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POPULATION STATISTICS OF AMERICAN SAMOA:
A REPORT TO THE GOVERNMENT OF AMERICAN SAMOA

by

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POPULATION STATISTICS OF AMERICAN SAMOA:
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O. INTRODUCTION

The Government of American Samoa (GAS) requires useful and reliable demographic information for comprehensive development planning and program evaluations. In spite of the territory having less than 30,000 population and its accessibility only by air and sea, the estimation of population has been a difficult task. This is principally due to the large, yet irregular, migration of Samoans. There has been a body of government-sponsored statistics of population. Unfortunately, they are frequently inconsistent with each other.

The Consultant was requested to examine the available demographic statistics for the territory and render services on:

- (a) assessing the reliability of variables as correlatives of population growth,
- (b) making recommendations for improvement in collection and compilation of demographic data,
- (c) developing methods for estimating the population, and
- (d) projecting future populations up to the year 1990.

In order to fulfill these assignments the Consultant visited Pago Pago during January 15-23, 1972. During the visit he made wide contacts with governmental agencies engaged in both producing and utilizing demographic statistics, such as Development Planning, Immigration Services, Medical Services, High Court, and Office of Samoan Affairs, and collected a variety of population-related data. Upon return from Pago Pago supplementary information was added. However, most of the analytical work was done after mid-April when the 1970 Population Census reports were made

available by the U.S. Bureau of the Census.

In preparation of the Report, no attempt was made to adjust the data of national censuses for the territory, although some questions were raised regarding the accuracy of age statement and the criteria on "usual place of residence" (McArthur, 1968). Because of the large migration, both in and out, it is impossible to use conventional statistical methods to ascertain the accuracy of age reporting and completeness of the census. However, even for 1920 census the reported ages of the population under 20 years are believed to be fairly accurate and the ages of older people are probably sufficiently accurate for a classification by broad age groups (Hill, 1922). For practical purposes the data of recent censuses will be considered as adequate to use without statistical adjustment.

Following the Summary and Recommendations, the Report is divided into four parts: (a) brief overview of the demographic situation; (b) description and assessment of the current GAS activities in the field of population statistics; (c) approaches to estimating population and (d) future population projections under several sets of assumptions. Appendix of the Report includes tables and document forms relevant and step-by-step procedure of 1971 population estimate.

The Consultant wishes to express his appreciation to the officials in various GAS agencies for the assistance provided. Special gratitude is due to: Mr. William Craven, Mr. Edgar S. Marcus, and Mrs. Evelyn Gebauer, Development Planning Office; Dr. Lowell Wiese, Dr. Peter Beales and Mrs. Camille Faircloth, Department of Medical Services; Mr. F. V. Vaovasa, Territorial Registrar; Mr. Fa'afetai Lefiti, Immigration Division; and Mr. Fau S. F. Tufele, Office of Samoan Affairs for their kind cooperation, to Dr. Y. Scott Matsumoto for his editorial help, and to Mrs. Marge Yokooji for her typing assistance.

1. SUMMARY AND RECOMMENDATIONS

- 1.1 During the past half century the population of the territory more than tripled but much of the natural increase was absorbed by emigration; especially in 1950-60 probably more than 30 percent of the total American Samoans in the territory left the islands.
- 1.2 Heavy out-migration is seen from age 15 to 30 years but after middle age there is a tendency that in-migrants outnumber emigrants. Of course, the population movement is much more pronounced in male than in female for either direction of migration.
- 1.3 Due to the high birth rate which is at the level of 40 or more per 1,000, the population is typically young; the median age has been 16 or less. The fertility of women of peak age 20-29 years is well over twice that of U. S. women. Even if fertility declines somewhat in the near future, the natural increase will maintain a level of 3.5 percent annum. With the current level of fertility the population should increase about three times in a generation and double in 20 years, if there is no migration.
- 1.4 In the Government there are several agencies which are involved with demographic statistics. Many of their statistical activities are interrelated. There are duplications of same activities, and large discrepancies of statistics between agencies are frequently observed. A coordinating body on statistical activities should be created for a constant review of statistical system.
- 1.5 The completeness of vital statistics appears to be satisfactory. However, a single system for birth and death registration should be established instead of the current dual system of Medical Services Department and High Court. Improvement of registration forms and compilation process should be

sought.

- 1.6 Migration statistics is of low quality, especially that of departures. An overhaul of the entire system is necessary. Clear definition of terminology and criterion of classification should be established. An expansion of statistical presentation should be studied to include age and sex of migrants.
- 1.7 Birth statistics, resident registry, and other statistical activities maintained by the Office of Samoan Affairs should be carefully examined as to their necessity, reliability, and utility.
- 1.8 It is urgently required to develop a more adequate system of protection and maintenance of demographic data. Methods of storage, retrieval, and safety from destruction should be strengthened.
- 1.9 Until a more reliable bookkeeping of migration is made available, a suitable method of estimating population should be developed using symptomatic variables which are sensitive to the population change and readily retrievable. For the present moment, birth, death and elementary school enrollment data appear to be useful for estimating population. As to the technique, a modification of Bogue-Duncan Composite Method is recommended for estimating population by broad age groups.
- 1.10 Statistics on dwelling units, electric utility, income tax and auto registration do not appear to be adequate for estimating population. This is partly due to relative newness of such statistical series. For possible future use, correlations of these data with population change should be constantly investigated.
- 1.11 Use of health statistics should be studied. Especially, the registration data in the filariasis program is likely to provide a powerful tool of estimating the current population by small areas.
- 1.12 If there were no migration and the current fertility were to prevail during

the next 20 years, the population of the territory would become more than 56,000 in 1990. The crude birth rate would become more than 43 per 1,000 after 1980. If fertility begin to decline 5 percent every 5 years from 1975, the population would become 52,500 in 1990. The difference of the population size under the assumption of constant fertility from that of declining fertility would be accelerated from 1990, when the birth cohort of 1975 enters to the child-bearing age.

- 1.13 If the level of migration observed in 1950-70 continues, the population would only slightly surpass 40,000 in 1990 under the assumption of constant fertility and 37,000 under the assumption of declining fertility. It is evident that the migration will relieve the population pressure considerably. However, actually the migration would increase the burden of dependency, as the proportion of children under 15 years of age and the old over 65 years would increase.

2. AN OVERVIEW OF THE DEMOGRAPHIC SITUATION

A brief review of the current population situation is presented in this Chapter in the hope of providing background information for the discussions to follow. The previous study by McArthur (1968), which is detailed and comprehensive, also the work by Pirie (1970) are valuable, but now need to be complemented with more recent data including 1970 census reports.

2.1 Growth and Migration

During the past half century, the population of American Samoa increased about three and half times. The population increased from 8,000 in 1920, when the first decennial census of the territory was taken as part of the U.S. census, to 27,000 in 1970. However, the pattern of increase varied with time. Between 1920 and 1940 each decennial growth was about 25 percent. A phenomenal increase was observed during the 1940's. However, during the next decade the population gained merely less than 6 percent. Then over the past decade a tremendous rise of the increase rate was again recorded as shown in Table 1.

TABLE 1. CENSUS POPULATION OF AMERICAN SAMOA, 1920-70

Year	Population	Increase %
1920	8,056	
1930	10,055	24.7
1940	12,908	28.4
1950	18,937	46.7
1960	20,051	5.9
1970	27,159	35.5

Though McArthur (1968) contests the method of enumeration for visitors, especially in the earlier censuses, these enumerated population should be by and

large regarded to reflect the actual population size at the time of census taking.

Migration has played an important role in the population growth. Prior to 1950, the population growth was much influenced by the traffic between American and Western Samoa. However, from 1950 the migration of American Samoans to Hawaii and California became an additional factor to determine the growth. Unfortunately, precise quantitative assessment of the movement is difficult to gauge from the available data (see, for instance, Bowman, 1972).

Although there must have been a large number of population exchange between the two Samoas during 1920-40, the net population gain from migration may have been negligible. The growth rate of the two decades does not appreciably differ from the natural increase. Bits and pieces of information indicate the crude death rates for 1920-30 seem to have ranged 20-15 per 1,000, and for 1930-40, 15-10. (For instance, Pirie (1970) says that average crude death rates were 35 between 1906-17 and 13 in 1927.) The crude birth rates must have always been 40 or over. The natural increase rate, therefore, should have been slightly over 20 per 1,000 during 1920-30, and 25 during 1930-40. An annual increase rate of 2 percent would result in a 22 percent of population growth in a decade, and an annual rate of 2.5 percent in turn 28 percent; these decennial rates roughly coincide with the observed intercensal growth.

The decrease of mortality in the 1940's should have been somewhat slackened compared with before, as the rate already reached a rather low level. (The 1961 UN Demographic Yearbook cites the rate as 9.1 for 1945-49 and 7.4 for 1955-59.) The spectacular rise of the increase rate in the decade of 1940-50, is obviously caused by an increased flow from Western Samoa. McArthur (1968) estimates one-fifth of the total increase of 6,000 were immigrants.

The Samoan population in Hawaii was meager prior to 1950. With the transfer of administration of the territory from Navy to the Department of Interior, a wave of migrants began to arrive in Honolulu in 1951 (Born, 1968). In July, 1952, U.S.S. *President Jackson* alone brought as many as 1,000 Samoans (Eyde, 1954). Apparently, the influx of Samoans to Hawaii continued through the decade and into the 60's. A survey of a Samoan community in Hawaii which consisted of 400 persons conducted in 1964 indicates that almost 80 percent of them arrived during 1959-63 (Yost, 1965). This situation is well supported by the extraordinary low growth rate of 1950-60 in the territory. From the recorded births and deaths, there were 6,490 intercensal natural increase. Since there were only 1,114 gains between the two censuses, the difference, which is nearly 5,400, is determined as the net outmigration in the 1950's. (However, according to the census reports, there were 200 net decrease even among the Western Samoan born during this decade, making the net outmigration of American Samoans at an order of 5,200 which is nearly 30 percent of 1950 total population.)

As Table 2 shows, although during the past decade the population gained more than 35 percent as a whole, there were about 1,300 net outmigration, which corresponds to 6.5 percent of the 1960 census population. However, in the meantime, a large number of immigrants came from Western Samoa. The 1960 census reports 1,704 persons born in Western Samoa, while the 1970 reports 4,535, a net gain of 2,831. There were also 955 more persons reported to have been born in other foreign countries (mostly Tongans?), thus making a total of 3,786 gain of the total foreign born. Adding the net outmigration of 1,290 to this number of increase in the foreign born, it is imputed that there were 5,076 American Samoan outflow. However, this is not all. There were also an increase of 990 persons born in the U.S. Naturally some of them are Samoans born in Hawaii or California. There is no way to assess the number

TABLE 2

MIGRATION AND NATURAL INCREASE
AMERICAN SAMOA, 1960-70

		<u>Total</u>	<u>Male</u>	<u>Female</u>
(1)	1960 Census Population	20,051	10,164	9,887
(2)	Intercensal Births	9,699	4,997	4,702
(3)	Intercensal Deaths	1,301	773	528
(4)	Imputed 1970 Population (1+2-3)	28,449	14,388	14,061
(5)	1970 Census Population	27,159	13,682	13,477
(6)	Net Migration (4-5)	1,290	706	584
(7)	Actual Increase (5-1)	7,108	3,518	3,590
(8)	Natural Increase (2-3)	8,398	4,224	4,174
(9)	Decennial Increase % (7/1)	35.4	34.6	36.3
(10)	Decennial Natural Increase % (8/1)	41.9	41.6	42.2
(11)	Decennial Migration % (6/1)	6.4	6.9	5.9
(12)	Annual Increase Rate	3.08	3.02	3.15

of returning Samoans. If it is wildly conjectured that one half of these 990 U.S. born were indeed Samoans, nearly 5,600 American Samoans are considered to have left the territory. If the territorial population of 1960 with American Samoan ethnicity was 18,000, this means that over 30 percent of them have moved out of the islands during the past 10 years, probably mainly to Hawaii.

The report of 1970 census also presents the residence status in 1965. There were 1,126 persons living in the U.S. and 2,806 in the foreign countries five years before 1970. It cannot be determined how many of those lived in the U.S. were Samoan returnees. However, judging from the number, a substantial proportion should be Samoans. Since nearly 80 percent of the foreign born were originated from the Western Samoa, over 2,000 Western Samoans may be regarded to have migrated during the 5 years preceding the census. In fact, among all the foreign born 22 percent migrated during a 15-month time from 1969, an additional 20 percent in 1967-68. In all, 51 percent of the foreign born migrated since 1965, and 74 percent since 1960 (1970 Census of Population, American Samoa).

Information regarding Samoans in Hawaii is practically non-existing. Since they are U.S. nationals, no immigration records are kept nor in any part of census reports are they identifiable (Bowman, 1972). The Hawaii Health Surveillance Program, surveying Oahu households over 36-month period ending March 31, 1967, estimated that there were 2,420 Samoans. Samoan Task Force on Immigration "identified" 6,544 Samoans in a survey in December 1971, which the Task Force itself does not place much reliability. The State statistician reached a figure of 5,660 from births reported (Bowman 1972). The State Health Department releases the vital statistics data by race, and since 1963 the Samoans have been established as a separate category. Prior to this time they were included in "other races". The number of Samoan births, which is the only vital event with appreciable size, has

been remarkably uniform ranging 280-300 annually, except for the two years 1968-69 when the number decreased to half or less in comparison with the usual number (see Table A1).^{*} There may have been a substantial number of Samoans returning home in these years. There were less than 200 annual births of "other races" in 1950-54, but from 1955 the births of this category started to increase rapidly reaching 517 in 1961. Most of these increased births may be that of the Samoans. If so, a large influx of Samoans to Hawaii is indicated for the latter half of the 50's.

The natural increase rate of the territory will continue to be very high at least for the time being, probably at an order of 3.5 - 3.8 percent annum which means less than 20 years is required to double the population. An extensive population outflow will undoubtedly modify the actual increase, as has been seen in the past, but with economic development and rising living standard in the territory it is more likely that the population increase will be accelerated since less American Samoans will leave and more Western Samoans will arrive.

2.2. Age and Sex Distribution

Migration, compounded by its size, direction, and selectivity, has caused distortions in the age and sex distribution. (Lack of reliable migration data also constrains the utility of conventional analytical techniques for evaluating the accuracy or age heaping of census data.) As evident from the age pyramids of the last two censuses in Figure 1, the population is typically young; the children's population under 15 years of age has occupied practically half of the total population. In the United States the comparable group consisted of 31 percent in 1960

^{*} Tables with the table numbers preceded by "A" are found in Appendix of this Report.

when its children's population was largest in the past several decades following the post-war baby-boom. (The proportion in 1970 was 28.4 percent. By 1980 it will become probably less than 25 percent.)

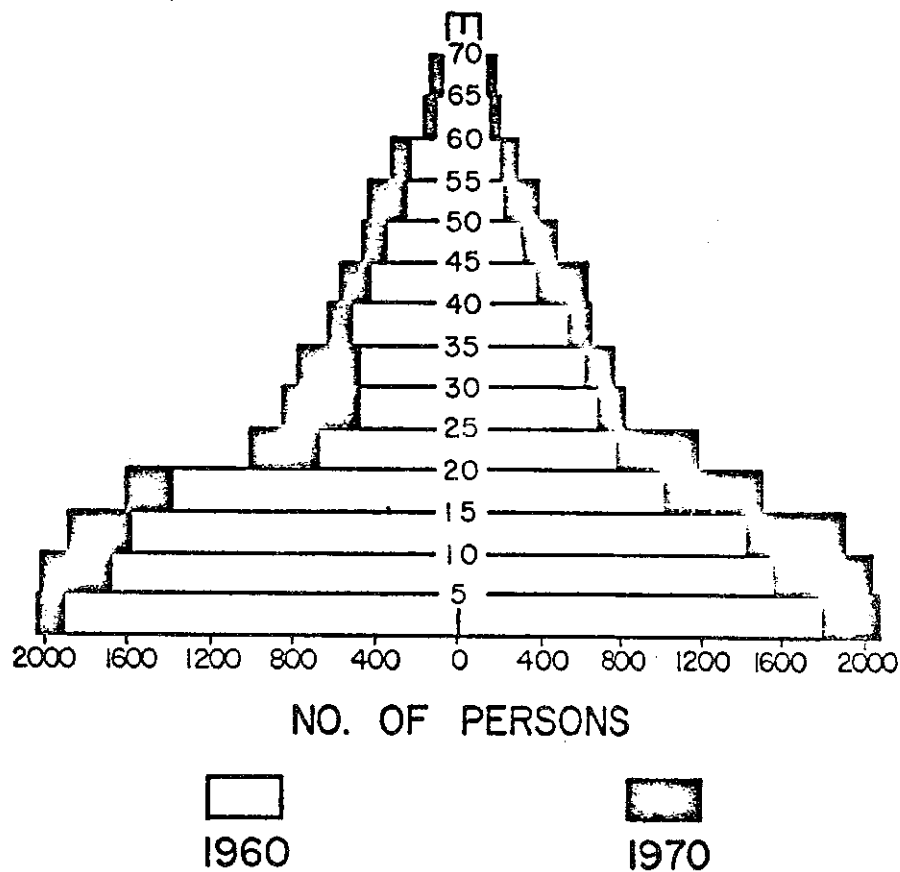
Consequently the median age has been 16 or so as shown in Table A2. In 1960 the median age of male was not even quite 15 years. Such age for Hawaii, which itself is one of the youngest state in the union, was 24.7 in 1960. The median age of the U.S. total population in 1970 was 28.1. Obviously this high proportion of children and young median age in the territory come from the high fertility and loss of persons in productive ages through migration.

A large dip at ages 20-30 in the population pyramid eloquently depicts the age selectivity of outmigration. This deficit in the young is especially noticeable in male in 1960; female outnumbered in 20-40 years of age. However, in 1970 among youths the male population was smaller than that of female only in age group 20-24. Instead, low sex ratios were observed in age groups 35-44, which were the cohorts with sex ratio less than 80 in 1960, and in the children of 10-14.

The discrepancy between the expected male survivors in 1960 obtained by applying estimated survival ratios to each age group of 1950 and the actually enumerated male population in 1960 will provide an estimate of net migration by age (residual method). With this technique, the net emigration rate of 15-19 age group in 1950 is estimated as much as 55 percent during the 10-years period of 1950-60. The rate of 10-14 years of age becomes 44 percent followed by groups aged 20-24 and 25-29 years which present 30 percent level (see Table A3). These rates do not differ much from the Wolf Report (1969) which shows consistently higher figure than the present report. Age specific migration of female did not necessarily comply with the pattern of male. Although the highest rate was observed with age group of 25-29 years in 1950 (33%), the emigration rate did not vary much from age to

FIGURE 1

AGE AND SEX DISTRIBUTION OF
AMERICAN SAMOA POPULATION
1960 AND 1970



age, ranging from 25 to 30 percent.

Between 1960-70 an entirely different picture of age specific net migration is observed. There are several age cohorts in which sizes of the 1970 population have even exceeded the original sizes of 1960. In male the 1960 age groups of 20-24, 25-29, 30-34, and 40-44 years and in female 0-4 years are these. In addition, those aged 45-49 years in male, 20-24, 30-34, and 40-44 years in female in 1960 decreased only slightly by 1970. In male all these groups present net immigration rate of over 10 percent according to the residual method. (The immigration rate of the age cohort of 25-29 in 1960 is as much as 32 percent.) The only cohorts with substantial outmigration are 10-20 years showing rates of 25-35 percent in male and 17 percent in female (Table A3).

The proportion of the old age is relatively small. The population over 65 years of age has been about 2.5 percent. The U.S. figure is about 10 percent in 1970. If a dependency ratio is defined to be the proportion of population under 15 and over 65 years of age over the remainder, it becomes just about 100 percent, meaning every person of productive age has one mouth to feed.

2.3 Mortality and Fertility

Because of the size of the population, the age and sex specific death rates present some erratic fluctuations (see Table A4). Though the general shape of the mortality curve by and large conforms with experiences in other countries, it appears that the rise of mortality after reaching a nadir in childhood begins somewhat earlier than usual. The general experience is that in age group 10-14 the lowest mortality is observed in entire life-span. However, in the territory the age group 5-9 appears to present the lowest death rate. This situation may well come from sample variations due to the small size. It should be noted, however, that in

the young and middle age the mortality "level" of the Coale-Demeny Model Life Tables is relatively low in comparison with that in childhood suggesting an increased risk of mortality in early adult life. (The mortality "level" of the model life table increases as the magnitude of mortality decreases.) In general, the mortality "level" of model life table is relatively high in early childhood, it decreases somewhat in the young and middle age, then it increases again in the old age. During the 10-year period of time, 1960-70, the "level" appeared to be generally improved except for the older age group. The case of the old group may be due to the improvement of death reporting, as discussed later.

Generally, mortality is very low and it is still being improved slowly. Each of the age specific rates are only slightly higher than the comparable rate of the U.S. However, due to the predominantly young population the crude death rate is nearly half of the rate of the nation. In fact, the age-adjusted death rate of the territory based on the 1970 U.S. population, thus eliminating the influence of the age structure on the crude death rate, becomes 11.0 per 1,000 for 1969-71. The rate for the nation in 1970 was 9.4.

Although it may be too soon to establish a downward trend of fertility, there is some sign of reduction of birth rate in recent time. The crude birth rate declined from an annual average of 42.7 per 1,000 in 1959-61 to 38.4 in 1969-71. However, the general fertility rate (number of births per 1,000 women of child bearing age) remained practically on the same level from 199 to 192. (In the nation the crude rate has been below 20 and general fertility rate below 100 since 1965.)

According to the preliminary data, some decline of fertility took place in the past decade only in the age groups of 25-29 and 30-34 in which highest birth rates were observed (see Table A5). In other age groups the changes are negligible. The total fertility rate (expected number of children born to a woman during her

lifetime) is 5.9. In the U.S. such rate has never approached 4 in the past 50 years; currently it is about 2.4. With this rate the territorial population will increase 2.9 times within a generation (gross reproduction rate). The difference in the pattern of age specific birth rate between the territory and nation is shown in Figure 2. The fertility below age 20 is somewhat lower for the territory but after that age the territory presents 2-3 times higher rates than the nation.

The census data also indicates signs of fertility reduction. As seen from Figure 1, the population of 0-4 years in 1970 is only slightly larger than the groups of 5-9 years. The ratio of children under 5 years of age to 1,000 women of child-bearing age (child-woman ratio) declined from 936 in 1960 to 864 in 1970. The average number of children born per woman also decreased among the young women as seen from Table 3.

TABLE 3. AVERAGE NUMBER OF CHILDREN EVER BORN PER
EVER-MARRIED WOMAN BY AGE GROUP, 1960 and 1970

Age of Women	1960	1970
15 - 24	1.79	1.57
25 - 34	4.49	3.68
35 - 44	5.73	5.97

The 1960 census data shows a large proportion of women with high parity. In the territory over 29 percent of ever-married women gave births of 7 or more children, but in the nation it was only 5 percent for white and 12.1 percent for non-white.

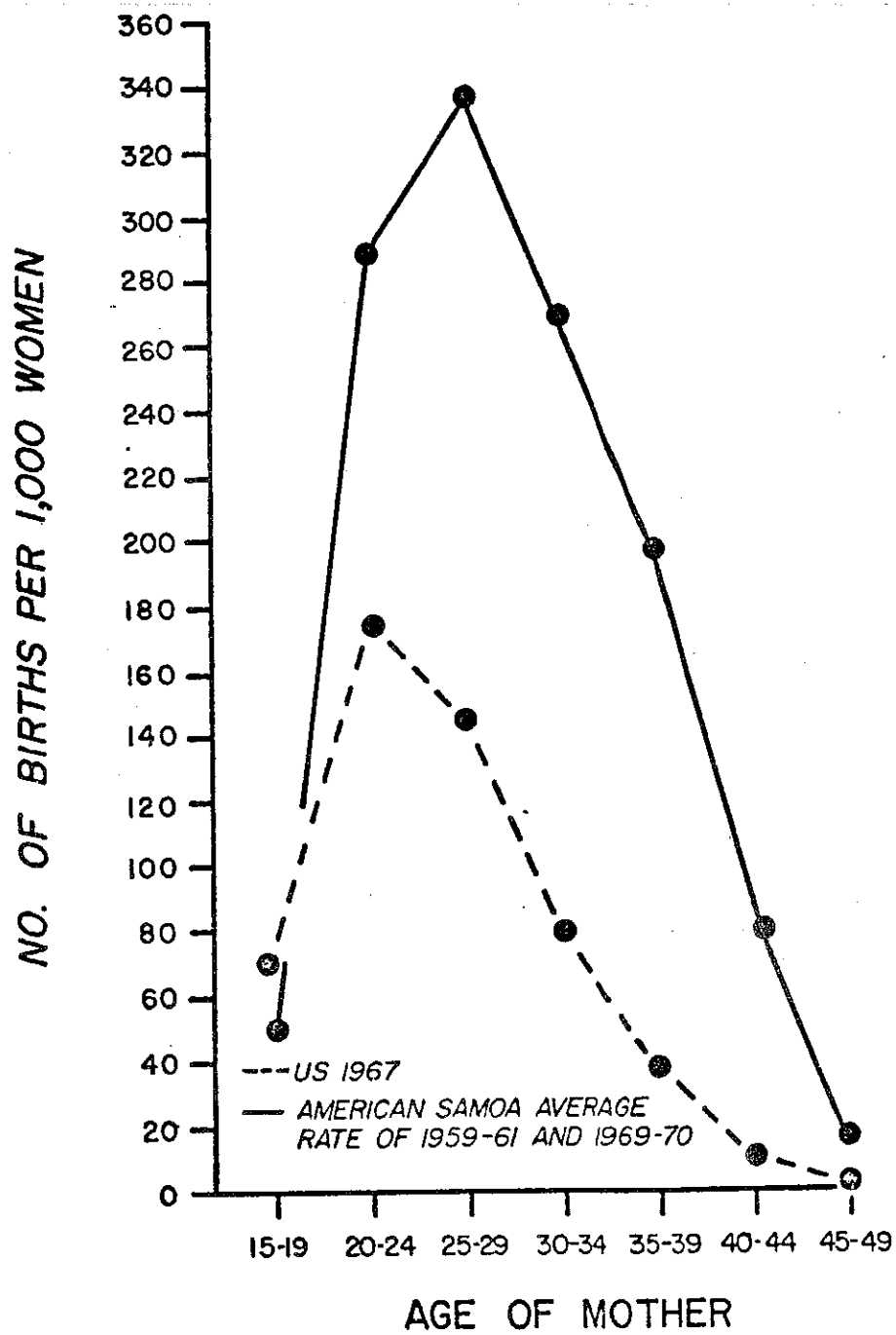
Family planning service has been in existence for some time. The Department of Medical Services indicates that no more than 4 to 7 percent of the population at

risk have accepted the program (Dept. of Med. Services, CHP 314(d), 1971).

Although fertility does present some sign of decline, probably a substantial reduction may not be observed in the near future, unless a vigorous family planning service is provided and the population accepts it.

FIGURE 2

AGE SPECIFIC BIRTH RATE OF
AMERICAN SAMOA AND UNITED STATES



3. GOVERNMENT POPULATION STATISTICS

This Chapter describes the current GAS activities in the field of population statistics, attempts to assess the quality and utility of the statistics with some analysis of data, and suggests measures for improving the demographic statistics system in the territory. Three major areas of their activities are the efforts on headcounts, vital registration, and migration. The local agencies concerned in these activities are Office of Samoan Affairs, Vital Statistics Registrar of High Court, Department of Medical Services, Immigration Division of the Office of the Attorney General, and Office of Tourism. In general, these agencies collect, process, and publish related data independently with minimal coordination. The quality of data does not seem to be very high, with the exception of vital statistics.

3.1 Local Census and Resident Registration (Office of Samoan Affairs)

In addition to the decennial U.S. census, it appears that since 1962 there have been a series of annual "censuses" collected by the Office of Samoan Affairs up to 1970. According to the officials at the Office, in the month of December, each of the 56 village chiefs (Plenuu) was given a form to enumerate all the inhabitants living in his village. The items included in the form were: name, sex, date of birth, birth place, social security number, father's name, mother's name, occupation, relation to the head of family, nationality, and marital status. It is claimed that the census was taken on a *de jure* basis. A person living in the same address for 30 days or more was regarded as a resident. However, in actuality, it is questionable to what degree this criterion was observed. For instance, in the 1968 "census" more than 2600 Oriental nationals were enumerated; presumably the vast majority of them, if not all, were tuna fishermen who customarily remained on the island for only a few days during the unloading and maintenance of boats.

Although the Office of Samoan Affairs states that the "census" was taken annually, there are no published results except for 1968. Under the title of *Population Report of American Samoa for 1968* (dated December 31, 1968) a 13-page mimeographed issue covers: Population of American Samoa 1900-1968, Population by Counties and Villages 1950 to 1968, Population of Districts and Counties by Sex, Population by National Status, Matai Population by Districts and Counties, Population by Church Affiliation and Birth Report by Districts and Counties in 1968.

In its last page it is stated:

"We shall include in future population reports the Population of American Samoa by age and sex; married population by sex and age groups; and population by occupation and place of occupation. Also, there will be some comments and detail analysis of our population".

To date there have been no such reports.

For 1967, the Consultant did manage to obtain age and sex distribution from one of the old files at the office. However, there were two conflicting series of age-sex distributions.* The official in charge thought that the annual "census" results has been published in the *Governor's Annual Report*. However, in the series of *Annual Report*, merely the statement, "based on unofficial census report approximating ...", appears for computing birth and death rates. The following

*

Out of one of the series of this "census" Peter Pirie, in his article, "Samoa: two approaches to population and resource problems", quoted the total population size, children under 5 years, and women of 15-44 years of age. Pirie says that these were provided by the Medical Service Department. Otherwise, 1967 "census" figures do not appear to have been released in any manner.

are these "unofficial census reports."*

1963	21,000
1964	22,000
1965	23,000
1966	24,500
1967	28,000
1968	32,097
1969	33,000

The Consultant, after spending some time in the storage room which supposedly contained the original "census returns" and possibly some tabulations based on them, has evaluated that tremendous effort would be required to put the storage room in order so that retrieval of information would be possible.

In 1970 the Office did not consider it necessary to take a local census which was considered superfluous because of the U.S. census. Instead the plenuus were asked to report all the births which occurred in their own villages since 1965 using the usual form of their census. Consequently, the Office released *Population of the Peoples Borned in the Year 1965 to 1970* in a mimeographed form. It lists number of births by village, year, and sex of child. It should be noted that the numbers collected from plenuus were consistently smaller than the birth registration figures especially for 1970 (see Table A6). (The number of births obtained in the 1968 census was only 164 as against over 1,000 registered in the medical record department of the LBJ Tropical Medical Center.)

The office does not take any more annual census. Instead they engage in a kind of resident registration called "census card". According to the *1968 Annual Report of the Governor*, "the office is developing a census card system and eventually will have on card records for each citizen of the territory".

*

Sources: for 1963-67	Annual Report of the Governor 1968
1968	Population Report of American Samoa for 1968
1969	Annual Report of the Governor 1970

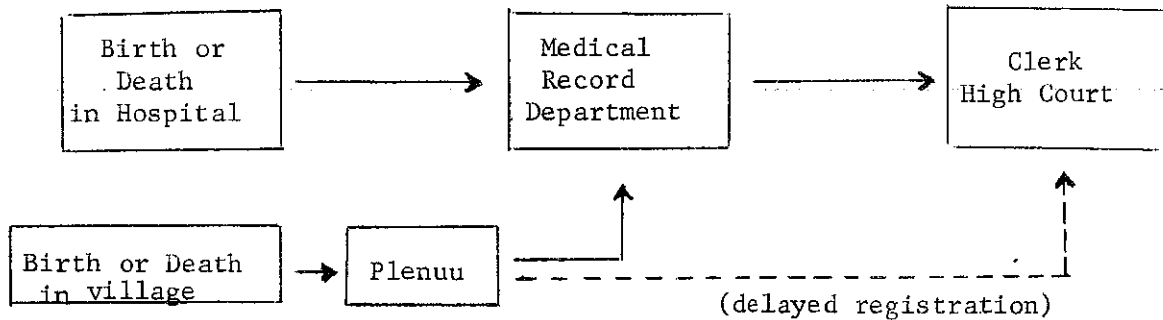
No mention of this system is found in the 1969 Report. The form of the card is attached in the Appendix (Figure A1). Although the 1968 Report indicates that 13,777 individual records (about one-half of the total population) were completed, the registration was still under way in January 1972. The stated purposes of the registration are (a) to substitute for birth certificate as proof of the U.S. national, (b) to use for voter's registration, and (c) to serve for estimating the current population size and its composition.

3.2 Vital Statistics

The Code of American Samoa prescribes that every birth or death must first be reported to the Plenuu of the village in which it has taken place, and the Plenuu in turn will report it to the health authority within 10 days. The health authority is then required to forward the birth and death certificate to the Clerk of the High Court (Territorial Registrar). In actuality, it is the practice that the health authority will accept births or deaths even though several months old, if reported, as current vital events registration. On the other hand, those events directly registered at the High Court are regarded as delayed registration regardless of the length of time elapsed since the event occurred. The Code also states that "no burial of the body shall take place until permit for same has been issued by the County Chief of the County in which said burial is to be made". However, practically all burials are performed without official permit.

The process of registration, currently practiced, may be shown schematically as Figure 3.

Figure 3. Birth and Death Registration Procedure, American Samoa



Until very recently, the Medical Record Department solely compiled, tabulated, and published birth and death statistics. Now the Territorial Registrar who has been responsible for the custody of records and issuing copies also provides statistics; the first report by the registrar was released in April 1972. Unfortunately, there are some disagreements between these two agencies even if the delayed reports are taken out.

Although birth, fetal death, and death statistics used to appear in the *Governor's Annual Report*, such data have not appeared since 1968. These published data are said to be prepared by the Department of Medical Services and tabulation plan was rather satisfactory for the recent years. As stated, in 1972 the Registrar released the First Vital Statistical Report covering all vital events, i.e., birth, death, fetal death, marriage, divorce and adoption. The reference period of the Report is 1970 and 1971 but it covers some historical figures of birth and death. The tabulation is primarily simple one-way classification.

The U.S. Bureau of the Census takes the attitude that "the relative completeness of the registration of births and deaths is not known" (*Current Population Reports*, P-25, No. 423. May 28, 1969). On the other hand, the UN's *1959 Demographic*

Yearbook states in a footnote that the registration of birth in the territory is estimated to be 99.8 percent complete. McArthur (1968) estimates that "about 12 percent of births were not registered before 1940, ten years later about 7 percent had not been registered and probably less than 5 percent escaped registration between 1951 and 1956." The Registrar believes that the birth registration may be at least 95 percent complete and the death registration should be 100 percent complete. It should be emphasized that this is a subjective judgment.

The Registrar encounters delayed reports of birth from time to time. During the recent years there have been 20 or less delayed registrations annually, according to the *First Vital Statistical Report 1970-71*. Though, it is not clear whether the year shown in the Report represents the year of registration or the year of birth taken place. (Most likely the former is the case.) In any case, these delayed reports are an indication of incompleteness of birth registration. (However, in the territory they may not simply mean the births escaped registration at the time of occurrence. There is a possibility that some of them may have actually been born in Western Samoa.)

Because of education or travel, the necessity for birth registration eventually arises, even if considerable time has elapsed since the birth occurred. However, in case of death, no acute necessity seems to arise in this commune society once at the time of death it has escaped registration. In fact, the Registrar says that he has never encountered delayed registration of death, thus providing no evidence of under-registration of death.

The enumerated population under 1 year old in 1960 was 871. Assuming the survival ratio from birth to under 1 year old being .95547 (Coale-Demeny Model Life Table "West" mortality "level" 19, with proportion of male birth as .5152), this means that there were 912 births during the one-year period preceding April 1, 1960.

However, according to the vital statistics reports of 1959 and 1960, the estimate of births during the period is 863, implying 95 percent completeness of birth registration. Although any error in the estimation of mortality level would result in a different conclusion, there would not be drastic difference as long as the mortality level estimated is not too unrealistic. However, even a moderate emigration would ensue an over-estimation of completeness. A similar procedure for 1970 data (assuming ratio .96944 mortality "level" "West" 21), indicates 99 percent registration. It is considered that the birth registration has improved over the years and by now only few cases, if any, escape prompt registration.

The general experience is that death registration is better than birth registration. If this is also true in the American Samoa, death registration may be considered practically 100 percent, as the Registrar of Vital Statistics claims.

Although young childhood mortality is very low, probably it is true. In view of large proportion of births attended by the medical profession (95 percent in 1971), it seems that all early infant deaths are registered and not classified as fetal deaths. However, in case of old age there may have been some under-registration because (a) the death rates had been too low (the "level" of model life table frequently surpassing 24) and (b) they generally increased over time. Therefore, assuming that (a) the observed death rates from childhood to middle age represent the actual situation and (b) the downward mortality "level" continue to old age, a series of 10-year survival ratios are derived for 1960-70 as shown in column (6) of Table A7. Applying these survival ratios to the Census population of 1960, expected survivors in 1970 are obtained in Column(7). Further recorded deaths during 1960-70 were attributed to cohorts initially in the given age group of 1960 census. Subtracting these attributed deaths from the original cohorts, another series of expected survivors in 1970 were obtained as shown in column (4). The striking agreement between these two series of expected survivors, except for the old, suggests the

validity of determination of the mortality "level".

3.3 Migration

Statistics related to migration is compiled by two agencies, Immigration Division and Tourism Office. The basic source of information is the Entry Clearance Form (GAS Form 452, see Figure A2) which is distributed to all persons entering the territory. This form is jointly utilized by Immigration, Agricultural Quarantine, Customs, and Tourist agencies. (The form is said to be kept for 5 years by the Immigration Division.) The collected forms by the Immigration Officer is checked with the airline or shipping company manifest. A daily report is prepared showing the name, nationality, address, age, sex, length of stay and a few other items. Accumulating these daily reports, monthly statistical reports are submitted to the Attorney General. The report treats immigrants and emigrants separately, which apparently mean the arrivals and departures respectively. A two-way table is prepared for each of them, noting the means of travel (sea or air), nationality (Western Samoans, Tongans and Residents), and purpose (business, transients and tourists). As seen from the table set-up, for Polynesians the nationality appears to be the over-riding characteristic, while for non-Polynesians, the purpose of the travel.

Outgoing passengers were required to fill the short form of GAS Form 452 (Figure A3) which provided the basic material for the departure statistics. However, since 1972 a new system was introduced discriminating the residents (American Samoans) and non-residents. Entering the territory, all non-residents are now given GAS Form 452A (Figure A4) which is to be surrendered at the time of departure. For the collection of departing residents' data, the Immigration Division rely on the manifest which lists the name, sex, ticket number and baggage weight of the passenger. The annual report of the Immigration office which used to appear in the *Governor's Annual Report*, covered total arrivals and departures dividing Western Samoans and

others for each quarter of the fiscal year. In addition, monthly total arrivals and departures were shown by route of traffic (air or sea). Regretfully, this annual report is not included in the Governor's Report since 1969.

Office of Tourism presents annual tables of arriving passengers by air classified (a) by purpose (tourists, business and transit) and sex, (b) nationality, (c) permanent address and (d) places of origin and destinations and a separate table giving the number of cruise passengers and excursionists. All these tables show figures for each month. Evidently, these tables are prepared for those passengers who checked in one of the three boxes, Tourist, Business, and Other, in the item of "Reason for Visit" in Form 452, since very few Western Samoans and Tongans and no American Samoans appear.

The Bureau of the Census endorses that "the migration component appears to be adequate, in that it is derived from reported data of the American Samoan Office of Immigration" (CPR P-25, No. 423, 1969). However, even a cursory inspection of the data does not warrant this statement. Table A8 presents a consolidated annual reports of the Immigration Division for 1959-1970. (Unfortunately, the data for a 6-month period, January-June 1968, is missing but it should not alter the general picture.) Other than the first three years 1959-61, each year shows a large number of net in-migration. According to this table, during 1960-69, which roughly corresponds to the intercensal period, there were as many as 10,379 excess of arrivals over departures. (Actually, it should be more since the data of Western Samoans are shown from 1961.) Even taking into consideration of a certain time lag between arrival and departure of tourists and business travelers and mortality among the immigrants, the discrepancy from the results of analysis of census and vital statistics through a residual method is too great to resolve. As Table 2 shows, it is estimated that there were 1,300 net out-migration between 1960 and 1970. Also as stated earlier, the censuses show a net migration of Western Samoans during 60's to be 2,831.

However, the Immigration figure of Table A8 presents an excess of 8,529 West Samoan arrivals during 1961-70. (The official statistics of the Western Samoa shows a net in-migration from Pago Pago since 1965 - Economic Development Board, Western Samoa, 1966)

Besides, more than 10,000 excess arrivals during 1960-69 means that nearly 40 percent of 1970 census population are newcomers to the territory over the past 10 years. Since an over-counting of passengers is less likely than an under-counting, it is suspected that there are more flaws in the departure statistics than the arrivals.

When the data from Immigration office with those of the Tourism agency are compared, further discrepancies are found. For instance, Table A9 presents the air arrivals (excluding Polynesians) during January-June 1970 by source of data. The Immigration agency provides consistently larger figures than the Tourism Office. Most conspicuous is in the category of "transients", in which the figure of Immigration is about 30 times that of Tourism. (Actually the term "transient" is used by Immigration Office, and Tourism Office uses the term "transit". The former office defines a transient as "one who remains on the island for 24 hours or less - one who is 'in transit' from one point to another and is 'passing through' Samoa " (Letter from Marcus January 31, 1972)). Each month in 1970 there were far more transient arrivals than transient departures according to the monthly report of the Immigration Division. In the first half of the year there were 9,439 such arrivals (both air and sea) and 8,105 such departures, in the second half 18,570 against 17,098. If transients are only "passing through" Samoa, there should be the same number of arrivals and departures.

3.4 Discussion and Recommendations

It is evident that a strong coordination is necessary on demographic activities

of GAS agencies. For the same data two or more offices are involved resulting in duplication, confusion and low quality of statistics. Creation of a central statistical coordination body is desirable so that it could provide technical and administrative guidelines for the improvement of demographic and other related statistical system of the territory.

Although the current coverage of birth and death registration is satisfactorily complete, reporting and statistical processing of vital data require further review. In the United States local health department is the sole registration unit and vital statistics is produced through the chain of health agencies. In the territory, plenuu, health agency and registrar are all involved in the registration, and the final custody of the legal document is in the hand of registrar. Somewhat conflicting statistics are produced at least by two agencies. The worth of birth data collected by the Office of Samoan Affairs should be questioned. In the first place, the coverage is extremely low in comparison with the vital registration. Secondly it has no legal value, yet the data is collected to establish the nativity of American Samoa according to the claim of the Office.

The birth and death certificate forms (GAS Forms 130 and 553, see Figure A5 and Figure A6) currently used in the territory should be revised for further clarification of terms and inclusion of additional basic items. For instance, according to the current birth certificate whether number of previous births includes only live births or live births and fetal deaths is not clear. Even though great majority of births take place in the hospital and dispensaries, medical information such as birth weight or complications and malformations, are not collected. Adoption of the nationally recommended standard certificates should be studied. (See National Center for Health Statistics: Vital and Health Statistics Series 4 No. 8, The 1968 Revision of the Standard Certificates) A provision of new forms for delayed reports is also necessary.

Extension of tabulation scheme should be explored. Since there are only about 1200 births and deaths annually, an introduction of marginal punch card system alone would greatly facilitate and accurately process the more complicated tabulations than currently practiced. The basic tabulations should refer to the internationally recommended annual tabulation program listed in the *Handbook of Vital Statistics Methods* by United Nations.

A comprehensive overhaul on migration statistics system should be undertaken. A strong administrative control should be exercised on the flow of entry clearance and embarkation cards which are the basic material for migration statistics. These forms require a careful study for further improvement. A new arrangement of information items being collected is suggested so that each of the agencies can tear its own portion and use it independently. The terms used in the forms should be clearly defined and such definitions must be uniformly understood by the offices and officials concerned. For any one particular item in the form, a consistent classification system should be applied to all passengers and mixing of several classification schemes should be avoided. Improvement of statistics on the departing passengers is especially important. Embarkation cards with proper design and information items should be given to all passengers including the residents of the territory.

The current situation of demographic statistics in the territory strongly calls for training of qualified personnel in the area. There are a number of short term training programs and special seminars on population, for instance, the East-West Population Institute of Hawaii holds a 5-week training seminar every summer. The GAS should seek active participation in these seminars so that the demographic statistics may be improved without outside assistance.

It is also urgently required to develop a more adequate system of protection and maintenance of demographic data. The current system of storage is, with exception

of medical records, extremely confusing. The recovery of reports of even the immediate past often requires painstaking search. Methods of storage, retrieval, and safety from destruction should be strengthened.

4. ESTIMATION OF POPULATION

In theory, the estimation of current total population or populations of the past for the territory is simple. Components needed are the natural increase and net migration which occurred between the previous census date and the time of estimation. The procedure is expressed as:

$$P_i = P_o + B_i - D_i + (IM)_i - (EM)_i .$$

where

P_i = estimated population at time i

P_o = enumerated census population at time o

B_i = number of births in the interval o to i

D_i = number of deaths in the interval o to i

$(IM)_i$ = number of immigration in the interval o to i

$(EM)_i$ = number of outmigration in the interval o to i

Assuming the census coverage is reasonably complete, the obviously required condition in this simple method, often called the balancing equation method, is accurate vital and migration statistics. As seen in the foregoing Chapter, while the degree of completeness of birth and death registration in the territory is very high, migration statistics is not reliable. Since the territory is accessible only by two ports, accurate migration records would seem to be theoretically not too difficult to collect. Unfortunately this does not seem to be the case. Until the time accurate migration data are available, some other method to estimate the current and past population must be sought. Even if accurate migration records are kept, estimation by district or other sub-area requires techniques beyond those of balancing equation method. In this Chapter discussion centers on (a) methods currently employed

for estimating population in areas subjected to migration, (b) inquiry of symptomatic data of population in the territory and (c) an approach currently usable for estimating territory's population.

4.1 Review of methods used for estimating population*

Techniques currently employed for the estimation of population for sub-areas include: Vital Rates Method, Component Method II, Composite Method, Regression Method, and Housing Unit Method. None of these methods are found to be definitely superior over the others. For the county and metropolitan estimates, the Bureau of the Census favors an average of several methods, supplemented by any available recent special censuses or surveys (CPR P-25 Nos. 427 & 432, 1969). For the post-censal estimates of American Samoa the Bureau made 5 estimates annually from 1965. A summary of these estimates are shown in Table A10. They are frequently inconsistent, demonstrating the difficulty of estimation for the territory. For instance, for 1965, the 1966 estimate gives a figure of 21,400, the 1967 estimate 24,700, and the 1968 estimate 25,000.

When reliable vital statistics are available, the *Vital Rates Method* may yield simple, rapid, and effective estimates. Changes in the number of birth and death reflect the changes in population and vital rates. If there is reliable estimate for trends in crude birth and death rates, the population may be estimated from the following formula:

$$P_i = \frac{1}{2} \left(\frac{B_i}{b_i} + \frac{D_i}{d_i} \right) \times 1,000 .$$

* For more detailed descriptions, reference should be made to other sources. For instance, see Peter A. Morrison. *Demographic Information for Cities: A Manual for Estimating and Projecting Local Population Characteristics*, Rand Corporation, 1971.

where

P_i = estimated population at time i

B_i = number of registered births for one-year period
centering time i

D_i = number of registered deaths for one-year period
centering time i

b_i = estimated crude birth rate at time i per 1,000
population

d_i = estimated crude death rate at time i per 1,000
population

While this method provides, quite often, fairly good estimates for State levels and large areas, for American Samoa it may be used with caution. Since the population size is so small, annual fluctuations of birth and death, especially the latter, may be subjected to chance factor rather than the change of population size. Furthermore, migration is age and sex selective; total birth and death data may reflect the population composition more than the total size in the territory. Annual estimates since 1960 are given in Table All, using this method.

Component Method II has been used extensively in making regional, state, and county estimates by the Bureau of the Census. To estimate the population change the components of natural increase and migration are separately determined. Natural increase is taken simply from vital records. Civilian migration is estimated from school enrollment. The population change in the armed forces and institutions are usually obtained from independent sources. The estimating formula is:

$$P_i = P_o + B_i - D_i + M_i - M_a + A_i .$$

where

- P_i = estimated population at time i
- P_o = civilian resident population at time o
- B_i = number of births in the interval o to i
- D_i = number of civilian deaths in the interval o to i
- M_i = estimated net civilian migration in the interval o to i
- M_a = estimated net movement of civilians into the Armed Forces in the interval o to i
- A_i = number of persons in the Armed Forces stationed in the study area at time i

Since the size of the armed forces is negligible in the territory (five in 1960 and ten in 1970), the problem is reduced to the school enrollment data which is used for estimating migration. Unfortunately, the relationship between the school age migration and the total migration, which is crucial for this method is not known for the territory. (There are also some problems in the school enrollment data.)

Separate age specific estimates derived from various symptomatic data build into the techniques of *Bogue-Duncan Composite Method*. For estimating females of childbearing age, birth data are used. This enables to estimate the male of corresponding age using the sex ratio. Children under 5 years of age is obtained from fertility ratios. School enrollment provides the estimate of the population 5 years up to childbearing age. Lastly, estimating the old is derived from the death statistics of old age. The feature of this method is in providing the population estimate by broad age group. Even though birth, death and school enrollment data may be too erratic for estimating independently the total population of the territory, they should be useful to estimate specific group of population and errors may compensate each other when each of the components are added to estimate the total population. A modification of this method is suggested for estimating the territorial population in Section 4.3 and the procedure is illustrated in the Appendix.

Multiple Regression Method is based on the assumption of a stable linear relationship between growth of population and change in a combination of symptomatic variables. In the United States such variables as vital events, school enrollment, automobile registrations, sales tax, and non-agricultural employment, are used as symptoms. The method is powerful in breaking up a known estimate for a parent population, e.g., a state, into estimates for subareas. It requires population and symptomatic data of areas for the preceding two census years. As a series of such symptomatic data are lacking in the territory, the procedure may be developed only in the future.

Change in the number of existing housing units since the benchmark year, such as the last census, is also indicative to the change in the population in the meantime. *Housing Unit Method* is developed to estimate the population by multiplying the average number of persons per household to the new dwelling units. The latter data may be obtained from the official records of building permit and demolition or public utility statistics. In the territory, due to the lack of appropriate data as discussed in the next section, this method is not feasible for the present moment.

4.2 Reliability of Symptomatic Indicators

In the absence of accurate vital and/or migration statistics, population changes are measured through the change in symptomatic variables. Therefore, the quality of such variables are essential for a useful estimate of population. This section discusses the adequacy of selected variables sensitive to population changes in the territory.

School enrollment. The *Annual Report of the Governor* used to include the school enrollment statistics through 1968. The consolidated data from the Annual Reports and data directly supplied by the Department of Education for 1969, 1970 and 1971 is shown in Table 4.

TABLE 4. ELEMENTARY SCHOOL ENROLLMENTS OF AMERICAN SAMOA, 1960-71

<u>Year</u>	<u>Grade</u>	<u>Enrollment</u>	<u>Year</u>	<u>Grade</u>	<u>Enrollment</u>
1960 ^{a)}	1-6	4,590	1966	1-8	6,715
1961	1-6	4,273	1967	1-8	6,684
1962	1-6	4,534	1968	1-8	6,757
1963	1-6	5,142	1969	1-8	7,415
1964	1-6	5,258	1970	1-8	7,193
1965	1-6	4,988	1971	1-8	7,294

a) For private schools all enrollees

As indicated earlier, the use of these figures for estimating migration of the entire population is limited. First, the relationship between migration of school children and total population is not known. Second, over a period of time the education system has been modified and extended. When the current educational system was established in 1962-64 period, the former junior high schools were eliminated and an eight-year elementary school was established (Wolf Report 1969). A discontinuity in the range of grade, therefore, is observed between 1965 and 1966. The enrollment rate has apparently improved over time; it was cited as 85 percent in 1960 and 99 percent in 1970 (GAS 1973 Program Memorandum). According to the census, however, for the children 7 - 13 years of age the enrollment was 89.2 percent in 1960 and 90.8 percent in 1970, indicating only a slight gain over the 10-year period.

The enrollment figure in the *Governor's Report* has been consistently higher than that in the census. In 1960, 4,305 were enumerated as attending elementary school grades 1-6 in the census as compared with 4,590 of the GAS report. In 1970 the figures were 6,715 and 7,193, respectively, for grades 1-8. The overcount in the GAS report was 6.6 percent in 1960 and 7.1 percent in 1970. This may be due partly to the difference of reference time. The census is taken as of April 1 and

the GAS enrollment figure is as of June 30. The method of taking school statistics may differ between the two series. Clearly the census school population refers to the attendance at a given time. However, in case of the GAS report individual schools may have reported total enrollment of the year including those who withdrew and transferred during the school year.

The census data of 1960 indicates that the elementary school enrollment is most sensitive to the population of 8-15 years of age, the rate being over 90 percent. For ages 5 and 6 years only 12.9 percent were enrolled in the elementary school. Whether the enrollment in these age group was changed during the past decade or not is not known, since 1970 data provides the total enrollment rate by age which includes nursery school and kindergarten. Probably, in the territory the enrollment data may be best used for estimating the population of 7-14 years of age.

Because of the change in the school system and improvement in the enrollment rate in the past, a careful investigation on the correlation between age and grade and on the change of enrollment by age should be undertaken in order to strengthen the use of school statistics for population estimation.

Voters' registration. The registry of voters, which should be sensitive to the population size of adults, is kept by the Office of Samoan Affairs. The register appears to be initiated by the Office in cooperation with plenuus rather than by the voluntary registration of voters. A long and careful process is carried out to correct the original register by removing or adding the transfers, movers, deceased, and aliens. The registry is renewed every two years for the election of senators and representatives of the territory. Since the voting age is 18 and over, nearly 50 percent of the total Samoan population should be on the list. Table A12 presents the voter registry for 1968 and 1970 by district together with the 1970 census population. The proportion of population in the registry is widely different from

district to district. Three districts which contain off-islands (Manua Islands) and East Vaifanua County show, for some reason, very high percentages. Other than these three and two additional ones (No. 4 and No. 6) the percentage centers around 28 percent. Although the percentage is unusually low, in view of the frequency of registration, there is potentiality here for effective use of data estimating the current population by county or district.

Housing Statistics. Building permits issued by GAS are available from FY 1964. The number fluctuates very much from year to year as seen from Table 5. Whether this is related to budgetary apportionment or some other matter is not clear. In any case it does not seem to reflect population change. Furthermore, the data lacks information on demolition and vacancy. This data does not appear to be useful for estimating population at present time.

TABLE 5. DWELLING UNIT PERMITS ISSUED, AMERICAN SAMOA

<u>Year</u>	<u>Number</u>
1964	194
1965	111
1966	193
1967	89
1968	806
1969	588
1970	264

The electricity utility statistics dates from 1967 only. It is too early to determine any relationship between the utility statistics and population changes. There are two potential measurements -- number of installations served and kilo-watt-hour sold. The five-year data, 1967-1971 shows that there is certain seasonal trend in electricity consumption. Although the number served increases in March-April in

comparison with the previous two months, the amount sold decreases. In July-August a large reduction is observed both in the number served and amount sold. There was a slight decrease in the total amount sold in 1968 compared with 1967. In 1969 it increased 5.2 percent over the previous year and in the following two years the annual increase was recorded 14.2 percent and 11.8 percent, respectively. To establish the relationship between utility consumption and population, a correlative study of these variables over a period of time is necessary. Separation of domestic and industrial use should be also attempted for the use of data.

Health Statistics. Utilization of health data is promising. Medical care is provided practically free-of-charge. Consequently the poor or rich, the young or old, equally seem to seek medical care. The record keeping at the Department of Medical Services is excellent. Though in-patients and out-patients statistics may be influenced by prevalence and incidence of diseases of a particular time, the use of such statistics for estimation of population should be investigated. Patient statistics which are not subjected to epidemics, such as dental clinic visits, may be able to provide a new tool for estimation of population. The school health unit keeps the record of students directly from each school. This record should complement the enrollment statistics of the Department of Education.

The most promising data is found in the filariasis program. Since 1970 complete village censuses have been taken as part of the program activities. A number was given to each dwelling unit, and public health nurses took careful census with the cooperation of plenuu. Of course, each village is necessarily covered at different times. (This "rolling census" took 2 years from March 1970 to February 1972.) However, the program keeps individual registry cards (see Figure A7) and utmost care is taken to maintain the file current by removing, adding, and reshuffling cards in accordance with the reports of field public health nurses. Although a few adjustments are to be made for a few villages, there is a very good agreement between the

national census and filariasis census as far as it concerns with the total population by island. Generally the population for each village also presents fairly high correlation. However, in a very few villages extremely large disagreements were observed and certain villages listed in the filariasis program could not be located in the census report or vice versa. (As an extreme example, the filariasis program gives a population figure of 577 for Malaeloa village while the census states 192.) For these villages miscoding or different interpretation on jurisdiction is suspected. There is a further dividend in the use of filariasis census; it gives the component of population by age and sex. Incorporation of the filariasis census with composite method will probably yield the most profitable population estimate in the territory.

Other Data. Other symptomatic variables, such as, automobile registration and income tax files, are relatively new statistics in the territory. Figures on total income tax returns filed are available since 1964. There was a gradual increase of returns filed between 1964 and 1967, reaching 5,585 from 5,051. Though there was a jump of over 500 in 1968, the number became again 5540 in 1969. For 1970 including 500 unmatched documents approximately 6,000 returns were filed. The statistics is liable to employment and age composition. For the use of population estimation, a study of the past correlation of the variable with population is necessary.

Currently cars are in great demand in the territory. It appears that the automobile registration is generally considered to reflect the frequency of new car shipments rather than the population change.

4.3 An Approach to Estimating Population for the Territory

When an estimation is made through a manipulation of symptomatic variables in the territory, there are two conspicuous factors which make a valid estimation of population extremely difficult. The first is the smallness of population. The total size being only 27,000 in 1970, any quantitative phenomenon which is supposedly

closely related to the change in population is subjected to a large random fluctuation. Necessarily an estimate based on these symptomatic series is likely to have a large margin of error.

The second is migration. As has been discussed earlier, a large mass of population, relative to the size of the population of the territory, selectively move back and forth. Motivating and forcing factors of migration are not only restricted to American Samoa, but also concerns Western Samoa and Hawaii. With facilitated means of transportation, the size and direction of migration are not effectively predictable. Without accurate bookkeeping of migration, the past estimates for the territory have been conflicting, as has been well demonstrated by the estimates of the Bureau of the Census shown in Table A10.

In this section a procedure of estimating population is presented. It should be emphasized that there are numerous approaches one can take for the estimation. Further, as new data are made available and statistics are improved, a constant examination and revision of the procedure should be attempted.

In developing a method of estimation, a few constrictions had to be taken into consideration. Most importantly to consider were: availability of reliable and sensitive symptomatic data, timely retrieval of such data, simplicity and flexibility of computational techniques, and presentation of estimate in a format of broad age structure. Although voters' registry and health statistics have high potential utility value, it seems that only birth, death, and school enrollment may serve as effective symptomatic variables at least for the time being.

Basic strategy of estimating population by broad age group. The approach of Bogue-Duncan Composite Method is probably best suited for the population estimation of the territory in view of the kinds of symptomatic variables available and desirability of estimates in broad age groups. From birth statistics, the adult 18-49 years of age

will be estimated. For children below 7 years old, accumulated birth statistics and child-woman ratio will form the base of estimation. The death statistics will be used for estimating the population of 50 years and over. Finally, the attendance ratio will determine the school age population of 7-17 years. If possible, for each group two different estimates are made and the average of the two is taken as the final estimate of the age group.

The total enrollment figures for the elementary school is available annually. Unfortunately, there is a serious jump in the series between 1965 and 1966, as already mentioned, when an eight-year elementary school enrollment data appeared replacing a six-year enrollment figure. The 1960 census report shows that the enrollment ratio jumps to 75 percent in age 7, but in age 6 the ratio is merely 20 percent. The attendance remains high until age 18 when it drops to 69 percent in male and 52 percent in female. Even in age 17, over 75 percent of the students were in the elementary school in 1960. It is anticipated that in 1970 a smaller proportion of students in this age should have been in the elementary school. Regretfully, the 1970 census report does not give the tabulation by grade and age. However, in both censuses, the overall enrollment ratio for 7-17 years of age (disregarding grades) is similar as shown in Table 6. Furthermore, if the voters' registry were to be used for estimating population in the future, it would be convenient and useful to put an end of category to age 17 years. Therefore, it is decided to use the enrollment statistics for the estimation of the population aged 7-17. In the actual procedure, due to the gap of the data between 1965 and 1966 two different attendance ratios, computed from the experiences of 1960 and 1970, were applied for other years; the 1960 ratio for years 1965 and before and the 1970 ratio for years afterwards.

TABLE 6
SCHOOL ENROLLMENT FOR AGES 7-17 YEARS

Age	Population		Enrolled in School			
			1960		1970	
	1960	1970	No.	%	No.	%
7 - 13	4,325	5,622	3,859	89.2	5,103	90.8
14 - 15	1,099	1,343	986	89.7	1,147	85.4
16 - 17	959	1,299	747	77.9	964	74.2
7 - 17	6,383	8,264	5,592	87.6	7,214	87.3

For the age group 18-49, two estimates were made: one from the number of births in the year estimating, and the other from the births of two successive years. The latter is taken in the hope of smoothing annual fluctuation of births. One can take a three-year average, but this technique will not work for the current estimation, as the births in the following year are one of the components. The ratios of births to the female population of 18-49 years of age were calculated for the two census years and an interpolation was made for other years. These ratios and births recorded would be used for estimating the size of the reproductive women population. The proportion of female population in this age group was applied to obtain the total population 18-49 years. The final estimate was the average of the two procedures.

In the estimation of pre-school age also, two different procedures were taken. An accumulation of a five-year births preceding the estimation time was first made. Estimated survival ratios were multiplied to this accumulation of births to result in the population under 5 years. Then the ratios of the population 0-4 years to the population 0-6 were applied to derive the population under 7. Another

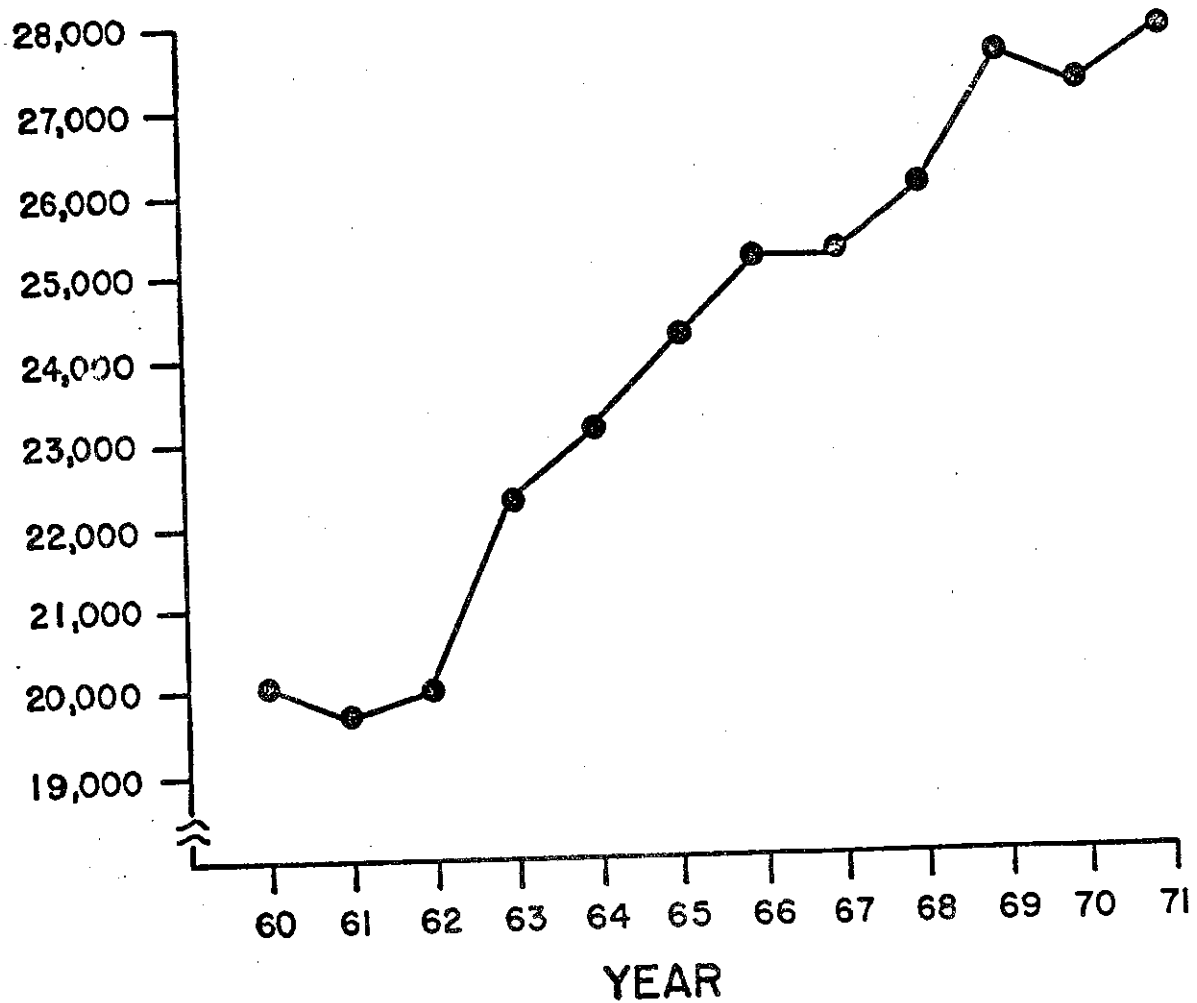
series of estimates was made from the ratio of children under 7 to women of 18-49 years which have been already estimated. Again the final estimate was the average of the two procedures.

For age group 50 years and over, estimates were made from the deaths recorded for this age group and a linear progression fitted to successive census figures. Excluding infant mortality, the deaths in over 50 years of life occupy about 50 percent of the total deaths recorded in the year. As the great majority of the births are taking place in the hospital, it is assumed that there are no "age unknown" among the infant deaths. Consequently it was determined that 50 percent of the total deaths of the "age unknown" belong to the deaths of 50 years of age and over. The death rate for this age group was applied to the number of death to obtain the population. It is also expected that little migration have taken place in the old age, This is the rationale that another series of estimate was made by a linear progression. As before, the final estimate was the average of the two methods.

A numerical illustration of the step-by-step estimation procedure is described in the Appendix. Table A13 and Figure 4 present the annual estimations of the territory for 1960-71. From these techniques of estimation, it appears that during the period 1960-62 there were no increase in the population but considerable growth took place in 1963-66, followed by another short stagnant period.

FIGURE 4

ESTIMATED TOTAL POPULATION
AMERICAN SAMOA
1960 - 1971



5. POPULATION PROJECTIONS*

In this Chapter the population of the territory is projected up to 1990 by age and sex under four different sets of assumptions which depend on levels of fertility and migration. A fixed set of mortality is assumed for all projections; the survival ratios by age and sex based on the mortality assumed are shown in Table A14-A15. These four sets of projections are:

Projection I	Constant fertility and no migration
Projection II	Declining fertility and no migration
Projection III	Constant fertility and constant migration
Projection IV	Declining fertility and constant migration

5.1 Fertility Assumptions

Two different sets of age specific fertility rates are assumed in the projections. One set is taken from the average rates for 1959-61 and 1969-70 and this set is assumed to prevail through the following 20 years providing a basis of Projections I and III. Another set assumes declining fertility; for each age group of women a successive 5 percent reduction of fertility is assumed to take place every 5 years. For the period 1970-75, the initial period, the fertility rates used for the Projections I and III are applied except for the age groups 25-29 and 30-34 for which 1969-70 observed rates were substituted. Projections II and IV are

*

A word of explanation is necessary to distinguish "estimate" and "projection" of population as used in this Report. While an estimate is intended to determine the size of total or portion of the unknown population, past, present or future, with a certain degree of exactitude, a projection indicates future population processes which would take place when a set of assumptions are imposed to a given population. Therefore, a projection may or may not predict the future population likely to occur.

based on these declining fertility assumptions. The numerical values of these fertility rates are shown in Table A16.

5.2 Migration Assumptions

Projections I and II are intended to present the population processes in the absence of migration. Assumptions regarding the future migration are most tantalizing to make. The six-fold difference in the growth rate between 1950-60 and 1960-70 is practically entirely due to changes in migration. Wolf Report (1969) asserted that migration of the territory was "rooted in economics" and assumed, studying 1950 and 1960 censuses, that 85 percent of the natural increase would emigrate in a static employment or conversely an increase in employment totaling 85 percent of the natural increase would nullify the migration. However, during the 1960-70 the emigration was greatly decreased to a level of 15 percent of the natural increase in spite that the employment was decreased from 54.6 percent in 1960 to 34.3 percent in 1970 for the population 14 years and over, according to the census.

The age pattern of migration also changed considerably. During the decade of 1950-60 the emigration rate increased fast to reach a peak at 15-19 years (54 percent in male and 32 percent in female - see Table A3) and then it decreased steadily, finally attaining net in-migration at the old age of 55 and over. In the following decade the out-migration decreased with age in early life and then from age group 5-9 it started to rise again. After a peak in teens, a large in-migration took place in male. (As indicated earlier, in three age groups of 1970, 30-44, the population was actually larger than the original cohort size of 1960.) In female also a similar trend is observed. However, the magnitude was much less pronounced resulting in no substantial migration after teens. (For detail see Table A3.)

The reduction of outmigration in early life after 1960 is plausible. As Table A1 shows, in Hawaii alone there have been about 300 Samoan births annually

since early 1960's. Some of them should have returned to the territory with their parents to offset the outmigration of their counterpart from the territory. Both of last two decades could have been unusual for the Samoan migration. With the change in administration and a decline in economic activities, a spur of emigration appears to have taken place in the '50's. The slackening of migration in the '60's may be partly due to a reaction of the massive emigration of the previous decade, especially considering the net in-migration in the age groups in which tremendous exodus was made earlier.

Although the territory's statistics show a consistent net immigration of the Western Samoans, due to the new "restrictions which make it very difficult for West Samoans to reside and work in American Samoa" (Western Samoa, Economic Development Board, 1966) the inflow to the territory may taper off in the future. (In fact, according to this Western Samoa source, since 1965 there is a reversal of the out-migration to Pago Pago. Until that time, there were about 1,000 annual net migration to the territory.)

In projecting population it is decided to arbitrarily assume that the average of migration trends between 1950-60 and 60-70 would prevail in the future. Other than fluctuations from age to age, a technical problem exists in converting the estimated decade rate of migration to quinquennial ones. Fortunately, as the migration rate from 5-year births to the age group of 0-4 years can be determined easily through a residual method, an assumption of additivity between 5-year and 10-year migration rates makes it possible to estimate, though very crude, 5-year migration rates.

A free-hand curve was fitted to these five-year migration rates by age for each of 1950-60 and 1960-70 data. Averages of two age specific rates read from these curves were assumed to prevail the following 20 years. The numerical values are given in Table A17. Projection III is made under the assumption of this set

of age-specific migration rate and constant fertility used for Projection I, and Projection IV is made with the combination of the above migration and declining fertility of Projection II.

5.3 Discussion

Results of these projections by broad age groups, percentage changes relative to the 1970 population and age structure for each of the reference time are shown in Tables 7-9. (The detailed projections by age and sex are given in Tables A18-21.)

Increase by age group. Under the assumption of no migration and constant fertility the population would increase to more than twice in 20 years becoming over 56,000 in 1990. Migration assumption checks population growth more than declining fertility. However, even with the continued migration the population would increase nearly 50 percent in 20 years and with both migration and declining fertility it would increase nearly 40 percent. With constant fertility the population increase rate would be accelerated over the years. The density would become 744 per square mile under Projection I and 490 under Projection IV in 1990.

The difference in the total size stems principally from that in young age. The effects of declining fertility are immediately felt under age 15. Since the migration is age-selective for the late teens and 20's, the proportion of this group is depleted in Projection III and IV. This group, in turn, influences to lower the number of births, as it is the highly child-bearing group.

By 1990 no migration and constant fertility assumption (Projection I) would result in over 200 percent of 1970 population in each of three broad age groups, the least increase being observed in productive ages. Projection II would show a considerably small increase in children under 15 but in all other ages about the same increase would be observed in comparison with Projection I. With migration assumption

up to 1980 the increase of the old age would be slightly faster but then on it would become much slower than that with no-migration assumption.

Change of Age Structure. (Table 9) Although the migration assumption would yield relatively small increase of population, it would result in a smaller proportion of productive age (15-59 years) than the no-migration assumption. When migration and constant fertility combined (Projection III), such proportion would acceleratingly decline over the time. If no migration and constant fertility were to take place, the proportion would slightly increase in the first 10 years, but afterwards a fast depletion would be observed in this age group. If fertility were to decline, the proportion of the productive age would increase, especially with no-migration assumption.

The proportion of children under 15 would steadily decrease over the years in Projections II and IV. The constant fertility assumption would cause an increase of the proportion of children after 1980. The heaviest burden of children would be under the constant assumption both in migration and fertility (Projection III), passing 48 percent level in 1990.

In no-migration assumptions the proportion of the old age group would be stabilized from 1980 following an increase during 1970-80. In Projection III and IV the group would keep increasing, especially in the latter which would occupy more than 6 percent of the total population in 1990.

It should be noted that under the assumption of a constant fertility the burden of dependency would increase more and more. This is especially pronounced with the additional assumption of migration, though migration may ease the total population pressure. Even with continuing migration which eliminates productive group more selectively, if fertility were to decline, the proportion of 15-59 years of age would be stabilized at least next 20 years. If a reduction of dependency were to contribute for elevating living standard of the inhabitants and increasing producti-

vity, evidently a policy of strong encouragement of fertility reduction should be established.

Birth rates and death rates. Ensuing crude birth rates and crude death rates under different assumptions are shown in Table 10. With Projection I the birth rate would keep increasing through 1980-85, reaching more than 43 per 1,000. This is due to the increase of child-bearing population, even if age-specific fertility remains constant. On the other hand, the crude death rate would continue to decrease to become about 5 per 1,000. A similar trend is observable with Projection III, death rate slightly elevated and birth rate slightly lowered. Even though age-specific fertility rate declines systematically it would be only after 1985 when a reduction of over-all birth rate is ensued. However, if migration assumption is added on declining fertility, a steady decrease of birth rate would be observed. Crude death rates are similar between Projections I and II, and between Projections III and IV.

The natural increase rate would keep increasing, with or without migration as long as a constant set of fertility is assumed. It would reach 3.8 and 3.6 percent annum in 1980-90 under Projection I and III, respectively. With the assumption of declining fertility and no migration, a decrease in the natural increase rate would, as in the birth rate, be seen only after 1985. Projection IV would bring steadily decreasing annual natural increase rate, finally, reaching about 3 percent in the following 20 years. It is the declining age-specific fertility rate, not migration, that would result in a reduction of natural increase rate.

TABLE 7
POPULATION PROJECTIONS 1970-90 BY
BROAD AGE GROUPS

AGE GROUP	1970 ^{a)}	1975 ^{b)}	1980 ^{b)}	1985 ^{b)}	1990 ^{b)}
Under 15					
Projection I	12,879	14,780	17,510	21,860	26,930
Projection II	12,879	14,550	16,650	19,760	23,100
Projection III	12,879	14,000	15,240	17,130	19,290
Projection IV	12,879	13,790	14,520	15,540	16,610
15 - 59					
Projection I	13,251	16,130	19,490	22,980	27,320
Projection II	13,251	16,130	19,490	22,980	27,100
Projection III	13,251	14,430	15,810	17,110	18,550
Projection IV	13,251	14,430	15,810	17,110	18,380
60+					
Projection I	1,029	1,290	1,610	1,910	2,310
Projection II	1,029	1,290	1,610	1,910	2,310
Projection III	1,029	1,300	1,620	1,910	2,270
Projection IV	1,029	1,300	1,620	1,910	2,270
Total ^{c)}					
Projection I	27,159	32,200	38,620	46,750	56,560
Projection II	27,159	31,970	37,750	44,660	52,500
Projection III	27,159	29,730	32,660	36,150	40,110
Projection IV	27,159	29,520	31,950	34,560	37,260

a) Census population

b) Population rounded to nearest 10

c) Disagreements from the addition of individual age groups are due to the rounding of estimates.

TABLE 8

POPULATION PROJECTIONS 1970-90 AS PERCENT
OF THE 1970 POPULATION BY BROAD AGE GROUPS

AGE GROUPS	1970 ^{a)}	1975	1980	1985	1990
Under 15					
Projection I	100.0	114.7	136.0	169.7	209.1
Projection II	100.0	113.0	129.3	153.5	179.4
Projection III	100.0	108.7	118.3	133.0	149.8
Projection IV	100.0	107.1	112.8	120.7	128.9
15-59					
Projection I	100.0	121.8	147.1	173.4	206.2
Projection II	100.0	121.8	147.1	173.4	204.5
Projection III	100.0	108.9	119.3	129.1	140.0
Projection IV	100.0	108.9	119.3	129.1	138.7
60+					
Projection I	100.0	125.4	156.4	185.8	224.2
Projection II	100.0	125.4	156.4	185.8	224.2
Projection III	100.0	126.2	157.4	185.8	220.5
Projection IV	100.0	126.2	157.4	185.8	220.5
Total					
Projection I	100.0	118.6	142.2	172.1	208.2
Projection II	100.0	117.7	139.0	164.4	193.3
Projection III	100.0	109.4	120.3	133.1	147.7
Projection IV	100.0	108.7	117.6	127.3	137.2

a) Census Population

TABLE 9

POPULATION PROJECTIONS 1970-90 PERCENTAGE
AGE DISTRIBUTION BY BROAD AGE GROUPS

AGE GROUP	1970 ^{a)}	1975	1980	1985	1990
Under 15					
Projection I	47.4	45.9	45.4	46.7	47.6
Projection II	47.4	45.5	44.1	44.2	44.0
Projection III	47.4	47.1	46.6	47.4	48.1
Projection IV	47.4	46.7	45.4	45.0	44.6
15-59					
Projection I	48.8	50.1	50.5	49.2	48.3
Projection II	48.8	50.4	51.6	51.5	51.6
Projection III	48.8	48.5	48.4	47.3	46.2
Projection IV	48.8	48.9	49.5	49.5	49.3
60+					
Projection I	3.8	4.0	4.2	4.1	4.1
Projection II	3.8	4.0	4.3	4.3	4.4
Projection III	3.8	4.3	5.0	5.3	5.6
Projection IV	3.8	4.4	5.1	5.5	6.1
Total					
Projection I	100.0	100.0	100.0	100.0	100.0
Projection II	100.0	100.0	100.0	100.0	100.0
Projection III	100.0	100.0	100.0	100.0	100.0
Projection IV	100.0	100.0	100.0	100.0	100.0

a) Census Population

TABLE 10

IMPUTED ANNUAL CRUDE BIRTH AND DEATH RATES
BY POPULATION PROJECTION, AMERICAN SAMOA,
1970-90

Projection	1970-75		1975-80		1980-85		1985-90	
	Crude Birth Rate	Crude Death Rate	Crude Birth Rate	Crude Death Rate	Crude Birth Rate	Crude Death Rate	Crude Birth Rate	Crude Death Rate
I	40.2	6.2	42.3	6.1	43.6	5.4	43.1	5.1
II	38.7	6.1	39.1	6.0	39.0	5.4	37.4	5.2
III	39.7	6.2	40.6	6.3	41.6	6.0	41.8	5.9
IV	38.3	6.1	37.6	6.2	37.2	6.0	36.4	6.0

Rates are per 1,000 population

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APPENDIX A

TABLES

TABLE A1

VITAL STATISTICS DATA PERTAINING TO SAMOANS
IN HAWAII

Year ^{a)}	Births, by race of			Fetal ^{b)} Deaths	Deaths	Marriages	
	Child	Mother	Father			Bride	Groom
1970	288	306	244	47	37	124	131
1969	146	148	120	19	35	92	85
1968	124	113	118	15	22	115	98
1967	278	300	235	8	19	84	65
1966	310	328	272	10	26	69	60
1965	285	311	242	11	27	87	67
1964	281	298	243	9	24	128	89
1963	289	331	256	18	27	106	78

Source:

a) Prior to 1963 Samoans are included in "other races".

b) By race of mother.

TABLE A2

PERCENT DISTRIBUTION BY AGE AND SEX, AMERICAN SAMOA
1950, 1960 and 1970

Age	Total Population			Male			Female		
	1950	1960	1970	1950	1960	1970	1950	1960	1970
0-4	18.7	18.5	17.3	18.7	18.9	17.4	18.6	18.1	17.1
5-9	15.2	16.2	16.2	15.7	16.6	16.2	14.6	15.7	16.3
10-14	12.4	14.9	13.9	12.6	15.6	13.7	12.2	14.3	14.1
15-19	11.4	10.9	11.4	11.6	11.6	11.7	11.2	10.2	11.0
20-24	8.6	7.2	8.0	7.9	6.6	7.4	9.4	7.8	8.6
25-29	8.1	5.8	6.2	7.9	4.8	6.3	8.2	6.8	6.0
30-34	6.0	5.5	5.6	6.2	4.8	5.7	5.7	6.2	5.6
35-39	5.3	5.1	4.6	5.4	5.0	4.5	5.2	5.2	4.6
40-44	3.4	4.1	4.3	3.3	4.2	4.1	3.6	3.9	4.4
45-49	3.2	3.4	3.4	3.3	3.5	3.5	3.1	3.4	3.4
50-54	2.6	2.4	3.0	2.4	2.6	3.2	2.7	2.2	2.8
55-59	1.4	2.1	2.3	1.4	2.3	2.5	1.5	2.0	2.1
60-64	1.3	1.2	1.3	1.1	1.1	1.4	1.6	1.4	1.3
65-69	1.0	1.1	1.2	1.1	1.0	1.2	.8	1.2	1.2
70-74	.7	.7	.5	.7	.6	.5	.7	.8	.6
75-	.7	.8	.7	.6	.8	.6	.8	.9	.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 15	46.3	49.6	47.4	47.0	51.0	47.3	45.4	48.1	47.5
Over 65	2.4	2.7	2.4	2.4	2.5	2.2	2.3	2.9	2.7
Median Age	16.6	15.2	16.1	16.3	14.6	16.1	17.0	15.8	16.1

TABLE A3

ESTIMATED AGE AND SEX-SPECIFIC MIGRATION
 RATES DURING INTERCENSAL PERIOD 1950-60
 AND 1960-70 THROUGH A RESIDUAL METHOD,
 AMERICAN SAMOA

AGE		MALE		FEMALE	
From	To	1950-60	1960-70	1950-60	1960-70
Birth	0 - 4	- 3.3	- 5.7	- 5.5	- 4.4
Birth	5 - 9	- 7.9	- 2.9	-11.6	- 0.3
0 - 4	10-14	-11.1	- 0.4	-14.3	+ 7.3
5 - 9	15-19	-21.9	- 3.9	-23.2	- 3.6
10-14	20-24	-43.6	-34.3	-28.7	-16.7
15-19	25-29	-54.3	-24.4	-32.2	-17.0
20-24	30-34	-32.4	+18.8	-24.4	- 0.8
25-29	35-39	-29.3	+32.2	-27.3	- 4.5
30-34	40-44	-24.3	+20.2	-22.2	+ 0.3
35-39	45-49	-26.8	- 1.2	-23.3	- 7.0
40-44	50-54	+12.2	+12.3	-26.5	+ 3.9
45-49	55-59	-16.4	+10.2	-21.3	- 7.8
50-54	60-64	-34.3	- 8.8	-32.2	- 7.0
55-59	65-69	+ 7.5	- 2.6	+ 6.6	+ 1.0
60-	70-	0	- 1.6	+ 1.7	0

TABLE A4

AVERAGE ANNUAL AGE-SEX-SPECIFIC MORTALITY AND
CORRESPONDING MORTALITY LEVEL OF
COALE-DEMENY MODEL LIFE TABLE "WEST",
AMERICAN SAMOA, 1959-61 AND 1969-71

Age	Mortality Rate/1,000				Mortality Level			
	Male		Female		Male		Female	
	1959-61	1969-71 a)	1959-61	1969-71 a)	1959-61	1969-71	1959-61	1969-71
0	31.46	26.69	25.04	24.14	22.0	22.5	21.8	21.9
1-4	3.62	1.96	2.69	2.79	20.1	21.5	20.4	20.3
5-9	0.99	0.60	0.43	0.30	20.9	22.4	22.0	22.7
10-14	0.63	0.89	0.71	0.70	21.7	20.4	20.3	20.3
15-19	1.13	1.25	0.66	1.57	21.8	21.4	21.8	19.2
20-24	3.48	2.64	0.86	0.29	17.8	19.5	21.9	23.9
25-29	4.13	1.54	3.48	1.63	17.1	21.9	17.6	20.8
30-34	2.04	2.58	1.62	3.11	21.3	20.4	21.4	18.9
35-39	5.20	3.22	3.87	0.54	17.8	21.4	18.7	*
40-44	3.09	6.48	2.62	3.90	22.1	18.2	21.8	20.0
45-49	15.11	5.61	4.98	5.81	12.8	21.6	20.6	19.4
50-54	10.26	8.99	9.34	6.22	20.6	21.5	18.4	21.6
55-59	12.99	18.30	6.87	19.12	22.3	18.9	23.3	13.7
60-64	29.50	38.80	12.44	17.44	17.9	12.8	22.8	20.4
65-69	15.58	55.56	16.81	18.75	*	12.7	*	23.7
70-74	49.75	49.02	20.83	49.38	23.1	*	*	19.9
75-79	130.43	31.00	40.65	83.33	11.0	*	*	19.4
80	182.80	200.00	149.66	70.42	21.7	19.0	23.5	*
Total	6.30	5.87	4.38	4.40				

* above level 24

a) non-resident deaths were excluded from 1970 and 1971 data

TABLE A5

AGE SPECIFIC BIRTH RATES
OF AMERICAN SAMOAN WOMEN FOR 1959-61 AND 1969-70

Age of Mother	1960 Female Population	Births 1959-61	Av. Annual Birth rate per 1,000 1959-61	1970 Female Population	Births ^{c)} 1969-70	Av. Annual Birth rate per 1,000 1969-70
15-19	1,004	139	46.15	1,486	157 ^{b)}	52.83
20-24	774	663	285.53	1,156	666	287.56
25-29	670	710	353.23	816	516	316.18
30-34	617	564	304.70	750	344	229.33
35-39	517	294	185.56	622	255	204.98
40-44	382	117	102.09	598	88	73.58
45-49	335	16 ^{a)}	15.92	459	13	14.16
Unknown		63			13	
Total	4,299	2,566	198.96	5,889	2,052	174.22

a) includes 2 births to mothers 50 years of age and over

b) includes 1 birth to mother under 15 years of age

c) preliminary

TABLE A6

COMPARISON OF BIRTH DATA

BY YEAR OF BIRTH AND SOURCE, AMERICAN SAMOA

1965-1970

Year	Office of Samoan Affairs ^{a)}			Total births ^{b)} Registered	Percent of Total of S.A. Office to that Registered
	Male	Female	Total		
1965	376	344	720	1,092	65.6
1966	445	378	823	996	82.6
1967	454	415	869	1,015	85.6
1968	444	399	843	1,052	80.1
1969	441	390	831	1,055	78.8
1970	156	157	313	997	31.4
Total	2,316	2,083	4,399	6,207	70.9

Source:

a) Office of Samoan Affairs. Population of the Peoples Born in the Year 1965 to 1970,
(mimeographed) 1971 (?)

b) Annual Reports of the Governor of American Samoa and Department of Medical Services

TABLE A7

EXPECTED SURVIVORS OF AMERICAN SAMOAN MALES
BY AGE BASED ON REGISTERED DEATHS AND
SURVIVAL RATIOS OF MODEL LIFE TABLE FROM 1960 TO 1970

Age in 1960	1960 Population	Deaths b) Recorded till 1970	Expected Survivors 1970	Model Life Table		Expected Survivors 1970	Difference Between Col (4) & (7)	1970 Census		Estimated Migration
				Level	Surv. Ratio			Age	Population	
(1)	(2)	(3)	(4)=(2)-(3)	(5)	(6)	(7)=(2)-(6)	(8)	(9)	(10)	(11)=(7)-(10)
Births (65-70)	(2,654) ^a	87	2,567	(21)	.95585	2,537	30	0 - 4	2,386	-151
Births (60-65)	(2,443) ^a	126	2,317	(29)(21)	.93497	2,284	33	5 - 9	2,214	- 70
0 - 4	1,919	32	1,887	(20)(20)	.98182	1,884	3	10-14	1,877	- 7
5 - 9	1,689	17	1,672	(20)(20)	.98772	1,668	4	15-19	1,602	- 66
10-14	1,581	22	1,559	(20)(20)	.98319	1,554	5	20-24	1,012	-542
15-19	1,178	23	1,153	(20)(20)	.97780	1,152	1	25-29	864	-288
20-24	670	22	648	(19)(19)	.96948	650	-2	30-34	776	+126
25-29	484	19	465	(18)(19)	.96218	466	-1	35-39	622	+156
30-34	490	26	464	(18)(19)	.95326	467	-3	40-44	566	+ 99
35-39	513	34	479	(18)(19)	.93798	481	-2	45-49	475	- 6
40-44	432	42	390	(18)(18)	.90866	392	-2	50-54	445	+ 53
45-49	353	47	308	(18)(18)	.87138	308	0	55-59	346	+ 38
50-54	260	42	218	(18)(18)	.81694	212	6	60-64	189	- 23
55-59	231	54	177	(17)(17)	.72726	168	9	65-69	162	- 6
60-	364	184	180	(17)	.41745	152	28	70-	146	- 6
Total	10,164	777	14,484			14,375			13,682	-693

a) estimated

b) The annual registered deaths in 5-year age groups are attributed to original age cohort in 1960.

TABLE A8

ARRIVALS AND DEPARTURES, AMERICAN SAMOA,
FISCAL YEAR 1959-70

Fiscal Year	Total Net Migration	Non-West Samoans			West Samoans		
		Arrivals	Departures	Net Migration	Arrivals	Departures	Net Migration
1959	(86)	8,326	8,240	+ 86	*	*	*
1960	(-910)	9,532	10,442	- 910	*	*	*
1961	-377	9,470	10,317	- 847	7,286	6,816	+ 470
1962	1,304	13,714	13,368	+ 346	9,511	8,553	+ 958
1963	1,024	18,850	18,711	+ 139	13,213	12,328	+ 885
1964	2,247	22,333	22,060	+ 273	16,744	14,770	+1974
1965	1,798	18,010	16,866	+1144	11,339	10,685	+ 654
1966	3,089	16,460	15,086	+1374	10,892	9,177	+1715
1967	667	33,693	33,470	+ 223	6,112	5,668	+ 444
1968	1,142	38,531	37,616	+ 915	8,470	8,243	+ 227
1969**	395	25,841	26,336	- 495	6,113	5,223	+ 890
1970	1,615	59,926	58,623	+1303	14,358	14,046	+ 312
61-70 Total	12,904	256,828	252,453	4375	104,038	95,509	8529

* Not available

** July - December 1968 only

Source:

1. *Annual Reports of the Governor of American Samoa.*
2. Memoranda from Immigration Division to Attorney General.

TABLE A9

COMPARISON OF AIR ARRIVAL STATISTICS
PREPARED BY IMMIGRATION DIVISION AND OFFICE OF TOURISM,
AMERICAN SAMOA

January - June 1970

Month	Total Air Arrivals a)		Tourists		Business		Transients f)	
	Immigration Division	Tourism Office	Immigration Division	Tourists Office	Immigration Division	Tourists Office	Immigration Division	Tourists Office
January	2,785	1,247 b)	1,467	1,138	126	86	1,192	23
February	2,574	1,155 b)	1,215	993	179	144	1,180	18
March	2,311	1,359 c)	1,215	1,150	237	176	859	33
April	1,808	1,049 d)	771	838	237	172	800	39
May	2,420	1,156 e)	1,108	843	331	271	981	42
June	1,875	1,126	662	787	277	293	936	46
Total	13,773	7,092	6,438	5,749	1,387	1,142	5,948	201

a) excludes American and Western Samoans and Tongans

b) includes 2 arrivals by sea (small craft)

c) includes 1 arrival by sea (small craft)

d) includes 6 arrivals by sea (small craft)

e) includes 3 arrivals by sea (small craft)

f) term used by Tourism Office is "transit"

TABLE A10

U.S. Bureau of the Census

POPULATION ESTIMATES FOR AMERICAN SAMOA

Year of Estimation	Year Estimations Were Made				
	1965 ^{a)}	1966 ^{b)}	1967 ^{c)}	1968 ^{d)}	1969 ^{e)}
1960	20,000	20,100	20,100	20,000	
1961	19,900	20,000	20,000	19,900	
1962	21,100	21,100	21,100	21,100	
1963	23,000	21,900	21,900	21,900	
1964	22,100	21,000	23,000	23,000	
1965		21,400	24,700	25,000	
1966			27,000	27,300	
1967				28,800	28,800
1968					30,800
1969					
1970					

Source:

Bureau of the Census, *Current Population Reports*, P-25

- a) No. 300, February 24, 1965
- b) No. 336, April 26, 1966
- c) No. 358, January 18, 1967
- d) No. 392, May 2, 1968
- e) No. 423, May 28, 1969

TABLE A11

ESTIMATION OF POPULATION BY
VITAL RATES METHOD,
AMERICAN SAMOA, 1960-71

Year	a) Births	Estim. ^{b)} Birth Rate	Pop. Estim.	Deaths ^{a)}	Estim. ^{b)} Death Rate	Pop. Estimated	Final Estimate of Pop.
(1)	(2)	(3)	(4)=(2)/(3)	(4)	(5)	(6)=(4)/(5)	(7)= $\frac{1}{2}[(4)+(6)]$
1960	858	.042791 ^{c)}	20,051	108	.005386 ^{c)}	20,051	20,051
1961	844	.042246	19,978	106	.005367	19,750	19,864
1962	812	.041700	19,472	131	.005347	24,500	21,986
1963	975	.041154	23,691	136	.005328	25,526	24,608
1964	981	.040609	24,157	111	.005308	20,912	22,534
1965	1,072	.040064	26,757	153	.005289	28,928	27,842
1966	996	.039518	25,204	150	.005270	28,463	26,834
1967	1,015	.038972	26,044	126	.005250	24,000	25,022
1968	1,052	.038427	27,376	121	.005231	23,131	25,254
1969	1,055	.037882	27,850	151	.005211	28,977	28,414
1970	1,014	.037336 ^{c)}	27,159	141	.005192	27,159 ^{c)}	27,159
1971	1,042	.036790	28,323	142	.005173	27,450	27,886

a) Data provided by the Department of Medical Services and *Governor's Annual Report*.
There are some discrepancies from the data released by the Territorial Registrar.

b) A linear reduction was assumed from the observed rates of 1960 and 1970 to estimate other years.

c) Observed rate

TABLE A12

REGISTERED VOTERS IN 1968 AND 1970 AND
COMPARISON WITH THE 1970 CENSUS POPULATION
BY VOTING DISTRICT, AMERICAN SAMOA a)

Voting District No.	1970 Census Pop	1968 Registered Voters	1970 Registered Voters Uncorrected b)	Prop. of 68 voters to 70 Pop (%)	Prop. of 70 voters to 70 Pop (%)
1	1,320	608	724	46.1	54.8
2	792	526	634	66.4	80.0
3	1,163	697	750	59.9	64.5
4	1,295	391	469	30.2	36.2
5	1,449	368	440	25.4	30.4
6	887	283	349	31.9	39.3
7	2,067	332	498	16.1	24.1
8	1,592	230	401	14.4	25.2
9	2,507	381	627	15.2	25.0
10	1,086	187	288	17.2	26.5
11	1,025	239	289	23.3	28.2
12	2,884	530	812	18.4	28.2
13	1,657	342	477	20.6	28.8
14	1,488	396	446	26.6	30.0
15	3,671	666	864	18.1	23.5
16	1,565	283	364	18.1	23.2
17	637	217	216	34.1	33.9
Total	27,085	6,676	8,648	24.6	31.9

a) excludes Swains Island

b) not corrected for transferred, deceased, and aliens

TABLE A13

ANNUAL ESTIMATE OF POPULATION OF AMERICAN SAMOA
BY BROAD AGE GROUPS, 1960-71 *

Year	Below 7 years	7 - 17 years	18 - 49 years	50 years and over	Total nearest in 100
1960	5042	6383	6940	1686	20,100
1961	5059	5942	6909	1766	19,700
1962	5018	6305	6750	1902	20,000
1963	5426	7151	7775	1982	22,300
1964	5668	7312	8270	1816	23,100
1965	6012	6936	9004	2200	24,200
1966	6072	7715	8889	2530	25,200
1967	6227	7679	9050	2268	25,200
1968	6476	7763	9546	2253	26,000
1969	6626	8519	9872	2566	27,600
1970	6607	8264	9814	2474	27,200
1971	6714	8380	10,154	2692	27,900

* For the method of estimation see the text.

TABLE A14

ASSUMED SURVIVAL RATIOS BETWEEN TWO SUCCESSIVE 5-YEAR AGE GROUPS
FOR PROJECTION OF MALE POPULATION
OF AMERICAN SAMOA

Age	1970-75		1975-80		1980-85		1985-90	
	Level ^{a)}	Ratio	Level ^{a)}	Ratio	Level ^{a)}	Ratio	Level ^{a)}	Ratio
Birth ^{b)}	21	.95585	21	.95585	22	.96717	22	.96717
0-4	21	.99139	21	.99139	22	.99433	22	.99433
5-9	21	.99570	21	.99570	22	.99688	22	.99688
10-14	21	.99467	21	.99467	22	.99598	22	.99598
15-19	20	.98981	21	.99181	21	.99181	22	.99375
20-24	19	.98530	20	.98787	20	.98787	21	.99033
25-29	19	.98395	20	.98687	20	.98687	21	.98957
30-34	19	.98093	20	.98432	20	.98432	21	.98743
35-40	19	.97531	20	.97929	20	.97929	21	.98292
40-44	19	.96583	20	.97038	20	.97038	21	.97458
45-49	19	.95075	20	.95599	20	.95599	21	.96090
50-54	19	.92774	19	.92774	20	.93370	20	.93370
55-59	18	.88634	18	.88634	19	.89331	19	.89331
60-	17	.68115	18	.68701	18	.68701	19	.69296

^{a)} Mortality level of Coale-Demeny "West" model life table

^{b)} From birth to age 0-4

TABLE A15

ASSUMED SURVIVAL RATIOS BETWEEN TWO SUCCESSIVE 5-YEAR AGE GROUPS
FOR PROJECTION OF FEMALE POPULATION
OF AMERICAN SAMOA

Age	1970-75		1975-80		1980-85		1985-90	
	Level ^{a)}	Ratio	Level ^{a)}	Ratio	Level ^{a)}	Ratio	Level ^{a)}	Ratio
Birth ^{b)}	21	.96618	21	.96618	22	.97564	22	.97564
0-4	21	.99358	21	.99358	22	.99605	22	.99605
5-9	21	.99695	21	.99695	22	.99800	22	.99800
10-14	21	.99647	21	.99647	22	.99764	22	.99764
15-19	20	.99254	21	.99470	21	.99470	22	.99648
20-24	20	.99053	21	.99309	21	.99309	22	.99539
25-29	20	.98880	21	.99168	21	.99168	22	.99425
30-34	20	.98649	21	.98968	21	.98968	22	.99253
35-39	20	.98294	21	.98633	21	.98633	22	.98960
40-44	20	.97710	21	.98066	21	.98066	22	.98449
45-49	20	.96755	21	.97164	21	.97164	22	.97639
50-54	20	.95294	20	.95294	21	.95798	21	.95798
55-59	20	.92919	20	.92919	21	.93574	21	.93574
60	20	.72560	20	.72560	21	.73196	21	.73196

^{a)} Mortality level of Coale-Demeny "West" model life table

^{b)} From birth to age 0-4

TABLE A16

ASSUMED AGE-SPECIFIC FERTILITY RATE
FOR PROJECTIONS OF POPULATION

Age of Women	Projection I, III a)	Projection II, IV			
		1970-75 b)	1975-80 c)	1980-85 c)	1985-90 c)
15-19	.0500	.0500	.0475	.0451	.0428
20-24	.2866	.2866	.2723	.2586	.2457
25-29	.3347	.3162	.3004	.2854	.2711
30-34	.2670	.2293	.2178	.2069	.1966
35-39	.1953	.1953	.1855	.1762	.1674
40-44	.0878	.0878	.0834	.0792	.0753
45-49	.0150	.0150	.0142	.0135	.0129

a) Average of rates for 1959-61 and 1969-70

b) Rates for women 25-34 years of age are taken from the observed rates for 1969-70. Others are same as those of Projection I.

c) Reduction of 5 per cent from the previous period is assumed.

TABLE A17

ASSUMED FIVE-YEAR MIGRATION RATE
BY AGE AND SEX USED FOR PROJECTION
OF POPULATION OF AMERICAN SAMOA

Age Group		Male	Female
From	To		
Birth	0 - 4	- 5.0	- 5.0
0 - 4	5 - 9	- 2.3	- 1.0
5 - 9	10-14	- 3.7	- 2.6
10-14	15-19	-11.8	-10.0
15-19	20-24	-25.0	-12.5
20-24	25-29	-19.5	-11.5
25-29	30-34	-11.0	-10.0
30-34	35-39	- 5.2	- 8.5
35-39	40-44	- 2.0	- 6.8
40-44	45-49	- 1.2	- 5.2
45-49	50-54	0	- 3.8
50-54	55-59	+ 1.0	- 2.2
55-59	60-64	+ 1.0	- 0.5
60-	65-	+ 1.0	+ 1.0

TABLE A18

POPULATION PROJECTION OF AMERICAN SAMOA: I
1975-1990

Age	Male					Female				
	1970	1975	1980	1985	1990	1970	1975	1980	1985	1990
0-4	2,386	2,934	3,686	4,634	5,542	2,305	2,791	3,506	4,398	5,261
5-9	2,214	2,365	2,909	3,665	4,607	2,201	2,290	2,773	3,492	4,381
10-14	1,877	2,204	2,355	2,900	3,653	1,896	2,194	2,283	2,767	3,485
15-19	1,602	1,867	2,193	2,346	2,888	1,486	1,889	2,186	2,278	2,761
20-24	1,012	1,586	1,852	2,175	2,331	1,158	1,475	1,879	2,175	2,270
25-29	864	997	1,566	1,829	2,154	816	1,147	1,465	1,866	2,165
30-34	776	850	984	1,546	1,810	750	807	1,137	1,452	1,856
35-39	622	761	837	969	1,526	622	740	798	1,126	1,442
40-44	566	607	745	819	952	598	611	730	788	1,114
45-49	475	547	589	723	799	459	584	600	716	775
50-54	445	452	523	563	695	375	444	568	582	699
55-59	346	413	419	488	525	279	357	423	544	558
60-64	189	307	366	374	436	172	259	332	396	509
65 -	308	338	443	556	644	360	386	468	586	718
Total	13,682	16,228	19,467	23,587	28,562	13,477	15,974	19,148	23,166	27,994

TABLE A19

POPULATION PROJECTION OF AMERICAN SAMOA: II

1975 - 1990

Age	Male					Female				
	1970	1975	1980	1985	1990	1970	1975	1980	1985	1990
0-4	2,386	2,817	3,359	4,002	4,532	2,305	2,680	3,195	3,799	4,302
5-9	2,214	2,365	2,793	3,340	3,979	2,201	2,290	2,663	3,182	3,784
10-14	1,877	2,204	2,355	2,784	3,329	1,896	2,194	2,283	2,658	3,176
15-19	1,602	1,867	2,193	2,346	2,773	1,486	1,889	2,186	2,278	2,651
20-24	1,012	1,586	1,852	2,175	2,331	1,158	1,475	1,879	2,175	2,270
25-29	864	997	1,566	1,829	2,154	816	1,147	1,465	1,866	2,165
30-34	776	850	984	1,546	1,810	750	807	1,137	1,452	1,856
35-39	622	761	837	969	1,526	622	740	798	1,126	1,442
40-44	566	607	745	819	952	598	611	730	788	1,114
45-49	475	547	589	723	799	459	584	600	716	775
50-54	445	452	523	563	695	375	444	568	582	699
55-59	346	413	419	488	525	279	357	423	544	558
60-64	189	307	366	374	436	172	259	332	396	509
65-	308	338	443	556	644	360	386	468	586	718
Total	13,682	16,111	19,024	22,514	26,485	13,477	15,863	18,727	22,148	26,019

TABLE A20

POPULATION PROJECTION OF AMERICAN SAMOA: III

1975 - 1990

Age	Male					Female				
	1970	1975	1980	1985	1990	1970	1975	1980	1985	1990
0 - 4	2,386	2,644	2,965	3,389	3,775	2,305	2,514	2,820	3,217	3,584
5 - 9	2,214	2,311	2,561	2,880	3,292	2,201	2,267	2,473	2,781	3,172
10-14	1,877	2,123	2,215	2,458	2,765	1,896	2,137	2,201	2,404	2,704
15-19	1,602	1,647	1,863	1,946	2,159	1,486	1,700	1,916	1,976	2,159
20-24	1,012	1,190	1,225	1,386	1,451	1,158	1,290	1,480	1,667	1,723
25-29	864	803	946	974	1,105	816	1,015	1,134	1,301	1,468
30-34	776	757	706	831	858	750	726	905	1,012	1,164
35-39	622	722	707	659	778	622	677	657	819	919
40-44	566	595	693	679	635	598	570	622	604	755
45-49	475	540	570	665	654	459	554	530	578	564
50-54	445	452	516	545	639	375	428	518	496	543
55-59	346	416	423	486	514	279	350	399	486	465
60-64	189	309	372	381	439	172	258	323	371	453
65-	308	342	451	571	667	360	390	474	589	710
Total	13,682	14,851	16,213	17,850	19,731	13,477	14,876	16,452	18,301	20,383

TABLE A21

POPULATION PROJECTION OF AMERICAN SAMOA: IV

1975 - 1990

	Male					Female				
	1970	1975	1980	1985	1990	1970	1975	1980	1985	1990
0 - 4	2,386	2,538	2,703	2,930	3,095	2,305	2,414	2,571	2,782	2,938
5 - 9	2,214	2,311	2,459	2,626	2,847	2,201	2,267	2,375	2,535	2,743
10-14	1,877	2,123	2,215	2,361	2,521	1,896	2,137	2,201	2,308	2,464
15-19	1,602	1,647	1,863	1,946	2,075	1,486	1,700	1,916	1,976	2,072
20-24	1,012	1,190	1,225	1,386	1,451	1,158	1,290	1,480	1,667	1,723
25-29	864	803	946	974	1,105	816	1,015	1,134	1,301	1,468
30-34	776	757	706	831	858	750	726	905	1,012	1,164
35-39	622	722	707	659	778	622	677	657	819	919
40-44	566	595	693	679	635	598	570	622	604	755
45-49	475	540	570	665	654	459	554	530	578	564
50-54	445	452	516	545	639	375	428	518	496	543
55-59	346	416	423	486	514	279	350	399	486	465
60-64	189	309	372	381	439	172	258	323	371	453
65-	308	342	451	571	667	360	390	474	589	710
Total	13,682	14,745	15,849	17,040	18,278	13,477	14,776	16,105	17,524	18,981

APPENDIX B

FIGURES

FIGURE A1

"Census Card" Form Used for the Registration
of Residents by Office of Samoan Affairs

NAME	(Last)	(First)	(Initial)
SEX	DATE OF BIRTH	SINGLE (.....)	MARRIED (.....)
PLACE OF BIRTH	(Village or City)	(Country)	
FATHER	(Full Name)	FATHER'S PLACE OF BIRTH	(City) (Country)
MOTHER	(Full Name)	MOTHER'S PLACE OF BIRTH	(City) (Country)
OCCUPATION		SOCIAL SECURITY NO.	
CHECK ONE:			
NATIONAL OF UNITED STATES ()	CITIZEN OF UNITED STATES ()	ALIEN ()	
IF ALIEN, PROVIDE ALIEN REGISTRATION NUMBER			
RACE		RELIGION	
REMARKS:			

FIGURE A2

GAS Form 452

GOVERNMENT OF AMERICAN SAMOA
ENTRY CLEARANCE FORM

(Part I - Immigration, Part II - Agricultural Quarantine, Part III - Customs
Part IV - Tourism)

This form must be filled by all persons entering American Samoa and presented to Immigration Inspector upon entering. Part I - III is required for clearance. Part IV is information that we need for statistical purposes only. All information given on this form is held Confidential. Please print all responses.

Part I - IMMIGRATION

Last Name	First Name	Initial	Sex	Birthdate	Birthplace
Nationality (Citizenship)	Passport Number	Alien Registration No. or Entry Permit No.		Length of Stay	Occupation
Permanent Address (No. and Street)		City	State	Zip Code	Local Sponsor
Address in American Samoa	Arriving From:	Airline and Flight No. or Vessel of Arrival		Destination after Samoa	Airline and Flight No. or Vessel of Departure
	Date				

Reason for Visit. Please Check:

- ☐ TOURIST ☐ RETURNING RESIDENT
☐ BUSINESS ☐ VISIT RELATIVES
☐ _____ OTHER (Specify)

Part III - CUSTOMS CLEARANCE

- ☐ I DO NOT have the following
☐ I HAVE the following:
☐ 50 Cigars
☐ 200 Cigarettes
☐ 1 pound smoking tobacco
☐ 2 quarts of alcoholic beverage
☐ Ammunition/Firearms
☐ Narcotics or Habit forming drugs

Part II - AGRICULTURAL QUARANTINE CLEARANCE

- ☐ I DO NOT have plants, live animals, cultures or Soil
☐ I HAVE the following: Please check

- | | |
|--|---|
| <input type="checkbox"/> Plants | <input type="checkbox"/> Live Snakes |
| <input type="checkbox"/> Cuttings | <input type="checkbox"/> Other reptiles |
| <input type="checkbox"/> Bulbs, seeds nuts | <input type="checkbox"/> Birds (live) |
| <input type="checkbox"/> Flowers or fruits | <input type="checkbox"/> Dogs |
| <input type="checkbox"/> Corn on cob | <input type="checkbox"/> Cats |
| <input type="checkbox"/> Radish, Turnips | <input type="checkbox"/> Other Animals |
| <input type="checkbox"/> Other vegetables | <input type="checkbox"/> Cultures |
| <input type="checkbox"/> Soil, peat, etc. | <input type="checkbox"/> Microorganisms |

Part IV - ADDITIONAL INFORMATION FOR TOURIST STATISTICS

1. How many other times have you visited Samoa? _____
2. Are you travelling alone _____
 with spouse _____
 with a group _____
3. Was your tour organized by yourself _____
 your travel agent _____
 an airline agent _____
4. What other points in the Pacific will you be visiting on this trip?

5. Where did you see an advertisement on American Samoa _____

Date: _____

Signature: _____

THANK YOU - HAVE A NICE STAY IN AMERICAN SAMOA

FIGURE A3

Old Form--Embarkation Card

GAS FORM 452		GOVERNMENT OF AMERICAN SAMOA	
IMMIGRATION OFFICE			
This form must be completed by all persons entering American Samoa and presented to the Immigration Inspector at port of entry			
LAST NAME (Print) Igoa Mulimuli (Lolomi)	FIRST NAME Igoa Muamua	INITIAL Igoa Ogototonu	SEX Tane pe Fafine
Nationality (Citizenship) Atunu'u (Tagata Nofonu'u)	Passport Number Numera Tusifolau	Allen Reg. Number or Entry Permit Number (if any) Numera fa'amau o Tagata 'ese po o le Numera Pemita	
Permanent Address Nu'u e nofo ai	Birthdate Aso Fanau	Birthplace Nu'u na fanau ai	Occupation Galuega
American Samoa Address Nu'u i Amerika Samoa	Proposed Length of Stay Faatautu o le 'umi e nofo ai	Local Sponsor (if any) O le e nofo ai tpe a (ai)	
Airline and Flight No. or Vessel of Arrival Va'alele ma le Numera o le Malaga po o le Va'a na san ai		Arrived From Na sau mai fea	Destination After Samoa E alu i fea le nu'u pe'a Mavae Samoa
REASON FOR VISIT: (Mafuaga o le Malaga mai) Please ✓			
<input type="checkbox"/>	TOURIST Maimoaga		
<input type="checkbox"/>	BUSINESS Galuega		
<input type="checkbox"/>	RETURNING RESIDENT Tagata nofo-nu'u Toe fo'i mai		
<input type="checkbox"/>	VISIT RELATIVES Aiga Asiasi		
<input type="checkbox"/>	OTHER (Specify) se isi mea (fa'amatala lelei)		

LAMSON PARAGON (N.Z.) LTD. 82471

FIGURE A4

New Form--Embarkation Card
Which is Used for Non-Residents Only

GAS FORM 452A

GOVERNMENT OF AMERICAN SAMOA
IMMIGRATION DEPARTMENT

Surrender this copy when leaving American Samoa

LAST NAME (Print) Igoa mulimuli (Lolomi)	FIRST NAME Igoa Muamua	INITIAL Igoa Ogototonu	SEX Tane pe Fafine
---	---------------------------	---------------------------	-----------------------

COUNTRY OF CITIZENSHIP: _____
Atunuu (Tagata Nofonuu)

CARRIER & FLIGHT NO.: _____
Va'a po'o le va'alele ma
le numera o le va'alele
na sau ai.

STATUS: _____
Mafua'aga o le Malaga mai
po'o le tulaga o lo'o i ai.

FIGURE A5

Certificate of Death

AMERICAN SAMOA

(1) Place of Death Village _____ District _____ Hospital (.....) _____				(2) Usual Residence Village _____ District _____			
(3) Name of Deceased First _____ Middle _____ Last _____				(4) Date of Death Month _____ Day _____ Year _____			
(5) Sex Male (.....) Female (.....)		(6) RACE _____		(7) Married (.....) Never Married (.....) Widowed (.....) Divorced (.....)		(8) Occupation _____	
(9) Date of Birth Mo. _____ Day _____ Yr. _____		(10) Birthplace _____		(11) Nationality _____			
(12) Father's Name _____			(13) Mother's Name _____			(14) Person giving information _____	

MEDICAL CERTIFICATE

(15) Cause of Death Conditions	Direct Cause			Interval between onset & Death
	Contributing Cause (a)			
	(b)			
	Other conditions and Remarks			
(16) Accident (.....) Suicide (.....) Homocide (.....)	(17) Place of Injury _____	(18) At work (.....) Not at work (.....)	(19) Autopsy Yes (.....) No (.....)	

(20) Time of Death A.M. (.....) (21)

..... P.M. (.....)

SIGNATURE:— NURSE, SMP, MD

(22)

PUBLIC HEALTH OFFICER

FIGURE A6

GAS FORM 553

Serial No.

**BIRTH CERTIFICATE
OF
AMERICAN SAMOA**

Village Full Name of Child

Sex	Twin, Triplet or other? To be answered only in event of plural birth	Number in order of birth:	Born at:	Date of Birth 19....
			Hospital	
			Dispensary	
			Home	

FATHER		MOTHER	
Full name		Full name	
Residence		Residence	
Race Age at last birthday.....		Race Age at last birthday.....	
Birthplace		Birthplace	
Nationality		Nationality	
Occupation		Occupation	

Number of children born to this mother including present birth

Number of children of this mother now living

**DO NOT WRITE IN THIS SPACE—For
Registrar's Use Only:**

I hereby certify that the foregoing information
is true to the best of my knowledge and belief.

.....
Person Attending Birth

Reviewed and accepted.

.....
Public Health Officer

(ALL BLANKS MUST BE FILLED IN)

Registry Card Form of Resident
Used by the Filariasis Control Program

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APPENDIX C

ILLUSTRATION OF POPULATION ESTIMATION PROCEDURE BY A MODIFIED
COMPOSITE METHOD FOR AMERICAN SAMOA, 1971

APPENDIX C

Illustration of Population Estimation Procedure by a Modified Composite Method for American Samoa, 1971

A. Estimation of population under 7 years of age.	
A.1 Estimating from birth data	
(a) Total registered births, 5 years preceding. (half of 1966 and 1971 births plus all births of 1967, 1968, 1969 and 1970)	5,155
(b) Underregistration ratio	1.000
(c) Estimated total births, 5 years preceding (a) ÷ (b).....	5,155
(d) "Survival ratio" to age group 0-4 years.....	.91230
(e) Estimated population 0-4 years, 1971 (c) x (d)	4,703
(f) Conversion ratio to population 0-6 years70749
(g) Estimated population 0-6 years, 1971	
(e) ÷ (f)	6,647
A.2 Estimating from the population of child-bearing age	
(a) Estimated population 18-49, 1971 Copy from C.3	10,154
(b) Conversion ratio to population 0-6 years66789
(c) Estimated population 0-6 years, 1971	
(a) x (b)	6,782
A.3 Final estimate	
Average of A.1(g) and A.2(c)	6,714

Remark

- A.1 (b) Birth registration is considered to be 100 percent from 1965.
- A.1 (d) This is a ratio interpolated from 1960 and 1970 data. In 1960 for an estimate of 4277, 5-year births 1955-60, there were 3709 children under age 5. In 1970 for 5161 births of preceding 5-years, there were 4691 children. Thus, the "survival ratios" from 5-year births to age group 0-4 become .86720 in 1960 and .90893. This ratio is determined by death rate in the age group and migration. It is assumed that the "depletion ratio", i.e., the complement of the "survival ratio", takes a constant reduction rate, that is, it takes a form of e^{-rt} , where e is the base of natural logarithm, r is the reduction rate, and t is the time in years. From the "depletion ratios" of 1960 and 1970 $r = .037722$ was estimated. For other years, measuring t from 1960 estimates of "depletion ratios" would be obtained. For instance, for 1971, $e^{(-.037722)(11)} = .08770$. Taking the complement from an estimated "depletion ratio" the "survival ratio" was obtained. The following table provides the "survival ratio" by year:

<u>Year</u>	<u>Survival Ratio</u>
1960	.86720
1961	.87212
1962	.87685
1963	.88141
1964	.88580
1965	.89003
1966	.89410
1967	.89802
1968	.90179
1969	.90543
1970	.90893
1971	.91230
1972	.91555
1973	.91868
1974	.92169

<u>Year</u>	<u>Survival Ratio</u>
1975	.92458
1976	.92738
1977	.93006
1978	.93265
1979	.93515

- A.1 (f) Assuming the ratio of population 0-4 years to that 0-6 years would be stabilized some day, again a negative exponential function e^{-rt} was fitted from observed ratios of 1960 and 1970. The actual values by year are:

<u>Year</u>	<u>Conversion Ratio</u>
1960	.73562
1961	.73302
1962	.73042
1963	.72784
1964	.72526
1965	.72270
1966	.72014
1967	.71759
1968	.71506
1969	.71252
1970	.71000
1971	.70749
1972	.70499
1973	.70250
1974	.70001
1975	.69754
1976	.69507
1977	.69261
1978	.69016
1979	.68772

- A.2 (b) Anticipating a decline of fertility, a constant amount of reduction in the ratio was assumed. The observed ratio was .72651 in 1960 and it was .67322 in 1970. One-tenth of the difference, i.e., .005329 was applied as the annual decrement for other years.

B. Estimation of population 7-17 years of age.

(a) Number of elementary school enrollment for 1971, grades 1-8	7,294
(b) Enrollment ratio87040
(c) Estimated population 7-17, 1971	
(a) + (b)	8,380

Remark

Since there was a discontinuity in the school statistics between 1965 and 1966, it was decided to apply a constant enrollment ratio prior to 1966 and another after that time. From the GAS enrollment figures for 1960 and 1970 and the census population of 7-17 years of age, the earlier ratio was determined to be .71910 and the later one .87040. It is realized a further refinement on the ratio is necessary.

C. Estimation of population 18-49 years of age.

C.1 Estimating from birth of the current year

(a) Number of births registered in 1971	1,042
(b) Under-registration factor	1.000
(c) Estimated births in 1971	1,042
(d) Estimated general fertility rate20098
(e) Estimated female population 18-49 years, 1971	
(c) + (d)	5,184
(f) Conversion ratio to the total population.....	.50184
(g) Estimated total population 18-49 years, 1971	
(e) + (f)	10,331

C.2 Estimating from a two-year birth data

(a) Number of registered births in 1970 and 1971 ..	2,056
(b) Underregistration factor	1.000

(c)	Estimated births in 1970 and 1971	2,056
(d)	Estimated fertility ratio41067
(e)	Estimated female population 18-49, 1971 (c) + (d)	5,006
(f)	Conversion ratio to the total population50184
(g)	Estimated total population 18-49, 1971 (e) + (f)	9,976

C.3 Final estimate

average of C.1 (g) and C.2 (g)	10,154
--------------------------------------	--------

Remark

C.1 (d) The observed ratios were .24628 for 1960 and .20510 for 1970. Assuming a constant reduction for the time being, an annual decrement .004118 was applied for other years.

C.1 (f) The observed ratios were .52305 for 1960 and .50377 for 1970. Assuming a constant reduction for the time being, an annual decrement .001928 was applied for other years.

C.2 (d) As in C.1(d) an annual decrement .00782 was applied for the observed ratios of .49669 in 1960 and .41849 in 1970.

C.2 (f) See the remark for C.1(f)

D. Estimation of population 50 years and over.

D.1 Estimating from the series of constant increase assumption

(a)	The census population aged 50 and over in 1970 ..	2,474
(b)	Annual increment	78.8
(c)	Estimated population aged 50 and over, 1971 (a) + 1 x (b)	2,553

D.2 Estimating from the death statistics

(a) Deaths registered for age 50 and over, 1971 ..	72
(b) Half of age unknown deaths, 1971	1
(c) Estimated deaths aged 50 and over, 1971 (a) + (b)	73
(d) Estimated death rate02579
(e) Estimated population aged 50 and over, 1971 .. (c) ÷ (d)	2,830

D.3 Final estimate

average of D.1 (c) and D.2 (f)	2,692
--------------------------------------	-------

Remark

D.1 (b) From the 1960 and 1970 census data, an annual increment of 78.8 persons was assumed for the old age.

D.2 (b) Currently the great majority of births are taking place in the medical facilities. It is assumed that there is no age unknown deaths among infants. Since the number of death over 50 years has been approximately one-half of the total deaths aged 1 and over, half of "age unknown" deaths are added to make an estimate of deaths for the age group in question.

D.2 (d) The observed death rates were .02669 in 1960 and .02587 in 1970. Since the difference is so small, any interpolation will come out nearly the same value. Applying the simplest method, an annual decrement .000082 was deducted from 1970 rate to estimate the 1971 rate.

E. Estimation of the total population 1971

Sum of A3, B(c), C.3, and D3	27,940
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