

ESTIMATES OF INFANT MORTALITY RATES FROM CHILD SURVIVORSHIP BY AGE OF MOTHER

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COUNTRY: AMERICAN SAMOA. YEAR: 1974 BREAKDOWN: TOTAL

| AGE GROUPS | FEMALES  | CHILDREN BORN | CHILDREN LIVING | MEAN CB | MEAN AGE CH BEARING | PROPORTION DEAD | IMR    | YPC    |
|------------|----------|---------------|-----------------|---------|---------------------|-----------------|--------|--------|
| 15-19      | 1641.000 | 120.000       | 119.000         | 0.073   | 30.000              | 0.008           | 0.0    | 0.0    |
| 20-24      | 1336.000 | 908.000       | 889.000         | 0.680   | 31.000              | 0.021           | 15.824 | 1.938  |
| 25-29      | 1065.000 | 2309.000      | 2261.000        | 2.168   | 30.000              | 0.021           | 12.607 | 3.635  |
| 30-34      | 809.000  | 2886.000      | 2802.000        | 3.567   | 0.0                 | 0.029           | 16.773 | 5.593  |
| 35-39      | 705.000  | 3470.000      | 3352.000        | 4.922   | 0.0                 | 0.034           | 14.588 | 8.007  |
| 40-44      | 608.000  | 3664.000      | 3490.000        | 6.026   | 0.0                 | 0.047           | 20.737 | 9.948  |
| 45-49      | 592.000  | 3711.000      | 3494.000        | 6.269   | 0.0                 | 0.058           | 24.819 | 13.864 |
| 50-54      | 426.000  | 2765.000      | 2502.000        | 6.491   | 0.0                 | 0.095           | 0.0    | 0.0    |
| 55-59      | 336.000  | 2154.000      | 1860.000        | 6.411   | 0.0                 | 0.136           | 0.0    | 0.0    |
| 60-64      | 235.000  | 1558.000      | 1347.000        | 6.630   | 0.0                 | 0.135           | 0.0    | 0.0    |
| 65-69      | 136.000  | 852.000       | 688.000         | 6.265   | 0.0                 | 0.192           | 0.0    | 0.0    |
| 70-74      | 124.000  | 650.000       | 547.000         | 5.242   | 30.333              | 0.158           | 0.0    | 0.0    |

$\mu = .72$

$\delta \mu = 18.16$

$\gamma = 1MR$  &  $\gamma$  before census

$\mu = .72$   
 $\gamma = 18.16$

COUNTRY: AMERICAN SAMOA YEAR: 1974 BREAKDOWN: WESTERN DISTRICT

| AGE GROUPS | FEMALES | CHILDREN BORN | CHILDREN LIVING | MEAN CB | MEAN AGE CH BEARING | PROPORTION DEAD | IMR    | VPC    |
|------------|---------|---------------|-----------------|---------|---------------------|-----------------|--------|--------|
| 15-19      | 606,000 | 42,000        | 41,000          | 0.069   | 30,000              | 0.024           | 0.0    | 0.0    |
| 20-24      | 499,000 | 313,000       | 306,000         | 0.627   | 32,000              | 0.022           | 17,318 | 1.830  |
| 25-29      | 373,000 | 824,000       | 808,000         | 2,209   | 30,000              | 0.019           | 11,681 | 3,494  |
| 30-34      | 303,000 | 1,082,000     | 1,043,000       | 3,571   | 0.0                 | 0.036           | 21,564 | 5,423  |
| 35-39      | 263,000 | 1,312,000     | 1,280,000       | 4,989   | 0.0                 | 0.024           | 8,337  | 7,830  |
| 40-44      | 219,000 | 1,282,000     | 1,235,000       | 5,854   | 0.0                 | 0.037           | 14,206 | 9,736  |
| 45-49      | 204,000 | 1,315,000     | 1,237,000       | 6,446   | 0.0                 | 0.059           | 25,503 | 13,649 |
| 50-54      | 159,000 | 1,092,000     | 998,000         | 6,868   | 0.0                 | 0.086           | 0.0    | 0.0    |
| 55-59      | 100,000 | 628,000       | 550,000         | 6,280   | 0.0                 | 0.124           | 0.0    | 0.0    |
| 60-64      | 70,000  | 481,000       | 436,000         | 6,167   | 0.0                 | 0.094           | 0.0    | 0.0    |
| 65-69      | 42,000  | 285,000       | 230,000         | 6,786   | 0.0                 | 0.193           | 0.0    | 0.0    |
| 70-74      | 34,000  | 181,000       | 144,000         | 5,324   | 30,667              | 0.204           | 0.0    | 0.0    |

$W = -1.13$   
 $Y = 16.30$

1.0 m  
 1.0 m

COUNTRY: AMERICAN SAMOA YEAR: 1974 BREAKDOWN: CENTRAL DISTRICT

| AGE GROUPS | FEMALES | CHILDREN BORN | CHILDREN LIVING | MEAN CB | MEAN AGE CH BEARING | PROPORTION DEAD | IMR    | VPC    |
|------------|---------|---------------|-----------------|---------|---------------------|-----------------|--------|--------|
| 15-19      | 707,000 | 55,000        | 55,000          | 0.078   | 29.000              | 0.0             | 0.0    | 0.0    |
| 20-24      | 580,000 | 373,000       | 365,000         | 0.643   | 31.000              | 0.021           | 16.284 | 1.938  |
| 25-29      | 479,000 | 946,000       | 930,000         | 1.975   | 31.000              | 0.017           | 9.717  | 3.636  |
| 30-34      | 343,000 | 1,184,000     | 1,161,000       | 3.458   | 0.0                 | 0.021           | 11.375 | 5.599  |
| 35-39      | 280,000 | 1,270,000     | 1,226,000       | 4.536   | 0.0                 | 0.035           | 15.009 | 8.007  |
| 40-44      | 233,000 | 1,297,000     | 1,244,000       | 5.591   | 0.0                 | 0.041           | 16.658 | 9.953  |
| 45-49      | 226,000 | 1,343,000     | 1,261,000       | 5.942   | 0.0                 | 0.061           | 26.246 | 13.860 |
| 50-54      | 185,000 | 928,000       | 835,000         | 6.987   | 0.0                 | 0.100           | 0.0    | 0.0    |
| 55-59      | 132,000 | 788,000       | 671,000         | 5.570   | 0.0                 | 0.148           | 0.0    | 0.0    |
| 60-64      | 102,000 | 640,000       | 529,000         | 6.275   | 0.0                 | 0.173           | 0.0    | 0.0    |
| 65-69      | 63,000  | 354,000       | 296,000         | 5.619   | 0.0                 | 0.164           | 0.0    | 0.0    |
| 70-74      | 47,000  | 238,000       | 204,000         | 5.064   | 30.333              | 0.143           | 0.0    | 0.0    |

99

16.70

99

16.70

ESTIMATES OF INFANT MORTALITY RATES FROM CHILD SURVIVORSHIP BY AGE OF MOTHER

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COUNTRY: AMERICAN SAMOA YEAR: 1974 BREAKDOWN: EASTERN DISTRICT

| AGE GROUPS                                     | FEMALES | CHILDREN BORN | CHILDREN LIVING | MEAN CB | MEAN AGE CH BEARING | PROPORTION DEAD | IMR    | VPC    |
|------------------------------------------------|---------|---------------|-----------------|---------|---------------------|-----------------|--------|--------|
| 15-19                                          | 245,000 | 20,000        | 20,000          | 0.082   | 30.000              | 0.0             | 0.0    | 0.0    |
| 20-24                                          | 225,000 | 193,000       | 190,000         | 0.858   | 30.000              | 0.016           | 10.770 | 2.150  |
| 25-29                                          | 173,000 | 417,000       | 405,000         | 2.410   | 29.000              | 0.029           | 18.281 | 3.917  |
| 30-34                                          | 138,000 | 517,000       | 504,000         | 3.746   | 0.0                 | 0.025           | 13.935 | 5.925  |
| 35-39                                          | 124,000 | 676,000       | 640,000         | 5.452   | 0.0                 | 0.053           | 26.914 | 8.363  |
| 40-44                                          | 109,000 | 742,000       | 694,000         | 6.807   | 0.0                 | 0.065           | 30.653 | 10.375 |
| 45-49                                          | 117,000 | 724,000       | 692,000         | 6.188   | 0.0                 | 0.044           | 16.602 | 14.314 |
| 50-54                                          | 76,000  | 427,000       | 427,000         | 6.171   | 0.0                 | 0.090           | 0.0    | 0.0    |
| 55-59                                          | 64,000  | 444,000       | 395,000         | 6.938   | 0.0                 | 0.110           | 0.0    | 0.0    |
| 60-64                                          | 46,000  | 312,000       | 271,000         | 7.800   | 0.0                 | 0.131           | 0.0    | 0.0    |
| 65-69                                          | 24,000  | 169,000       | 127,000         | 7.042   | 0.0                 | 0.249           | 0.0    | 0.0    |
| 70-74                                          | 20,000  | 146,000       | 133,000         | 5.266   | 0.0                 | 0.101           | 0.0    | 0.0    |
| ERROR FOUND AMERICAN SAMOA 1574 MANUA DISTRICT |         |               |                 |         |                     |                 |        |        |
| 1.49                                           |         |               |                 |         |                     |                 |        |        |
| 20.29                                          |         |               |                 |         |                     |                 |        |        |

20.29

ESTIMATES OF INFANT MORTALITY RATES FROM CHILD SURVIVORSHIP BY AGE OF MOTHER

5

COUNTRY: AMERICAN SAMOA YEAR: 1974 BREAKDOWN: MANUA DISTRICT

| AGE GROUPS | FEMALES | CHILDREN BORN | CHILDREN LIVING | MEAN CB | MEAN AGE CH BEARING | PROPORTION DEAD | IMR     | VPC    |
|------------|---------|---------------|-----------------|---------|---------------------|-----------------|---------|--------|
| 15-19      | 63,000  | 3,000         | 3,000           | 0.036   | 29,000              | 0.0             | 0.0     | 0.0    |
| 20-24      | 32,000  | 29,000        | 28,000          | 0.906   | 31,000              | 0.034           | 26,359  | 2.369  |
| 25-29      | 40,000  | 122,000       | 118,000         | 3.050   | 27,000              | 0.033           | 20,907  | 4.199  |
| 30-34      | 25,000  | 101,000       | 94,000          | 4.040   | 0.0                 | 0.069           | 42,846  | 6.221  |
| 35-39      | 38,000  | 312,000       | 206,000         | 8.211   | 0.0                 | 0.340           | 211,447 | 8.504  |
| 40-44      | 48,000  | 343,000       | 317,000         | 7.146   | 0.0                 | 0.076           | 37,057  | 10.807 |
| 45-49      | 45,000  | 329,000       | 304,000         | 7.311   | 0.0                 | 0.076           | 33,374  | 14.691 |
| 50-54      | 36,000  | 276,000       | 242,000         | 7.667   | 0.0                 | 0.123           | 0.0     | 0.0    |
| 55-59      | 40,000  | 294,000       | 244,000         | 7.350   | 0.0                 | 0.170           | 0.0     | 0.0    |
| 60-64      | 15,000  | 125,000       | 111,000         | 8.333   | 0.0                 | 0.112           | 0.0     | 0.0    |
| 65-69      | 7,000   | 44,000        | 35,000          | 6.286   | 0.0                 | 0.205           | 0.0     | 0.0    |
| 70-74      | 15,000  | 83,000        | 66,000          | 5.633   | 29,000              | 0.205           | 0.0     | 0.0    |

9.05

63.81

0.5

3.0

ORIGINAL : ENGLISH

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UNITED NATIONS ECONOMIC AND SOCIAL  
COMMISSION FOR ASIA AND THE PACIFIC

ESCAP/SPC CONFERENCE SEMINAR ON POPULATION PROBLEMS OF  
SMALL ISLAND COUNTRIES OF THE ESCAP/SPC REGION  
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MORTALITY SITUATION IN THE SOUTH PACIFIC REGION

by

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Martin Bakker

by

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15-20 February 1982  
Noumea, New Caledonia

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of Small Island Countries of the ESCAP/SPC Region

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SOUTH PACIFIC COMMISSION

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# Mortality in the South Pacific Region

## SUMMARY\*

In most countries in the South Pacific region, data from vital and medical registration cannot be used for deriving basic measures of mortality. These come largely from indirect methods of estimation from census data.

For the pre-World War II period, mortality estimates have been obtained by subtracting assumed crude birth rates from the inter-censal annual growth rates. These indicate that mortality in the Polynesian part of the Pacific, including Fiji, was very high until about 1921, and that it decreased in an irregular fashion till about 1940. Less data are available for Melanesian and Micronesian countries and, though not always reliable, these data indicate that pre-1921 mortality was as high as, or higher than, and declined later than in the Polynesian Islands.

With the availability of more, and more reliable, census data after the Second World War, better mortality estimates can be derived. This period saw a phenomenal decline in mortality. By the mid-seventies, the crude death rates of most countries, which must have been approximately 40 per thousand around 1900, had dropped to figures of about ten per thousand or less.

Post-war infant mortality rates also declined considerably, as is shown in Figure 3, where figures based on the Feeney method are given. They indicate that the infant mortality in the Gilbert and Ellice Islands (Kiritabati and Tuvalu) dropped consistently from over 160 per thousand after the war to about 90 per thousand by 1978. Infant mortality figures for Solomon Islands for the period 1952-1976 are surprisingly low, but show the same trend as in the Gilbert and Ellice Islands. In the French and American territories, census questions allowing fertility and mortality analysis are extremely limited, and mortality measures must be derived from registration data (which in some countries, e.g. New Caledonia, are considered complete).

The pace of infant mortality decline was approximately the same for all populations and was dependent on the level of infant mortality (Table 2 refers). It appears that the declining trend of infant mortality gradually levels off when a rate of 40 per thousand is reached and stops close to 30 per thousand.

The estimated levels of child mortality shown in Figure 3 give a rather vague indication that in some countries the level of infant mortality was rather low compared with that of mortality at the ages 1-4. This may be related to the fact that a high proportion of children are born in hospitals, thus providing low risk in the first days of life, whereas later, and especially after breastfeeding has stopped, the risk of mortality becomes relatively higher.

It is now increasingly difficult to obtain accurate estimates of adult mortality from censuses in the South Pacific region. The stable population methods used for this purpose in the past can no longer be



successfully applied because, with changing fertility and mortality levels, populations are no longer stable, and because levels of net-migration (for which statistics are incomplete) are increasing. For these reasons, retrospective and current status questions have been included in many recent South Pacific censuses, as they allow estimation of adult mortality by means of Brass and Hill maternal and paternal orphanhood techniques as well as by that of Preston. The results are shown in Table 5, where the estimated life expectancy at birth ( $e_0$ ) and at age 25 ( $e_{25}$ ) is given for a few countries.

It is pointed out that there is very little information available on *differential mortality* in countries in the South Pacific region, although a breakdown of mortality by ethnic component is often provided.

## MORTALITY SITUATION IN THE SOUTH PACIFIC REGION

### A. DATA SOURCES AND LIMITATIONS

A systematic study of trends and differentials in mortality in the South Pacific region is seriously handicapped by the lack of adequate and reliable statistical information. Completeness and quality of the vital registration system in the South Pacific is far from uniform. On the one hand, there are countries where vital or civil registration has not yet been institutionalised; on the other, there are countries with a very long history of registration of vital events. Countries belonging to the first category are to be found in the western (Melanesian) part of the region, especially Papua New Guinea and Solomon Islands. <sup>1</sup> Countries belong to the second category are mainly to be found in the eastern (Polynesian) part of the Pacific.

Even among countries with a long history of institutionalised registration of vital events, the diversity in completeness and accuracy of the registered events is again extensive. Death registration, especially of infants, in the eastern part of the region ranges from very incomplete and deficient (for instance in Tonga) to almost complete and fairly accurate (for instance in Niue and New Caledonia). In most countries in this part of the region, the death of a deceased person is usually entered in a death certificate certified by a registrar. It may also be noted that

<sup>1</sup> This does not mean that registration of vital events is totally unknown in these countries. In Papua New Guinea, vital events are entered in Village Books. Also records of vital events have been kept by missionaries, district administrators, local government councils, medical personnel etc. However, the data collected by these persons and agencies are not part of an overall and comprehensive institutionalised system of vital registration, and the information collected by them are usually incomplete and deficient.

recording of vital events is undertaken primarily for administrative purposes, and the derivation of population statistics and estimates is only a by-product of this administrative system and is an activity with a very low priority or no priority at all.

Hospital records of deaths in both categories of countries are also incomplete since they cover only a portion of the population.

However, the proportion of vital events covered by hospitals and dispensaries in the eastern part of the region is usually much larger than in Western part. It must also be emphasised that the births and deaths covered by a medical registration cannot be considered as being a representative sample of all births and deaths in that population. However, in some countries in the central part of the Pacific (such as Fiji and Tonga) it has recently been observed that the registration of deaths by the Ministry of Health is less incomplete and deficient than that of the official vital registration system.

It may thus be noted that in most countries of the region, the data from the vital registration as well as medical registration systems cannot be used for deriving basic estimates of mortality. One has therefore to depend largely on indirect methods of estimation based primarily on census data to assess levels and trends in mortality in these countries. In this connection it may be noted that while some countries have a fairly long tradition of census taking, in others census taking is a relatively new experience. Most of the early censuses were merely head counts and did not even provide an age-sex distribution of the population which is the first requirement for any indirect methods.

## B. MORTALITY LEVELS PRIOR TO SECOND WORLD WAR

As noted earlier, data from the registration system are incomplete and deficient to provide reliable estimates of mortality levels in the South Pacific region. Most of the censuses carried out in this region before the Second World War were only simple head counts and did not provide information on the age-sex distribution of the population. However, a rough idea of the mortality situation prior to the Second World War could be obtained from the inter-censal annual growth rate ( $r$ ) of the population. If it is assumed that fertility rates in the first half of the twentieth century were high and more or less constant and that net migration was negligible, then changes inter-censal growth rates could be attributed to changes in mortality. A study of the course of  $r$  in some countries in the central and eastern parts of the region indicates that before the 1921 censuses, the size of these populations either declined or remained more or less unchanged. If it is assumed that crude birth rates for these countries averaged 40 per thousand during this period, then the crude death rate must also have been approximately 40 per thousand and for certain periods even much higher. In fact, for some periods in the 19th century, crude death rates close to 40 per thousand have been reported. For instance, a crude death rate of 36 per thousand was reported for Tonga for the period 1881-1890.<sup>2/</sup> Given the fact that these rates are based on registered deaths, it may be safely assumed that the actual crude death rate during this period was higher. An examination of the registered deaths prior to 1921 suggests that the mortality level for most countries have been fluctuating violently.

<sup>2/</sup> B.H. Thomson, Savage Island (London, John Murray) 1902 p. 179.

3/ Before the Second World War, death registration was some what more complete in nine than in other countries.

No doubt most of the fluctuations have been due to the small numbers of registered events, and differential under registration probably played an important role. Nevertheless, many high peaks in the mortality level in the South Pacific region in the pre-1921 period were caused by diseases and epidemics introduced as a result of European contact. The influenza epidemic of 1919 was the last major epidemic experienced by the countries in the eastern and central part of the region.

Since 1921, there has been an acceleration in the intercessal rates of population growth (r) of many countries in the central and eastern South Pacific. Since fertility did not probably change very much, the acceleration in r must have been caused by declining mortality. The growth of the populations of Fiji, Tonga, Western Samoa, Niue, Cook Islands and French Polynesia are shown in Figure 1. In this figure, index numbers have been used to compare the growth of the population of these countries with the growth of the total world population. The 1921 populations were taken as the base, that is, 1921 population = 100. It would be seen from the figure that population growth (and therefore to a certain extent mortality decline) was faster for these countries than for the total world population. In the case of Cook Islands, the growth curve is downwardly biased due to considerable out-migration. Obviously, the time around the 1921 census after the 1919 influenza epidemics can be considered as a turning point in the mortality history of the central and eastern part of the South Pacific region. For instance, the 3-year moving average crude death rates calculated for Niue<sup>3/</sup> on the basis of registration data between 1902 and 1977 and presented in figure 2

Figure 1 Population growth in Fiji, Tonga, Western Samoa, French Polynesia and Cook Islands during the 20th century compared to growth of the total world population.

Note: 1921 population is given in the brackets

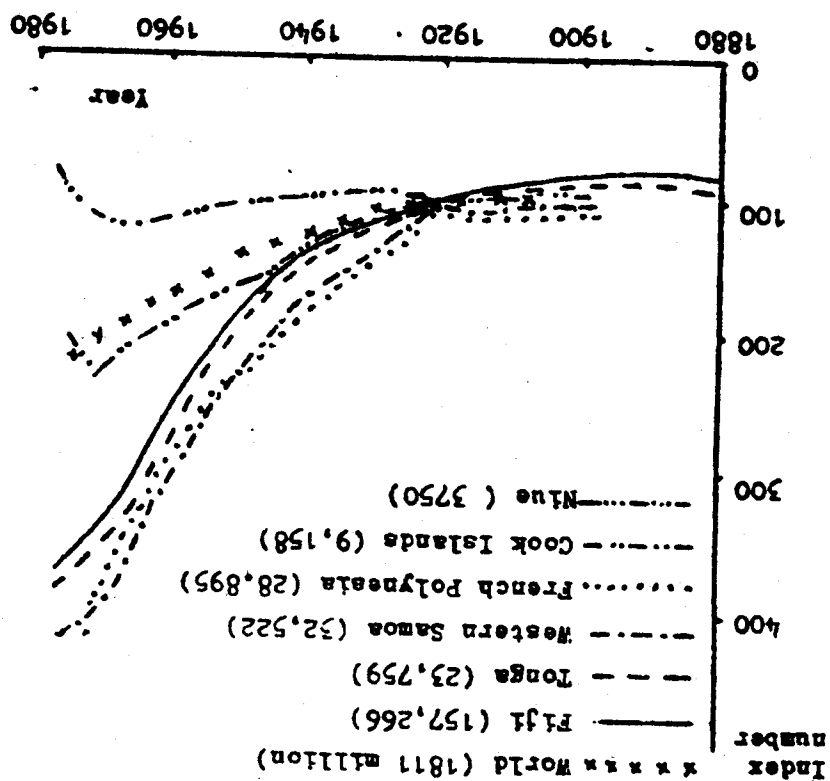
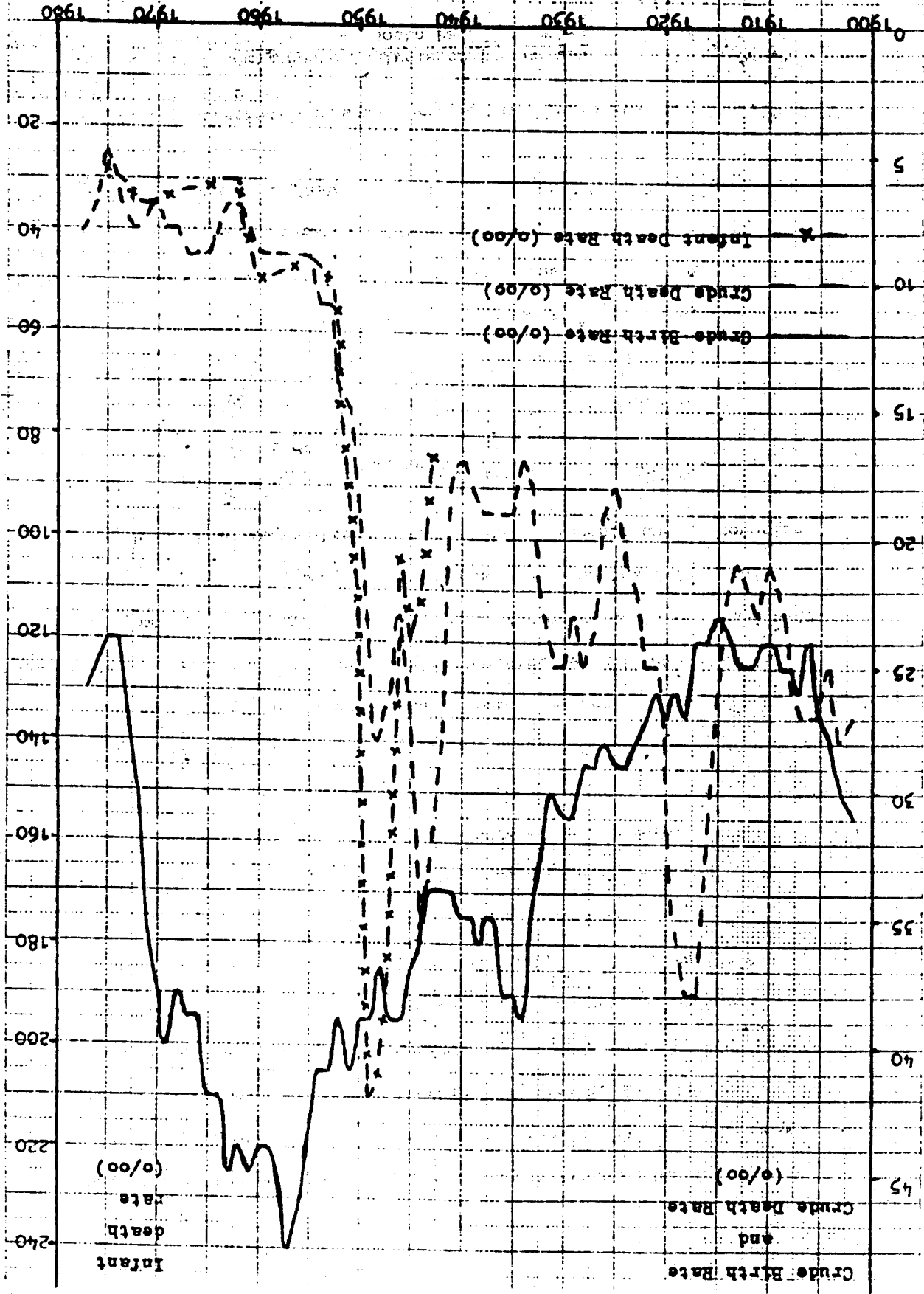


Figure 2: 5-Year Moving CBR, CDR and IDR of Nine (all components of the



show clearly the downward trend in CDR after the influenza epidemic of 1918-19. Also the decline in mortality was not gradual. A very high peak, comparable to 1921 levels, was reached during and immediately after the Second World War, but the 'final' downward trend started thereafter.<sup>4</sup> CDRs computed from death registration data for other countries included in figure 1 show the same downward trend after 1921, but registration of deaths in these countries is far less complete than in Nine.

As noted earlier, fully-fledged censuses were not carried in most of the countries in Melanesian and Micronesian part of the region prior to the Second World War and hence intercensal annual rates of growth cannot be calculated. However, the little evidence provided by missionaries, anthropologists etc. seem to suggest that before 1921 mortality in these countries must have been equally high, possibly even higher than in the countries mentioned in earlier paragraphs. Moreover, decline in mortality also appears to have started much later at least in Papua New Guinea and Solomon Islands, and probably also in Vanuatu, New Caledonia and Micronesian part of the South Pacific.

There was also a considerable decline in infant mortality after 1921 in the central and eastern part of the region though the rates were still high just prior to the Second World War. In countries like Fiji, Tonga, Western Samoa, Cook Islands, and Nine, the infant mortality rate was certainly over 100 per thousand live births. Even the rate for Tonga based on grossly under-registered infant deaths indicate a level close to 100 prior to Second World War.<sup>5</sup> Roberts held the view that before and around

<sup>4</sup>/ Registration in later years was probably more complete than in the beginning of this century.

<sup>5</sup>/ M.L. Baker, A Demographic Analysis of the Population of Tonga 1777-1975, Occasional Paper No. 14, South Pacific Commission, March 1979. p.22.



1927, infant mortality was higher in the Polynesian Ellice Islands

(now Tuvalu) than in the Micronesian Gilbert Islands (now Kiribati).<sup>6/</sup>

#### C. MORTALITY LEVELS AFTER SECOND WORLD WAR

More reliable estimates of mortality could be made for the period

after the Second World War, not because there has been and improvement in the completeness and accuracy of vital registration data, but because of the availability of census data from which mortality estimates could be derived.

The available information on mortality suggest a phenomenal

decline in mortality after the Second World War in most countries of

the region. For instance, the average CDR, IDR, neonatal and late foetal

death rates for various intercensal periods calculated on the basis of

registration data and presented in table 1 show that in Niue there has been

marked decline in mortality between 1945-1951 and 1951-1956. The average

crude death rates have been 8 and 7 per thousand for the intercensal periods

1966-71 and 1971-76.<sup>7/</sup> Since death registration during the first decades

after 1945 was still less complete than at present, the downward trend in

mortality in Niue since 1945 is in reality even more pronounced than suggested

by data in table I. In the absence of reliable information, it is not clear

whether the pace of mortality decline since 1945 has been the same as

in Niue.

#### 1. Infant and child mortality

Estimates of infant and child mortality based on Feeney method

for selected countries are presented in figure 3. For Niue, the gap between the 1966 and 1976 estimates is fairly large<sup>8/</sup>; the 1956 and 1966 Tongan data

<sup>6/</sup> S.H. Roberts, Population Problems of the Pacific, London 1927, p. 125.

<sup>7/</sup> It may be noted that the crude death rates for Niue computed on the basis of census data for the intercensal periods 1966-1971 and 1971-1976 are also

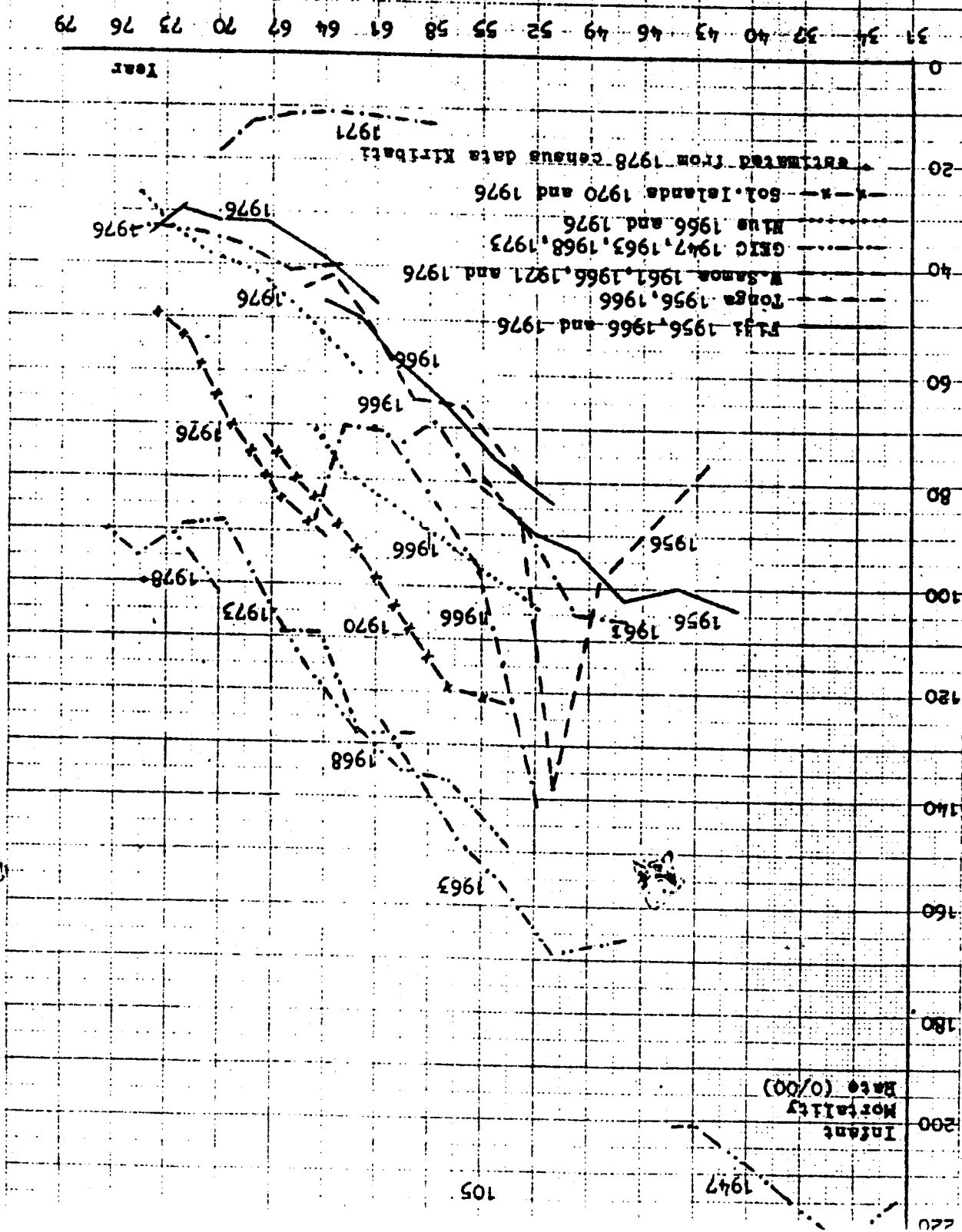
<sup>8/</sup> The unadjusted IMRs derived from 1966 and 1976 census data showed

Table 1: CDR, IDR, neonatal death rate and late foetal death rate, (o/oo), during the intercensal periods since 1945 in Nine (all components of the population)

| Intercensal period | CDR | IDR | Neonatal death rate | Late foetal death rate |
|--------------------|-----|-----|---------------------|------------------------|
| 1945 - 1951        | 23  | 151 | 39                  | -                      |
| 1951 - 1956        | 12  | 60  | 28                  | -                      |
| 1956 - 1961        | 9   | 46  | 25                  | 22                     |
| 1961 - 1966        | 8   | 28  | 14                  | 14                     |
| 1966 - 1971        | 8   | 30  | 14                  | 13                     |
| 1971 - 1976        | 7   | 25  | 8                   | 21                     |

Source: Based on vital registration data

Figure 3: Estimates of Infant Mortality for FIJI (Fijian component), Tonga (Tongan component), Western Samoa, GIC New Kiriabati and Tuvalu (total indigenous component), Rius (all components and based on adjusted D<sub>1</sub> values) and Solomon Islands (Solomon Islanders only)



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10/ K. Groenewegen, Report on the Census of the Population, 1970.  
British Solomon Islands Protectorate, Hobbs, the Printers Ltd., Southampton, 1970.

11/ It has been suggested that the difference between Micronesian and Polynesian mortality in Gilbert and Ellice Islands Colony (GEIC) can partly be explained by the fact that in many populations, mortality amongst children ever born (CEB) to teen age mothers is substantially higher than mortality among children born to older mothers and that Micronesian women aged 15-19 have been more fertile than their Polynesian counterparts. See M.F.M. Veltman, (Groningen Demographic Reports, No.3), Geographical Institute, Groningen state University, The Netherlands, 1980, p. 84.

10/ data by Groenewegen and the 1976 census data by Macrae indicate considerable

census data for Solomon Islands are unexpectedly low. The analysis of 1970

Infant and child mortality estimates based on 1970 and 1976

reversed in favour of the population of Ellice Islands (Tuvalu). 9/

around 1927 was true, it would appear that the situation has now been

regard to infant and child mortality in the Gilbert and Ellice Islands

than for the Polynesian component. Thus, if the observation of Roberts in

child mortality for the Micronesian component of the population was higher

is clear from the 1947, 1963, 1968 and 1973 censuses of GEIC that infant and

censuses in GEIC, but they are not inconsistent with these estimates. It

1979 census of Tuvalu can of course not be compared with those for previous

and Tuvalu). The estimates derived from the 1978 census of Kiribati and the

1968 and 1973 censuses of Gilbert and Ellice Islands Colony (now Kiribati

The most consistent series of estimates is obtained from the 1963,

in Tonga.

but probably somewhat higher than in Fiji and Niue and somewhat lower than

different from the situation in other countries in the central triangle,

the situation in regard to infant mortality in this country is not very

be totally unreliable, it is clear from the 1961, 1966 and 1976 data that

link up fairly well. Though the 1971 data for Western Samoa appear to

differences in the level of infant and child mortality for several

districts in Solomon Islands. The results of these two analysts also

show that infant and child mortality in the Solomon Islands is somewhat

higher than in countries in the central triangle and Tuvalu and much lower

than in Kiribati.

In the French territories, questions on children ever born and

children surviving have not been included in the census schedule. Estimates

of infant and child mortality have therefore to be based on vital registration

data. In New Caledonia, where death registration is considered to be almost

complete, the average IDR for the Melanesian component of the population

during 1967-1976 was 57.2 per thousand births.

No recent data on infant and child mortality for the American

territories - Guam, American Samoa and TPT - are available.<sup>12/</sup> However,

the situation regarding infant and child mortality particularly in Guam and

American Samoa is probably not very different from that in the central

triangle.

Table 2 gives the annual rates of infant mortality decline for

corresponding age groups in consecutive censuses for populations included in

figure 3. It will be noted from the table that the pace of decline was

approximately the same for all populations and that it was independent of

the level of infant mortality. The annual rate of decline in the IMR

averages 3 to 4 per cent in Fiji, GEIC and Solomon Islands and probably

also in Tonga and Western Samoa. Only the average rate of decline for

Nine seems to be higher than 4 per cent and this may be partly due to the

adjustment procedure which was applied to the Nine data. It would seem

that the declining trend in infant mortality gradually levels off when an

IMR of approximately 40 is reached and comes to a standstill when an IMR

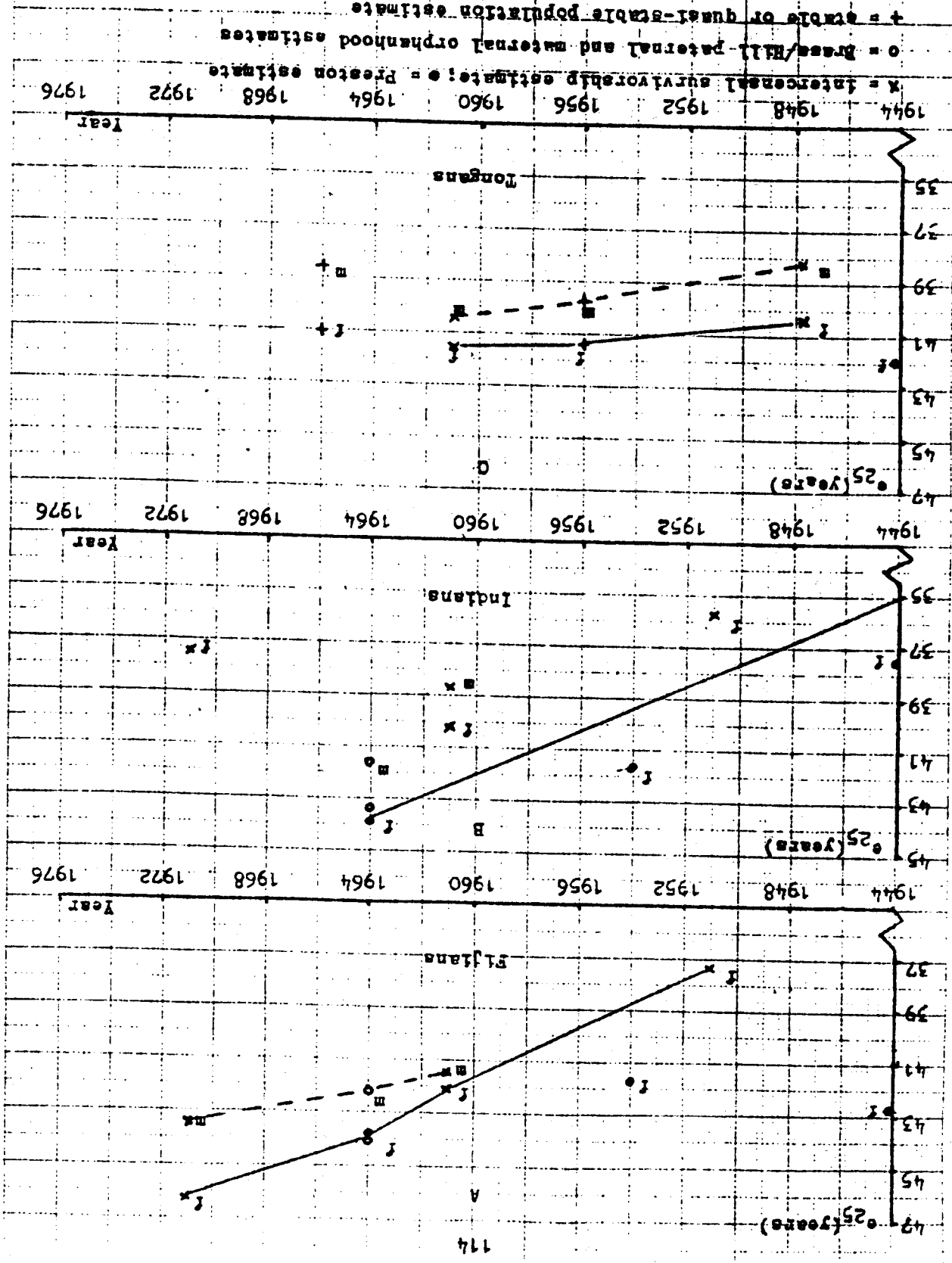
<sup>12/</sup>

Most census schedules in the American territories are modelled on a blue print used in mainland USA and lifetime fertility questions are usually not included in the schedules.

Table 2 : Annual rates of decline in infant mortality rates, (o/oo), for corresponding age-groups in consecutive censuses for populations represented in figure 3

| Country | Inter. | Age-Group | Mean  |       |       |       |       |       |       |       |       |       |       |       |       |       |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |           |           |           |           |          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        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |        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          |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |      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         |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |             |
|---------|--------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------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| period  | 20-24  | 25-29     | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | 95-99 | 100-104 | 105-109 | 110-114 | 115-119 | 120-124 | 125-129 | 130-134 | 135-139 | 140-144 | 145-149 | 150-154 | 155-159 | 160-164 | 165-169 | 170-174 | 175-179 | 180-184 | 185-189 | 190-194 | 195-199 | 200-204 | 205-209 | 210-214 | 215-219 | 220-224 | 225-229 | 230-234 | 235-239 | 240-244 | 245-249 | 250-254 | 255-259 | 260-264 | 265-269 | 270-274 | 275-279 | 280-284 | 285-289 | 290-294 | 295-299 | 300-304 | 305-309 | 310-314 | 315-319 | 320-324 | 325-329 | 330-334 | 335-339 | 340-344 | 345-349 | 350-354 | 355-359 | 360-364 | 365-369 | 370-374 | 375-379 | 380-384 | 385-389 | 390-394 | 395-399 | 400-404 | 405-409 | 410-414 | 415-419 | 420-424 | 425-429 | 430-434 | 435-439 | 440-444 | 445-449 | 450-454 | 455-459 | 460-464 | 465-469 | 470-474 | 475-479 | 480-484 | 485-489 | 490-494 | 495-499 | 500-504 | 505-509 | 510-514 | 515-519 | 520-524 | 525-529 | 530-534 | 535-539 | 540-544 | 545-549 | 550-554 | 555-559 | 560-564 | 565-569 | 570-574 | 575-579 | 580-584 | 585-589 | 590-594 | 595-599 | 600-604 | 605-609 | 610-614 | 615-619 | 620-624 | 625-629 | 630-634 | 635-639 | 640-644 | 645-649 | 650-654 | 655-659 | 660-664 | 665-669 | 670-674 | 675-679 | 680-684 | 685-689 | 690-694 | 695-699 | 700-704 | 705-709 | 710-714 | 715-719 | 720-724 | 725-729 | 730-734 | 735-739 | 740-744 | 745-749 | 750-754 | 755-759 | 760-764 | 765-769 | 770-774 | 775-779 | 780-784 | 785-789 | 790-794 | 795-799 | 800-804 | 805-809 | 810-814 | 815-819 | 820-824 | 825-829 | 830-834 | 835-839 | 840-844 | 845-849 | 850-854 | 855-859 | 860-864 | 865-869 | 870-874 | 875-879 | 880-884 | 885-889 | 890-894 | 895-899 | 900-904 | 905-909 | 910-914 | 915-919 | 920-924 | 925-929 | 930-934 | 935-939 | 940-944 | 945-949 | 950-954 | 955-959 | 960-964 | 965-969 | 970-974 | 975-979 | 980-984 | 985-989 | 990-994 | 995-999 | 1000-1004 | 1005-1009 | 1010-1014 | 1015-1019 | 1020-1024 | 1025-1029 | 1030-1034 | 1035-1039 | 1040-1044 | 1045-1049 | 1050-1054 | 1055-1059 | 1060-1064 | 1065-1069 | 1070-1074 | 1075-1079 | 1080-1084 | 1085-1089 | 1090-1094 | 1095-1099 | 1100-1104 | 1105-1109 | 1110-1114 | 1115-1119 | 1120-1124 | 1125-1129 | 1130-1134 | 1135-1139 | 1140-1144 | 1145-1149 | 1150-1154 | 1155-1159 | 1160-1164 | 1165-1169 | 1170-1174 | 1175-1179 | 1180-1184 | 1185-1189 | 1190-1194 | 1195-1199 | 1200-1204 | 1205-1209 | 1210-1214 | 1215-1219 | 1220-1224 | 1225-1229 | 1230-1234 | 1235-1239 | 1240-1244 | 1245-1249 | 1250-1254 | 1255-1259 | 1260-1264 | 1265-1269 | 1270-1274 | 1275-1279 | 1280-1284 | 1285-1289 | 1290-1294 | 1295-1299 | 1300-1304 | 1305-1309 | 1310-1314 | 1315-1319 | 1320-1324 | 1325-1329 | 1330-1334 | 1335-1339 | 1340-1344 | 1345-1349 | 1350-1354 | 1355-1359 | 1360-1364 | 1365-1369 | 1370-1374 | 1375-1379 | 1380-1384 | 1385-1389 | 1390-1394 | 1395-1399 | 1400-1404 | 1405-1409 | 1410-1414 | 1415-1419 | 1420-1424 | 1425-1429 | 1430-1434 | 1435-1439 | 1440-1444 | 1445-1449 | 1450-1454 | 1455-1459 | 1460-1464 | 1465-1469 | 1470-1474 | 1475-1479 | 1480-1484 | 1485-1489 | 1490-1494 | 1495-1499 | 1500-1504 | 1505-1509 | 1510-1514 | 1515-1519 | 1520-1524 | 1525-1529 | 1530-1534 | 1535-1539 | 1540-1544 | 1545-1549 | 1550-1554 | 1555-1559 | 1560-1564 | 1565-1569 | 1570-1574 | 1575-1579 | 1580-1584 | 1585-1589 | 1590-1594 | 1595-1599 | 1600-1604 | 1605-1609 | 1610-1614 | 1615-1619 | 1620-1624 | 1625-1629 | 1630-1634 | 1635-1639 | 1640-1644 | 1645-1649 | 1650-1654 | 1655-1659 | 1660-1664 | 1665-1669 | 1670-1674 | 1675-1679 | 1680-1684 | 1685-1689 | 1690-1694 | 1695-1699 | 1700-1704 | 1705-1709 | 1710-1714 | 1715-1719 | 1720-1724 | 1725-1729 | 1730-1734 | 1735-1739 | 1740-1744 | 1745-1749 | 1750-1754 | 1755-1759 | 1760-1764 | 1765-1769 | 1770-1774 | 1775-1779 | 1780-1784 | 1785-1789 | 1790-1794 | 1795-1799 | 1800-1804 | 1805-1809 | 1810-1814 | 1815-1819 | 1820-1824 | 1825-1829 | 1830-1834 | 1835-1839 | 1840-1844 | 1845-1849 | 1850-1854 | 1855-1859 | 1860-1864 | 1865-1869 | 1870-1874 | 1875-1879 | 1880-1884 | 1885-1889 | 1890-1894 | 1895-1899 | 1900-1904 | 1905-1909 | 1910-1914 | 1915-1919 | 1920-1924 | 1925-1929 | 1930-1934 | 1935-1939 | 1940-1944 | 1945-1949 | 1950-1954 | 1955-1959 | 1960-1964 | 1965-1969 | 1970-1974 | 1975-1979 | 1980-1984 | 1985-1989 | 1990-1994 | 1995-1999 | 2000-2004 | 2005-2009 | 2010-2014 | 2015-2019 | 2020-2024 | 2025-2029 | 2030-2034 | 2035-2039 | 2040-2044 | 2045-2049 | 2050-2054 | 2055-2059 | 2060-2064 | 2065-2069 | 2070-2074 | 2075-2079 | 2080-2084 | 2085-2089 | 2090-2094 | 2095-2099 | 2100-2104 | 2105-2109 | 2110-2114 | 2115-2119 | 2120-2124 | 2125-2129 | 2130-2134 | 2135-2139 | 2140-2144 | 2145-2149 | 2150-2154 | 2155-2159 | 2160-2164 | 2165-2169 | 2170-2174 | 2175-2179 | 2180-2184 | 2185-2189 | 2190-2194 | 2195-2199 | 2200-2204 | 2205-2209 | 2210-2214 | 2215-2219 | 2220-2224 | 2225-2229 | 2230-2234 | 2235-2239 | 2240-2244 | 2245-2249 | 2250-2254 | 2255-2259 | 2260-2264 | 2265-2269 | 2270-2274 | 2275-2279 | 2280-2284 | 2285-2289 | 2290-2294 | 2295-2299 | 2300-2304 | 2305-2309 | 2310-2314 | 2315-2319 | 2320-2324 | 2325-2329 | 2330-2334 | 2335-2339 | 2340-2344 | 2345-2349 | 2350-2354 | 2355-2359 | 2360-2364 | 2365-2369 | 2370-2374 | 2375-2379 | 2380-2384 | 2385-2389 | 2390-2394 | 2395-2399 | 2400-2404 | 2405-2409 | 2410-2414 | 2415-2419 | 2420-2424 | 2425-2429 | 2430-2434 | 2435-2439 | 2440-2444 | 2445-2449 | 2450-2454 | 2455-2459 | 2460-2464 | 2465-2469 | 2470-2474 | 2475-2479 | 2480-2484 | 2485-2489 | 2490-2494 | 2495-2499 | 2500-2504 | 2505-2509 | 2510-2514 | 2515-2519 | 2520-2524 | 2525-2529 | 2530-2534 | 2535-2539 | 2540-2544 | 2545-2549 | 2550-2554 | 2555-2559 | 2560-2564 | 2565-2569 | 2570-2574 | 2575-2579 | 2580-2584 | 2585-2589 | 2590-2594 | 2595-2599 | 2600-2604 | 2605-2609 | 2610-2614 | 2615-2619 | 2620-2624 | 2625-2629 | 2630-2634 | 2635-2639 | 2640-2644 | 2645-2649 | 2650-2654 | 2655-2659 | 2660-2664 | 2665-2669 | 2670-2674 | 2675-2679 | 2680-2684 | 2685-2689 | 2690-2694 | 2695-2699 | 2700-2704 | 2705-2709 | 2710-2714 | 2715-2719 | 2720-2724 | 2725-2729 | 2730-2734 | 2735-2739 | 2740-2744 | 2745-2749 | 2750-2754 | 2755-2759 | 2760-2764 | 2765-2769 | 2770-2774 | 2775-2779 | 2780-2784 | 2785-2789 | 2790-2794 | 2795-2799 | 2800-2804 | 2805-2809 | 2810-2814 | 2815-2819 | 2820-2824 | 2825-2829 | 2830-2834 | 2835-2839 | 2840-2844 | 2845-2849 | 2850-2854 | 2855-2859 | 2860-2864 | 2865-2869 | 2870-2874 | 2875-2879 | 2880-2884 | 2885-2889 | 2890-2894 | 2895-2899 | 2900-2904 | 2905-2909 | 2910-2914 | 2915-2919 | 2920-2924 | 2925-2929 | 2930-2934 | 2935-2939 | 2940-2944 | 2945-2949 | 2950-2954 | 2955-2959 | 2960-2964 | 2965-2969 | 2970-2974 | 2975-2979 | 2980-2984 | 2985-2989 | 2990-2994 | 2995-2999 | 3000-3004 | 3005-3009 | 3010-3014 | 3015-3019 | 3020-3024 | 3025-3029 | 3030-3034 | 3035-3039 | 3040-3044 | 3045-3049 | 3050-3054 | 3055-3059 | 3060-3064 | 3065-3069 | 3070-3074 | 3075-3079 | 3080-3084 | 3085-3089 | 3090-3094 | 3095-3099 | 3100-3104 | 3105-3109 | 3110-3114 | 3115-3119 | 3120-3124 | 3125-3129 | 3130-3134 | 3135-3139 | 3140-3144 | 3145-3149 | 3150-3154 | 3155-3159 | 3160-3164 | 3165-3169 | 3170-3174 | 3175-3179 | 3180-3184 | 3185-3189 | 3190-3194 | 3195-3199 | 3200-3204 | 3205-3209 | 3210-3214 | 3215-3219 | 3220-3224 | 3225-3229 | 3230-3234 | 3235-3239 | 3240-3244 | 3245-3249 | 3250-3254 | 3255-3259 | 3260-3264 | 3265-3269 | 3270-3274 | 3275-3279 | 3280-3284 | 3285-3289 | 3290-3294 | 3295-3299 | 3300-3304 | 3305-3309 | 3310-3314 | 3315-3319 | 3320-3324 | 3325-3329 | 3330-3334 | 3335-3339 | 3340-3344 | 3345-3349 | 3350-3354 | 3355-3359 | 3360-3364 | 3365-3369 | 3370-3374 | 3375-3379 | 3380-3384 | 3385-3389 | 3390-3394 | 3395-3399 | 3400-3404 | 3405-3409 | 3410-3414 | 3415-3419 | 3420-3424 | 3425-3429 | 3430-3434 | 3435-3439 | 3440-3444 | 3445-3449 | 3450-3454 | 3455-3459 | 3460-3464 | 3465-3469 | 3470-3474 | 3475-3479 | 3480-3484 | 3485-3489 | 3490-3494 | 3495-3499 | 3500-3504 | 3505-3509 | 3510-3514 | 3515-3519 | 3520-3524 | 3525-3529 | 3530-3534 | 3535-3539 | 3540-3544 | 3545-3549 | 3550-3554 | 3555-3559 | 3560-3564 | 3565-3569 | 3570-3574 | 3575-3579 | 3580-3584 | 3585-3589 | 3590-3594 | 3595-3599 | 3600-3604 | 3605-3609 | 3610-3614 | 3615-3619 | 3620-3624 | 3625-3629 | 3630-3634 | 3635-3639 | 3640-3644 | 3645-3649 | 3650-3654 | 3655-3659 | 3660-3664 | 3665-3669 | 3670-3674 | 3675-3679 | 3680-3684 | 3685-3689 | 3690-3694 | 3695-3699 | 3700-3704 | 3705-3709 | 3710-3714 | 3715-3719 | 3720-3724 | 3725-3729 | 3730-3734 | 3735-3739 | 3740-3744 | 3745-3749 | 3750-3754 | 3755-3759 | 3760-3764 | 3765-3769 | 3770-3774 | 3775-3779 | 3780-3784 | 3785-3789 | 3790-3794 | 3795-3799 | 3800-3804 | 3805-3809 | 3810-3814 | 3815-3819 | 3820-3824 | 3825-3829 | 3830-3834 | 3835-3839 | 3840-3844 | 3845-3849 | 3850-3854 | 3855-3859 | 3860-3864 | 3865-3869 | 3870-3874 | 3875-3879 | 3880-3884 | 3885-3889 | 3890-3894 | 3895-3899 | 3900-3904 | 3905-3909 | 3910-3914 | 3915-3919 | 3920-3924 | 3925-3929 | 3930-3934 | 3935-3939 | 3940-3944 | 3945-3949 | 3950-3954 | 3955-3959 | 3960-3964 | 3965-3969 | 3970-3974 | 3975-3979 | 3980-3984 | 3985-3989 | 3990-3994 | 3995-3999 | 4000-4004 | 4005-4009 | 4010-4014 | 4015-4019 | 4020-4024 | 4025-4029 | 4030-4034 | 4035-4039 | 4040-4044 | 4045-4049 | 4050-4054 | 4055-4059 | 4060-4064 | 4065-4069 | 4070-4074 | 4075-4079 | 4080-4084 | 4085-4089 | 4090-4094 | 4095-4099 | 4100-4104 | 4105-4109 | 4110-4114 | 4115-4119 | 4120-4124 | 4125-4129 | 4130-4134 | 4135-4139 | 4140-4144 | 4145-4149 | 4150-4154 | 4155-4159 | 4160-4164 | 4165-4169 | 4170-4174 | 4175-4179 | 4180-4184 | 4185-4189 | 4190-4194 | 4195-4199 | 4200-4204 | 4205-4209 | 4210-4214 | 4215-4219 | 4220-4224 | 4225-4229 | 4230-4234 | 4235-4239 | 4240-4244 | 4245-4249 | 4250-4254 | 4255-4259 | 4260-4264 | 4265-4269 | 4270-4274 | 4275-4279 | 4280-4284 | 4285-4289 | 4290-4294 | 4295-4299 | 4300-4304 | 4305-4309 | 4310-4314 | 4315-4319 | 4320-4324 | 4325-4329 | 4330-4334 | 4335-4339 | 4340-4344 | 4345-4349 | 4350-4354 | 4355-4359 | 4360-4364 | 4365-4369 | 4370-4374 | 4375-4379 | 4380-4384 | 4385-4389 | 4390-4394 | 4395-4399 | 4400-4404 | 4405-4409 | 4410-4414 | 4415-4419 | 4420-4424 | 4425-4429 | 4430-4434 | 4435-4439 | 4440-4444 | 4445-4449 | 4450-4454 | 4455-4459 | 4460-4464 | 4465-4469 | 4470-4474 | 4475-4479 | 4480-4484 | 4485-4489 | 4490-4494 | 4495-4499 | 4500-4504 | 4505-4509 | 4510-4514 | 4515-4519 | 4520-4524 | 4525-4529 | 4530-4534 | 4535-4539 | 4540-4544</ |

Figures A, B and C: Estimates of 25 for the Fijian and Indian components of the population of Tonga for years and methods as indicated.



of 30 is in sight. Fiji, Niue and Western Samoa have now reached this

point.

Estimates of child mortality for some countries derived by

application of Brass method to proportions dead amongst children ever born alive are given in table 3. The fertility pattern was determined by the indices  $P_2/P_3$  (for the three youngest age groups) and by the mean age of the fertility schedule,  $\bar{x}$  (for the older age-groups). The table includes only the values of  $I_2$ ,  $I_3$  and  $I_5$  since for the South Pacific region these values are considered as the most reliable, though giving minimum estimates of mortality.

It will be noted from table 3 that the child mortality estimates

provide the same picture as the infant mortality estimates in figure 3

since the estimates are in both cases derived from lifetime fertility

data for these countries. A comparison of the two sets of data gives a

rather vague indication that in some countries the level of infant mortality

is relatively low compared to mortality of children between age 1 and 4.

This is for instance suggested by the vital registration data of Niue.<sup>13/</sup>

This difference in Niue could partly be explained by the fact that the risk

of mortality in the first days of life is reduced to a minimum since

virtually all children in Niue are born in the hospital in Alofi, whereas

later and especially after breast feeding has stopped, the risk of mortality

becomes relatively higher.<sup>14/</sup>

## 2. Adult Mortality

During the period immediately following the Second World War,

methodology for indirect mortality estimation was a poorly developed

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14/ A part of the difference in infant mortality and child mortality for the age group 1-4 appeared not to be real and were corrected by means of a "stillbirth" correction and a "rounding on age 1" correction. Even after these corrections there was still a small difference.

51

Source: For Fig. 1, See F.H.A.G. Zwart, Report on the Census of Population

Notes: \* Corresponding level in "West" M.T.'s.

\*\* Either  $D_i$  or  $I_x$  values have been graduated.

\*\*\* Estimates derived by means of Preston method were considered to be superior and the  $\lambda$  values estimated by means of this method were used for life table construction.

Fltians: males 94,800, females 96,000, Indians; males 94,200, females 95,400 (Zwart, 1979, p. 211).



modern-type censuses of the South Pacific region, although most censuses after World War II provided information on the age-structure of the population in at least 5-year age-groups. However, at a much later stage, data from censuses were used as a basis of estimating mortality levels, but by that time a number of other methods was already available.

It should also be noted that the results of the stable population analysis must be considered as approximate in most cases. Most populations, also in the South Pacific region, have evidently deviated from the stable state during the period after the Second World War, although notable exceptions seem to have been Tonga until 1966 and parts of Papua New Guinea. Until quite recently, the populations of these two countries were more or less closed and fertility had remained almost unchanged at very high levels for a long time.

In spite of the not very robust character of the stable and quasi-stable methods, fairly reasonable results were obtained by means of these methods in the analysis of census data of the population of Tonga for 1956 and 1966<sup>15</sup> and the indigenous population of Papua New Guinea<sup>16</sup>. Stable and quasi-stable population analysis was also attempted for

population of other island countries such as Gilbert and Ellice Islands, Solomon Islands, Western Samoa and Fiji, but in most cases the results were not published. The results of the analysis for Fiji, Tonga and Papua

New Guinea are summarised in table 4.

It is now becoming increasingly more difficult to obtain accurate estimates of adult mortality in the South Pacific region. The stable

methods cannot any more be successfully applied to census data in many

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15/ M.L. Bakker, A. Demographic Analysis of the Population of Tonga, Occasional Paper No. 14) South Pacific Commission, March 1979.  
16/ van de, D.J. van de, The Demography of Papua and New Guinea's Population (Ph.D. thesis), Australian National University, 1981.

Table 4. Estimates of mortality level, stable crude death rate(d),  $e_0$  and  $e_5$  for Fiji, Tonga and Papua New Guinea

| Census Sex Level                        | d      | $e_0$  | $e_5$          |
|-----------------------------------------|--------|--------|----------------|
| Year                                    | "West" | (0/00) | (yrs)          |
| Fiji (all components)                   |        |        |                |
| 1966                                    | f      | 13.9   | 14.3 52.1 57.1 |
| Tonga (Tongan component)                |        |        |                |
| 1956                                    | m      | 15.1   | 13.9 52.0 56.4 |
| "                                       | f      | 14.4   | 13.5 53.5 57.9 |
| 1966                                    | m      | 14.0   | 15.5 49.5 55.0 |
| "                                       | f      | 13.9   | 14.1 52.3 57.2 |
| Papua New Guinea (Indigenous component) |        |        |                |
| 1966                                    | m      | -      | 22.4 40.8 -    |
| "                                       | f      | -      | 24.0 39.4 -    |

Sources:

For Fiji, see Henry S. Shryock, Jacob, S. Siegel and Associates, The Methods and Materials of Demography, Vol. II, 1973, p. 825. For Tonga, see M.L. Bakker, A Demographic Analysis of the Population of Tonga, 1977-1975, South Pacific Commission, 1979, p. 56 and p. 63. For Papua New Guinea, see D.J. van de Kaap, Die Berechnung der Bevölkerungsziffern und die voraussichtliche Entwicklung in Papua-Neuguinea. Jahrbüchern für Nationalökonomie und Statistik, Band 186, Heft 5:419-444 Gustav Fischer Verlag, Stuttgart (1972), p. 432.

Notes:

Quasi stable estimates.

In addition to the estimates given in table 5, estimates of female adult mortality for the Fijian and Indian component of the population of Fiji were also obtained by means of the Brass and Hill technique as well as Preston's "orphanhood" method. The estimates of  $e_{25}$  obtained by various methods for Fiji and Tonga are shown in Figure 4.

It would appear that the Preston estimates of  $e_{25}$  derived from 1966 and 1956 census data are considerably higher than the intercensal survivorship estimates for the intercensal periods prior to 1966. In the case of Fijian females, it is possible that the Preston estimates of  $e_{25}$  are on the high side. Because of the frequent occurrence of adoption in many countries of the region, it seems justifiable to presume that many foster mothers reported their adopted children as own children still alive at the census. However, a considerable number of these children were orphans in reality and this has led to an over-estimate of the number of non-orphaned children. These non-orphaned children are input data for the Preston method and consequently the values of  $e_{25}$  must be over estimated for population where the adoption bias had occurred.

In addition to the estimates included in table 5, reasonable estimates of adult mortality for the Melanesian component of the population of New Caledonia were made by application of Brass' intercensal survivorship method.<sup>17/</sup> The average values of  $e_{25}$  obtained by this method were as follows.

| Intercensal period | Males | Females |
|--------------------|-------|---------|
| 1956-1963          | -     | 41.2    |
| 1963-1969          | -     | 42.0    |
| 1969-1976          | 43.3  | 43.8    |

<sup>17/</sup> M.J. Garsen, The Melanesians of New Caledonia: An Assessment of the Accuracy of the Population Statistics, 1956-1976. Geographical Institute, Groningen State Institute for Population Studies.

Table 5 : Estimates of adult mortality for Fiji (Fijian and Indian component), Kiribati, Niue (all components), Solomon Islands (Melanesian component) and Tuvalu by means of the maternal and paternal orphanhood method of Brass and Hill. Standard is GPF. ....

| Population          | year | Int.val. <sub>12</sub> | $\alpha$ | $\beta$ | $\sigma$ | $\sigma_{25}$ | Source                              |
|---------------------|------|------------------------|----------|---------|----------|---------------|-------------------------------------|
| Maternal orphanhood |      |                        |          |         |          |               |                                     |
| Fiji, Fij.comp...   | 1976 | 96000                  | -        | 1.2400* | -        | -             | Zwart, 1979, p.212-220 and p.144    |
| " (adj)             | "    | 96000                  | -0.7378  | 1.1900  | 63.9     | 44.1          | "                                   |
| Fiji, Ind.comp...   | "    | 95400                  | -        | 1.2300* | -        | -             | " and p.146                         |
| " (adj)             | "    | 95400                  | -0.6719  | 1.1800  | 62.4     | 43.3          | "                                   |
| Kiribati            | 1978 | 89300                  | -        | 1.0300  | 53.8     | 40.2          | Macrae, 1980,                       |
| Niue                | 1976 | 96085                  | -0.7533  | 1.1841  | 64.3     | 44.4          | Kalauni and Bakker, 1979, p.182-193 |
| Solomon Islands     | "    | 93800                  | -0.3499  | 1.4100  | 54.0     | 36.8          | Macrae, 1981,                       |
| Tuvalu              | 1978 | 94700                  | -        | 1.2100  | 60.1     | 39.9          | Macrae, 1980,                       |
| Paternal orphanhood |      |                        |          |         |          |               |                                     |
| Fiji, Fij.comp...   | 1976 | 94800                  | -        | 1.2700  | -        | -             | Zwart, 1979, p.212-220 and p.143    |
| " (adj)             | "    | 94800                  | -0.6003  | 1.1900  | 60.7     | 42.2          | "                                   |
| Fiji, Ind.comp...   | "    | 94200                  | -        | 1.2800  | -        | -             | " and p.145                         |
| " (adj)             | "    | 94200                  | -0.5497  | 1.1800  | 59.5     | 41.6          | "                                   |
| Kiribati            | 1978 | 87500                  | -        | 1.0700  | 50.3     | 38.1          | Macrae, 1980                        |
| Niue                | 1976 | 94628                  | -0.7090  | 1.0143  | 64.3     | -             | Kalauni and Bakker, 1979, p.182-193 |
| Niue (adj)          | "    | 93880...               | -0.5894  | 1.1841  | 60.5     | 42.1          | "                                   |
| Solomon Islands     | "    | 92800                  | -0.3484  | 1.3000  | 54.1     | 37.7          | Macrae, 1981,                       |
| Tuvalu              | 1978 | 93400                  | -        | 1.2200  | 56.9     | 41.7          | Macrae, 1980,                       |

Notes: \* Using the Hill/Trussell regression equations = 1.2600 for Fijian and 1.2200 for Indian females.

\*\*  $\beta$  values considered to be too high. Life tables have been calculated with adjusted  $\beta$ 's.

\*\*\*  $\beta$  value taken in stead of  $\beta_2$  value.

\*\*\*\*Widowhood method has been applied to Fijian 1976 census data. The results were not consistent and have not been published. (Zwart, 1979, p.215)



For Western Samoa, hybrid life tables developed by <sup>18/</sup>Hauman for 1971-76 gave <sup>25</sup> value of 42.3 for males and 44.6 for females.

There are no recent estimates of adult mortality available for the American territories and French Polynesia. Orphanhood questions are not included in the census schedules and inter-censal survivorship methods cannot be applied because of the lack of complete and accurate external migration data.

### 3. Mortality Differentials

Very little information is available on differential mortality in countries of the South Pacific region. Censuses usually provide separate information for major ethnic groups. Information is usually available for the indigenous component of the census populations and in addition for the Chinese and European components. Nevertheless difficulties of classification arise in regard to such categories as "mixed races", "part Europeans", "half Europeans", "non-indigenous" etc. in the censuses. Moreover, the official registry for vital events and the immigration authorities often do not use the same definitions of ethnic groups. These factors make estimation of mortality for these groups very difficult, if not impossible. Separate estimates of infant and child mortality were made for rural and urban areas in Kiribati for 1978. The rates appeared to be higher in rural than in urban areas (Tarawa); but it is not certain whether this difference is artificial (differential response) or genuine.<sup>19/</sup> Geographically, the rates appeared to be higher in the northern group and lower in the southern group inspite the fact that islands in the northern group are more fertile and receive more rainfall and the people have better food to eat. Nevertheless, these differences could partly be explained by

<sup>18/</sup> M. Hartman, Evaluation of the mortality region during 1971-1976 in Western Samoa, Department of Statistics, Western Samoa, Apia March 1979.  
<sup>19/</sup> S.M. Macrae, Kiribati 1978 census Vol. II, South Pacific Commission, Noumea, New Caledonia, 1980.

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the high incidence of parasitic diseases in the more humid northern  
islands. 20/