMI			
		Palau	Total	Guam	CNMI		Palau	Total	Guam	CNMI
Total.....	16,053	12,575	3,478	1,858	1,620	100.0	100.0	100.0	100.0	100.0
0-4 yrs.....	1,808	1,420	388	199	189	11.3	11.3	11.2	10.7	11.7
5-9 yrs.....	1,728	1,441	287	158	129	10.8	11.5	8.3	8.5	8.0
10-14 yrs...	1,790	1,457	333	173	160	11.2	11.6	9.6	9.3	9.9
15-19 yrs...	1,761	1,390	371	200	171	11.0	11.1	10.7	10.8	10.6
20-24 yrs...	1,418	955	463	238	225	8.8	7.6	13.3	12.8	13.9
25-29 yrs...	1,432	1,016	416	209	207	8.9	8.1	12.0	11.2	12.8
30-34 yrs...	1,268	930	338	153	185	7.9	7.4	9.7	8.2	11.4
35-39 yrs...	1,126	853	273	155	118	7.0	6.8	7.8	8.3	7.3
40-44 yrs...	821	626	195	96	99	5.1	5.0	5.6	5.2	6.1
45-49 yrs...	625	500	125	79	46	3.9	4.0	3.6	4.3	2.8
50-54 yrs...	510	410	100	65	35	3.2	3.3	2.9	3.5	2.2
55-59 yrs...	417	344	73	54	19	2.6	2.7	2.1	2.9	1.2
60-64 yrs...	409	353	56	42	14	2.5	2.8	1.6	2.3	0.9
65-69 yrs...	339	312	27	21	6	2.1	2.5	0.8	1.1	0.4
70-74 yrs...	258	240	18	8	10	1.6	1.9	0.5	0.4	0.6
75-79 yrs...	154	145	9	4	5	1.0	1.2	0.3	0.2	0.3
80-84 yrs...	93	89	4	2	2	0.6	0.7	0.1	0.1	0.1
85 + yrs....	96	94	2	2	0	0.6	0.7	0.1	0.1	-
Median.....	23.3	23.0	23.9	24.2	23.6	...	...	...	...	...

Sources: U.S. Bureau of the Census, 1992a, Table 57; 1992b, Table 57; 1992c, Table 57.

The age composition of the Palau-born populations in the three places differed considerably, as expected when comparing the resident population of Palau with the migrant populations of Guam and the CNMI. These differences are seen both in the relative size of each age group and in median ages. The largest percentages of Palau-born residents in Palau were in the age groups under 20 years old, with each of the five-year groups containing at least 11 percent of the population and together comprising more than 45 percent of the total. In contrast, the ages most heavily represented among Palau-born migrants to Guam or the CNMI were between 15 and 29 years, with the largest group

aged 20-24 years. Young adults were more prevalent among the migrants while even younger persons were more prevalent among those Palau born of Palau. Because very few old people migrate, more older Palau born lived in Palau than outside Palau — yielding similar median ages for Palau and the two main migrant destinations.

In 1990, about 6,450 males residing in Palau were born in Palau, while 1,660 male residents of Guam and CNMI were born in Palau (Table 16.2). The age distribution of Palau-born males was similar to that noted for all Palau born — that is, proportionally more young males resided in Palau while the Palau-born males of Guam and the CNMI were more likely to be young adults. The Palau-born male population in these three areas was younger than the total Palau-born population. The median age of Palau-born males living in Guam or CNMI was 1.4 years less than all Palau born living in these two places. Males had similar median ages for the three areas — 22.6 years for the entire Palau-born male population, 22.6 for Palau-born males residing in Palau, and 22.5 for males living in the Marianas.

Table 16.2. Palau-born Males in Palau, Guam, and the CNMI, by Age: 1990

Age Group	Number					Percent				
	Total	Guam and CNMI				Total	Palau	Guam and CNMI		
		Palau	Total	Guam	CNMI			Total	Guam	CNMI
Males.....	8,111	6,451	1,660	882	778	100.0	100.0	100.0	100.0	100.0
0-4 yrs.....	916	715	201	110	91	11.3	11.1	12.1	12.5	11.7
5-9 yrs.....	901	739	162	86	76	11.1	11.5	9.8	9.8	9.8
10-14 yrs...	936	760	176	88	88	11.5	11.8	10.6	10.0	11.3
15-19 yrs...	926	750	176	98	78	11.4	11.6	10.6	11.1	10.0
20-24 yrs...	737	509	228	119	109	9.1	7.9	13.7	13.5	14.0
25-29 yrs...	744	558	186	89	97	9.2	8.6	11.2	10.1	12.5
30-34 yrs...	646	496	150	64	86	8.0	7.7	9.0	7.3	11.1
35-39 yrs...	559	454	105	63	42	6.9	7.0	6.3	7.1	5.4
40-44 yrs...	425	336	89	41	48	5.2	5.2	5.4	4.6	6.2
45-49 yrs...	305	248	57	33	24	3.8	3.8	3.4	3.7	3.1
50-54 yrs...	239	199	40	25	15	2.9	3.1	2.4	2.8	1.9
55-59 yrs...	203	162	41	31	10	2.5	2.5	2.5	3.5	1.3
60-64 yrs...	181	155	26	19	7	2.2	2.4	1.6	2.2	0.9
65-69 yrs...	151	139	12	9	3	1.9	2.2	0.7	1.0	0.4
70-74 yrs...	116	112	4	2	2	1.4	1.7	0.2	0.2	0.3
75-79 yrs...	62	59	3	2	1	0.8	0.9	0.2	0.2	0.1
80 + yrs....	64	60	2	1	1	0.8	0.9	0.1	0.1	0.1
Median.....	22.6	22.6	22.5	22.5	22.6	...	...	...	...	...

Sources: U.S. Bureau of the Census, 1992a, Table 46; 1992b, Table 46; 1992c, Table 46.

The 1990 censuses recorded 6,124 Palau-born females in Palau and another 1,818 in Guam and CNMI (Table 16.3). The general observations on age distribution for all Palau born and Palau-born males held for females: females in Palau were more likely to be young, those in Guam and CNMI somewhat older. The median age for Palau-born females was about one year older than for all Palau born, with those living on Palau only 0.6 years older on average and those living on Guam or in the CNMI more than one year older.

Table 16.3. Palau-born Females in Palau, Guam, and the CNMI, by Age: 1990

Age Group	Number					Percent				
	Total	Guam and CNMI				Total	Guam and CNMI			
		Palau	Total	Guam	CNMI		Palau	Total	Guam	CNMI
Females...	7,942	6,124	1,818	976	842	100.0	100.0	100.0	100.0	100.0
0-4 yrs.....	892	705	187	89	98	11.2	11.5	10.3	9.1	11.6
5-9 yrs.....	827	702	125	72	53	10.4	11.5	6.9	7.4	6.3
10-14 yrs...	854	697	157	85	72	10.8	11.4	8.6	8.7	8.6
15-19 yrs...	835	640	195	102	93	10.5	10.5	10.7	10.5	11.0
20-24 yrs...	681	446	235	119	116	8.6	7.3	12.9	12.2	13.8
25-29 yrs...	688	458	230	120	110	8.7	7.5	12.7	12.3	13.1
30-34 yrs...	622	434	188	89	99	7.8	7.1	10.3	9.1	11.8
35-39 yrs...	567	399	168	92	76	7.1	6.5	9.2	9.4	9.0
40-44 yrs...	396	290	106	55	51	5.0	4.7	5.8	5.6	6.1
45-49 yrs...	320	252	68	46	22	4.0	4.1	3.7	4.7	2.6
50-54 yrs...	271	211	60	40	20	3.4	3.4	3.3	4.1	2.4
55-59 yrs...	214	182	32	23	9	2.7	3.0	1.8	2.4	1.1
60-64 yrs...	228	198	30	23	7	2.9	3.2	1.7	2.4	0.8
65-69 yrs...	188	173	15	12	3	2.4	2.8	0.8	1.2	0.4
70-74 yrs...	142	128	14	6	8	1.8	2.1	0.8	0.6	1.0
75-79 yrs...	92	86	6	2	4	1.2	1.4	0.3	0.2	0.5
80 + yrs....	125	123	2	1	1	1.6	2.0	0.1	0.1	0.1
Median.....	24.1	23.6	25.2	25.9	24.5	...	...	...	...	...

Sources: U.S. Bureau of the Census, 1992a, Table 46; 1992b, Table 46; 1992c, Table 46.

These three places slightly more Palau-born males than females in 1990 (Table 16.4). But male-female ratios differed considerably between those residing in Palau and those living on Guam or in the CNMI, the latter two containing only about 9 males for every 10 females. Males were more prevalent in the early ages, with as many as 143 males for every 100 females aged 5 to 9 years in the CNMI, but in the middle years (ages 25-54), females made up more of the Palau-born populations living outside Palau. Many differences in the male-female ratio for individuals aged 15 years and older reflect different employment trends, with jobs attracting (or retaining in Palau) more males than females and other jobs attracting more females than males. The differences in age groups greater than 60 years probably are a consequence of higher male mortality.

Table 16.4. Palau-born Males per 100 Palau-born Females in Palau, Guam, and the CNMI, by Age: 1990

Age Group	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Males.....	102	105	91	90	92
0-4 yrs.....	103	101	107	124	93
5-9 yrs.....	109	105	130	119	143
10-14 yrs.....	110	109	112	104	122
15-19 yrs.....	111	117	90	96	84
20-24 yrs.....	108	114	97	100	94
25-29 yrs.....	108	122	81	74	88
30-34 yrs.....	104	114	80	72	87
35-39 yrs.....	99	114	63	68	55
40-44 yrs.....	107	116	84	75	94
45-49 yrs.....	95	98	84	72	109
50-54 yrs.....	88	94	67	63	75
55-59 yrs.....	95	89	128	135	111
60-64 yrs.....	79	78	87	83	100
65-69 yrs.....	80	80	80	75	100
70-74 yrs.....	82	88	29	33	25
75-79 yrs.....	67	69	...	...	...
80 + yrs.....	51	49	...	...	...

Sources: U.S. Bureau of the Census, 1992a, Table 46; 1992b, Table 46; 1992c, Table 46.

Note: For Guam and the CNMI, 70 + grouped in 70-74 category.

### Marital Status

Adult Palau-born males living in Palau were slightly less likely to be married in 1990 than those living outside Palau, but most of the difference is attributable to those living on Guam (Table 16.5). Palau-born males living in the CNMI were less likely than those living on Guam or in Palau to be married and much more likely to have never married, possibly because workers in the garment industry that employs many migrants were more likely to be single and living with relatives. Palau-born males in Guam were much more likely to have divorced than those in either Palau or the CNMI, probably in part because those living on Guam tended to be less traditional than those living in the other two places.

Table 16.5. Palau-born Males Aged 15 Years and Over in Palau, Guam, and the CNMI, by Marital Status: 1990

Marital Status	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Males 15 years and over.....	5,215	4,195	1,020	474	546
Percent.....	100.0	100.0	100.0	100.0	100.0
Never married.....	44.0	43.9	44.3	40.9	47.3
Now married except separated.....	50.1	49.8	51.2	53.8	48.9
Separated.....	2.1	2.4	1.1	0.4	1.6
Widowed.....	1.6	1.7	1.0	1.1	0.9
Divorced.....	2.3	2.3	2.5	3.8	1.3

Sources: U.S. Bureau of the Census, 1992a, Table 46; 1992b, Table 46; 1992c, Table 46.

Slightly less than half the Palau-born adult males residing in Palau were married compared to more than half the females living there (Table 16.6). In contrast, less than half the adult Palau-born females living in the Marianas were married — compared to more than half the males residing there. About half the Palau-born females on Guam were married compared to much less than half of those in the CNMI — the lack of marriage possibly due to easier migration for unmarried females.

Table 16.6. Palau-born Females Aged 15 Years and Over in Palau, Guam, and the CNMI by Marital Status: 1990

Marital Status	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Females 15 years and over....	5,268	3,969	1,299	660	639
Percent.....	100.0	100.0	100.0	100.0	100.0
Never married.....	31.9	30.3	36.6	32.1	41.3
Now married except separated.....	51.7	53.0	47.7	50.8	44.6
Separated.....	2.5	2.5	2.7	2.3	3.1
Widowed.....	10.0	10.8	7.4	6.5	8.3
Divorced.....	3.9	3.4	5.5	8.3	2.7

Sources: U.S. Bureau of the Census, 1992a, Table 46; 1992b, Table 46; 1992c, Table 46.

Of the Palau-born residents of Guam, adult females were much more likely than males to be divorced — more than 8 percent of the females compared to about 4 percent of the males. More than 5 percent of all adult females outside Palau were divorced. In comparison, adult Palau-born females

living in Palau were more likely to be widowed than those outside, partly because those living in Palau were older.

### *Fertility*

The average Palau-born female between 15 and 49 years old had given birth to 2.4 children by the time of the 1990 census (Table 16.7). For several years fertility in Palau has been low by Pacific standards. Evidence from the 1990 census shows that low levels of fertility have continued. The average numbers of children ever born were similar for Palau-born females living in Palau, on Guam, and in the CNMI. Despite relatively fewer married persons among the adult migrants from Palau to the Marianas, fertility was similar for Palau and the Marianas.

Table 16.7. Average Children Ever Born to Adult Palau-born Females in Palau, Guam, and the CNMI, by Age of Mothers: 1990

Age Group	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Total.....	2.0	2.0	2.0	2.0	2.1
15 to 19 years.....	0.1	0.1	0.1	0.1	0.1
20 to 24 years.....	0.8	0.8	0.7	0.6	0.8
25 to 29 years.....	1.5	1.6	1.5	1.4	1.6
30 to 34 years.....	2.3	2.2	2.4	2.2	2.6
35 to 39 years.....	3.2	3.3	3.0	2.7	3.4
40 to 44 years.....	3.9	3.8	4.0	3.7	4.3
45 to 49 years.....	4.6	4.6	4.3	4.3	4.3

Sources: U.S. Bureau of the Census, 1992a, Table 46; 1992b, Table 46; 1992c, Table 46.

### *Citizenship*

Table 16.8 shows citizenship for the 1,233 Palau born on Guam and the 1,407 Palau born in the CNMI. The 463 Palau born in these two areas who were citizens or nationals of the U.S. constituted about 18 percent of the total. Palau-born residents of Guam were more likely to be U.S. citizens than were Palau born in the CNMI.

Table 16.8. Citizenship for Palau-born Individuals in Guam and the CNMI: 1990

Citizenship	Number			Percent		
	Total	Guam	CNMI	Total	Guam	CNMI
Total.....	2,640	1,233	1,407	100.0	100.0	100.0
Citizen or national.....	463	256	207	17.5	20.8	14.7
Born abroad, U.S. parent(s)...	94	55	39	3.6	4.5	2.8
Naturalized citizen.....	369	201	168	14.0	16.3	11.9
Not a citizen or national.....	2,177	977	1,200	82.5	79.2	85.3
Permanent residence.....	1,205	617	588	45.6	50.0	41.8
Temporary residence.....	972	360	612	36.8	29.2	43.5

Source: U.S. Bureau of the Census, 1992a, Table 47; 1992b, Table 47; 1992c, Table 47.

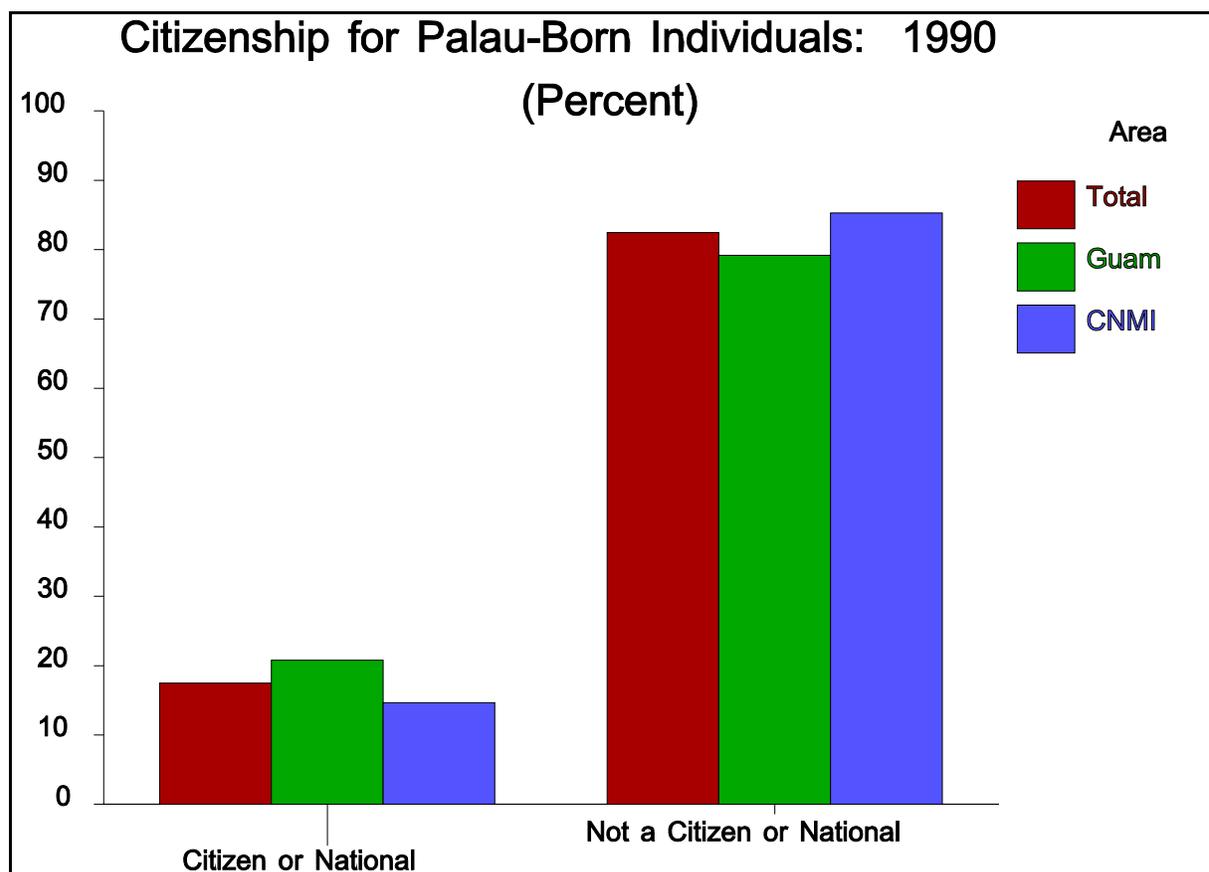


Figure 16.1. Citizenship for Palau Born in Guam and the CNMI: 1990

The majority of Palau born who were not U.S. citizens were permanent rather than temporary residents. Palau born living on Guam were more likely to be permanent residents, with the residence status of those living in the CNMI more likely to be temporary. This difference primarily reflects the different political relationships between Palau and the two places in the Marianas. Currently, free movement from Palau to Guam is not possible — and as a result many Palauans residing there had more permanent reasons for their move. The CNMI, on the other hand, maintains a more open door policy towards the immigration of Palauans, enabling many Palauans to relocate to the Northern Marianas Islands on a temporary basis.

Compared to all Palau born males residing on Guam or in the CNMI in 1990, a slightly smaller proportion of males were U.S. citizens (Table 16.9). As was the case with the total Palau-born populations of Guam and the CNMI, most of these citizens were naturalized. Once more, most Palau-born males in these two areas were not U.S. citizens — with permanent residents more likely on Guam and temporary residents slightly more likely in the CNMI.

Table 16.9. Citizenship for Palau-born Males in Guam and the CNMI: 1990

Citizenship	Numbers			Percent		
	Total	Guam	CNMI	Total	Guam	CNMI
Males.....	1,192	526	666	100.0	100.0	100.0
Citizen or national.....	201	105	96	16.9	20.0	14.4
Born abroad, U.S. parent(s)...	40	22	18	3.4	4.2	2.7
Naturalized citizen.....	161	83	78	13.5	15.8	11.7
Not a citizen or national.....	991	421	570	83.1	80.0	85.6
Permanent resident.....	509	242	267	42.7	46.0	40.1
Temporary Resident.....	482	179	303	40.4	34.0	45.5

Sources: U.S. Bureau of the Census, 1992a, Table 47; 1992b, Table 47.

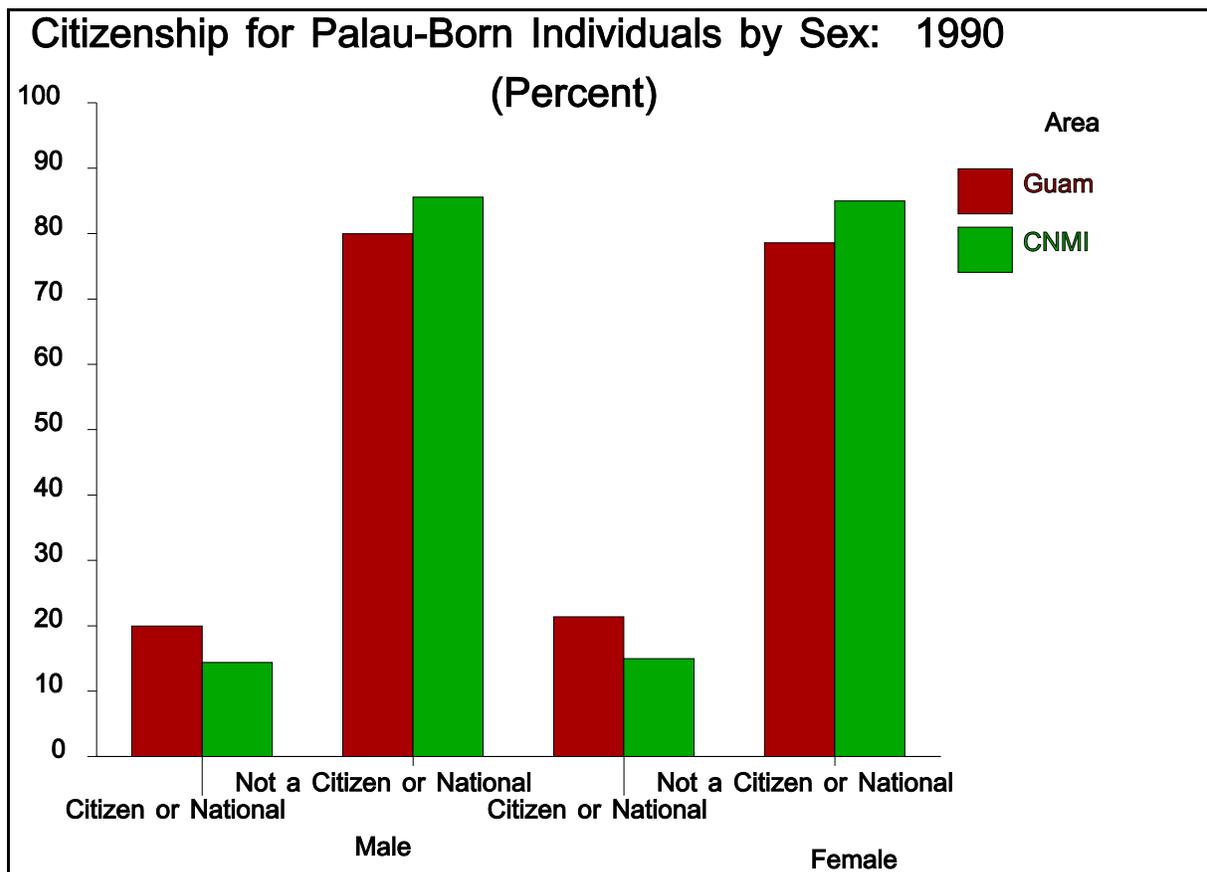


Figure 16.2. Citizenship of Palau Born by Residence and Sex: 1990

Table 16.10 shows the citizenship status of Palau-born females living on Guam and in the CNMI. The distributions were similar to those for all Palau-born residents of these two places, with females more likely than the males to be U.S. citizens. Of the alien females in Guam, more than twice as many were permanent than temporary residents. In contrast to all Palau-born residents and male Palau-born residents of the CNMI, more females were permanent than temporary residents.

Table 16.10. Citizenship for Palau-born Females in Guam and the CNMI: 1990

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Citizenship	Number			Percent		
	Total	Guam	CNMI	Total	Guam	CNMI
Female.....	1,448	707	741	100.0	100.0	100.0
Citizen or national.....	262	151	111	18.1	21.4	15.0
Born abroad, U.S. parent(s)...	54	33	21	3.7	4.7	2.8
Naturalized citizen.....	208	118	90	14.4	16.7	12.1
Not a citizen or national.....	1,186	556	630	81.9	78.6	85.0
Permanent residence.....	696	375	321	48.1	53.0	43.3
Temporary residence.....	490	181	309	33.8	25.6	41.7

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Source: U.S. Bureau of the Census, 1992a, Table 47; 1992b, Table 47; 1992c, Table 47.

*Year of Entry*

Nearly 24 percent of the Palau-born migrants who lived in Guam or the CNMI in 1990 had migrated in 1989 or 1990 (Table 16.11). Relatively recent movement is particularly seen in the migrants to the CNMI — about 27 percent of the Palau-born residents in 1990 had moved there in the previous 15 months. Once again, the large percentage of recent Palau-born immigrants may reflect the more fluid, temporary status of many of the Palauans living there.

Table 16.11. Year of Entry for Palau-born Individuals in Guam and the CNMI: 1990

Year of Entry	Number			Percent		
	Total	Guam	CNMI	Total	Guam	CNMI
Born outside Guam or CNMI...	2,640	1,233	1,407	100.0	100.0	100.0
1990.....	197	84	113	7.5	6.8	8.0
1989.....	426	162	264	16.1	13.1	18.8
1988.....	228	74	154	8.6	6.0	10.9
1987.....	164	67	97	6.2	5.4	6.9
1986.....	118	56	62	4.5	4.5	4.4
1985.....	118	51	67	4.5	4.1	4.8
1984.....	108	43	65	4.1	3.5	4.6
1983.....	86	35	51	3.3	2.8	3.6
1982.....	60	30	30	2.3	2.4	2.1
1981.....	46	24	22	1.7	1.9	1.6
1980.....	101	52	49	3.8	4.2	3.5
1975 to 1979.....	302	152	150	11.4	12.3	10.7
1970 to 1974.....	241	130	111	9.1	10.5	7.9
1962 to 1969.....	190	117	73	7.2	9.5	5.2
1960 or 1961.....	54	44	10	2.0	3.6	0.7
Before 1960.....	201	112	89	7.6	9.1	6.3

Source: U.S. Bureau of the Census, 1992a, Table 47; 1992b, Table 47; 1992c, Table 47.

In both the Marianas destinations, the majority of Palau-born residents had moved sometime during the 1980s or in 1990 — 67 percent of those residing in Guam and 69 percent of those residing in the CNMI. Overall, the migration to Guam was earlier than the migration to the CNMI. The migrant stream to the CNMI has been stronger in recent years than the stream to Guam, in part due to the attraction of the CNMI for jobs and in part due to the more stringent immigration laws of Guam.

Slightly more than 20 percent of the Palau-born males who resided in Guam or the CNMI in 1990 had moved there in 1989 or 1990 (Table 16.12). In contrast to all Palau-born migrants to the

Marianas, a larger percentage of Palau-born male migrants moved to Guam over the 15 months preceding the census (21 percent) than to the CNMI (20 percent). The majority of Palau-born male residents of these two places migrated in 1980 or after — nearly 67 percent of those living in Guam and about 72 percent of those residing in the CNMI.

Table 16.12. Year of Entry for Palau-born Males in Guam and the CNMI: 1990

Year of Entry	Number			Percent		
	Total	Guam	CNMI	Total	Guam	CNMI
Born outside Guam or CNMI...	1,408	526	882	100.0	100.0	100.0
1990.....	73	41	32	5.2	7.8	3.6
1989.....	216	71	145	15.3	13.5	16.4
1988.....	100	29	71	7.1	5.5	8.0
1987.....	67	32	35	4.8	6.1	4.0
1986.....	69	31	38	4.9	5.9	4.3
1985.....	65	20	45	4.6	3.8	5.1
1984.....	73	19	54	5.2	3.6	6.1
1983.....	53	11	42	3.8	2.1	4.8
1982.....	28	12	16	2.0	2.3	1.8
1981.....	22	12	10	1.6	2.3	1.1
1980.....	44	21	23	3.1	4.0	2.6
1975 to 1979.....	170	51	119	12.1	9.7	13.5
1970 to 1974.....	143	54	89	10.2	10.3	10.1
1962 to 1969.....	119	50	69	8.5	9.5	7.8
1960 or 1961.....	26	17	9	1.8	3.2	1.0
Before 1960.....	140	55	85	9.9	10.5	9.6

Sources: U.S. Bureau of the Census, 1992a, Table 47; 1992b, Table 47.

The migration of Palau-born females to the Marianas over the 15 months preceding the 1990 census was stronger than for either Palau-born males or all Palau-born persons (Table 16.13). Nearly 3 in every 10 Palau-born female migrants to Guam or the CNMI had moved in 1989 or 1990. Recent migration was particularly evident in the latter — more than 15 percent of the Palau-born females in the CNMI came in the first three months of 1990, with nearly 66 percent having moved after 1986. Relatively few (11.9 percent) of the Palau-born females living in the CNMI immigrated before 1980.

Table 16.11. Year of Entry for Palau-born Females in Guam and the CNMI: 1990

Year of Entry	Numbers			Percent		
	Total	Guam	CNMI	Total	Guam	CNMI
Born Outside Guam or CNMI...	1,232	707	525	100.0	100.0	100.0
1990.....	124	43	81	10.1	6.1	15.4
1989.....	210	91	119	17.0	12.9	22.7
1988.....	128	45	83	10.4	6.4	15.8
1987.....	97	35	62	7.9	5.0	11.8
1986.....	49	25	24	4.0	3.5	4.6
1985.....	53	31	22	4.3	4.4	4.2
1984.....	35	24	11	2.8	3.4	2.1
1983.....	33	24	9	2.7	3.4	1.7
1982.....	32	18	14	2.6	2.5	2.7
1981.....	24	12	12	1.9	1.7	2.3
1980.....	57	31	26	4.6	4.4	5.0
1975 to 1979.....	132	101	31	10.7	14.3	5.9
1970 to 1974.....	98	76	22	8.0	10.7	4.2
1962 to 1969.....	71	67	4	5.8	9.5	0.8
1960 or 1961.....	28	27	1	2.3	3.8	0.2
Before 1960.....	61	57	4	5.0	8.1	0.8

Sources: U.S. Bureau of the Census, 1992a, Table 47; 1992b, Table 47; 1992c, Table 47.

### *Parents' Place of Birth*

Nearly 96 percent of the Palau born in Palau had fathers also born in Palau (Table 16.14). In contrast, only 84 percent of the fathers of Palau born on Guam were born in Palau, with about 87 percent of the fathers of Palau born in the CNMI born in Palau. These figures show the relatively large extent of Palauan intermarriage on Guam and CNMI. However, although most of the non-Palauan fathers of CNMI residents were from the Northern Marianas, most of the non-Palauan fathers on Guam were from some part of Asia — probably from the relatively large Filipino population on that island. Nearly 3 percent of all Palau born living in Palau, on Guam, or in the CNMI had fathers born in Asia, showing again the important role Asian migration to Palau. Relatively few fathers came from another part of Micronesia, such as the FSM or the Marshalls. Nevertheless, Palau-born residents of the Marianas were more likely to have fathers from other places than the Palau-born persons who remained in Palau.

Table 16.14. Father's Place of Birth for Palau-born Individuals in Palau, Guam and the CNMI: 1990

Father's Place of Birth	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Total.....	14,961	12,321	2,640	1,233	1,407
Percent.....	100.0	100.0	100.0	100.0	100.0
Palau.....	93.8	95.6	85.3	84.0	86.5
Guam.....	0.5	0.0	2.5	2.9	2.1
Northern Marianas Islands.....	0.6	0.2	2.7	1.1	4.1
Federated States of Micronesia...	0.9	0.7	2.0	2.0	1.9
Chuuk.....	0.3	0.1	1.0	0.8	1.2
Kosrae.....	0.1	0.1	0.2	0.3	0.1
Pohnpei.....	0.2	0.2	0.5	0.6	0.4
Yap.....	0.3	0.3	0.3	0.3	0.3
Marshall Islands.....	0.1	-	0.5	-	0.2
Other Pacific Islands.....	0.1	-	0.4	0.6	0.2
Asia.....	2.7	2.5	3.9	5.4	2.6
United States.....	1.4	0.9	3.3	3.5	2.3
Elsewhere.....	0.1	0.1	0.4	0.5	0.3

Sources: U.S. Bureau of the Census, 1992a, Table 48; 1992b, Table 48; 1992c, Table 48.

The Palau-born residents of Palau were even more likely to have mothers born in Palau than fathers born there (Table 16.15). More than 98 percent of the mothers of Palau born on Palau were born in Palau, compared to about 96 percent of the fathers. Similarly, the Palau born on Guam and in the CNMI were more likely to have mothers born in Palau than to have fathers born there. Some of this discrepancy must be attributed to persons either not knowing their father or not knowing where their father was born. Although many Palau-born residents of the Marianas had mothers born in their place of current residence, these percentages were less than for the fathers. In general, Palau-born females traditionally have been less likely to move abroad than the males, with this phenomenon reflected in the data presented here.

Table 16.15. Mother's Place of Birth for Palau-born Individuals in Palau, Guam, and the CNMI: 1990

Mother's Place of Birth	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Total.....	14,961	12,321	2,640	1,233	1,407
Percent.....	100.0	100.0	100.0	100.0	100.0
Palau.....	97.1	98.4	91.4	91.6	91.3
Guam.....	0.4	0.1	1.8	2.1	1.6
Northern Marianas Islands.....	0.5	0.1	2.5	1.0	3.8
Federated States of Micronesia...	0.8	0.6	1.7	2.1	1.4
Chuuk.....	0.2	0.1	0.6	0.6	0.6
Kosrae.....	-	-	0.2	0.3	-
Pohnpei.....	0.3	0.2	0.6	0.6	0.5
Yap.....	0.3	0.3	0.3	0.5	0.2
Marshall Islands.....	0.1	0.1	-	-	0.1
Other Pacific Islands.....	-	-	0.1	0.2	-
Asia.....	0.9	0.7	1.9	2.4	1.6
United States.....	0.2	0.1	0.4	0.5	0.3
Elsewhere.....	0.1	-	0.1	0.2	0.1

Sources: U.S. Bureau of the Census, 1992a, Table 48; 1992b, Table 48; 1992c, Table 48.

### *Language*

Less than 2 percent of all Palau-born residents of Palau, Guam, and the CNMI spoke English at home in 1990 (Table 16.16). However, language use differed based on place of residence: less than 1 percent of the Palau born in Palau spoke English at home, compared to 7 percent of those residing in the Marianas. The 12 percent of Palau born on Guam who spoke English at home suggests both that Palauans have been moving to Guam over a longer period of time than to the CNMI, and that these migrants have integrated more fully into the English-speaking community. Since good jobs and education on Guam clearly are related to English use, these figures are not surprising.

Table 16.16. Language Spoken at Home for Palau-born Individuals in Palau, Guam, and the CNMI: 1990

Language Spoken at Home	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Persons 5 years and over....	13,489	10,930	2,559	1,210	1,349
Speak only English at home.....	252	74	178	145	33
Percent.....	1.9	0.7	7.0	12.0	2.4
Speak other language at home....	13,237	10,856	2,381	1,065	1,316
Percent.....	100.0	100.0	100.0	100.0	100.0
Palauan.....	96.1	98.7	84.3	88.0	81.3
Chamorro.....	1.8	-	10.0	7.1	12.4
Carolinian.....	0.1	-	0.8	0.5	1.0
Chuukese.....	0.2	-	0.9	0.4	1.4
Kosraean.....	-	-	0.1	0.1	0.1
Marshallese.....	0.1	0.1	0.1	0.0	0.2
Pohnpeian.....	-	-	0.2	0.3	0.2
Yapese.....	-	-	0.1	0.2	0.1
Other Pacific languages.....	0.7	0.6	1.0	0.6	1.4
Asian languages.....	0.7	0.4	1.9	2.3	1.7
Other languages.....	0.2	0.2	0.3	0.1	0.4

Source: U.S. Bureau of the Census, 1992a, Table 50; 1992b, Table 50; 1992c, Table 50.

Of those Palau born not speaking English at home, nearly all remaining in Palau spoke Palauan — with a few people speaking Philippines languages or some other Pacific Island language. On the other hand, only 84 percent of those living on Guam and in the CNMI who did not speak English at home spoke Palauan, with 10 percent speaking Chamorro (especially in the CNMI) and about 2 percent speaking Asian languages (slightly more so on Guam). Palau-born persons speaking other languages at home almost certainly reflects intermarriage with persons speaking those languages — suggesting a relatively many of Palauan-Chamorro marriages and Palauan-Asian (probably Filipino) marriages.

Because Paluans in Palau do not need to speak English at home or in daily activities, very few spoke English more frequently than Palauan (Table 16.17). More than 90 percent of Palau born in Palau who did not speak English at home spoke another language (presumably Palauan) at home more frequently than English. Conversely, only about 60 percent of Palau born of the Marianas spoke the other language at home more frequently than English — with less than half the non-English speakers on Guam in this category.

Table 16.17. Frequency of Language Use for Palau-born Individuals in Palau, Guam, and the CNMI: 1990

Frequency of Use	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Persons 5 years and over....	13,489	10,930	2,559	1,210	1,349
Speak only English at home.....	252	74	178	145	33
Speak other language at home....	13,237	10,856	2,381	1,065	1,316
Percent.....	100.0	100.0	100.0	100.0	100.0
More frequently than English...	90.7	97.6	59.3	47.5	68.8
Both equally often.....	6.1	1.4	27.6	34.0	22.4
Less frequently than English...	2.6	0.4	12.6	18.2	8.0
Does not speak English.....	0.5	0.5	0.5	0.3	0.8

Sources: U.S. Bureau of the Census, 1992a, Table 50; 1992b, Table 50; 1992c, Table 50.

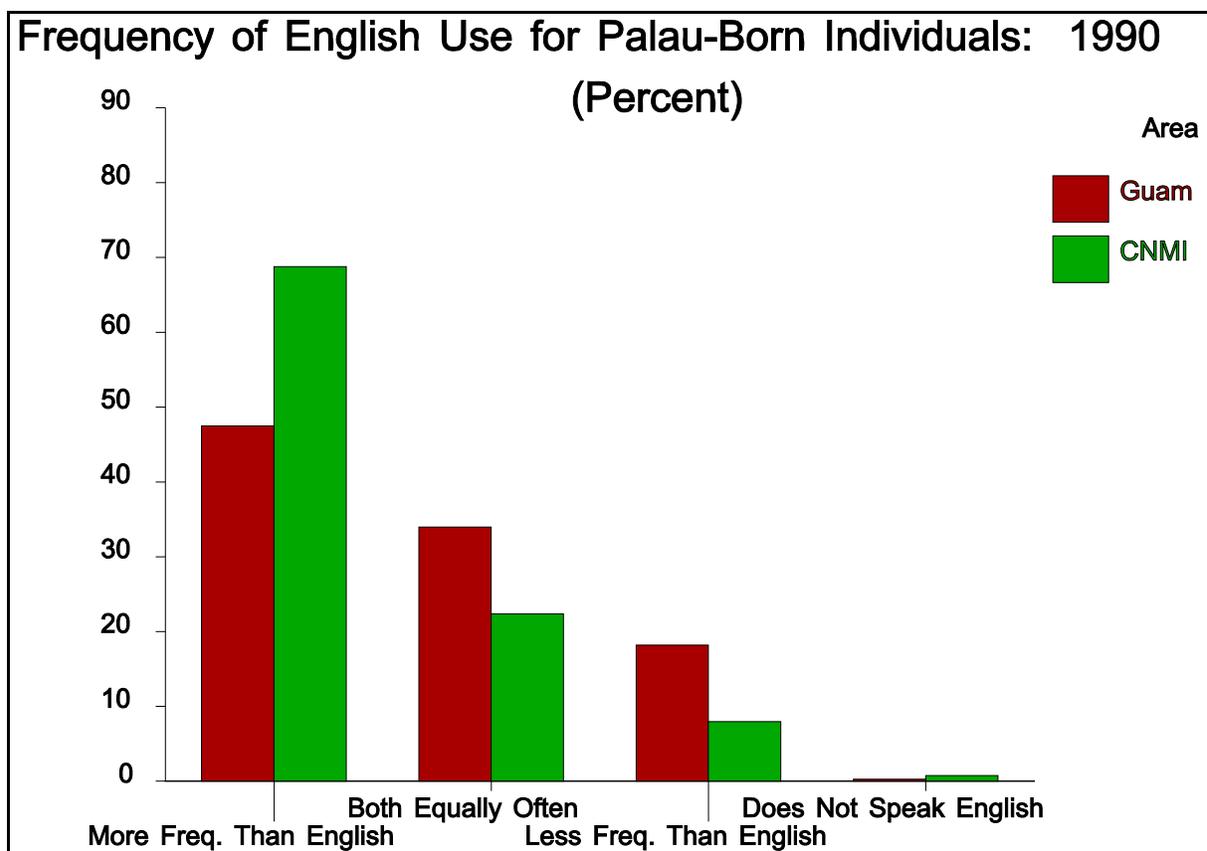


Figure 16.3. Frequency of English Use for Palau Born by Residence: 1990

More than one-third of the non-English speakers on Guam spoke English and another language equally often, and nearly 13 percent actually spoke English more than the other language — once again suggesting a high degree of integration into the English-speaking community. Nearly 69 percent of the non-English speakers in the CNMI spoke some other language more often than English, falling between frequency of English use in Palau and Guam and in general attesting to the differing migration histories of Palau born. Only 8 percent of the Palau-born residents in the CNMI spoke English more frequently than their other language. Very few Palau-born residents of Palau, Guam, or the CNMI did not speak English.

*Education*

Data from the 1990 census show that of the nearly 4,400 Palau-born individuals enrolled in school, more than 550 resided on Guam or in the CNMI (Table 16.18). Compared to Palauans living in Palau, relatively few Palau-born residents of the Marianas attended primary or elementary school. This difference in enrollment largely is a function of the greater percentage of young Palau-born persons residing in Palau. In contrast, relatively more of the Palau-born population of the CNMI attended high school than Palauans in either Palau or Guam.

Table 16.18. School Enrollment for Palau-born Individuals in Palau, Guam, and the CNMI: 1990

School Enrollment	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Persons 3 + yrs enrolled.....	4,396	3,840	556	272	284
Percent.....	100.0	100.0	100.0	100.0	100.0
Primary school.....	2.1	2.3	1.1	0.4	1.8
Elementary school, 1st to 8th grade...	52.4	55.6	30.4	20.6	39.8
High school 9th to 12th grade.....	32.8	32.6	34.5	23.9	44.7
College.....	12.6	9.5	34.0	55.1	13.7

Sources: U.S. Bureau of the Census, 1992a, Table 50; 1992b, Table 51; 1992c, Table 51.

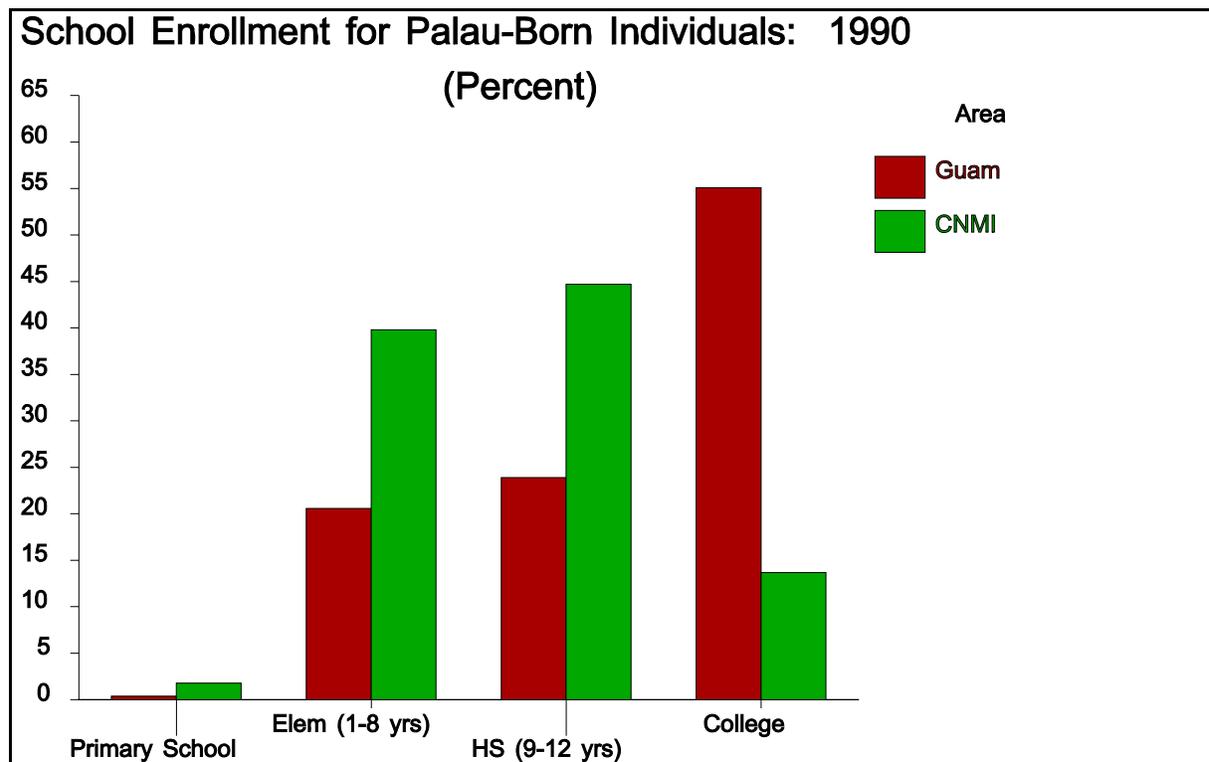


Figure 16.4. School Enrollment of Palau Born by Residence: 1990

More than 55 percent of the Palau-born residents of Guam in 1990 attended college, attesting to the attraction of Guam's colleges, including the University of Guam. The relatively lower college enrollment of Palauans in Palau in part reflects the age composition of this sector of Palau's population, which includes many individuals younger or older than most college students, and in part reflects the limited options for post-high school education in Palau. Although many of the Palau-born residents of the CNMI attended high school in 1990, relatively few attended college — once again due both to the age composition and the limited access to tertiary education.

The data in Table 16.19 show educational attainment of Palau-born persons aged 25 years and over in terms of cumulative percentages. For example, the 53 percent of all Palauans who were high school graduates (or equivalent) means that 53 percent had at least a high school diploma — including the 1 percent with graduate or professional degrees, the 8 percent with Bachelor's degrees, and so on. Of all the Palauans considered in this analysis, more than 25 percent had fewer than 8 years of formal education and about 27 percent had some post high school education.

Table 16.19. Educational Attainment for Palau-born Individuals in Palau, Guam, and the CNMI: 1990

Educational Attainment	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Persons 25 years and over .....	7,556	5,888	1,668	849	819
Cumulative percent:					
None.....	100.0	100.0	100.0	100.0	100.0
Elementary: 1 to 7 years.....	97.8	97.8	97.7	96.3	99.0
Elementary: 8 years.....	74.4	71.5	84.8	83.6	86.0
High School: 1 year.....	68.2	64.8	80.2	79.2	81.2
2 years.....	61.5	57.7	74.8	73.5	76.2
3 years.....	58.7	55.2	71.1	69.5	72.8
4 years, no diploma.....	56.1	52.4	68.9	66.9	71.1
High school grads, incl. equivalency...	53.9	50.5	65.8	64.3	67.4
Some college, no degree.....	27.4	27.0	28.7	31.4	25.9
Associate degree, occup. program.....	16.6	17.6	13.1	10.5	15.9
Associate degree, academic program.....	11.4	11.7	10.4	8.2	12.7
Bachelors degree.....	7.9	8.0	7.7	7.1	8.3
Graduates or professional degree.....	1.4	1.3	1.6	1.4	1.8

Sources: U.S. Bureau of the Census, 1992a, Table 51; 1992b, Table 51; 1992c, Table 51.

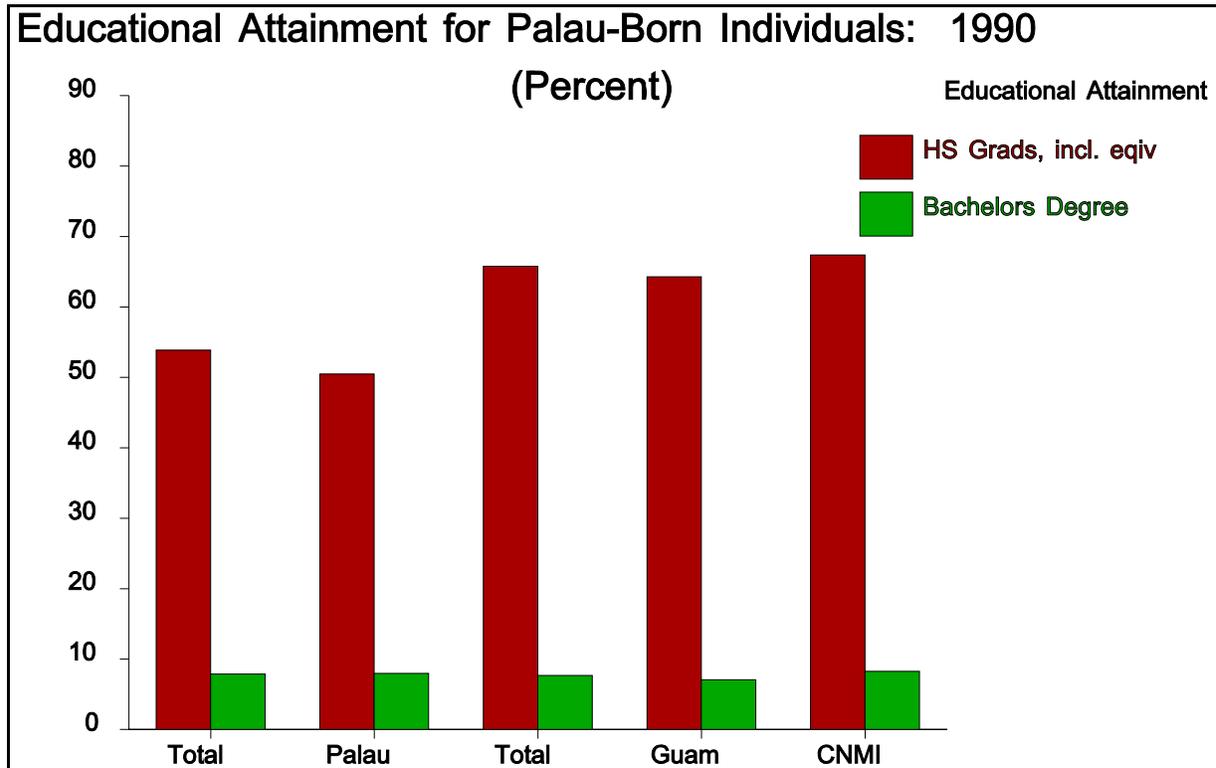


Figure 16.5. Educational Attainment of Palau born by Residence: 1990

In 1990, slightly more than half the Palau-born in Palau had at least a high school diploma, compared to nearly 2 out of 3 of all Palauans residing on Guam or in the CNMI. The Palau-born population of the Marianas had larger proportions of persons with some college background (but no degree) and graduate or professional degrees. Palau, in contrast, contained proportionally more individuals with associate and Bachelor's degrees. Palau-born individuals residing in the CNMI in 1990 had more post high school education than those residing in Palau in all educational attainment categories except "Some college (no degree)" and "Associate degree, occupational program." Palau contained larger percentages of Palauans aged 25 years or more with fewer than 8 years of formal schooling. Once again, educated migrants (including Palauans) are more likely to migrate, although it is impossible to determine with the data available whether this education was obtained before or after they left Palau. As Table 16.18 showed, many Palau-born individuals emigrate to the Marianas specifically for higher education, so it is not surprising that better educated Palauans were present in larger percentages outside Palau.

Nearly 19 percent of the Palauans aged 16 to 64 years and living in Palau, on Guam, or in the CNMI had completed a course in vocational training by the time of the last decennial census (Table 16.20). Relatively more Palau-born residents of Palau acquired their vocational training within Palau than elsewhere, thanks to ready access to the Micronesian Occupational College (MOC) in Koror. Conversely, more Palauans residing in Guam and CNMI acquired their vocational training outside the respective area — once again, most likely at the MOC prior to their emigration from Palau. The latter trend is particularly evident in the CNMI; proportionally more of the Palauans living on Guam received their vocational training on that island than somewhere else, in large part reflecting the greater educational access there (particularly at Guam Community College) and the training related to skilled jobs on Guam.

Table 16.20. Vocational Training for Palau Born Individuals in Palau, Guam, and the CNMI: 1990

Educational Attainment	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Persons 16 to 64 years.....	9,169	6,992	2,177	1,074	1,103
Percent.....	100.0	100.0	100.0	100.0	100.0
Completed requirements for a program...	18.5	18.5	18.5	15.8	21.1
In the area of enumeration.....	9.9	10.6	7.7	9.7	5.8
Not in area of enumeration.....	8.6	7.9	10.8	6.1	15.3
Did not complete requirements.....	81.5	81.5	81.5	84.2	78.9

Sources: U.S. Bureau of the Census, 1992a, Table 51; 1992b, Table 51; 1992c, Table 51.

### *Labor Force Participation*

One of the main reasons given for migration from Palau to Guam and the CNMI is looking for jobs. The remainder of this chapter explores employment characteristics of Palauans residing in Palau and the Marianas.

Slightly more than 55 percent of all Palau-born persons living in Palau or the Marianas and aged 16 years or older were in the labor force the week before the 1990 census (Table 16.21). This figure was lower in Palau itself (53 percent) than on Guam (58 percent) or in the CNMI (71 percent).

Table 16.21. Labor Force Participation for Palau-born Individuals in Palau, Guam, and the CNMI: 1990

Labor Force Participation	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Person 16 years and over.....	10,146	7,874	2,272	1,118	1,154
In labor force.....	5,624	4,161	1,463	648	815
Percent.....	55.4	52.8	64.4	58.0	70.6
Civilian labor force.....	5,615	4,159	1,456	641	815
Employed.....	5,081	3,711	1,370	602	768
Also did subsistence activity...	419	393	26	15	11
At work.....	4,982	3,669	1,313	569	744
35 or more hours.....	4,608	3,440	1,168	493	675
Percent.....	92.5	93.8	89.0	86.6	90.7
Unemployed.....	534	448	86	39	47
Percent of civilian labor force...	9.5	10.8	5.9	6.1	5.8
Not in labor force.....	4,522	3,713	809	470	339
Subsistence activity only.....	426	419	7	4	3

Sources: U.S. Bureau of the Census, 1992a, Table 53; 1992b, Table 53; 1992c, Table 53.

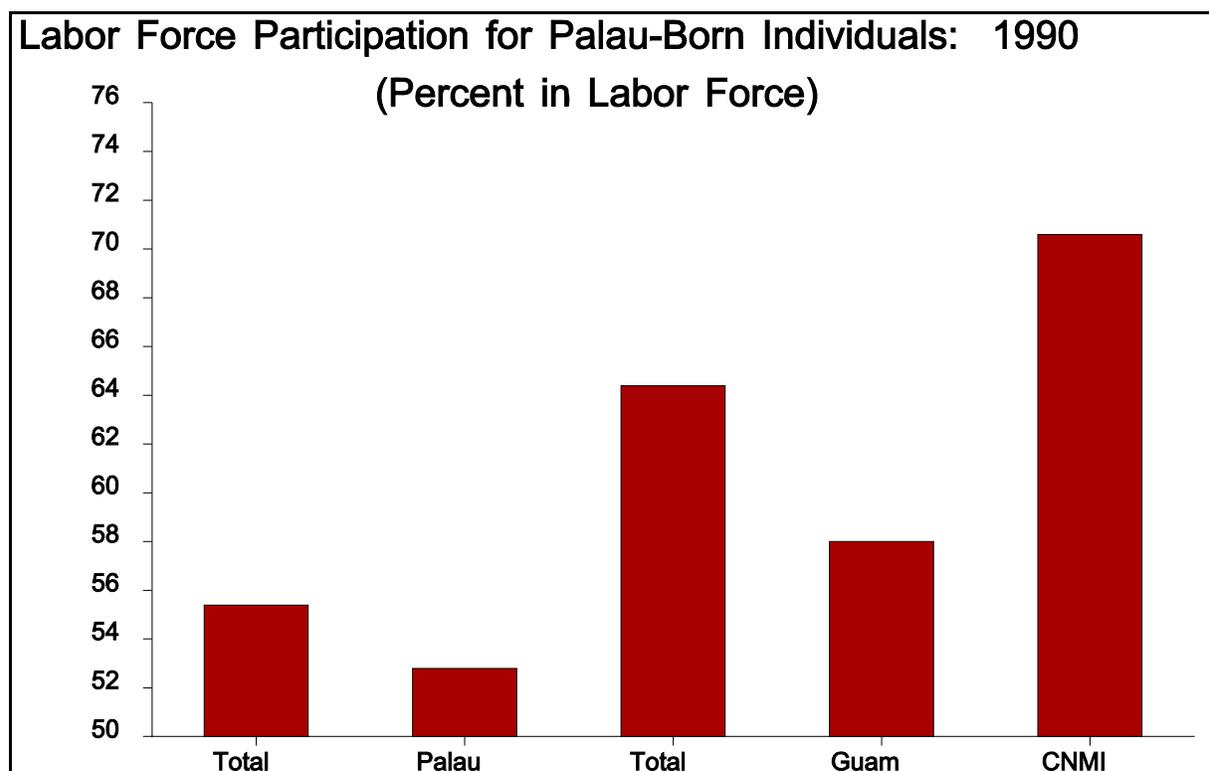


Figure 16.6. Percent of Palau Born in Labor Force by Residence: 1990

In 1990, Palau-born persons living in Palau were much more likely than those living in the Marianas to be unemployed. In total, about 10 percent of the Palau born were unemployed in 1990, with nearly 11 percent in Palau compared to roughly 6 percent in both Guam and the CNMI. However, those Palauans residing in Palau and employed the week before the decennial census were more likely to have full-time employment (35 or more hours per week). The greater frequency of part-time employment on Guam and in CNMI probably partly reflects the greater access to work — including the desire on the part of some larger companies to minimize their full-time employees and reduce benefits.

Slightly more than 8 percent of the Palau-born employed adult residents of Palau, Guam, or the CNMI also practiced some form of subsistence activity in 1990. Most of this activity occurred in Palau itself, with less than 2 percent of the employed Palauans living in the Marianas also practicing some type of subsistence. Also, more than 11 percent of Palauans living in Palau but not in the labor force practiced subsistence, compared to less than 1 percent on Guam or in the CNMI. The

persistence of traditional subsistence activities in Palau, their greater acceptance and *ease* of practice compared to Guam or the CNMI probably largely account for these differences.

In 1990, slightly more than 55 percent of the Palau born in Palau and the Marianas aged 16 years and over were in the local labor force (Table 16.22). Labor force participation was particularly high in the CNMI (nearly 71 percent), although it was higher in Guam (58 percent) than in Palau itself (53 percent). Greater labor force participation in these two places probably reflects both more variety in jobs as well as the necessity for employment in Guam and the CNMI.

Table 16.22. Labor Force Participation for Palau-born Individuals Aged 16 Years and Over in Palau, Guam, and the CNMI, by Sex: 1990

Labor Force Participation Rates	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Total.....	55.4	52.8	64.4	58.0	70.6
Males.....	64.4	61.9	74.5	72.4	76.2
Females.....	46.6	43.3	56.5	47.5	65.8

Sources: U.S. Bureau of the Census, 1992a, Table 53; 1992b, Table 53; 1992c, Table 53.

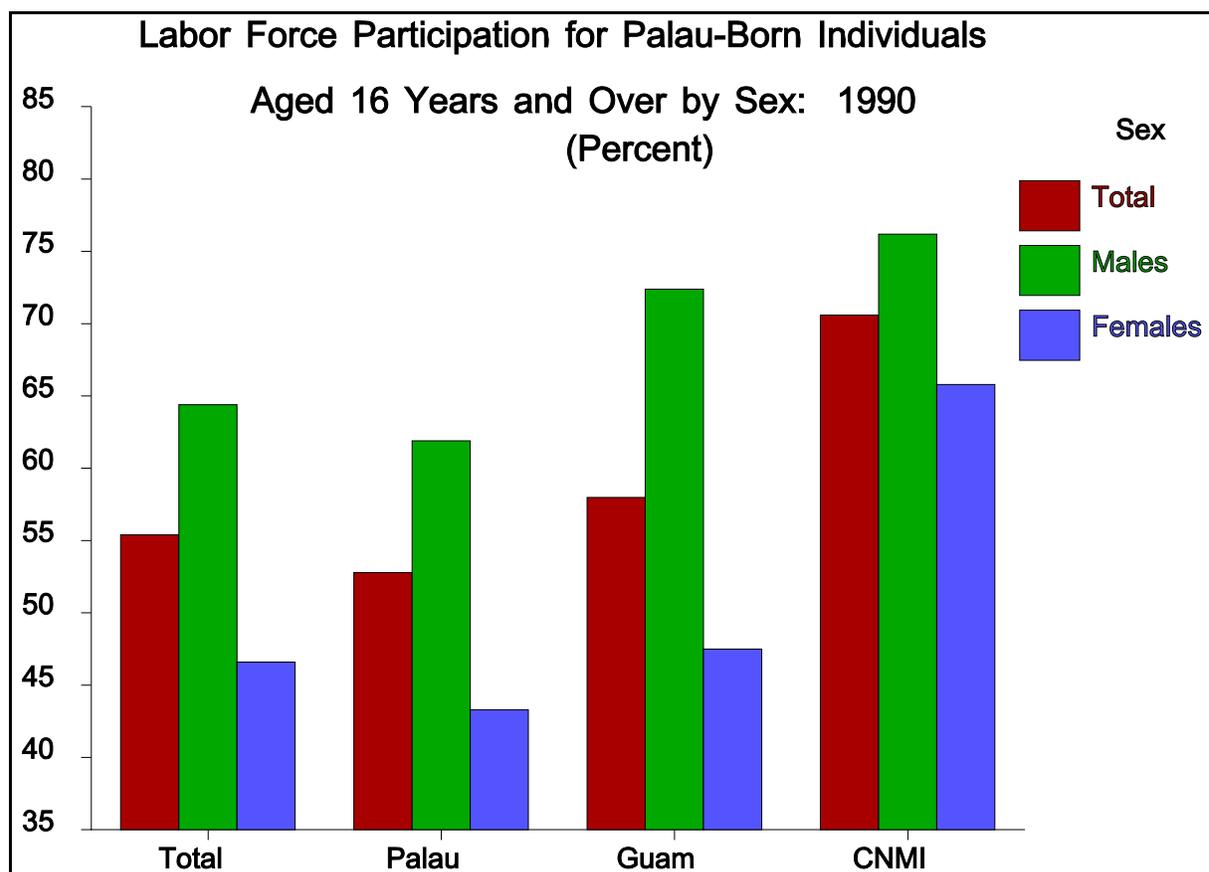


Figure 16.7. Percent of Palau Born in the Labor Force by Sex and Residence: 1990

Palau-born males tended to participate in the labor force of Palau, Guam, and the CNMI more than Palau-born females. Once again, the highest male labor force participation rates in 1990 occurred in the CNMI and on Guam — roughly 76 and 72 percent, respectively. The labor force participation rates for Palau-born females was particularly high in the CNMI, probably a consequence of female employment in the local textile industry. Labor participation recorded for Palau-born females on Guam in 1990 was only slightly higher than that recorded for Palau itself.

Unemployment for Palauans living in Palau and the Marianas approached 10 percent in 1990 (Table 16.23). Female unemployment was slightly less than male unemployment. Once again, however, differences are evident between Palauans residing in Palau and those residing in the Marianas. For the former, male unemployment was higher by more than 1/2 a percentage point. But for Palauans living in the CNMI, male and female unemployment rates were equal in 1990, while on Guam a substantially lower proportion of males (less than 5 percent) were unemployed than females (nearly 8 percent).

Table 16.23. Unemployment for Palau-born Individuals Aged 16 Years and Over in Palau, Guam, and the CNMI, by Sex: 1990

Unemployment Rates	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Total.....	9.5	10.8	5.9	6.1	5.8
Males.....	9.8	11.0	5.8	4.8	5.8
Females.....	9.1	10.4	6.0	7.5	5.8

Sources: U.S. Bureau of the Census, 1992a, Table 53; 1992b, Table 53; 1992c, Table 53.

Proportionally more Palauans living in Palau claimed full-time work in 1990 than in either Guam or the CNMI (Table 16.24). Palau-born males in Palau and on Guam were more likely to be employed at full-time work than were females. Fully 95 percent of the males in Palau and nearly 91 percent of the males on Guam claimed full-time employment at the time of the 1990 census, compared to 92 percent of the females in Palau and about 82 percent of the females on Guam. In CNMI, however, the females were more likely to be employed full time than the males — once again probably due to employment in garment factories.

Table 16.24. Full-time Employment of Employed Palau-born Individuals Aged 16 Years and Over in Palau, Guam, and the CNMI, by Sex: 1990

Percent Full-time Employed	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Total.....	92.5	93.8	89.0	86.6	90.7
Males.....	93.9	95.0	90.1	90.5	89.7
Females.....	90.6	91.9	87.8	82.3	91.7

Sources: U.S. Bureau of the Census, 1992a, Table 53; 1992b, Table 53; 1992c, Table 53.

Table 16.25 presents data on work status in all of 1989, as opposed to the week preceding the 1990 Census Day. Nearly 58 percent of Palau-born individuals enumerated in Palau, on Guam, and in the CNMI worked at least some weeks in 1989. Proportionally fewer Palauans residing in Palau (about 55 percent) worked the year preceding the 1990 census, compared to nearly 63 percent of Palau-born residents of Guam and about 70 percent of Palau-born residents of the CNMI.

Table 16.25. Work Status in 1989 for Palau-born Individuals Aged 16 Years and Over in Palau, Guam, and the CNMI: 1990

Work Status in 1989	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Persons 16 years and over.....	10,146	7,874	2,272	1,118	1,154
Worked in 1989.....	5,831	4,326	1,505	699	806
Percent.....	57.5	54.9	66.2	62.5	69.8
50 to 52 weeks.....	4,168	3,111	1,057	490	567
Percent.....	71.5	71.9	70.2	70.1	70.3
40 to 49 weeks.....	517	401	116	47	69
27 to 39 weeks.....	253	161	92	55	37
14 to 26 weeks.....	479	345	134	54	80
1 to 13 weeks.....	414	308	106	53	53
Usually worked 35 + hours per wk...	5,342	3,964	1,378	606	772
Percent.....	91.6	91.6	91.6	86.7	95.8
50 to 52 weeks.....	4,002	2,983	1,019	467	552
Percent.....	74.9	75.3	73.9	77.1	71.5
40 to 49 weeks.....	444	347	97	33	64
27 to 39 weeks.....	198	128	70	37	33
14 to 26 weeks.....	383	273	110	33	77
1 to 13 weeks.....	315	233	82	36	46
Usually worked 15-34 hrs per wk....	363	259	104	74	30
Did not work in 1989.....	4,315	3,548	767	419	348

Sources: U.S. Bureau of the Census, 1992a, Table 53; 1992b, Table 53; 1992c, Table 53.

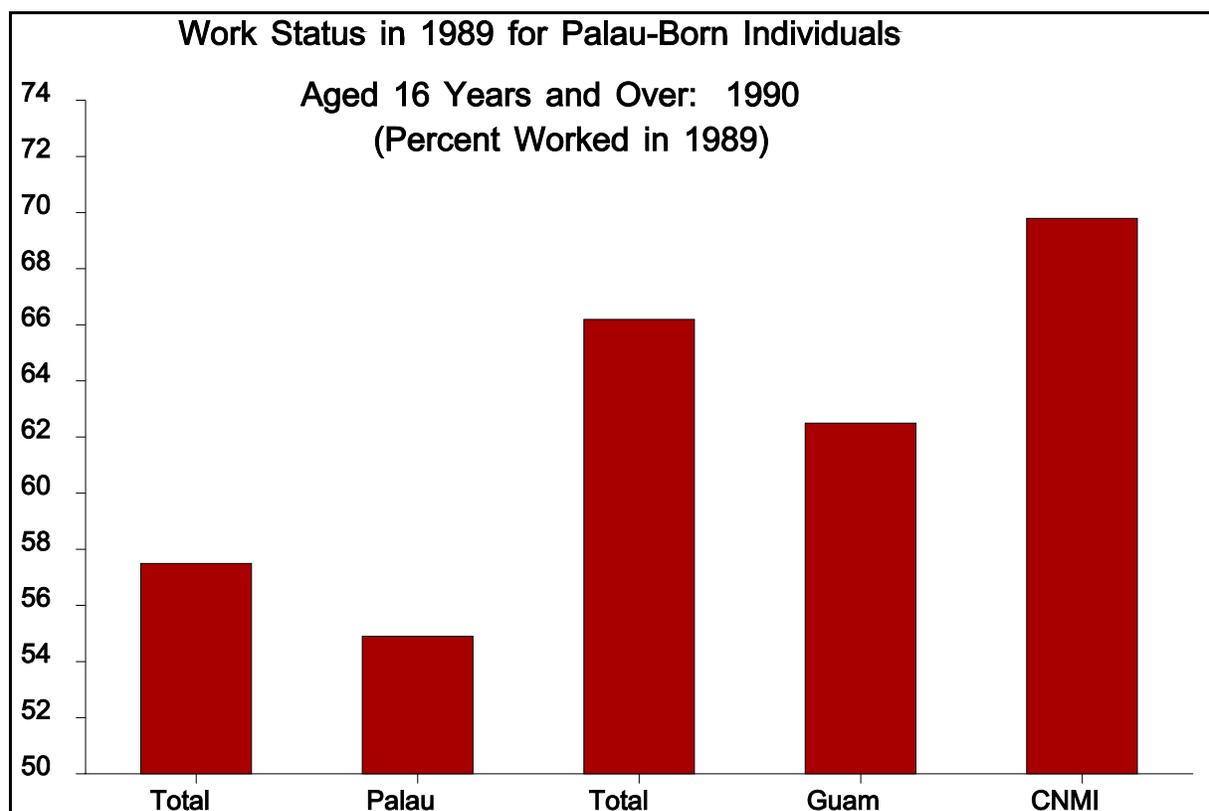


Figure 16.8. Percent of Palau Born Who Worked in 1989 by Residence: 1990

In contrast, those Palauans residing in their home republic who did work in 1989 tended to work for more weeks than those living in either Guam or the CNMI. For the number of weeks worked, the percentage working all year was just slightly higher in Palau (about 72 percent) than outside Palau (roughly 70 percent) — though some of this difference possibly resulted from Palauans moving to Guam or the CNMI during the year and thus not having an opportunity to work the entire year.

During the weeks worked in 1989, about 92 percent of Palau-born persons living both in Palau and in the Marianas worked 35 or more hours per week — the Census Bureau definition of full-time work. Palau-born residents of the CNMI were more likely to work full-time than those living on Guam. On the other hand, although about 75 percent of the full-time Palau-born workers worked the entire year, this percentage was slightly higher in Palau than outside Palau. For Palauans living in the Marianas in 1989, those residing on Guam were more likely to be employed full-time, year-round than those residing in the CNMI.

*Occupation, Industry, and Class of Worker*

In 1990 Palau-born residents of Palau and the Marianas claimed "Technical, sales, and administrative support" and "Managerial and professional specialty" most frequently as their occupations — about 29 and 25 percent, respectively (Table 16.26). However, these figures differed depending on place of residence. Although the same two occupations figured prominently among Palauans living in Palau, their importance was reversed as "Managerial ..." increased and "Technical ..." decreased slightly. On Guam, most employed adult Palauans claimed "Service" (32.1 percent) or "Technical ..." occupations in 1990. In the CNMI, on the other hand, although the same occupations as those noted for Guam were most important, the percentage of individuals employed in "Service" occupations was nearly 13 percentage points less and was nearly equalled by individuals employed as "Operators, fabricators, and laborers" (19 percent). Relatively few Palauans engaged in "Farming, forestry, and fishing" in 1990, regardless of their place of residence.

Table 16.26. Employed Palau-born Individuals Aged 16 Years and Over in Palau, Guam, and the CNMI, by Occupation: 1990

Occupation	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Employed persons 16 years and over...	5,081	3,711	1,370	602	768
Percent.....	100.0	100.0	100.0	100.0	100.0
Managerial and professional specialty.....	25.2	29.0	14.8	13.0	16.3
Technical, sales, and admin. support.....	29.4	28.3	32.3	28.7	35.0
Service.....	19.1	16.9	25.0	32.1	19.5
Farming, forestry, and fishing.....	2.8	3.4	1.2	0.7	1.7
Precision production, craft, and repair...	9.2	8.8	10.0	12.0	8.5
Operators, fabricators, and laborers.....	14.3	13.5	16.6	13.6	19.0

Sources: U.S. Bureau of the Census, 1992a, Table 54; 1992b, Table 54; 1992c, Table 54.

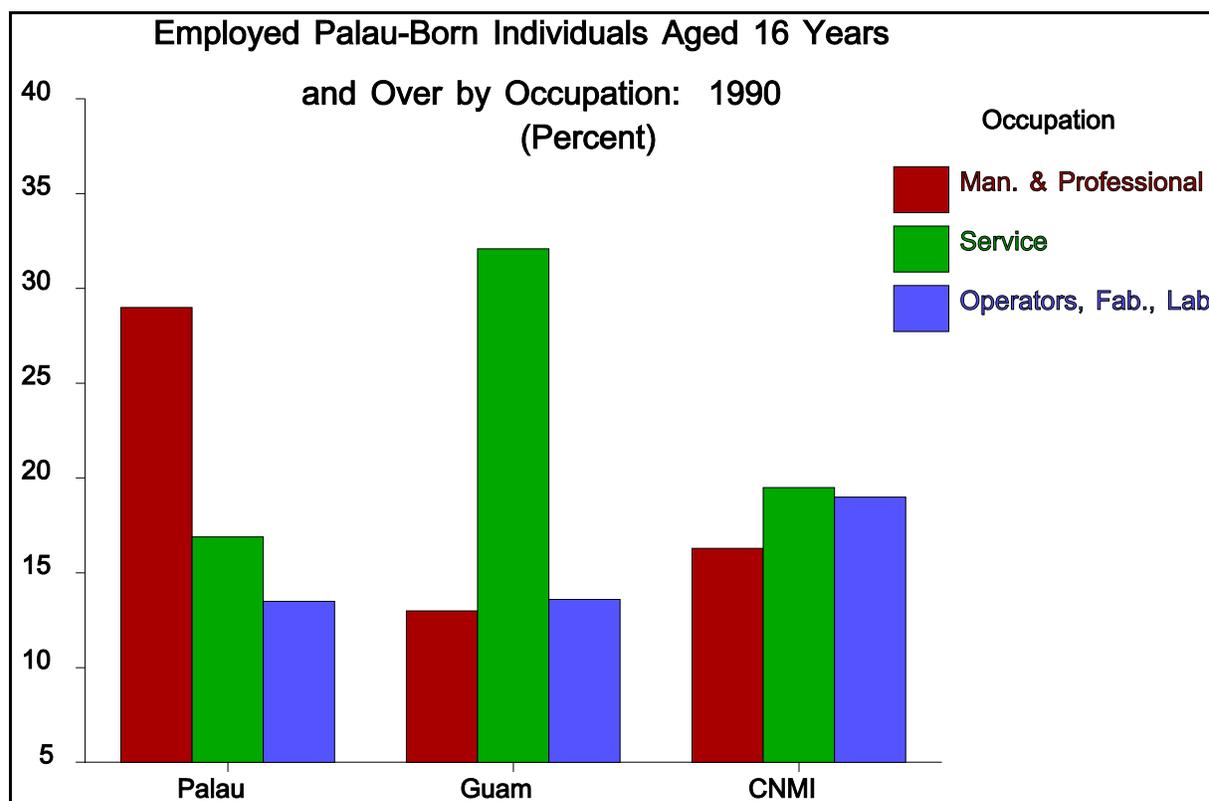


Figure 16.9. Percent Employed in Selected Occupations: 1990

The occupations of Palau-born males living in Palau, on Guam, or in the CNMI were more evenly distributed than the occupations of all Palauans, with "Managerial ...," "Operators ...," "Technical ...," "Service," and "Precision production, craft, and repair" all having comparatively large numbers. The same five occupations predominated among the Palauan males living in Palau, although "Managerial ..." was slightly more important. In contrast to Palau, "Managerial ..." was claimed by less than half the percentage of Palauan males on Guam or in the CNMI, the remaining four occupations gaining in prevalence. Some employed Palau-born males in both the Marianas locations claimed occupations as "Operators ...", with "Service" ranked second on Guam and "Technical ..." ranked second in the CNMI.

Table 16.27. Employed Palau-born Males in Palau, Guam, and the CNMI, by Occupation: 1990

Occupation	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Employed males 16 years and over.....	2,924	2,226	698	318	380
Percent.....	100.0	100.0	100.0	100.0	100.0
Managerial and professional specialty.....	23.6	27.0	12.8	12.6	12.9
Technical, sales, and admin. support.....	18.4	17.7	20.8	21.4	20.3
Service.....	16.5	15.5	19.6	18.2	20.8
Farming, forestry, and fishing.....	4.1	4.6	2.4	1.3	3.4
Precision production, craft, and repair...	15.4	14.2	19.1	22.3	16.3
Operators, fabricators, and laborers.....	22.1	21.1	25.4	24.2	26.3

Sources: U.S. Bureau of the Census, 1992a, Table 54; 1992b, Table 54; 1992c, Table 54.

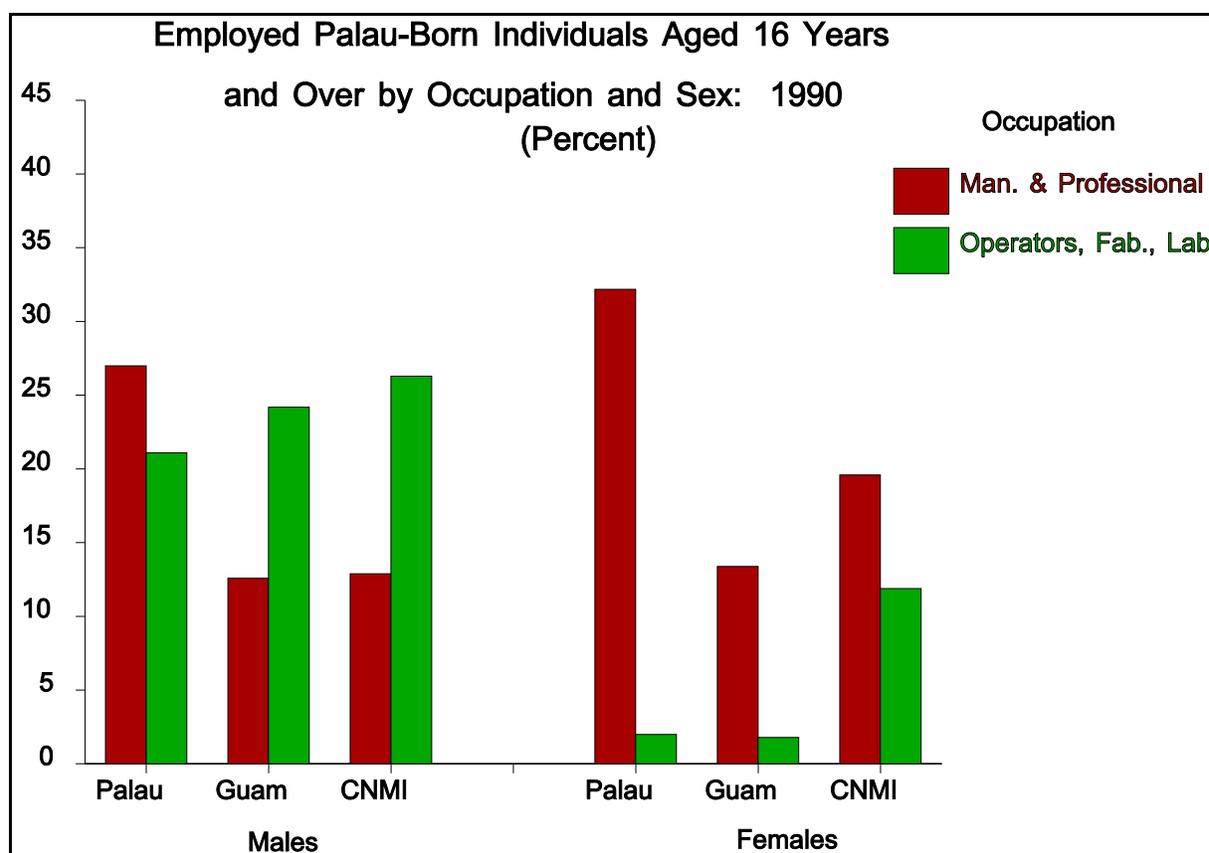


Figure 16.10. Employed Palau Born for Selected Occupations by Sex: 1990

"Technical ..." occupations were most prominent among Palau-born females living in Palau, on Guam, or in the CNMI, employing more than half again as many as the next most prevalent occupation "Managerial ..." (Table 16.28). This general pattern held for Palau itself and for the CNMI. On Guam, however, some females cited "Service" as their occupation, in combination with "Technical ..." accounting for nearly 85 percent of the employed Palau-born females residing there. A larger percentage of Palau-born females living in Palau were managers and professionals than were those living in either the Marianasn location.

Table 16.28. Employed Palau-born Females Aged 16 Years and Over in Palau, Guam, and the CNMI, by Occupation: 1990

Occupation	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Employed females 16 years and over...	2,157	1,485	672	284	388
Percent.....	100.0	100.0	100.0	100.0	100.0
Managerial and professional specialty.....	27.4	32.2	17.0	13.4	19.6
Technical, sales, and admin. support.....	44.3	44.4	44.2	37.0	49.5
Service.....	22.7	19.1	30.7	47.5	18.3
Farming, forestry, and fishing.....	1.1	1.5	-	-	-
Precision production, craft, and repair...	0.7	0.8	0.6	0.4	0.8
Operators, fabricators, and laborers.....	3.8	2.0	6.2	1.8	11.9

Sources: U.S. Bureau of the Census, 1992a, Table 54; 1992b, Table 54; 1992c, Table 54.

Of the total Palau-born residents employed and living in Palau or the Marianas, most (nearly 22 percent) cited "Professional and related services" (primarily education and health services) as the industry that employed them in 1990 (Table 16.29). Relatively large percentages of employed Palauans also claimed occupations in "Public administration" (nearly 17 percent) and "Retail trade" (about 16 percent). "Professional ..." and "Public administration" were even more important industries on Palau itself. In contrast, most Palau-born persons living in the Marianas cited employment in "Retail trade" — nearly 24 percent of those on Guam and 25 percent of those residing in the CNMI.

Table 16.29. Employed Palau-born Individuals Aged 16 Years and Over in Palau, Guam, and the CNMI, by Industry: 1990

Industry	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Employed persons 16 years and over....	5,081	3,711	1,370	602	768
Percent.....	100.0	100.0	100.0	100.0	100.0
Agriculture.....	1.1	1.3	0.5	0.3	0.7
Forestry and fisheries.....	1.4	1.8	0.3	0.3	0.3
Mining.....	0.2	0.3	0.1	-	0.1
Construction.....	8.4	9.5	5.5	10.0	2.1
Manufacturing.....	3.1	1.6	7.0	3.2	10.0
Transport, communic. & other utilities....	12.2	10.8	16.2	15.3	16.9
Wholesale trade.....	3.2	3.0	3.6	4.5	3.0
Retail trade.....	15.6	12.4	24.5	23.9	25.0
Finance, insurance, and real estate.....	2.9	2.7	3.2	3.2	3.3
Business services.....	1.3	1.1	1.9	1.7	2.1
Repair services.....	1.2	1.1	1.4	1.8	1.0
Personal services.....	9.9	8.3	14.4	14.0	14.7
Entertainment and recreation services....	1.4	1.0	2.4	2.8	2.1
Professional and related services.....	21.6	24.1	14.6	15.3	14.1
Public Administration.....	16.5	21.0	4.3	3.8	4.7

Sources: U.S. Bureau of the Census, 1992a, Table 55; 1992b, Table 55; 1992c, Table 55.

The geographic differences in industries that employ Palauans generally reflect available employment. For instance, 21 percent of the employed Palau-born residents of Palau claimed as industry "Public administration" — nearly five times the percentage for those living in the Marianas but hardly surprising given the large proportion of Palau-born government employees in Palau. About 14 percent of the Palauans living on Guam or in the CNMI worked in personal services, probably associated with the tourism industry. The 10 percent of Palau-born residents of the CNMI working in manufacturing probably were employed in the garment industry.

More than 20 percent of all employed Palau-born males worked in some form of "Public administration" in 1990, with another 16 percent working in "Transportation, communication, and other utilities" (Table 16.30). In Palau the proportion of Palau born males employed in "Public administration" was even greater, reaching 25 percent of all adult employed males. Most Palauan males living in the Marianas worked in "Transportation ..." (approximately 22 percent), with a large percentage also employed in "Retail trade" (nearly 19 percent). The "Construction" industry employed a large percentage of Palauan men on Guam (more than 16 percent), while nearly 13 percent of Palau-born males residing in the CNMI worked in "Personal services."

Table 16.30. Employed Palau-born Males in Palau, Guam, and the CNMI, by Industry: 1990

Occupation	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Employed males 16 years and over.....	2,924	2,226	698	318	380
Percent.....	100.0	100.0	100.0	100.0	100.0
Agriculture.....	1.5	1.7	0.9	0.3	1.3
Forestry and fisheries.....	1.9	2.3	0.6	0.6	0.5
Mining.....	0.4	0.4	0.1	0.0	0.3
Construction.....	13.5	14.7	9.7	16.4	4.2
Manufacturing.....	3.2	2.2	6.7	5.0	8.2
Transport, communic. & other utilities...	16.1	14.3	21.6	18.9	23.9
Wholesale trade.....	4.0	3.3	6.0	7.9	4.5
Retail trade.....	11.3	8.9	18.8	18.2	19.2
Finance, insurance, and real estate.....	1.8	1.6	2.4	2.2	2.6
Business services.....	1.8	1.4	3.2	2.5	3.7
Repair services.....	1.9	1.7	2.6	3.5	1.8
Personal services.....	7.3	6.4	10.0	5.7	13.7
Entertainment and recreation services....	1.6	1.1	3.2	3.5	2.9
Professional and related services.....	13.4	14.9	8.7	10.7	7.1
Public administration.....	20.3	25.0	5.4	4.7	6.1

Sources: U.S. Bureau of the Census, 1992a, Table 55; 1992b, Table 55; 1992c, Table 55.

The data on industry for Palau-born females differed from all Palauans and Palauan males. Nearly one-third of the employed Palauan females living in Palau, on Guam, or in the CNMI claimed an occupation in "Professional and related services" in 1990, with another 22 percent working in retail trade (Table 16.31). On Palau, the percentage of females employed in the "Professional ..." industry exceeded 38 percent, while the proportion employed in "Public administration" was nearly 10 percent less than among Palauan males residing there. The greatest percentage of employed Palauan females in the Marianas worked in "Retail trade," with the percentages for Guam and the CNMI both in excess of 30 percent. More than 23 percent of the Palau-born females on Guam worked in "Personal services" industry, once again probably associated with tourism.

Table 16.31. Employed Palau-born Females Aged 16 Years and Over in Palau, Guam, and the CNMI by Industry: 1990

Industry	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Employed females 16 years and over...	2,198	1,526	672	284	388
Percent.....	100.0	100.0	100.0	100.0	100.0
Agriculture.....	0.6	0.8	0.1	0.4	-
Forestry and fisheries.....	0.7	1.0	-	-	-
Mining.....	-	-	-	-	-
Construction.....	1.5	1.6	1.2	2.8	-
Manufacturing.....	2.8	0.8	7.3	1.1	11.9
Transport, communic. & other utilities....	6.9	5.3	10.6	11.3	10.1
Wholesale trade.....	2.0	2.4	1.2	0.7	1.5
Retail trade.....	21.6	17.7	30.5	30.3	30.7
Finance, insurance, and real estate.....	4.2	4.3	4.0	4.2	3.9
Business services.....	0.5	0.5	0.6	0.7	0.5
Repair services.....	0.2	0.3	0.1	-	0.3
Personal services.....	13.6	11.2	18.9	23.2	15.7
Entertainment and recreation services.....	1.0	0.7	1.6	2.1	1.3
Professional and related services.....	32.8	38.1	20.7	20.4	20.9
Public Administration.....	11.5	15.2	3.1	2.8	3.4

Sources: U.S. Bureau of the Census, 1992a, Table 55; 1992b, Table 55; 1992c, Table 55.

In 1990 slightly more than half of all employed Palau born worked in the private sector for wages and salary, with most of the remainder (about 41 percent) employed for a local or territorial government (Table 16.32). Most of the latter in fact lived in Palau — the relative importance of the two classes of workers reversed. The difference between Palau-born workers living in Palau compared to those living on Guam or in the CNMI is striking. Although more than 53 percent of the employed Palau born in Palau worked for the federal, local, or territorial government, less than 20 percent of those residing in the Marianas did so. Most of the latter lived in the CNMI and many were probably former TTPI administration employees. As one might expect, the vast majority of employed Palauans on Guam or in the CNMI had "Private for profit wage and salary" jobs — more than 76 percent of those in the CNMI and nearly 78 percent of those on Guam.

Table 16.32. Employed Palau-born Individuals Aged 16 Years and Over in Palau, Guam, and the CNMI, by Class of Worker: 1990

Class of Worker	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Employed persons 16 years and over...	5,081	3,711	1,370	602	768
Percent.....	100.0	100.0	100.0	100.0	100.0
Private for profit wage and salary.....	50.7	41.1	76.9	77.6	76.4
Private not for profit wage & salary.....	2.2	2.2	2.2	3.3	1.3
Local and territorial government.....	41.4	50.3	17.5	13.5	20.7
Federal government.....	2.7	3.0	2.1	3.7	0.9
Self-employed.....	2.8	3.3	1.2	2.0	0.7
Unpaid family.....	0.1	0.2	-	-	-

Sources: U.S. Bureau of the Census, 1992a, Table 54; 1992b, Table 54; 1992c, Table 54.

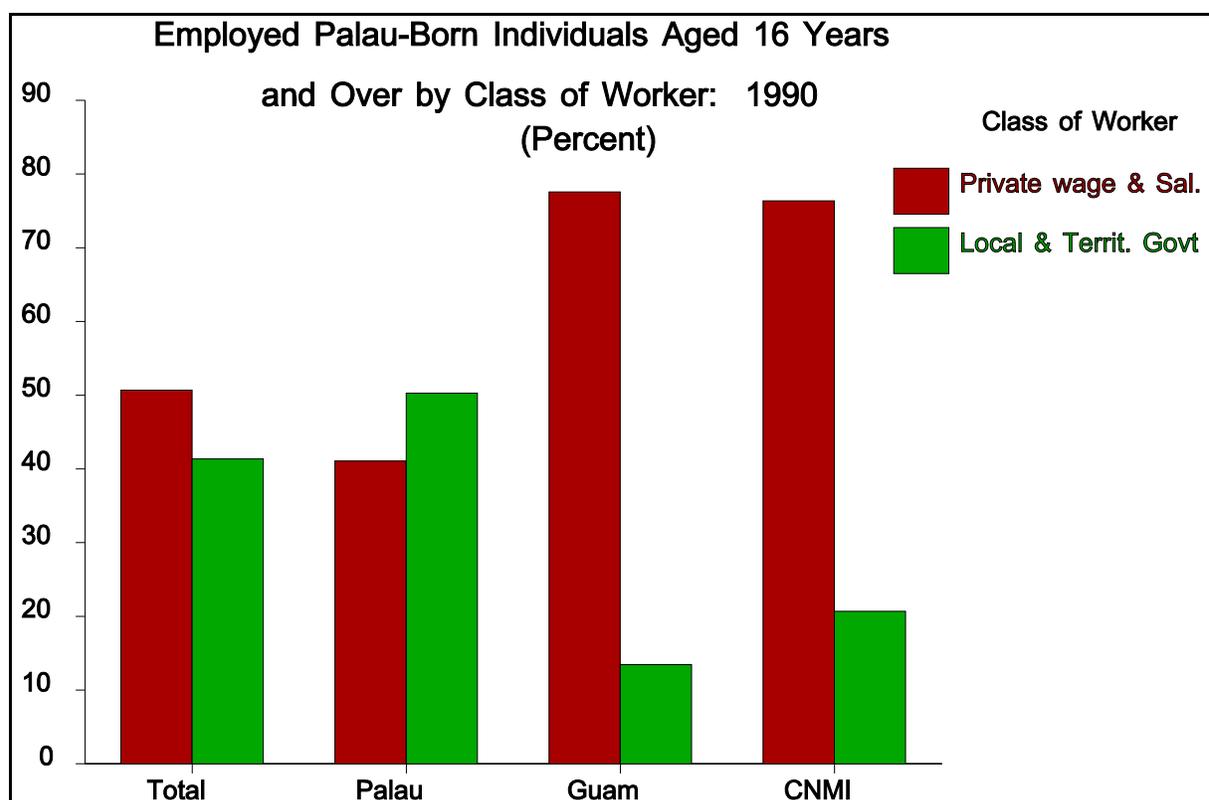


Figure 16.11. Employed Palau Born by Class of Worker and Residence: 1990

*Transportation to Work*

Nearly 70 percent of all Palau-born workers living in Palau, on Guam, or in the CNMI traveled to work by car, truck, or private van or bus (Table 16.33). Within Palau, these means of transportation to work accounted for about 62 percent of the workers. In the Marianas, in contrast, more than 88 percent of the adult Palau born workers commuted to work by one of the means.

Table 16.33. Means of Transportation to Work and Carpooling for Palau-born Individuals Aged 16 Years and Over in Palau, Guam, and the CNMI: 1990

Means of Transportation to Work and Carpooling	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Workers 16 years and over.....	4,991	3,671	1,320	576	744
Percent.....	100.0	100.0	100.0	100.0	100.0
Car, truck, or private van/bus.....	69.0	62.0	88.3	92.5	84.9
Drove alone.....	30.7	22.9	52.4	74.7	35.2
Carpooled.....	38.3	39.2	35.8	17.9	49.7
2-person carpool.....	25.4	24.7	27.4	14.6	37.4
3-person carpool.....	5.1	4.9	5.6	1.9	8.5
4-person carpool.....	2.7	3.3	1.1	0.5	1.6
5-person carpool.....	1.1	1.3	0.5	-	0.9
6-person carpool.....	0.6	0.6	0.5	0.7	0.4
7 to 9 person carpool.....	0.6	0.7	0.3	0.2	0.4
10 or more person carpool.....	2.8	3.7	0.3	-	0.5
Public van/bus.....	1.2	1.6	0.2	0.2	0.1
Boat.....	1.1	1.5	0.1	-	0.1
Taxicab.....	7.3	9.9	-	-	-
Motorcycle.....	0.6	0.8	-	-	-
Bicycle.....	0.1	0.1	0.2	0.2	0.3
Walked.....	16.6	19.7	8.1	4.9	10.6
Other method.....	0.9	0.6	1.8	1.4	2.2
Worked at home.....	3.1	3.7	1.3	0.9	1.6

Sources: U.S. Bureau of the Census, 1992a, Table 56; 1992b, Table 56; 1992c, Table 56.

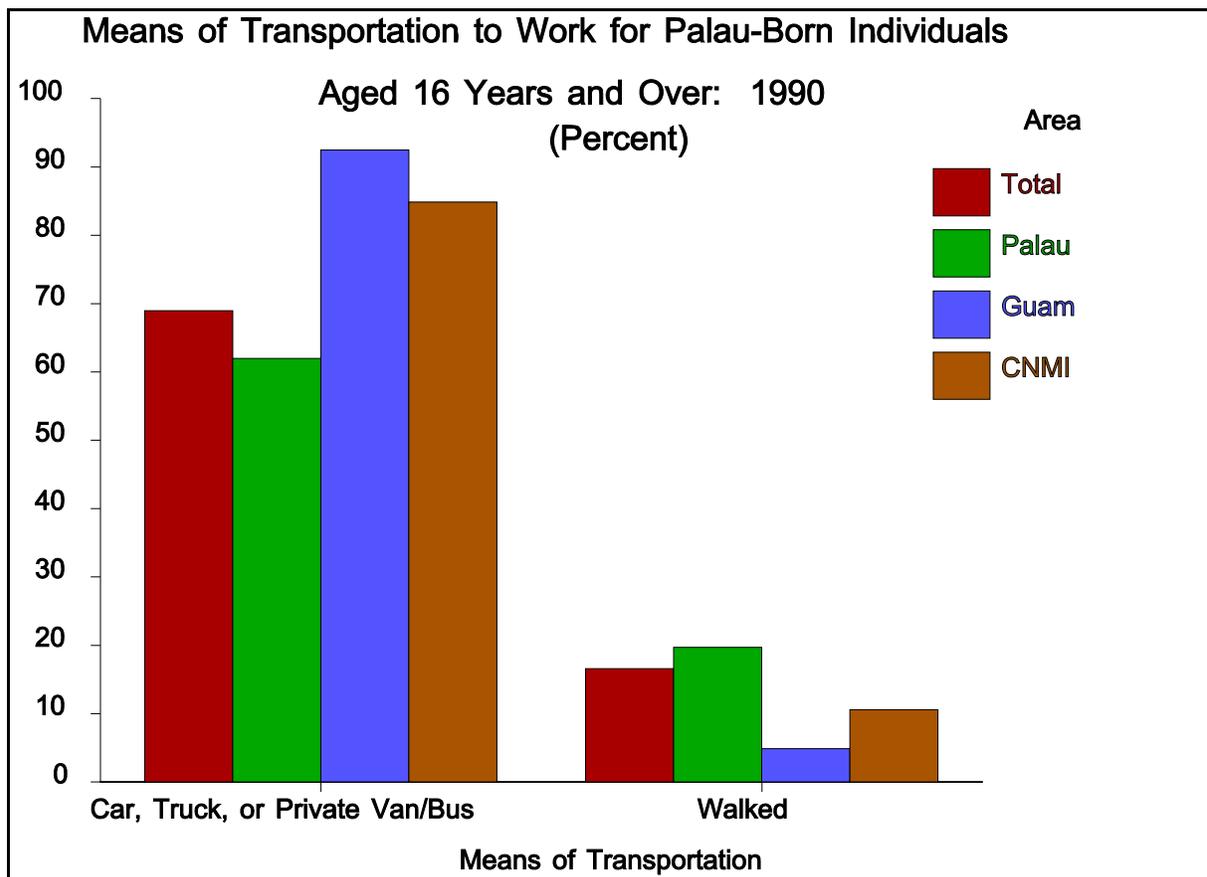


Figure 16.12. Selected Means of Transportation to Work for Palau Born by Residence: 1990

The impact of inadequate public transportation on Guam, coupled possibly with greater affluence and more Westernized behavior patterns, emerges in Table 16.33 in the 75 percent of Palau-born workers living on the island who drove alone to work — compared to about 35 percent of those in the CNMI and less than 23 percent in Palau. About half of all Palau-born CNMI workers carpooled, compared to about 38 percent in Palau and roughly 18 percent on Guam. Two-person carpools were the most common in all three places.

Palau-born workers residing in Palau tended to live closer to their place of employment in 1990 than did Palauan workers residing in the Marianas. Nearly 32 percent of all Palau-born workers in Palau lived within 10 minutes of their place of work, compared to about 14 percent of those living in Guam and about 24 percent of those living in the CNMI (Table 16.34). As expected, long commutes were more common outside Palau — with nearly 13 percent of the Palau-born workers living in the Marianas commuting 30 minutes or more each way to work. These patterns in commuting time relate to the general geographic distributions of jobs and residences in the three places: in the 1990 Palau census, most workers lived and worked in the Koror area, making commuting times relatively short; on Guam and in the CNMI, however, workers were more likely to live and work in different places.

Table 16.34. Travel Time to Work for Palau-born Individuals Aged 16 Years and Over in Palau, Guam, and the CNMI: 1990

Means of Transportation to Work and Carpooling	Total	Palau	Guam and CNMI		
			Total	Guam	CNMI
Workers 16 years and over.....	4,991	3,671	1,320	576	744
Worked at home.....	154	137	17	5	12
Percent.....	3.1	3.7	1.3	0.9	1.6
Did not work at home.....	4,839	3,534	1,305	571	734
Percent.....	100.0	100.0	100.0	100.0	100.0
Less than 5 minutes.....	10.1	12.1	4.8	4.9	4.6
5 to 9 minutes.....	25.5	29.4	14.9	9.1	19.5
10 to 14 minutes.....	21.8	22.9	18.7	16.3	20.6
15 to 19 minutes.....	22.1	20.1	27.4	31.9	24.0
20 to 24 minutes.....	9.2	6.5	16.6	17.5	15.9
25 to 29 minutes.....	2.1	1.2	4.8	6.1	3.7
30 to 34 minutes.....	7.2	6.0	10.4	10.3	10.5
35 to 39 minutes.....	0.2	0.1	0.4	0.9	-
40 to 44 minutes.....	0.2	0.1	0.4	0.7	0.1
45 to 49 minutes.....	0.9	0.8	1.1	1.6	0.8
60 to 89 minutes.....	0.7	0.8	0.3	0.7	-
90 or more minutes.....	-	-	-	-	-

Sources: U.S. Bureau of the Census, 1992a, Table 56; 1992b, Table 56; 1992c, Table 56.

## **Conclusions**

This chapter has compared demographic, social, and employment characteristics of Palau-born persons residing in Palau, on Guam, and in the CNMI. The comparisons made in this chapter have contrasted two fundamentally different groups of people — the resident Palauan population in the Republic of Palau with the migrant Palauan populations in the Marianas. Many differences came from migrant Palauans having moved for jobs and education.

The data presented here confirm that the majority of Palauans residing on Guam or in the CNMI were attending school or employed in wage labor. Many of these migrants have obtained, or are obtaining, valuable skills that could serve Palau well should they choose to return. In the case of employment, the original reason for emigration also becomes the main reason for not returning to Palau — more jobs exist in the Marianas than in Palau. As long as Guam and the CNMI continue to offer better jobs, many of the Palauans who already have migrated likely will remain, and other Palauans quite probably will follow. The only obvious means to stem the flow of Palau-born migrants, and possibly begin return migration to Palau, is through reducing the differences in the job markets of Palau and the Marianas.

## CHAPTER 17. SUMMARY AND CONCLUSIONS

This monograph presented historical data and data from the 1990 Census of the Republic of Palau to show past and current demographic, social, economic, and housing conditions in Palau. We have tried to present information in a way which is both easily understood and easily used by planners and policy makers. While the focus of the monograph was on Palau, we want to take the opportunity in this chapter to look at how Palau compares with the other territories and with the United States. We will look at population characteristics from the 1990 Censuses of Population and Housing for the United States, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), and the Republic of Palau. A later, separate publication will also present comparative data from the 1990 Censuses of Puerto Rico and the U.S. Virgin Islands as well, but data on social and economic characteristics are not yet available from these areas. Data on housing characteristics for the United States and its territories will also be presented in a separate paper.

For the 1990 censuses, the Census Bureau worked with the governments of Puerto Rico, the Virgin Islands, and the Pacific Islands areas to develop items which were as close as possible to the U.S. items, but also permitted satisfying local needs. In most cases, the questionnaire items were identical. However, as noted in the monograph itself, some items such as literacy, parental birthplace, military dependency, and vocational training were not on the 1990 U.S. questionnaire, so we cannot present comparable data.

Monographs based on the 1990 census are planned for the Pacific Islands areas to look at historical trends for the population and housing items. The governments of Guam (Barcinas, Levin, and Naval 1988), and American Samoa (Filiga and Levin 1988) published 1980 census volumes. The CNMI also developed a 1980 census volume (Borja and Levin, ms) but did not publish it. The present 1990 Census volume for Palau is the first of the series for the 1990 censuses.

### DEMOGRAPHIC CHARACTERISTICS

Median Age. The median age in the United States in 1990 — that age halving the population into younger and older parts — was 32.9 years, an increase of almost 3 years from the 30 years in 1980 (Table 17.1). The median age for the United States was more than 5 years older than the oldest of the Pacific Islands areas — CNMI at 27.4 years. Palau followed at 25.6 years, Guam at 25.0, and American Samoa had the youngest population, at 20.9 years, fully 12 years younger than the median for the United States.

Table 17.1. Median Age by Sex, United States and Pacific Islands:  
1980 and 1990

Sex and Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
Total:					
1990.....	32.9	25.0	20.9	27.4	25.6
1980.....	30.0	22.2	18.8	19.6	18.8
Males:					
1990.....	31.6	25.2	20.6	29.9	26.0
1980.....	28.8	22.2	18.3	20.9	18.7
Females:					
1990.....	34.0	24.9	21.2	24.9	25.1
1980.....	31.3	22.2	19.2	18.3	18.9

Sources: 1990 CPH-6-P, G, AS, and CNMI

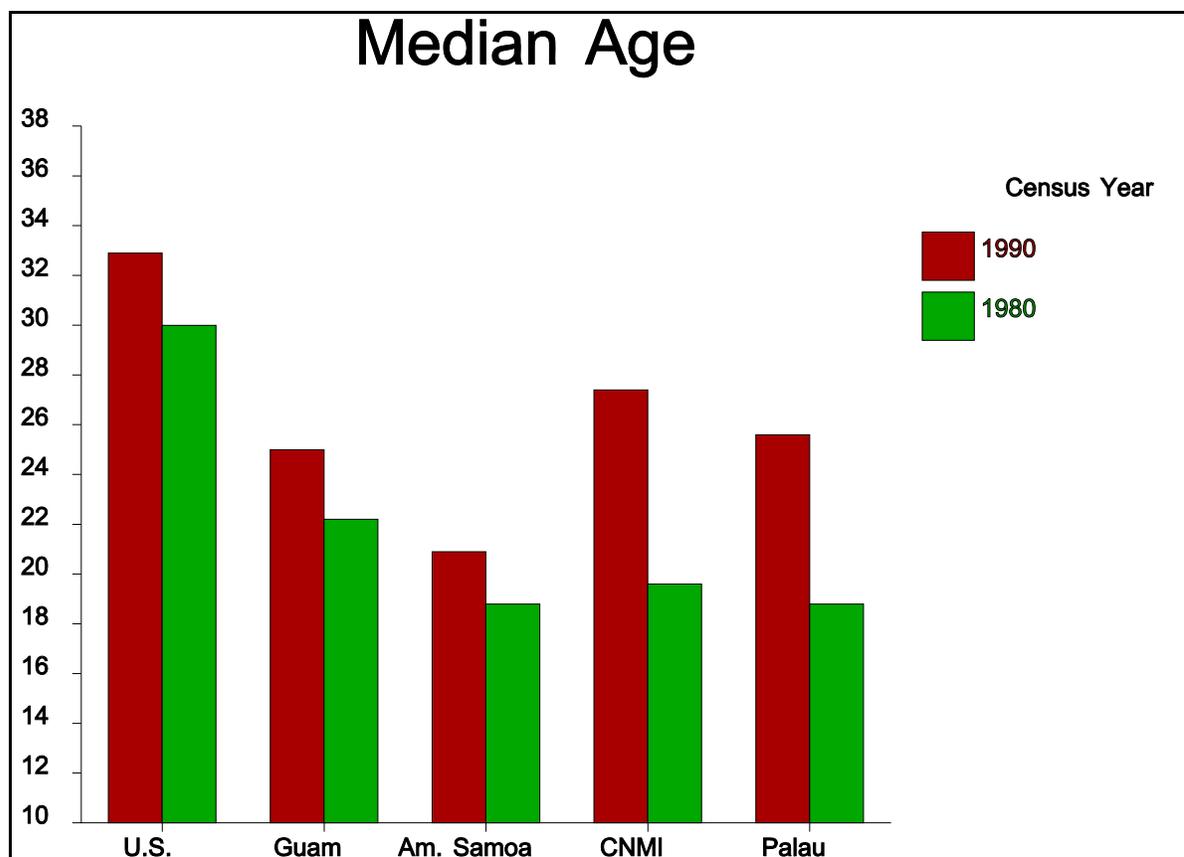


Figure 17.1. Median Age for the United States and Pacific Islands: 1980 and 1990

The median age increased by about 2 years in American Samoa, and a little more than 3 years in Guam. The median for Palau, however, increased by almost 7 years and by almost 8 years in the CNMI. Between 1980 and 1990, both Palau and CNMI experienced massive immigration, particularly of Asian laborers, the majority of whom were older than the median ages in these areas.

In the United States, as in most countries, the median age for males (31.6 years) was lower than for females (34.0 years) in 1990. In the Pacific Islands areas, however, the median age for males was older than for females in all the areas except American Samoa. The difference was greatest in CNMI where the male median of 29.9 years was 5 years older than the median for females. The median for males in Palau was about one year older than for females. In both CNMI and Palau, selective immigration is likely to have influenced the median ages.

The differences in the age distributions are represented by looking at one group — those aged less than 5 (Table 17.2). While about 7 percent of the total U.S. population was less than 5 years old, about 9.5 percent of CNMI's population was in this category, 10 percent of Palau's, 11 percent of Guam's, and almost 15 percent of American Samoa's population.

Table 17.2. Percentage of Population Less than 5 Years, United States and Pacific Islands: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	7.4	11.3	14.9	9.5	10.0
1980.....	7.2	12.3	14.8	14.7	11.6

Sources: 1990 CPH-6-P, G, AS, and CNMI

Males per 100 Females. Most human populations have more females than males because male mortality is higher. The common demographic measure is the number of males per 100 females. Hence, the number of males per 100 females in the United States increased only slightly between 1980 and 1990 — from 94.5 to 95.1 (partly because of increased female mortality) (Table 17.3).

Table 17.3. Males Per 100 Females, United States and Pacific Islands:  
1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	95.1	114.0	105.6	111.0	116.6
1980.....	94.5	109.2	103.0	110.7	107.6

Sources: 1990 CPH-6-P, G, AS, and CNMI

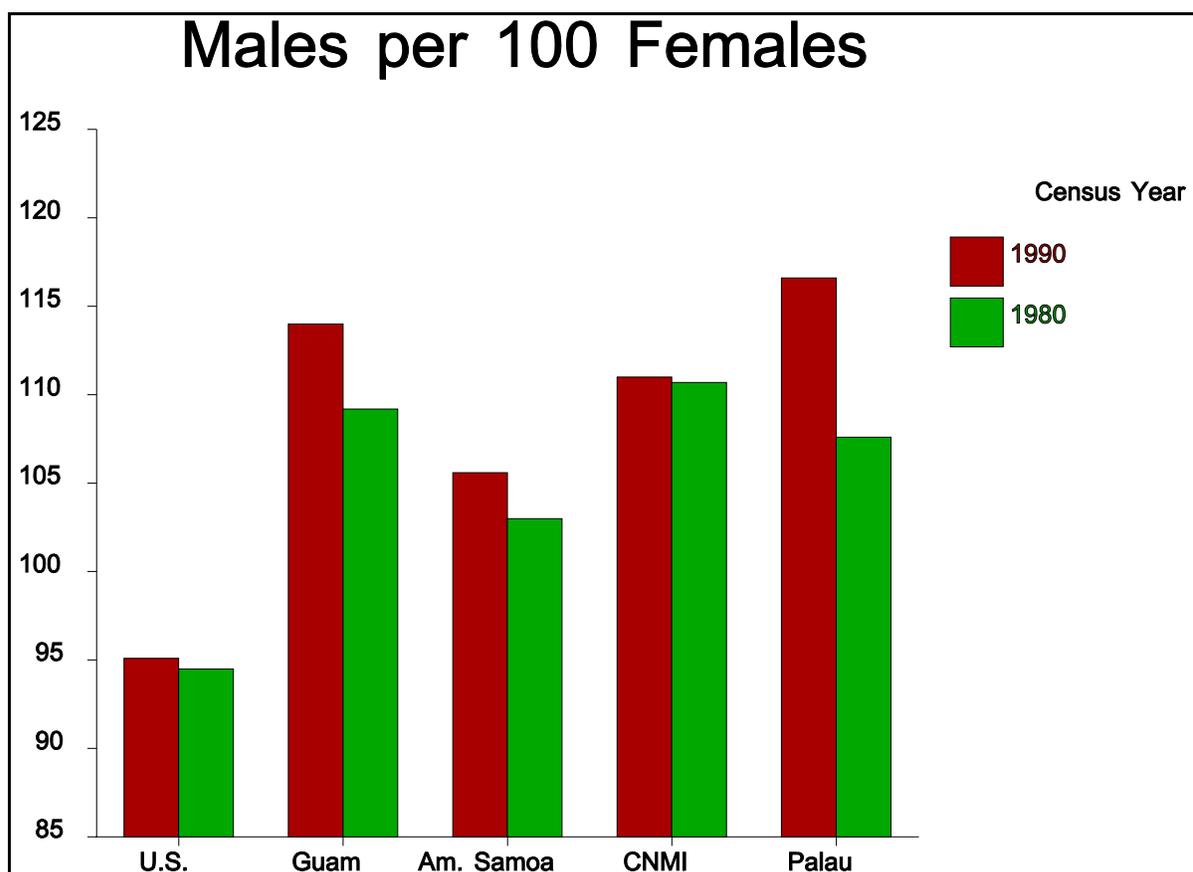


Figure 17.2. Males per 100 Females, United States and Pacific Islands: 1980 and 1990

Each of the Pacific Islands areas, however, had more males than females, and, except in the CNMI, the proportion male became much more pronounced in 1990 than in 1980. That is, while the number of males per 100 females in the CNMI stayed at about 111 between 1980 and 1990, the number of males per 100 females increased from 103 to 106 in American Samoa (the least male of

the 4 areas), Guam increased from 109 to 114, and Palau, from 108 to 117. Although increased female mortality may be contributing a small amount to this change, most of the change is due to selective immigration of males to these areas, particularly to Palau.

Persons per Household. The average number of persons per household decreased in the United States and all of the Pacific Islands areas between 1980 and 1990. The decrease in the United States was from 2.75 persons per household in 1980 to 2.63 in 1990 (Table 17.4). None of the Pacific areas, of course, had this small number of persons per household. Guam, the closest to the United States economically, was also closest demographically, in this case about 4 persons per household, down slightly from 1980. CNMI and Palau each decreased by about 3/4ths of a person per household, with CNMI at 4.6 in 1990 and Palau at 5.0. The number of persons per household in American Samoa, however, remained very high, at 7.0, showing continued housing of extended families.

Table 17.4. Persons Per Household, United States and Pacific Islands:  
1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	2.63	3.97	7.00	4.63	5.01
1980.....	2.75	4.07	7.08	5.36	5.79

Sources: 1990 CPH-6-P, G, AS, and CNMI

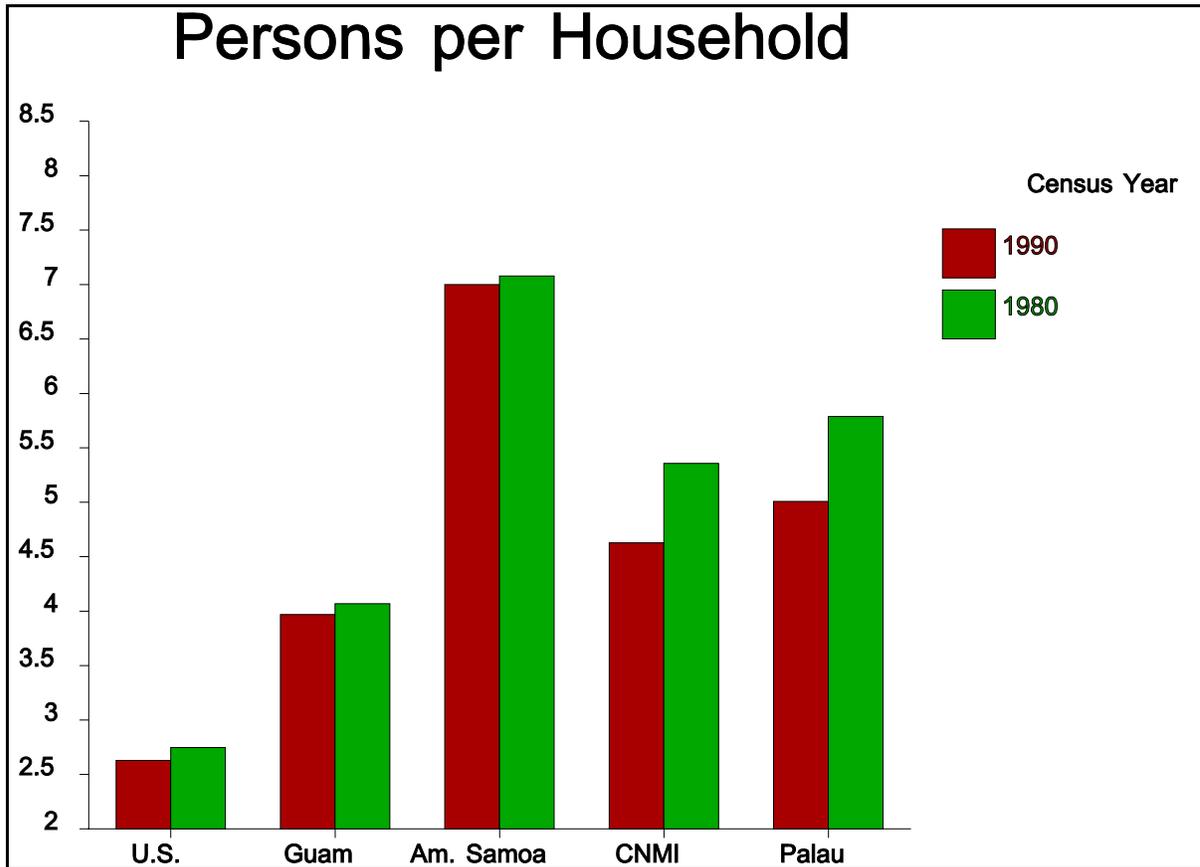


Figure 17.3. Persons per Household, United States and Pacific Islands: 1980 and 1990

Percent Living in Households. Except for CNMI, the U.S. and the Pacific areas all showed high percentages of persons living in households (compared to group quarters.) Almost 99 percent of persons in American Samoa lived in households. In CNMI, on the other hand, less than 3 out of every 4 of the residents lived in households (Table 17.5). Most of the rest were garment and other factory workers, living in dormitories.

Table 17.5. Percent Living in Households, United States and Pacific Islands: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	97.3	93.6	98.9	73.5	95.5
1980.....	97.5	95.3	99.0	96.7	97.5

Sources: 1990 CPH-6-P, G, AS, and CNMI

**Family Type.** About 79 percent of all families in the United States in 1990 were married-couple families, that is, at least a husband and wife, whether or not children were present as well. In 1980, 83 percent of the U.S. families were in this category (Table 17.6). The percentage of married-couple families also decreased on Guam, and in the Northern Marianas, but remained about the same in Palau and American Samoa. Only about 3 in every 4 families in the CNMI and Palau were married-couple families in 1990.

Table 17.6. Percent of Families Being Married-Couple Families, United States and Pacific Islands: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	78.6	78.1	81.8	74.3	75.5
1980.....	82.8	84.8	81.1	79.7	75.4

Sources: 1990 CPH-6-P, G, AS, and CNMI

The percentage of U.S. families with a female householder having no husband present increased between 1980 and 1990, from 14.0 percent of the families in 1980 to 16.5 percent in 1990 (Table 17.7). The percentage of American Samoa's families in this category actually decreased slightly between 1980 and 1990, but all of the other areas showed increases. More than 18 percent of Palau's families were in this category, but only 12 percent of the families in American Samoa.

Table 17.7. Percent of Families with Female Householder, no Husband Present, United States and Pacific Islands: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	16.5	14.0	12.2	14.0	18.1
1980.....	13.9	11.1	12.7	12.1	17.6

Sources: 1990 CPH-6-P, G, AS, and CNMI

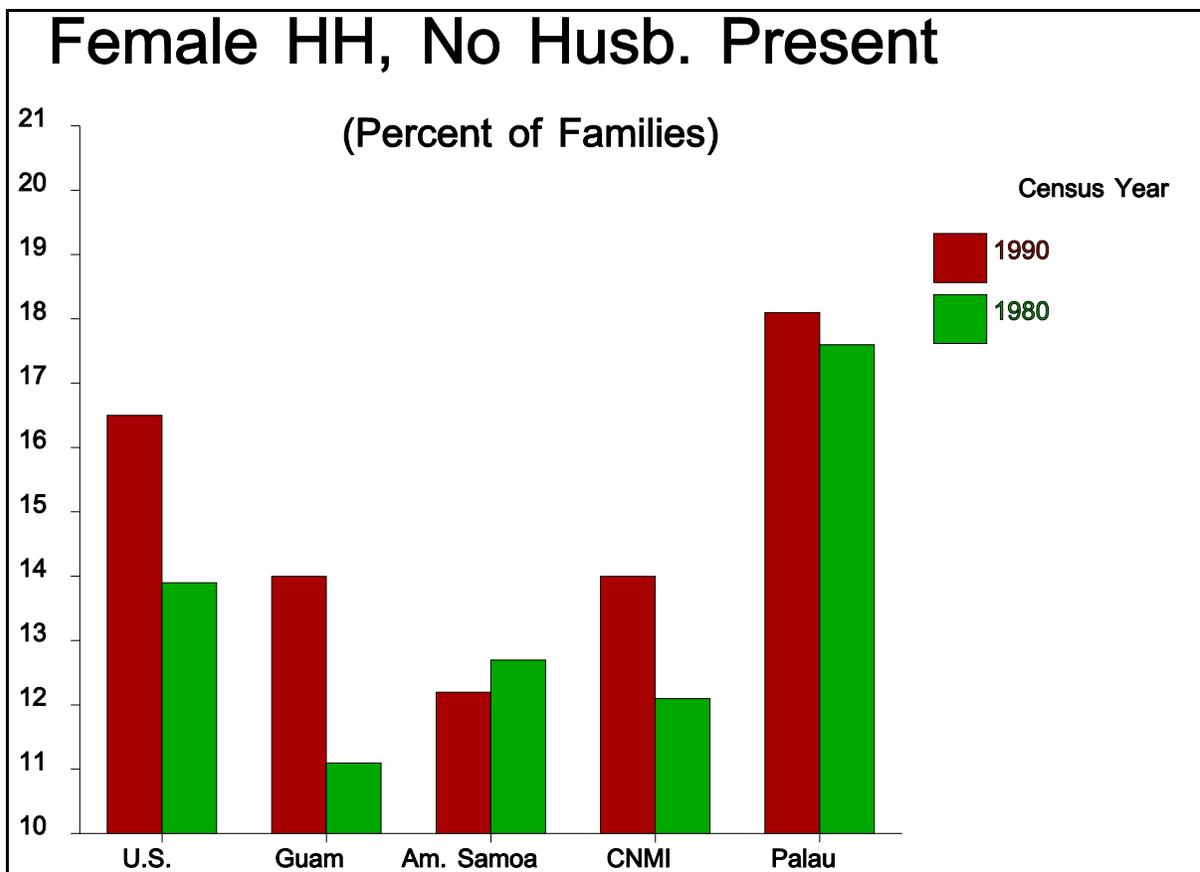


Figure 17.4. Percent Female Householder, No Husband Present, United States and Pacific Islands: 1980 and 1990

**Fertility.** The number of children ever born to females 15 to 44 decreased in the United States from 1.3 to 1.2 during the 1980s (Table 17.8). Decreases in each of the Pacific Islands area were much steeper. The decrease was steepest in the CNMI, which went from 2.2 children per woman in 1980 (the highest in that year) to 1.2 in 1990 (the lowest in that census year.) The decrease was one full child.

Table 17.8. Children Ever Born per Woman 15 to 44 Years, United States and Pacific Islands: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	1.2	1.5	1.8	1.2	1.6
1980.....	1.3	1.7	1.9	2.2	2.1

Sources: 1990 CPH-6-P, G, AS, and CNMI

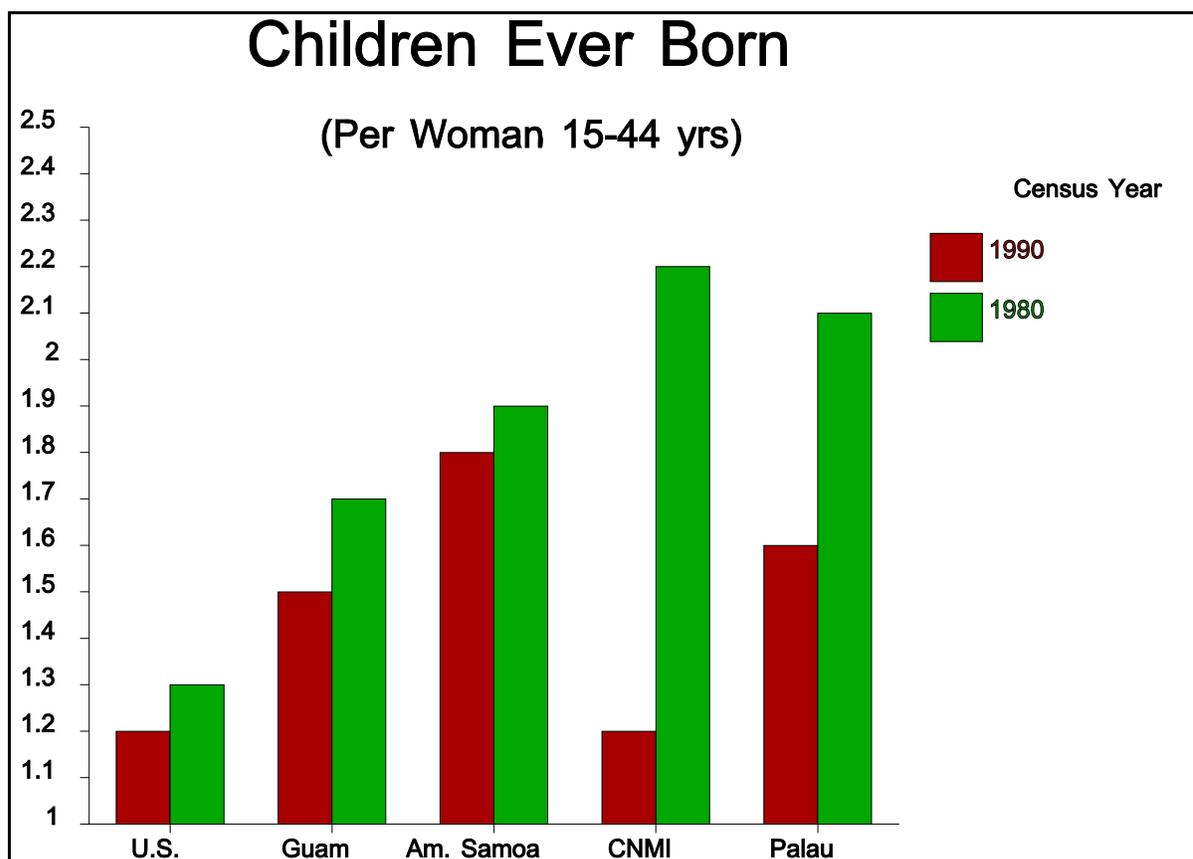


Figure 17.5. Children Ever Born per Woman 15 to 44 Years, United States and Pacific Islands: 1980 and 1990

The other areas experienced smaller decreases. The children ever born per woman declined from 2.1 to 1.6 in Palau (about half a child), from 1.9 to 1.8 in American Samoa, and from 1.7 to 1.5 in Guam.

## SOCIAL CHARACTERISTICS

**Birthplace.** The percentage of persons born and living in the United States decreased somewhat between 1980 and 1990, from 94 to 92 percent (Table 17.9). The percentage of American Samoa born in American Samoa continued its long decline, going from 58 to 55 percent during the decade. Although more than half of American Samoa's population is still American Samoa born, the percentage continued to decrease towards the halfway level.

Table 17.9. Percent Born in Area of Residence, United States and Pacific Islands: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	92.1	47.7	54.7	38.6	81.5
1980.....	93.8	49.2	57.5	71.5	96.0

Sources: 1990 CPH-6-P, G, AS, and CNMI

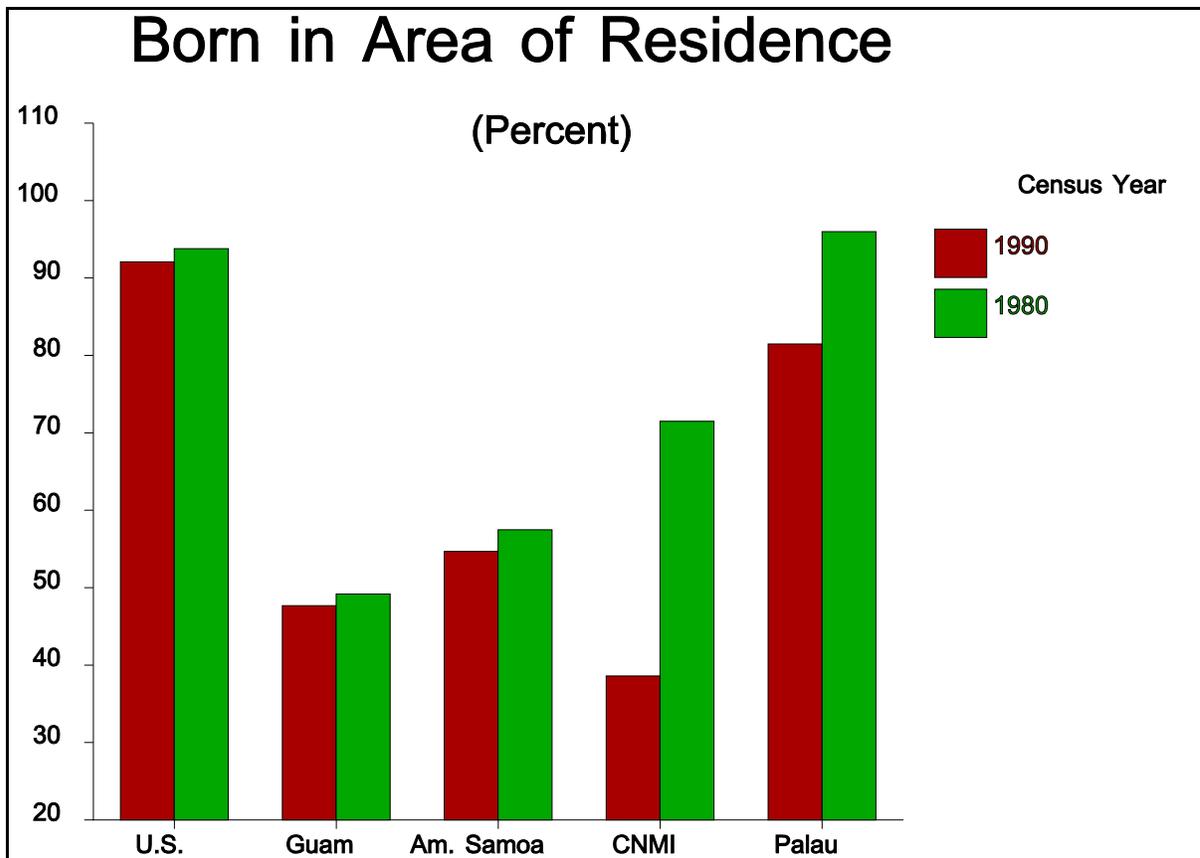


Figure 17.6. Percent Born in Area of Residence, United States and Pacific Islands: 1980 and 1990

More than 4 out of every 5 persons in Palau were Palau born in 1980, but this proportion still represented a considerable decrease from the 96 percent of 1980.

Less than half of Guam's population was born on Guam, partly because of the large number of military personnel who are on the island only temporarily, and partly because of the increasing numbers of immigrants on Guam — the percentage Guam born decreased from 49 percent in 1980 to 48 percent in 1990. CNMI experienced by far the biggest decrease in percentage born in CNMI. While 72 percent of the Commonwealth's population was born in the Commonwealth in 1980, this percentage decreased to 39 percent in 1990, attributable to the extremely large influx of foreign workers.

Residence 5 Years Before the Census. Residence 5 years before the census shows short-term migration, contrasted to data on birthplace, which gives long term migration. More than half of the United States population 5 years and over in 1990 — 53 percent — had lived in the same house in 1985 as 1990, and only 2 percent had lived outside the United States in 1985 but inside in 1990 (Table 17.10).

Table 17.10. Percent Persons 5 and Over Living in Same House or Outside Area in 1985, United States and Pacific Islands: 1990

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Residence in 1985	United States	Guam	American Samoa	Northern Mariana Islands	Palau
Same house..	53.3	56.3	77.2	29.3	65.9
Outside Area	2.2	32.7	15.8	53.2	16.8

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Sources: 1990 CPH-6-P, G, AS, and CNMI

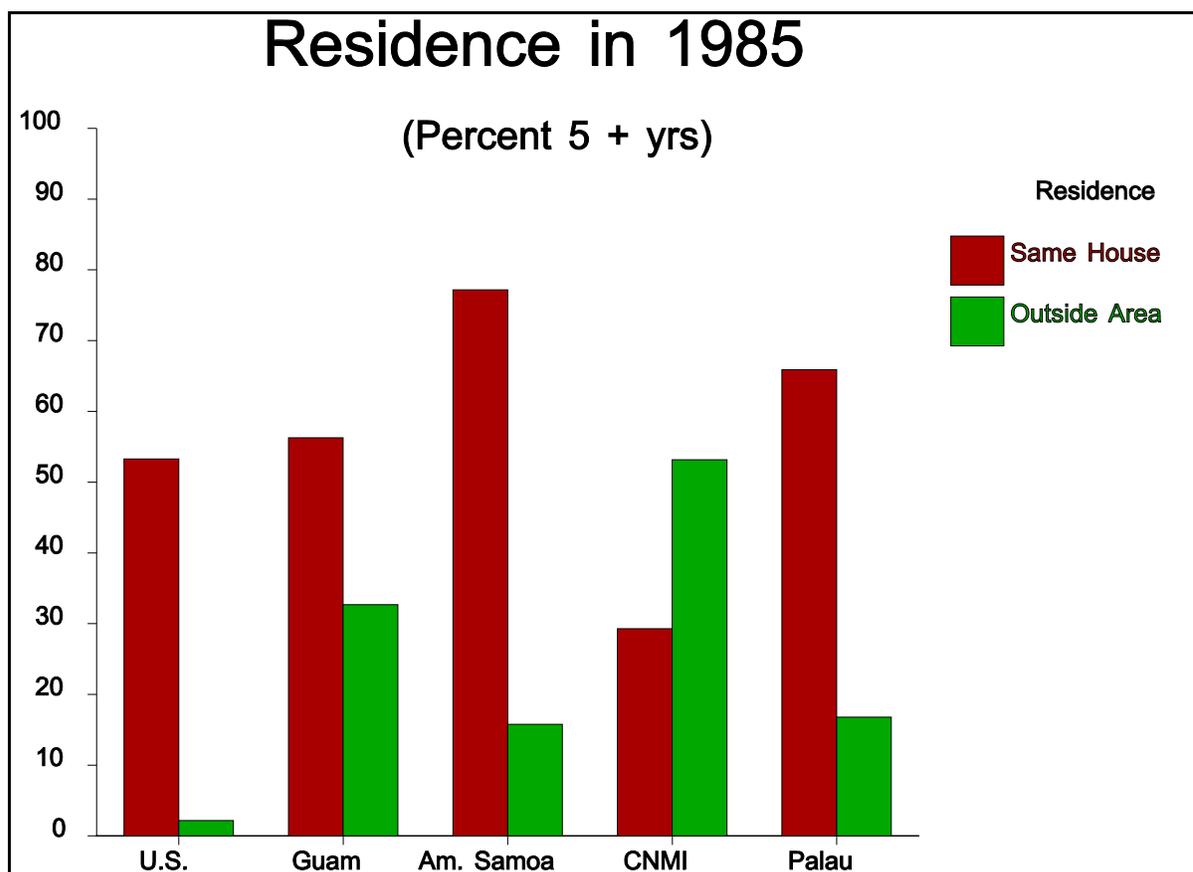


Figure 17.7. Percent Residence in Same House or Outside Area in 1985, United States and Pacific Islands: 1990

The Pacific Islands areas showed considerable variation for this item. For Guam, with its large military and migrant populations, the percentage living in the same house was somewhat less than for the U.S., but about 1/3rd of all the persons over 5 living on Guam in 1990 actually lived outside Guam in 1985. The rest — about 21 percent — lived in another house on Guam in 1985.

At the other extreme, more than 3/4ths of American Samoa's population lived in the same house in 1985 as in 1990, but only 1 in 6 lived outside American Samoa in 1985 but inside in 1990. About 2/3rds of Palau's population lived in the same house at both points in time, and, again, about 1 in 6 lived outside Palau in 1985.

For the CNMI, the largest percentage — 53 percent — lived outside CNMI in 1985, but had moved to CNMI by 1990, meaning that more than half of CNMI's resident population in 1990 had moved

there within the 5 years before the census, pretty astounding even given the special case of CNMI and its open-armed attitude toward the immigrants. Less than 3 in every 10 persons lived in the same house in 1985 as 1990.

Speak a Language Other Than English at Home. The percentage of persons 5 years old and over in the United States who spoke a language other than English at home in 1990 was 14 percent, up from 11 percent in 1980, due to increased immigration during the decade (Table 17.11).

Table 17.11. Percent Persons 5 and Over Speaking a Language Other than English at Home, United States and Pacific Islands: 1980 and 1990

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Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	13.8	62.7	97.0	95.2	97.0
1980.....	11.0	64.3	96.1	95.0	99.0

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Sources: 1990 CPH-6-P, G, AS, and CNMI

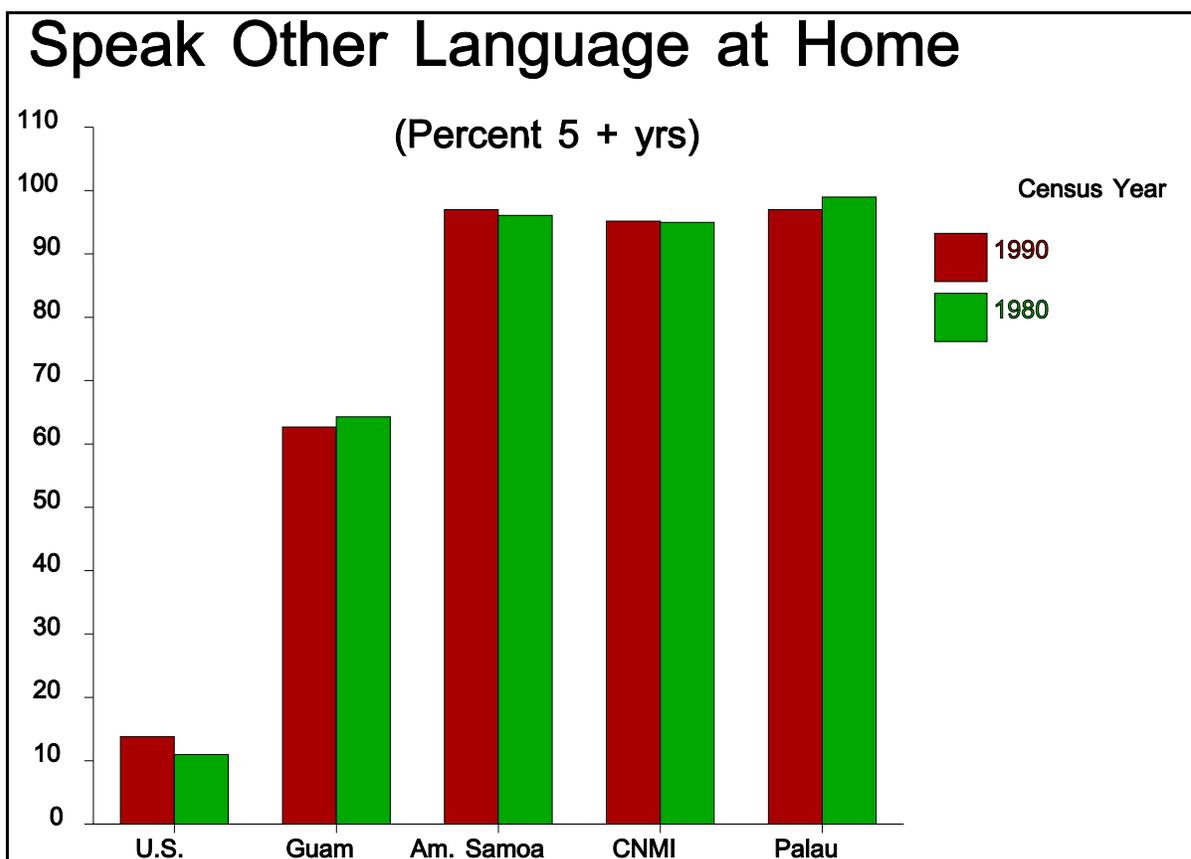


Figure 17.8. Percent Speaking a Language Other than English at Home, United States and Pacific Islands: 1980 and 1990

Guam had the lowest percentages speaking a language other than English in both 1980 and 1990, the percentage decreasing from 64 to 63 percent during the decade. Less than 5 percent of the people 5 years and over in the other areas spoke English at home.

Frequency of Language Use. The United States did not have a question on frequency of English use for non-English speakers, not this question appeared on the Pacific Islands forms in both 1980 and 1990.

In 1990 almost 94 percent of Palau's population 5 years and over and NOT speaking English, spoke the non-English language (in most cases Palauan) more than English at home, with only smaller numbers speaking English the same, or the other language less than English, or not speaking English at all (Table 17.12).

Table 17.12. Percent Persons 5 and Over Speaking a Language Other than English at Home More Frequently than English, Pacific Islands: 1980 and 1990

Year	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	35.6	86.0	65.4	93.8
1980.....	40.1	87.6	87.1	85.6

Sources: 1990 CPH-6-P, G, AS, and CNMI

Similarly, 86 percent of the residents of American Samoa who did not speak English, spoke the other language (usually Samoan) more than English, and another 9 percent spoke English and the other language about equally often.

CNMI was next, with about 65 percent speaking the other language (usually Chamorro or an Asian language) more frequently than English, and another 17 percent spoke English and the other language equally often.

Finally, Guam, with its many bilingual speakers looked least like the other Pacific areas. About 36 percent of Guam's population not speaking English at home, spoke the other language more than English at home, and another 36 percent spoke both languages equally often. Another 27 percent spoke English more than the other language, and less than 2 percent did not speak English at all.

Educational Attainment. About 3 in every 4 persons 25 years old and over in the United States in 1990 were high school graduates, up from 2 in every 3 in 1980 (Table 17.13). The percentages for Guam were slightly lower in each census year. The other areas had much lower high school graduation rates in both years than Guam, but each experienced large increases over the decade. The CNMI went from 45 percent high school graduates to 66 percent during the decade, and American Samoa increased from 42 percent in 1980 to 54 percent in 1990. But Palau had the biggest increase, from 34 percent in 1980 to 58 percent in 1990, and increase of 24 percentage points.

Table 17.13. Percent Persons 25 and Over Who Are High School Graduates, United States and Pacific Islands: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	75.2	73.3	54.5	66.3	57.6
1980.....	66.5	65.6	42.1	44.7	33.9

Sources: 1990 CPH-6-P, G, AS, and CNMI

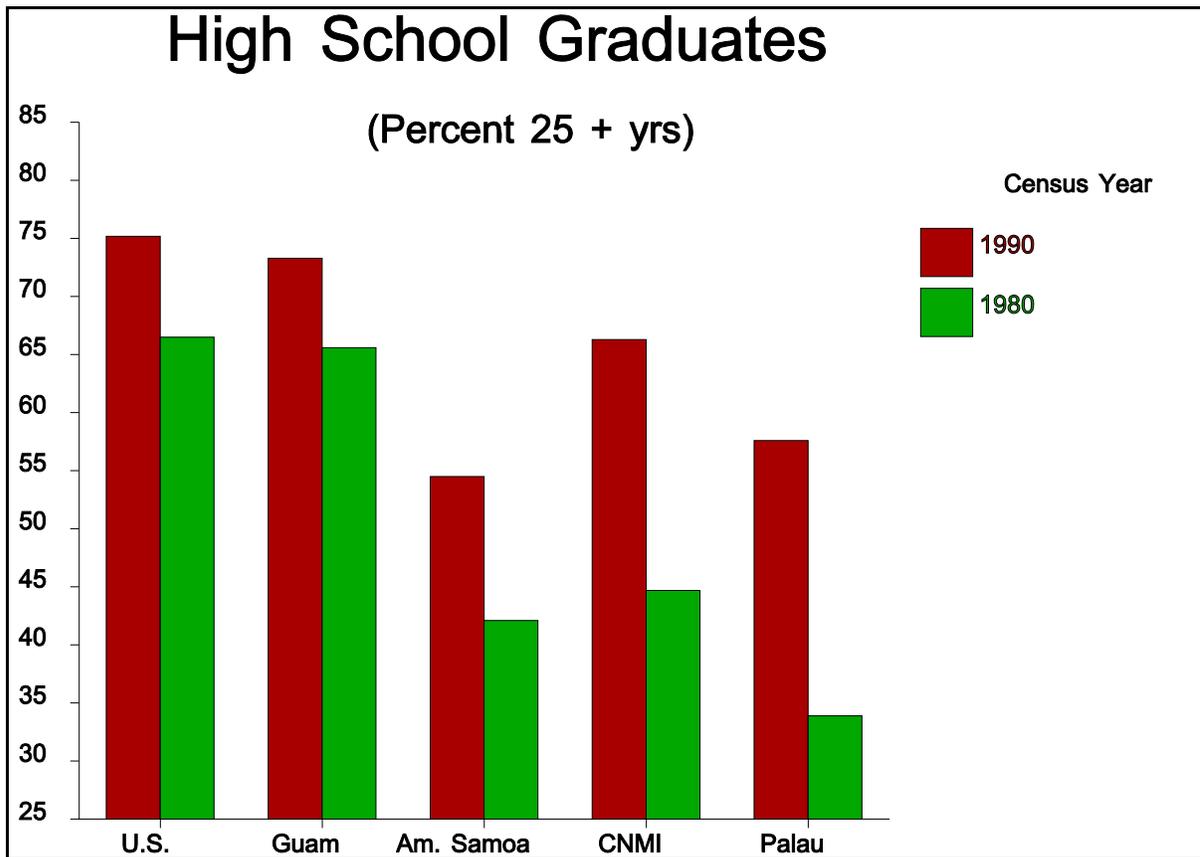


Figure 17.9. Percent Persons 25 Years and Over Being High School Graduates, United States and Pacific Islands: 1980 and 1990

The percent of college graduates ages 25 years and over in the United States increased from 16 percent to 20 percent during the decade (Table 17.14). (The 1980 data were collected in terms of number of years in school, making them not completely comparable with the 1990 data which collected highest degree obtained.) The percent of college graduates on Guam did not change over

the decade. However, the college graduates increased from 11 percent to 16 percent of CNMI's adult population, and 5 to 10 percent in Palau. The percentage of college graduates in American Samoa decreased slightly during the decade, probably because of migration flow — more educated Samoans going to Hawaii and the U.S. mainland for jobs. (Because of the continuing influx migrants, it is possible that the rate of college graduates could go down without the number decreasing.)

Table 17.14. Percent Persons 25 and Over Who Are College Graduates,  
United States and Pacific Islands: 1980 and 1990

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Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	20.3	17.5	6.9	15.6	10.3
1980.....	16.2	17.5	7.6	11.3	5.4

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Sources: 1990 CPH-6-P, G, AS, and CNMI

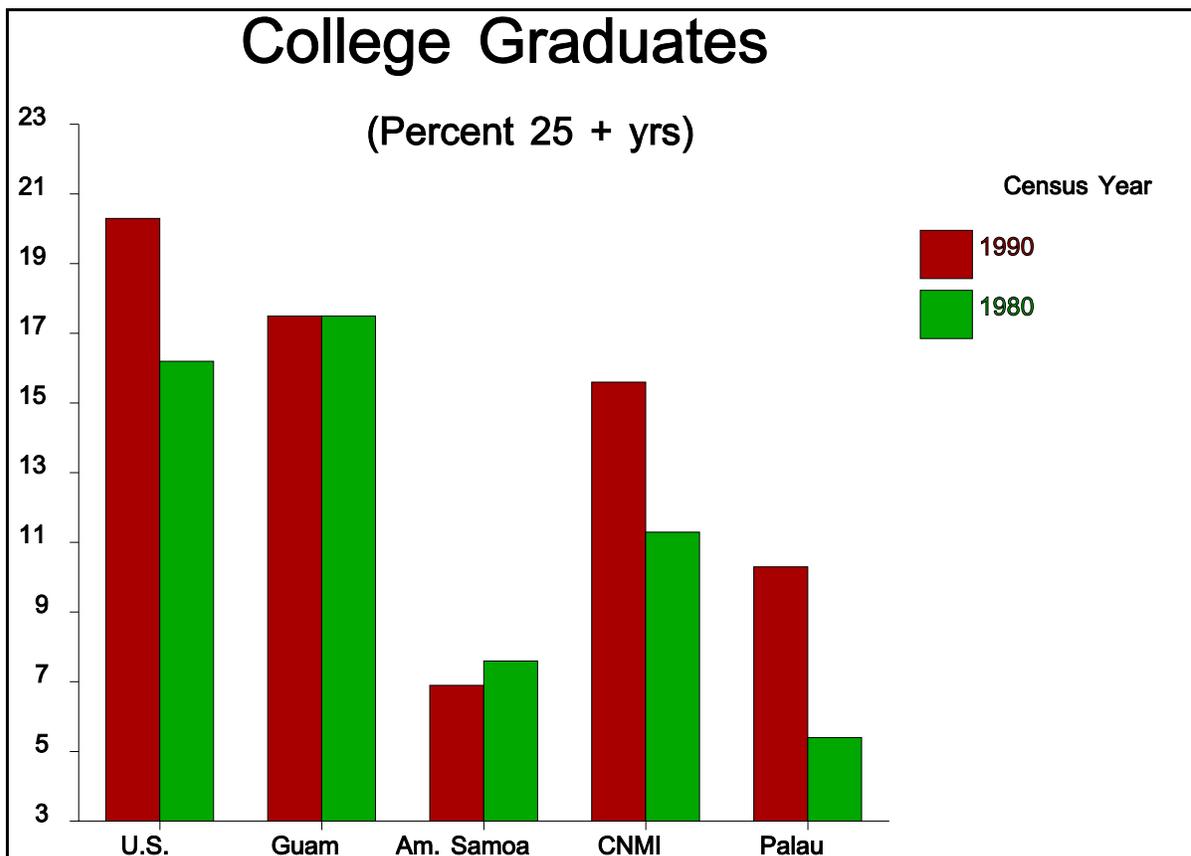


Figure 17.10. Percent 25 Years and Over Being College Graduates, United States and Pacific Islands: 1980 and 1990

Vocational Training. The 1990 Census in the United States did not collect information on vocational training. The item was collected, however, in both 1980 and 1990 in the Pacific Islands. The percentage of persons 16 to 64 who completed a vocational training program in Guam, remained about the same, at 26 percent (Table 17.15). The percentages in CNMI and Palau increased, probably because of vocational training among the immigrants, particularly those from Asia. The percentage with vocational training in American Samoa decreased, possibly because many with this training may have left for jobs in Hawaii and the U.S. mainland.

Table 17.15. Percent Persons 16 to 64 Years Completed Requirements for a Vocational Training Program, Pacific Islands: 1980 and 1990

Year	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	26.0	6.5	21.1	19.7
1980.....	26.1	10.5	18.5	16.8

Sources: 1990 CPH-6-P, G, AS, and CNMI

## ECONOMIC CHARACTERISTICS

**Labor Force Participation.** Labor force participation depends on the current economic situation at the time of the census. However, even with these snapshots, general trends can be seen. The overall labor force participation of persons 16 years and over during the week before the census in the U.S. in 1990 was 65 percent, up from 62 percent in 1980 (Table 17.16). All of the Pacific Islands areas also experienced increases in labor force participation rates during the decade.

Table 17.16. Percent Persons 16 and Over In the Labor Force, United States and Pacific Islands: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	65.3	72.7	50.7	81.8	59.3
1980.....	62.0	66.6	45.5	63.6	41.6

Sources: 1990 CPH-6-P, G, AS, and CNMI

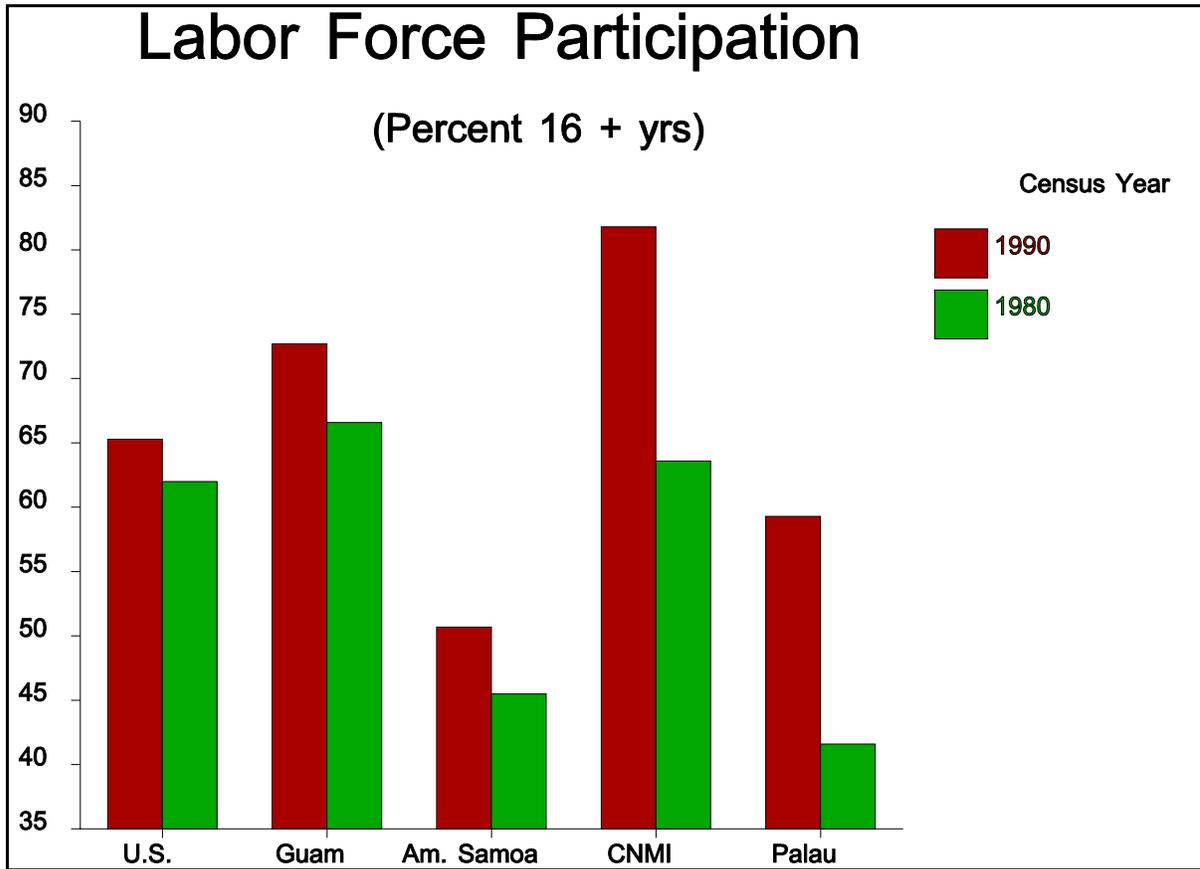


Figure 17.11. Percent in the Labor Force, United States and Pacific Islands: 1980 and 1990

The CNMI experienced by far the largest increase — from 64 percent in 1980 to 82 percent in 1990 — partially because of the emerging private sector. With virtually full employment, almost anyone wanting a job would be able to have one. The very large immigrant population was almost completely employed, since most could not stay in the CNMI if they were not employed.

The labor force participation on Guam increased from 67 percent to 73 percent during the decade, higher than the rate for the U.S. because of the large number of alien workers in construction, tourism, and related activities, and, perhaps because of the presence of the military.

American Samoa and Palau had lower, but improving rates of labor force participation. American Samoa's rate increased from 46 percent to 51 percent, and Palau's from 42 percent to more than 59 percent.

The labor force participation of males in the United States decreased slightly during the decade, while female labor force participation increased considerably. This improvement in female labor force participation was seen in all of the territories as well — with American Samoa increasing by 7 percentage points, Guam by 10, Palau by 18, and CNMI by 28 points (Table 17.17). More than 3 out of every 4 adult females in the CNMI in 1990 were in the labor force.

Table 17.17. Percent Persons 16 Years and Over In the Labor Force by Sex, United States and Pacific Islands: 1980 and 1990

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Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
<b>Males:</b>					
1990.....	74.4	83.8	58.8	87.4	68.3
1980.....	75.1	82.2	55.6	77.1	52.6
<b>Females:</b>					
1990.....	56.8	59.5	42.4	75.3	48.4
1980.....	49.9	49.2	35.5	47.6	29.7

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Sources: 1990 CPH-6-P, G, AS, and CNMI

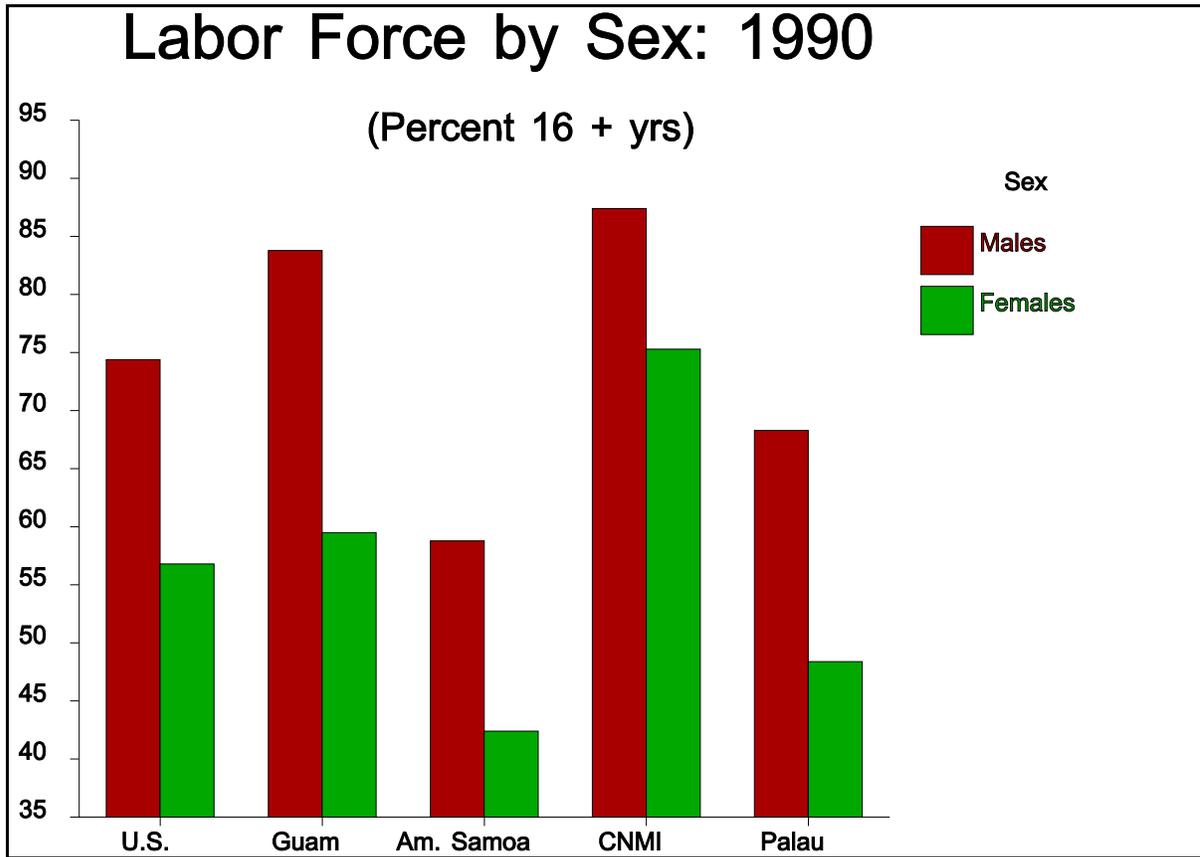


Figure 17.12. Percent in Labor Force by Sex, United States and Pacific Islands: 1980 and 1990

The percentage of CNMI males in the labor force was even greater — almost 7 out of every 8 adult males was in the labor force (compared to 3 of 4 in the U.S.). Much of this elevated employment has to do with the very large number of immigrants who must be working to legally remain in the CNMI. Guam's male labor force rate was also very high, and had increased since 1980. Both American Samoa and Palau saw increased rates for males as well.

Class of Worker. The percentage of private sector workers in the United States increased slightly between 1980 and 1990, from less than 76 percent to more than 77 percent (Table 17.18). The only Pacific area with a larger percentage in the private sector in 1990 was the CNMI at 85 percent, up from 56 percent in 1980. Palau also experienced an enormous increase, from 37 percent to 59 percent between 1980 and 1990 — hence while almost 4 in every 10 workers in 1980 worked in the private sector in 1980, the reverse was true in 1990 — almost 4 in every 10 did not work for the private sector in 1990.

Table 17.18. Percent Employed 16 Years and Over Private Wage and Salary Workers, United States and Pacific Islands: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	77.4	65.3	63.4	84.8	59.3
1980.....	75.6	50.7	46.0	55.7	37.0

Sources: 1990 CPH-6-P, G, AS, and CNMI

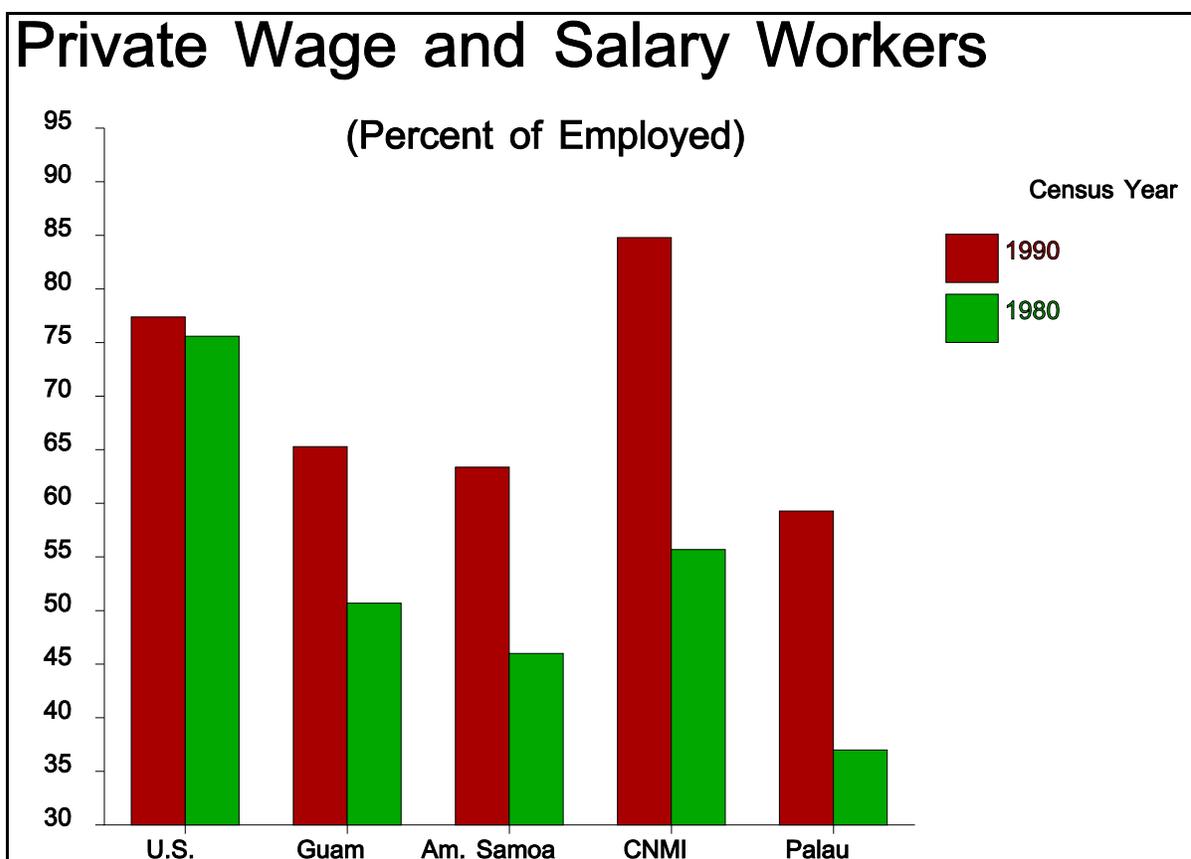


Figure 17.13. Percent Private Wage and Salary Workers, United States and Pacific Islands: 1980 and 1990

The percentage of private sector employment on Guam increased from 51 percent to 65 percent during the decade, and in American Samoa from 46 to 63 percent.

**Industry.** About 23 percent of the employed persons 16 years and over in the United States were working in professional and related services in 1990, a larger percentage than in any of the Pacific Islands areas (Table 17.19). Palau had the highest proportion in these industries of the Pacific areas, at 18.7 percent, although the 18.2 percent for American Samoa was only slightly less. About 17 percent of the employed on Guam were in this category, but only 8 percent of those in the CNMI.

Table 17.19. Percent Employed 16 Years and Over in Professional and Related Service Industries, United States and Pacific Islands: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	23.3	16.6	18.2	7.9	18.7
1980.....	20.3	19.6	21.6	15.1	29.6

Sources: 1990 CPH-6-P, G, AS, and CNMI

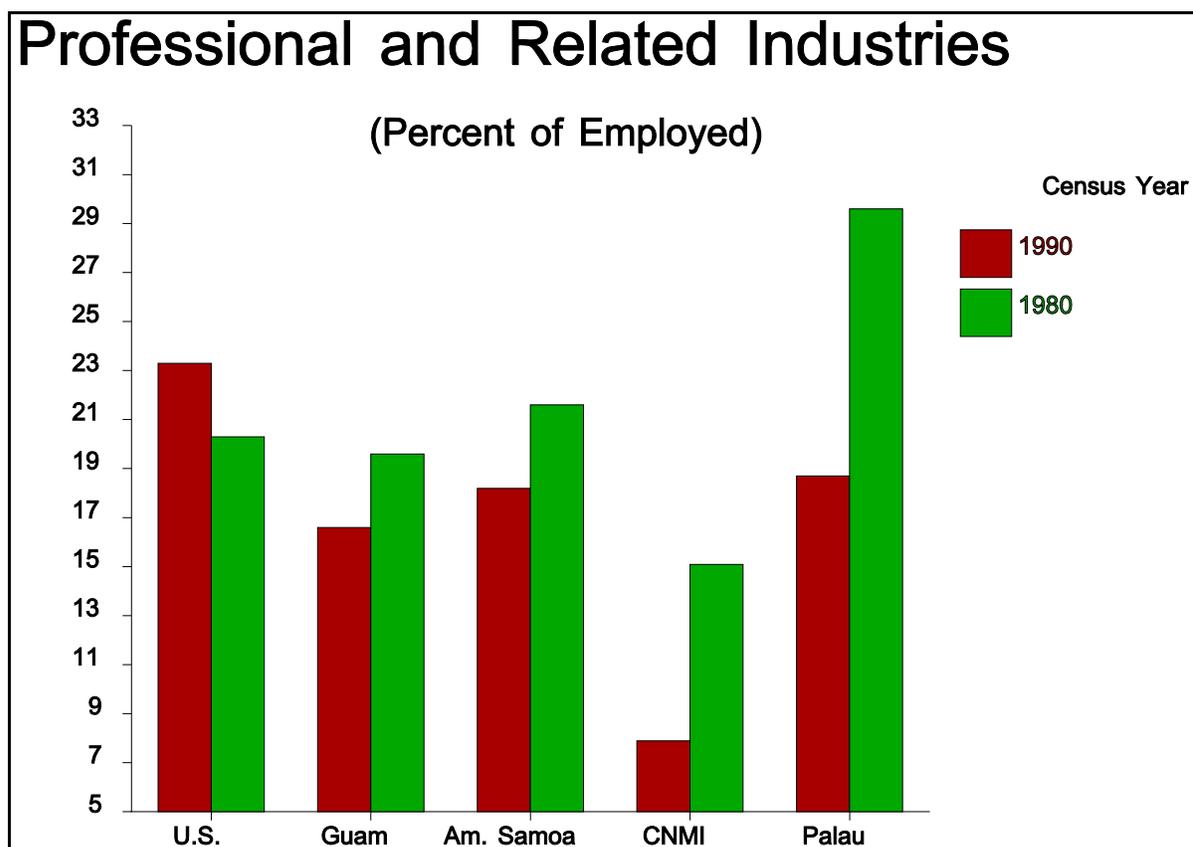


Figure 17.14. Percent Professional and Related Industries, United States and Pacific Islands: 1980 and 1990

The percentage of employed professionals and related service industry persons increased from 20 to 23 percent in the United States during the decade. None of the Pacific areas had similar increases — in fact all decreased — mostly because of diversification in the Pacific Islands' economies, particularly the movement from the public sector to the private sector. In the CNMI, the percentage in this industry category decreased from 15 percent of the employed to 8 percent. Palau had a decrease of 12 percentage points.

On the other hand, in 1990, while 17 percent of the employed in the United States worked at retail trade, 19 percent of those in Guam were in this category, as were 12 percent of those in Palau and CNMI, and 11 percent of those in American Samoa (Table 17.20).

Table 17.20. Percent Employed 16 Years and Over in Retail Trade Industries, United States and Pacific Islands: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	16.8	19.1	10.8	11.9	12.0
1980.....	16.1	20.0	9.6	13.8	8.1

Sources: 1990 CPH-6-P, G, AS, and CNMI

The U.S. percentage in retail trade increased slightly during the decade, from 16.1 to 16.8 percent. The percentage for American Samoa increased slightly while the percentages for Guam and the CNMI decreased somewhat. The percentage for Palau, however, increased by 50 percent, from 8 percent of the employed to 12 percent.

**Household Income.** The median household income in the United States in 1989 based on the 1990 census was \$30,056 (Table 17.21). Again, the median is the value which divides household income in half — half the households in the United States had incomes above \$30,056, half had incomes below. The median for Guam was slightly higher at \$30,755. But the median incomes for the other Pacific areas lagged behind Guam. The median household income in the CNMI was \$20,644 in 1989, followed by American Samoa at \$16,114, with Palau, at \$8,882 the lowest of all, less than one-third that of the U.S. or Guam.

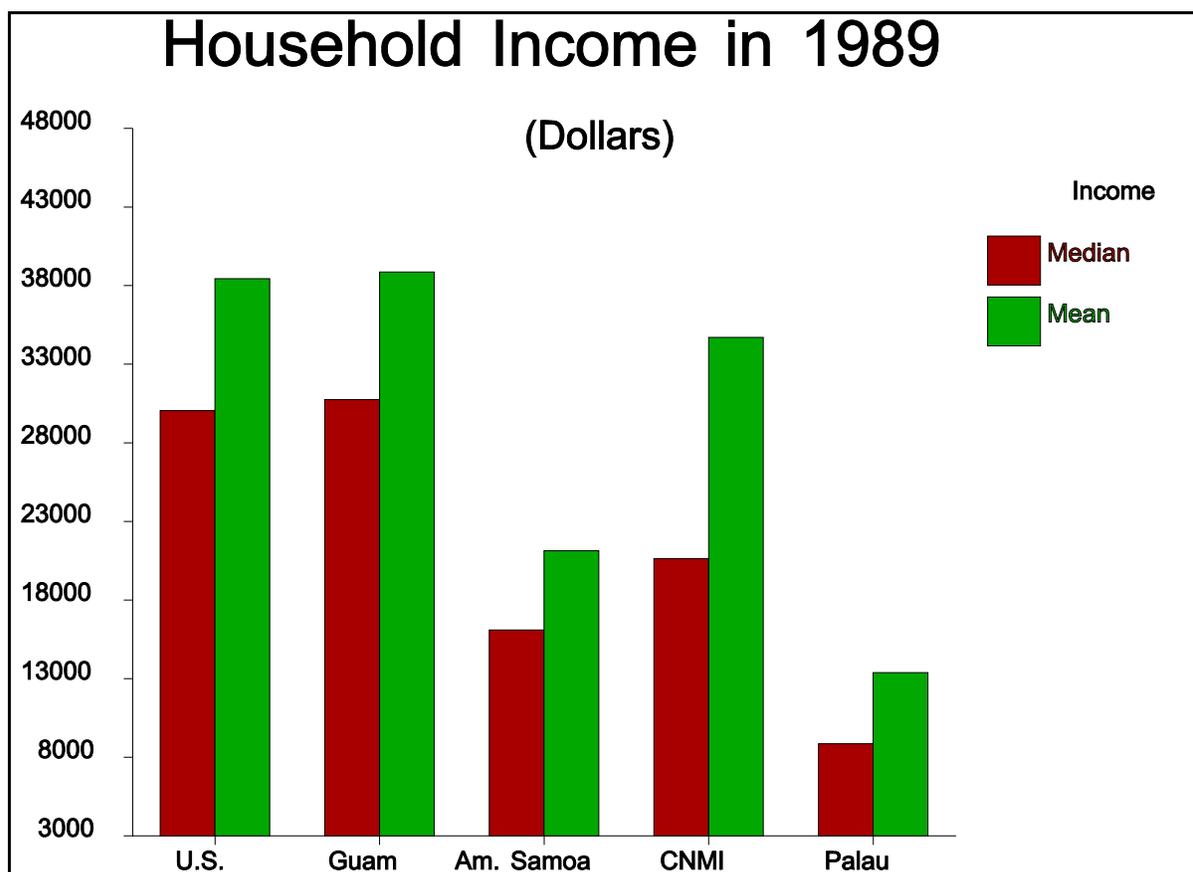


Figure 17.15. Household Income in 1989, Pacific Islands: 1990

Table 17.21. Median and Mean Household Income in 1989, United States and Pacific Islands: 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
Median.....	\$30,056	\$30,755	\$16,114	\$20,644	\$8,882
Mean.....	\$38,453	\$38,873	\$21,146	\$34,713	\$13,395

Sources: 1990 CPH-6-P, G, AS, and CNMI

Table 17.21 also shows mean household incomes for the United States and the areas. The mean income for the United States, for example, is the sum of all income (from all sources, earned and unearned) from all the households in the United States *divided by* the sum of all the households in

the United States. Since the mean includes all the income, it takes into account "outliers", so is more susceptible than the median to cases which are most aberrant — either much higher or much lower than average. In the case of the median household income for the United States in 1989, the \$38,453 value shows that many cases fell in the upper levels, increasing the mean somewhat above the median value.

The mean income for Guam was similar to the mean for the United States, the mean for CNMI was about \$4,000 less than that of the U.S. or Guam, while American Samoa's mean was about \$21,000, about \$17,000 less than the U.S. mean, and Palau's was about \$13,000, slightly more than one-third the value for the U.S.

## CONCLUSIONS

This chapter has presented comparative information from the 1990 Censuses of the United States, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and the Republic of Palau. A more detailed paper including data from the Puerto Rico and the U.S. Virgin Islands will be developed when data from those two areas are published. Also, after data for Pacific Islanders in the United States are available, comparative analyses for Pacific Islanders in the United States and in the Pacific Islands similar to those developed after the 1980 census will be possible (see, for example, Levin 1992, Ahlburg and Levin 1990).

The whole monograph focused for the first time on historical demographic, social, economic, and housing data for Palau. Here, for the first time planners and policy makers can use data compiled from earlier censuses, and cross-tabular data from the 1990 census, to assist in planning Palau's future. The Office of Planning and Statistics has also started a program of intercensal statistical work which has already seen taking and publishing results from the 1991 Household Income and Expenditures Survey, and a resumption of the Statistical Yearbook Series. OPS also has taken a Census of Businesses in the republic, and has plans for an Agriculture Census and a Labor Force Survey. This monograph is Palau's first analytical document for any sense, and so, while extensive, will be even more extensive after the next census, when data which were collected for the first time will show trends for the first time. Until then, we hope that Palau's government and its growing private sector will find these data and analyses useful.

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## APPENDIX A. ACCURACY OF THE DATA

### Confidentiality of the Data

To maintain confidentiality as required by U.S. law (Title 13, United States Code), the Bureau of the Census applied a confidentiality edit to the 1990 census data to ensure that published data do not contain information about specific individuals, households, and housing units. One result of this edit is the introduction of a small amount of uncertainty into some of the census characteristics to prevent identification. The Census Bureau controlled the confidentiality edit so that it did not affect the counts of total persons, total by race or ethnic group, persons aged 18 years and over, or total housing units by tenure.

Census Bureau personnel conducted the confidentiality edit for the Pacific Outlying Areas (American Samoa, CNMI, Guam, and Palau) in a similar manner for each of the two types of data collected from everyone in these areas -- stateside 100-percent equivalent (basic) data and sample stateside equivalent (detailed) data. In the census of the U.S., the Census Bureau collected certain information (stateside sample data) from the entire population and collected selected additional information (stateside sample data) from about one-sixth of the population. Conversely, in the censuses of the Pacific Outlying Areas the Census Bureau collected all information from the entire population. The Pacific Outlying Areas basic (stateside 100-percent equivalent) data corresponded to the U.S. census 100-percent data and included information on age, sex, ethnic origin or race, relationship, marital status, and certain questions concerning housing units (e.g., tenure, value, rent, and number of rooms). The Pacific Outlying Areas detailed (stateside sample equivalent) data corresponded to the U.S. census sample data and included information on subjects such as income, water source, language spoken at home, and commuting characteristics.

The Census Bureau conducted a confidentiality edit for the Pacific Outlying Areas by selecting a sample of households from internal census files and replacing a random subset of either the 100-percent equivalent data or the sample equivalent data with information from households featuring identical characteristics for selected key variables (but located in another part of that outlying area). The process employed a higher sampling rate for small areas, to provide more protection.

### **Editing of Unacceptable Data**

The goal of census data processing was to produce a set of data which described the population as clearly and accurately as possible. To meet this objective, crew leaders reviewed and edited questionnaires during field data collection to ensure consistency, completeness, and acceptability. Census clerks in district offices also reviewed questionnaires for omissions, certain inconsistencies, and population coverage. Census personnel conducted a telephone or personal visit follow-up to obtain missing information. The follow-ups considered potential coverage errors as well as questionnaires with omissions or inconsistencies beyond the completeness and quality tolerances specified in the review procedures.

Following field operations, census staff assigned remaining incomplete information and corrected inconsistent information on the questionnaires using imputation procedures during the final automated edit of the data. The use of allocations, or computer assignments of acceptable data, occurred most often when an entry for a given item was lacking or when the information reported for a person or housing unit on an item was 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 data in place of blanks or unacceptable entries enhanced the usefulness of the data.

Another means of correcting the census data during the computer editing process was through substitution -- that is, the assignment of a full set of characteristics for a person or housing unit. For instance, when a questionnaire contained no information for the persons in a household or did not list housing unit occupants, census staff selected a previously accepted household as a substitute and duplicated the full set of characteristics for the persons(s) or housing unit lacking characteristics data. The assignment of the full set of housing characteristics occurred when a questionnaire listed no housing information. If the housing unit was recorded occupied but the census collected no information, Census Bureau personnel assigned characteristics of the unit and occupants, as well as the number of persons, from a previously processed occupied unit. If the housing unit was vacant, staff assigned the housing characteristics from a previously processed vacant unit.

## Sources of Error

Human and machine-related errors occur in any large-scale statistical operation. Researchers generally refer to these problems as *nonsampling errors*. Such errors include the failure to enumerate every household or every person in a population, failure to obtain all required information from residents, collection of incorrect or inconsistent information, and incorrect recording of information. In addition, errors can occur during the field review of the enumerators' work, during clerical handling of the census questionnaires, or during the electronic processing of the questionnaires. To reduce various types of nonsampling errors, Census Bureau personnel used several techniques during planning, data collection, and data processing activities. Quality assurance methods were used throughout the data collection and processing phases of the census to improve the quality of the data.

Census staff implemented several coverage improvement programs during the development of census enumeration and processing strategies to minimize undercoverage of the population and housing units. The development of these programs drew upon experience from the 1980 decennial census and results from the 1990 U.S. decennial census testing cycle.

A quality assurance program, designed to improve coverage, began with an advance listing of addresses and recorded map spots for six housing units in each of two sample blocks in every enumerator assignment or address register area. The quality assurance check consisted of matching the advance listed addresses and map spots to the enumerator's complete address register area listing. If the number of non-matches exceeded a predetermined level, personnel rechecked the address register area.

Telephone and personal visit follow-ups also helped improve coverage. Computer and clerical edits emphasized improving the quality and consistency of the data. Local officials participated in post-census local reviews. Census enumerators conducted additional recanvassing where appropriate.

**APPENDIX B. QUESTIONNAIRES**

**APPENDIX C. MAPS**