# CURRENT POPULATION REPORTS <br> POPULATION ESTIMATES 

# Illustrative projections of the population OF THE UNITED STATES, BY AGE AND SEX 1960 TO 1980 

Prepared by Meyer Zitter and Jacob S. Siegel


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# ILLUSTRATIVE PROJECTIONS OF THE POPULATION OF THE UNITED STATES, BY AGE AND SEX: 1960 TO 1980 

(The projections in this report supersede those previously published in Current Population Reports,
Series $\mathrm{P}-25$, No. 123 )

## INTRODUCTION

This report presents four series of profections of the population of the United States, by age and sex, for 1960 to 1980. The figures are not offered as predictions of the tuture size of the population but indicate sather the approximate future level and age-sex composition of our population under given alternative assumptions as to future fertility, mortality, and net immigration. As such, they should prove userul to persons requiring some indication of the size of our population for leter years. It should be emphasized, however, that the long-run projections of total population are subject to considerable error and that, even in the short-run, the projected population for some age groups may differ substentially from the actual population.

The varying sets of assumptions concernIng fertility are only some of many which might have been included in preparing these projections. These assumptions were not chosen to demarcate a reasonable range within which fertility is almost certain to remain. In hew of the experience of the last 20 years, the fertility assumptions ohosen are higher as a set than any set previously used in the Bum reauts projections but there is considerable overlap with the levels of earlier assumptions. In particular, the gross reproduction rate used for series $I$ is at a level higher than thet reported in the years since World War II and, in fact, has not been attained in this country since the beginning of the twentieth century. On the other hand, the ultimete gross reproduction rate assumed for series IV is not as Low as the level reached during the depression of the 1930's. Different assumptions concerning the future levels of mortality and net lmmigration from abroad would also affect the future size of the total population but to a considerably lesser degree than the variations In future fertility. For the older age groups, however, the level of mortality is an important determinant of future population size.

As already noted, by far the most important area of uncertainty in projections of fum ture population is that relating to fertility. Therefore, the tables in this report distin" guish projections of the population already born by July 1, 1957, from projections of the population yet to be born during the pexiod under consideration. The projections are based on the assumption that there will be no disastrous war, epidemic, or other catastrophe. It is further assumed that there will be no mejor economic depression; in fact, the projections are designed to be consistent with high employment and high economic activity. It must be admitted, however, that only very general impressions are now available as to just how the components of population change respond to changes in economic conditions.

The present set of projections is conm sistent with current estimates of the popum lation for July 1, 1957. All the series employ assumptions which are tied in initially with the recent level of fertility (1955m57 average), the recent level of mortality (1955), and the current estimated population by age and sex (July 1, 1957). As compared with prem viously published projections (Series P-25, No. 123), this revision involves not only a shift in the benchmark date from July 1,1955 , to July 1,1957 , but also some changes in prom jected levels of fertility, mortality, and net immigration from abroad: Because of these changes, none of the series shown here agrees exactly with any of the earlier projections, although some of the fertility assumptions parallel, at a somewhat higher level, thoge used in the earlier report.

The four series of projections given here differ among themselves only in the projections of persons born after January 1, 1958. All four series include the same set of prom jections of the number of persons born berore January 1, 1958. Since the possible range of variation in the number of deaths and migrants for this group is small compared to the
possible range of future fertility, it was considered unnecessary to make alternative allowances for these components. The four series of projections of the total population and the earlier projections published in Sem ries $P-25$, No. 123 , are given in table A.

The fertility assumptions of Series it (designated as "very high" fertility) repre: sent a gross reproduction rate that has not been attained since the beginning of this cen tury. This level is not expeoted to be sus. tained over any length of time.

Table A...-COMPARLSON BETWEEN REVISED AND EARLIER SERIES OF POPULATTON PROJECTIONS: 1960 TO 1980 (In míllions)

| Year (July 1) | Revised projections of total population |  |  |  | Projections of total population in Series P-25, No. 123 |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Series I | Serjes $I$ | Series III | Series IV | Series AA | Series | Series | Serter 0 |
| 1960. | 181.2 | 180.1 | 179.8 | 179.4 | 179.4 | 177.8 | 1777 | 176.5 |
| 1965. | 199.0 | 195.7 | 193.6 | 191.5 | 193.3 | 190.3 | 190.3 | 186,3 |
| 1970. | 219.5 | 213.8 | 208.2 | 202.5 | 209.4 | 204.6 | 203.0 | 196.4 |
| 1975. | 243.9 | 235.2 | 225.6 | 215.8 | 228.5 | 221.5 | 214.6 | 206.9 |
| 1980................. | 272.6 | 260.0 | 245.4 | 230.8 | -** | ** | ... |  |

Comparison of earlier projections with curm rent estimates.-By July 1, 1958, the estimated population of the United States (174,064,000) had exceeded, by about 400,000 , the figure for this date implied by the highest series of projections (173,682,000-mSeries AA) jnoluded in the previous set of published projeotions, mainly as a result of the difference between the projected and actual number of births for the period July 1, 1955, to July $1,1958$. Differences between the current estimates and the other projections, Series $A$ and $B$, and

Series C, wexe somewhat larger. A omparison of the difference between the estimated current population and the projections for Julyl, 1958, and some approximations to the contribution of each of the components of change to the ecoumulated difference for the pertod July 1,1955 , to July 1,1958 , are given, in table B.
${ }^{1}$ See section on "Description of methodology" for a fuller discussion of the fertility assumptions and the Interpretation of the gross reproduction rate.

Table B.-mCOMPARISON OF PROJECTED AND ESTIMATED POPULATION FOR JULY 1, 1958, AND OF COMPONENTS OF CHANGE, JULY 1, 1955, TO JUNE 30, 1958
(In thousands)

| Component of change | Actual | Projected series (Series P-25, No. 123) |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | $A$ | $A$ and $B$ | 0 |
| Population, July 1, 1955....................... | 165,270 | 165,248 | 165,248 | 165,248 |
| Change, July 1955 to June 1958: .., |  |  |  |  |
| Births......................8.0.4........... | 12,715 | 12,352 | 11,426 | 10,704 |
| Deaths..................................... | 4,824 | 4,740 | 4,722 | 4,707 |
| Net immigration | 903 | 822 | 822 | 822 |
| Total change | 8,794 | 8,434 | 7,526 | 6,819 |
| Population, July 1, 1958............................ Excess of current estimate: | 174,064 | 173,682 | 172,774 | 172,067 |
| Number. . . . . . . . . ............................. | $\cdots$ | 382 | 1,290 | 1,997 |
| Part due to revision of base ${ }^{\text {d }}$........... | ... | 22 | 22 | - 22 |
| Part due to higher actual change........ | ... | 360 | 1,268 | 1,975 |
| Percent of actual population.............. | ** | 0.22 | 0.74 | 1.15 |

[^0]In the perspective of long-term projecWons, these differences are, of course, reladively minor and well within the margin of error characteristic of population projections ta general. The direction of the differences could easily be reversed in several more years. Tor short-mun projections, however, such as Soose up to 1960 and 1965, the fact that the highest projection is below the actual aurrent estimate creates certain difficulties in the use of the previous short-run projections in sombination with the most recent current estimites. The use of existing projections without any adjustment gives an unreasonable picture of prospective population changes.

By age, the differences between the current estimated and projected populations were elso relatively minor. Relatively larger erpors occur in the projections of children under 5 years of age, reflecting, of course, the sifference between the actual and projected numbers of births.

## INDICATED CHANGES

Primarily because of the uncertainty as to the future course of fertility, projections of the cohorts representing survivors of future births are, as indicated earlier, subject to a wide margin of error. The indicated changes in these groups are direct consequences of the various underlying assumptions. The projections of the total population for early years are affected only very little by this uncertainty, but the range of reasonable possibility widens as one looks ahead farther into the future. For a substantial portion of the populetion, including certain important funcFional segments (e.g., the college-age population, the population in the main working ages, and the aged population), the future size can be projected for at least two deaedes with a high degree of accuracy. The paragraphs below touch upon some of the indicated changes for these age groups.

Projected changes in the age-sex structure of our population are depicted in the population pyramid on the cover. The composition of our population is shown for 1957 and 1980 . For the portion of the population dependent upon future births, Series II and Series IV projec\#ons are shown for illustrative purposes.
and high school age.--The number of children
of elementary school age, i.e., 5 to 13 years of age, will continue to grow during the next several years, as children born between 1953 and 1957 enter this group and replace those born between 1945 and 1949. By 1962, when children born in 1957 reach age 5 , the group will number about $34 \frac{1}{2}$ million, or about $4 \frac{1}{2}$ million more than in July 1957. Growth in this group for the remainder of this decade should amount to over l million per year; annual changes between 1960 and 1963, however, will be substantially less then in the late $1950^{\circ} \mathrm{s}$. Growth in this group for years after 1963 is dependent, of course, primarily on the unpredictable number of babies to be born in future years.

Persons of high school age (14 to 17 years) will number about 14.3 million by 1965 and about 15.9 million by 1970 , or more than 4.2 million and 5.7 miliion, respectively, over the estimated 10.2 million in 1957.

Population 18 to 24 years of age. --This group includes the college-age group, and prom vides the bulk of new recruits into the labor force. It is also the age range within which most families are formed, since most women marry and have their first child during this period of their life. By 1970, the group will be made up entirely of persons born in the years sinoe the end of World War II. There will be about 25 million persons in this group in 1970 , or about 10 million more than in 1957. During the next 10 to 15 years, this age group will grow relatively fast, with the growth averaging close to one-half million annually in the early part of the $1960^{\prime} s$ and about 1 million per year in the second half of the decade.

The college-age group (18 to 21 years) will number about 14.6 million by 1970 and 16.3 mililion by 1975; the latter figure implies roughly twice as many college-age persons in 1975 as in 1957.

Data on annual changes in the population of school and college age are of considerable use in the planing of intermediate and longrange development programs. Table $C$ shows the projected number of persons in selected age groups ( 5 to 13 years, 14 to 17 years, 18 to 21 years), roughly representing the elementary, high school, and college ages, respectively. For illustrative purposes Series II and Series IV figures are given for years which depend on projections of births.

Table C. --ANNUAL BSTIMATES AND PROJECTIONS OF THE POPULAFION IN SELECTED AGE GROUPS: 1955 TO 1975
(In thousands. Figures below the heavy line depend on projections of births. Sexies II and Series IV population projections are shown for illustrative purposes)


Population in the main working ages.--The 25-to-64-year group as a whole will grow from a $195 \%$ total of 81.8 million to 90.5 million in 1970 and 106.3 million in 1980 , or by about 25 million in the next 23 years.

For the next 10 to 15 years, the population 25 to 44 years old will remain virtually the same. It will number about 48.2 million in 1970, as compared with 47.1 million in 1957. After 1970, however, the group will grow at a somewhat higher rate; it will number 53.9 million in 1975 and 62.4 million in 1980. Thus,
between 1970 and 1980, this age group will life crease by 14 miliion, or 29 percent. In the
whole period 1957 to 1980 the group 25 to 44 will increase by 32.5 percent.

The 45-to-64-year group will grow oniy moderately after 1957 , reaching 43.9 milliont by 1975; this figure implies a gain of about 9 million, or 27 percent, in 18 years. This group will number the same in 1980 as In 1975.

Although these rates of growth suggest: some stability in the age structure of our work force between 1957 and 1970, the sharp increase expected in the 18-to-24-year group will virtually assure a lower average age for the working age population in 1980. By 1975, the median age of the 18-to-64 group is estimated to be about 36.6 years, as compared with 38.3 years in 1957.

Aged population.--The number of persons: 65 years and over has risen steadily in the past. For example, the increase was from about 9 million in 1940 to almost 15 million in 1957. Continued substantial increases in the population 65 years and over are indicated by the projections. It will not be until well after 1980 that the declines in number of births during the 1920's and $1930^{\circ} \mathrm{s}$ will atfect the size of this age group. By 1980, the group may number about $24 \frac{1}{2}$ million, representing an increase of 10 million, or 66 percent, in 23 years and a gain of roughly one-half million persons annually. The expectation of continuing decline in the sex ratio (males per 100 females) in this group is of significance. In 1940, there were about 95 males per 100 females 65 years and over. By 1957, the sex ratio had fallen to 85 . By 1980 , according to these projections, there will be only 72 males per 100 females in the aged population, and an excess of 4 million women 65 and over. This decline in the sex ratio of the aged is caused by the dying off of the many foreign-born men who immigrated before 1924 and by the increasing spread between the death rates of men and women.

Although the future size of the population in this age group is dependent to some extent upon the course of mortality, most of the expected increase in the elderly population is due mainly to past trends in fertility. (Past trends in fertility have more effect upon prospective changes in the number of eged.
persons than do past and prospective trends in mortailty and immigretion.) Even if mortality were to remein at 1955 levels, the expected norease in the aged population would still be olose to 8 mililion by 1980. (A negljgible part of the projected increase is accounted for by future immigration.)

Numbers reaching selected "key" ages.-Other important projected changes in the population during this period are those in the number of persons reaching certain "key" ages. Rough approximations to the number of persons reaching selected key ages throughout the projection period are shown in table D.

Table D. m- ESTIMAJED AND PROJECTED AVERAGE ANNUAL NUMBER OF PERSONS REACHING SELECTED AGFS, BY SEX: 1950 T0 1980
(In thousands. Series II and IV shown for years involving projections of births)


Ordinarily, the number of persons reaching agiven age annually increases or decreases, as the case may be, rather smoothly. Because of the marked ohenges in the annual number of births during the war and postwar years, however, irregular onanges appear in the annual numbers reaching selected ages in later years corregponding to these bjxths. This pettern is illustroted by figure A showing the annual number reaching age 18 for 1940-41 to $1974-75$. There is a particularly sharp increase between 1963-64 and 1964-65, reflecting the upsurge in births between 1945-46 and 1946-47.

Short-run projections to 1965.---Because of the interest usually shown in "short run" projections, annual projections of the total population for July 1 of each year to 1965 are shown in table $\mathbb{E}$ for all four series.

Table E.--ANNUAL PROJECTIONS OF THE POPULATTON OF THE UNTMED STATES: 1957 TO 1965
(In thousands)

| Year (July 1) | Series I | Series II | Series III | Series IV |
| :---: | :---: | :---: | :---: | :---: |
| 1957. | 1171,229 | 1171,229 | 1171,229 | 1171,229 |
| $1958{ }^{2}$ | 174,503 | 174,274 | 174,103 | 174, 034 |
| 1959. | 177,815 | 177,139 | 176,954 | 176,769 |
| 1960. | 181,154 | 180,126 | 179,773 | 179,420 |
| 1961 | 184,549 | 183,160 | 182,591 | 182,021 |
| 1962. | 188,016 | 186,213 | 185,368 | 184,519 |
| 1963. | 191,564 | 189,306 | 188,118 | 1.86,923 |
| 1964. | 195,205 | 192,475 | 190,869 | 189,250 |
| 1965. | 198,950 | 195,747 | 193,643 | 191,517 |

${ }^{1}$ Base for projections. The latest ourrent estimate for this date is 171,196,000.
${ }^{2}$ A current estimate of the population for July 1 , 1958, which became available after the projections were completed, is 174,064,000.

Figure A.--ESTImated and PROJECTED ANNUAL NUMBERS OF PERSONS REACHING AGE 18: 1840 TO 1975


## DESCRIPTION OF METHOD

General method.--A "component" method was used to develop the population projections shown here. This method involves the preparation of separate projections of each of the components of population change (i.e., births, deaths, and net immigration) on the basis of certain assumptions and the combination of the projections of change with estimates of the ourrent population. More specifically, a "cohort survival" procedure was used to oarry forward the population, age by age, by 5 -year time periods to future dates. This procedure yields population projections for the desired projeation dates, by 5-year age groups and sex. This method is the same as the one used by the Census Bureau in making its earlier national population projections.

The projections were based on ourrent es timates of the population including Armed Forces overseas, by age and sex, for July 1 , 195\%. These estimates are based on 1950 Census data which have been adjusted for net census
undercounts of children under 5 years of age and for age biases in the nonwhite population as enumerated at the older ages. A detailed explanation of the derivation of the current estimates for 1957 is given in Current Population Reports, Series $P \times 25$, No. 170.

The population in 1957 was carried forward by the use of appropriate survival rates to July 1960 in such fashion as to yield estimates in the conventional 5 -year age groups at that date. Then, the 1960 population, by 5 -year age-sex groups, was carried forward by 5 -year time periods to 1980, using the mortality rates and net immigration allowances described below.

The projections for the age group under 5 years old in all four serles for a given date were derived by estimating survivors of births during the preceding five years and adding an allowance for net immigration. This computation gave estimates of the "true" number of children under 5 years. Then, in order to permit comparisons with the 1950 Census, the
number of children under 5 years old for each projection year was reduced by 802,000 (male, 486,000; female, 366,000 ), the estimated net undercount of children under 5 years old in the 1950 Census. Accordingiy, these reduced ficures do not provide the proper beses for examining changes in the size of age cohorts. The appropriate beses are the figures shown in Whe bottom of each table labeled "adjusted for net census undercount." a more detailed dis. cussion of this point is given on page 7 of report No. 170 in Series P-25.

Projections of births--Calendar-year agespecific birth rate method.--In developing the fortility rates used in deriving births for future years, no attempt was made to forecast the future courge of the birth rate. On the contrary, because of the uncertainties inwolved, some assumptions were chosen. For convenience in computation and to provide smooth junctures with the present, the current fertility level, represented by the 1955-57 average, is used as the base point for all fertility projections.

In the earlier report (Series P-25, No. 223), three sets of annual age-specific fertil1 ty rates (annual births per 1,000 females of childbearing age in a given 5 -year age group at the midale of the year) were used to define the ultimate age-specific fertility patterns and levels used in the projections. For the present report, four fertility levels are used to define the ultimate fertility levels. The specific projection technique used was unlike that of the earlier report in that age-specific rates were not used directly. The fertility levels assumed for each future period were expressed in terms of the gross reproduction rate ${ }^{2}$ (GRR), a sumnary measure of annual fertility which permits comparison from year to year unaffected by changes in age compositions; and only one pattern of age-specific rates was used to derive the number of births. The results from this procedure, in terms of number of births, are the same, or neariy the same, as by the direct procedure using several sets of age-specific rates, and it involves much less work to carry out the computations by the indirect procedure.

Essentially, the procedure involves using the same set of age-specific fertility rates ( in this instance rates for 1955, the latest ones available), to dexive the births for all fertility series and profection perioas. The
number of births so obtained for each period were then inflated or deflated, as required, by the appropriate factor based on the assumed fertility level for the period and the fertility level in the "base" period (1955). For example, in deriving the number of births for Series $I$, the number of births for each period obtained by applying the 1955 age-specific rates to the number of females in the childbearing aces, by age, was inflated by 13 percent, inkmuch as the projected fertility level (in terms of the GRR) under Series I is 23 percent higher than in 1955. Similarly, the births under series II were obtained by use of an inflation factor of about 3 percent. The births under Series III and IV were derived by use of deflation factors which varied from period to period in accordance with the projected level of fertility.

This procedure implicitiy assumes that the age-specific fertility rates will continue to have the same ratios to each other as they did in 1955. Furthermore, it implies that the specific pattern of age-specific birth rates is not important in estimating the number of births, once the over-all level of age-adjusted fertility in any year is fixed. Given thé gross reproduction rate for a certain year, and the number of women by age, the number of births an be closely estimated on the basis of any reasonable get of age-specific rates. ${ }^{3}$

The age-specific birth rates in 1955 corresponding to a gross reproduction rate of 1.74 are shown below. The estimated gross reproduction rate for 1855-57, referred to here as "current" level, is 1.79.

[^1]| Age of female | Ammal. <br> birthe <br> per 1,000 <br> females | Age of Cemale | Annual <br> bixthas <br> per 1,000 <br> females |
| :---: | :---: | :---: | :---: |
| 15 to 19 gears ${ }^{3}$ | 90.8 | 30 to 34 years. | 115.8 |
| 20 to 24 years... | 240.4 | 35 to 39 yeats. | 99.5 |
| 25 to 29 yenris... | 190.8 | 40 to $44 y^{\text {y }}$ 年ars ${ }^{2}$ | 16.7 |
| I Includes birthe to fembled under 15 years of age. <br> 2 Incuudes birthe to femeles 45 yeara of age and orex. |  |  |  |
| Source: National Office of yital Statistics, Wital |  |  |  |
| Statistioe of the Thited States: 1955, Port I, Public |  |  |  |
| Healbh Service, Uo Sa Department of Health; Eduotion. and Welfare. |  |  |  |

The exact assumptions used in this report regarding the agomaduated tertintty levela for future yegrs are as tollow

Series I, w-mox the whole projection period 1958 to 1980, fertility whll average 10 percent above the $1955 m 57$ or "current" Level (ORR of 1.97 ).

Beries IL...Fertility why memein constant at the $2555-5 \%$ leqel throughout the projection perfod (cRR of 1.79).

Serves ITL. - Fertilty mal dealine from the $1955-57$ leqeq to the $1949-51$ leval by 1865-70, then xeman at thin level to 1975-80 (ultimate CRE on I.54).

Sertes Ty - - mextiltby mil acoline from the $3955-57$ level to the $1942 \times 4$ level by 1965-70, them remeth ot this level to 1975-80 (ulthmate (ant of 3.28).
Frevre $B$ shows the armual levens of fextility (th berms of the gross seproduction mate) from 1955 to date ana projected levels tore groups of yeare trom 2950 to 1980.

FHGUxe B. $m$ AGTUAL AND PROJECTED GROSS REPRODUCTTON RATES: 2935 TO 1960
(Projected rater are 5-year averages plotted at the eenter of each 5wyear period and connected
by stratght dabhed Lines)


Sounce: Rates to 1955 from: National Office of Vital Statisties, mbirths by Age of Mother, Race, and LiveBirth Order: United States, 1955,"Vital Statistios--Special Reports, VoI. 46, No, 18. Rates for 1956 and 1957 . estinates based on provisjonal estmates of btrths from the Nationai office of Vital Statistics. Rates for 1958 and later: projected by Bureau of the Gensus.

These four series imply the total numbers of future births and the crude birth rates for future years given in table F. As the table indicates, Series III and IV imply some decline in the orude birth rate to about 1965-70, then a rise to the end of the projecthon period. Series IV reaches a low of 18.5 births per thousand of the population, a crude rate about as low as that in 1933-34. Sem ries I, on the other hand, implies crude birth retes as high as those prevailing in the early decedes of this century. Figure $C$ compares the actual crude birth rates for years from 1910 to 1957 and the projected rates given in table $F$. The upturn in the aruae birth rate (and in the number of births) after 1970 in Series III and IV reflects the predominanoe in the chilabearing ages of the women born in the recent high birth years.

In spite of the wide range in the ultimate fertility levels (a difference of approx imetely 0.69 in the gross reproduction rate of Series I and IV), these fextility assumptions imply that there would be very little difference in the completed fertility of women now past 30 years of age. For example, woren now in the age group 30 to 34 years would have had, on the average, epproximately 3.07 chjl. aren when they complete their families, under fertility sssumption $I$, compared with 2.90 children under assumption IV. Of course, women of these ages have already completed most of their childbearing. On the othex hend, women now 15 to 19 years would have had, on the average, about 4.13 children when they complete their families under fertility assumption $I$, compared with 2.99 children under assumption IV.

Figure C.--AOTUAL AND PROJECTED CRUDE BIRTH RATES: 1910 TO 1980
तate




1. Fertility 10 percent above 1955-57 Level throughout projection period.
2. Fertility at 1955-57 level to 1975-80.
3. Fextility declines from 1955-57 level to 1949-51 level by 1965m70, then rem mains constant to 1975-80.
iv. Fertility declines from 1955-57 level to $1942-44$ level by 1965-70, then remains constant to 1975-80.

Table F.--projected birtes and crude birter ratms: 1950 to 1980

| Period | Births (in millions) |  |  |  | Average annual rate per 1,000 of midmeriod population |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\underset{I}{\text { Series }}$ | Series II | $\begin{gathered} \text { Series } \\ \text { III } \end{gathered}$ | Sexies IV | Series <br> $\pm$ | Series TI | Serieg ITI | Seriea IV |
| July 1,1950 to 1955. | 19.6 | 29.6 | 19.6 | 29.6 | 24.8 | 24.8 | 24.8 | 24.8 |
| July 1,2955 to 1960. | 22.3 | 21.3 | 20.9 | 20.6 | 25.8 | 24.7 | 24.3 | 23.9 |
| fly 1,1960 to 1965. | 24.7 | 22.5 | 20.7 | 18.9 | 26.0 | 23.9 | 22.2 | 20.4 |
| duly 1, 1965 to 1970..... | 28.0 | 25.4 | 21.9 | 18.2 | 26.7 | 24.8 | 21. 8 | 18.5 |
| July 1, 2970 to $1975 .$. | 32.4 | 29.4 | 25.2 | 21.0 | 28.0 | 26.2 | 23.2 | 20.1 |
| July 1, 1975 to 1980.a...... | 37.3 | 33.3 | 28.3 | 23.4 | 28.9 | 26.9 | 24.0 | 20.9 |
| July 1955 to December $1957^{1}$ | 10.7 | 10.7 | 10.7 | 10.7 | 25.2 | 24.4 | 24.3 | 24.3 |
| Tanuary 1958 to June 1960.0. | 11.7 | 10.6 | 20.3 | 9.9 | 26.4 | 24.1 | 23.3 | 22.5 |

2 Registered birtha adusted for underregistmation.

Table $\}$ presents the average number of children ever bom pex woman by age in Marob 1957, as shown by the Current Population Survey, and the estimated completed fertility rate that is, the average number of children
ever born per woman by ake 49) implied by each serfea of projected fertility rabeas for conorts of women completing all, or a portion of their childbearing in tuture years.

Table G. .-WSTMMATES OF COMPIETED FHRTILITY IMELTED BY FFRTILITY PROXEGXIONS, BY COHORTS: 1960 TO 1980

| Age in March 1957 | Period in which childbearing is assumed to be completed | Average number of ohildren per woman, March 1957 | Completed Sertility xate implied by projections |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Series <br> I | $\begin{gathered} \text { Series } \\ I I \end{gathered}$ | Series III | Series IV |
| 15 to 19 years. | 1980. 85 | 0.12 | 4.13 | 3.76 | 3.38 | 2.99 |
| 20 to 24 years. | 1975-80 | 0.97 | 3.95 | 3.68 | 3.44 | 3.19 |
| 25 to 29 years. | 1970-75 | 1.90 | 3.63 | 3.48 | 3.35 | 3.23 |
| 30 to 34 years. | 1965-70 | 2.25 | 3.07 | 3.00 | 2.95 | 2.90 |
| 35 to 39 years. | 1960 . 65 | 2.46 | 2.75 | 2.73 | 2.71 | 2.70 |
| 40 to 44 years. | 1955-60 | 2.34 | 24.40 | 2,39 | 2.39 | 2.39 |
| 45 to 49 years............. | 1950.55 | 2.24 | a.. | . . |  | ... |

I Average number of ohildren ever bom per woman by age 49.

Women now 20 to 24 years and 25 to 29 years old would average at least three children, even according to the lowest projections. Women 20 to 24 years old will complete their childbearing about 1980, and those 25 to 29 years old about 1975 . These rates for the 20 -to-24 and 25-to-29-year groups may appear too high. They are, however, consigtent with the assumption that the calendar-year gross reprom duction rate wll not drop to the level of the depression years during any part of the projection period. In view of the present cumulative fertility rates for these groups, a

[^2]completed fertility rate (OFR) below 3.0 could hardly be achieved for these cohorts without assuming a precipitous decline in the next few years in annual age-adjusted fertility rates.

Projections of births-Conort-fertility method.--Pasoal K. Whelpton and Arthur A. Campbell of the Scripps Foundation for Researon in Populetion Problems, Miami Univergity, have recently prepared a new set of projeotions of fertility and population. ${ }^{5}$ Their fextillty

5 These will appear in the book Eamily Plaming, Sterility, and Population Growth by Ronald Freedman, pascal K . Whelpton, and Arthur A . Campbell which will be published by MoGraw-Hill in 1959. Cextain material from that book is used here with the permission of the authors and publisher.
projections are based upon cumulative birth rates for cohorts of women (that is, for women born in specific years). ${ }^{6}$ They differ substanthally from those offered here by the Bureau of the Census, whish are based upon agespecific fertility rates for calendar years. ISsentially, the projections of Whelpton and Campbell utilize assumptions about the proportion of women in each birth cohort who will marry by various ages and about the number of ohildren they will bear by those ages. In projecting the marriage and fertility rates of cohorts that have already begun reproducing, the past experience of each cohort is taken Into acoount. Although this approach appears to be more reasonable than the "calendar year" procedure used by the Census Bureau, it is necessary to make assumptions concerning the completed fertility of each cohort and the timing of their future births. Such assumptions, like the assumptions made by the Bureau regarding age-specifio fertility rates for future calendar years, are subject to considerable error.

The assumptions made by Whelpton and Campbell imply a range in the completed fertility rate (everage number of births per women living to age 49) from 2.60 to 3.20 for women in the cohorts aged 20 to 24 years in 1957, whereas the Bureau's figures for this group imply completed fertility rates from 3.19 to 3.95 . An approximate comparison of the Bureau's assumptions and those of Whelpton and Campbell in terms of completed fertility rates is as follows:

| Bureau of the Census |  |  | Whelpton and Campbell |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Series | CFR for women 20.24 in 1957 | U1ti. <br> mate <br> level <br> of CFR | Series | CFR for women 20-24 in 1957 | Untimate level of CFR |
| 2. | 3.95 | 4.04 | High..... | 3.20 | 3.28 |
| II. | 3.68 | 3.68 | Medium. . | 2.89 | 2.87 |
| III...... | 3.44 | 3.16 | Medium. . - | 2.89 | 2.87 |
| IV. | 3.19 | 2.64 | Low. . . . . . | 2.60 | 2.25 |

Wource: Census: See text of this report. Freedman, Whelpton, and Campbell, op. cit., Chapter X.

[^3]The projections of completed fertility by Whelpton and Campbell take into account the expectations regarding size of completed family reported in 1955 by a nationwide representative sample of white married women, aged 18-39 years, husband present. ${ }^{7}$ Because of the wide interest in the use of this kind of cohort analysis for projecting births, the Bureau of the Census has prepared one series of population projections incorporating the high series of fertility projections developed by Whelpton and Campbell. Inasmuch as the Census Bureau is not in a position at this time fully to evaluate this technique of making fertility projections, the population projections are offered as a supplement to, rather than as a part of, the main tables.

In the procedure followed by Whelpton and Campbell the rise from one age to another for the cumulative birth rate of women of all marital statuses in a given cohort group is used to derive the number of births during specific time periods. . For example, in the high series shown here, it is estimated that each 1,000 women born during July 1,1935 , to June 30, 1940, and living to ages 20 to 24 years in July 1960 will bear 1,069 babies by that date. It is then assumed that each 1,000 women in this group who live through the next 5 years will bear an adaitional 1,249 babies, so that by July 1965 , their cumulative birth rate will be 2,318 . Those living to age 49 in the late $1980^{\prime}$ s are assumed to have a completed fertility rate of 3,266 per 1,000. The total number of births during a specific 5 -year time period is obtained by summing the projected numbers of births for all cohorts in that period.

The method and assumptions used in developing the high series of cohort projections of birth rates are as follows (see appendix tables $A-1$ to $A-3$ ):

1. Projections were made of the proportion of women married by specified ages in groups of cohorts, assuming a continustion (but at a decreasing rate) of the reduction in age at marriage and of the slight increase in the proportion of women marrying by ages 45 to 49 years--trends which have been under way during the last 20 years.

[^4]2. Projections were made of the blrth rates of ever-married women by specified ages in groups of cohorts. The cumulative birth rate for each cohort group was projected to the end of the childbearing ages on the basis of the expectations regarding size of completed femilies obtained in the Growth of American Familles survey mentioned above. The projections of rates for younger ages (involving the "timing" of births) were made on the assumption that the tendency to concentrate childbearing in the early part of married life, which has been under way for at least 10 years, will continue for a time but at a decreasing pace.
3. Cumulative birth rates for evermarried women in cohort groups were then converted to rates for women of all marital gtatuses by multiplying the birth rate for evermarried women of a given age group (1tem 2) by the proportion of women who have married by that age (item 1).

The projected numbers of births for 5 -year periods, 1955 to 1980, based upon the foregoing rates, are given in appendix table A-4. Population projections by age and sex, for July 1,1960 to 1980 , using these projections of births, are given in appendix table A-5. It should be emphasized that only the highest of the three series of birth rate projections made by Whelpton and Campbell was employed in the population projections presented here. Cohort population projections based on birth rates under the high, medium, and low assumptions will be shown in their forthcoming book.

The projected numbers of births shown in appendix table A-4 differ somewhat from those that are to be published by Whelpton and his associates. Although the cohort birth rates are the same, Whelpton and Campbell applied their rates to adjusted population estimates for 1955 which include allowances developed at the Scripps Foundation for net undercount in the 1950 Census throughout the age scale. ${ }^{8}$

Projections of deaths.--One series of age-sex specific mortality rates was used for all four series of population projections. These rates represent an average of the "high" and "low" mortality projections prepared in the Division of the Actuary, Social Security

[^5]Administration. (A detailed description of tho method and assumptions is given in the Social Security Administration's report, Illustrative United States Population Projections, prepared by T. N. E. Greville, Actuarial Study No. 46 , May 1957.) Hypothethical low and high age. specific death rates, by sex, for the year 2000 were arrived at by applying assumed high and low percentages of reduction between $195 a^{\circ}$ and 2000 of death rates by age, sex, and 10 broed groups of causes of death, to the corresponding rates for 1953, and converting the results to age-sex-specific rates for all causes combined. The corresponding 5 -year survival rates were then computed. Five-year survival rates for each 5 -year period between 1955 and 2000 were obtained by interpolation between survival rates for $1949-51$, 1953-55, and 2000.

In general, the low-mortality projection is intended to reflect a definitely optimistic view as to the future course of mortallty, whereas the high-mortality projection is intended to reflect a less optimistic view, particularly with regard to the possibility of reduction in death rates for the diseases typical of old age. Even the high mortality projection contemplates some future improvements in mortality, however. The expectation of life at birth ( $8_{0}$ ) in years implied by the "average" mortality projections is as follows:

| Sex | 1955 | 1975-80 | 2000. |
| :---: | :---: | :---: | :---: |
| Male. | 66.7 | 69.8 | 72.3 |
| Female... | 72.9 | . 76.0 | 77.1 |

The alternative assumptions regarding future mortality would bring about only moderate variations in the future size and composition of the population. The difference in the projected population levels for 1980 using the "high" and "low" mortality assumptions is somewhere in the neighborhood of 3.9 million persons; more than half of the difference ls in the group 65 years and over. The use of the "average" mortality rates results in about 2.2 million fewer deaths for the whole 23 -year projection period to 1980 , than would have resulted if it had been assumed that mortality remained constant at the 1955 levels. Because of the expectation of continuing advances in medical science and allied fields, an assumption of increasing or even constant mortality has not been considered here.

A enemeral fndication of the projected trend in mortality is given in table H below which shows average annual crude death rates (average annual deaths per 1,000 of the mid period population) for recent years and for the projection period. The substantial effeot of the age composition of the population on the crude death rate is apparent in these projections. the much "younger" population implied under the Series II assumptions than under the Series IV assumptions results in a continuation of the decline in the crude death rate, whereas Saxien IV, with its corisiderably smallar numbers of births, implies a nearly oonstant crude death rate from 1960-65 to $1975-80$.

Table $H_{e}-\infty$ ETTMATED AND PHOJECTED CRUDE DEATH RATES: 1950701980

| Period | Series II | $\begin{aligned} & \text { Series } \\ & \text { IV } \end{aligned}$ |
| :---: | :---: | :---: |
| 1950.55. | 9.5 | 9.5 |
| 1955-60. | 9.2 | 9.2 |
| 1960.65.. | 8.9 | 8.9 |
| 1965-70. | 8.7 | 8.8 |
| 1970.75. | 8.4 | 8.9 |
| 1975.80. | 8.1 | 8.8 |

Projections of net immigration.--0nly one series of allowances for future net immigration was used for all four geries of population projections. Moreover, the same allowance for net civilian imnigration by age and gex was used for each quinquenntum in eaoh series of projections. The volune of olvilian immeration to the United Stetes is determined Iargely by the laws controlling international migration, which have tended to keep the numbers arriving at a relatively low level. In view of the relatively minor role of net immigration as a component of population change in the United States in recont yearg and the impossibility of predioting the specific trend, an arbitrary allowance of 300,000 per year for 1.5 million per quinquennium) was used here; this amount is roughly equal to the average annual net number arriving during the period 1851 to 2956. The assumed future age-sex distribution also approximates the distribution of these years.

The number and distribution of net immigrants incorporated into the population projeations are as follows:

Table $3 .-$ ASSOMED DTSTRTBUTION OF FUTURE NET IMRXGRANIS, BY ACE AND SEX
(In thousunds. Age shown as of the end of each period)

| Age | 1957-60 |  | 1960-65 and later perdods |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Male | Temala | Maje | Female |
| All agem | 414 | 486 | 692 | 808 |
| Under 5 yeara. | 32 | 30 | 37 | 36 |
| 5 to 9 years. | 37 | 37 | 66 | 64 |
| 10 to 14 years. | 28 | 28 | 50 | 49 |
| 15 to 19 years.......** | 29 | 40 | 47 | 60 |
| 20 to 24 years......... | 40 | 76 | 62 | 113 |
| 25 to 29 years. | 55 | 80 | 87 | 137 |
| 30 to 34 years.......... | 54. | 56 | 92 | 105 |
| 35 to 39 years. | 42 | 38 | 74 | 68 |
| 40 to 44 years......... | 34 | 30 | 58 | 50 |
| 45 to 49 years. | 26 | 24 | 46 | 42 |
| 50 to 54 years......... | 18 | 19 | 33 | 32 |
| 55 to 59 years......... | 13 | 13 | 22 | 23 |
| 60 to 64 years........ | 6 | 8 | 12 | 14 |
| 65 to 69 years......... | 2 | 4 | 4 | 8 |
| 70 to 74 years........ | -. | 2 | 2 | 4 |
| 75 years and over.... | *** | 1 |  | 3 |

To simplisy the oomputations it was assumed thet ell migrants would survive to the end of the 3- or 5-year period (1957-60, 1960-85, 1965-70, etc.) in which they entet. At the same time, the age distribution was adjusted to reflect the change in age between the date of entry and the end of the entry pertod. In all, the projections assume a total of about 7 million "net irmagrants $s^{*}$ over the $23-y e a x$ projection period. By the end of the projection period, this number is augmented by about 3.6 million bebles born to immigrant women entering dux m ing the projection period and reduced by 400,000 deaths (including deaths to bebies born after the immigretion of the mother). The net owmulative additiong to our populam tion at verious dates resulting from the assumption of 300,000 net immigrants per year (or 1.5 million for each 5 -year period) are shown in table K . (Series II fertility Les used for illustrative purposes.) This table can elso be used to measure the net effect of other immigration assumptions on the future size of the American population. Thus, if the volume of net immigration per year is assumed to be twice or one-halif of that asgumed earlier in this report, the net addition to our population would be twice or onem half, respectively, that shom in teble $\mathbb{K}$.

Table K.---ESTIMATED NET CUMULATIVE ADDITIONS TO THE POPULATTON OF THE UNITED STATES WHICH WOULD RESULT FROM AN ANNUAL AVERAGE NET IMMIGRATTON OF 300,000
(Figures are based on Series II fertility and population projections and assume that all inmigrants survive to the end of the 5 -year period in which they enter)

| Year (July 1) | $\begin{aligned} & \text { Number } \\ & \text { (thousands) } \end{aligned}$ | Percent of total population |
| :---: | :---: | :---: |
| 1960. | 940 | 0.5 |
| 1.965. | 2,773 | 1.4 |
| 1970. | 4,913 | 2.3 |
| 1975. | 7,382 | 3.1 |
| 1980............. | 10,163 | 3.9 |

## LIMITATIONS

The four series of population projections given here offer the user a fairly wide choice of assumptions as to the course of future population changes. Nevertheless, it is not likely that actual population changes will follow any particular series very closely. It is possible that, for some part of the projection period, future population size will fall below the range defined. In view of the many uncertainties in predicting future fertility, the Bureau of the Census does not recommend any one series as the "best" series. As noted earlier, Series $I$, which is the highest of the four series shown here, incorporates fertility levels higher than any that have been observed in the past 50 years. Although over the long run (throughout the 23-year projection period), it is highly improbable that fertility will remain at such high levels, the series is included to illustrate a possibility in the short run. Annual fertility in the past has fluctuated widely, and a 10 -percent rise in annual rates is not unprecedented in the light of the postwar experience. On the other hand, population Series IV, the lowest series given here, incorporates fertility levels whioh fall only to the 1942-44 level. Thus, the average fertility for the projection period for the lowest fertility series is still well above the 1930-39 depression level. This series is by no means regarded as a probable iower limit.

## EXTENSION OF THE PROJECTIONS

Projections for dates or for age groups other than those shown may generally be obtained by some form of interpolation. In
most instances Innear interpolation will ytel adequate results for intermediate dates. Sim larly, assuming a rectangular (even) distribu tion by age within a 5-year age group wil ordinarily give satisfeactory results for othe age groups, provided the age range sought 1 not too narrow (e.g., at least three years) The principal problem cohort, a cohort mue larger than the next younger one, is the groy born in the period July 1946 mune 1947 lage 10 in 1957, aged 13 in 1960, etc.). The 5 --yea age group including this age cohort should nol be subdivided rectangularly, therefore. ${ }^{9}$

## RELATED REPORTS

As noted above, the current estimates of the population of the United States, by age, sex, and color for July 1, 1957, used as bases for making these projections, were published first in Current Population Reports, Series P-25, No. 170. This report also contains the corresponding figures for 1955 and 1956. Revised estimates for 1957 and estimates for 1958 are given in later reports in the P-25 series.

Projections of the population of States for 1960, 1965, and 1970 were published in August 1957 in Current Population Reports, Series $P-25$, No. 160. The national totals shown in that report are, for the most part, consistent with those given in the earlier No. l23 report. The national total of one series, Series I, was a new one at that time; it incorporated the same mortality projections as those used in the present report but different fertility assumptions. A simple procedure for adjusting the State projections to add to the revised national totals shown in this report is to multiply each of the State figures in any given series by the ratio of the revised totals, as given here, to the old totals of each State series. (Allowance should be made to exclude Armed Forces abroad--about $900,000-$ from these revised national totals.) A more refined technique would be to distribute the differences between the old and the new totals in accordance with the projected distribution of births, by States, given in table 3 of the No. 160 report.

[^6]RecentIy, In connection with the prepara6納 of longerange cost estimates for the Whin-ase, borvivors and Disebility Insurance brograms, the Social Security Administration deyoloped population projections to the year gifo, These were published in IlIustrative fruted States Population Projections, ActuHivat Study No. 46, May 1957. The fertility and immifretion assumptions used in thet study tre sumilar to those incorporated in some of the series shown here. The "nigh" and "Low" finctality assumptions employed in that report
 Whe, "average" mortality rates incorporated Whereln. There are two important areas of didiference between the two'sets of profecm 610ns, which make comparability difficult, whever. First, the projections of the Social Security Administration relate to the popuWation of the United States and Alaska, Ha11. Puerto Rico, and the Virgin Islands of She United States. Second, the base populaHion was adjusted upwards by about $2 \frac{7}{2}$ persent for assumed net census undercount. As s result of these two adjustments, the base Hegures in Actuarial Stuay No. 46 include roughly 7.4 million more people than are Included in the bese used in the Buresu of The Census projections.

Projections of the number of households and of the labor force in the United States to 1975 were published by the Bureau of the Census in Current Population Reports, Series Pwe, No. 69, and Series P-50, No. 69, respectively. These projections were designed to be consistent with earlier national population projeations (Series P-25, No. 123); however, because they depend only on the projections of adult population, which have not been changed very nuoh here, they are also approximately in line with the revised population projections given in the present report, partioulariy for the early part of the projection perlod (i.e., 1957 to 1970). Revised household projections which use these revised national population projections as a base as wellas new assumptions concerning the rates of family and housenold formation will be published shortiy in the P-20 series. A comprehensive revision of the labar force projections is not contemplated at this time. Revised labor force projections which use the same projeoted labor force participation rates as in report Series P-50, No. 69, but which apply thoge rates to these new population projections will be available upon request. Projections of the educational attainment of the national population for 1960 to 1980 will also soon be published in the $\mathrm{P}-20$ series of reports.

Table 1..--ESTIMATES AND PROJECTIONS OF THE TOTAL POPULATTON OF THE UNIED STATES INCLUDTNG ARMED FORCES OVERSEAS, BY ACE: 1950 TO 1980
(In thousands. Figures relate to July 1. Series I, II, III, and IV imply the following assumptions as to
 III-1955-57 level declines to 1949-51 level by 1965-70, and continues at that level to 1980; IV.-1955-5 level declines to $1942-44$ level by 1965 m 70 , and continues at that level to 1980. Figures inside heart lines represent, in whole or part, survivors of births projected for years after 1957. See text for de. tailed explanation)


Table 1.-mESTIMATES AND PROJECTIONS OF THE TOTAL POPULATION OF THE UNITED STATES INGLUDING ARMED FORCES OVERSEAS, BY AGE: 1950 TO 1980...Con.

| Series and age | 1950 | 1955 | 1957 | 1960 | 1965 | 1970 | 1975 | 1980 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SELECTED AGES <br> Series I |  |  |  |  |  |  |  |  |
| 5 to 17 years... | 30,730 | 37,342 | 40,238 | 44,811 | 51,733 | 57,996 | 65,492 | 74,377 |
| 18 to 21 years........... | 8,948 | 8,577 | 8,939 | 9,605 | 12,153 | 14,573 | 16,265 | 18,634 |
| , 14 years and over....... | 113,078 | 118,865 | 122,023 | 126,528 | 138,127 | 150,691 | 165,641 | 182,355 |
| 18 years and over....... | 104,633 | 109,623 | 111,847 | 115,324 | 123,795 | 134,816 | 147,290 | 162,219 |
| 21 years and over....... | 97,976 | 103,123 | 105,092 | 108,039 | 114,423 | 123,820 | 134,985 | 148,160 |
| 65 years and over....... | 12,287 | 14,069 | 14,749 | 15,779 | 17,638 | 19,549 | 21,872 | 24,526 |
| Adjusted for net census undercount |  |  |  |  |  |  |  |  |
| Whaer 5 years........... | 17,123 | 19,108 | 19,947 | 21,821. | 24,224 | 27,464 | 31,900 | 36,763 |
| T), Series II |  |  |  |  |  |  |  |  |
| 25 to 17 years........... | 30,730 | 37,342 | 40,238 | 44,811 | 50,709 | 54,804 | 59,845 | 67,550 |
| . 18 to 21 years.......... | 8,948 | 8,577 | 8,939 | 9,605 | 12,153 | 14,573 | 16,265 | 17,172 |
| 14. jears and over....... | 113,078 | 118,865 | 122,023 | 126,528 | 138,127 | 150,691 | 164,266 | 178,707 |
| \%8 years and over....... | 104,633 | 109,623 | 111,847 | 115,324 | 123,795 | 134,816 | 147,290 | 160,440 |
| 21 years and over....... | 97,976 | 103,123 | 105,092 | 108,039 | 114,423 | 123,820 | 134,985 | 147,498 |
| 65 years and over........ | 12,287 | 14,069 | 14,749 | 15,7779 | 17,638 | 19,549 | 21,872 | 24,526 |
| Acjusted for net census undercount |  |  |  |  |  |  |  |  |
| Tnder 5 years........... | 17,123 | 19,108 | 19,947 | 20,793 | 22,045 | 24,992 | 28,913 | 32,793 |
| 5 to 17 years........... | 30,730 | 37,342 | 40,238 | 44,811 | 50,358 | 52,708 | 54,252 | 58,715 |
| 18 to 21 years........... | 8,948 | 8,577 | 8,939 | 8,605 | 12,153 | 14,573 | 16,265 | 16,40? |
| 14 years and over....... | 113,078 | 118,865 | 122,023 | 126,528 | 138,127 | 150,691 | 163,704 | 176,045 |
| 18 years and over....... | 104,633 | 109,623 | 111,847 | 115,324 | 123,795 | 134,816 | 147,290 | 159,609 |
| 21 years and over....... | 97,976 | 103,123 | 105,092 | 108,039 | 114,423 | 123,820 | 134,985 | 147,318 |
| 65 years and over....... | 12,287 | 14,069 | 14,749 | 15,779 | 17,638 | 19,549 | 21,872 | 24,526 |
| Hajusted for net census undercount |  |  |  |  |  |  |  |  |
| linder 5 years........... | 17,123 | 19,108 | 19,947 | 20,440 | 20,292 | 21.477 | 24,812 | 27,887 |
| 4, Series IV |  |  |  |  |  |  |  |  |
| 5 to 117 years............. | 30,730 | 37,342 | 40,238 | 44,811 | 50,006 | 50,589 | 48,610 | 49,818 |
| 28 to 21 years.......... | 8,948 | 8,577 | 8,939 | 9,605 | 12,153 | 14,573 | 16,265 | 15,639 |
| 14 years and over....... | 113,078 | 118,865 | 122,023 | 126,528 | 138,127 | 150,691 | 163,140 | 173,358 |
| 18 years and over....... | 104,633 | 109,623 | 111,847 | 115,324 | 123,795 | 134,816 | 147,290 | 158,774 |
| 25 years and over....... | 97,976 | 103,123 | 105,092 | 108,039 | 114,423 | 123,820 | 134,985 | 147,137 |
| 65 years and over....... | 12,287 | 14,069 | 14,749 | 15,779 | 17,638 | 19,549 | 21,872 | 24,526 |
| Mojusted for net census undercount |  |  |  |  |  |  |  |  |
| Inder 5 years............ | 17,123 | 19,108 | 19,947 | 20,087 | 18,51.8 | 17,938 | 20,692 | 23,044 |

Table 2.-.ESTIMATES AND PROJECTTONS OF THE MALE POPULATION OF THE UNTTED STATES INCLUDING ARMED FORCES OVERSEAS, BY AGE: 1950 TO 1980
(In thousands. Figures relate to July 1. Series I, II, III, and IV imply the following assumptions as t fertility: I--1958-80 fertility 10 percent above $1955-57$ level; II- $1955-57$ level continues to 1980 . III- $-1955-57$ level declines to 1949-51 level by 1965m 70, and continues at that level to 1980; IV- 1955 , level declines to $1942-44$ level by 1965-70, and continues at that level to 1980 . Figures inside heavy lines represent, in whole or part, survivors of births projected for years after 1957. See text for dee tailed explanation)


Table 2...-ESTIMATES AND PROJECTIONS OF THE MALE PORULATION OF THE UNITED STATES INCLUDING ARMED FORCES OVERSEAS, BY AGE: 1950 TO 1980....Con.


Table 3.-wSTMATES AND PROJECTIONS OF THE TEMALE FOPULITION OF IPEE UNITED STATES, BY AGE:
1950 TO 1980
(Tn thousands. Figures relate to July 1. Series I. IL, JII, and IV imply the following assumptions as to
 III-m1955-57 level decines to 1949-51 level by 1965-70, and continues at that level to 1980; 1V-m $1955-57$ level dechines to 1942 m 44 level by $1965 \mathrm{~m} \%$, and continues at that level to 1980 . Figures finside heavy ines refresent, in whole or part, survivors of births projected for yeare after 1957 . See text for de tajled explanation)


Table 3....ESTIMATES AND PROJECTIONS OF THE FEMALE POPULATION OF THE UNTTED STATES, BY AGE: 1950 TO 1980...Con.

| Series and age | 1950 | 1955 | 1957 | 1960 | 1965 | 1970 | 1975 | 1980 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SEIECTED AGES |  |  |  |  |  |  |  |  |
| Series I |  |  |  |  |  |  |  |  |
|  | 15,120 | 18,307 | 19,722 | 21,948 | 25,336 | 28,402 | 32,062 | 36,399 |
| 18 to 21 years........... | 4,445 | 4,247 | 4,412 | 4,746 | 5,983 | 7,170 | 8,001 | 9,161 |
| 14 years and over....... | 57,204 | 60,510 | 62,265 | 64,763 | 70,888 | 77,444 | 85, 113 | 93,580 |
| 18 years and over....... | 53,030 | 55,966 | 57,257 | 59,259 | 63,860 | 69,658 | 70,068 | 73,806 |
| 21 years and over....... | 49,731 | 52,754 | 53,924 | 55,661 | 59,255 | 64,253 | 12,612 | 14,259 |
| 65. years and over....... | 6,480 | 7,541 | 7,980 | 3,660 | ,895 | , |  |  |
| Adjusted for net census undercount |  |  |  |  |  |  |  |  |
| Under 5 years............ | 8,368 | 9,347 | 9,758 | 10,676 | 11,846 | 13,426 | 15,591 | 17,965 |
| Series II |  |  |  |  |  |  |  |  |
| 5 to 17 years............ |  | 18,307 | 19,722 | 21,948 | 24,835 | 26,841 | 29,301 | 33,060 |
| 18 to 21 years.......... | 4,4,45 | 4,247 | 4,412 | 4,746 | 5,983 | 7,170 | 8,001 | 8,445 |
| 14 years and over....... | 57,204 | 60,510 | 62,265 | 64,763 | 70,888 | 77,444 | 84,441 | 91,793 |
| 18 years and over....... | 53,030 | 55,966 | 57,257 | 59,259 | 63,860 | 69,658 | 76,115 | 82,840 |
| 21) years and over....... | 49,731 | 52,754 | 53,924 | 55,661 | 59,255 | 64,253 | 70,068 | 76,481 |
| 65 years and over....... | 6,480 | 7,541 | 7,980 | 8,660 | 9,895 | 11,150 | 12,612 | 14,259 |
| Adjusted for net census undercount |  |  |  |  |  |  |  |  |
| Under 5 years........... | 8,368 | 9,347 | 9,758 | 10,173 | 10,781 | 12,219 | 14,132 | 16,024 |
| Series III |  |  |  |  |  |  |  |  |
|  |  |  |  | 21,948 | 24,663 | 25,815 | 26,563 | 28,737 |
| 18 to 21 years............ | 15,14,45 | 4,247 | -4,412 | 4,746 | 5,983 | 7,170 | 8,001 | 8,071 |
| 14 years and over........ | 57,204 | 60,510 | 62,265 | 64,763 | 70,888 | 77,444 | 84, 164 | 90,488 |
| 18 years and over....... | 53,030 | 55,966 | 57,257 | 59,259 | 63,860 | 69,658 | 76,115 | 82,431 |
| 21 years and over....... | 49,731. | 52,754 | 53,924 | 55,661 | 59,255 | 64,253 | 70,068 | 76,391 |
| 65 years and over....... | 6,480 | 7,541 | 7,980 | 8,660 | 9,895 | 11,150 | 12,612 | 14,259 |
| Adjusted for net census undercount |  |  |  |  |  |  |  |  |
| Under 5 years............ | 8,368 | 9,347 | 9,758 | 10,000 | 9,924 | 10,500 | 12,127 | 13,628 |
| Series IV |  |  |  |  |  |  |  |  |
|  |  | 18,307 | 19,722 | 21,948 | 24,491 | 24,778 | 23,802 | 24,384 |
| 18 to 21 years.......... | 4,445 | 4, 247 | 4,412 | 4,746 | 5,983 | 7,170 | 8,001 | 7,692 |
| 14 years and over....... | 57,204 | 60,510 | 62,265 | 64,763 | 70,888 | 77,444 | 83,887 | 89,177 |
| 18 years and over....... | 53,030 | 55,966 | 57,257 | 59,259 | 63,860 | 69,658 | 76,115 | 82, 7 |
| 21 years and over....... | 49,731 | 52,754 | 53,924 | 55,661 | 59,255 | 64,253 | 70,068 |  |
| 65 years and over....... | 6,480 | 7,541 | 7,980 | 8,660 | 9,895 | 11,150 | 12,612 |  |
| Adjusted for net census undercount |  |  |  |  |  |  |  |  |
| Under 5 years............ | 8,368 | 9,347 | 9,758 | 9,828 | 9,056 | 8,770 | 10,113 |  |

## APPENDIX TABLES

Table Am1.--ESTIMATED AND PROJECTED (HTGH SERTES) CUMULATIVE MARRIAGE AND BIPTH RATTS BY AGE 49

| Cohorts (women born during period shown) | Cumum lative percent ever married |  | Number of births per 1,000 women (single and ever married) |
| :---: | :---: | :---: | :---: |
| 1950-55. | 98.0 | 3,350 | 3,283 |
| 194-50. | 98.0 | 3,350 | 3,283 |
| 1940-45. | 98.0 | 3,350 | 3,283 |
| 1935-40. | 97.5 | 3,350 | 3,266 |
| 1930-35. | 97.0 | 3,250 | 3,152 |
| 1925-30. | 96.0 | 3,150 | 3,024 |
| 1920-25. | 95.5 | 3,050 | 2,913 |
| 1915-20. | 94.8 | 2,700 | 2,560 |
| 1910-15. | 94.0 | 2,460 | 2,312 |
| 2905-10. | 93.1 | 2,442 | 2,272 |
| 1900-05. | 92.1 | 2,627 | 2,420 |
| 1895-1900 | 91.5 | 2,962 | 2,710 |

Table A-2.....ESTIMATED AND PROJECTED (HIGH SERTES) CUMU LAT TVE MARRIAGE AND BIRTH RATES FOR COHORTS BORN TN 1920-25, BY SUCCESSTVE AGES

| Age | Cumu- <br> lative <br> percent <br> ever <br> married |  | Number of bleths per 1,000 women (single and ever married) |
| :---: | :---: | :---: | :---: |
| 15 to 19 years. | 11.9. | 714 | 85 |
| 20 to 24 years | 60.4 | 1,052 | 635 |
| 25 to 29 years.............. | 86.7 | 1,758 | 1,524 |
| 30 to 34 years.............. | 92.9 | 2,419 | 2,246 |
| 35 to 39 years. | 94.2 | 2,863 | 2,697 |
| 40 to 44 years. | 95.0 | 3,048 | 2,896 |
| 45 to 49 years. | 95.5 | 3,050 | 2,913 |

Table A-3 - - ESTIMATED AND PROJECTED (HIGH SERIES) CUMULATIVE NUMBER OF CHILDREN BORN PER I,OOO WOMEN, BY COHORTS

| Cohorts (women born during period shown) ${ }^{1}$ | Period in which cohort reaches ages 15 to 19 years ${ }^{1}$ | Oumulative rates by age (years) ${ }^{2}$ |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 15 to 19 | 20 to 24 | 25 to 29 | 30 to 34 | 35 to 39 | 40 to 44 | $\begin{gathered} 45 \text { to } \\ 49 . \end{gathered}$ |
| 1960-65. | 1975-80 | 175 | 1,319 | 2,538 | 3,043 | 3,230 | 3,274 | 3,283 |
| 1955-60. | 1970-75 | 175 | 1,319 | 2,538 | 3,043 | 3,230 | 3,274 | 3,283 |
| 1950-55. | 1965m.70 | 175 | 1,319 | 2,538 | 3,043 | 3,230 | 3,274 | 3,283 |
| 1945-50. | 1960-65 | 173 | 1,312 | 2,529 | 3,014 | 3,221 | 3,274 | 3,283 |
| 1940-45. | 1955-60 | 152 | 1,211 | 2,463 | 2,983 | 3,209 | 3,274 | 3,283 |
| 1935-40. | 1950-55 | 1.43 | 1,069 | 2,318 | 2,968 | 3,192 | 3,258 | 3,266 |
| 1930-35. | 1945-50 | 126 | 975 | 2,169 | 2,847 | 3,069 | 3,144 | 3,152 |
| 1925-30. | 1940-4.5 | 85 | 788 | 1,805 | 2,618 | 2,902 | 3,016 | 3,024 |
| 1920.25. | 1935040 | 85 | 635 | 1,524 | 2,246 | 2,697 | 2,896 | 2,913 |
| 1915-20. | 1930-35 | 77 | 564 | 1,298 | 1,942 | 2,346 | 2,539 | 2,560 |
| 1910-15. | 1925-30 | 88 | 560 | 1.,177 | 1,734 | 2,119 | 2,285 | 2,312 |
| 1905-10. | 1920-25 | 94 | 642 | 1,266 | 1,738 | 2,073 | 2,242 | 2,272 |
| 1900-05. | 1915-20 | 85 | 700 | 1,435 | 1,936 | 2,237 | 2,388 | 2,420 |
| 1895-1900. | 1910-15 | 92 | 701 | 1,553 | 2,166 | 2,518 | 2,678 | 2,710 |

[^7]${ }^{2}$ Figures relate to the terminal dates of successive 5 myear periods following the period in which the cohorts reach ages 15 to 19 years. The figures above the hoxizontal line are projections.

Source, tables Aml to A-3: Ronald Freedman, P. K. Whelpton, and Arthur A. Campbeli, Family Flanning, Sterility, and Population Growth, to be published early in 1959 by MoGraw-Hinl. Book Company. Used by permission.

Table A-4....-PROJECTED NUBER OF BIRTES USING THE WHELPRON-CAMPBELL HIGH SERTES OF COHORT PROTECTIONS OF BTRTHS: 1955 TO 1980
(Computed at the Bureau of the Census)

| Period ${ }^{2}$ | $\begin{aligned} & \text { Number } \\ & \text { (millions) } \end{aligned}$ | Period ${ }^{1}$ | $\begin{aligned} & \text { Number } \\ & \text { (millions) } \end{aligned}$ |
| :---: | :---: | :---: | :---: |
| 1955m60... | 21.7 | 1970-75. . . . . . . . . . . . . . . . . . . . . . . . . . . . | 28.5 |
| 1960-65. | 22.4 | 1975-80...................................... | 31.8 |
| 1965-70.... | 25.6 |  |  |

${ }^{1}$ Period extends from July 1 of initial year to June 30 of terminal year.

TabIe A-5.--PROJECTIONS OF THE POPULATION OF THE UNTTED STATES INCLUDING ARMED FORCES OVERSEAS, BY AGE AND SEX, 1960 TO 1980, PREPARED BY THE BUREAU OF THE CENSUS ON THE BASTS OF THE WHELPTON CAMPBELL HIGH SERIES OF OOHOR PROJECTIONS OF BIRTHS

In thousands. Figures relate to July 1. See text, pages 10 to 12 , for explanation of basis of computation. Fis. ures inside the heavy lines depend in whole or part on projections of births. Other figures are the same as those shown in the main tables)


Thb E A－5．mPROJECTIONS OF THE POPULATION OF THE UNITED STATES INCLUDING ARMED FORCES OVERSEAS，BY AGE AND SEX， 1960 TO 1980，PREFARED BY THE BUREAU OF THE CENSUS ON THE BASLS OF THE WHELPTON CAMPBELL HIGH SERIES OF COHORT PROJECTIONS OF BIRTHE－CON．
n thousands．Figures relate to July 1 ．See text，pages 10 to 12 ，for explanation of basis of computation．Fig ures inside the heavy lines depend in whole or part on projections of births．Other figures are the same as those shown in the main tables）

| 3）．Age and sex | 1957 | 1960 | 1965 | 1970 | 1975 | 1980 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4 CEMATE |  |  |  |  |  |  |
| Wi．A11 ages． | 86，371 | 91，193 | 99，261 | 108，566 | 118，967 | 130，628 |
| Winder 5 years | 9，392 | 9，986 | 10，388 | 11，917 | 13，338 | 14，942 |
| Whto 9 years． | 8，803 | 9，377 | 10，378． | 10，781 | 12，307 | 13，726 |
| Whit to 14 years．．．．．．．．．．．．．．．．．．．．．．．． | 7，345 | 8，422 | 9，410 | 10，410 | 10，814 | 12，338 |
| \％hz to 19 years．．．．．．．．．．．．．．．．．．．．．．．． | 5，826 | 6，602 | 8，464 | 9，451 | 10，449 | 10，853 |
| Wht to 24 years．．．．．．．．．．．．．．．．．．．．．．．． | 5，355 | 5，608 | 6，694 | 8，552 | 9，537 | 10，533 |
| Vheres to 29 years．．．．．．．．．．．．．．．．．．．．．．．． | 5，758 | 5，497 | 5，723 | 6，807 | 8，660 | 9，643 |
| 30 to 34 years． | 6，277 | 6，018 | 5，575 | 5，801 | 6，882 | 8，729 |
| Whto to 39 years． | 6，119 | 6，350 | 6，043 | 5，606 | 5，833 | 6，910 |
| Whty to 44 years．．．．．．．．．．．．．．．．．．．．．．．．． | 5，791 | 5，902 | 6，332 | 6，033 | 5，604 | 5，831 |
| Wht to 49 years．．．．．．．．．．．．．．．．．．．．．．．．． | 5，361 | 5，660 | 5，848 | 6，278 | 5，989 | 5，571 |
| 50 to 54 years． | 4，658 | 5，006 | 5，556 | 5，750 | 6，179 | 5，902 |
| W655to 59 year | 4，119 | 4，314 | 4，853 | 5，398 | 5，597 | 6，022 |
| Why to to 64 years．．．．．．．．．．．．．．．．．．．．．．．．． | 3，587 | 3，791 | 4，102 | 4，632 | 5，166 | 5，369 |
| WSist to 69 years．．．．．．．．．．．．．．．．．．．．．．．．．．． | 2，899 | 3，130 | 3，475 | 3，782 | 4，292 | 4，806 |
| Whto to 74 years．．．．．．．．．．．．．．．．．．．．．．．． | 2，256 | 2，371 | 2，721 | 3，046 | 3，339 | 3，811 |
| 縣絽 to 79 years．．．．．．．．．．．．．．．．．．．．．．．．． | 1，543 | 1，711 | 1，892 | 2，196 | 2，480 | 2，737 |
| 校30 to 84 years．．．．．．．．．．．．．．．．．．．．．．．． | 798 | 922 | 1，148 | 1，287 | 1，511 | 1，724 |
| dest years and ove | 485 | 526 | 659 | 839 | 990 | 1，181 |
|  | 9，758 | 10，352 | 10，754 | 12，283 | 13，704 | 15，308 |


[^0]:    ${ }^{2}$ An estimate of $165,248,000$ for July 1, 1955, was used as the base for the earlier population profection; the revised estimate for this date is $165,270,000$. Hence, part of the difference between the estimated current population and the projected population for July 1, 1958, is due to the revision in the July 1955 estimate.

[^1]:    2 The gross reproduction rate represents the number of daughters a hypothetical cohort of 1,000 women en. tering the childbearing perfod together would bear dur. ing their lives if they were subject to a given set of age-specifle fertility rates and there were no deaths in this cohort between birth and completion of the chlldbearing period.
    ${ }^{3}$ It is recognized, of course, that changes in age. specific rates may vary considerably from one age group to another. Thus, for example, although total fertility (in terms of the gross reproduction rate) in 1955 was about 50 percent greater than in 1940, the changea in rates for specific age groups range from a $77 \%$ percent increase for the 20 m to -24 myear group to a 30 m percent increase for the $35-\mathrm{to}-39$-year group and a decline of about 5 percent for the 40 mtom 44 myear group. On balance, however, when 1940 agemspecific rates are Inflated uniformly by approximately 50 percent and then applied to the 1955 midyear female population 15 to 44 years, by age, the result approximates the actual num ber of births for 1955.

[^2]:    4 See: U. S. Bureau of the Census, Current Population Reports, Series P-20, No. 84, "Fertility of the Population: March 1957," August 1958.

[^3]:    GFor an explanation of these rates, see Pascal K. Whelpton, Cohort Fertility, Native White Women in The United States, Princeton University Press, Prince. Ton, 1954, or Wilison H. Grabill, Glyde V. Kiser, and Fascal K. Whelpton, The Fertility of American Women, Chapter 9, John Wiley and Sons, New York, 1958 .

[^4]:    7 Freedman, Whelpton, and Campbell, op. cit., and P. K. Whelpton and Ronald Freedman, "A Study of the Growth of American Families," The American Journal of Sociology, Vol. 61, No. 6, pp. 595-601, May 1956.

[^5]:    ${ }^{8}$ A description of the base population used for deriving the projected numbers of births employed in developing the Census Bureau population projections shown in tables 1 to 3 is given on page 6 of this report.

[^6]:    ${ }^{9}$ The percent distribution of the popilation in the age group 5 to 9 years old on July 1, 1955 (10 to 14 years on July l, 1960, etc.) is as follows: Age $5=20.5 ;$ age $6=20.6 ;$ age $7=20.6 ;$ age $8=22.2$; age $9=16.1$.

[^7]:    ${ }^{1}$ Period extends from July 1 of initial year to June 30 of terminal year.

