Sources of World Bank Estimates of Current Mortality Rates

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Sources of the infant mortality rate and life expectancy at birth for each of the 186 countries for which the Population and Human Resources Department of the World Bank makes demographic estimates and projections.
This paper — a product of the Population, Health, and Nutrition Division, Population and Human Resources Department — is part of a larger effort in the department to construct and document indicators of human resources development. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Otilia Nadora, room S6-065, extension 31091 (23 pages). February 1992.

Bos, Vu, and Stephens discuss the sources of estimates of the infant mortality rate and life expectancy at birth for each of the 186 countries for which the Population and Human Resources Department of the World Bank makes demographic estimates and projections.

The intention is to give some background on the derivation of mortality estimates and projections used in the Bank’s demographic estimates and projections, so people who use the data know how recent and reliable they may be.

Bos, Vu, and Stephens discuss mortality projection methodology and list the sources and assumptions used in constructing estimates for individual countries. They also plan to issue a companion paper on the sources of fertility estimates.

The first section of the paper provides an overview of the sources of data, discusses their nature, and explains the projection methodology used to arrive at current estimates.

In the second section, the authors document mortality data sources for each country, organized by region.

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Table of Contents

Introduction 2
Frequently used sources 2
Constructing quinquennial and single-year mortality rates 3
Model life tables 4
World Bank projections of mortality indicators 4
U.N. Population Division projections of mortality indicators 6
How good are current mortality estimates 7
References 9

Sub-Saharan Africa 10
North Africa 13
Latin America and the Caribbean 13
Northern America 16
South, East, and Southeast Asia and Oceania 17
Southwest Asia 19
Europe and USSR 21
Introduction

This paper discusses the sources of the infant mortality rate (IMR) and life expectancy at birth for each of the 186 countries for which the Population and Human Resources Department at the World Bank makes demographic estimates and projections. Its purpose is to give some background on the derivation of mortality estimates used in the World Bank's demographic estimates and projections to provide users of the data with information on their recency and reliability. The paper attempts to do this through a general discussion of mortality projection methodology and a listing of the sources and assumptions used in constructing estimates for individual countries. It is envisioned that a companion paper on the sources of fertility estimates will be issued in the future.

The paper consists of two sections. The first section gives an overview of the sources, discusses their nature, and explains the projection methodology used to obtain current estimates. The second section provides the documentation of mortality sources for each country, organized by region.

Frequently used sources

The single most frequently used source for both the IMR and life expectancy at birth for the 1985-89 base period is *World Population Prospects 1990*, published by the Department of International Economic and Social Affairs of the United Nations. This publication contains quinquennial estimates and projections made by the U.N. Population Division for 152 countries for the period 1950 to 2025. The Population Division revises its estimates when new data or analyses become available and issues *World Population Prospects* biennially. In constructing its estimates, the Population Division considers population censuses, demographic and health surveys, vital registration data, and uses analyses of others as well as its own. Data are adjusted to achieve consistency among vital rates, age structure, and total population. Demographers at the World Bank have a working arrangement to receive further details concerning the original sources consulted, their quality, and the adjustments applied from the demographers in the Estimates and Projections section of the Population Division. *World Population Prospects 1990* is the first source considered for Bank estimates of mortality, but other sources are used for the 34 countries for which the U.N. does not make estimates, for countries for which more recent data are available from other sources, and when analysis in the Bank indicates different rates.

Another frequently used source is *Population and Vital Statistics Report*, which is a quarterly publication of the Statistical Office of the U.N. Department of International Economic and Social Affairs. This publication gives the latest official estimates of vital rates from registration data, as well as an indication of the completeness of registration coverage. The reported estimates are sometimes more recent than were considered by the U.N. Population Division for *World Population Prospects 1990*. Figures appear in *Population and Vital Statistics Report* even when the registration system is not complete or when rates are internally inconsistent. Bank estimates are taken from this publication only when the U.N. Statistical Office indicates that vital registration is complete (covering at least 90 percent of vital events occurring in a given year). *Population and Vital Statistics Report* gives registered deaths and registered infant deaths, but not life expectancy figures, which have to be estimated with life tables from the information given for the CDR or IMR or gathered from other sources.

Eurostat, the Statistical Office of the European Community (EC), annually publishes *Demographic Statistics*, which includes IMR as well as life expectancy estimates from vital registration systems of the EC member countries. These are mostly very recent estimates, and given the near-
completeness of vital- and population registration systems in the EC member countries, very reliable estimates.

Mortality estimates for other developed countries that are not EC members are often from an annual article "La conjoncture démographique: L'Europe et les pays développés d'outre-mer" by Alain Monnier in the French journal Population, published by the French Institut National d'Études Démographiques. These are also mostly recent and reliable registration based estimates and include IMR and life expectancy estimates.

Survey reports, such as those produced by the Demographic and Health Surveys (DHS), as well as census publications are a frequent source of IMR estimates. When surveys or census results have only recently become available, they are often not yet incorporated in U.N. or other sources. DHS data are generally considered to be of high quality and are particularly useful because they cover many countries which do not otherwise have adequate demographic statistics. DHS reports present IMR and under-five mortality (q5) estimates, from which life expectancy at birth is derived with a model life table.

Mortality estimates for some small countries, mostly in the Pacific and the Caribbean, are from a publication of the Center for International Research at the U.S. Bureau of the Census, World Population Profile: 1989. The original sources of the estimates in this publication are not known, and while rates are internally consistent, they may lack a recent empirical basis.

For a few countries, estimates are obtained directly from publications issued by country statistical offices. These estimates may be based on vital registration or censuses or surveys and are used when they are more recent than those in previously listed sources.

**Table 1. Frequency of use of sources of mortality data**

<table>
<thead>
<tr>
<th>Source</th>
<th>IMR</th>
<th>Life expectancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.N. Population Division</td>
<td>79</td>
<td>84</td>
</tr>
<tr>
<td>U.N. Statistical Office</td>
<td>47</td>
<td>39</td>
</tr>
<tr>
<td>Survey or census</td>
<td>33</td>
<td>24</td>
</tr>
<tr>
<td>U.S. Bureau of the Census</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td>Other</td>
<td>26</td>
<td>39</td>
</tr>
</tbody>
</table>

Notes: "Other" consists of Eurostat, Monnier, Official publications, and Bank assessments. Total does not add to total number of countries, because multiple sources are used in some cases.

For a few countries, estimates are obtained directly from publications issued by country statistical offices. These estimates may be based on vital registration or censuses or surveys and are used when they are more recent than those in previously listed sources.

**Constructing quinquennia: and single-year mortality rates**

Mortality estimates constructed by the Population and Human Resources Department of the World Bank are of two kinds: single-year estimates (i.e, 1989 IMR and life expectancy at birth estimates used in World Development Report 1991) and quinquennial estimates (i.e, average rates for the period 1985-89). The choice of procedures used in constructing either type depends largely on the availability of data.

Single-year IMR estimates for countries with complete vital registration systems are generally available from one of the sources listed above (except World Population Prospects 1990, which gives only quinquennial figures). About one-third of all countries for which the Bank makes separate estimates were classified by the U.N. Statistical Office as having complete vital registration (United Nations, various years). Five-year IMR estimates for the 1985-89 base quinquennium are usually the mean of single-year rates. Life expectancy at birth estimates tend to lag IMR and CDR estimates because life expectancy is a statistical abstraction that needs to be constructed from period
age-specific mortality rates. For many countries with complete vital registration, quinquennial life expectancy at birth figures are estimated from Coale-Demeny model life tables, selected on the basis of IMR, CDR, and the age distribution. Current or very recent single-year life expectancies for all but a few countries are interpolated between the estimated 1985-89 average life expectancy and the 1990-94 projected life expectancy (See below on how mortality indicators are projected).

For countries without complete vital registration, single-year estimates are interpolations between projected quinquennial figures. The usual procedure for constructing a current IMR estimate is to use an estimate from any previous time that has been derived from a census or survey, either from retrospectively collected birth histories, or more commonly, through indirect estimation techniques such as the Brass methods (United Nations 1990). Life expectancy at birth estimates are frequently derived from IMR and \( q_1 \) estimates from surveys or censuses with model life tables. As an example of how these procedures work, consider estimates for Indonesia. The DHS conducted in Indonesia yielded an indirect estimate of the IMR of 72 (calculated with a Brass procedure) for the period 1982-86. This estimate was then projected with the Bank IMR projection model to 1985-89 and to 1990-94. A 1989 IMR estimate was obtained through linear interpolation of the 1985-89 and 1990-94 projections. Life expectancy at birth for 1982-86 was obtained by fitting a Coale-Demeny "North" model life table ("North" was selected on the basis of prior analysis of the 1980 census) to the IMR and \( q_5 \) survey estimates, which were subsequently projected with the Bank life expectancy projection model to 1985-89 and 1990-94. A 1989 life expectancy at birth estimate was obtained through linear interpolation of the 1985-89 and 1990-94 projections. While the availability of the latest empirical data differs, the above approach is similar for many countries.

**Model life tables**

Mortality estimates for many countries are approximated with model life tables constructed by A. Coale and P. Demeny. Model life tables are used here to estimate the IMR and life expectancy from indirect estimates (Brass procedures) of child mortality, and to estimate life expectancy from registration derived IMR estimates (often in conjunction with CDR and age structure information). Besides Coale-Demeny, the United Nations (1983) has constructed model life tables, which are used in some of the estimates obtained from *World Population Prospects 1990*.

The Coale-Demeny model life tables are derived from over 300 empirical life tables and consist of four broad patterns of mortality called "families": North, South, East, and West. Within each of the families, mortality ranges from high to low; a recent extension of the Coale-Demeny tables by Coale and Guo (1991) adds life tables for very low mortality populations. The North family, based on Scandinavian life tables, is characterized by relatively low infant and old age mortality, and high adult mortality. The South family, based on Mediterranean country life tables, has relatively high \( q_5 \), low adult mortality, and high mortality over 65. The East family, primarily based on Central European country life tables, has relatively high infant and old-age mortality, and relatively low child and adult mortality. The West family is based on 130 life tables from countries all over the world which were considered accurate but did not fit the pattern for the three other families. The West family life tables are selected when no information on the pattern of mortality is available.

**World Bank projections of mortality indicators**

As noted above, current estimates of mortality are frequently projections of estimates for previous years or periods, and single-year estimates for current years are often interpolations between 1985-89 and projected 1990-94 figures. When current estimates are from *World Population Prospects*
1990, the projections are made by the U.N. Population Division with methodology discussed below; otherwise they are Bank projections.

World Bank methodology for projecting mortality indicators is described in detail in Bulatao and Bos (1989). The IMR and life expectancy are projected separately. Life expectancy at birth for males and females separately is projected from previous trends and from socioeconomic factors. Life expectancy at birth is projected from year 0 to year \( t \) using a logistic function over time of the form

\[
et = k_0 + k / \{1 + \exp[\logit(e_0) + rt]\}, \quad \text{with} \quad \logit(e_0) = \log \left( (k_0 + k - e_0) / (e_0 - k_0) \right).
\]

The logistic function is set to rise most rapidly from a level of 50 years or so and increasingly slowly at higher levels. The minimum \((k_0)\) for the logistic functions for both sexes is assumed to be 20 years, and the maxima \((k_0 + k)\) are assumed to be 90 for females and 83.3 for males. The rate of change \((r)\) for the logistic function is allowed to vary across countries, and for a given country to vary over time.

For the first quinquennium (1985-90), the rate of change \((r_1)\) is estimated from the rate of change in the previous quinquennium \((r_0)\) and from the female secondary enrolment ratio \((s_0)\) using the equations

\[
\begin{align*}
r_1 &= .00379 + .723 \ r_0 - .000254 \ s_0 \quad \text{for females, and} \\
r_1 &= .01159 + .885 \ r_0 - .000318 \ s_0 \quad \text{for males.}
\end{align*}
\]

Percent urban is used in a few cases, with a different equation (see Bulatao and Bos 1989), where secondary enrolment is not available, and in fewer cases still the rate of change in the previous decade is used instead of the rate of change in the previous quinquennium when the latter appears to have been affected by exceptional circumstances. Limits are imposed on the rate of change for the first quinquennium (and for all other quinquennia), such that it cannot be greater than -.017 and less than -.053.

For the second quinquennium, the rate of change is estimated as a function of the rate of change for the first quinquennium:

\[
r_2 = -.007 + .8 \ r_1.
\]

The rate of change for the third quinquennium is estimated from the rate of change for the second quinquennium in the same way, but none of these projections influences estimates of current rates, which for most countries are linear interpolations between projections of the first and second quinquennia rates. Table 2 shows how annual increments in life expectancy vary by initial levels of life expectancy. The minimum and maximum increments shown in the table result from the limits imposed on the rates of change.

The infant mortality rate is projected using a similar logistic function. The rate of change for each of the first three quinquennia is obtained from the equation

\[
r_t = .0275 + .5 \ r_{t-1}.
\]
with the restriction that this rate must be in the interval [0.024, 0.130]. These limits provide schedules of minimum and maximum annual decrements to infant mortality, varying by the initial rate, shown in Table 3.

Life tables are selected from Coale-Demeny models that provide the projected life expectancy and infant mortality rates. First, a level of the life tables is chosen to give the desired IMR (an interpolated table is constructed if necessary). Mortality rates up to age 14 are taken from this table. Second, another level of the life tables is chosen to give the rates for ages 15 and older such that the desired level of life expectancy is obtained. Among the four Coale-Demeny families, that families is chosen which minimizes the divergence between the two chosen levels.

**U.N. Population Division projections of mortality indicators**

As many of the mortality estimates are from the U.N. Population Division, a brief description of its mortality projection assumptions is included here. The U.N. Population Division model for projecting mortality is based on an assumed schedule of age and sex-specific survival rates, which is obtained from model life tables, or from national life tables when reliable data are available (United Nations 1989). As in the World Bank model, improvements in life expectancy are projected depended on the initial level of life expectancy. Three variants, "fast", "middle", and "slow" are defined to project mortality trends into the future. For particular countries, one of these is selected on the basis of the initial level of mortality and its reported speed of mortality improvements. No definition is given of what constitutes past slow, middle, or fast improvement or how the selection of a schedule is made. Table 4 shows the schedule of improvements in life expectancy at birth for each of the variants. Based on the resulting life expectancy at birth estimates, the U.N. chooses appropriate life tables from among nine models: the four Coale-Demeny families, and five United Nations (1983) models. These models are extended to give a maximum male life expectancy of 82.5 and a female life expectancy of 87.5.

<table>
<thead>
<tr>
<th>Initial life expectancy</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>0.14</td>
<td>0.34</td>
</tr>
<tr>
<td>45</td>
<td>0.15</td>
<td>0.38</td>
</tr>
<tr>
<td>50</td>
<td>0.16</td>
<td>0.39</td>
</tr>
<tr>
<td>55</td>
<td>0.16</td>
<td>0.39</td>
</tr>
<tr>
<td>60</td>
<td>0.15</td>
<td>0.37</td>
</tr>
<tr>
<td>65</td>
<td>0.13</td>
<td>0.32</td>
</tr>
<tr>
<td>70</td>
<td>0.10</td>
<td>0.26</td>
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<tr>
<td>75</td>
<td>0.07</td>
<td>0.18</td>
</tr>
<tr>
<td>80</td>
<td>0.03</td>
<td>0.08</td>
</tr>
<tr>
<td>85</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initial infant mortality rate</th>
<th>Minimum</th>
<th>Medium</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>0.83</td>
<td>2.08</td>
<td>4.02</td>
</tr>
<tr>
<td>140</td>
<td>0.92</td>
<td>2.32</td>
<td>4.47</td>
</tr>
<tr>
<td>130</td>
<td>1.00</td>
<td>2.50</td>
<td>4.81</td>
</tr>
<tr>
<td>120</td>
<td>1.13</td>
<td>2.63</td>
<td>5.03</td>
</tr>
<tr>
<td>110</td>
<td>1.16</td>
<td>2.69</td>
<td>5.15</td>
</tr>
<tr>
<td>100</td>
<td>1.16</td>
<td>2.71</td>
<td>5.16</td>
</tr>
<tr>
<td>90</td>
<td>1.14</td>
<td>2.66</td>
<td>5.07</td>
</tr>
<tr>
<td>80</td>
<td>1.10</td>
<td>2.56</td>
<td>4.86</td>
</tr>
<tr>
<td>70</td>
<td>1.03</td>
<td>2.41</td>
<td>4.56</td>
</tr>
<tr>
<td>60</td>
<td>0.93</td>
<td>2.20</td>
<td>4.16</td>
</tr>
<tr>
<td>50</td>
<td>0.81</td>
<td>1.94</td>
<td>3.65</td>
</tr>
<tr>
<td>40</td>
<td>0.67</td>
<td>1.62</td>
<td>3.05</td>
</tr>
<tr>
<td>30</td>
<td>0.50</td>
<td>1.26</td>
<td>2.35</td>
</tr>
<tr>
<td>20</td>
<td>0.31</td>
<td>0.84</td>
<td>1.56</td>
</tr>
<tr>
<td>10</td>
<td>0.09</td>
<td>0.36</td>
<td>0.68</td>
</tr>
</tbody>
</table>
"Good" mortality estimates are based on recent empirical data of high reliability. The main reasons for estimates not being of good quality are:

- The observations on which the estimates are based are too old. This happens mainly in countries without reliable vital registration. Figure 1 shows the number of countries by the last period for which empirical data were considered in construction of the estimates. For estimating the current IMR, about 60 percent of considered data were collected in 1985 or later. For life expectancy estimates, this percentage was 55. ("N.A." indicates that no empirical data were available, or that the date could not be determined from the source from which the estimate was obtained). From this figure, it appears fair to conclude that estimates of the IMR and life expectancy for most countries are based on up-to-date observations. The currentness of sources is expected to improve further in the next few years, when more of the over 100 countries that have planned a census around 1990 are anticipated to release results.

- The data on which the estimates are based are of low or quality or are not representative of the entire population. This could result from underregistration of vital events in registers, incomplete coverage in censuses, defective sampling frames used in surveys, misreporting, etc. For vital registration and census data, the U.N. Statistical Office's publication *Population and Vital Statistics Report* provides an assessment of their completeness. For survey data, no single evaluation source exists, and data have to be checked for internal consistency and agreement with other sources. The U.N. Population Division carries out extensive consistency checks and adjusts numbers which appear incompatible with other information. One of the consequences of such adjustment is that short-term trends are often smoothed out. Many of the surveys conducted in the 1970s and 1980s under the guidance of the WFS and DHS programs are considered to be of good quality.

- Methods used are not appropriate for the data. So-called *indirect estimation techniques*, which are frequently used to calculate mortality estimates from survey and census data, make assumptions about past trends in fertility and mortality that may not be accurate. Resulting rates may be biased up or downwards. When surveys provide both direct and indirect estimates and the differences are large, further caution is advised. Another assumption, both in calculating the IMR from surveys or censuses as well as in deriving life expectancy from IMR and/or CDR concerns the appropriateness of model life tables. When the mortality pattern of the chosen model life table is different from the actual mortality pattern, estimates will not be correct.

### Table 4. Assumed five-year increments to life expectancy in United Nations Population Division projections

<table>
<thead>
<tr>
<th>Initial life expectancy</th>
<th>Males</th>
<th></th>
<th>Females</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>55.0-57.5</td>
<td>2.0</td>
<td>2.5</td>
<td>2.5</td>
<td>2.0</td>
</tr>
<tr>
<td>57.5-60.0</td>
<td>2.0</td>
<td>2.5</td>
<td>2.5</td>
<td>2.0</td>
</tr>
<tr>
<td>60.0-62.5</td>
<td>2.0</td>
<td>2.5</td>
<td>2.5</td>
<td>2.0</td>
</tr>
<tr>
<td>62.5-65.0</td>
<td>1.5</td>
<td>1.5</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>67.5-70.0</td>
<td>1.0</td>
<td>1.2</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>70.0-72.5</td>
<td>0.8</td>
<td>1.0</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>72.5-75.0</td>
<td>0.5</td>
<td>0.8</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>75.0-77.5</td>
<td>0.3</td>
<td>0.5</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>77.5-80.0</td>
<td>0.3</td>
<td>0.6</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>80.0-82.5</td>
<td>0.3</td>
<td>0.4</td>
<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>82.5-85.0</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.3</td>
</tr>
<tr>
<td>85.0-87.5</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.3</td>
</tr>
</tbody>
</table>

*Source: United Nations 1989*
Adequacy of mortality estimates also depends on what they are being used for. Estimates of the IMR or life expectancy from a few years back often are suitable for an approximate picture of health conditions in a given country. Indirect estimates of the average IMR for the five years preceding a survey may be valuable input in a population projection. To document short-term fluctuations, and even more so to link them to a changing socioeconomic environment, requires far greater detail than can often be obtained from surveys or censuses.
References


Sub-Saharan Africa

ANGOLA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. estimates are based on the 1940 census as analyzed by Brass et al. (1966).

BENIN: The IMR is a Bank projection from a 1961 national demographic survey. The 1981 World Fertility Survey estimates for 1977-81 are also considered. Life expectancy at birth is projected from the 1961 survey.

BOTSWANA: Both life expectancy estimates and the IMR are Bank projections from the 1988 Demographic and Health Survey.

BURKINA FASO: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. These estimates are model-derived, based on a 1976 post-enumeration survey.


CAMEROON: The IMR and life expectancy estimates are based on a Bank assessment of the 1978 World Fertility Survey, and a projection of the IMR by the U.N.


COMOROS: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. derived life expectancy estimates from the 1980 census and projected them to 1985-89.

CONGO: The IMR is a Bank projection from the 1984 census. Life expectancy at birth estimates are from *World Population Prospects 1990*, and are projections from the 1974 census.


DJIBOUTI: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on levels in neighboring countries.

EQUATORIAL GUINEA: The IMR is from *World Population Prospects 1990*. It is based on a projection from the 1983 census. Life expectancy at birth estimates are Bank projections from the 1983 census.

ETHIOPIA: The IMR is from *World Population Prospects 1990*. The U.N. based its estimate on a Coale-Demeny "North" model life table selection on the basis of the situation of the country. Life expectancy estimates are based on a Bank assessment.
GABON: The IMR is from *World Population Prospects 1990*. The U.N. based its estimate on the 1960-61 census. Life expectancy estimates are World Bank projections from the same census.


GHANA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on the 1988 Demographic and Health Survey.

GUINEA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on the assumption that mortality levels are comparable to those in neighboring countries.

GUINEA-BISSAU: The IMR is from *World Population Prospects 1990*. Life expectancy estimates are World Bank projections based on the 1973 census. Life expectancy estimates are based on the 1988 Demographic and Health Survey and the 1973 census.

GHANA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on the 1988 Demographic and Health Survey.


GHANA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on the 1988 Demographic and Health Survey.

GUINEA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on a 1955 survey.


LIBERIA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimate on the 1986 Demographic and Health Survey. Life expectancy estimates are based on the 1986 survey and projected to 1985-89.

MADAGASCAR: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimate on the 1984 survey. Life expectancy at birth is a Bank projection based on the 1984 and a 1980 survey.

MALAWI: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. These estimates are based on extrapolations of the 1982 Malawi Demographic Survey.

MAURITANIA: Both IMR and Life expectancy estimates are Bank projections from *World Population Prospects 1990*.

MAURITIUS: Both IMR and life expectancy estimates are from official vital registration from the Bureau of Statistics.

MOZAMBIQUE: The IMR estimate is from *World Population Prospects 1990*. Life expectancy at birth is a Bank projection from the official CDR.
NAMIBIA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on the levels of mortality in other countries within Southern Africa.


NIGERIA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*.


RWANDA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. These estimates are based on the 1978 census and a 1983 survey.

SAO TOME AND PRINCIPE: The IMR is a Bank estimate from official estimates from vital statistics for 1989, as published in *PVSR*. Life expectancy estimates are Bank projections based on official estimates as published in *PVSR Supplement 1984*.

SENEGAL: The IMR is from *World Population Prospects 1990*. It is based on the 1978 National Fertility Survey and the 1988 Demographic and Health Survey. Life expectancy is a Bank projection derived from country life tables.

SEYCHELLES: The IMR is an official estimate for 1989 from *Statistical Bulletin*. Life expectancy estimates are Bank projections based on the CDR and CSR.

SOMALIA: The IMR is from *World Population Prospects 1990*. This estimate is based on the 1975 census and a 1980 survey. Life expectancy is a Bank projection and is consistent with the 1982-86 National Development Plan.

SOUTH AFRICA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. estimates are based on adjusted vital registration data.

SUDAN: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on the 1979 Sudan Fertility Survey and the 1983 census.

SWAZILAND: Both IMR and life expectancy estimates are Bank projections based on the 1965, 1976, and 1986 censuses.

TOGO: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on the 1988 Demographic and Health Surveys, and on the 1961 and 1971 censuses.

TANZANIA: Both the IMR and life expectancy at birth are Bank projections from the 1978 census.


ZAMBIA: The IMR is from *World Population Prospects 1990*. The U.N. estimate is based on a projection of 1980 census data. Life expectancy at birth estimates are Bank projections from the 1980 census.
Zaire: The IMR is a Bank projection from the 1984 census. Life expectancy at birth are from *World Population Prospects 1990*. The U.N. estimate is based on extrapolations from a 1955-57 survey.

Zimbabwe: Both IMR and life expectancy estimates are Bank projections from the 1988 DHS.

North Africa

Algeria: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on an official life table for 1985 and projected them to 1985-89 with the U.N. medium mortality decline scenario.

Egypt: The IMR is estimated by linear interpolation between the 1980 World Fertility Survey and the 1988 Demographic and Health Survey. Life expectancy at birth estimates is from *World Population Prospects 1990*, which based its estimates on adjusted registered deaths for 1975-77 and projected them to the 1985-89.

Libya: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on the 1973 and 1984 censuses. Current estimates are obtained by projecting these estimates with the U.N. medium decline scenario.

Morocco: The IMR is from the 1987 Demographic and Health Survey. Life expectancy at birth estimates are from *World Population Prospects 1990*, and are based on Coale-Demeny "South" model life tables selected on the basis of IMRs from the 1979-80 World Fertility Survey, the 1983-84 Contraceptive Prevalence Survey and the 1987 Demographic and Health Survey.

Tunisia: The IMR is from the 1988 Demographic and Health Survey obtained through linear extrapolation. Life expectancy at birth estimates are from *World Population Prospects 1990*, which are based on adjusted registered deaths through 1988.

Latin America and the Caribbean

Antigua and Barbuda: The IMR is projected by linear extrapolation from official estimates for 1980 and 1985, as published in *PVSR*. Life expectancy at birth is obtained from Coale-Demeny model life tables on the basis of the official CDR and population distribution by age and sex.

Argentina: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N./CELADE based their estimates on the adjusted 1980 census and on vital registration, and projected these estimates to 1985-89.

Bahamas, The: The IMR is the average of official vital registration estimates for 1985 to 1989 as published in *PVSR*. Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

Barbados: The IMR is the average of official vital registration estimates for 1985 to 1989 as published in *PVSR*. Life expectancy at birth is obtained from Coale-Demeny model life tables, based on the official CDR and age-sex distribution.
BELIZE: The IMR is derived from projections of an IMR estimate for 1985 and CDR estimates for 1976 and 1985. Life expectancy at birth is estimated from Coale-Demeny model life tables based on the CDR and age-sex distribution.

BOLIVIA: Both the IMR and life expectancy at birth are from World Population Prospects 1990. The U.N./CELADE based its estimates on analysis of the 1976 census as well as on surveys. The IMR and life expectancy at birth were projected to 1985-89 with the U.N. medium scenario. The Demographic and Health Survey (1989) estimate of the IMR was also considered.

BRAZIL: Both the IMR and life expectancy at birth estimates are from World Population Prospects 1990. The IMR estimate is close to the results of the Demographic and Health Survey (1986). Life expectancy and IMR estimates for 1985-89 are as projected by the U.N./CELADE.

CHILE: Both the IMR and life expectancy at birth estimates are from World Population Prospects 1990. The U.N./CELADE estimates are based on the 1982 census and on vital registration estimates.

COLOMBIA: Both the IMR and life expectancy at birth estimates are from World Population Prospects 1990. The U.N./CELADE estimates are based on the 1985 census and the 1986 Demographic and Health Survey, and are consistent with the 1990 Demographic and Health Survey.

COSTA RICA: Both the IMR and life expectancy at birth estimates are from World Population Prospects 1990. The U.N./CELADE estimates are based on current vital registration system estimates.

CUBA: The IMR is the average of official vital registration estimates for 1985 to 1989 as published in PVSR. Life expectancy at birth is obtained from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

DOMINICAN REPUBLIC: Both the IMR and life expectancy at birth are from World Population Prospects 1990. The U.N./CELADE estimate for the IMR is based on the 1986 Demographic and Health Survey. Life expectancy at birth is estimated from model life tables based on the IMR.

ECUADOR: Both the IMR and life expectancy at birth are from World Population Prospects 1990. The U.N./CELADE based its estimates on the 1979 World Fertility Survey, the 1982 census, and the 1987 Demographic and Health Survey. The U.N. medium mortality decline trend was used to project the estimates to 1985-89.

EL SALVADOR: Both the IMR and CDR are estimated from government sources (Statistical Digest, Economic Affairs Secretariat, and Ministry of Finance) and from estimates of the U.S. Bureau of the Census. Life expectancy at birth is estimated from Coale-Demeny model life tables selected on the basis of the official CDR and the age-sex distribution. Current IMR and life expectancy estimates were obtained by Bank projection.
GUADELOUPE: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on the 1982 census and the vital registration system. The IMR and life expectancy for 1985-89 were projected with the U.N. medium mortality decline scenario.

GUATEMALA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N./CELADE used the 1981 census results, projected with the U.N. medium mortality decline scenario. The estimates are consistent with the 1987 Demographic and Health Survey.

GUYANA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. These estimates are based on the 1980 census and on current vital registration data, projected with the U.N. medium mortality decline scenario.

HAITI: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N./CELADE based its estimates on an analysis of the 1982 census, the 1981 Contraceptive Prevalence Survey, and other surveys. The U.N. medium mortality decline scenario was used to obtain 1985-89 estimates.

HONDURAS: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N./CELADE based its estimates on an analysis of the 1982 National Demographic Survey of Honduras and projected them with the U.N. medium mortality decline scenario.


MARTINIQUE: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on the 1982 census and on vital registration data, and applied the U.N. medium mortality decline scenario.

MEXICO: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N./CELADE based the IMR estimate on the 1987 Demographic and Health Survey and life expectancy at birth on a corresponding model life table. The U.N. medium mortality decline scenario was used to obtain 1985-89 estimates.

MONTSETRAT: An estimate of the IMR for 1979-81 made by the U.S. Bureau of the Census, the official CDR, and the 1980 census were used in selecting a Coale-Demeny model life table to estimate current IMR and life expectancy estimates.

NETHERLANDS ANTILLES: The IMR is an official vital registration estimate, as published in *PVSR* 10/1990. Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

PANAMA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. These estimates are based on the 1980 census and the vital registration system, and projected to 1985-89 with the U.N. medium mortality decline scenario.

PARAGUAY: The IMR is obtained from the 1990 Demographic and Health Survey. Life expectancy at birth estimates are from *World Population Prospects 1990*, which are based on the 1982 census.
PERU: The IMR is derived from the 1977-78 National Fertility Survey and the 1986 Demographic and Health Survey. Life expectancy at birth estimates are from Coale-Demeny model life tables selected on the basis of the 1981 census.

SAINT KITTS AND NEVIS: The IMR and CDR are estimated from government sources (Statistics Office, Planning Unit). The IMR is obtained through linear interpolation. Life expectancy at birth is estimated from Coale-Demeny model life tables selected on the basis of the official CDR and the age-sex distribution.

SAINT LUCIA: The IMR estimate is based on interpolation of official vital registration data, as published in PVSR. Life expectancy at birth is estimated from Coale-Demeny model life tables, selected on the basis of official CDR and age-sex distribution of the population.

SURINAME: The IMR and life expectancy at birth estimates are estimated from Coale-Demeny model life tables, selected on the basis of annual vital rates and the age-sex distribution.

TRINIDAD AND TOBAGO: Both the IMR and life expectancy at birth are from World Population Prospects 1990. The U.N. based its estimates on the 1980 census and preliminary results of the 1987 Demographic and Health Survey. The current estimates are obtained with the U.N. medium mortality decline scenario.

URUGUAY: Both the IMR and life expectancy at birth are from World Population Prospects 1990. The U.N./CELADE based its estimates on data from the vital registration system through 1987 and on the 1985 census.

VENEZUELA: Both the IMR and life expectancy at birth are from World Population Prospects 1990. The U.N./CELADE based its estimates on the 1977 World Fertility Survey and on adjusted vital registration data. Current estimates are obtained by projection with the U.N. medium mortality decline scenario.

VIRGIN ISLANDS (U.S.): The IMR is the average of official vital registration estimates for 1985 to 1989 as published in PVSR. Life expectancy at birth estimates are derived from Coale-Demeny model life tables selected on the basis of the CDR and age-sex distribution.

Northern America

CANADA: The IMR is the average of official vital registration estimates for 1985 to 1989 as published in PVSR. Life expectancy at birth are official projections from Population Projections for Canada 1984-2006.

PUERTO RICO: The IMR is the average of official vital registration estimates for 1985 to 1989 as published in PVSR. Life expectancy at birth is from World Population Prospects 1990. The U.N. based its estimates on the 1980 census and the official CDR.

UNITED STATES OF AMERICA: The IMR is the average of vital registration estimates for 1985 to 1989 as published in Monthly Vital Statistics Report. Life expectancy estimates are obtained from the U.S. Bureau of the Census.
South, East, and Southeast Asia and Oceania

AMERICAN SAMOA:  The IMR is the average from vital registration estimates for 1987 and 1988, as published in *PVSR* 1/90 and 10/90. Life expectancy at birth is derived from Coale-Demeny model life tables selected on the basis of the IMR and the vital registration based CDR.

AUSTRALIA:  Both the IMR and life expectancy at birth are based on average vital registration data for the period 1985 to 1989 as published in *PVSR*.

BANGLADESH:  The IMR measured by the vital registration system for 1987 is used. Also considered is the 1989 Bangladesh Fertility Survey, which provides retrospective estimates that are consistent with the vital registration system. Life expectancy at birth estimates are from *World Population Prospects 1990*, and are derived from model life tables selected on the basis of infant and child mortality.

BHUTAN:  Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. Official estimates of the IMR and Coale-Demeny "West" model life tables were used.


FEDERATED STATES OF MICRONESIA:  Both the IMR and life expectancy at birth are Bank projections from estimates for 1989 (U.S. Bureau of the Census, 1989).

FIJI:  Both the IMR and life expectancy at birth are Bank projections from estimates for 1989 (U.S. Bureau of the Census, 1989).

FRENCH POLYNESIA:  Both the IMR and life expectancy at birth are Bank projections from estimates for 1989 (U.S. Bureau of the Census, 1989).


HONG KONG:  The IMR is the average of the official estimates based on the vital registration system for 1987 and 1988, as published in *PVSR* 10/89 and 10/90. Life expectancy at birth is from *World Population Prospects 1990*, and is calculated from vital registration data through 1987.

INDIA:  The IMR is from *World Population Prospects 1990*, and is based on sample registration data through 1986. Life expectancy at birth is also from *World Population Prospects 1990*, and is based on sample registration data through 1987, adjusted for incompleteness of registration of all deaths.

INDONESIA:  The IMR is derived from an indirect estimate from the 1987 National Contraceptive Prevalence Survey (DHS) for 1982-87, adjusted upwards to account for exclusion of certain high mortality areas. Life expectancy at birth is estimated from Coale-Demeny "North" model life tables, selected on the basis of 1980 census analysis and the estimated IMR.

KAMPUCHEA, DEM.: Both the IMR and life expectancy at birth are Bank projections from estimates for 1989 (U.S. Bureau of the Census, 1989).

KIRIBATI: Both the IMR and life expectancy at birth are from World Population Prospects 1990. Life expectancy at birth estimates are based on vital registration data through 1987, adjusted for underregistration. The IMR is from the U.N. "Far Eastern" model life table selected on the basis of estimated life expectancy at birth.

KOREA, DEM. PEOPLE'S REP.: The IMR and life expectancy at birth are from World Population Prospects 1990. Life expectancy at birth estimates are based on the CDR from the 1987 Continuous Demographic Survey and the sex-age pattern of mortality in the official life table for 1978-79. Infant mortality is based on the estimated life expectancy at birth.

KOREA, REP. OF: The IMR and life expectancy at birth are from World Population Prospects 1990. Life expectancy at birth estimates are based on the 1986 and 1988 Demographic Survey, and Coale-Demeny "West" model life tables.

LAOS: Both the IMR and life expectancy at birth are from World Population Prospects 1990. These estimates are based on the 1986 and 1988 Demographic Survey, and Coale-Demeny "West" model life tables.

Macao: The IMR is average of official estimates for 1985 to 1989 as published in PVSR (10/87-10/90). Life expectancy at birth is from Coale-Demeny "West" model life table selected on the basis of the IMR.

MALAYSIA: Both the IMR and life expectancy at birth are from World Population Prospects 1990. They are estimated from vital registration for Peninsular Malaysia through 1985 and official government estimates for Sabah and Sarawak in 1980 and projected to 1985-89.

MALDIVES: The IMR is a Bank projection of an estimate provided by ESCAP (1988); it is consistent with the indirect estimate calculated from the 1990 census. Life expectancy at birth is the corresponding Coale-Demeny "West" model life table estimate and is consistent with the 1990 census indirect estimate.

MONGOLIA: Both the IMR and life expectancy at birth are from World Population Prospects 1990. Life expectancy at birth is based on official estimates of the CDR through 1986 and a United Nations estimate of a general pattern model life table. The IMR is based on the United Nations general model life table and life expectancy at birth.

MYANMAR: Both the IMR and life expectancy at birth are from World Population Prospects 1990. These estimates are based on analysis of the 1983 census, projected with the U.N. medium decline scenario to 1985-89.

NEPAL: The IMR and life expectancy at birth are from World Population Prospects 1990. The IMR is based on the Demographic Sample Survey of 1986/87 and projected with the U.N. medium decline model. Life expectancy at birth estimates are from corresponding model life tables.

NEW ZEALAND: Both the IMR and life expectancy at birth are based on average vital registration data for the period 1985 to 1989 as published in *PVSR*.

PAPUA NEW GUINEA: The IMR is from ESCAP 1988 and is based on analysis of the 1980 census. Life expectancy at birth estimates are from *World Population Prospects 1990* and are based on indirect estimates from the 1980 census, projected with the U.N. slow mortality decline pattern.

PHILIPPINES: The IMR is from *World Population Prospects 1990*. Life expectancy at birth estimates are based on Coale-Demeny "West" model life tables selected on the basis of the IMR.

SINGAPORE: The IMR is an official estimate for 1987 from vital registration, as published in *PVSR* (1/89). Life expectancy at birth is from *World Population Prospects 1990* and is based on vital registration data through 1988.

SOLOMON ISLANDS: Life expectancy at birth estimates are Bank projections from official estimates from the 1986 census for 1980-84. The IMR is derived from a corresponding Coale-Demeny "West" model life table.

SRI LANKA: The IMR is projected from the 1987 Demographic and Health Survey estimate for 1983-87 and is consistent with vital registration estimates of 1986-88 as published in *PVSR*. Life expectancy at birth estimates are from *World Population Prospects 1990* and are based on vital registration estimates projected with the U.N. medium decline model.

TAIWAN, CHINA: Life expectancy at birth is estimated from the official CDR and age-sex distribution as published in the Taiwan Statistical Data Book 1987. The IMR is from U.S. Bureau of the Census (1989) and corresponds to the life expectancy at birth estimates in Coale-Demeny "East" model life tables.

THAILAND: The IMR is projected from the 1987 Demographic and Health Survey estimate for 1983-87. Life expectancy at birth estimates are government projections and are consistent with model life table estimates based on the IMR.

TONGA: The IMR is from the U.S. Bureau of the Census (1989). Life expectancy at birth estimates are corresponding Coale-Demeny "West" model life table estimates.

VIETNAM: The IMR is an interpolation of an estimate derived from the 1976 census (King and Vu 1979) and a 1989 census indirect estimate. The 1988 Vietnam Demographic Survey estimate was also considered. Life expectancy at birth are Coale-Demeny "West" model life table estimates corresponding to the estimated IMR.

WESTERN SAMOA: Both the IMR and life expectancy at birth are Bank projections from official estimates for 1986 as published by ESCAP, 1988.

Southwest Asia
AFGHANISTAN: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The current estimates are obtained by projection with the U.N. slow mortality decline scenario.

BAHRAIN: The IMR and life expectancy estimates are Bank projections from official estimates from the 1981 census for Bahrain and non-Bahrain citizens separately, as published by the Central Statistical Organization.

CYPRUS: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on the 1980-81 Multi-round Demographic Survey and on the Demographic Reports of 1984 and 1986. The current estimates are obtained by projection with the U.N. medium mortality decline scenario.

GAZA STRIP: Both the IMR and life expectancy at birth estimates are obtained from the U.S. Bureau of the Census (1987). These estimates are based on official data published in Israel. Current estimates are projections by the U.S. Bureau of the Census.

IRAQ: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. estimates are based on a 1974-75 survey and the 1977 census. Current estimates are obtained by projection with the U.N. medium mortality decline scenario.

ISRAEL: The IMR is the average of official vital registration estimates for 1985 to 1989 as published in *PVSR*. Life expectancy at birth is from *World Population Prospects 1990*, and is based on vital registration data through 1986.

JORDAN: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. estimates are based on the 1971 National Fertility and Family Planning Survey and the 1970 Family Health Survey. Life expectancy estimates are based on the CDR and the age-sex distribution.

KUWAIT: The IMR is an average estimate of official vital registration data for 1985 to 1989 as published in *PVSR*. Life expectancy at birth estimates are from *World Population Prospects 1990* and are based on vital registration data through 1987.


OMAN: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. estimates are based on the 1986 Child Mortality Survey. Current estimates are obtained by projection with the U.N. medium mortality decline scenario.

QATAR: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on a 1981 survey and the 1986 census. Current estimates are obtained by projection with the U.N. medium mortality decline scenario.

SAUDI ARABIA: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. considered the 1974 census and obtained current estimates by projection with the U.N. medium mortality decline scenario.

TURKEY: Both the IMR and life expectancy at birth are official estimates, as published in *Social Indicators*. These data are based on the 1988 Population and Health Survey and several other surveys.

UNITED ARAB EMIRATES: Both the IMR and life expectancy at birth are from *World Population Prospects 1990*. The U.N. based its estimates on the 1975 and 1980 censuses. The U.N. medium mortality decline scenario was used to obtain current estimates.

YEMEN: Estimated IMR and life expectancy at birth are weighted averages for former Yemen Arab Republic and Democratic Yemen. For Yemen Arab Republic, the IMR and life expectancy are World Bank estimates based on the 1979 World Fertility Survey and 1986 census. For Democratic Yemen, the estimates are from *World Population Prospects 1990*.

### Europe and U.S.S.R.

ALBANIA: The IMR is the average of official vital registration estimates for 1985 to 1989, as published in *PVSR*. Life expectancy at birth estimates are from *World Population Prospects 1990*.

AUSTRIA: The IMR is the average of official vital registration estimates for 1985 to 1989 as published by Institut National d'Etudes Demographiques (1990) and *PVSR*. Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

BELGIUM: The IMR is the average of official vital registration estimates for 1985 to 1989 as published by Eurostat (1990). Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

BULGARIA: The IMR is the average of official vital registration estimates for 1985 to 1988 as published by *PVSR*. Life expectancy at birth estimates are from *World Population Prospects 1990*.

CHANNEL ISLANDS: The IMR is the average of official vital registration estimates for 1985 to 1989 as published in *PVSR*. Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

CZECHOSLOVAKIA: The IMR is the average of official vital registration estimates for 1985 to 1988 as published by *PVSR*. Life expectancy at birth estimates are from *World Population Prospects 1990*.

DENMARK: The IMR is the average of official vital registration estimates for 1985 to 1989 as published by Eurostat (1990). Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

FINLAND: The IMR is the average of official vital registration estimates for 1985 to 1988 as published by Institut National d'Etudes Demographiques (1990) and *PVSR*. Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.
FRANCE: The IMR is the average of official vital registration estimates for 1985 to 1989 as published by Eurostat (1990). Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

GERMANY: Estimated IMR and life expectancy at birth are weighted averages for former German Federal Republic and German Democratic Republic. The IMR is the average of official vital registration estimates for 1985 to 1989 as published by Eurostat (1990). Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

GREECE: The IMR is the average of official vital registration estimates for 1985 to 1988 as published by Eurostat (1990). Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

HUNGARY: The IMR is the average of official vital registration estimates for 1985 to 1989 as published in PVSR. Life expectancy at birth estimates are from World Population Prospects 1990.

ICELAND: The IMR is the average of official vital registration estimates for 1985 to 1988 as published in PVSR. Life expectancy at birth estimates are from World Population Prospects 1990.

IRELAND: The IMR is the average of official vital registration estimates for 1985 to 1989 as published by Eurostat (1990). Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

ITALY: The IMR is the average of official vital registration estimates for 1985 to 1989 as published by Eurostat (1990). Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

LUXEMBOURG: The IMR is the average of official vital registration estimates for 1985 to 1989 as published by Eurostat (1990). Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

NETHERLANDS: The IMR is the average of official vital registration estimates for 1985 to 1988 as published in PVSR. Life expectancy at birth estimates are from World Population Prospects 1990.

POLAND: The IMR is the average of official vital registration estimates for 1986 to 1989 as published in PVSR. Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

PORTUGAL: The IMR is the average of official vital registration estimates for 1985 to 1989 as published by Eurostat (1990). Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.
ROMANIA:  The IMR is the average of official vital registration estimates for 1985 to 1989 as published in *PVSR*. Life expectancy at birth estimates are from *World Population Prospects 1990*.

SPAIN:  The IMR is the average of official vital registration estimates for 1985 to 1988 as published by Eurostat (1990). Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

SWEDEN:  The IMR is the average of official vital registration estimates for 1985 to 1989 as published in *PVSR*. Life expectancy at birth estimates are from *World Population Prospects 1990*.

SWITZERLAND:  The IMR is the average of official vital registration estimates for 1985 to 1989 as published in *PVSR*. Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

UNITED KINGDOM:  The IMR is the average of official vital registration estimates for 1985 to 1989 as published by Eurostat (1990). Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

YUGOSLAVIA:  The IMR is the average of official vital registration estimates for 1985 to 1989 as published in *PVSR*. Life expectancy at birth is from Coale-Demeny model life tables, selected on the basis of the official CDR and age-sex distribution.

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
<th>Date</th>
<th>Contact for paper</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Ibrahim Elbadawi</td>
<td>January 1992</td>
<td>V. Barthelmes 39175</td>
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</tr>
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<td></td>
<td>34150</td>
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<td>WDR Office</td>
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<td>B. Mondestin</td>
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<tr>
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<td>36071</td>
</tr>
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<td>Larry Forgy</td>
<td>January 1992</td>
<td>O. Nadora</td>
</tr>
<tr>
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