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**Regression estimates of changes
in fertility, 1955 - 60 to 1965 - 75,
for most major nations
and territories**

James A. Palmore

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James A. Palmore

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PREFACE

The research reported here was funded primarily by a grant to the author (No. 5R01HD09051) from the National Institute of Child Health and Human Development and in part by a grant from the Office of Population, United States Agency for International Development, to the East-West Population Institute (Grant No. AID/pha-G-1058). Many persons participated in the data collection and computer programming on which the present report is based. I am particularly indebted to Carol Carlson, David Swanson, Ruby Bussen, and George C. Omen. Monica Fong collaborated in early stages of the present research and contributed substantially to the data collection strategies. Helpful comments on an earlier draft were received from Lee-Jay Cho, Griffith Feeney, and Sandra Ward.

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ABSTRACT Using data from the 1970 round of censuses, this paper updates procedures originally proposed by Bogue and Palmore in 1964. Two types of fertility measure are common: direct measures, based on both vital statistics and census data, and indirect measures, based solely on census data. Examples of direct measures are the total fertility rate and age-specific fertility rates. The child-woman ratio is an example of indirect measures. Using information for countries with good data from both censuses and vital registration, one can calculate regression equations for estimating direct fertility measures from indirect fertility measures. These equations can be used subsequently to estimate the direct fertility measures for countries lacking good vital statistics.

Employing the methods described above, the paper estimates trends in fertility for the less developed countries of the world from around 1960 to around 1970. Also discussed are the probable margins of error. The results support the contention that most of the countries reduced their fertility between 1955–60 and 1965–75. Despite these declines, however, fertility rates for much of the world remained very high as of the latest census.

In 1964, almost two-thirds of the world's population was characterized by inadequate birth registration. In 1978, the situation is not much better. Knowledge of world-wide fertility trends must therefore be based on estimates using alternative data sources.

Several methods are currently available for preparing such estimates. The methods most often applied are the own-children method (Cho 1973, Cho 1975, Cho and Feeney 1978, and Retherford and Cho 1978), the Brass method (Brass and Coale 1968), and the Bogue-Palmore method (Bogue and Palmore 1964). Other methods include "reverse survival" techniques and methods based on stable or quasi-stable population theory (United Nations 1949, 1956, 1967). Newer methods are numerous and include those of Coale, Hill, and Trussell (1975), Talwar (1971), Arriaga and Anderson (1975), and Feeney (1974, 1977).

The principal differences between the various estimation techniques arise from two sources: different data requirements as input to the estimation method, and different assumptions about the nature of the populations for which the estimation is being performed. Of the three

methods most often applied, the Bogue-Palmore method has the advantage of requiring only data that are usually available in published sources, although the precision of the estimates is probably less than that of several other techniques. Since many nations do not, even in 1978, possess the data required for using many of the other methods, the Bogue-Palmore method remains useful, particularly for assessing fertility changes in countries with minimal published census data and inadequate vital registration.

Recently, I have updated and revised the 1964 Bogue-Palmore regression equations, for two reasons. First, the equations currently in use were derived with 1955-60 data. Since that period, several countries (e.g., West Malaysia and Hong Kong) that were not included in the original regression equations have obtained data of sufficient detail and quality to allow their inclusion in the equations. Second and more important, the relationships between the various fertility measures in 1955-60 may not still obtain for 1965-75. Using estimates calculated based on the newly derived regression equations, this report summarizes fertility changes for most major nations and territories in the world. The focus is on the period from 1955-60 to 1965-75.

DATA AND METHODS

Fertility estimates were prepared for every country or territory in the world for which my colleagues and I could obtain the needed data. Since recent census data were unavailable for China, it is omitted from the estimates, although the method could be applied if the input data become known.

The new regression equations, and the methodology used to derive them, are presented in the Appendix, since the procedure is complex in practice although relatively simple in principle. The principle can be summarized in two paragraphs.

Using data from the 1970 round of censuses, I updated the method originally proposed by Bogue and Palmore (1964). Two types of fertility measures are common: direct measures, based on both vital statistics and census data, and indirect measures, based solely on census data. Examples of direct measures are the total fertility rate and age-specific fertility rates. The child-woman ratio is an example of indirect measures.

Using information for countries with good data from both censuses and vital statistics, one can calculate regression equations for estimating direct fertility measures from indirect fertility measures. These

equations can be used subsequently to estimate the direct fertility measures for countries lacking good vital statistics.

The data used for the 1965–75 period are presented in the Appendix Table. The data needed for the most recent census year were (1) the percentage of the total population in three age groups (0–4, 5–9, and 0–14); (2) the ratio of children to women aged 15–49 for three age groups of children (0–4, 5–9, and 0–14); (3) the percentage of women ever married in each five-year age group in the age range of 15–49; (4) the index of fertility age composition (explained in the Appendix); (5) the median age at marriage; and (6) the infant mortality rate. For countries missing one or more of the above data sets, regression equations that did not include that set(s) were employed (see Appendix). For the 1955–60 period, the data presented by Cho (1964, appendix table A) were used.

The input data are all census data with the exception of the infant mortality rate. This rate, often an estimate, was found to strongly affect the explained variance of the newly derived regression equations and also is a logical entry since the children alive at the census date are only a fraction of those born X years before. The inclusion of the infant mortality rate does, however, raise some questions about both the estimates themselves and the basic method. I will return to this issue later in the paper.

The estimates I obtained are summarized in Tables 1–4. In Table 1, only the crude birth rate and total fertility rate are presented. These are compared with the same rates for an earlier year using the data presented by Lee-Jay Cho (1964), who first applied the Bogue-Palmore 1964 equations to obtain estimates for every country. I have used his data as input with the new equations to obtain estimates that use a consistent method for two dates, hence allowing calculation of changes in fertility rates from 1955–60 to 1965–75. For simplicity, although this yields an underestimate of the annual rates of change, I have assumed that Cho's data were all for the year 1960 (Cho's article does not give the year for each country's data). Table 1 provides the years for the later estimates. Tables 2 and 3 summarize data contained in Table 1.

Table 4 reports more fully the estimates for the most recent census year. The age-specific rates are included in this table. For all countries (except those with good vital registration), two sets of figures are presented. In the first row, the "standard" estimate of rates is recorded. This set of "standard" estimates was prepared as follows:

TABLE 1 Regression estimates of national crude birth rates and total fertility rates for 1955–60 and most recent census year available; Population Reference Bureau estimates of crude birth rates for 1970–75; and average annual percentages of change in fertility rates: major countries and territories

| Region and country or territory | Class of estimate ^a | Most recent census year for which data were available | Regression estimate of rate, 1955–60 ^b | | Regression estimate of rate, most recent census year ^c | | Population Reference Bureau estimate, 1970–75 | Average annual percentage increase or decrease since 1955–60 | |
|---------------------------------------|--------------------------------|---|---|-------|---|-------|---|--|------|
| | | | CBR | TFR | CBR | TFR | CBR | CBR | TFR |
| AFRICA | | | | | | | | | |
| Algeria | 3, II | 1966 | 44.7 | 6,818 | 48.4 | 7,609 | 48 | 1.3 | 1.8 |
| Angola | 3 | 1960 | u | u | 52.6 | 6,954 | 47 | u | u |
| Benin (Dahomey): Afr. pop. | 5 | 1961 | u | u | 51.2 | 6,427 | 50 | u | u |
| Botswana | 3 | 1971 | u | u | 43.5 | 6,272 | 46 | u | u |
| Burundi (Ruanda-Urundi) | 5 | 1965 | u | u | 45.9 | 6,378 | 41 | u | u |
| Brazzaville, People's Rep. of (Congo) | 3, IV | 1974 | 47.6 | 5,987 | 46.2 | 5,984 | 45 | -0.2 | -0.0 |
| Central African Rep. (Fr. Eq. Africa) | 3 | 1960 | u | u | 48.5 | 5,181 | 43 | u | u |
| Chad: Afr. pop. | 5 | 1964 | u | u | 53.1 | 5,783 | 44 | u | u |
| Comoro Is. | 5 | 1958 | u | u | 44.9 | 5,541 | 45 | u | u |
| Egypt (United Arab Rep.) | 5, II | 1960 | 40.6 | 5,990 | 41.5 | 6,085 | 36 | u | u |
| Equatorial Guinea (Fr. Guinea) | 5 | 1965 | u | u | 42.1 | 5,819 | 37 | u | u |
| Gabon | 5 | 1961 | u | u | 40.4 | 4,992 | 32 | u | u |
| Gambia | 5 | 1973 | u | u | 54.1 | 7,132 | 42 | u | u |
| Ghana | 5 | 1970 | 48.2 | 6,697 | 50.1 | 7,182 | 47 | 0.3 | 0.7 |
| Guinea Bissau | 5 | 1970 | u | u | 46.7 | 6,458 | 40 | u | u |
| Guinea | 5, II | 1955 | 54.6 | 6,596 | 54.8 | 6,259 | 47 | u | u |

| | | | | | | | | | |
|----------------------------------|--------|------|------|-------|------|-------|----|------|------|
| Ivory Coast | 5, III | 1961 | 43.9 | u | 52.1 | 6,820 | 46 | u | u |
| Kenya | 3, IV | 1969 | 49.0 | 6,714 | 51.1 | 7,705 | 49 | 0.5 | 1.5 |
| Lesotho (Basutoland) | 3, II | 1966 | 50.9 | 6,705 | 37.5 | 4,773 | 39 | -5.1 | -5.7 |
| Liberia | 3 | 1962 | u | u | 44.7 | 5,085 | 50 | u | u |
| Libyan Arab Rep. (Libya) | 5 | 1973 | u | u | 49.3 | 8,783 | 48 | u | u |
| Malagasy Rep. (Madagascar) | 3, III | 1966 | 44.9 | 5,843 | 45.8 | 6,731 | 50 | 0.3 | 2.4 |
| Malawi (Br. Nyasaland) | 5 | 1966 | u | u | 49.4 | 6,525 | 48 | u | u |
| Mali (Fr. Sudan) | 5 | 1961 | u | u | 47.8 | 6,077 | 50 | u | u |
| Mauritius | 1, I | 1972 | 40.8 | 5,907 | 24.8 | 3,418 | 25 | -4.1 | -4.6 |
| Morocco | 3 | 1971 | u | u | 46.4 | 7,015 | 48 | u | u |
| Mozambique | 5 | 1960 | u | u | 48.0 | 6,087 | 43 | u | u |
| Namibia (Southwest Africa) | 3 | 1960 | u | u | 47.8 | 6,882 | 44 | u | u |
| Nigeria | 5, IV | 1963 | 49.8 | 6,285 | 52.6 | 6,141 | 49 | u | u |
| Reunion | 1, III | 1967 | 46.4 | 6,844 | 38.7 | 6,007 | 28 | -2.6 | -1.9 |
| Rwanda | 5 | 1970 | u | u | 45.6 | 6,625 | 51 | u | u |
| Sao Tome & Principe | 5 | 1960 | u | u | 43.8 | 5,975 | 45 | u | u |
| Senegal | 5 | 1961 | u | u | 46.9 | 5,435 | 46 | u | u |
| Seychelles | 3 | 1971 | u | u | 31.8 | 5,845 | 33 | u | u |
| Sierra Leone | 5 | 1963 | u | u | 47.3 | 5,262 | 45 | u | u |
| Somalia | 5 | 1965 | u | u | 52.5 | 7,408 | 47 | u | u |
| S. Rhodesia | | | | | | | | | |
| Afr. pop. | 5 | 1969 | u | u | 45.6 | 6,534 | | u | u |
| Asian pop. | 3 | 1969 | u | u | 24.5 | 2,970 | 48 | u | u |
| Colored pop. | 3 | 1969 | u | u | 41.0 | 5,851 | | u | u |
| Euro. pop. | 3 | 1969 | u | u | 16.3 | 2,233 | | u | u |
| Spanish Sahara | 3 | 1970 | u | u | 37.1 | 5,501 | u | u | u |
| Sudan | 5, III | 1970 | 52.2 | 7,804 | 51.1 | 7,536 | 48 | -0.3 | -0.3 |
| Swaziland | 5, IV | 1966 | 50.3 | 7,134 | 50.3 | 7,233 | 49 | 0.0 | 0.2 |
| Tanganyika (U. Rep. of Tanzania) | 3, II | 1967 | 48.3 | 6,116 | 51.4 | 6,909 | u | 0.9 | 1.7 |

TABLE 1 (continued)

| Region and country or territory | Class of estimate ^a | Most recent census year for which data were available | Regression estimate of rate, 1955-60 ^b | | Regression estimate of rate, most recent census year ^c | | Population Reference Bureau estimate, 1970-75 | Average annual percentage increase or decrease since 1955-60 | |
|--|--------------------------------|---|---|-------|---|-------|---|--|------|
| | | | CBR | TFR | CBR | TFR | | CBR | TFR |
| <i>AFRICA (continued)</i> | | | | | | | | | |
| Tunisia | 1, II | 1966 | 43.5 | 6,063 | 42.8 | 7,218 | 34 | -0.3 | 2.9 |
| Togo | 5, IV | 1970 | 51.8 | 6,336 | 55.9 | 7,257 | 51 | 0.8 | 1.4 |
| Uganda | 5, II | 1969 | 47.5 | 5,320 | 51.3 | 7,617 | 43 | 0.9 | 2.1 |
| Union of South Africa | | | | | | | | | |
| White pop. | 3 | 1970 | u | u | 22.7 | 2,974 | | u | u |
| Black pop. | 3, II | 1970 | 46.7 | 7,030 | 46.1 | 6,841 | 40 | -0.1 | -0.3 |
| Asian pop. | 3 | 1970 | u | u | 33.0 | 3,902 | | u | u |
| Bantu pop. | 3 | 1970 | u | u | 42.2 | 6,105 | | u | u |
| Upper Volta | 5, III | 1961 | 49.4 | 6,292 | 51.7 | 6,307 | 48 | u | u |
| West Cameroon, United Rep. of | | | | | | | | | |
| Zaire: Afr. pop. | 3 | 1958 | u | u | 42.2 | 4,660 | 45 | u | u |
| Zambia | 3 | 1969 | u | u | 51.0 | 6,769 | 50 | u | u |
| Zanzibar & Pemba (United Rep. of Tanzania) | 3, III | 1967 | 40.2 | 5,449 | 51.1 | 7,231 | 47 | 3.4 | 4.0 |
| <i>NORTH AND CENTRAL AMERICA</i> | | | | | | | | | |
| Antigua | 5 | 1970 | u | u | 31.5 | 5,021 | u | u | u |
| Bahamas | 2 | 1970 | u | u | 25.3 | 3,453 | 20 | u | u |
| Barbados | 2, II | 1970 | 33.6 | 5,022 | 20.3 | 2,720 | 19 | -5.1 | -6.1 |
| Belize (Br. Honduras) | 2 | 1970 | u | u | 37.2 | 6,276 | u | u | u |
| Bermuda | 5, II | 1970 | 28.2 | 4,014 | 18.2 | 2,193 | u | -4.4 | -6.0 |

| | | | | | | | | | |
|------------------------------|--------|------|------|-------|------|-------|----|------|------|
| Canada | 1, I | 1971 | 27.8 | 4,075 | 16.8 | 2,219 | 16 | -4.6 | -5.5 |
| Canal Zone, USA | 2 | 1970 | u | u | 16.4 | 2,209 | u | u | u |
| Costa Rica | 1, I | 1973 | 49.7 | 7,068 | 28.5 | 3,913 | 29 | -4.3 | -4.5 |
| Cuba | 3, III | 1970 | 32.5 | 4,324 | 31.2 | 4,332 | 22 | -0.4 | 0.0 |
| Dominica | 2, II | 1960 | 46.8 | 7,591 | 46.9 | 7,130 | u | u | u |
| Dominican Rep. | 3, III | 1970 | 42.1 | 6,171 | 39.4 | 5,827 | 46 | -0.7 | -0.6 |
| El Salvador | 1, I | 1971 | 46.5 | 6,232 | 43.5 | 6,119 | 40 | -0.6 | -0.2 |
| Granada | 5, II | 1960 | 46.1 | 7,618 | 47.9 | 7,368 | 26 | u | u |
| Greenland | 2, II | 1970 | 42.7 | 6,146 | 24.6 | 3,483 | u | -5.5 | -5.7 |
| Guadeloupe | 1, III | 1967 | 37.3 | 5,542 | 31.6 | 5,296 | 28 | -2.4 | -0.7 |
| Guatemala | 1, I | 1973 | 49.5 | 6,510 | 43.4 | 6,257 | 43 | -1.0 | -0.3 |
| Haiti | 3, II | 1971 | 42.4 | 5,662 | 39.9 | 5,579 | 36 | -0.5 | -0.1 |
| Honduras | 3, II | 1961 | 43.1 | 6,517 | 44.1 | 6,458 | 49 | u | u |
| Jamaica | 2, II | 1970 | 37.1 | 5,499 | u | u | 30 | u | u |
| Martinique | 1, III | 1967 | 38.0 | 5,666 | 30.8 | 5,118 | 22 | -3.0 | -1.5 |
| Mexico | 1, I | 1970 | 45.0 | 6,268 | 43.6 | 6,565 | 42 | -0.3 | 0.5 |
| Netherlands Antilles | 3, III | 1971 | 37.1 | 5,875 | 24.5 | 3,332 | 20 | -3.8 | -5.2 |
| Nicaragua | 3, II | 1971 | 42.2 | 6,208 | 39.4 | 5,690 | 48 | -0.5 | -0.8 |
| Panama | 1, I | 1970 | 40.9 | 5,667 | 37.1 | 5,086 | 31 | -1.0 | -1.1 |
| Puerto Rico | 1, I | 1970 | 33.7 | 4,855 | 24.2 | 3,159 | 23 | -3.1 | -4.3 |
| St. Kitts, Nevis, & Anguilla | 2, III | 1970 | 45.4 | 7,379 | 25.8 | 5,126 | u | -5.7 | -3.6 |
| St. Lucia | 2, II | 1970 | 43.6 | 6,676 | 39.9 | 6,638 | u | -0.9 | -0.1 |
| St. Vincent | 2, II | 1960 | 51.4 | 8,419 | 49.6 | 7,250 | u | u | u |
| Trinidad & Tobago | 2, I | 1970 | 39.5 | 5,536 | 27.0 | 3,732 | 24 | -3.8 | -3.9 |
| USA | | | | | | | | | |
| Non-white pop. | 1, I | 1970 | 34.3 | 4,861 | 25.1 | 3,070 | 15 | -3.1 | -4.6 |
| White pop. | 1, I | 1970 | 23.5 | 3,674 | 17.4 | 2,385 | | -3.0 | -4.3 |
| Virgin Is., USA | 2, I | 1970 | 35.2 | 5,348 | 46.7 | 5,300 | u | 2.8 | -0.1 |

TABLE 1 (continued)

| Region and country or territory | Class of estimate ^a | Most recent census year for which data were available | Regression estimate of rate, 1955-60 ^b | | Regression estimate of rate, most recent census year ^c | | Population Reference Bureau estimate, 1970-75 | Average annual percentage increase or decrease since 1955-60 | |
|---------------------------------|--------------------------------|---|---|-------|---|-------|---|--|------|
| | | | CBR | TFR | CBR | TFR | | CBR | TFR |
| SOUTH AMERICA | | | | | | | | | |
| Argentina | 1, I | 1970 | 23.2 | 2,962 | 22.5 | 3,088 | 23 | -0.3 | 0.4 |
| Bolivia | 3, III | 1950 | 42.1 | 5,845 | 40.9 | 5,285 | 44 | u | u |
| Brazil | 3, II | 1970 | 43.5 | 6,131 | 44.1 | 6,249 | 37 | 0.1 | 0.2 |
| Chile | 1, I | 1970 | 35.4 | 4,537 | 27.0 | 3,584 | 24 | -2.7 | -2.4 |
| Colombia | 3, III | 1973 | 41.5 | 5,886 | 30.0 | 3,967 | 33 | -2.5 | -3.0 |
| Ecuador | 3, II | 1974 | 39.9 | 6,304 | 39.4 | 5,794 | 42 | -0.1 | -0.6 |
| French Guiana | 3 | 1967 | u | u | 33.2 | 6,043 | u | u | u |
| Guyana (Br. Guiana) | 5, I | 1970 | 43.2 | 6,174 | 35.8 | 5,833 | 32 | -1.9 | -0.6 |
| Paraguay | 3, II | 1972 | 36.3 | 5,285 | 35.1 | 5,266 | 40 | -0.3 | -0.0 |
| Peru | 3, II | 1972 | 42.7 | 6,470 | 39.8 | 5,803 | 41 | -0.6 | -0.9 |
| Surinam (Dutch Guiana) | 5 | 1964 | u | u | 37.2 | 5,618 | 37 | u | u |
| Uruguay | 1 | 1963 | u | u | 23.8 | 2,911 | 21 | u | u |
| Venezuela | 3, II | 1971 | 40.9 | 6,466 | 38.6 | 4,850 | 37 | -0.5 | -2.6 |
| ASIA | | | | | | | | | |
| Afghanistan | 5, IV | 1975 | 46.9 | 7,221 | 54.7 | 7,540 | 43 | 1.0 | 0.3 |
| Bahrain | 5 | 1971 | u | u | 36.6 | 6,312 | 43 | u | u |
| Bangladesh (E. Pakistan) | 5 | 1974 | u | u | 44.8 | 6,360 | 47 | u | u |
| Bhutan | 6 | 1970 | u | u | 38.2 | 5,360 | 44 | u | u |
| Brunei | 1, II | 1971 | 48.8 | 7,976 | 38.4 | 5,957 | u | -2.2 | -2.7 |
| Burma | 5, III | 1973 | 44.1 | 5,552 | 42.4 | 5,973 | 40 | -0.3 | 0.6 |

| | | | | | | | | | |
|-----------------------------------|--------|------|------|-------|------|-------|-----|------|------|
| Dem. Rep. of Vietnam (North) | 3, II | 1973 | 27.5 | 3,930 | 18.3 | 2,426 | 17 | -3.1 | -3.7 |
| Hong Kong | 6 | 1970 | u | u | 34.7 | 5,058 | 42+ | u | u |
| India | 1, II | 1971 | 35.2 | 5,455 | 19.7 | 3,549 | 20 | -5.3 | -3.9 |
| Indonesia | 3, III | 1971 | 41.0 | 5,424 | 40.1 | 5,761 | 34 | -0.2 | 0.5 |
| Iran | 3, III | 1971 | 45.4 | 5,856 | 44.2 | 5,939 | 38 | -0.2 | 0.1 |
| Iraq | 3, III | 1966 | 44.2 | 6,493 | 49.0 | 7,661 | 44 | 1.7 | 2.8 |
| Israel | 3, II | 1976 | 47.1 | 7,690 | 49.9 | 8,285 | 44 | 1.1 | 1.5 |
| Japan | 1, I | 1972 | 27.9 | 4,101 | 27.8 | 3,778 | 28 | 0.0 | -0.7 |
| Jordan | 1, I | 1970 | 16.8 | 1,978 | 19.0 | 2,069 | 17 | 1.2 | 0.4 |
| Khmer Rep. (Cambodia) | 3 | 1961 | u | u | 42.8 | 6,247 | 48 | u | u |
| Kuwait | 3, III | 1962 | 48.9 | 7,179 | 40.7 | 5,771 | 47 | u | u |
| Laos | 5, III | 1970 | 33.8 | 6,742 | 45.2 | 7,125 | 44 | 2.9 | 0.5 |
| Lebanon | 5 | 1970 | u | u | 44.5 | 6,199 | 45 | u | u |
| Macau | 3 | 1970 | u | u | 33.4 | 5,162 | 40 | u | u |
| Maldives Is. | 3, II | 1970 | 27.4 | 4,771 | 16.1 | 2,681 | 25 | -5.3 | -5.8 |
| Mongolia | 6 | 1967 | u | u | 41.7 | 5,851 | u | u | u |
| Nepal | 6, III | 1970 | 34.4 | 4,975 | 41.4 | 5,817 | 40 | 1.8 | 1.6 |
| Pakistan (W. Pakistan) | 5 | 1971 | u | u | 43.1 | 5,805 | 43 | u | u |
| Philippines | 3 | 1968 | 48.6 | 7,600 | 44.8 | 6,842 | 44 | u | u |
| Rep. of China (Taiwan) | 3, II | 1970 | 42.8 | 6,252 | 38.5 | 5,505 | 35 | -1.1 | -1.3 |
| Rep. of Korea (South) | 1, I | 1973 | 39.5 | 5,809 | 23.8 | 3,211 | 23 | -3.9 | -4.6 |
| Rep. of Vietnam (South) | 3, II | 1970 | 41.0 | 5,690 | 31.3 | 4,516 | 24 | -2.7 | -2.3 |
| Ryukyu Is. | 6, IV | 1970 | 42.3 | 6,196 | 34.7 | 5,057 | 42+ | -1.9 | -2.0 |
| Sabah (North Borneo, E. Malaysia) | 1, I | 1970 | 25.8 | 3,600 | 22.3 | 3,136 | u | -1.5 | -1.4 |
| Sarawak (E. Malaysia) | 3, II | 1970 | 45.5 | 6,579 | 39.6 | 6,134 | u | -1.4 | -0.7 |
| Saudi Arabia | 3, II | 1970 | 42.7 | 6,231 | 37.3 | 5,446 | u | -1.4 | -1.3 |
| Sikkim | 5 | 1970 | u | u | 50.5 | 7,338 | 50 | u | u |
| | 3 | 1961 | u | u | 44.6 | 6,282 | u | u | u |

TABLE 1 (continued)

| Region and country or territory | Class of estimate ^a | Most recent census year for which data were available | Regression estimate of rate, 1955-60 ^b | | Regression estimate of rate, most recent census year ^c | | Population Reference Bureau estimate, 1970-75 | Average annual percentage increase or decrease since 1955-60 | |
|---------------------------------|--------------------------------|---|---|-------|---|-------|---|--|------|
| | | | CBR | TFR | CBR | TFR | CBR | CBR | TFR |
| <i>ASIA (continued)</i> | | | | | | | | | |
| Singapore | 1, I | 1970 | 36.6 | 5,541 | 22.1 | 3,100 | 18 | -5.0 | -5.8 |
| Sri Lanka (Ceylon) | 1, I | 1971 | 40.0 | 5,494 | 30.1 | 4,188 | 28 | -2.6 | -2.5 |
| Syrian Arab Rep. (Syria) | 3 | 1970 | u | u | 48.0 | 8,073 | 45 | u | u |
| Thailand | 3, II | 1970 | 44.4 | 6,477 | 40.3 | 5,864 | 35 | -1.0 | -1.0 |
| Turkey | 3, II | 1970 | 45.5 | 6,755 | 41.5 | 6,034 | 39 | -0.9 | -1.1 |
| United Arab Emirates | 5 | 1968 | u | u | 38.8 | 6,073 | 50 | u | u |
| West Malaysia (Fed. of Malaya) | 1, II | 1970 | 42.1 | 6,274 | 33.8 | 5,052 | 35 | -2.2 | -2.2 |
| Yemen | 5 | 1970 | u | u | 50.3 | 7,336 | 50 | u | u |
| Yemen (Dem.) | 5 | 1973 | u | u | 44.8 | 6,566 | 50 | u | u |
| <i>EUROPE AND USSR</i> | | | | | | | | | |
| Austria | 1, I | 1971 | 17.2 | 2,558 | 14.6 | 2,201 | 12 | -1.5 | -1.4 |
| Belgium | 1, I | 1970 | 17.0 | 2,565 | 14.7 | 2,244 | 12 | -1.5 | -1.3 |
| Bulgaria | 1, I | 1965 | 18.6 | 2,512 | 15.3 | 2,075 | 17 | -3.9 | -3.0 |
| Channel Is. (Guernsey & Jersey) | 3 | 1971 | u | u | 14.3 | 2,083 | u | u | u |
| Czechoslovakia | 1, I | 1970 | 18.0 | 2,692 | 15.9 | 2,069 | 20 | -1.2 | -2.6 |
| Dem. Rep. of Germany (East) | 1 | 1971 | u | u | 13.8 | 1,841 | 11 | u | u |
| Denmark | 1, I | 1970 | 16.8 | 2,577 | 14.4 | 1,959 | 14 | -1.5 | -2.7 |

| | | | | | | | | | |
|----------------------------------|--------|------|------|-------|------|-------|----|------|------|
| England & Wales (United Kingdom) | 1, I | 1971 | 16.1 | 2,506 | 16.0 | 2,404 | 12 | -0.1 | -0.4 |
| Faerøe Is. | 2, III | 1966 | 23.6 | 3,915 | 26.1 | 4,314 | u | 1.7 | 1.6 |
| Fed. Rep. of Germany (West) | 1, I | 1970 | 17.0 | 2,336 | 13.4 | 2,013 | 10 | -2.4 | -1.5 |
| Finland | 1, I | 1968 | 19.6 | 2,810 | 14.0 | 1,815 | 14 | -4.2 | -5.5 |
| France | 1, I | 1968 | 18.4 | 2,797 | 16.7 | 2,608 | 14 | -1.2 | -0.9 |
| Gibraltar | 2, II | 1970 | 15.7 | 2,244 | 21.7 | 2,960 | u | 3.2 | 2.8 |
| Greece | 1, II | 1971 | 21.7 | 2,881 | 15.9 | 2,376 | 16 | -2.8 | -1.8 |
| Hungary | 1, I | 1970 | 17.3 | 2,367 | 14.7 | 1,989 | 18 | -1.6 | -1.7 |
| Iceland | 2, I | 1973 | 28.1 | 4,256 | 21.5 | 2,906 | 21 | -2.1 | -2.9 |
| Ireland | 1, I | 1971 | 21.1 | 3,432 | 22.7 | 3,975 | 22 | 0.7 | 1.3 |
| Isle of Man | 2 | 1971 | u | u | 14.3 | u | u | u | u |
| Italy | 1, I | 1971 | 18.2 | 2,362 | 16.8 | 2,402 | 15 | -0.7 | 0.2 |
| Liechtenstein | 5 | 1970 | u | u | 20.8 | 2,456 | u | u | u |
| Luxembourg | 1, I | 1970 | 15.9 | 2,206 | 13.2 | 1,969 | 11 | -1.9 | -1.1 |
| Malta & Gozo | 1, I | 1967 | 25.6 | 3,559 | 16.7 | 2,262 | 19 | -6.1 | -6.5 |
| Monaco | 3 | 1968 | u | u | 4.7 | 1,022 | u | u | u |
| Netherlands | 1, I | 1970 | 21.2 | 3,174 | 18.3 | 2,584 | 13 | -1.5 | -2.1 |
| Northern Ireland | 3 | 1971 | u | u | 21.1 | 3,325 | u | u | u |
| Norway | 1, I | 1970 | 18.0 | 2,961 | 16.6 | 2,490 | 14 | -0.8 | -1.7 |
| Poland | 1, I | 1970 | 26.3 | 3,324 | 16.8 | 2,229 | 19 | -4.5 | -4.0 |
| Portugal | 1, I | 1970 | 23.5 | 3,020 | 20.0 | 2,885 | 20 | -1.6 | -0.5 |
| Romania | 1, I | 1966 | 22.3 | 2,668 | 14.3 | 1,903 | 20 | -7.4 | -5.6 |
| Scotland | 1, I | 1971 | 19.0 | 2,832 | 16.6 | 2,526 | u | -1.2 | -1.0 |
| Spain | 1, I | 1970 | 21.5 | 2,796 | 19.6 | 2,849 | 18 | -0.9 | 0.2 |
| Sweden | 1, I | 1970 | 14.4 | 2,296 | 13.7 | 1,921 | 13 | -0.5 | -1.8 |
| Switzerland | 1, I | 1970 | 17.5 | 2,319 | 15.8 | 2,086 | 12 | -1.0 | -1.1 |
| USSR | 1, II | 1970 | 27.8 | 3,132 | 17.4 | 2,421 | 18 | -4.7 | -2.6 |
| Yugoslavia | 1, I | 1971 | 24.6 | 3,022 | 18.3 | 2,373 | 18 | -2.7 | -2.2 |

TABLE 1 (continued)

| Region and country or territory | Class of estimate ^a | Most recent census year for which data were available | Regression estimate of rate, 1955-60 ^b | | Regression estimate of rate, most recent census year ^c | | Population Reference Bureau estimate, 1970-75 | Average annual percentage increase or decrease since 1955-60 | |
|---------------------------------|--------------------------------|---|---|-------|---|-------|---|--|------|
| | | | CBR | TFR | CBR | TFR | | CBR | TFR |
| OCEANIA | | | | | | | | | |
| American Samoa | 2, I | 1974 | 40.6 | 6,267 | 37.4 | 5,223 | u | -0.6 | -1.3 |
| Australia | 1, I | 1971 | 22.6 | 3,485 | 21.7 | 2,950 | 17 | -0.4 | -1.5 |
| Solomon Is. (Br. Solomon Is.) | 3, II | 1970 | 40.7 | 6,110 | 39.2 | 5,897 | 36 | -0.4 | -0.4 |
| Fiji Is. | 1, II | 1966 | 43.6 | 6,712 | 34.9 | 4,958 | 29 | -3.7 | -5.0 |
| French Polynesia | 6 | 1971 | u | u | 39.9 | 6,229 | u | u | u |
| Gilbert & Ellice Is. | 5 | 1973 | u | u | 38.0 | 5,510 | u | u | u |
| Guam | 2, III | 1970 | 37.0 | 6,847 | 33.8 | 4,756 | u | -0.9 | -3.6 |
| New Caledonia | 3, II | 1969 | 33.0 | 4,927 | 33.9 | 5,011 | u | 0.3 | 0.2 |
| New Hebrides | 4 | 1967 | u | u | 39.9 | 5,993 | u | u | u |
| New Zealand | 1, I | 1971 | 26.3 | 4,239 | 22.7 | 3,197 | 18 | -1.3 | -2.6 |
| Pacific Is. | 3, III | 1970 | 39.6 | 6,473 | 40.4 | 6,683 | u | 0.2 | 0.3 |
| Papua New Guinea | 3 | 1971 | u | u | 47.3 | 6,621 | 41 | u | u |
| Tonga | 3, II | 1966 | 41.9 | 6,310 | 40.2 | 6,132 | u | -0.7 | -0.5 |
| Western Samoa | 3, II | 1971 | 44.9 | 7,365 | 42.0 | 7,264 | 35 | -0.6 | -0.1 |

u—unavailable.

a The first entry in this column is the class of equations used for estimating rates for the most recent census (see Appendix). The second entry is the class of equations used by Cho (1964).

b Base data from Cho (1964).

c Base data from Appendix Table.

TABLE 2 Number of countries experiencing increased or decreased fertility rates: 1955–60 to most recent census year for which data were available

| Region | Number of countries ^a | Crude birth rate | | | Total fertility rate | | |
|-------------------------|----------------------------------|------------------|-----------|-----------|----------------------|-----------|-----------|
| | | Increased | Decreased | No change | Increased | Decreased | No change |
| Africa | 16 | 8 | 7 | 1 | 10 | 6 | 0 |
| North & Central America | 23 | 1 | 22 | 0 | 1 | 21 | 1 |
| South America | 9 | 1 | 8 | 0 | 2 | 7 | 0 |
| Asia | 26 | 6 | 19 | 1 | 9 | 17 | 0 |
| Europe & USSR | 29 | 3 | 26 | 0 | 5 | 24 | 0 |
| Oceania | 10 | 2 | 8 | 0 | 2 | 8 | 0 |
| All regions | 113 | 21 | 90 | 2 | 29 | 83 | 1 |

a Includes only those for which rates were available for 1955–60 and which also took a census in 1965 or later.

TABLE 3 Percentage distribution of estimated crude birth rates for 163 countries: most recent census year for which data were available

| Percentage with specified crude birth rate | Region | | | | | | |
|--|--------|-------------------------|---------------|-------|---------------|---------|-------------|
| | Africa | North & Central America | South America | Asia | Europe & USSR | Oceania | All regions |
| Under 15 | 0.0 | 0.0 | 0.0 | 0.0 | 37.1 | 0.0 | 8.0 |
| 15-19 | 2.7 | 14.8 | 0.0 | 10.0 | 42.9 | 0.0 | 12.9 |
| 20-24 | 8.1 | 14.8 | 10.0 | 7.5 | 17.1 | 14.3 | 11.7 |
| 25-29 | 0.0 | 18.5 | 10.0 | 2.5 | 2.9 | 0.0 | 4.9 |
| 30-34 | 5.4 | 14.8 | 20.0 | 15.0 | 0.0 | 21.4 | 10.4 |
| 35-39 | 8.1 | 22.2 | 50.0 | 17.5 | 0.0 | 35.7 | 16.0 |
| 40-44 | 13.5 | 11.1 | 10.0 | 30.0 | 0.0 | 21.4 | 14.7 |
| 45-49 | 29.7 | 3.7 | 0.0 | 10.0 | 0.0 | 7.1 | 10.4 |
| 50 or more | 32.4 | 0.0 | 0.0 | 7.5 | 0.0 | 0.0 | 9.2 |
| All rates | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Number of countries ^a | 37 | 27 | 10 | 40 | 35 | 14 | 163 |

a Includes only those for which rates were available for 1965 or a later year.

1. For the total fertility rate, crude birth rate, and the age-specific fertility rates for ages 20–24, 25–29, 30–34, 35–39, and 40–44, the Type 1 first equation estimates were chosen (see Appendix).
2. For the age-specific fertility rates for ages 15–19 and 45–49 the Type 3 first equation estimates were chosen, except for Class 6 countries, where estimates for ages 15–19 were taken from Type 1 equations (see Appendix).
3. The age-specific rates were added to obtain the “implied” total fertility rate. Then the ratio

$$\frac{\text{Predicted total fertility rate}}{\text{“Implied” total fertility rate}}$$

was multiplied by each age-specific rate to produce a new set of age-specific rates consistent with the total fertility rate chosen in step (1) above.

Although this so-called standard procedure does not always produce the set of “best” estimates with the highest R^2 for every measure, I have used it because I believe it is desirable to use the census directly (rather than to use the staged procedure of Type 2 estimates presented in the Appendix) and to allow curvilinear fitting of the age-specific rates for ages 15–19 and 45–49.

The second line for each country in Table 4 reports a summary of all of the other estimates prepared. While these figures are not confidence limits in the statistical sense, they do provide some indication of the degree to which the different estimating equations produce similar estimates. To take just one example, the “standard” estimate of Algeria’s crude birth rate is 48.4. Other estimating equations yielded crude birth rates ranging from 46.6 to 49.0. In Table 1 (and hence also Tables 2 and 3), only the “standard” estimates are reported.

SUMMARY OF FERTILITY CHANGES, 1955–60 TO 1965–75

A review of the “standard” estimates suggests that fertility declined in most nations for which I could prepare estimates for both time periods. If one relies on the data and methods described above, a broad generalization is clear: the fertility transition has begun for much of the world.

For 113 countries, I was able to estimate fertility changes between 1955–60 and a census in 1965 or later, or accurate reported rates were available. For most countries, both the crude birth rate and the

TABLE 4 Regression estimates of national crude birth rates, total year available: major countries and territories

| Region and country or territory | Crude birth rate | Total fertility rate |
|---------------------------------------|----------------------|----------------------|
| AFRICA | | |
| Algeria | 48.4 -1.8 to 0.6 | 7,609 12 to 287 |
| Angola | 52.6 -2.1 to 0.4 | 6,954 -66 to 60 |
| Benin (Dahomey): Afr. pop. | 51.2 -3.5 to 0.9 | 6,427 -267 to 449 |
| Botswana | 43.5 -0.6 to 0.3 | 6,272 -145 to 11 |
| Burundi (Ruanda-Urundi) | 45.9 -0.5 to 0.9 | 6,378 -117 to 168 |
| Brazzaville (Congo) | 46.2 -1.8 to 1.1 | 5,984 -54 to 27 |
| Central African Rep. (Fr. Eq. Africa) | 48.5 -4.8 to 2.0 | 5,181 -327 to 58 |
| Chad: Afr. pop. | 53.0 -6.5 to 1.9 | 5,783 -317 to 690 |
| Comoro Is. | 44.9 -2.9 to 0.7 | 5,541 -153 to 268 |
| Egypt (United Arab Rep.) | 41.5 -0.9 to 0.1 | 6,085 -5 to 5 |
| Equatorial Guinea (Fr. Guinea) | 42.1 -1.5 to 0.4 | 5,807 3 to 11 |
| Gabon | 40.4 -2.5 to 1.4 | 4,917 75 to 101 |
| Gambia | 54.1 -2.5 to 0.4 | 7,132 -104 to 67 |
| Ghana | 50.1 -2.2 to 0.0 | 7,002 -173 to 180 |
| Guinea Bissau | 46.7 -0.7 to 0.6 | 6,685 -228 to 180 |
| Guinea | 54.8 -5.4 to 1.8 | 6,259 -185 to 487 |
| Ivory Coast | 52.1 -5.1 to 0.7 | 6,820 -407 to 685 |
| Kenya | 51.1 -1.4 to -0.1 | 7,705 25 to 42 |

fertility rates, and age-specific fertility rates for most recent census

| Age-specific fertility rates | | | | | | |
|------------------------------|------------------|-------------------|------------------|------------------|------------------|-----------------|
| 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
| 144 -7 to 36 | 362 -16 to 5 | 329 -6 to 17 | 295 -6 to 11 | 240 -24 to 2 | 127 -18 to 1 | 25 0 to 18 |
| 143 -10 to 42 | 297 31 to 51 | 270 -43 to 46 | 265 1 to 17 | 238 -41 to 20 | 145 -72 to 4 | 32 -10 to 1 |
| 128 -55 to 38 | 309 -10 to 11 | 242 -16 to 44 | 236 -28 to 27 | 214 -20 to 2 | 110 -14 to 20 | 35 -19 to 3 |
| 125 -41 to 2 | 243 9 to 12 | 294 -13 to -5 | 264 0 to 8 | 197 2 to 9 | 100 -3 to 27 | 32 -15 to 0 |
| 109 -15 to 29 | 291 -11 to 15 | 277 -46 to -6 | 253 -2 to 16 | 205 -14 to 3 | 114 -23 to 5 | 26 -19 to 3 |
| 88 -1 to 35 | 303 -9 to 7 | 320 -21 to 1 | 234 -8 to 19 | 160 -2 to 25 | 71 -15 to 11 | 20 -2 to 1 |
| 140 -1 to 96 | 285 -1 to 40 | 196 -40 to 18 | 163 -21 to 37 | 143 -39 to 47 | 86 -62 to 3 | 22 -45 to -1 |
| 97 -3 to 116 | 296 -14 to 22 | 171 -62 to 55 | 185 -33 to 46 | 203 -34 to 14 | 109 -23 to 4 | 44 -39 to 12 |
| 115 -13 to 55 | 278 -4 to 14 | 189 -26 to 11 | 197 -12 to 25 | 190 -1 to 12 | 110 -30 to 2 | 29 -24 to 4 |
| 121 -49 to -1 | 275 -3 to 6 | 263 -12 to -1 | 239 -1 to 8 | 193 -6 to 1 | 104 -8 to 0 | 23 -8 to 1 |
| 139 -38 to 11 | 280 -10 to 14 | 207 -28 to -6 | 213 -4 to 20 | 192 -9 to 3 | 115 -53 to 1 | 15 -9 to 11 |
| 69 -7 to 120 | 280 -18 to 29 | 145 -60 to -18 | 170 -5 to 41 | 187 -17 to 10 | 123 -94 to 0 | 9 -29 to 17 |
| 204 -77 to 3 | 326 -9 to 18 | 215 -34 to -4 | 254 -10 to 26 | 243 -9 to 4 | 151 -62 to 6 | 33 -23 to 1 |
| 163 -80 to 3 | 311 -3 to 7 | 262 -11 to 10 | 264 -13 to 14 | 231 -11 to -7 | 128 -12 to 30 | 41 -22 to 1 |
| 154 -30 to 18 | 306 -13 to 20 | 242 -58 to -5 | 254 -3 to 21 | 224 -6 to 18 | 139 -71 to 3 | 17 -12 to 15 |
| 107 -6 to 118 | 313 -16 to 25 | 170 -59 to 29 | 204 -25 to 47 | 227 -25 to 10 | 134 -52 to 1 | 41 -18 to 12 |
| 139 -50 to 52 | 333 -11 to 10 | 215 -15 to 57 | 242 -36 to 36 | 253 -38 to -3 | 137 -26 to 16 | 45 -24 to 2 |
| 130 -12 to 19 | 332 9 to 21 | 342 -18 to 27 | 309 -1 to 8 | 252 -26 to 5 | 138 -19 to 16 | 38 -11 to 0 |

TABLE 4 (continued)

| Region and country or territory | Crude birth rate | Total fertility rate |
|---------------------------------|----------------------|----------------------|
| <i>AFRICA (continued)</i> | | |
| Lesotho (Basutoland) | 37.5 -1.8 to 0.7 | 4,773 85 to 203 |
| Liberia | 44.7 -3.0 to 1.5 | 5,085 -105 to -69 |
| Libyan Arab Rep. | 49.3 -1.9 to 0.9 | 8,733 -308 to 142 |
| Malagasy Rep. (Madagascar) | 45.8 -1.7 to 0.2 | 6,731 0 to 179 |
| Malawi (Br. Nyasaland) | 49.4 -2.5 to 1.3 | 6,352 8 to 173 |
| Mali (Fr. Sudan) | 47.8 -3.3 to 1.1 | 6,077 -119 to 331 |
| Mauritius | 24.8 u | 3,418 u |
| Morocco | 46.4 -1.8 to -0.4 | 7,015 64 to 184 |
| Mozambique | 48.0 -2.5 to 1.1 | 5,901 -46 to 186 |
| Namibia (S.W. Africa) | 47.8 -0.5 to 1.0 | 6,883 -117 to 21 |
| Nigeria | 52.6 -1.4 to 1.0 | 6,141 -28 to -27 |
| Reunion | 38.7 u | 6,007 u |
| Rwanda | 45.6 -0.2 to 0.8 | 6,625 -130 to 204 |
| Sao Tome & Principe | 43.8 -1.4 to 0.3 | 5,975 -144 to 82 |
| Senegal | 46.9 -4.3 to 1.3 | 5,435 -240 to 485 |
| Seychelles | 31.8 -1.0 to 0.4 | 5,845 -63 to -29 |
| Sierra Leone | 47.3 -3.7 to 1.7 | 5,262 -82 to 271 |
| Somalia | 52.5 -0.8 to 0.5 | 7,536 -128 to 109 |

Age-specific fertility rates

| 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
|--------------------|------------------|------------------|------------------|------------------|------------------|-----------------|
| 107 -20 to 2 | 243 12 to 26 | 223 -27 to 15 | 173 -9 to 8 | 126 -12 to 10 | 69 -22 to 10 | 14 -1 to 2 |
| 133 1 to 113 | 311 -2 to 12 | 177 -21 to 14 | 155 -1 to 31 | 145 -27 to 41 | 79 -49 to -2 | 16 -29 to 4 |
| 187 -137 to -2 | 355 -21 to 6 | 354 11 to 45 | 356 -8 to 12 | 296 -29 to -9 | 157 -17 to 70 | 42 -10 to 20 |
| 126 1 to 33 | 323 -8 to 1 | 294 -11 to 17 | 259 -0 to 9 | 209 -20 to 6 | 110 -17 to 0 | 26 -4 to 2 |
| 108 -17 to 49 | 305 -16 to 17 | 259 -31 to 11 | 242 -14 to 28 | 212 -10 to 8 | 113 -17 to -1 | 31 -27 to 5 |
| 109 -29 to 48 | 300 -15 to 13 | 241 -25 to 29 | 227 -21 to 29 | 205 -16 to 6 | 106 -19 to 0 | 27 -20 to 4 |
| 50 u | 188 u | 191 u | 130 u | 88 u | 32 u | 4 u |
| 119 -10 to 18 | 300 1 to 34 | 298 -31 to 45 | 278 -4 to 9 | 236 -38 to 8 | 138 -29 to 3 | 33 -17 to 0 |
| 115 -10 to 56 | 294 -13 to 18 | 215 -35 to 8 | 215 -13 to 30 | 199 -10 to 6 | 113 -36 to 2 | 27 -27 to 5 |
| 55 -13 to 55 | 236 36 to 45 | 327 -34 to 61 | 309 7 to 16 | 262 -42 to 14 | 152 -40 to 2 | 35 -14 to 0 |
| 172 -62 to 25 | 297 -13 to 19 | 217 -37 to 1 | 221 -12 to 25 | 187 0 to 15 | 111 -50 to 9 | 24 -24 to 3 |
| 62 u | 277 u | 310 u | 260 u | 191 u | 91 u | 11 u |
| 99 -15 to 25 | 295 -11 to 13 | 305 -47 to -7 | 270 -2 to 14 | 213 -2 to 12 | 114 -15 to 7 | 29 -19 to 3 |
| 194 -129 to -10 | 282 -15 to 7 | 223 -11 to 22 | 217 -12 to 16 | 175 -14 to 5 | 95 -50 to 7 | 9 -1 to 18 |
| 100 -33 to 64 | 286 -15 to 17 | 217 9 to 52 | 197 -32 to 32 | 178 -23 to 8 | 85 -17 to 5 | 23 -19 to 4 |
| 62 -4 to 12 | 236 -6 to 8 | 296 9 to 16 | 272 -7 to -2 | 196 -21 to -3 | 93 -10 to 31 | 14 -3 to 4 |
| 112 -22 to 63 | 284 -21 to 21 | 198 -43 to 32 | 186 -28 to 36 | 167 -11 to 9 | 88 -42 to 4 | 16 -30 to 6 |
| 164 -58 to 3 | 329 -12 to 15 | 293 -41 to -8 | 293 -2 to 18 | 249 -4 to 12 | 144 -28 to 1 | 35 -19 to 2 |

TABLE 4 (continued)

| Region and country or territory | Crude birth rate | Total fertility rate |
|----------------------------------|----------------------|----------------------|
| <i>AFRICA (continued)</i> | | |
| S. Rhodesia | | |
| Afr. pop. | 40.0 -1.4 to -0.1 | 6,480 -97 to 55 |
| Asian pop. | 24.5 0.2 to 0.9 | 2,970 -141 to 22 |
| Colored pop. | 41.0 -0.3 to 0.7 | 5,851 41 to 65 |
| Euro. pop. | 16.3 -0.8 to 0.3 | 2,233 14 to 56 |
| Spanish Sahara | 37.1 -0.7 to 0.3 | 5,501 -162 to 55 |
| Sudan | 51.1 -0.7 to 0.7 | 7,633 -97 to 63 |
| Swaziland | 50.3 -1.2 to 0.1 | 7,233 -83 to 2 |
| Tanganyika (U. Rep. of Tanzania) | 51.4 -2.1 to 0.3 | 6,909 -111 to 18 |
| Tunisia | 42.8 u | 7,218 u |
| Togo | 55.9 -4.7 to 0.6 | 7,257 -400 to 629 |
| Uganda | 51.3 -1.4 to 0.1 | 7,617 -94 to 57 |
| Union of S. Africa | | |
| White pop. | 22.7 -0.5 to 0.3 | 2,974 18 to 79 |
| Black pop. | 46.1 -0.3 to 0.7 | 6,841 -117 to 59 |
| Asian pop. | 32.9 -0.4 to 0.9 | 3,902 -21 to 19 |
| Bantu pop. | 42.2 -0.2 to 0.5 | 6,106 -43 to 60 |
| Upper Volta | 51.7 -3.5 to 1.2 | 6,307 -148 to 320 |
| West Cameroon, United Rep. of | 54.1 -0.9 to 0.7 | 7,719 -27 to 80 |

| Age-specific fertility rates | | | | | | |
|------------------------------|------------------|-------------------|------------------|------------------|------------------|-----------------|
| 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
| 143 -66 to 4 | 285 0 to 5 | 262 -9 to 8 | 250 -7 to 9 | 207 -5 to -1 | 114 -10 to 28 | 36 -23 to 10 |
| 52 -11 to 7 | 160 -2 to 6 | 192 -17 to 2 | 115 -9 to -2 | 56 -2 to 8 | 16 0 to 6 | 3 -4 to 6 |
| 59 -4 to 15 | 227 -1 to 42 | 288 -10 to 27 | 253 -8 to 18 | 200 -15 to 5 | 112 -19 to 63 | 32 -13 to 0 |
| 45 -9 to 3 | 162 -10 to -1 | 140 -10 to 0 | 71 -2 to 2 | 26 -1 to 8 | 3 1 to 7 | 1 -2 to 2 |
| 183 -19 to 51 | 332 -33 to 5 | 187 -26 to 39 | 173 -1 to 3 | 150 -26 to -5 | 69 -39 to 7 | 6 0 to 20 |
| 165 -78 to -7 | 328 -11 to 10 | 313 -28 to -10 | 302 -3 to 12 | 248 -7 to 9 | 137 -13 to 1 | 34 -9 to 2 |
| 174 -73 to 0 | 311 -3 to 11 | 271 -23 to 0 | 276 0 to 13 | 236 -7 to 8 | 138 -12 to 11 | 40 -25 to 1 |
| 147 -2 to 62 | 323 10 to 29 | 270 -26 to 30 | 254 -3 to 13 | 224 -39 to 16 | 130 -49 to 1 | 33 -11 to 0 |
| 78 u | 296 u | 347 u | 315 u | 241 u | 120 u | 46 u |
| 143 -61 to 48 | 339 -7 to 8 | 249 -10 to 53 | 264 -35 to 31 | 258 -29 to -1 | 136 -21 to 58 | 62 -39 to 3 |
| 181 -103 to 0 | 340 -7 to 6 | 314 -9 to 6 | 308 -5 to 12 | 257 -10 to 0 | 139 -9 to 23 | 37 -10 to 2 |
| 49 -2 to 2 | 185 -1 to 2 | 185 -10 to 1 | 107 0 to 5 | 53 4 to 9 | 15 -3 to 6 | 2 0 to 4 |
| 64 -12 to -1 | 230 30 to 32 | 347 -28 to 25 | 312 4 to 10 | 241 -12 to 7 | 131 -18 to 93 | 44 -22 to 0 |
| 75 -10 to 5 | 205 1 to 6 | 230 -30 to 0 | 152 -2 to 15 | 85 10 to 20 | 29 -3 to 12 | 6 -0 to 4 |
| 80 -24 to 0 | 216 26 to 28 | 309 -27 to 13 | 272 5 to 8 | 206 -6 to 7 | 111 -13 to 38 | 29 -11 to 0 |
| 134 -20 to 61 | 314 -14 to 19 | 204 -39 to 21 | 224 -21 to 36 | 222 -17 to 3 | 129 -45 to 2 | 33 -33 to 5 |
| 142 -56 to 12 | 336 -14 to 12 | 328 -31 to -5 | 309 -3 to 17 | 252 -4 to 6 | 135 -6 to 10 | 41 -20 to 3 |

TABLE 4 (continued)

| Region and country or territory | Crude birth rate | Total fertility rate |
|--|---------------------|----------------------|
| <i>AFRICA (continued)</i> | | |
| Zaire: Afr. pop. | 42.2 -3.8 to 1.8 | 4,660 36 to 133 |
| Zambia | 51.0 -2.1 to 0.6 | 6,769 10 to 74 |
| Zanzibar & Pemba (U. Rep. of Tanzania) | 51.1 -3.0 to 0.0 | 7,231 -543 to -45 |
| <i>NORTH AND CENTRAL AMERICA</i> | | |
| Antigua | 31.5 -0.2 to 0.5 | 5,021 -89 to 59 |
| Bahamas | 25.2 u | 3,453 u |
| Barbados | 20.3 u | 2,720 u |
| Belize (Br. Honduras) | 37.1 u | 6,276 u |
| Bermuda | 18.2 -0.2 to 0.1 | 2,193 -49 to 30 |
| Canada | 16.8 u | 2,219 u |
| Canal Zone, USA | 16.4 u | 2,209 u |
| Costa Rica | 28.5 u | 3,913 u |
| Cuba | 31.2 -1.2 to 0.2 | 4,332 -194 to -32 |
| Dominica | 46.9 u | 7,130 u |
| Dominican Rep. | 39.4 -0.7 to 0.1 | 5,827 -48 to 36 |
| El Salvador | 43.5 u | 6,119 u |
| Granada | 47.9 -1.5 to 0 | 7,368 -93 to 158 |
| Greenland | 24.6 u | 3,483 u |

| Age-specific fertility rates | | | | | | |
|------------------------------|------------------|------------------|------------------|------------------|------------------|----------------|
| 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
| 121 -1 to 71 | 283 -16 to 21 | 210 -27 to 3 | 148 -17 to 35 | 106 -10 to 42 | 51 -26 to 4 | 12 -25 to 3 |
| 145 -21 to 26 | 313 7 to 34 | 293 -28 to 19 | 254 -9 to 16 | 205 -23 to 20 | 113 -39 to 4 | 31 -9 to 0 |
| 179 -1 to 89 | 354 -16 to 13 | 257 -11 to 29 | 254 -19 to 10 | 233 -57 to 10 | 133 -45 to -2 | 37 -17 to 0 |
| 46 -20 to 20 | 231 -3 to 4 | 297 -10 to 4 | 222 -8 to 5 | 141 1 to 3 | 60 -10 to 4 | 8 -0 to 6 |
| 77 u | 199 u | 183 u | 112 u | 82 u | 33 u | 4 u |
| 91 u | 152 u | 125 u | 89 u | 60 u | 25 u | 3 u |
| 143 u | 310 u | 304 u | 241 u | 174 u | 76 u | 9 u |
| 28 -6 to 20 | 149 -1 to 2 | 150 8 to 10 | 80 -2 to 1 | 28 -1 to 5 | 2 -1 to 9 | 1 -3 to 3 |
| 40 u | 136 u | 144 u | 79 u | 34 u | 10 u | 1 u |
| 19 u | 153 u | 155 u | 81 u | 25 u | 8 u | 1 u |
| 94 u | 202 u | 187 u | 143 u | 100 u | 47 u | 10 u |
| 105 1 to 24 | 253 -13 to 4 | 201 -8 to 13 | 152 -10 to 3 | 105 -9 to 5 | 45 -17 to 1 | 6 -1 to 6 |
| 133 u | 326 u | 352 u | 292 u | 195 u | 101 u | 26 u |
| 113 -1 to 4 | 292 -7 to 0 | 268 -4 to 8 | 227 0 to 2 | 170 0 to 2 | 79 -5 to 4 | 16 -0 to 2 |
| 151 u | 301 u | 276 u | 228 u | 173 u | 72 u | 22 u |
| 115 -60 to 1 | 324 -7 to 2 | 330 -2 to 14 | 302 -5 to 9 | 245 -15 to -6 | 123 -8 to 19 | 33 -7 to 3 |
| 115 u | 206 u | 164 u | 105 u | 68 u | 36 u | 3 u |

TABLE 4 (continued)

| Region and country or territory | Crude birth rate | Total fertility rate |
|---------------------------------------|---------------------|----------------------|
| NORTH AND CENTRAL AMERICA (continued) | | |
| Guadeloupe | 31.6 u | 5,296 u |
| Guatemala | 43.4 u | 6,257 u |
| Haiti | 39.9 -0.3 to 0.5 | 5,579 19 to 36 |
| Honduras | 44.1 -1.0 to 0.4 | 6,458 -123 to -83 |
| Jamaica | u u | u u |
| Martinique | 30.8 u | 5,118 u |
| Mexico | 43.6 u | 6,565 u |
| Netherlands Antilles | 24.5 0.1 to 1.2 | 3,332 -76 to 6 |
| Nicaragua | 39.4 -0.8 to 0.3 | 5,690 -29 to 1 |
| Panama | 37.1 u | 5,086 u |
| Puerto Rico | 24.8 u | 3,159 u |
| St. Kitts, Nevis, & Anguilla | 25.8 u | 5,126 u |
| St. Lucia | 39.9 u | 6,638 u |
| St. Vincent | 49.6 u | 7,250 u |
| Trinidad & Tobago | 27.0 u | 3,732 u |
| USA | | |
| Non-white pop. | 25.1 u | 3,070 u |
| White pop. | 17.4 u | 2,385 u |
| Virgin Is., USA | 46.7 u | 5,300 u |

| Age-specific fertility rates | | | | | | |
|------------------------------|----------|----------|-----------|----------|-----------|----------|
| 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
| 57 | 220 | 286 | 237 | 164 | 86 | 10 |
| u | u | u | u | u | u | u |
| 116 | 285 | 291 | 252 | 194 | 90 | 25 |
| u | u | u | u | u | u | u |
| 53 | 205 | 270 | 250 | 200 | 113 | 25 |
| -3 to 17 | 30 to 39 | -8 to 37 | 7 to 14 | -17 to 8 | -23 to 27 | -10 to 1 |
| 126 | 321 | 288 | 252 | 194 | 90 | 20 |
| -2 to 11 | -12 to 1 | -4 to 14 | -0 to 8 | -1 to 9 | -13 to 9 | -1 to 6 |
| u | u | u | u | u | u | u |
| u | u | u | u | u | u | u |
| 50 | 208 | 275 | 236 | 164 | 79 | 11 |
| u | u | u | u | u | u | u |
| 93 | 282 | 317 | 272 | 202 | 144 | 4 |
| u | u | u | u | u | u | u |
| 44 | 145 | 205 | 153 | 84 | 30 | 4 |
| -3 to 3 | -1 to 14 | -7 to 4 | -12 to -1 | -2 to 3 | 1 to 6 | -4 to 2 |
| 107 | 287 | 274 | 222 | 160 | 73 | 15 |
| -1 to 4 | -8 to 0 | -6 to 5 | -1 to 0 | -0 to 2 | -6 to 4 | -1 to 3 |
| 135 | 275 | 247 | 184 | 123 | 44 | 9 |
| u | u | u | u | u | u | u |
| 73 | 194 | 182 | 103 | 56 | 21 | 3 |
| u | u | u | u | u | u | u |
| 152 | 254 | 257 | 183 | 138 | 38 | 3 |
| u | u | u | u | u | u | u |
| 150 | 285 | 313 | 288 | 192 | 91 | 9 |
| u | u | u | u | u | u | u |
| 204 | 387 | 335 | 263 | 188 | 65 | 11 |
| u | u | u | u | u | u | u |
| 86 | 205 | 197 | 135 | 88 | 30 | 5 |
| u | u | u | u | u | u | u |
| 139 | 197 | 140 | 83 | 42 | 13 | 1 |
| u | u | u | u | u | u | u |
| 58 | 163 | 146 | 72 | 30 | 7 | 0 |
| u | u | u | u | u | u | u |
| 230 | 288 | 250 | 161 | 96 | 31 | 4 |
| u | u | u | u | u | u | u |

TABLE 4 (continued)

| Region and country or territory | Crude birth rate | Total fertility rate |
|---------------------------------|----------------------|-----------------------|
| SOUTH AMERICA | | |
| Argentina | 22.5 u | 3,088 u |
| Bolivia | 40.9 -1.0 to 0.7 | 5,285 -261 to 10 |
| Brazil | 44.1 -0.7 to 0.3 | 6,249 -41 to 46 |
| Chile | 27.0 u | 3,584 u |
| Colombia | 30.0 -0.3 to 0.8 | 3,967 -94 to -27 |
| Ecuador | 39.4 -0.1 to 0.3 | 5,794 -32 to 1 |
| French Guiana | 33.2 -1.1 to 1.9 | 6,043 -187 to -102 |
| Guyana (Br. Guiana) | 35.8 -0.8 to -0.3 | 5,833 -59 to 13 |
| Paraguay | 35.1 -0.2 to 0.2 | 5,266 -46 to -3 |
| Peru | 39.8 -0.5 to 0.0 | 5,803 -27 to -4 |
| Surinam (Dutch Guiana) | 37.2 -1.4 to -0.3 | 5,618 -167 to 181 |
| Uruguay | 23.8 u | 2,911 u |
| Venezuela | 38.6 -1.4 to 1.4 | 4,850 -65 to -53 |
| ASIA | | |
| Afghanistan | 54.7 -0.6 to 1.2 | 7,540 -158 to 221 |
| Bahrain | 36.6 0.0 to 0.7 | 6,312 -170 to -17 |
| Bangladesh (E. Pakistan) | 44.8 0.0 to 1.2 | 6,581 -220 to 118 |
| Bhutan | 38.2 -0.8 to 0 | 5,360 0 to 4 |

| Age-specific fertility rates | | | | | | |
|------------------------------|------------------|------------------|-----------------|------------------|------------------|----------------|
| 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
| 67 u | 153 u | 170 u | 118 u | 70 u | 27 u | 8 u |
| 130 -59 to 40 | 223 16 to 25 | 241 -15 to 46 | 209 1 to 18 | 156 -15 to 22 | 79 -27 to 9 | 18 -8 to 0 |
| 74 -3 to 10 | 225 33 to 41 | 290 -37 to 40 | 273 6 to 15 | 226 -24 to 6 | 132 -28 to 11 | 30 -11 to 0 |
| 74 u | 183 u | 187 u | 138 u | 84 u | 43 u | 8 u |
| 82 -14 to 2 | 205 -8 to -1 | 217 -19 to 8 | 159 -8 to 1 | 93 6 to 14 | 32 -1 to 13 | 5 -2 to 3 |
| 88 1 to 43 | 257 -4 to 0 | 280 -1 to 76 | 241 -3 to 8 | 182 -40 to 1 | 90 -28 to 2 | 20 -10 to 0 |
| 102 -25 to 8 | 239 2 to 10 | 259 12 to 20 | 275 -2 to 5 | 214 -5 to 5 | 105 -6 to 35 | 16 -2 to 13 |
| 75 -39 to 15 | 256 -5 to 9 | 304 -5 to 21 | 250 -8 to 5 | 179 -5 to -2 | 85 -3 to 15 | 17 -6 to 1 |
| 92 -14 to 7 | 248 -6 to 0 | 260 0 to 8 | 218 -2 to 4 | 154 2 to 5 | 69 -5 to 7 | 12 0 to 2 |
| 92 -4 to 1 | 260 4 to 8 | 284 0 to 7 | 239 3 to 5 | 178 -3 to 4 | 88 -6 to 2 | 19 -1 to 0 |
| 66 -36 to 24 | 263 -5 to 5 | 288 11 to 29 | 238 -13 to 6 | 175 -12 to -4 | 79 -7 to 2 | 14 -1 to 7 |
| 62 u | 160 u | 157 u | 112 u | 63 u | 24 u | 4 u |
| 85 -3 to 21 | 259 -10 to -2 | 248 -19 to 7 | 188 -3 to 16 | 126 6 to 20 | 50 -3 to 14 | 15 -4 to 0 |
| 138 -26 to 38 | 338 -19 to 21 | 311 -62 to 0 | 300 -8 to 24 | 252 0 to 16 | 143 -32 to 6 | 35 -28 to 6 |
| 137 -84 to 7 | 259 -10 to 12 | 290 -25 to 28 | 259 -12 to 7 | 192 -13 to 8 | 103 -7 to 23 | 22 -15 to 0 |
| 149 -67 to -4 | 286 -6 to 9 | 283 -33 to -7 | 261 -6 to 8 | 201 -5 to 16 | 113 -22 to 3 | 23 -9 to 3 |
| 81 -27 to 0 | 252 0 to 5 | 280 -7 to 0 | 220 -3 to 1 | 153 -1 to 1 | 69 -16 to 2 | 10 0 to 6 |

TABLE 4 (continued)

| Region and country or territory | Crude birth rate | Total fertility rate |
|---------------------------------|----------------------|----------------------|
| <i>ASIA (continued)</i> | | |
| Brunei | 38.4 u | 5,957 u |
| Burma | 42.4 -0.8 to 0.6 | 6,012 -39 to 78 |
| Cyprus | 18.3 -0.1 to 1.1 | 2,426 24 to 28 |
| Dem. Rep. of Vietnam (North) | 34.7 -0.4 to 0 | 5,058 0 to 1 |
| Hong Kong | 19.7 u | 3,549 u |
| India | 40.1 -1.8 to -0.1 | 5,761 -36 to 158 |
| Indonesia | 44.2 -1.9 to 0.5 | 5,939 -48 to 50 |
| Iran | 49.0 -1.9 to -0.4 | 7,661 15 to 20 |
| Iraq | 49.8 -0.9 to 1.2 | 8,285 -30 to -3 |
| Israel | 27.8 u | 3,778 u |
| Japan | 19.0 u | 2,069 u |
| Jordan | 42.8 -1.0 to 0.2 | 6,247 23 to 212 |
| Khmer Rep. (Cambodia) | 40.7 -1.0 to -0.1 | 5,771 33 to 67 |
| Kuwait | 46.1 -1.5 to 1.4 | 7,260 -324 to 115 |
| Laos | 44.5 -0.6 to 0.6 | 6,271 -72 to 82 |
| Lebanon | 33.4 -0.5 to -0.2 | 5,162 -90 to 10 |
| Macau | 16.1 -0.4 to 1.0 | 2,681 80 to 176 |
| Maldives Is. | 41.7 -1.4 to -0.3 | 5,851 -10 to -1 |

Age-specific fertility rates

| 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
|------------|-----------|-----------|-----------|-----------|-----------|----------|
| 73 | 263 | 319 | 261 | 174 | 77 | 24 |
| u | u | u | u | u | u | u |
| 115 | 279 | 259 | 235 | 191 | 104 | 19 |
| -34 to 12 | -10 to 11 | -29 to -7 | -1 to 14 | -4 to 6 | -23 to 1 | -9 to 4 |
| 30 | 118 | 171 | 104 | 47 | 14 | 1 |
| -14 to 3 | -2 to 9 | -5 to 16 | -3 to 2 | -6 to 3 | -6 to 1 | -4 to 1 |
| 79 | 244 | 269 | 211 | 146 | 67 | 9 |
| -14 to 1 | 0 to 1 | -2 to 0 | 0 to 1 | 0 to 1 | -11 to 0 | 0 to 5 |
| 18 | 146 | 268 | 160 | 85 | 29 | 4 |
| u | u | u | u | u | u | u |
| 141 | 313 | 203 | 195 | 179 | 104 | 18 |
| -1 to 75 | -5 to 7 | -11 to 31 | -4 to 5 | -43 to -4 | -31 to -2 | -8 to 5 |
| 112 | 284 | 259 | 222 | 182 | 103 | 25 |
| -1 to 40 | 8 to 21 | -27 to 23 | -3 to 8 | -28 to 10 | -34 to 3 | -7 to 0 |
| 142 | 338 | 310 | 298 | 259 | 149 | 37 |
| -2 to 35 | 5 to 18 | -20 to 39 | -1 to 8 | -41 to 2 | -29 to 1 | -12 to 1 |
| 126 | 343 | 375 | 347 | 281 | 149 | 35 |
| -9 to 7 | -1 to 4 | -4 to 25 | 6 to 8 | -21 to 0 | -16 to 12 | -6 to 15 |
| 41 | 203 | 228 | 166 | 89 | 25 | 3 |
| u | u | u | u | u | u | u |
| 4 | 95 | 207 | 85 | 20 | 3 | 0 |
| u | u | u | u | u | u | u |
| 118 | 297 | 303 | 246 | 181 | 88 | 15 |
| -13 to 1 | -5 to 8 | -4 to 4 | -4 to 7 | -5 to 5 | -18 to 1 | 0 to 10 |
| 83 | 249 | 281 | 235 | 183 | 102 | 22 |
| -6 to 2 | 22 to 29 | -26 to 27 | 1 to 10 | -16 to 8 | -17 to 16 | -12 to 0 |
| 177 | 319 | 306 | 294 | 226 | 115 | 15 |
| -140 to -3 | -14 to 2 | 21 to 47 | -11 to 9 | -27 to -2 | -34 to 10 | -3 to 40 |
| 126 | 287 | 272 | 247 | 196 | 106 | 21 |
| -47 to 7 | -11 to 11 | -29 to -8 | -3 to 13 | -1 to 8 | -24 to 1 | -8 to 4 |
| 82 | 227 | 263 | 217 | 154 | 75 | 14 |
| -15 to 1 | -4 to 3 | -5 to 6 | -3 to 3 | -8 to 1 | -6 to 5 | -6 to 0 |
| 53 | 102 | 170 | 123 | 61 | 24 | 3 |
| -48 to 16 | -7 to 10 | -14 to 31 | -15 to -6 | -20 to 8 | -14 to 18 | -11 to 1 |
| 131 | 294 | 276 | 235 | 182 | 95 | 15 |
| -56 to 1 | -7 to 11 | 0 to 16 | 0 to 12 | -2 to 4 | -17 to 0 | 0 to 9 |

TABLE 4 (continued)

| Region and country or territory | Crude birth rate | Total fertility rate |
|---------------------------------|----------------------|----------------------|
| <i>ASIA (continued)</i> | | |
| Mongolia | 41.4 -0.8 to 0.0 | 5,817 0 to 2 |
| Nepal | 43.1 -2.1 to 0.1 | 5,708 -107 to 96 |
| Pakistan (W. Pakistan) | 44.8 -1.2 to 0.2 | 6,842 -82 to 68 |
| Philippines | 38.5 -0.5 to 0.2 | 5,505 -129 to 16 |
| Rep. of China (Taiwan) | 23.8 u | 3,211 u |
| Rep. of Korea (South) | 31.3 0.0 to 0.3 | 4,516 21 to 35 |
| Rep. of Vietnam (South) | 34.7 -0.3 to 0.0 | 5,057 0 to 1 |
| Ryukyu Is. (Japan) | 22.3 u | 3,135 u |
| Sabah (N. Borneo, E. Malaysia) | 39.5 -1.1 to -0.1 | 6,128 -115 to -12 |
| Sarawak (E. Malaysia) | 37.4 -1.6 to 0.2 | 5,450 -200 to 10 |
| Saudi Arabia | 50.5 -0.7 to 0.6 | 7,454 -116 to 74 |
| Sikkim | 44.6 -1.1 to 1.4 | 6,282 76 to 230 |
| Singapore | 22.1 u | 3,100 u |
| Sri Lanka (Ceylon) | 30.1 u | 4,188 u |
| Syrian Arab Rep. (Syria) | 48.0 -1.1 to 0.3 | 8,073 6 to 23 |
| Thailand | 40.3 -0.9 to 0.1 | 5,864 29 to 40 |
| Turkey | 41.5 -2.1 to -0.3 | 6,034 137 to 229 |

| Age-specific fertility rates | | | | | | |
|------------------------------|------------------|------------------|-----------------|------------------|------------------|----------------|
| 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
| 94 -27 to 3 | 279 -1 to 3 | 303 -6 to 3 | 245 -2 to 2 | 175 -1 to 2 | 80 -15 to 2 | 13 -1 to 8 |
| 142 -38 to 12 | 274 -1 to 12 | 191 -23 to -5 | 205 -6 to 18 | 191 -9 to -1 | 115 -41 to 3 | 24 -17 to 0 |
| 132 -27 to 0 | 285 21 to 36 | 298 -25 to 34 | 273 -6 to 4 | 225 -32 to 8 | 128 -25 to 4 | 28 -12 to 1 |
| 65 -2 to 7 | 244 0 to 6 | 301 -7 to -2 | 235 1 to 6 | 163 1 to 7 | 76 -4 to 14 | 17 -4 to 0 |
| 33 u | 203 u | 250 u | 105 u | 37 u | 12 u | 2 u |
| 17 -9 to 2 | 198 -4 to 8 | 297 -12 to 10 | 199 -1 to 7 | 127 -6 to 4 | 56 -9 to 30 | 10 0 to 5 |
| 79 -16 to 1 | 243 0 to 2 | 269 -2 to 0 | 211 0 to 1 | 146 0 to 1 | 67 -11 to 0 | 9 0 to 5 |
| 15 u | 128 u | 229 u | 172 u | 71 u | 13 u | 1 u |
| 96 -1 to 26 | 312 -23 to 3 | 312 -10 to 14 | 244 -7 to 1 | 174 -10 to -1 | 78 -31 to 3 | 10 -1 to 17 |
| 104 -6 to 4 | 280 -14 to 8 | 279 -8 to 1 | 211 -5 to 3 | 143 -16 to 4 | 52 -5 to 15 | 10 -1 to 8 |
| 155 -74 to -7 | 323 -11 to 11 | 299 -32 to -8 | 292 -3 to 14 | 242 -7 to 10 | 137 -21 to 1 | 31 -10 to 2 |
| 136 -25 to 0 | 232 -1 to 67 | 240 -49 to 63 | 252 -6 to 18 | 230 -45 to 9 | 147 -50 to 6 | 21 -2 to 9 |
| 26 u | 139 u | 210 u | 138 u | 75 u | 27 u | 5 u |
| 43 u | 176 u | 226 u | 202 u | 139 u | 43 u | 7 u |
| 115 -10 to 1 | 334 3 to 6 | 370 -10 to 27 | 338 2 to 8 | 273 -23 to 3 | 147 -17 to 30 | 38 -10 to 2 |
| 91 -3 to 1 | 265 4 to 5 | 292 -11 to 7 | 239 2 to 5 | 176 -5 to 4 | 89 -7 to 5 | 20 -5 to 0 |
| 228 -139 to 34 | 236 0 to 47 | 227 -40 to 55 | 217 -8 to 7 | 176 -25 to 15 | 106 -29 to 13 | 18 -9 to 5 |

TABLE 4 (continued)

| Region and country or territory | Crude birth rate | Total fertility rate |
|----------------------------------|----------------------|----------------------|
| <i>ASIA (continued)</i> | | |
| United Arab Emirates | 38.8 -1.5 to 3.1 | 6,459 -386 to -14 |
| West Malaysia (Fed. of Malaysia) | 33.8 u | 5,052 u |
| Yemen | 50.3 -0.8 to 0.5 | 7,440 -104 to 74 |
| Yemen (Dem.) | 44.8 -2.6 to -0.1 | 6,566 -249 to 347 |
| <i>EUROPE</i> | | |
| Austria | 14.6 u | 2,201 u |
| Belgium | 14.7 u | 2,244 u |
| Bulgaria | 15.3 u | 2,075 u |
| Channel Is. (Guernsey & Jersey) | 14.3 -0.3 to 0.6 | 2,083 -79 to -14 |
| Czechoslovakia | 15.9 u | 2,069 u |
| Dem. Rep. of Germany (East) | 13.8 u | 1,841 u |
| Denmark | 14.4 u | 1,959 u |
| England & Wales (United Kingdom) | 16.0 u | 2,404 u |
| Faeroe Is. | 26.1 u | 4,314 u |
| Fed. Rep. of Germany (West) | 13.4 u | 2,013 u |
| Finland | 14.0 u | 1,815 u |
| France | 16.7 u | 2,608 u |
| Gibraltar | 21.7 u | 2,960 u |

Age-specific fertility rates

| 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
|-------------------|------------------|------------------|------------------|------------------|------------------|----------------|
| 313 -239 to -7 | 246 -14 to 4 | 217 -33 to 10 | 225 -10 to 9 | 173 -26 to 23 | 107 -48 to 7 | 11 -4 to 15 |
| 57 u | 235 u | 276 u | 225 u | 143 u | 58 u | 16 u |
| 163 -70 to -6 | 323 -11 to 11 | 299 -31 to -8 | 292 -2 to 14 | 243 -6 to 9 | 137 -19 to 1 | 32 -11 to 2 |
| 111 -54 to 18 | 299 -1 to 4 | 275 3 to 32 | 258 -19 to 13 | 222 -20 to -5 | 113 -13 to 32 | 35 -14 to 0 |
| 56 u | 148 u | 110 u | 74 u | 39 u | 12 u | 1 u |
| 31 u | 149 u | 143 u | 78 u | 36 u | 10 u | 1 u |
| 68 u | 175 u | 105 u | 46 u | 17 u | 4 u | 1 u |
| 47 -4 to 7 | 138 2 to 4 | 123 3 to 11 | 71 -1 to 2 | 31 -5 to 1 | 7 -4 to 0 | 0 -2 to 0 |
| 46 u | 179 u | 114 u | 51 u | 19 u | 5 u | 0 u |
| 72 u | 171 u | 66 u | 39 u | 17 u | 3 u | 0 u |
| 33 u | 133 u | 130 u | 66 u | 25 u | 5 u | 0 u |
| 51 u | 154 u | 157 u | 78 u | 33 u | 8 u | 1 u |
| 74 u | 252 u | 236 u | 153 u | 96 u | 48 u | 3 u |
| 36 u | 130 u | 108 u | 77 u | 40 u | 11 u | 1 u |
| 33 u | 120 u | 105 u | 65 u | 31 u | 9 u | 1 u |
| 25 u | 170 u | 164 u | 98 u | 48 u | 15 u | 1 u |
| 59 u | 209 u | 186 u | 92 u | 34 u | 12 u | 0 u |

TABLE 4 (continued)

| Region and country or territory | Crude birth rate | Total fertility rate |
|---------------------------------|---------------------|----------------------|
| EUROPE (continued) | | |
| Greece | 15.9 u | 2,376 u |
| Hungary | 14.7 u | 1,989 u |
| Iceland | 21.5 u | 2,906 u |
| Ireland | 22.7 u | 3,975 u |
| Isle of Man | u u | u u |
| Italy | 16.8 u | 2,402 u |
| Liechtenstein | 20.8 0.1 to 0.4 | 2,456 -15 to 2 |
| Luxembourg | 13.2 u | 1,969 u |
| Malta & Gozo | 16.7 u | 2,262 u |
| Monaco | 4.7 -0.6 to 1.2 | 1,022 -108 to -17 |
| Netherlands | 18.3 u | 2,584 u |
| Northern Ireland | 21.1 -0.3 to 0.2 | 3,325 -42 to -31 |
| Norway | 16.6 u | 2,490 u |
| Poland | 16.8 u | 2,229 u |
| Portugal | 20.0 u | 2,885 u |
| Romania | 14.3 u | 1,903 u |
| Scotland | 16.6 u | 2,526 u |
| Spain | 19.6 u | 2,849 u |
| Sweden | 13.7 u | 1,921 u |

Age-specific fertility rates

| 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
|----------|---------|----------|---------|-----------|----------|---------|
| 37 | 143 | 156 | 87 | 42 | 9 | 1 |
| u | u | u | u | u | u | u |
| 51 | 163 | 110 | 52 | 18 | 4 | 0 |
| u | u | u | u | u | u | u |
| 69 | 186 | 153 | 102 | 51 | 19 | 1 |
| u | u | u | u | u | u | u |
| 19 | 150 | 244 | 200 | 132 | 47 | 3 |
| u | u | u | u | u | u | u |
| u | u | u | u | u | u | u |
| u | u | u | u | u | u | u |
| 22 | 138 | 154 | 99 | 52 | 16 | 1 |
| u | u | u | u | u | u | u |
| 33 | 163 | 165 | 92 | 34 | 3 | 1 |
| -9 to 26 | -5 to 5 | -2 to 10 | -8 to 3 | 1 to 8 | 1 to 7 | -1 to 0 |
| 28 | 132 | 127 | 65 | 33 | 9 | 1 |
| u | u | u | u | u | u | u |
| 14 | 111 | 148 | 100 | 56 | 21 | 2 |
| u | u | u | u | u | u | u |
| 12 | 66 | 90 | 42 | 2 | 0 | 0 |
| -9 to 1 | -5 to 4 | 3 to 12 | -5 to 1 | -10 to -2 | -7 to 10 | -9 to 0 |
| 23 | 137 | 185 | 108 | 49 | 14 | 1 |
| u | u | u | u | u | u | u |
| 35 | 183 | 193 | 135 | 84 | 33 | 2 |
| 0 to 9 | -5 to 2 | 4 to 10 | 1 to 6 | -2 to 2 | -12 to 1 | 0 to 5 |
| 45 | 167 | 147 | 87 | 41 | 10 | 1 |
| u | u | u | u | u | u | u |
| 30 | 162 | 132 | 73 | 37 | 11 | 1 |
| u | u | u | u | u | u | u |
| 29 | 144 | 171 | 121 | 77 | 32 | 3 |
| u | u | u | u | u | u | u |
| 52 | 143 | 97 | 54 | 25 | 8 | 1 |
| u | u | u | u | u | u | u |
| 48 | 163 | 165 | 84 | 36 | 9 | 0 |
| u | u | u | u | u | u | u |
| 14 | 121 | 197 | 131 | 77 | 26 | 3 |
| u | u | u | u | u | u | u |
| 34 | 121 | 127 | 69 | 27 | 6 | 0 |
| u | u | u | u | u | u | u |

TABLE 4 (continued)

| Region and country or territory | Crude birth rate | Total fertility rate |
|-----------------------------------|---------------------|----------------------|
| EUROPE (continued) | | |
| Switzerland | 15.8 u | 2,086 u |
| USSR | 17.4 u | 2,421 u |
| Yugoslavia | 18.3 u | 2,373 u |
| OCEANIA | | |
| American Samoa | 37.4 u | 5,233 u |
| Australia | 21.7 u | 2,950 u |
| Solomon Is. (British Solomon Is.) | 39.2 -0.3 to 0.3 | 5,897 16 to 40 |
| Fiji Is. | 34.9 u | 4,958 u |
| French Polynesia | 39.9 -0.1 to 0.7 | 6,229 -4 to 0 |
| Gilbert & Ellice Is. | 38.0 -0.1 to 0.3 | 5,510 -46 to 68 |
| Guam | 33.8 u | 4,756 u |
| New Caledonia | 33.9 -0.5 to 0.0 | 5,011 -20 to -13 |
| New Hebrides | 39.9 -0.1 to 0.6 | 5,993 83 to 127 |
| New Zealand | 22.7 u | 3,197 u |
| Pacific Is. | 40.5 -0.5 to 0.7 | 6,685 7 to 83 |
| Papua New Guinea | 47.3 -1.9 to 0.3 | 6,621 -148 to 82 |
| Tonga | 40.2 0.1 to 0.5 | 6,132 -53 to 7 |
| Western Samoa | 42.0 -0.7 to 0.4 | 7,263 28 to 182 |

NOTE: See Table 1 for most recent census year for which data were available on each country. summarizes all other estimates prepared. (See text for details.)

u—unavailable.

| Age-specific fertility rates | | | | | | |
|------------------------------|-----------|-----------|----------|-----------|-----------|---------|
| 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
| 23 | 125 | 137 | 83 | 38 | 10 | 1 |
| u | u | u | u | u | u | u |
| 32 | 179 | 119 | 89 | 47 | 16 | 3 |
| u | u | u | u | u | u | u |
| 54 | 170 | 131 | 73 | 34 | 11 | 2 |
| u | u | u | u | u | u | u |
| 65 | 254 | 330 | 194 | 148 | 51 | 3 |
| u | u | u | u | u | u | u |
| 56 | 183 | 193 | 102 | 44 | 11 | 1 |
| u | u | u | u | u | u | u |
| 89 | 265 | 304 | 246 | 176 | 84 | 15 |
| -11 to 1 | 0 to 4 | -2 to 4 | -1 to 5 | -1 to 2 | -9 to 1 | 0 to 6 |
| 63 | 276 | 271 | 179 | 130 | 54 | 17 |
| u | u | u | u | u | u | u |
| 76 | 283 | 320 | 265 | 190 | 87 | 15 |
| -3 to 6 | -12 to 0 | -5 to 0 | -3 to 0 | -4 to 0 | -4 to 3 | 0 to 10 |
| 69 | 253 | 300 | 234 | 159 | 71 | 15 |
| -29 to 13 | -3 to 3 | -12 to -4 | -3 to 1 | 2 to 5 | -1 to 6 | -1 to 1 |
| 96 | 280 | 266 | 161 | 103 | 42 | 3 |
| u | u | u | u | u | u | u |
| 99 | 248 | 247 | 198 | 139 | 63 | 8 |
| -14 to 0 | -3 to 1 | -4 to 3 | 1 to 3 | 2 to 5 | -17 to 5 | 0 to 8 |
| 90 | 282 | 318 | 243 | 176 | 83 | 10 |
| -8 to 2 | 0 to 6 | -6 to 4 | -4 to 7 | -6 to 0 | -18 to 1 | 0 to 14 |
| 69 | 210 | 203 | 104 | 41 | 12 | 1 |
| u | u | u | u | u | u | u |
| 106 | 301 | 335 | 280 | 205 | 98 | 13 |
| -19 to 2 | -8 to 5 | -1 to 14 | 1 to 4 | -10 to 2 | -26 to 4 | 0 to 22 |
| 121 | 301 | 314 | 260 | 197 | 104 | 27 |
| -22 to 3 | 5 to 27 | -21 to 8 | -7 to 11 | -12 to 13 | -28 to 16 | -9 to 0 |
| 67 | 270 | 352 | 273 | 181 | 77 | 8 |
| -14 to 5 | -14 to -1 | -4 to 8 | 1 to 8 | 7 to 13 | -31 to 11 | 0 to 21 |
| 75 | 316 | 377 | 314 | 234 | 116 | 20 |
| -19 to 3 | -9 to 8 | 12 to 21 | 3 to 15 | -20 to 4 | -7 to 20 | 0 to 11 |

Rate shown in first row for each country is a "standard" estimate; range shown in second row

total fertility rate declined: in 90 countries (79.6 percent of 113) the crude birth rate declined and in 83 countries (73.5 percent) the total fertility rate declined.

Crude birth rates declined at an average annual rate in excess of 1 percent in slightly more than half of these 113 countries (60/113 = 53.1 percent). Most of the rapid declines in fertility rates occurred in North and Central America (15 of 23 countries), Asia (15 of 26 countries), and Europe and the USSR (21 of 29 countries). In Africa, South America, and Oceania, relatively few countries (three in each region) had rapid fertility declines in the 1955–60 to 1965–75 period.

In spite of these declines, fertility rates for much of the world remained very high as of the latest census. For the 1965–75 period, vital rates, including those estimated using the new regression equations, were available for 163 nations. Among these countries, about one-third (34.3 percent) had crude birth rates exceeding 40. An additional third (31.3 percent) had birth rates of 25 or more but less than 40. Only one-third (32.6 percent) had birth rates less than 25.

The fertility declines (and current levels) have, of course, occurred differentially by region. We turn now to a brief review of each region (see Tables 2 and 3).

Africa

For many African nations, the most recent census data available dated from the 1960 round of censuses. The estimates for those countries hence refer to an earlier time period and provide little indication of recent fertility changes. For 16 nations, however, it was possible to compare rates from the 1955–60 period with those for more recent dates. Of these 16, half had higher birth rates and half higher total fertility rates at the more recent dates. The only sizable fertility decreases measured were for Lesotho (Basutoland), Mauritius, and Reunion. Among the 37 countries for which we had census data in 1965 or later years, 23 had crude birth rates exceeding 45 and only 4 had birth rates less than 25.

North and Central America

In North and Central America, the situation was quite different. It was possible to calculate fertility changes for 23 nations; in all but two of those, both the crude birth rate and total fertility rate had declined. In 14 (Barbados; Bermuda; Canada; Costa Rica; Greenland; Guadeloupe; Guatemala; Martinique; the Netherlands Antilles; Panama;

Puerto Rico; St. Kitts, Nevis, and Anguilla; Trinidad and Tobago; and the USA) the average annual rate of decrease for the decade was 1 percent or more. Of 27 countries with data for 1965 or later,¹ only one area (Virgin Islands) had a birth rate over 45 and 17 had birth rates under 35.

South America

In South America, data were available in 1965 or later for ten nations and we were able to calculate fertility changes for nine of these. Our estimates suggest substantial fertility declines took place in Chile, Colombia, and Guyana, and more modest declines in Ecuador, Paraguay, Peru, and Venezuela. For Argentina and Brazil, fertility changed little and the total fertility rate appears to have increased moderately in both countries. As of the latest census, four nations had crude birth rates under 35, five were in the 35–39 range, and one had a rate over 40.

Asia

In Asia, fertility changes could be assessed for 26 nations. Eighteen showed fertility declines in the reference period. Brunei, Cyprus, Hong Kong, Macau, the Philippines, South Korea, the Ryukyu Islands, Sabah and Sarawak (East Malaysia), Singapore, Sri Lanka, the Republic of China (Taiwan), Thailand, and West Malaysia all had fertility declines exceeding an average annual rate for the decade of 1 percent a year. Among these 14 territories, three—Singapore, Hong Kong, and Macau—had fertility rates that declined at average annual rates of 5 percent or more.

By the end of the reference period, however, many nations still had high fertility. We were able to calculate rates for 40 nations, almost half (47.5 percent) of which had crude birth rates of 40 or above. Roughly another third (32.5 percent) had crude birth rates in the 30s. Only one-fifth (20.0 percent) had birth rates under 30.

Europe and the USSR

Between 1955–60 and 1965–75, most European nations and the USSR showed fertility declines; they also had low fertility rates at the terminal dates. Well over two-thirds of the European countries showed fertility declines and all had birth rates less than 30 by the end of the reference period.

¹ Data on Jamaica were not available at the time these calculations were made.

Oceania

The situation with respect to fertility declines was similar in Oceania (80 percent of the areas experienced some fertility decline), but fertility rates remained relatively high at the end of the intercensal period. Almost two-thirds (64.2 percent) of the areas had crude birth rates of 35 or more. Only two countries (New Zealand and Australia) had birth rates under 25.

DISCUSSION

For much of the world, then, the “standard” regression estimates, combined with known fertility rates, indicate fertility decline in the 1955–60 to 1965–75 period. It is also clear, however, that fertility rates remain very high for much of the world. The fertility transition is, at best, in only the beginning stages for many countries. Furthermore, since I have presented estimates only of fertility, the regression estimates do not specify what happened to population growth rates in the same time period. Obviously, if death rates fell as much (or more) than the fertility rates, then population growth rates may have changed little if at all.

Some may be tempted to interpret the estimates presented here as indication that the family planning movement has been successful. These data neither confirm nor deny that interpretation; the finding that fertility declined in many nations does not necessarily mean that family planning programs have been the major cause. Changes in marriage patterns (later ages at first marriage or increased divorce rates), the use of induced abortion, and many other factors listed by Davis and Blake (1956) must also be considered as probable causes for the fertility changes shown by the regression estimates. In any case, this report does not address the causes but instead presents only the rates.

The fact that most of the data are estimated cannot be overlooked. Although the regression estimates have the merit of requiring relatively little input data, they lack the precision that more input data would undoubtedly impart. The method as applied here also has disadvantages because no investigator can be sensitive to the errors of every census and hence must use the data with relatively few adjustments to age distributions or other census items. Another source of error is that the regression estimates rely, for many countries, on estimates of the infant mortality rate.

Probable errors introduced by using estimated infant mortality rates

While the precise effect of using estimated infant mortality rates on the

regression estimates is difficult to specify, an approximate idea of the effect can be gained by recalculating the crude birth rate and total fertility rate “standard” estimates holding all other variables constant but increasing the infant mortality rate (IMR) by up to 30 points and decreasing it up to 30 points as compared with the rates reported in the Appendix Table. Increasing or decreasing the IMR by 10 points (per 1,000) has, on the average, the effect of increasing or decreasing the total fertility rate (TFR) by 135 points (per 1,000). A change of 20 points in the IMR results in a change of 271 points in the TFR. A change of 30 points in the IMR corresponds to a change of 406 points in the TFR. For the crude birth rate (CBR), the changes can be summarized as follows:

- (a) $IMR \pm 10$ corresponds to $CBR \pm .85$;
- (b) $IMR \pm 20$ corresponds to $CBR \pm 1.65$; and
- (c) $IMR \pm 30$ corresponds to $CBR \pm 2.55$.

Clearly, a poor choice of estimate for the IMR can strongly affect the fertility estimates.

The same procedure as that just employed for the infant mortality rate can also be employed to assess the effects of probable errors in other input parameters. We have not yet completed these calculations, partly because there are so many equations; but we intend to carry out these calculations for all equations, not just the “standard” series.

Other limitations in the regression procedures

In addition to errors introduced by having incorrect input data, the regression estimation technique suffers from other deficiencies. Most obvious perhaps is that most of the countries used to generate the estimating equations are Western. As Talwar (1971), among others, has documented, the basic age patterns of fertility and other interrelations among fertility measures differ in present-day less developed and more developed countries. What may be necessary, hence, is to move toward systems of equations more closely following the logic underlying the Coale and Demeny (1966) model life tables. This would require obtaining much additional, including historical, data for indirect and direct fertility measures.

Insight into the effects of broadening the range of data included in deriving the regression equations is provided by comparing estimates prepared with the Bogue-Palmore 1964 equations (derived with 1955–60 data) and the newly derived equations (calculated from 1965–75 data). To make this comparison, we used the data found in Cho (1964,

appendix table A) for the 1955–60 period and prepared estimates of the crude birth rate and total fertility rate using both sets of estimating equations. We then calculated the difference between the two estimates as the relative percentage that the new equations exceeded (or undershot) the estimates based on Bogue-Palmore 1964 equations.² For the crude birth rate, 58 percent of the estimates were within a relative difference range of 0–4 percent. Eighty-nine percent of the estimates differed by a relative difference less than 10 percent. For the total fertility rate, 38 percent differed by less than 4 percent, 57 percent by less than 6 percent, and 82 percent by less than 10 percent.

Another problem with the regression method is that the various calculations from census data used for estimation are not independent of one another. Census data tend to have error patterns and these patterns may affect the estimates obtained.

Probable errors of the regression procedure may be further understood when we are able to compare the regression estimation method with other fertility estimation techniques—using data for the same countries and same dates. This work has begun and will be reported at a later date.

For any one country, the best procedure is of course to prepare a series of estimates making various assumptions about errors in the input parameters and also selecting several different equations. We have not done that for every country in the world, for obvious reasons. Hence, it would be surprising if any reader fails to find at least one country's estimate with which he or she takes issue.

CONCLUSION

Even with the limitations mentioned above (and others that can be raised), the regression estimates have two basic advantages over other methods. First, the fertility changes reported rely on a consistent methodology across countries, and, second, estimates could be prepared for many countries whose fertility rates cannot be estimated with techniques requiring more data. Furthermore, it seems unlikely that refinements in method would change the finding of major fertility decline during the 1955–60 to 1965–75 decade.

2 For example, suppose the 1964 equations estimated 53.0 and the new equations estimated 49.1. The difference is 3.9 and the relative difference is 7.4 (3.9/53.0).

APPENDIX: NEWLY DERIVED REGRESSION EQUATIONS FOR ESTIMATING FERTILITY RATES FROM CENSUS DATA

The method used to derive the equations is based on the original formulation presented in Bogue and Palmore (1964). The procedures were as follows:

1. Data were collected for every country in the world on the items shown in the Appendix Exhibit. The census year was used for all data wherever possible.
2. Each country was classified into one of six classes on the basis of a careful evaluation of the data available and whether or not the vital statistics were complete or nearly so:
 - Class 1 = estimator (good data for census and vital registration and all items available): 56 countries
 - Class 2 = not to be estimated (good data for census and vital registration but some items not available): 18 countries
 - Class 3 = to be estimated (all items available but incomplete vital registration): 65 countries
 - Class 4 = to be estimated (incomplete vital registration, has all items except infant mortality rate): 1 country
 - Class 5 = to be estimated (incomplete vital registration, has all items except marital status data): 47 countries
 - Class 6 = to be estimated (incomplete vital registration, has all items except marital status data and infant mortality rate): 5 countries
3. Data collection itself took more than a year. Monica Fong and I visited New York and Washington to make use of data files and published materials at the United Nations Statistical Office and the U.S. Bureau of the Census. Publications of international agencies, such as the United Nations *Demographic Yearbooks* and World Health Organization Statistical Reports, were used extensively. For any missing data, Monica Fong and I wrote to each country requesting those data. Special attempts were made to include as many countries as possible in Class 1. Nevertheless, 18 countries with good data had to be excluded because we could not obtain all of the necessary information for them.
4. Fifty-six countries were finally selected as estimators. To verify the appropriateness of the approach to be used in generating the regression equations, we undertook careful checks to assess whether or not the census data and the fertility rates bore linear relationships to each other. Each census variable was plotted against each fertility rate and the resulting scatter plots were visually inspected for signs of curvilinearity. We discovered that relationships involving the age-specific fertility rates for ages 15–19 and 45–49 required nonlinear equations to achieve the best fit. Otherwise, linear equations appeared to be appropriate.
5. Some of the items we attempted to collect for every country proved to be unavailable for so many countries that we did not use them in the regression

equations. The percentage urban and rural proved not useful owing to inconsistent definitions as well as the unavailability of the data for many countries. Life expectancy information was unavailable for many countries, although this finding led to research reported elsewhere (Swanson and Palmore 1976; Swanson, Palmore, and Sundaram 1977).

The percentage of the population aged 0 (and the corresponding child/woman ratio) also proved to be unavailable for many countries. Finally, attempts to use more refined classifications of marital status than ever-married or never-married also proved to be difficult because the data were not available for enough countries.

6. The data finally selected for use in independent variables are shown in the column headings of the Appendix Table.
7. Data for the 56 Class 1 countries were used to derive regression equations relating census data and the infant mortality rate to conventional fertility measures such as the total fertility rate. Different equations were derived for each of the last four classes of countries (see (2) above). For example, equations omitting the infant mortality rate as an independent variable were derived for Class 4 countries. To derive the "best" equations, we decided that maximizing R^2 would be the criterion for selecting the best equations. For all of the procedures subsequently described, we also decided to make use of the RLEAP algorithm to select the maximum R^2 equations from all possible equations.³
8. The dependent variables for the regression equations were as follows: total fertility rate, crude birth rate, age-specific fertility rate for females 25–29, age-specific fertility rate for females 20–24, age-specific fertility rate for females 15–19, age-specific fertility rate for females 30–34, age-specific fertility rate for females 35–39, age-specific fertility rate for females 40–44, and age-specific fertility rate for females 45–49. The ordering of the dependent variables was as listed above for reasons to be explained later in this discussion.
9. For each dependent variable, many different regression equations were generated. In addition to generating different equations for each class of country (see (2) and (7) above), we prepared several types of estimating equation:
 - Type 1: Only census data and the infant mortality rate were entered as independent variables.
 - Type 2: Census data and the infant mortality rate were entered as independent variables, but previously estimated values were also entered as

3 The RLEAP algorithm is available in the subroutines of the International Mathematical and Scientific Libraries (IMSL) computer programs, Library 1, Edition 6, 1977 (Vol. 2), Subroutine RLEAP. A technical discussion of the algorithm is available in Furnival and Wilson (1974).

independent variables. For example, an equation was generated for the total fertility rate first. Then, the total fertility rate could be moved to the right-hand side of subsequent equations (e.g., the equation for the 25–29 age-specific fertility rate). It was for Type 2 estimating equations that the order of dependent variables specified in (8) above became important.

Type 3: The log transformation was used to estimate two of the age-specific fertility rates, those for ages 15–19 and 45–49. Otherwise, Type 3 was the same as Type 1. Other transformations

$$\left[1/x, x^{.14} - (1-x)^{.14}, \text{ and } \ln \left(\frac{x}{1-x} \right) \right]$$

were also tried but we found that the log transformation achieved as good or better fits than all other transformations tried.

10. The RLEAP subroutine provides the user with the option of choosing the n best equations using x independent variables. After starting with n at 10 and x at 17 and carefully reviewing hundreds of equations, we decided that $n = 3$ and $x = 4$ would be used for the final estimating equations. Very small increments in R^2 were achieved by using more than four independent variables. Also, each additional independent variable makes the method more difficult to use and somewhat less reliable due to the small number (56) of Class 1 countries used to derive the equations. The R^2 values were .95 or better for the crude birth rate and total fertility rate and the best equations for the age-specific rates always exceeded .75 except for the age-specific fertility rate ages 15–19. An n of 3 was chosen because it was felt that little was to be gained by more than three estimates for each type of equation (see (9) above).
11. For Type 2 equations, two minor variants were used. For three equations, when a fertility rate was moved to the right-hand side of the equation, the average of Type 1 estimates was used for the value of that fertility rate. For three other equations, only the highest R^2 equation was employed for the variable moved to the right-hand side.
12. For a given class (e.g., Class 3) of country, then, the following equations were produced:
 - Total fertility rate: three equations, all Type 1 (three because the RLEAP n was set at 3)
 - Crude birth rate: nine equations, three of Type 1 and six of Type 2 (see (11) above)
 - Age-specific fertility rates except 15–19 and 45–49: nine equations, three of Type 1 and six of Type 2
 - Age-specific fertility rates for ages 15–19 and 45–49: 12 equations, three of Type 1, six of Type 2, and three of Type 3
 These equations may be requested from the author.

The newly derived regression equations can be used by first deciding the class of the country on the basis of available data, and subsequently choosing the equation with the highest R^2 for any given dependent variable. Alternate strategies are also possible, of course, and one of these is explained in the body of this report.

APPENDIX EXHIBIT: Base data collected for each country

1. Year of census data
 2. Year of vital registration data
 3. Total population by sex
 4. Total urban population by sex
 5. Total rural population by sex
 6. Population by sex of age groups 0–1, 1–4, 5–9, and 10–14
 7. Female population in age groups 15–19, 20–24, 25–29, 30–34, 35–39, 40–44, and 45–49
 8. Male population by marital status
 9. Males aged 15 or older by marital status
 10. Female population by marital status
 11. Females aged 15 or older by marital status
 12. Females by marital status for age groups 15–19, 20–24, 25–29, 30–34, 35–39, 40–44, and 45–49
 13. Median age at marriage and percentage single at that age (Hajnal's method)
 14. Live births to women of age groups 0–14, 15–19, 20–24, 25–29, 30–34, 35–39, 40–44, and 45–49
 15. Registered crude birth rate
 16. Infant mortality rate
 17. Life expectancy at birth and at age 5 by sex
-

APPENDIX TABLE: Indices used to estimate fertility rates reported

| Region and country or territory | Percentage of total population in age group | | | Ratio of children, by age group, to women aged 15-49 | | | Index of fertility age com- position |
|--|---|------|------|--|-------|---------|---|
| | 0-4 | 5-9 | 0-14 | 0-4 | 5-9 | 0-14 | |
| AFRICA | | | | | | | |
| Algeria | 19.4 | 14.8 | 47.2 | 939.3 | 717.4 | 2,285.5 | 1.10 |
| Angola | 17.2 | 14.7 | 41.7 | 701.4 | 601.7 | 1,703.6 | 1.16 |
| Benin (Dahomey): Afr. pop. | 19.8 | 16.8 | 46.0 | 836.8 | 710.1 | 1,945.7 | 1.20 |
| Botswana | 17.4 | 16.1 | 46.8 | 747.3 | 692.9 | 2,013.5 | 1.09 |
| Burundi (Ruanda-Urundi) | 16.7 | 14.2 | 44.1 | 679.3 | 576.0 | 1,789.3 | 1.07 |
| Brazzaville, People's Rep. of (Congo) | 19.8 | 16.6 | 49.1 | 820.4 | 689.4 | 2,036.6 | 1.16 |
| Central African Rep. (Fr. Eq. Africa) | 16.7 | 15.7 | 40.0 | 556.9 | 522.2 | 1,335.2 | 1.13 |
| Chad: Afr. pop. | 19.4 | 17.9 | 45.6 | 729.5 | 673.0 | 1,717.3 | 1.17 |
| Comoro Is. | 15.5 | 16.3 | 43.1 | 614.7 | 644.6 | 1,708.9 | 1.13 |
| Egypt (United Arab Rep.) | 15.9 | 14.6 | 42.8 | 702.3 | 645.7 | 1,888.3 | 1.08 |
| Equatorial Guinea (Fr. Guinea) | 14.2 | 11.9 | 35.2 | 588.6 | 493.5 | 1,458.2 | 1.08 |
| Gabon | 12.1 | 10.1 | 29.6 | 397.6 | 333.7 | 976.0 | 0.99 |
| Gambia | 16.9 | 14.9 | 41.4 | 704.9 | 622.3 | 1,730.2 | 1.21 |
| Ghana | 18.3 | 16.9 | 46.9 | 816.9 | 757.9 | 2,098.8 | 1.17 |
| Guinea Bissau | 14.8 | 11.3 | 36.3 | 605.0 | 462.2 | 1,487.4 | 1.07 |
| Guinea | 18.3 | 16.2 | 42.5 | 672.5 | 595.3 | 1,564.2 | 1.14 |
| Ivory Coast | 19.6 | 16.1 | 42.7 | 852.2 | 701.9 | 1,857.5 | 1.11 |
| Kenya | 19.2 | 16.5 | 48.4 | 900.9 | 774.8 | 2,265.8 | 1.15 |
| Lesotho (Basutoland) | 14.4 | 14.8 | 43.5 | 564.0 | 581.8 | 1,708.5 | 1.06 |
| Liberia | 16.3 | 13.2 | 37.2 | 599.8 | 485.1 | 1,369.9 | 1.18 |
| Libyan Arab Rep. (Libya) | 19.7 | 16.9 | 48.8 | 1,066.8 | 913.7 | 2,634.3 | 1.11 |
| Malagasy Rep. (Madagascar) | 18.2 | 15.2 | 46.5 | 814.6 | 679.5 | 2,083.2 | 1.07 |
| Malawi (Br. Nyasaland) | 18.5 | 14.8 | 43.9 | 739.9 | 591.0 | 1,755.0 | 1.11 |
| Mali (Fr. Sudan) | 18.5 | 14.7 | 42.2 | 755.4 | 600.2 | 1,726.0 | 1.12 |
| Mauritius | 12.3 | 14.4 | 40.1 | 519.0 | 607.0 | 1,695.9 | 1.08 |
| Morocco | 16.3 | 16.2 | 46.2 | 750.3 | 745.0 | 2,130.7 | 1.08 |
| Mozambique | 16.8 | 14.9 | 42.0 | 652.4 | 577.4 | 1,630.4 | 1.14 |
| Namibia (S.W. Africa) | 15.9 | 13.1 | 39.6 | 682.6 | 562.5 | 1,697.0 | 1.13 |
| Nigeria | 17.2 | 15.2 | 43.0 | 662.1 | 585.1 | 1,658.8 | 1.33 |
| Reunion | 16.6 | 15.2 | 45.7 | 753.9 | 691.1 | 2,077.3 | 1.05 |
| Rwanda | 17.5 | 14.4 | 45.8 | 727.5 | 599.2 | 1,906.0 | 1.03 |
| Sao Tome & Principe | 16.2 | 10.4 | 32.8 | 729.7 | 468.0 | 1,477.4 | 1.23 |
| Senegal | 18.7 | 15.6 | 42.5 | 750.0 | 624.3 | 1,705.1 | 1.19 |
| Seychelles | 14.6 | 15.4 | 43.5 | 736.4 | 780.8 | 2,200.0 | 0.99 |
| Sierra Leone | 17.3 | 12.9 | 36.7 | 647.6 | 481.6 | 1,373.6 | 1.21 |
| Somalia | 18.2 | 14.2 | 44.4 | 780.5 | 608.9 | 1,903.9 | 1.12 |
| S. Rhodesia | | | | | | | |
| Afr. pop. | 16.8 | 17.4 | 47.8 | 747.6 | 776.5 | 2,130.7 | 1.15 |
| Asian pop. | 11.2 | 14.3 | 39.0 | 440.4 | 564.9 | 1,538.5 | 1.13 |
| Colored pop. | 14.5 | 17.1 | 48.0 | 621.3 | 732.2 | 2,056.6 | 1.12 |
| Euro. pop. | 8.7 | 10.0 | 28.9 | 351.1 | 401.0 | 1,162.7 | 0.96 |
| Spanish Sahara | 15.9 | 14.3 | 41.4 | 761.8 | 682.4 | 1,981.1 | 1.20 |
| Sudan | 18.8 | 14.4 | 45.2 | 843.1 | 643.8 | 2,030.0 | 1.12 |
| Swaziland | 17.1 | 16.2 | 46.6 | 754.0 | 714.6 | 2,051.4 | 1.15 |

APPENDIX TABLE (continued)

| Region and country or territory | Percentage of total population in age group | | | Ratio of children, by age group, to women aged 15-49 | | | Index of fertility age com- position |
|---|---|------|------|--|---------|---------|---|
| | 0-4 | 5-9 | 0-14 | 0-4 | 5-9 | 0-14 | |
| <i>AFRICA (continued)</i> | | | | | | | |
| Tanganyika (U. Rep. of Tanzania) | 17.9 | 15.8 | 43.9 | 761.5 | 670.0 | 1,865.9 | 1.18 |
| Tunisia | 18.5 | 15.2 | 46.3 | 879.5 | 721.5 | 2,198.5 | 1.08 |
| Togo | 21.3 | 19.0 | 50.1 | 929.7 | 829.0 | 2,187.3 | 1.18 |
| Uganda | 19.3 | 15.4 | 46.2 | 891.1 | 713.2 | 2,136.1 | 1.16 |
| Union of S. Africa | | | | | | | |
| White pop. | 10.9 | 10.4 | 31.4 | 448.9 | 429.9 | 1,295.1 | 1.06 |
| Black pop. | 16.9 | 15.8 | 46.2 | 745.0 | 698.4 | 2,036.6 | 1.11 |
| Asian pop. | 14.6 | 13.9 | 41.3 | 569.8 | 540.9 | 1,607.2 | 1.16 |
| Bantu pop. | 15.7 | 14.7 | 43.4 | 674.5 | 630.2 | 1,866.5 | 1.10 |
| Upper Volta | 17.7 | 15.2 | 41.6 | 696.9 | 598.4 | 1,637.8 | 1.16 |
| West Cameroon, United Rep. of | 20.4 | 15.5 | 48.6 | 883.3 | 669.2 | 2,102.1 | 1.13 |
| Zaire: Afr. pop. | 16.9 | 12.9 | 39.4 | 612.7 | 467.8 | 1,428.1 | 1.12 |
| Zambia | 18.8 | 15.9 | 46.1 | 788.6 | 665.2 | 1,929.5 | 1.15 |
| Zanzibar & Pemba (United Rep. of Tanzania) | 18.3 | 17.1 | 42.8 | 826.0 | 774.0 | 1,934.2 | 1.19 |
| <i>NORTH & CENTRAL AMERICA</i> | | | | | | | |
| Antigua | 14.7 | 15.0 | 44.1 | 675.9 | 685.3 | 2,020.1 | 1.04 |
| Bahamas | 15.9 | 15.5 | 43.6 | 705.9 | 688.0 | 1,934.9 | 1.12 |
| Barbados | 10.8 | 12.6 | 35.9 | 460.5 | 536.7 | 1,530.3 | 1.04 |
| Belize (Br. Honduras) | 18.1 | 17.4 | 49.3 | 934.8 | 896.1 | 2,545.5 | 1.05 |
| Bermuda | 8.9 | 10.6 | 29.7 | 356.6 | 424.1 | 1,186.6 | 1.08 |
| Canada | 8.4 | 10.5 | 29.6 | 343.9 | 426.8 | 1,208.1 | 1.04 |
| Canal Zone, USA | 8.6 | 11.7 | 31.8 | 352.6 | 478.1 | 1,301.8 | 1.04 |
| Costa Rica | 13.8 | 15.4 | 44.1 | 605.2 | 675.5 | 1,927.1 | 1.10 |
| Cuba | 13.8 | 13.6 | 37.0 | 606.0 | 598.1 | 1,619.8 | 1.10 |
| Dominica | 18.7 | 14.4 | 44.7 | 853.8 | 656.3 | 2,043.2 | 1.07 |
| Dominican Rep. | 17.0 | 16.4 | 47.5 | 768.1 | 741.0 | 2,149.2 | 1.10 |
| El Salvador | 17.8 | 16.2 | 47.1 | 793.1 | 723.9 | 2,103.4 | 1.11 |
| Granada | 19.8 | 15.7 | 47.7 | 926.4 | 734.1 | 2,225.6 | 1.08 |
| Greenland | 15.2 | 16.2 | 43.4 | 712.5 | 761.0 | 2,038.9 | 1.14 |
| Guadeloupe | 14.8 | 14.9 | 42.9 | 671.3 | 677.2 | 1,950.0 | 1.01 |
| Guatemala | 16.9 | 15.1 | 45.1 | 733.6 | 655.6 | 1,960.8 | 1.11 |
| Haiti | 14.0 | 13.7 | 41.5 | 565.1 | 549.2 | 1,668.5 | 1.06 |
| Honduras | 19.0 | 16.3 | 47.8 | 856.9 | 736.6 | 2,156.8 | 1.13 |
| Jamaica | 15.8 | 16.6 | 45.9 | 784.4 | 822.0 | 2,273.3 | 1.05 |
| Martinique | 14.2 | 14.9 | 43.0 | 647.8 | 681.4 | 1,962.6 | 0.99 |
| Mexico | 16.9 | 16.0 | 46.2 | 762.0 | 720.5 | 2,079.2 | 1.12 |
| Netherlands Antilles | 11.3 | 13.1 | 48.0 | 461.4 | 536.7 | 1,554.1 | 1.09 |
| Nicaragua | 17.2 | 16.7 | 48.1 | 765.4 | 746.5 | 2,143.9 | 1.11 |
| Panama | 16.2 | 15.1 | 43.5 | 725.3 | 675.3 | 1,944.5 | 1.12 |
| Puerto Rico | 11.7 | 12.5 | 36.5 | 481.1 | 511.6 | 1,498.7 | 1.08 |
| St. Kitts, Nevis, & Anguilla | 14.7 | 17.5 | 48.7 | 845.0 | 1,006.9 | 2,795.7 | 0.91 |
| St. Lucia | 18.4 | 17.5 | 49.6 | 904.6 | 862.0 | 2,443.7 | 1.04 |
| St. Vincent | 20.3 | 16.1 | 49.2 | 947.2 | 752.7 | 2,296.7 | 1.09 |

APPENDIX TABLE (continued)

| Region and country or territory | Percentage of total population in age group | | | Ratio of children, by age group, to women aged 15-49 | | | Index of fertility age com- position |
|--|---|------|------|--|-------|---------|---|
| | 0-4 | 5-9 | 0-14 | 0-4 | 5-9 | 0-14 | |
| NORTH & CENTRAL AMERICA (continued) | | | | | | | |
| Trinidad & Tobago | 13.0 | 15.6 | 42.1 | 569.5 | 681.6 | 1,841.0 | 1.08 |
| USA | | | | | | | |
| Non-white pop. | 10.7 | 12.0 | 35.0 | 430.7 | 482.4 | 1,403.3 | 1.04 |
| White pop. | 8.1 | 9.5 | 27.5 | 340.5 | 398.9 | 1,156.8 | 1.01 |
| Virgin Is., USA | 13.3 | 12.0 | 35.7 | 513.0 | 462.3 | 1,378.7 | 1.18 |
| SOUTH AMERICA | | | | | | | |
| Argentina | 10.1 | 9.8 | 29.3 | 398.4 | 388.5 | 1,159.2 | 1.02 |
| Bolivia | 15.7 | 14.0 | 39.6 | 628.8 | 560.1 | 1,581.9 | 1.14 |
| Brazil | 14.8 | 14.5 | 42.1 | 619.1 | 603.3 | 1,754.0 | 1.09 |
| Chile | 8.1 | 13.3 | 33.3 | 352.3 | 579.8 | 1,453.7 | 1.08 |
| Colombia | 14.1 | 15.5 | 44.1 | 579.2 | 639.0 | 1,814.4 | 1.10 |
| Ecuador | 16.1 | 15.1 | 44.6 | 718.1 | 675.0 | 1,991.4 | 1.12 |
| French Guiana | 14.5 | 12.7 | 37.9 | 732.5 | 641.8 | 1,919.9 | 1.01 |
| Guyana (Br. Guiana) | 15.8 | 16.9 | 47.1 | 757.7 | 808.2 | 2,254.8 | 1.05 |
| Paraguay | 15.6 | 15.3 | 44.8 | 700.4 | 685.8 | 2,009.2 | 1.08 |
| Peru | 16.3 | 15.0 | 43.9 | 721.6 | 663.1 | 1,946.4 | 1.10 |
| Surinam (Dutch Guiana) | 16.6 | 16.7 | 46.1 | 779.4 | 782.8 | 2,163.7 | 1.10 |
| Uruguay | 9.9 | 9.6 | 28.1 | 390.9 | 379.8 | 1,112.5 | 1.02 |
| Venezuela | 17.1 | 16.1 | 47.5 | 674.9 | 635.2 | 1,875.3 | 1.11 |
| ASIA | | | | | | | |
| Afghanistan | 19.3 | 13.9 | 45.3 | 780.5 | 562.3 | 1,835.1 | 1.11 |
| Bahrain | 14.5 | 15.9 | 44.3 | 725.4 | 798.2 | 2,218.5 | 1.06 |
| Bangladesh (E. Pakistan) | 16.2 | 14.1 | 43.5 | 709.8 | 618.8 | 1,903.7 | 1.13 |
| Bhutan | 16.6 | 13.5 | 41.7 | 717.8 | 585.1 | 1,809.1 | 1.10 |
| Brunei | 16.0 | 14.3 | 43.4 | 752.0 | 669.3 | 2,038.5 | 1.11 |
| Burma | 15.9 | 13.2 | 40.5 | 670.2 | 553.9 | 1,703.6 | 1.07 |
| Cyprus | 8.6 | 9.5 | 28.9 | 341.8 | 380.3 | 1,151.3 | 1.06 |
| Dem. Rep. of Vietnam (North) | 15.1 | 13.9 | 41.3 | 670.5 | 617.7 | 1,827.6 | 1.08 |
| Hong Kong | 9.6 | 12.9 | 35.8 | 419.7 | 566.8 | 1,570.6 | 0.96 |
| India | 14.4 | 15.1 | 42.0 | 651.6 | 682.6 | 1,896.6 | 1.11 |
| Indonesia | 16.1 | 15.9 | 44.0 | 667.3 | 655.5 | 1,818.2 | 1.09 |
| Iran | 17.7 | 16.4 | 46.1 | 851.2 | 787.7 | 2,217.7 | 1.10 |
| Iraq | 19.8 | 15.9 | 48.0 | 993.3 | 798.1 | 2,411.2 | 1.11 |
| Israel | 12.1 | 10.5 | 32.6 | 505.3 | 440.2 | 1,367.8 | 1.07 |
| Japan | 8.5 | 7.9 | 24.0 | 298.9 | 277.4 | 844.1 | 1.07 |
| Jordan | 17.9 | 14.4 | 45.4 | 815.3 | 657.0 | 2,066.6 | 1.13 |
| Khmer Rep. (Cambodia) | 14.9 | 15.6 | 43.8 | 649.6 | 678.2 | 1,905.6 | 1.11 |
| Kuwait | 18.5 | 14.8 | 43.2 | 954.7 | 765.1 | 2,233.7 | 1.27 |
| Laos | 16.7 | 13.4 | 41.7 | 709.2 | 570.2 | 1,770.8 | 1.11 |
| Lebanon | 14.2 | 15.4 | 42.7 | 645.9 | 703.3 | 1,943.2 | 1.05 |
| Macau | 8.1 | 13.2 | 37.6 | 341.0 | 557.2 | 1,590.4 | 0.93 |
| Maldives Is. | 17.1 | 16.1 | 44.4 | 777.7 | 734.4 | 2,023.3 | 1.18 |
| Mongolia | 17.7 | 14.2 | 43.7 | 775.4 | 621.1 | 1,912.3 | 1.12 |
| Nepal | 14.1 | 15.1 | 40.5 | 586.8 | 626.0 | 1,678.6 | 1.13 |

APPENDIX TABLE (continued)

| Region and country or territory | Percentage of total population in age group | | | Ratio of children, by age group, to women aged 15-49 | | | Index of fertility age com- position |
|--------------------------------------|---|------|------|--|-------|---------|---|
| | 0-4 | 5-9 | 0-14 | 0-4 | 5-9 | 0-14 | |
| <i>ASIA (continued)</i> | | | | | | | |
| Pakistan (W. Pakistan) | 15.9 | 16.2 | 43.4 | 764.4 | 776.1 | 2,086.0 | 1.16 |
| Philippines | 16.4 | 15.5 | 44.7 | 710.6 | 674.7 | 1,939.2 | 1.10 |
| Rep. of China (Taiwan) | 11.9 | 12.7 | 37.5 | 501.6 | 536.6 | 1,584.1 | 1.08 |
| Rep. of Korea (South) | 13.7 | 14.4 | 42.1 | 591.5 | 621.1 | 1,814.6 | 1.07 |
| Rep. of Vietnam (South) | 15.1 | 13.9 | 41.2 | 670.5 | 617.9 | 1,827.7 | 1.08 |
| Ryukyu Is. (Japan) | 10.8 | 11.4 | 34.8 | 426.3 | 452.9 | 1,379.9 | 0.99 |
| Sabah (North Borneo, E. Malaysia) | 17.9 | 16.8 | 47.1 | 844.3 | 790.9 | 2,224.8 | 1.09 |
| Sarawak (E. Malaysia) | 16.9 | 16.8 | 45.8 | 759.3 | 757.4 | 2,062.7 | 1.09 |
| Saudi Arabia | 18.1 | 14.1 | 44.1 | 802.6 | 623.6 | 1,954.2 | 1.12 |
| Sikkim | 12.9 | 13.7 | 39.6 | 559.2 | 595.2 | 1,718.6 | 1.17 |
| Singapore | 11.4 | 13.5 | 38.8 | 477.1 | 568.4 | 1,630.7 | 1.10 |
| Sri Lanka (Ceylon) | 13.1 | 13.2 | 39.0 | 552.1 | 554.2 | 1,639.9 | 1.13 |
| Syrian Arab Rep. (Syria) | 18.9 | 17.1 | 49.3 | 953.4 | 862.2 | 2,489.6 | 1.08 |
| Thailand | 16.5 | 15.4 | 45.1 | 726.1 | 678.1 | 1,989.5 | 1.08 |
| Turkey | 14.3 | 14.6 | 41.8 | 634.1 | 645.8 | 1,850.4 | 1.06 |
| United Arab Emirates | 12.2 | 11.6 | 33.8 | 632.3 | 598.0 | 1,750.9 | 1.19 |
| West Malaysia (Fed. of Malaya) | 15.6 | 15.5 | 44.7 | 694.7 | 688.4 | 1,990.3 | 1.09 |
| Yemen | 18.1 | 14.1 | 44.1 | 801.2 | 623.2 | 1,951.7 | 1.11 |
| Yemen (Dem.) | 18.3 | 17.4 | 47.5 | 847.2 | 804.4 | 2,196.2 | 1.09 |
| <i>EUROPE</i> | | | | | | | |
| Austria | 8.0 | 8.6 | 24.4 | 347.0 | 376.1 | 1,065.3 | 0.98 |
| Belgium | 8.8 | 8.2 | 25.0 | 377.2 | 349.7 | 1,069.4 | 0.96 |
| Bulgaria | 7.6 | 8.0 | 23.9 | 300.0 | 314.5 | 938.1 | 0.99 |
| Channel Is. (Guernsey & Jersey) | 7.1 | 7.7 | 21.6 | 311.6 | 337.1 | 944.9 | 1.04 |
| Czechoslovakia | 7.5 | 7.7 | 23.1 | 297.3 | 307.2 | 921.3 | 1.00 |
| Dem. Rep. of Germany (East) | 7.1 | 8.4 | 23.3 | 307.0 | 361.3 | 1,004.5 | 0.95 |
| Denmark | 7.7 | 8.0 | 23.2 | 331.7 | 343.1 | 994.7 | 1.05 |
| England & Wales (United Kingdom) | 8.0 | 8.3 | 23.8 | 358.5 | 371.3 | 1,062.9 | 1.01 |
| Faeroe Is. | 11.4 | 10.5 | 31.7 | 530.1 | 484.9 | 1,472.7 | 0.96 |
| Fed. Rep. of Germany (West) | 7.8 | 8.2 | 23.2 | 330.8 | 350.0 | 986.1 | 0.96 |
| Finland | 7.4 | 8.3 | 24.3 | 293.0 | 328.9 | 965.3 | 1.03 |
| France | 8.4 | 8.4 | 25.1 | 364.5 | 362.3 | 1,083.4 | 0.95 |
| Gibraltar | 9.4 | 8.7 | 25.6 | 403.1 | 373.6 | 1,098.0 | 1.05 |
| Greece | 8.8 | 8.0 | 24.9 | 357.1 | 324.5 | 1,013.6 | 0.95 |
| Hungary | 6.8 | 6.3 | 21.1 | 263.1 | 243.0 | 814.3 | 0.96 |
| Iceland | 10.0 | 10.3 | 31.0 | 429.2 | 442.1 | 1,331.8 | 1.06 |
| Ireland | 10.6 | 10.6 | 31.3 | 503.8 | 505.9 | 1,486.2 | 1.00 |
| Isle of Man | 6.7 | 7.0 | 19.9 | 337.0 | 351.0 | 1,003.9 | 0.97 |
| Italy | 8.2 | 8.5 | 24.4 | 335.6 | 350.1 | 1,002.7 | 0.98 |
| Liechtenstein | 9.9 | 9.3 | 27.9 | 391.0 | 365.7 | 1,099.8 | 1.11 |
| Luxembourg | 6.9 | 7.7 | 22.1 | 290.8 | 321.1 | 928.9 | 0.95 |
| Malta & Gozo | 8.4 | 10.5 | 29.8 | 324.8 | 404.1 | 1,152.7 | 1.04 |
| Monaco | 3.8 | 4.3 | 13.0 | 164.6 | 186.9 | 563.9 | 0.94 |

| Percentage of women ever married, by age group | | | | | | | Median age at marriage | Infant mortality rate |
|--|-------|-------|-------|-------|-------|-------|------------------------|-----------------------|
| 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | | |
| 31.4 | 82.0 | 94.4 | 98.1 | 99.1 | 98.3 | 99.2 | 19.3 | 124.3 |
| 10.9 | 49.7 | 78.5 | 88.4 | 92.0 | 92.7 | 93.3 | 22.1 | 60.0 |
| 6.0 | 45.8 | 86.8 | 95.7 | 97.0 | 97.4 | 97.3 | 22.9 | 16.2 |
| 2.9 | 42.8 | 90.3 | 98.6 | 99.6 | 99.8 | 99.9 | 23.3 | 47.0 |
| u | u | u | u | u | u | u | u | u |
| 2.9 | 30.7 | 71.4 | 87.8 | 93.6 | 96.5 | 97.8 | 24.7 | 9.1 |
| 30.1 | 69.4 | 90.4 | 95.0 | 96.6 | 97.0 | 97.2 | 19.9 | 25.5 |
| 23.7 | 68.2 | 87.3 | 92.7 | 94.3 | 96.0 | 96.7 | 20.3 | 31.3 |
| u | u | u | u | u | u | u | u | 152.0 |
| 28.1 | 74.5 | 87.1 | 93.6 | 96.5 | 96.6 | 97.1 | 19.7 | 208.0 |
| 4.8 | 35.4 | 77.4 | 90.4 | 94.9 | 96.7 | 96.9 | 24.1 | 20.5 |
| 10.6 | 46.8 | 75.4 | 89.1 | 94.2 | 95.3 | 95.9 | 22.7 | 43.0 |
| 27.7 | 70.2 | 89.0 | 94.3 | 96.3 | 96.8 | 97.6 | 20.0 | 93.0 |
| 19.1 | 62.1 | 84.4 | 91.9 | 94.8 | 96.1 | 97.0 | 20.9 | 81.0 |
| 19.8 | 87.0 | 87.0 | 97.8 | 97.8 | 98.4 | 98.4 | 19.7 | 153.0 |
| u | u | u | u | u | u | u | u | 138.0 |
| 16.1 | 57.0 | 86.2 | 94.4 | 96.7 | 98.1 | 98.7 | 21.6 | 40.8 |
| u | u | u | u | u | u | u | u | 152.0 |
| u | u | u | u | u | u | u | u | 79.9 |
| 7.0 | 55.0 | 81.4 | 87.7 | 89.4 | 89.6 | 88.4 | 21.4 | 26.1 |
| 6.9 | 59.9 | 88.3 | 92.8 | 93.4 | 92.9 | 92.3 | 21.2 | 21.1 |
| 18.5 | 74.6 | 92.8 | 96.2 | 96.9 | 97.4 | 97.8 | 20.2 | 30.8 |
| 8.8 | 53.5 | 80.6 | 89.8 | 91.2 | 91.8 | 91.6 | 21.6 | 16.0 |
| 7.8 | 65.1 | 89.9 | 94.6 | 95.8 | 95.6 | 95.0 | 21.0 | 22.1 |
| 6.8 | 65.4 | 90.6 | 92.9 | 92.8 | 91.3 | 89.4 | 20.7 | 18.0 |
| 4.1 | 55.3 | 86.2 | 92.6 | 93.7 | 93.4 | 93.1 | 21.6 | 14.2 |
| 8.7 | 60.3 | 86.7 | 92.2 | 93.0 | 92.6 | 92.2 | 21.1 | 17.5 |
| 5.4 | 55.2 | 87.2 | 91.2 | 93.1 | 92.7 | 89.2 | 21.4 | 17.5 |
| 4.1 | 51.7 | 85.1 | 91.5 | 92.5 | 91.6 | 90.2 | 21.8 | 23.6 |
| 5.4 | 47.7 | 78.0 | 86.0 | 88.0 | 88.1 | 87.8 | 22.1 | 13.2 |
| 3.2 | 43.9 | 81.9 | 89.5 | 90.9 | 91.0 | 91.3 | 22.7 | 20.4 |
| 8.6 | 56.5 | 80.4 | 89.1 | 90.5 | 90.4 | 89.6 | 21.3 | 8.7 |
| 11.2 | 47.4 | 74.4 | 85.8 | 90.0 | 91.4 | 92.4 | 22.3 | 26.9 |
| 12.5 | 67.7 | 89.6 | 94.1 | 95.4 | 94.9 | 94.6 | 20.7 | 35.9 |
| 3.8 | 49.9 | 82.9 | 90.3 | 91.1 | 90.7 | 89.5 | 21.9 | 9.6 |
| 2.1 | 31.1 | 68.9 | 80.6 | 82.9 | 82.2 | 81.8 | 23.8 | 18.0 |
| 6.9 | 57.7 | 85.2 | 88.8 | 89.2 | 90.2 | 89.1 | 21.2 | 24.9 |
| 6.4 | 43.5 | 76.8 | 85.5 | 87.2 | 87.1 | 86.2 | 22.4 | 28.3 |
| u | u | u | u | u | u | u | u | 16.7 |
| 6.1 | 55.9 | 85.4 | 91.1 | 91.9 | 91.4 | 89.6 | 21.4 | 24.6 |
| 2.7 | 32.8 | 66.6 | 73.6 | 76.0 | 77.1 | 79.1 | 23.5 | 27.3 |
| 1.5 | 33.1 | 70.3 | 81.6 | 83.5 | 85.3 | 86.0 | 23.8 | 4.7 |

APPENDIX TABLE (continued)

| Region and country or territory | Percentage of total population in age group | | | Ratio of children, by age group, to women aged 15-49 | | | Index of fertility age com- position |
|------------------------------------|---|------|------|--|-------|---------|---|
| | 0-4 | 5-9 | 0-14 | 0-4 | 5-9 | 0-14 | |
| <i>EUROPE (continued)</i> | | | | | | | |
| Netherlands | 9.1 | 9.3 | 27.3 | 384.6 | 393.1 | 1,151.6 | 1.04 |
| Northern Ireland | 10.2 | 10.2 | 29.8 | 459.5 | 462.1 | 1,344.1 | 1.01 |
| Norway | 8.5 | 8.1 | 24.4 | 384.2 | 366.0 | 1,109.2 | 1.02 |
| Poland | 7.7 | 8.4 | 26.4 | 293.2 | 319.8 | 1,009.7 | 0.97 |
| Portugal | 10.8 | 9.9 | 30.1 | 439.9 | 400.8 | 1,223.9 | 0.98 |
| Romania | 7.3 | 9.1 | 26.0 | 284.3 | 357.5 | 1,017.8 | 1.02 |
| Scotland | 8.5 | 9.0 | 25.9 | 377.7 | 398.2 | 1,151.7 | 0.99 |
| Spain | 9.4 | 9.5 | 27.8 | 390.1 | 391.4 | 1,149.8 | 0.98 |
| Sweden | 7.2 | 7.1 | 20.8 | 312.8 | 309.4 | 909.2 | 1.05 |
| Switzerland | 7.8 | 8.2 | 23.4 | 318.8 | 332.6 | 953.8 | 1.05 |
| USSR | 8.5 | 10.1 | 29.0 | 324.6 | 387.3 | 1,107.4 | 0.93 |
| Yugoslavia | 8.8 | 8.9 | 26.9 | 328.2 | 334.8 | 1,005.4 | 0.97 |
| <i>OCEANIA</i> | | | | | | | |
| American Samoa | 15.9 | 15.6 | 44.9 | 686.5 | 672.0 | 1,936.7 | 1.11 |
| Australia | 9.6 | 9.6 | 28.8 | 402.0 | 401.0 | 1,206.0 | 1.04 |
| Solomon Is. (Br. Solomon Is.) | 16.6 | 15.0 | 44.6 | 764.4 | 691.2 | 2,054.5 | 1.12 |
| Fiji Is. | 17.3 | 16.2 | 46.7 | 779.0 | 730.4 | 2,104.2 | 1.13 |
| French Polynesia | 17.5 | 14.9 | 45.7 | 807.8 | 690.2 | 2,111.2 | 1.07 |
| Gilbert & Ellice Is. | 16.6 | 15.4 | 46.4 | 723.8 | 671.9 | 2,018.7 | 1.09 |
| Guam | 13.7 | 13.8 | 39.7 | 635.9 | 642.8 | 1,841.8 | 1.13 |
| New Caledonia | 14.9 | 13.4 | 39.6 | 671.8 | 602.7 | 1,780.5 | 1.08 |
| New Hebrides | 17.3 | 15.6 | 45.6 | 808.3 | 731.2 | 2,134.3 | 1.15 |
| New Zealand | 10.4 | 10.8 | 31.8 | 458.6 | 477.0 | 1,400.5 | 1.03 |
| Pacific Is. | 17.3 | 15.4 | 46.3 | 879.9 | 759.7 | 2,291.8 | 1.09 |
| Papua New Guinea | 18.5 | 16.1 | 45.2 | 808.3 | 703.1 | 1,977.7 | 1.12 |
| Tonga | 18.5 | 14.9 | 46.2 | 852.8 | 687.3 | 2,127.7 | 1.11 |
| Western Samoa | 18.3 | 17.0 | 50.4 | 927.7 | 863.6 | 2,559.2 | 1.05 |

SOURCES: Latest censuses for which data were available. Infant mortality rates estimated

| Percentage of women ever married, by age group | | | | | | | Median age at marriage | Infant mortality rate |
|--|-------|-------|-------|-------|-------|-------|------------------------|-----------------------|
| 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | | |
| 4.9 | 53.7 | 86.1 | 91.8 | 92.5 | 92.2 | 91.8 | 21.7 | 12.7 |
| 4.9 | 46.7 | 79.2 | 86.7 | 87.3 | 86.3 | 85.0 | 22.0 | 22.7 |
| 5.6 | 53.8 | 83.7 | 91.6 | 93.3 | 93.0 | 91.6 | 21.7 | 12.8 |
| 4.5 | 53.4 | 85.9 | 92.6 | 93.8 | 93.2 | 92.3 | 21.8 | 33.2 |
| 5.3 | 39.3 | 75.0 | 85.0 | 87.5 | 87.4 | 87.5 | 23.1 | 58.0 |
| 21.6 | 75.9 | 92.1 | 95.1 | 95.5 | 95.6 | 95.7 | 19.9 | 46.6 |
| 7.9 | 58.0 | 85.4 | 90.8 | 91.2 | 89.9 | 88.6 | 21.1 | 19.9 |
| 3.1 | 31.7 | 73.4 | 86.3 | 88.5 | 88.0 | 87.9 | 24.0 | 27.9 |
| 2.3 | 40.0 | 77.0 | 88.5 | 91.7 | 92.4 | 92.2 | 23.3 | 11.0 |
| 3.7 | 45.2 | 78.1 | 87.0 | 88.7 | 88.6 | 87.8 | 22.3 | 15.1 |
| 8.2 | 55.9 | 82.7 | 85.3 | 83.9 | 79.0 | 71.3 | 20.4 | 24.4 |
| 16.1 | 63.4 | 87.4 | 81.5 | 93.5 | 93.9 | 93.7 | 20.8 | 49.5 |
| 9.1 | 46.6 | 83.5 | 91.0 | 95.1 | 95.1 | 97.1 | 22.8 | 16.5 |
| 8.8 | 64.3 | 88.4 | 93.5 | 95.0 | 95.2 | 95.1 | 21.0 | 17.3 |
| 15.6 | 58.7 | 82.1 | 90.2 | 93.5 | 95.0 | 95.9 | 21.3 | 52.0 |
| 16.8 | 68.3 | 89.2 | 94.4 | 95.8 | 96.5 | 96.8 | 20.6 | 27.9 |
| u | u | u | u | u | u | u | u | u |
| u | u | u | u | u | u | u | u | 48.9 |
| u | 40.4 | u | 89.4 | u | 93.2 | 93.2 | u | 21.6 |
| 15.5 | 58.8 | 78.2 | 85.3 | 87.9 | 87.9 | 89.0 | 20.9 | 41.0 |
| 17.6 | 68.1 | 90.0 | 96.2 | 97.0 | 97.2 | 97.5 | 20.6 | u |
| 8.8 | 64.5 | 89.1 | 94.0 | 94.9 | 94.9 | 94.5 | 21.0 | 16.5 |
| 19.1 | 63.1 | 83.8 | 91.1 | 94.1 | 96.2 | 96.2 | 20.8 | 33.2 |
| 28.0 | 83.2 | 95.1 | 97.2 | 97.9 | 98.1 | 97.8 | 19.4 | 106.0 |
| 7.3 | 46.2 | 74.6 | 86.8 | 89.0 | 92.5 | 93.4 | 22.6 | 16.0 |
| 10.3 | 62.2 | 89.1 | 95.3 | 96.2 | 97.2 | 97.3 | 21.2 | 42.5 |

(see text).

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