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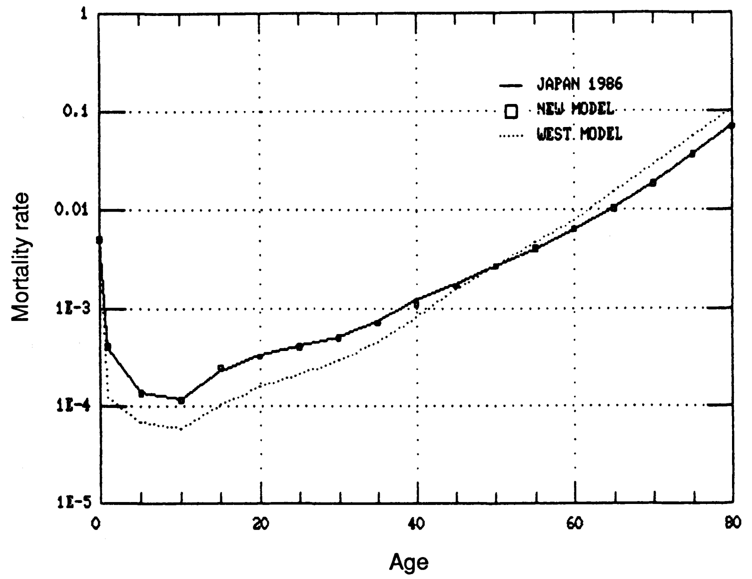
MORTALITY RATES, FEMALES IN JAPAN, 1986, AND RATES IN NEW MODEL SCHEDULE, AND OLD WEST MODEL, WITH SAME l_{65}/l_{10}



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CURRENT ITEMS

REVISED REGIONAL MODEL LIFE TABLES AT VERY LOW LEVELS OF MORTALITY

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Introduction

The Regional Model Life Tables by Coale and Demeny (revised with the help of Barbara Vaughan) are widely used as exemplars of actual mortality schedules over a wide range of mortality levels (Coale and Demeny, 1966; with Vaughan, 1983). At very low mortality (e_0 for females above 75 years), the model tables are based on extrapolation of relations among mortality rates observed in schedules of mortality at lower expectations of life (no more than 75.2 years in West models and no more than 74.7, 72.3, and 69.8 years in North, East, and South models). Although the existing model tables provide a satisfactory fit to the lowest mortality schedules recorded in the late 1950s (the latest observations available when the original models were formulated), extrapolations of relations based on the then-existent range of data do not fit at all closely the very low mortality schedules observed in the 1980s. In particular, as will be shown later, model schedules presented in the 1983 edition at female e_0 of 80 years are a quite poor match to the recorded mortality in populations with high-quality data and female expectation of life of about 80 years. We have therefore formulated new model tables at very low mortality, making use of extensive data of age-specific death rates in the 1960s, 1970s, and 1980s. The new tables fit the recorded death rates in very low mortality populations much better than do the existing model tables.

The modifications of the Regional Model Life Tables offered here are of three sorts:

- There is a minor modification of the method previously used to "close out" the model tables at ages above 80.
- Basically new tables covering ages from 0 to over 100 are calculated at very high expectations of life: e_0 for females of 77.5 and 80 years in the West family; 72.5, 75, 77.5, and 80 for the East family; and 65, 67.5, 70, 72.5, 75, 77.5, and 80 for the South family.
- Additional new tables common to the different families are presented at still lower levels of mortality: female e_0 of 82.5 and 85 years, well beyond any yet-recorded experience, but potentially useful for projections.

The remainder of this article explains the rationale and describes the method of calculation of these modifications of the model tables. Following the text is an appendix that presents the new model tables for males and females in three families.

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The New Procedure for "Closing Out" Model Life Tables above Age 80

In the first edition of the Regional Model Life Tables, published in 1966, the last mortality rate for a five-year age interval was at ages 75-80. Each table was "closed out" at 80 by an estimate of e_{80} derived from a regression of e_{80} on l_{80}. No age-specific information on mortality above 80 was supplied. In the revised edition, published in 1983, age-specific death rates and other life table functions were provided in five-year intervals from 80 to 100, with an open interval above 100 rather than above 80.

The more detailed mortality information on mortality above age 80 in the 1983 edition was derived from the Gompertz assumption that the force of mortality ($\mu(x)$) rises exponentially with age above 80. It has long been observed that mortality rates at ages over 75 or 80 increase with age at a diminishing rate rather than at the constant Gompertz rate (see, e.g., Perks, 1932). Typical patterns of the increase of the mortality rate from one five-year age group to the next are shown in Figure 1. In all seven populations (selected because mortality data at older ages in these countries are relatively reliable), the relative increase from one age group to the next decreases above 80 or 85.

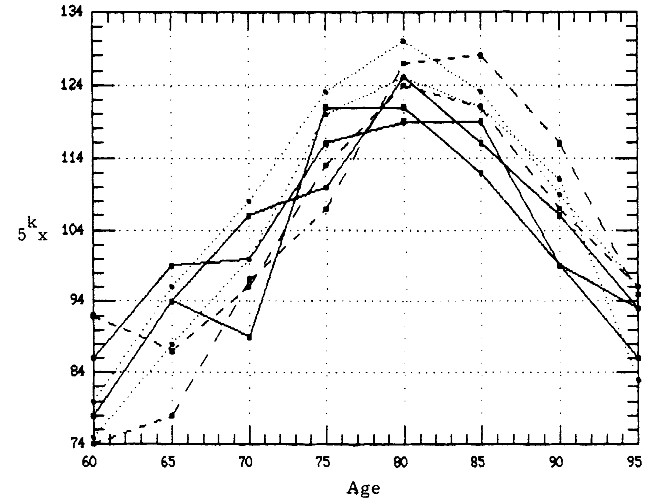

Figure 1. Natural logarithm (per 1,000) of the ratio $_5m_x/_5m_{x-5}$, selected female populations with accurate data (Netherlands, Japan, France, West Germany, Austria, Sweden, and Norway).

In the modified procedure for closing out the model life tables above age 80, we have incorporated an assumption of a steady decrease rather than Gompertzian constancy in the rate of increase in mortality with age above age 80. The logarithm of the ratio of the mortality rate in the interval x+5 to x+10 to the ratio from x to x+5 is assumed to decline by a constant increment as x rises above 80, thus representing the decline in ratios at older ages seen in Figure 1 by a simple straight line. Specifically, if $\ln({}_5m_{80}/{}_5m_{75})$ is designated k_{80}, and if k_{85} is k_{80}-R, and k_{90} is k_{80}-2R, etc., then $\ln({}_5m_{105}/{}_5m_{75}) = 6k_{80}-15R$.

We have assigned an arbitrary high value of ${}_5m_{75}$+.66 to ${}_5m_{105}$. When e_0 is 70 years or higher, this formulation assigns a death rate of about .71 (when e_0 is 80) to about .74 (e_0=70), thereby insuring that only about two percent of persons reaching age 105 survive to 110 and that the highest age at death is not much above 110 (Coale and Kisker, 1987). The formula given above for

$\ln({}_5m_{105}/{}_5m_{75})$ permits the calculation of the decline in the increase of mortality from one five-year age interval to the next (R) and the estimation of mortality rates in every interval from 75-80 to 105-110.

To test the procedure of closing out mortality rates at advanced ages, we have compared the rates calculated by this procedure with those calculated by the Gompertz method previously used in the Regional Model tables and with actual rates at ages over 80 years. The old and new methods of estimating death rates at five-year intervals from 85 to 100 were compared with accurately recorded female death rates over this age range: Germany, 1910; Belgium, 1970; Scotland, 1971; England and Wales, 1971; Japan, the Netherlands, Norway, and Sweden, 1980; Australia and New Zealand, 1981; and Denmark, 1984. At ages 85-89, the new estimates are closer than the Gompertz estimates to the recorded rates in 8 of the 12 comparisons; at 90-94 in 10 of 12; and at 95-99 in all 12 instances.

The new method of closing out the life table is used in the calculation of the new model tables presented in the Appendix.

Failure of Regional Model Life Tables to Match Actual Mortality Patterns at Very Low Levels

The extent of agreement between one of the families of model life tables and an actual schedule of mortality rates is revealed by examining the model life table level of mortality (indexed by the expectation of life at birth) consistent with the observed mortality rate at each age interval from 0-1 to 75-80. The standard deviation of the 17 different e_0's is a summary measure of the fit of the model family to the mortality schedule in question. In Table 1, this index of agreement is shown with each of the four families of model tables for female mortality schedules in selected populations that were part of the basis of the original calculation of the West, East, North, and South families. Note that the North family was based on only nine mortality schedules, only one of which, Norway 1954, was after 1950. Note also that before 1960 the standard deviations are least for West models in the schedules that underlie this family; similarly, the schedules used in the construction of the East and South tables are best fitted by these families. Norwegian mortality in 1954 is about equally well fitted by West, East, and North, and the fit to Spanish mortality in 1940 is about equally good with South and East models. With only two slight exceptions in this sample, then, each family provides the best fit to the tables used in its calculation.

The changing patterns of mortality in different populations with improving mortality from the 1950s to the 1980s shared two general characteristics. First, populations that in the 1950s were best fitted by West model life tables experienced a modification of mortality pattern in that all (except England and Wales) moved from being best fitted by West model tables to being best fitted by North model life tables, as shown in the second part of Table 1. For example, the standard deviation of expectation of life at birth in the West family consistent with the Australian mortality schedules at different ages varied between .78 and 1.43 in the mortality schedules from 1952 to 1972. The lowest standard deviation for the North family during this time was 2.28. However, in 1977 and 1985, the standard deviation of e_0 consistent with individual death rates using North model schedules was less than that using West models (substantially less in 1985). In Belgium, the West model was the best-fitting one from 1962 through 1977, but in 1984 the North model fits better. In England and Wales, the West pattern fits best from 1952 through 1985, but the difference in standard deviations between West and North fits diminished. In France the fit of the West model tables was best for mortality schedules from 1952 to 1962; from 1967 to 1985 the North pattern fits better, with a widening margin between the standard deviations calculated from the North and West models. Japan switched from West to North after 1977, the Netherlands after 1967, Switzerland after 1967, and the United States from 1975 on. A typical sequence for populations that formed the basis for

Table 1. Variation (standard deviation) of the model level of mortality (indexed by e_0) consistent with mortality rates from 0-1 to 75-79 in various female populations, 1960 or before. Four families of model life tables.

	Standard Deviation of Model Level (indexed by e_0)			
	West	North	East	South
Part 1: 1960 or Before				
A. Populations incorporated in West model				
Japan, 1957	0.83	3.68	1.80	4.40
France, 1957	1.10	2.18	1.55	3.75
Netherlands, 1954	0.85	3.45	1.03	3.98
Australia, 1957	0.78	2.83	1.60	4.43
United States, 1958	1.03	2.65	1.68	4.38
Sweden, 1960	0.63	3.00	0.88	3.98
B. Populations incorporated in East Model				
Austria, 1957	1.05	3.80	0.43	3.65
Central Italy, 1956	1.60	4.25	0.55	3.60
North Italy, 1956	1.93	4.73	0.45	3.83
West Germany, 1957	1.48	3.78	0.63	3.23
C. Populations incorporated in South Model				
Portugal, 1952	4.40	4.15	3.98	1.03
Spain, 1940	3.30	4.50	2.40	2.40
D. Population incorporated in North Model				
Norway, 1954	1.28	1.43	1.40	3.03
Part 2: 1980s				
A. Populations incorporated in West Model				
Japan, 1986	2.58	1.28	2.55	2.80
France, 1985	2.98	1.68	3.10	3.53
Netherlands, 1986	2.13	1.15	2.23	3.15
Australia, 1985	1.98	1.05	2.20	3.38
United States, 1985	2.35	1.83	2.75	4.28
Sweden, 1985	2.03	0.90	2.18	3.08
B. Populations incorporated in East Model				
Austria, 1986	1.60	1.05	1.90	3.45
Central Italy, 1981	1.50	0.75	1.53	2.65
North Italy, 1981	1.35	0.95	1.53	3.05
West Germany, 1986	1.55	0.90	1.80	3.25
C. Populations incorporated in South Model				
Portugal, 1986	2.13	1.03	2.25	2.90
Spain, 1981	2.13	0.90	2.13	2.63
D. Population incorporated in North Model				
Norway, 1985	2.08	1.00	2.26	3.03

the East model life tables in the 1950s is to move from mortality schedules in which the standard deviation of the estimated levels is least for the East model to a minimum standard deviation for the West model and then, finally, to a minimum standard deviation from the North model.[1]

Among populations classified as South in the Coale-Demeny construction of model life tables, we find that the standard error of mortality levels at different ages in Portugal was least in the 1950s and 1960s for South model life tables, but by 1980 the standard error in the North family was least by a wide margin. In Spain in 1940 the standard deviation for South and East was the same; then in the 1960s and early 1970s, the standard deviation was least for the East family, but by the 1970s it was least for the North family. In short, there is a tendency for populations that once conformed most closely to West, South, or East patterns to move in the most recent years to closest conformity with the North pattern, which is characterized by the lowest mortality at high ages among the four families. When the reduction in mortality at each age from the 1950s (or 1960s) until the 1980s is characterized by the increase in equivalent level in one of the families of model life tables, for almost every very low mortality population in our collection of mortality schedules, the increase in corresponding model level from the earlier to the later date is greater at age 75-79 (the highest age for which rates are compared) than at any younger age. In general, the increase in equivalent mortality levels rises from age 55 or 60 on and exceeds the overall increase in level for the whole mortality schedule. Another age at which there is characteristically a large rise in model life table level is in infancy. To take a specific example, in France from 1957 to 1982 the median change in equivalent level in the West system from age 0 through age 75 is a change in e_0 of 4.6 years. However, the decrease in infant mortality was equivalent to a change in West model e_0 of 7.5 years; the decline in ${}_5m_{75}$ was equivalent to a change of 9.0 years. The equivalent change was more than five years only at age 0 and at all ages over 55. (If the equivalent changes in e_0 in the other three families are used in place of the West family, the conclusion is much the same. Very much larger increases in equivalent expectation of life are required at age 0 and at ages over 55 or 60.) In other words, the characteristic change in the pattern of age-specific mortality rates in the populations we have analyzed was a decrease in mortality greater than predicted within any of the families of model life tables at age 0 and at ages above 60 or 65. It is this change in pattern that accounts for the better fit of the North model tables to almost all the populations examined in the 1980s, whether the best fit in the 1950s was with the West, South, or East model tables.

Deviations at individual ages from the West pattern have been calculated from the experience of eight populations with very low mortality in the 1980s. The measure of deviation at each age interval is the difference of the model level at the interval from the median level for all 17 age intervals. Included are countries wherein earlier life tables were used to construct the West family (Japan, Canada, the Netherlands, and France), the South family (Spain and Portugal), and the East family (Austria), plus Switzerland (not used in making the model tables). In the female populations the deviations extend from nearly three years below the median life expectancy to more than eight years above. Despite the wide range, the pattern of deviations is similar among the different populations: a positive deviation at age 0 to 1, generally negative small deviations from 1-4 to 40-44, and increasing positive deviations above age 45. (There is much less uniformity in the pattern of deviations of male mortality from the West models.)

For a given increase in l_{65}/l_{10} in a low-mortality population's life tables from the 1950s to the 1980s, the actual decrease in mortality in infancy and at late ages was much greater (at least for females) than in any of the four families of model tables. Moreover, the age pattern of mortality for a given l_{65}/l_{10} was very similar among populations that had formerly differed by conforming to different families of model tables. There is a clear need for new tables at very low levels to replace the existing model tables at these levels.

Calculation Procedures for Female Tables at Very High Life Expectancies in the West, East, and South Model Systems

As a first step in discerning a more accurate picture of the age pattern of mortality at very high expectations of life to serve as the basis for modification of the existing families of model life tables, we examined the actual patterns of mortality by age in a large collection of mortality schedules generously provided for this research by the U.N. Population Division. The tables included some 200 different female schedules of mortality from the 1950s into the 1980s. As we have noted, the very low mortality schedules in the 1980s seem to be best fitted by the so-called North models, no matter by what family of model life tables the population had been best fitted in the 1950s. That is to say that Spanish and Portuguese female schedules of mortality were best fitted by North rather than South model life tables by the 1980s, that mortality schedules for Austria, West Germany, and North and Central Italy were best fitted by North rather than East model schedules, and that many populations that had been best fitted by West schedules in the 1950s were best fitted by the North in the 1980s.

This relative uniformity of congruence with North patterns of mortality indicates that at very low levels of mortality for female populations the age patterns of mortality were becoming quite similar. The first step, then, was to search for a single pattern of mortality related to the overall low level of death rates that characterize these different populations in the 1980s. The index of overall mortality that was chosen against which to examine the relation between mortality at each age and overall level was the proportion surviving from ages 10 to 65 according to each observed mortality schedule. This index was chosen in place of the expectation of life at age 10 that had been used in the earlier model life table calculations because at the very low levels of mortality being examined, the expectation of life at age 10 is mostly determined by mortality rates at ages above 65. We decided after some preliminary exploration to restrict our examination of the relation between mortality at each individual age and the proportion surviving from 10 to 65 to populations in which the calculated proportion surviving from 10 to 65 was 0.834 or higher. This lower cutoff restricted our calculations to the 118 female tables with the highest proportion surviving over this age range. When 83.4 percent survive from 10 to 65, the expectation of life at birth ranges from about 71 years in the South model life tables to about 74 in the North model tables, so the analysis is restricted to quite low mortality data. All the mortality schedules selected in this way incorporate experience that occurred later than the data available at the time the original model life tables were made, with the exception of two mortality schedules from Norway, one from Sweden, and one from the Netherlands, instances in which the proportion surviving from 10 to 65 was above .834 before 1960.

Our aim, then, was to discern the pattern of the relation between each m_x value from 0-1 and 1-4 to 80-85 and l_{65}/l_{10} in 118 mortality schedules from the 1960s to the 1980s with the highest proportions who survived from 10 to 65.

Our procedure was as follows: mortality schedules were arrayed in order from the highest proportion surviving from 10 to 65 (in Japan, 1986, with l_{65}/l_{10} equal to .912) to Poland in 1967 (where the corresponding proportion surviving was .834). We then looked at the sequence of mortality rates in each age interval from the lowest mortality schedule, Japan 1986, to the highest mortality schedule in the sequence, Poland 1967. The next step was to smooth the sequence of 118 mortality rates at each age, because there was a wide scatter of points even within mortality schedules with about the same rate of survival from 10 to 65. The scatter was particularly large at the lower survival rates, because at the earlier dates different mortality schedules conformed to different regional patterns.

The method of smoothing was adopted from the system of exploratory data analysis originated by John Tukey. The specific procedure was the calculation of a complex sequence of moving medians applied to the mortality rates at each age interval, arrayed in descending order of the proportion surviving from 10 to 65 in the mortality schedule to which each age-specific rate belongs. Finally, the method of smoothing end points suggested in Velleman and Hoaglin (1981) was applied.

This smoothing led to values of ${}_1m_0$, ${}_4m_1$, ${}_5m_5$ ... ${}_5m_{80}$ at selected values of l_{65}/l_{10} from .836 to .908, at slightly uneven intervals. The relation between the sequence of smooth m_x values and the proportion surviving from 10 to 65 was then examined. Experimental regressions were calculated with the dependent variable being the individual m_x and the independent variable the proportion surviving from 10 to 65. The smoothed points and the fitted lines that were incorporated in the new model life tables are shown at three ages in Figure 2, illustrating the three different procedures that were used. We tried fitting a logarithmic regression of m_x on l_{65}/l_{10} and two forms of linear regression, one a straight linear estimate of the relationship of m_x to the proportion surviving from 10 to 65, the second a double linear regression that changed slope at l_{65}/l_{10} = .882. We used the simple linear regression where it fitted the data closely, but at ages 1-4, 5-9, 10-14, and 15-19 we selected the regression that changed slope, because the smoothed data showed a distinct change in the relation at about that point. At these ages the decline in mortality became more rapid at higher rates of survival from 10 to 65. Figure 2 shows the double slope at ${}_5m_{15}$ where the change in slope is conspicuous. At this age interval R^2 for a single straight line is only .929, but it is .987 when the change in slope is introduced. Above age 30, R^2 with a single straight line is above .98 in every age interval and above .99 in most intervals. In this age range, the difference between R^2 with a single slope and a double slope is insignificant, so the single line was used.

At age 0-1, the smoothed sequence of infant mortality rates shows a fairly steady decrease in rate of increase. A logarithmic fit is very close indeed with an R^2 of .996 compared with only .956 for a single straight line and .979 for a straight line with a double slope.

Thus, our preliminary new model life tables were calculated by assigning arbitrary values of proportion surviving from 10 to 65 and reading off the associated death rates in each age interval from the regressions just described. The set of death rates associated with a given proportion surviving from 10 to 65 were assumed to constitute a preliminary model mortality schedule. Each schedule was then "closed out" by assuming that the log of the ratio of ${}_5m_{x+5}/{}_5m_x$ declines linearly with age above age 80 by an amount that leads to a value of ${}_5m_{105}$ of mortality rate at 75-80 plus .66 (see p. 615 above).

This procedure produces a calculated life table in very close agreement with recorded age-specific mortality rates in the populations (Japan 1986, Switzerland 1986, Sweden 1985, France 1985, and the Netherlands 1985) that have the highest proportion surviving from 10 to 65. The agreement is also good with other populations, such as Austria 1986, West Germany 1985, and Central Italy 1981, that had formerly conformed to the East model life tables, and also in Spain 1981 and Portugal 1986, which had at one time belonged to the South family of model life tables (Figure 3). In other words, these calculated model life tables represent the more or less uniform pattern of mortality at very high levels of expectation of life quite satisfactorily. In the 1950s and 1960s, the Japanese mortality schedules were best fitted by a West mortality pattern. But when, in Figure 3, the fit of a West model schedule and the new model schedule with the same proportion surviving from 10 to 65 is compared with the 1986 female mortality schedule for Japan, the new model schedule is essentially indistinguishable from the observed Japanese schedule, whereas the West model fits rather poorly.

The strategy that has been devised to move from the different families of mortality patterns that fitted the observed data quite well prior to 1960 to a uniform pattern of mortality at very low death rates is a little different in the different families to be considered. The general problem is

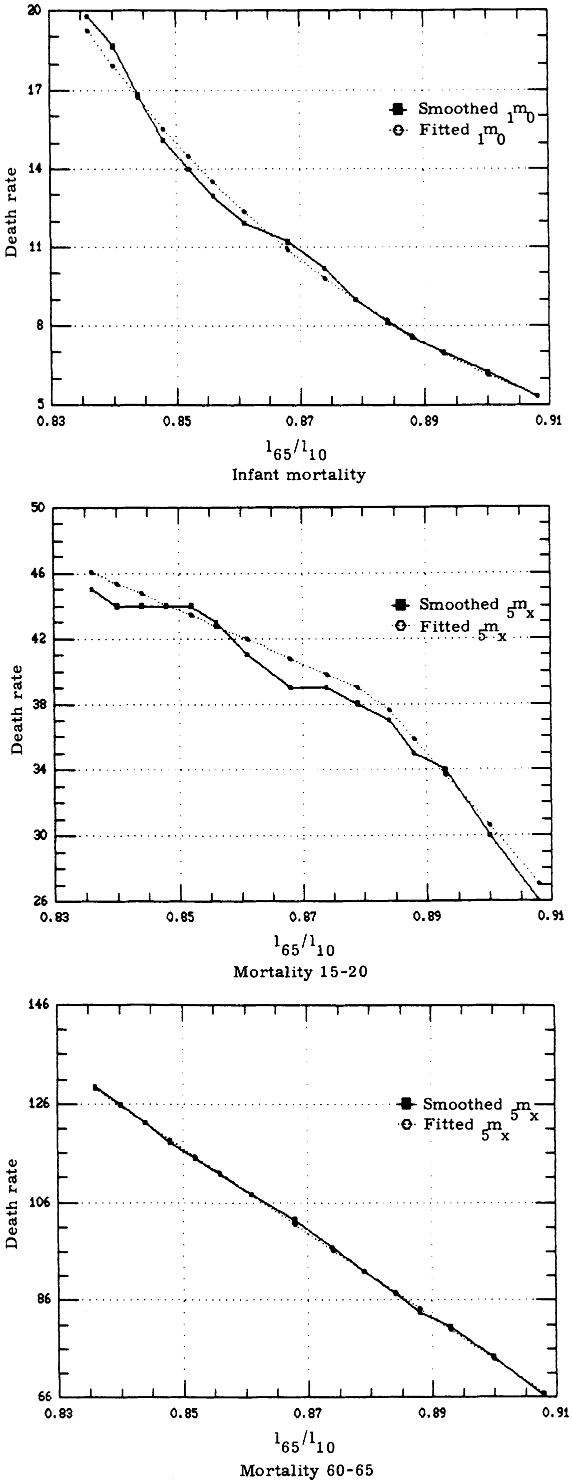

Figure 2. Comparison of (a) smoothed values of female age-specific mortality rates, at different levels of l_{65}/l_{10}, and (b) regression lines fitted to the smoothed values.

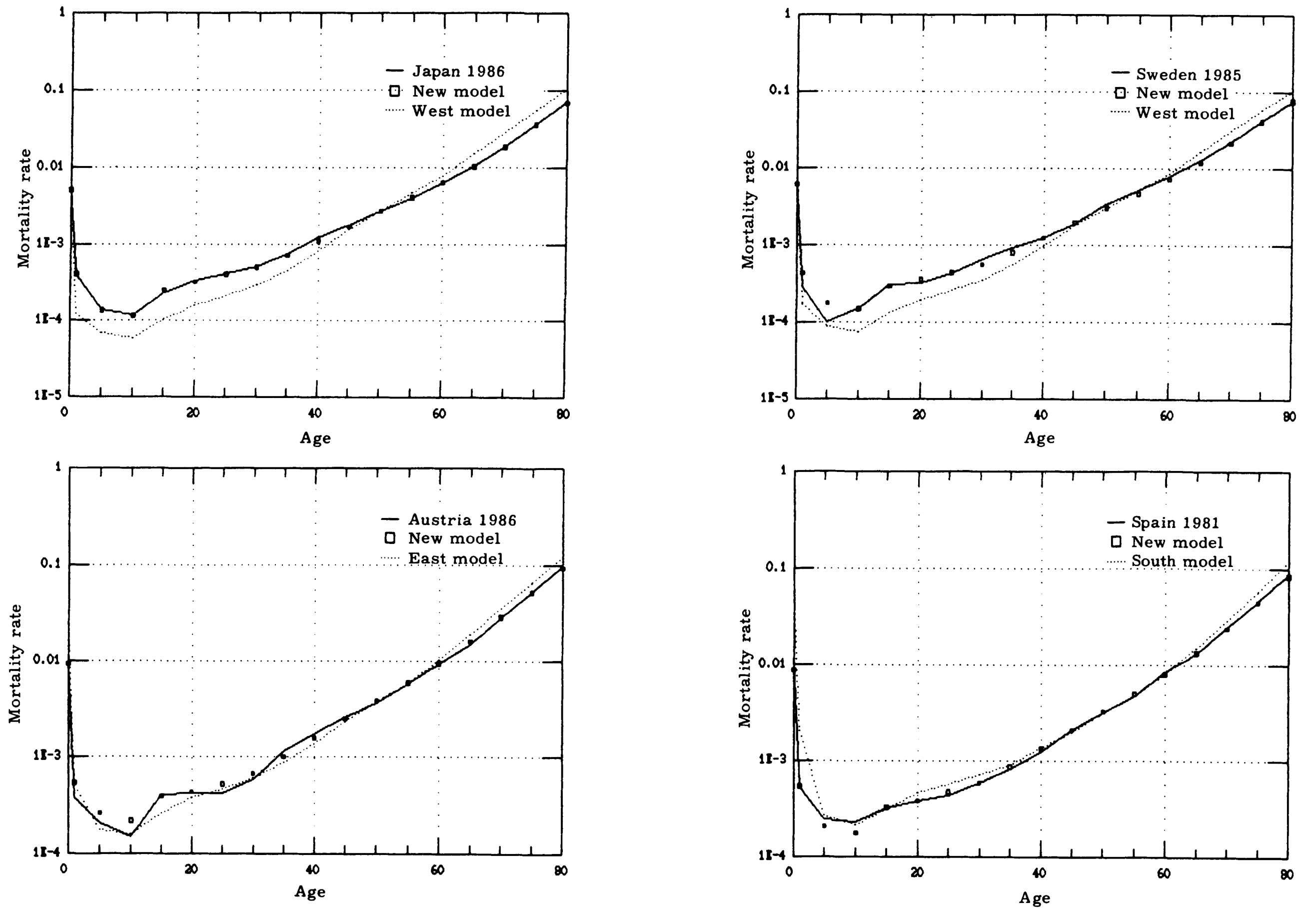

Figure 3. Female mortality rates, ages 0-1 to 80-85, compared to new low-mortality model, and to appropriate family of old regional model tables, with same value of l_{65}/l_{10}.

illustrated by Figure 4, which shows the relation between proportion surviving from 10 to 65 and infant mortality rates in the new model and in the existing four families of tables. At higher mortality (lower proportion surviving from 10 to 65), the old model tables fitted individual

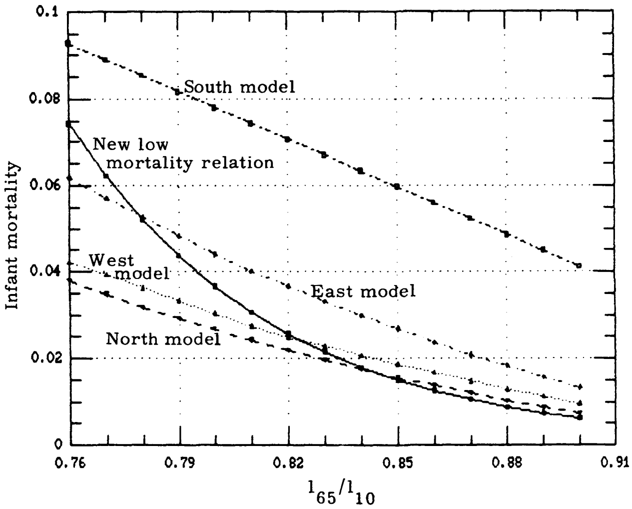

Figure 4. Comparison of female infant mortality rates in the four families of model life tables with the new estimates, at different values of l_{65}/l_{10}.

populations belonging to a particular region moderately well. The new relation of mortality to the proportion surviving from 10 to 65 is a sensible fit only at very low mortality rates. To make new West model life tables, we calculated the mortality at each age associated within the West family with the proportion surviving from 10 to 65. We then made a new set of West model life tables by accepting the old West values up to the point of intersection between the estimates based on the old West relations and the estimates based on the new regressions. The new estimates are accepted for values of l_{65}/l_{10} above the intersection. For the East model life table estimates of infant mortality, it was assumed that the infant mortality rates associated with the old East pattern would prevail up until the proportion surviving from 10 to 65 was .78, and then, from that survival rate up to .85, the weighted average of the infant mortality rates from the old model and the new was utilized, with the weights changing from 100 percent old East at .78 to 100 percent new model at .85. At ages above zero, the modified East model life tables were constructed by a procedure precisely analogous to the procedure described above for the West tables.

In the South model life tables, infant mortality (but also mortality at other age intervals less than 30 years) is very much higher than in the new model relation for a given level of l_{65}/l_{10}. Thus, the mortality rates from the original Coale-Demeny South tables do not intersect the relation of mortality rates to the proportion surviving from 10 to 65 that exists at very low mortality levels. Therefore, the revised South model life tables at very low mortality were constructed by accepting from the old South models the mortality rates associated with each level of l_{65}/l_{10} up until the proportion surviving from 10 to 65 reached 0.78. From 0.78 to 0.90, the estimated mortality rate at each age was taken as the weighted average of the value in the earlier South model tables and in the new tables based on the regressions described above. (The weights change linearly from 1.0 for the South tables and 0.0 for the new tables when the proportion surviving from 10 to 65 is .78 to 0.0 for the South tables, and 1.0 for the new tables when l_{65}/l_{10} equals .90.) The new model South table at an expectation of life of 77.5 years has slightly higher mortality at young ages than the new West model at this expectation of life at birth. The West model at this level is determined by the new calculations of mortality at each age based on the regressions in the low-mortality populations of mortality at each age on the proportion surviving from 10 to 65. At e_0 = 77.5, the proportion surviving from 10 to 65 is still below .90; therefore the procedure we employ for calculating the South model still incorporates a weighted average of the old South values and new regression-based values, although with very low weights for the old South values.

The validity of the new regional model life tables for infant mortality is indicated in Figure 5, which shows recorded infant mortality rates in populations that underlie the original regional life tables as compared with the rates in the new models at different levels of the proportion surviving from 10 to 65. The scatter of points is least and the fit is generally good in each new set of model life tables for high values of the proportion surviving from 10 to 65. Note that the totally new model life table values based on the logarithmic regression of ${}_1m_0$ on the proportion surviving from 10 to 65 does not affect the new West model life tables until after l_{65}/l_{10} is greater than .84.

Features of the New Female Model Life Tables

The new model life tables for females presented here (along with the male models to be discussed later) are an amalgam of slightly modified old model tables and tables within each family that merge into a wholly new model at an expectation of life at birth for females of 80 years. In the West family, the new tables at expectations of life of 70 and 72.5 differ from the old West tables only at the higher ages because of the new form of "closing out" above age 80, and to a minor degree at ages below 80 in order to keep expectations of life at exactly 70 and 72.5 years. At an expectation of life of 75 years, the proportion surviving from 10 to 65 is 84.8 percent. This is in the domain in which at some ages the estimated mortality incorporated in the model tables is taken from the new estimates. Therefore, the new table at e_0=75 years differs slightly from the already-published West table at this level. At higher expectations of life at birth, the difference between the new estimates and the old West mortality schedules increase. At an expectation of life of 77.5 years, the new table is quite different from the previously published table. At an expectation of life of 80 years, the difference is still greater. In general, the newer model has higher mortality rates than the West, East, or South model life tables until above age 60 or 70. This difference is the result of the low mortality that characterizes the new life tables at high ages, a feature that at this very low overall mortality requires much higher mortality rates at younger ages in order to attain the same expectation of life at birth.

The fit of the new model tables at high life expectancies to the recorded mortality schedules of populations with the lowest overall mortality yet recorded was discussed earlier and illustrated in Figure 3. Note that in all instances the fit of the new model life table is very close and the fit of the relevant old model life table is not nearly as good.

These figures show that a single set of model tables at very high life expectancy fits well-recorded mortality closely. The final female model tables that we have constructed therefore begin with slightly modified tables at expectations of life at 70.0 and 72.5 years (and at 67.5 for the South tables). Model tables at higher life expectancies gradually merge to a completely uniform pattern at an expectation of life of 80 years. This convergence to a common single pattern of mortality rates by age is a particularly intriguing feature of the new model tables.

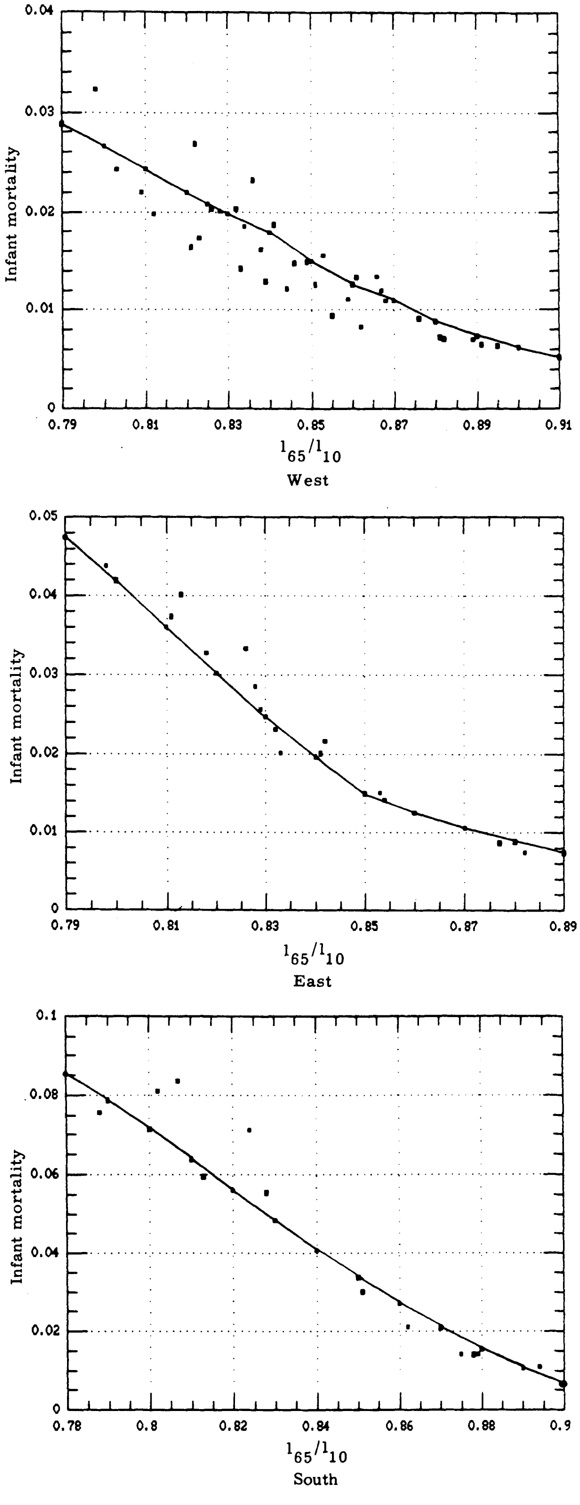

Figure 5. Female infant mortality rates in the new regional model life tables compared to actual rates in selected populations that underlie the original West, East, and South tables.

New Tables with Expectation of Life at Birth of 82.5 and 85.0 Years

Another feature of the new models is to offer extrapolated model tables at female expectations of life of 82.5 and 85 years. It was the inaccuracy (in the old model tables) of extrapolation well above observed mortality experience that motivated construction of new tables. The clustering of mortality experience in populations that formerly had patterns conforming to different models emboldens us to project the relations found between the proportion surviving from 10 to 65 and individual mortality rates to still higher proportions surviving. There is a particular feature of the estimation procedure employed to estimate mortality rates at individual ages from the overall index of l_{65}/l_{10} that gives some confidence to the validity of extrapolation to unobserved low levels of mortality. At all ages except 0-1, the estimation of mortality in individual age intervals from the proportion surviving from 10 to 65 is by a linear equation, or, at four age intervals, by two linear segments. The constant and the slope at each age of the straight line estimator were determined by a least squares fit to the smoothed values based on observed mortality schedules. The constant term and the slope coefficient at ages 1-5 to ages 80-85 are shown in Table 2. Also shown is the implied proportion surviving from 10 to 65 at the time that the mortality rate at each age

Table 2. Constants and slopes used to estimate each m_x from l_{65}/l_{10}, and l_{65}/l_{10} when each m_x is estimated to equal zero.

Age	Constant 1	Slope 1	Constant 2	Slope 2	l_{65}/l_{10}, m_x=0
1	0.0080	-0.0085	0.0034	-0.0033	1.0344
5	0.0025	-0.0025	0.0037	-0.0039	0.9474
10	0.0016	-0.0016	0.0031	-0.0033	0.9473
15	0.0018	-0.0017	0.0042	-0.0044	0.9698
20	0.0032	-0.0031	--	--	1.0160
25	0.0035	-0.0034	--	--	1.0324
30	0.0052	-0.0051	--	--	1.0098
35	0.0084	-0.0084	--	--	0.9964
40	0.0129	-0.0130	--	--	0.9977
45	0.0208	-0.0209	--	--	0.9952
50	0.0319	-0.0320	--	--	0.9969
55	0.0514	-0.0519	--	--	0.9898
60	0.0851	-0.0864	--	--	0.9855
65	0.1514	-0.1548	--	--	0.9781
70	0.2692	-0.2749	--	--	0.9792
75	0.4414	-0.4448	--	--	0.9924
80	0.6744	-0.6639	--	--	1.0158

becomes zero. The near equality of the constant term and the slope term implies that the proportion surviving from 10 to 65 when individual mortality rates are zero is very close to 1.0. This is a reassuring feature, when one contemplates extrapolating the relations of the individual mortality rates to the proportion surviving from 10 to 65 to higher proportions surviving than yet observed. At ages from 10 to 65 the logical mortality rate at each age when the proportion surviving becomes 1.0 is zero. The least squares fit yields mortality rates very close to zero when l_{65}/l_{10} is 1.0, without imposition of this feature in the determination of the equation of each line. Since the individual mortality rates have logically correct values at the upper limit of survival, extrapolation to mortality rates consistent with l_{65}/l_{10} up to 0.944 (e_0=85.0) should yield sensible estimates.

The Construction of New Model Life Tables for Males

The natural procedure to use in constructing a model life table for males to accompany the female tables already described would be to employ a wholly analogous estimation method for males, as was done in the earlier editions of the regional model tables. However, the age patterns of mortality at very high life expectancies for males are much less uniform in different populations than the female patterns of mortality. A basic difficulty is that as mortality has changed in the last two or three decades, mortality for males at some ages in some populations has increased rather than decreased from the 1950s to the 1960s or 1970s. In more than 10 of the populations with very low mortality rates, there was an increase in male mortality at some of the older ages.

In constructing the original model life tables, Coale and Demeny noticed lower correlations for males than for females among mortality rates at different ages, and also between mortality at individual age intervals and the expectation of life at age 10. For example, in the West tables, the linear correlation coefficient between the mortality rate from 65 to 70 and the expectation of life at age 10 was -.962 for females and -.887 for males. It was noted that if, in addition to the independent variable expectation of life at age 10, the date of the mortality schedule was entered as another independent variable, the multiple correlation for females was insignificantly different from the zero order correlation with expectation of life at age 10. However, the correlation for males between mortality from 65 to 70 and $-e_{10}$ increased from .887 to .932 when date was introduced as an additional independent variable. The partial correlation between the older age mortality rate and the date of the mortality experience with expectation of life at age 10 held constant was positive. In other words, the expected value of mortality from 65 to 70 for a given value of e_{10} was higher at later dates. Preston constructed regression estimates of older male mortality (standardized mortality rate from age 40 to 70) from younger mortality (mortality from 5 to 30 for males) and older female mortality, with regressions based on mortality schedules prior to 1930. The observed older-age mortality for males in the post-World War II period was consistently higher than that estimated from these regressions. The excess of the actual mortality above the estimated, country by country, was closely correlated with per capita consumption of cigarettes (Preston, 1970). Because of this tendency for the relation of old-age mortality among males to mortality at other ages and to mortality of females to be dependent on the date of the mortality experience, since mortality has perversely risen at some ages during the post-World War II period at the same time that mortality at most ages was being reduced, one cannot expect to find as uniform a pattern of male mortality rates as we have observed for females at very low mortality levels. One could scarcely design a set of model life tables intended in some sense to be universal that included increasing mortality at some ages for males while mortality rates in the other segments of the population were going down.

Another different element in the evolution of male mortality as very high expectations of life have been attained is the absence of the tendency found among female mortality schedules to shift from best fit by schedules taken from the East, West, or South families to best fit by schedules taken from the North family. In the 1980s, the fit of the East and West models to 30 tables with relatively low mortality was not very different. Moreover, the fit was much better than the fit of the North tables. In fact, in these 30 populations the standard deviation of the West expectation of life for the different ages was lowest in 19 populations, the East in 9 populations, and the North in 2 (Japan and

Iceland). The standard deviation for the North models was highest in 21 of the 30 populations; the South models gave the highest deviation for the other 9.

It was therefore necessary to use a wholly different procedure in constructing model life tables for males to correspond to the female tables constructed by procedures already described. The method we adopted was to manufacture mortality schedules for the male population by multiplying the female model death rates from ages 0-1 through 80-85 by a representative vector of the ratio of male to female mortality rates over these ages. At mortality level 25 (female e_0=80 years), the set of ratios of male to female mortality utilized was the average for 16 populations with the lowest mortality in the 1980s. The ratios in these 16 populations were not uniform. Because of the nature of the data on low mortality schedules for males, the calculated male model life tables at the lowest life expectancies fit the average experience among low-mortality male populations, but the fit of model to individual mortality schedules is not as close for males as for females.

There are nevertheless reassuring features of the ratio of male to female mortality schedules. In the first place, the ratio of male to female mortality has risen at every age from the 1950s to the 1980s in the 14 populations for which we found data for both periods, so that the high sex ratios of mortality that are utilized to make model male mortality schedules from the model female schedules are real and produce approximately suitable differences in male and female expectation of life. Another reassuring feature is that separately constructed averages of the ratios for nine "Western" populations, four "Eastern" populations, and three "Southern" populations are not significantly different from the overall pattern.

The specific choice of ratios of male to female mortality rates to convert the female model table to a male model table at different levels of mortality was as follows:

- In the West model life tables, the ratios of male to female mortality rates in the unrevised tables at expectations of life of 70.0, 72.5, and 75.0 were applied to the new female death rates; at 77.5, the sex ratios were taken as the average of those in the original model life table at that expectation of life and of the ratios in the 16 low-mortality populations mentioned above. For expectations of life for females of 80.0, the new set of such ratios for the 16 low-mortality populations was employed. In the model tables in which the expectation of life for females is 82.5 and 85.0 years, higher ratios of male to female mortality rates were estimated. Average ratios of male to female mortality rates in the 14 populations mentioned above were calculated for the 1950s and the 1980s; the average proportions surviving from 10 to 65 in the female mortality schedules for these populations were also calculated. It was then assumed that as the proportion of females surviving from 10 to 65 rose above 0.90113 (e_0=80), the ratio of male to female mortality rates changed by an amount at each age interval that was proportional to the change in the average ratios of male to female rates from the 1950s to the 1980s in the aforementioned 14 populations. The factor of proportionality was estimated as the ratio of the increase in female l_{65}/l_{10} from level 25 (e_0=80) to level 26 or 27 (e_0=85) to the average increase in the female l_{65}/l_{10} from the 1950s to the 1980s in the 14 populations. The resultant male life tables at the two highest levels of expectation of life were characterized by an expectation of life at birth that remained at an essentially constant margin (a little more than six years) below the female e_0.
- For the East model life tables at expectations of life of 70.0, 72.5, and 75.0, the sex ratios of mortality rates from the old East models at these levels were employed.
- For the South model tables, the sex ratios from the old model tables for expectations of life for 67.5, 70.0, and 72.5 were used. At expectation of life of 75, the average of the old model sex ratios and the new average of 16 low-mortality countries was employed; at expectation of life at birth for females 77.5, sex ratios as the weighted average of the old South tables at

this level and the new low mortality average were used with a weight of 0.3 for the old South ratios and .7 for the new.[2]

The new male model life tables fit the lowest mortality schedules from the 1980s quite closely, although the fit is not as astonishingly good as for females in the same populations; also, the improvement over the West model is less (see Figure 6). In Japan, the new model fits substantially better than the old West model at virtually every age. In Switzerland, the fit is mostly better, although it is worse at ages 5 and 10. In West Germany, the fit is marginally better at ages 5 and 10 and essentially the same (namely, almost a perfect fit) at ages above 30 as in the West model. In the Netherlands, the West model is better from age 15 to about 50, although the fit of the new model is better at ages 1 through 10. In all of these populations, the new model gives a substantially better fit to infant mortality.

In summary, the new male mortality schedules seem to give a good average representation of mortality patterns consistent with the closer-fitting female mortality models, even though the new models do not represent as big a change as do the female models from the former model tables and the scatter of observed mortality rates around the models is larger for the males than for the females. This latter feature is consistent with the lower correlation coefficients for males than for females between individual mortality rates and expectation of life at age 10 that was characteristic of the old families of model tables.

Comments and Conclusions

The new model life tables presented in the Appendix are surely superior to the former model life tables at expectations of life of 77.5 and 80.0 years. The old tables incorporated too-high mortality at the higher ages and in infancy and they incorporated regional differences that appear to have vanished. A minor improvement incorporated in the new tables is a more realistic way of "closing out" the mortality schedules above age 80.

The convergence of age patterns of mortality at very high life expectancies in populations that used to conform to different families is in itself of demographic interest. A tendency toward convergence is perhaps to be expected. Some years ago, Jeremiah Sullivan (1973) found an intriguing basis for a salient feature of South model life tables, namely the much higher mortality at ages 1-5 than in the other families. Specifically, Sullivan found, in looking at data from Taiwan, that the comparison of mortality at ages 1-5 to mortality at 5-35 in Taiwan in the late 1950s showed higher mortality at the younger ages relative to the ensuing 30-year age interval than was found in any of the models, including the South model, which has the highest relative mortality from ages 1-5 among the four regional patterns. Then in the late 1960s, the relation of mortality at 1-5 to mortality at 5-35 in Taiwan fell to a position intermediate between the West and South tables. Sullivan found in data on mortality by cause of death a large reduction in mortality from diarrhea and enteritis, doubtless as a result of improvement in environmental sanitation. Mortality from these causes is concentrated among young children, and reduction in deaths from these causes would naturally diminish the excess mortality in this age interval. (The very high mortality at ages 0-1 also found in the South pattern could not be verified in Taiwan because registration of infant mortality was incomplete.) Sullivan found that the mortality pattern in Spain had moved from South to West in the 1950s in terms of the relation of mortality from 1-5 to mortality from 5-35.

The East pattern, characterized by especially high mortality in infancy (but not from 1 to 5), may be the result of the prevalence of early weaning or avoidance of breast-feeding altogether

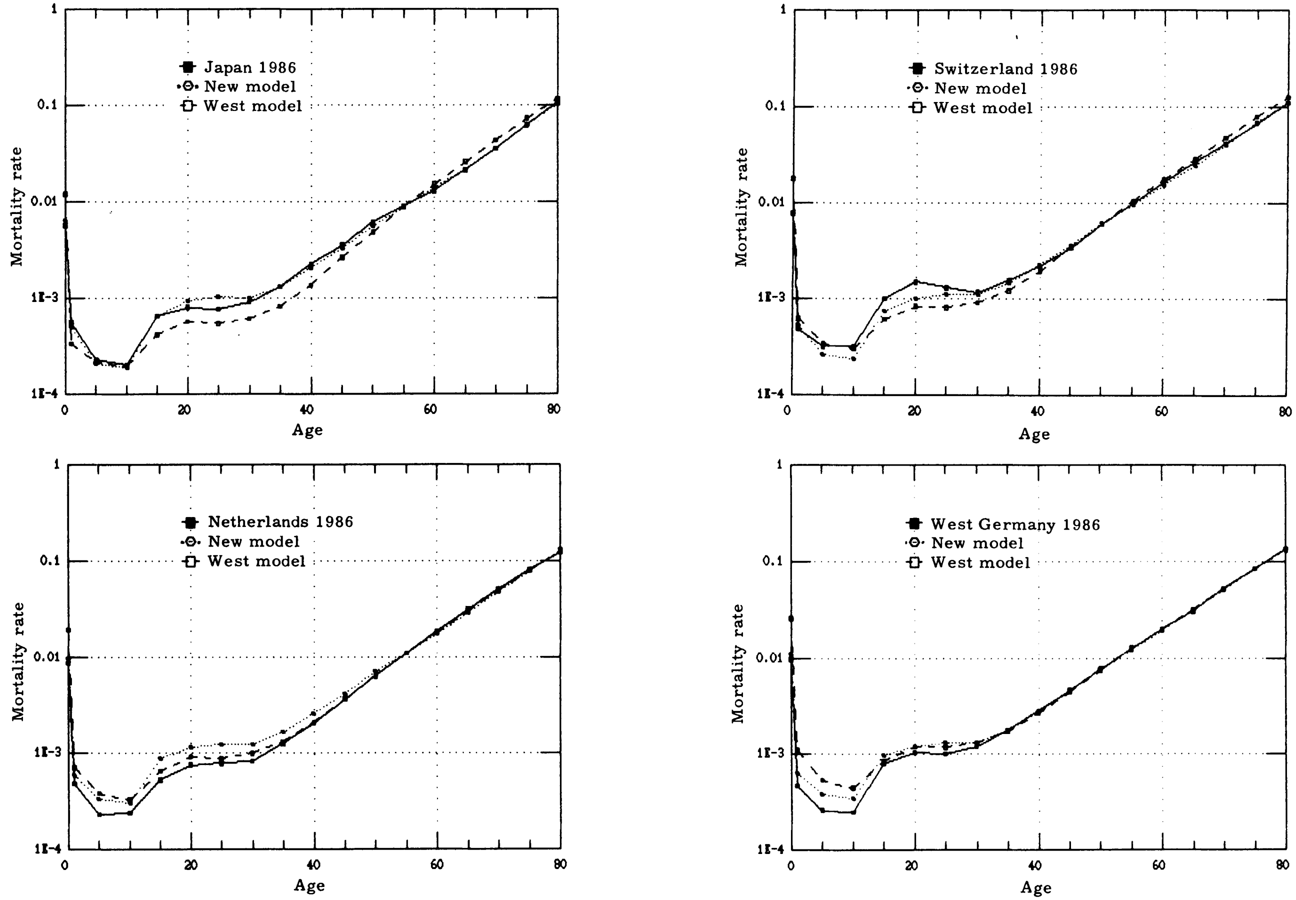

Figure 6. Male mortality rates in selected low-mortality populations, compared to new estimates (based on female model), and to original West model with the same l_{65}/l_{10}.

in the populations characterized by this pattern. As health conditions have improved, evidenced by the overall decline of mortality, these special factors are diminished or erased. Doubtless, mortality from diarrhea and enteritis is no longer excessive in Spain, Portugal, or South Italy; either the prevalence of breast-feeding has increased or high mortality associated with artificial feeding of infants has become unimportant in the areas formerly characterized by the East pattern.

Model life tables at these very low mortality levels have different uses from most applications of model life tables at higher mortality. The use of model tables to estimate accurate schedules of mortality when the basic data are incomplete or inaccurate is less relevant in this range of mortality levels. However, mortality rates at higher ages in the United States are, we believe, seriously understated, and the use of a model table with the recorded proportion surviving from 10 to 65 (for example) might be a suitable method of correcting a defective feature of U.S. mortality schedules. The most intriguing possible use of these tables is for population projection. As was noted earlier, the estimated mortality rates from 10 to 65 for females approach 0 as the input parameter of the proportion surviving from 10 to 65 approaches 1, as they should. This feature, which was not imposed but emerged from the data, does suggest that extrapolation may be rather robust. The age patterns of mortality projected at expectations of life for females of 82.5 and 85.0 years may not prove as unsuitable as the extrapolated rates in the earlier families of model life tables. Time will tell.

Notes

[1] The Eastern European countries that are part of the Warsaw Pact have exceptional mortality experience, so they cannot be included in the generalizations that are being developed here. One of the reasons for the general movement from conformity to East tables through conformity to West tables to conformity to North tables is the widespread large improvement that has occurred in mortality at higher ages. In the Eastern European population, mortality at higher ages has not improved markedly and in some cases has deteriorated. The North family of model tables is characterized by relatively low mortality at the higher ages for a given overall level of mortality, a feature that is the principal basis for the better fit of North model tables to the most recent mortality experience in countries with very low mortality. However, in East Germany and Czechoslovakia, the standard deviation of mortality rates when fitted to the North model life tables is hardly lower in 1985 than it was 20 years earlier. Thus, in the mortality schedule of 1962 for Czechoslovakia, the standard deviation from the North model fit is 4.23 years and in 1985 it was still 4.15. In East Germany in the same two years the fit goes from a standard deviation of 3.7 years to a standard deviation of 3.1. In Austria, in contrast, the standard deviation for the North fit in 1962 is 3.2 years and in 1986 it is 1.2. In North Italy from 1962 to 1983, the North standard deviation goes from 3.1 to .95 and in West Germany from 3.5 to .95. East Germany, Czechoslovakia, and Poland have moved from being best fitted by East schedules of mortality to a best fit with West, but have not moved to best conformity with North.

[2] When male mortality rates at each level are calculated by multiplying female mortality rates at that level by the estimated ratio of male to female mortality, there are anomalies that appear in the male mortality rates at young adult ages in the revised West and South model tables. The anomalous feature is mortality rates at a few ages that are slightly higher at model level 24 than at level 23 (West tables), or slightly higher at level 23 than at level 22 (South tables). In some populations with very low mortality, there have been increases in male mortality at these ages because of higher death rates from accidents, but it seems undesirable to incorporate death rates that increase as expectation of life at birth rises in model tables, given the relatively large variance in male mortality rates at low mortality levels. We have therefore introduced ad hoc adjustments in the age range between 15-19 and 35-39 at levels 23 and 24 in the West male tables, and at levels 22 and 23 in the South male tables, adjustments that are of the order of a change in age-specific mortality of 1 or 2 per 10,000.

The rates per 1,000 before adjustment are:

Age range	West males level 23	South males level 22	West males level 24	South males level 23
15-19	.83	.78	.90	.86
20-24	1.12	1.05	1.24	1.24
25-29	1.05	1.11		
30-34	1.18	1.54		
35-39	1.16	2.07		

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Appendix

NEW REGIONAL MODEL LIFE TABLES AT HIGH EXPECTATION OF LIFE

West tables are for males and females, e_0 for females of 70.0, 72.5, 75.0, 77.5, 80.0, 82.5, and 85.0 years. East tables are for males and females, e_0 for females of 70.0, 72.5, and 75.0 years. (At higher e_0, tables are the same as West.) South tables are for males and females, e_0 for females of 67.5, 70.0, 72.5, 75.0, and 77.5. (At higher e_0, tables are the same as West.)

West Tables
Level 21

FEMALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e_x^0
0	1000.000	32.19	31.38	974.90	70000	70.00
1	968.621	1.99	7.90	3847.71	69025	71.26
5	960.972	0.69	3.45	4795.74	65177	67.82
10	957.656	0.56	2.77	4781.91	60382	63.05
15	955.001	0.89	4.43	4764.86	55600	58.22
20	950.774	1.23	6.13	4739.88	50835	53.47
25	944.945	1.50	7.47	4707.79	46095	48.78
30	937.889	1.83	9.12	4668.91	41387	44.13
35	929.334	2.36	11.75	4620.46	36718	39.51
40	918.412	3.22	15.97	4556.87	32098	34.95
45	903.748	4.69	23.17	4468.49	27541	30.47
50	882.811	7.10	34.93	4340.06	23072	26.14
55	851.978	10.41	50.77	4156.08	18732	21.99
60	808.724	16.49	79.33	3889.65	14576	18.02
65	744.571	27.26	127.93	3494.25	10687	14.35
70	649.320	46.18	207.84	2922.70	7192	11.08
75	514.362	78.03	326.47	2152.00	4270	8.30
80	346.439	125.59	473.61	1306.40	2118	6.11
85	182.363	194.11	634.20	595.83	811	4.45
90	66.708	288.06	782.29	181.16	215	3.23
95	14.523	410.50	892.70	31.58	34	2.36
100	1.558	567.78	1000.00	2.74	3	1.76

MALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e_x^0
0	1000.000	43.03	41.60	966.72	66009	66.01
1	958.398	2.47	9.80	3800.72	65042	67.87
5	949.007	0.97	4.85	4732.37	61241	64.53
10	944.403	0.78	3.89	4713.20	56509	59.84
15	940.728	1.38	6.88	4688.11	51796	55.06
20	934.257	1.87	9.32	4650.40	47108	50.42
25	925.553	1.92	9.57	4606.51	42457	45.87
30	916.695	2.23	11.08	4559.10	37851	41.29
35	906.537	2.87	14.24	4501.71	33292	36.72
40	893.629	4.11	20.35	4424.51	28790	32.22
45	875.447	6.32	31.13	4311.83	24365	27.83
50	848.193	10.04	49.01	4141.20	20054	23.64
55	806.622	15.46	74.51	3888.87	15912	19.73
60	746.520	24.03	113.60	3529.06	12024	16.11
65	661.714	37.32	171.25	3036.60	8494	12.84
70	548.394	58.78	257.57	2402.97	5458	9.95
75	407.143	93.40	378.61	1650.35	3055	7.50
80	252.995	145.56	527.75	917.25	1405	5.55
85	119.477	218.33	682.12	373.28	487	4.08
90	37.980	315.16	817.46	98.51	114	3.00
95	6.933	437.86	913.62	14.47	15	2.23
100	0.599	590.53	1000.00	1.01	1	1.69

West Tables
Level 22

FEMALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e^0_x
0	1000.000	23.24	22.82	981.74	72500	72.50
1	977.181	1.18	4.69	3892.67	71518	73.19
5	972.595	0.45	2.23	4857.01	67625	69.53
10	970.427	0.36	1.82	4847.90	62768	64.68
15	968.664	0.59	2.96	4836.43	57920	59.79
20	965.794	0.83	4.16	4819.33	53084	54.96
25	961.775	1.04	5.16	4796.96	48265	50.18
30	956.809	1.29	6.45	4769.23	43468	45.43
35	950.636	1.73	8.64	4733.48	38698	40.71
40	942.427	2.48	12.33	4684.24	33965	36.04
45	930.802	3.82	18.92	4611.74	29281	31.46
50	913.191	5.81	28.67	4503.11	24669	27.01
55	887.008	8.92	43.68	4342.06	20166	22.73
60	848.267	14.34	69.29	4100.26	15824	18.65
65	789.488	24.40	115.24	3729.09	11724	14.85
70	698.509	42.22	191.66	3171.24	7995	11.45
75	564.633	72.87	308.19	2388.13	4823	8.54
80	390.620	120.77	459.74	1486.94	2435	6.23
85	211.037	190.75	626.71	693.35	948	4.49
90	78.777	287.10	779.84	213.98	255	3.24
95	17.344	411.76	891.84	37.57	41	2.36
100	1.876	568.62	1000.00	3.30	3	1.76

MALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e^0_x
0	1000.000	31.80	31.01	975.19	68565	68.57
1	968.991	1.55	6.18	3855.00	67590	69.75
5	963.002	0.69	3.45	4805.87	63735	66.18
10	959.678	0.57	2.84	4791.85	58929	61.41
15	956.953	1.06	5.27	4772.67	54137	56.57
20	951.912	1.47	7.35	4742.78	49365	51.86
25	944.920	1.48	7.39	4707.85	44622	47.22
30	937.941	1.68	8.35	4670.91	39914	42.55
35	930.111	2.16	10.77	4626.52	35243	37.89
40	920.097	3.21	15.91	4565.36	30617	33.28
45	905.460	5.18	25.59	4471.68	26051	28.77
50	882.286	8.36	40.98	4324.65	21580	24.46
55	846.128	13.62	65.96	4096.68	17255	20.39
60	790.313	21.56	102.50	3757.15	13158	16.65
65	709.307	34.23	158.15	3277.30	9401	13.25
70	597.128	54.80	242.13	2638.63	6124	10.26
75	452.542	88.09	360.97	1854.32	3485	7.70
80	289.186	141.18	516.04	1057.00	1631	5.64
85	139.954	216.08	677.16	438.58	574	4.10
90	45.183	315.83	816.76	116.85	135	2.99
95	8.279	440.85	913.43	17.15	18	2.22
100	0.717	592.49	1000.00	1.21	1	1.69

West Tables
Level 23

FEMALE

Age	l_x	${}_nm_x$	${}_nq_x$	${}_nL_x$	T_x	e_x^0
0	1000.000	15.52	15.33	987.74	75000	75.00
1	984.671	0.79	3.16	3927.81	74013	75.16
5	981.564	0.34	1.70	4903.24	70085	71.40
10	979.898	0.22	1.11	4896.87	65182	66.52
15	978.806	0.40	1.99	4889.36	60285	61.59
20	976.859	0.55	2.75	4877.85	55395	56.71
25	974.173	0.67	3.34	4863.05	50518	51.86
30	970.916	0.86	4.29	4844.58	45654	47.02
35	966.751	1.29	6.41	4818.88	40810	42.21
40	960.554	1.91	9.53	4780.81	35991	37.47
45	951.402	3.11	15.46	4721.72	31210	32.80
50	936.697	4.74	23.43	4630.80	26488	28.28
55	914.746	7.33	36.03	4494.63	21858	23.89
60	881.789	11.82	57.48	4287.30	17363	19.69
65	831.103	20.08	95.79	3964.45	13076	15.73
70	751.493	36.02	165.78	3458.47	9111	12.12
75	626.912	64.13	276.33	2701.47	5653	9.02
80	453.677	111.35	431.97	1759.94	2951	6.51
85	257.702	182.26	608.05	859.75	1191	4.62
90	101.006	281.18	770.36	276.72	332	3.28
95	23.195	408.90	887.29	50.33	55	2.37
100	2.614	566.27	1000.00	4.62	5	1.77

MALE

Age	l_x	${}_nm_x$	${}_nq_x$	${}_nL_x$	T_x	e_x^0
0	1000.000	22.05	21.67	982.66	70955	70.96
1	978.329	1.12	4.48	3897.97	69972	71.52
5	973.945	0.60	2.97	4861.77	66074	67.84
10	971.051	0.40	2.00	4850.59	61213	63.04
15	969.109	0.90	4.49	4835.10	56362	58.16
20	964.757	1.30	6.48	4808.78	51527	53.41
25	958.506	1.30	6.48	4777.62	46718	48.74
30	952.295	1.38	6.88	4745.76	41941	44.04
35	945.746	1.80	8.96	4708.39	37195	39.33
40	937.270	2.51	12.48	4658.27	32486	34.66
45	925.570	4.26	21.09	4581.01	27828	30.07
50	906.053	6.96	34.24	4455.80	23247	25.66
55	875.026	11.60	56.43	4256.63	18791	21.48
60	825.649	18.54	88.74	3952.40	14535	17.60
65	752.381	29.02	135.64	3516.98	10582	14.07
70	650.328	47.87	214.70	2916.55	7065	10.86
75	510.705	78.43	327.85	2134.94	4149	8.12
80	343.269	131.51	489.70	1278.25	2014	5.87
85	175.169	208.24	661.22	556.21	736	4.20
90	59.343	311.40	809.42	154.25	179	3.02
95	11.310	439.73	909.63	23.40	25	2.22
100	1.022	591.06	1000.00	1.73	2	1.69

West Tables
Level 24

FEMALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e_x^0
0	1000.000	9.53	9.46	992.44	77500	77.50
1	990.544	0.56	2.23	3954.46	76507	77.24
5	988.338	0.27	1.35	4938.01	72553	73.41
10	986.999	0.18	0.90	4932.88	67615	68.51
15	986.116	0.35	1.76	4926.42	62682	63.56
20	984.384	0.47	2.33	4916.42	57755	58.67
25	982.094	0.52	2.61	4904.31	52839	53.80
30	979.528	0.68	3.42	4889.61	47935	48.94
35	976.180	1.06	5.26	4868.57	43045	44.10
40	971.042	1.56	7.76	4837.13	38177	39.32
45	963.507	2.54	12.63	4788.33	33339	34.60
50	951.340	3.86	19.13	4713.01	28551	30.01
55	933.136	5.91	29.13	4600.44	23838	25.55
60	905.952	9.45	46.21	4429.28	19238	21.23
65	864.085	15.83	76.28	4162.24	14808	17.14
70	798.176	28.48	133.30	3735.54	10646	13.34
75	691.783	51.93	229.80	3061.49	6911	9.99
80	532.814	93.14	375.41	2147.52	3849	7.22
85	332.789	157.47	551.80	1166.10	1702	5.11
90	149.157	250.94	726.42	431.78	536	3.59
95	40.806	376.90	861.60	93.28	104	2.54
100	5.648	540.84	1000.00	10.44	10	1.85

MALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e_x^0
0	1000.000	13.21	13.07	989.54	72152	72.15
1	986.928	0.78	3.13	3936.90	71162	72.10
5	983.838	0.48	2.42	4912.64	67225	68.33
10	981.457	0.34	1.70	4903.28	62313	63.49
15	979.788	0.82	4.09	4889.32	57409	58.59
20	975.779	1.10	5.49	4866.05	52520	53.82
25	970.426	1.20	5.98	4838.20	47654	49.11
30	964.620	1.21	6.04	4809.12	42816	44.39
35	958.794	1.68	8.38	4774.69	38007	39.64
40	950.761	2.48	12.34	4725.64	33232	34.95
45	939.025	4.17	20.62	4648.65	28506	30.36
50	919.661	6.86	33.74	4523.84	23858	25.94
55	888.634	11.18	54.44	4327.07	19334	21.76
60	840.257	17.89	85.78	4028.29	15007	17.86
65	768.178	28.53	133.53	3594.72	10979	14.29
70	665.606	46.75	210.18	2992.28	7384	11.09
75	525.712	76.73	321.90	2205.50	4392	8.35
80	356.488	124.62	470.81	1346.77	2186	6.13
85	188.650	193.85	633.49	616.49	839	4.45
90	69.143	288.79	782.86	187.43	223	3.22
95	15.014	412.02	893.23	32.55	35	2.36
100	1.603	568.95	1000.00	2.82	3	1.76

East Tables
Level 21

FEMALE

Age	l_x	${}_nm_x$	${}_nq_x$	${}_nL_x$	T_x	e_x^0
0	1000.000	40.46	39.20	968.64	70000	70.00
1	960.805	1.98	7.88	3816.73	69032	71.85
5	953.235	0.59	2.94	4758.48	65215	68.41
10	950.435	0.46	2.30	4746.92	60456	63.61
15	948.245	0.72	3.61	4733.00	55709	58.75
20	944.817	1.02	5.07	4712.60	50976	53.95
25	940.030	1.21	6.02	4686.56	46264	49.22
30	934.369	1.49	7.42	4655.21	41577	44.50
35	927.437	1.98	9.83	4615.30	36922	39.81
40	918.319	2.69	13.38	4562.11	32307	35.18
45	906.033	4.07	20.15	4486.34	27745	30.62
50	887.774	6.04	29.75	4375.49	23258	26.20
55	861.366	9.19	44.94	4213.93	18883	21.92
60	822.656	15.17	73.21	3968.75	14669	17.83
65	762.433	26.39	124.08	3585.11	10700	14.03
70	667.827	47.27	212.27	2998.92	7115	10.65
75	526.069	82.81	343.02	2179.22	4116	7.82
80	345.618	140.07	512.61	1264.88	1937	5.60
85	168.449	222.24	686.96	520.68	672	3.99
90	52.731	330.77	830.68	132.43	151	2.87
95	8.929	461.78	921.92	17.83	19	2.12
100	0.697	608.61	1000.00	1.15	1	1.64

MALE

Age	l_x	${}_nm_x$	${}_nq_x$	${}_nL_x$	T_x	e_x^0
0	1000.000	51.27	49.25	960.60	65415	65.42
1	950.752	2.29	9.07	3772.81	64455	67.79
5	942.125	0.81	4.02	4700.20	60682	64.41
10	938.335	0.70	3.51	4683.76	55982	59.66
15	935.038	1.35	6.72	4660.11	51298	54.86
20	928.754	1.94	9.66	4622.24	46638	50.22
25	919.785	1.97	9.81	4577.27	42016	45.68
30	910.761	2.17	10.78	4530.25	37438	41.11
35	900.946	2.71	13.47	4475.60	32908	36.53
40	888.807	3.86	19.13	4403.22	28433	31.99
45	871.803	6.21	30.60	4294.99	24029	27.56
50	845.127	10.10	49.32	4125.60	19734	23.35
55	803.445	15.95	76.80	3869.14	15609	19.43
60	741.743	24.43	115.39	3503.30	11740	15.83
65	656.155	37.87	173.56	3007.45	8236	12.55
70	542.270	60.93	265.79	2365.44	5229	9.64
75	398.141	98.21	394.24	1598.30	2863	7.19
80	241.178	161.22	566.33	847.21	1265	5.25
85	104.592	222.24	689.88	324.67	418	4.00
90	32.436	330.77	834.95	81.88	93	2.88
95	5.353	461.78	927.18	10.75	11	2.13
100	0.390	608.61	1000.00	0.64	1	1.64

East Tables
Level 22

FEMALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e_x^0
0	1000.000	26.85	26.29	978.97	72500	72.50
1	973.712	1.36	5.40	3876.45	71521	73.45
5	968.456	0.42	2.11	4836.67	67645	69.85
10	966.415	0.34	1.71	4828.11	62808	64.99
15	964.763	0.54	2.70	4817.57	57980	60.10
20	962.161	0.77	3.84	4801.94	53163	55.25
25	958.468	0.92	4.60	4781.75	48361	50.46
30	954.058	1.17	5.82	4756.97	43579	45.68
35	948.508	1.60	7.96	4724.43	38822	40.93
40	940.962	2.26	11.22	4679.47	34098	36.24
45	930.402	3.58	17.73	4612.43	29418	31.62
50	913.910	5.33	26.30	4511.86	24806	27.14
55	889.872	8.16	40.01	4363.91	20294	22.81
60	854.267	13.61	65.90	4136.22	15930	18.65
65	797.969	23.50	111.22	3776.85	11794	14.78
70	709.223	42.09	191.14	3220.77	8017	11.30
75	573.664	73.94	312.03	2420.81	4796	8.36
80	394.662	126.01	474.37	1485.78	2375	6.02
85	207.446	202.18	649.13	666.04	889	4.29
90	72.786	305.45	801.68	191.04	223	3.07
95	14.435	434.50	905.37	30.08	32	2.24
100	1.366	586.77	1000.00	2.33	2	1.70

MALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e_x^0
0	1000.000	34.37	33.45	973.24	67789	67.79
1	966.548	1.60	6.37	3844.63	66815	69.13
5	960.387	0.62	3.08	4793.79	62971	65.57
10	957.425	0.58	2.91	4780.43	58177	60.76
15	954.636	1.14	5.68	4760.17	53396	55.93
20	949.214	1.64	8.17	4727.46	48636	51.24
25	941.458	1.67	8.34	4688.45	43909	46.64
30	933.606	1.84	9.18	4647.47	39220	42.01
35	925.040	2.31	11.49	4599.69	34573	37.37
40	914.409	3.34	16.58	4535.66	29973	32.78
45	899.250	5.49	27.10	4437.76	25438	28.29
50	874.878	9.31	45.55	4278.76	21000	24.00
55	835.031	15.07	72.72	4029.42	16721	20.02
60	774.309	23.32	110.40	3666.38	12692	16.39
65	688.825	35.43	163.28	3174.18	9025	13.10
70	576.350	56.19	247.56	2539.32	5851	10.15
75	433.669	89.77	366.57	1770.92	3312	7.64
80	274.699	147.93	533.26	990.24	1541	5.61
85	128.213	202.18	651.81	413.35	551	4.29
90	44.642	305.45	805.77	117.77	137	3.07
95	8.671	434.50	910.59	18.17	19	2.25
100	0.775	586.77	1000.00	1.32	1	1.70

East Tables
Level 23

FEMALE

Age	l_x	${}_nm_x$	${}_nq_x$	${}_nL_x$	T_x	e_x^0
0	1000.000	15.48	15.29	987.77	75000	75.00
1	984.707	0.94	3.73	3925.98	74012	75.16
5	981.035	0.34	1.69	4900.62	70086	71.44
10	979.380	0.25	1.27	4893.92	65185	66.56
15	978.139	0.41	2.02	4885.94	60291	61.64
20	976.159	0.59	2.93	4873.93	55405	56.76
25	973.297	0.70	3.49	4858.33	50532	51.92
30	969.900	0.90	4.50	4839.03	45673	47.09
35	965.538	1.28	6.38	4812.91	40834	42.29
40	959.382	1.90	9.48	4775.09	36021	37.55
45	950.290	3.10	15.37	4716.39	31246	32.88
50	935.680	4.62	22.86	4627.06	26530	28.35
55	914.286	7.13	35.05	4494.53	21903	23.96
60	882.243	11.75	57.15	4290.19	17408	19.73
65	831.819	19.96	95.22	3968.99	13118	15.77
70	752.609	35.80	164.85	3465.29	9149	12.16
75	628.545	63.77	275.01	2710.59	5684	9.04
80	455.690	110.82	430.38	1769.69	2973	6.52
85	259.569	181.54	606.50	867.20	1203	4.64
90	102.142	280.30	769.16	280.28	336	3.29
95	23.579	407.97	886.59	51.24	56	2.37
100	2.674	565.52	1000.00	4.73	5	1.77

MALE

Age	l_x	${}_nm_x$	${}_nq_x$	${}_nL_x$	T_x	e_x^0
0	1000.000	20.05	19.73	984.21	70069	70.07
1	980.267	1.14	4.55	3905.47	69085	70.48
5	975.810	0.54	2.68	4871.86	65180	66.80
10	973.194	0.50	2.47	4860.20	60308	61.97
15	970.788	1.00	4.97	4842.36	55448	57.12
20	965.962	1.43	7.15	4813.24	50605	52.39
25	959.057	1.45	7.22	4778.68	45792	47.75
30	952.137	1.58	7.86	4742.73	41013	43.08
35	944.655	1.97	9.82	4701.01	36271	38.40
40	935.377	2.93	14.57	4644.18	31570	33.75
45	921.751	4.99	24.64	4554.24	26925	29.21
50	899.038	8.53	41.78	4405.05	22371	24.88
55	861.480	14.20	68.67	4165.42	17966	20.85
60	802.323	21.73	103.27	3812.75	13801	17.20
65	719.465	31.97	148.47	3340.97	9988	13.88
70	612.649	49.91	222.85	2735.58	6647	10.85
75	476.122	79.65	332.11	1985.29	3911	8.22
80	317.995	133.32	494.65	1179.85	1926	6.06
85	160.699	181.54	608.84	538.96	746	4.64
90	62.859	280.30	772.93	173.33	207	3.30
95	14.273	407.97	891.61	31.19	34	2.38
100	1.547	565.52	1000.00	2.74	3	1.77

South Tables
Level 20

FEMALE

Age	l_x	${}_nm_x$	${}_nq_x$	${}_nL_x$	T_x	e^0_x
0	1000.000	65.80	62.51	950.00	67500	67.50
1	937.494	5.36	21.05	3680.92	66550	70.99
5	917.763	0.86	4.28	4578.02	62869	68.50
10	913.838	0.59	2.96	4562.71	58291	63.79
15	911.136	0.87	4.35	4546.18	53728	58.97
20	907.176	1.21	6.05	4522.72	49182	54.21
25	901.691	1.42	7.06	4493.19	44660	49.53
30	895.330	1.68	8.34	4458.72	40166	44.86
35	887.861	2.08	10.36	4417.24	35708	40.22
40	878.667	2.80	13.91	4363.99	31290	35.61
45	866.441	3.84	19.00	4292.69	26926	31.08
50	849.976	5.74	28.32	4192.11	22634	26.63
55	825.907	8.46	41.47	4047.34	18442	22.33
60	791.660	13.96	67.55	3829.96	14394	18.18
65	738.185	24.00	113.45	3489.93	10564	14.31
70	654.437	43.95	198.79	2959.96	7074	10.81
75	524.341	79.70	332.28	2186.13	4114	7.85
80	350.112	141.49	515.94	1276.64	1928	5.51
85	169.476	231.64	702.16	513.72	652	3.84
90	50.477	349.70	847.51	122.33	138	2.73
95	7.697	486.80	931.37	14.73	16	2.02
100	0.528	627.88	1000.00	0.84	1	1.59

MALE

Age	l_x	${}_nm_x$	${}_nq_x$	${}_nL_x$	T_x	e^0_x
0	1000.000	74.06	69.91	944.07	63695	63.69
1	930.086	5.51	21.64	3649.90	62751	67.47
5	909.960	1.03	5.15	4536.92	59101	64.95
10	905.275	0.78	3.91	4517.88	54564	60.27
15	901.737	1.16	5.79	4496.15	50046	55.50
20	896.514	1.65	8.21	4464.90	45550	50.81
25	889.151	1.75	8.73	4427.13	41085	46.21
30	881.390	2.25	11.20	4383.25	36658	41.59
35	871.515	2.78	13.82	4328.67	32275	37.03
40	859.472	4.04	19.99	4256.12	27946	32.52
45	842.288	6.04	29.75	4151.30	23690	28.13
50	817.229	9.32	45.60	3996.72	19538	23.91
55	779.967	14.31	69.19	3770.32	15542	19.93
60	726.003	21.78	103.49	3449.69	11771	16.21
65	650.867	33.79	156.28	3010.21	8322	12.79
70	549.147	56.51	248.81	2417.82	5311	9.67
75	412.514	97.49	391.93	1658.38	2894	7.01
80	250.838	167.16	579.94	870.24	1235	4.92
85	105.367	264.85	756.38	300.91	365	3.46
90	25.669	387.76	883.48	58.48	64	2.50
95	2.991	524.58	950.49	5.42	6	1.89
100	0.148	658.05	1000.00	0.23	0	1.52

South Tables
Level 21

FEMALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e_x^0
0	1000.000	50.83	48.85	960.92	70000	70.00
1	951.154	3.67	14.50	3756.34	69039	72.58
5	937.360	0.63	3.16	4678.66	65283	69.65
10	934.401	0.44	2.20	4667.06	60604	64.86
15	932.342	0.67	3.32	4654.28	55937	60.00
20	929.246	0.93	4.66	4635.83	51283	55.19
25	924.913	1.09	5.44	4612.49	46647	50.43
30	919.881	1.33	6.62	4584.79	42034	45.70
35	913.792	1.73	8.61	4550.08	37450	40.98
40	905.924	2.41	11.98	4503.57	32899	36.32
45	895.069	3.46	17.15	4438.50	28396	31.72
50	879.719	5.24	25.86	4344.00	23957	27.23
55	856.971	7.82	38.39	4205.89	19613	22.89
60	824.069	12.87	62.40	3996.93	15407	18.70
65	772.645	22.19	105.35	3667.87	11411	14.77
70	691.246	40.78	185.72	3148.13	7743	11.20
75	562.871	74.27	313.19	2373.64	4595	8.16
80	386.584	132.79	492.72	1434.43	2221	5.75
85	196.106	219.24	680.16	608.40	787	4.01
90	62.723	334.24	831.70	156.07	178	2.84
95	10.556	470.54	922.89	20.70	22	2.09
100	0.814	615.08	1000.00	1.32	1	1.63

MALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e_x^0
0	1000.000	57.29	54.78	956.18	66053	66.05
1	945.222	3.79	14.97	3731.35	65097	68.87
5	931.068	0.80	3.97	4645.17	61366	65.91
10	927.369	0.63	3.14	4629.85	56721	61.16
15	924.454	0.95	4.71	4611.81	52091	56.35
20	920.095	1.32	6.56	4585.99	47479	51.60
25	914.060	1.40	6.96	4555.03	42893	46.93
30	907.699	1.86	9.24	4518.37	38338	42.24
35	899.316	2.40	11.94	4470.81	33820	37.61
40	888.578	3.56	17.64	4405.28	29349	33.03
45	872.905	5.59	27.57	4306.76	24943	28.58
50	848.837	8.76	42.88	4156.83	20637	24.31
55	812.440	13.77	66.64	3932.26	16480	20.28
60	758.300	20.91	99.54	3610.35	12548	16.55
65	682.819	32.31	149.93	3168.39	8937	13.09
70	580.441	53.79	238.19	2570.40	5769	9.94
75	442.188	92.69	376.25	1795.00	3198	7.23
80	275.814	159.61	561.86	970.90	1403	5.09
85	120.845	254.29	740.12	351.72	433	3.58
90	31.405	374.82	872.26	73.08	81	2.57
95	4.012	511.13	944.58	7.41	8	1.93
100	0.222	647.39	1000.00	0.34	0	1.54

South Tables
Level 22

FEMALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e_x^0
0	1000.000	36.70	35.65	971.48	72500	72.50
1	964.346	2.38	9.43	3825.54	71528	74.17
5	955.249	0.46	2.32	4770.15	67703	70.87
10	953.032	0.33	1.62	4761.44	62933	66.03
15	951.484	0.51	2.56	4751.57	58171	61.14
20	949.047	0.72	3.60	4737.04	53420	56.29
25	945.632	0.84	4.18	4718.66	48683	51.48
30	941.675	1.05	5.23	4696.55	43964	46.69
35	936.749	1.43	7.14	4667.69	39267	41.92
40	930.057	2.06	10.24	4627.43	34600	37.20
45	920.535	3.08	15.30	4568.88	29972	32.56
50	906.453	4.70	23.26	4481.66	25403	28.03
55	885.370	7.10	34.89	4352.70	20922	23.63
60	854.476	11.62	56.50	4156.51	16569	19.39
65	806.198	20.02	95.50	3846.22	12412	15.40
70	729.209	36.82	169.14	3350.03	8566	11.75
75	605.868	67.42	288.46	2592.42	5216	8.61
80	431.098	121.55	461.44	1636.64	2624	6.09
85	232.171	202.86	649.32	743.13	987	4.25
90	81.418	313.42	808.72	210.08	244	3.00
95	15.573	448.27	910.33	31.63	34	2.18
100	1.396	597.57	1000.00	2.34	2	1.67

MALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e_x^0
0	1000.000	41.44	40.11	967.91	68238	68.24
1	959.894	2.47	9.79	3806.69	67270	70.08
5	950.498	0.61	3.06	4744.50	63464	66.77
10	947.592	0.50	2.52	4732.23	58719	61.97
15	945.207	0.92	4.59	4715.62	53987	57.12
20	940.868	1.20	5.98	4690.83	49271	52.37
25	935.239	1.35	6.73	4661.10	44580	47.67
30	928.947	1.64	8.17	4626.52	39919	42.97
35	921.359	2.17	10.79	4582.93	35293	38.31
40	911.415	3.12	15.50	4523.16	30710	33.69
45	897.285	5.12	25.30	4431.94	26187	29.18
50	874.582	8.15	39.96	4289.04	21755	24.87
55	839.636	13.07	63.38	4070.46	17466	20.80
60	786.420	19.78	94.42	3753.89	13395	17.03
65	712.166	30.31	141.25	3319.40	9641	13.54
70	611.570	50.04	223.36	2730.02	6322	10.34
75	474.972	86.09	354.21	1954.26	3592	7.56
80	306.730	149.02	535.53	1102.32	1638	5.34
85	142.467	239.18	715.60	426.25	535	3.76
90	40.518	355.98	854.86	97.30	109	2.69
95	5.881	491.29	935.30	11.20	12	2.01
100	0.380	631.69	1000.00	0.60	1	1.58

South Tables
Level 23

FEMALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e_x^0
0	1000.000	24.11	23.65	981.08	75000	75.00
1	976.348	1.42	5.67	3886.02	74019	75.81
5	970.812	0.34	1.72	4849.46	70133	72.24
10	969.140	0.24	1.20	4842.92	65283	67.36
15	967.981	0.41	2.04	4835.17	60440	62.44
20	966.009	0.56	2.82	4823.51	55605	57.56
25	963.288	0.65	3.25	4808.93	50782	52.72
30	960.157	0.83	4.15	4791.22	45973	47.88
35	956.173	1.19	5.94	4767.24	41182	43.07
40	950.495	1.74	8.68	4732.68	36414	38.31
45	942.246	2.71	13.47	4680.77	31682	33.62
50	929.554	4.15	20.56	4601.91	27001	29.05
55	910.445	6.30	31.03	4484.42	22399	24.60
60	882.191	10.23	49.94	4305.22	17915	20.31
65	838.136	17.51	84.03	4021.66	13609	16.24
70	767.710	32.15	149.22	3563.61	9588	12.49
75	653.151	59.26	258.08	2844.33	6024	9.22
80	484.583	107.92	421.46	1892.46	3180	6.56
85	280.349	182.63	608.10	933.49	1287	4.59
90	109.870	287.19	776.66	297.12	354	3.22
95	24.539	419.69	892.29	52.17	57	2.31
100	2.643	575.05	1000.00	4.60	5	1.74

MALE

Age	l_x	$_nm_x$	$_nq_x$	$_nL_x$	T_x	e_x^0
0	1000.000	24.10	23.64	981.09	70334	70.33
1	976.357	1.32	5.24	3887.52	69353	71.03
5	971.240	0.45	2.26	4850.17	65466	67.40
10	969.049	0.36	1.80	4841.06	60615	62.55
15	967.307	0.90	4.49	4826.11	55774	57.66
20	962.964	1.18	5.88	4801.22	50948	52.91
25	957.298	1.18	5.87	4772.99	46147	48.21
30	951.674	1.37	6.85	4742.72	41374	43.47
35	945.153	1.87	9.31	4704.66	36631	38.76
40	936.358	2.80	13.90	4650.55	31927	34.10
45	923.341	4.66	23.03	4565.67	27276	29.54
50	902.075	7.59	37.26	4429.71	22710	25.18
55	868.464	12.20	59.25	4218.82	18281	21.05
60	817.005	19.06	91.13	3906.34	14062	17.21
65	742.554	30.43	141.81	3460.04	10156	13.68
70	637.250	50.25	224.21	2843.34	6696	10.51
75	494.370	84.70	349.50	2039.89	3852	7.79
80	321.587	139.98	512.58	1177.62	1812	5.64
85	156.749	218.72	681.19	488.18	635	4.05
90	49.973	323.15	823.53	127.35	146	2.93
95	8.819	451.43	917.66	17.93	19	2.17
100	0.726	600.60	1000.00	1.21	1	1.66

South Tables
Level 24

FEMALE

Age	l_x	${}_nm_x$	${}_nq_x$	${}_nL_x$	T_x	e_x^0
0	1000.000	13.64	13.49	989.21	77500	77.50
1	986.512	0.77	3.06	3935.47	76511	77.56
5	983.491	0.26	1.30	4913.93	72575	73.79
10	982.211	0.21	1.07	4908.52	67661	68.89
15	981.156	0.38	1.89	4901.34	62753	63.96
20	979.305	0.43	2.16	4891.44	57852	59.07
25	977.185	0.53	2.64	4879.74	52960	54.20
30	974.609	0.67	3.34	4865.23	48080	49.33
35	971.352	0.97	4.81	4845.53	43215	44.49
40	966.675	1.49	7.41	4816.17	38370	39.69
45	959.508	2.32	11.53	4770.98	33553	34.97
50	948.440	3.61	17.88	4701.51	28782	30.35
55	931.484	5.46	26.96	4597.14	24081	25.85
60	906.367	8.79	43.03	4438.23	19484	21.50
65	867.364	14.77	71.32	4188.36	15046	17.35
70	805.506	26.91	126.39	3783.20	10857	13.48
75	703.701	50.09	222.59	3126.91	7074	10.05
80	547.064	92.28	372.57	2208.58	3947	7.22
85	343.246	158.90	554.87	1198.64	1738	5.06
90	152.788	255.69	732.91	437.94	540	3.53
95	40.808	384.55	866.65	91.97	102	2.50
100	5.442	547.26	1000.00	9.94	10	1.83

MALE

Age	l_x	${}_nm_x$	${}_nq_x$	${}_nL_x$	T_x	e_x^0
0	1000.000	16.84	16.62	986.70	71528	71.53
1	983.380	0.91	3.63	3921.02	70542	71.73
5	979.810	0.39	1.96	4893.76	66621	67.99
10	977.888	0.37	1.85	4885.09	61727	63.12
15	976.076	0.88	4.40	4870.08	56842	58.24
20	971.785	1.08	5.40	4846.32	51972	53.48
25	966.535	1.18	5.87	4819.05	47125	48.76
30	960.860	1.29	6.42	4789.48	42306	44.03
35	954.687	1.71	8.50	4753.96	37517	39.30
40	946.571	2.66	13.20	4702.88	32763	34.61
45	934.081	4.32	21.39	4622.45	28060	30.04
50	914.101	7.20	35.40	4492.84	23438	25.64
55	881.742	11.53	56.10	4289.99	18945	21.49
60	832.276	18.17	87.06	3987.47	14655	17.61
65	759.815	29.12	136.10	3550.88	10667	14.04
70	656.401	47.86	214.64	2943.87	7116	10.84
75	515.511	80.42	334.79	2146.08	4173	8.09
80	342.923	131.28	489.30	1278.07	2026	5.91
85	175.132	204.27	654.17	560.87	748	4.27
90	60.566	302.91	800.48	160.05	188	3.10
95	12.084	428.12	903.97	25.52	28	2.28
100	1.160	581.96	1000.00	1.99	2	1.72