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Methodology for Texas Population Projections

Projections of the Population of Texas and Counties in Texas by
Age, Sex and Race/Ethnicity for 2000-2040
produced by:

Population Estimates and Projections Program
Texas State Data Center
Office of the State Demographer
Institute for Demographic and Socioeconomic Research
The University of Texas at San Antonio

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Introduction

The Texas State Population Estimates and Projections Program's projections of the population of Texas and of each county in Texas were prepared by personnel from the Office of the State Demographer and the Texas State Data Center in the Institute for Demographic and Socioeconomic Research at the University of Texas at San Antonio. These projections, like all projections, involve the use of certain assumptions about future events that may or may not occur. Users of these projections should be aware that although the projections have been prepared with the use of detailed methodologies and with extensive attempts being made to account for existing demographic patterns, they may not accurately project the future population of the State or of particular counties in the State. These projections should be used only with full awareness of the inherent limitations of population projections in general and with particular and detailed knowledge of the procedures and assumptions delineated below which characterize the projections presented in this report.

These projections are of the population of the State and of all counties in the State for each year from 2000 through 2040. They are thus similar in form to those released by the program in previous years (see Texas Population Estimates and Projections Program 2000-2040 released in 2006) but have been revised using post-2000 census and other enhanced data bases. They are by single years of age for ages 0 through 85 years of age and older for males and females in each of four racial/ethnic groups--Anglos, Blacks, Hispanics, and persons from Other racial/ethnic groups. These four groups have been configured so that the total population is the sum of Anglos, Blacks, Hispanics, and persons of Other racial/ethnic groups.

This summary provides a relatively detailed description of the projection methodology and then discusses the bases for, and the assumptions used in, creating the alternative projection scenarios. It concludes with a description of the products available from the projection process.

Projection Methodology

The projections were completed using a cohort-component projection technique. As the name implies, the basic characteristics of this technique are the use of separate cohorts--persons with one or more common characteristic--and the separate projection of each of the major components of population change--fertility, mortality and migration--or each of the cohorts. These projections of components for each cohort are then combined in the familiar demographic bookkeeping equation as follows:

$$P_{t_2} = P_{t_1} + B_{t_1-t_2} - D_{t_1-t_2} + M_{t_1-t_2}$$

Where:

P_{t_2} = the population projected at some future date $t_1 - t_2$ years hence

P_{t_1} = the population at the base year t_1

$B_{t_1-t_2}$ = the number of births that occur during the interval $t_1 - t_2$

$D_{t_1-t_2}$ = the number of deaths that occur during the interval $t_1 - t_2$

$M_{t_1-t_2}$ = the amount of net migration that takes place during the interval $t_1 - t_2$

When several cohorts are used, P_{t_2} may be seen as:

$$P_{t_2} = \sum_{i=1}^n P_{c_i, t_2}$$

Where:

P_{t_2} is as in the equation above

P_{c_i, t_2} = population of a given cohort at time t_2 and

$P_{c_i, t_2} = P_{c_i, t_1} + B_{c_i, t_1-t_2} - D_{c_i, t_1-t_2} + M_{c_i, t_1-t_2}$

Where:

all terms are as noted above but are specific to given cohorts c_i

In this, as in any other use of the cohort-component technique at least four major steps must be completed:

1. The selection of a baseline set of cohorts for the projection area or areas of interest for the baseline time period (usually the last census and for other dates for which detailed base data are available);
2. The determination of appropriate baseline migration, mortality, and fertility measures for each cohort for the baseline time period;
3. The determination of a method for projecting trends in fertility, mortality and migration rates over the projection period;
4. The selection of a computational procedure for applying the rates to the baseline cohorts to project the population for the projection period.

Each of these steps as performed for the Texas State Population Estimates and Projections Program's projections are briefly discussed in the pages which follow.

Selection of Baseline Cohorts

The baseline cohorts used in the projections are single-year-of-age cohorts for males and females of Anglo, Black, Hispanic and Other racial/ethnic groups extracted from the PL94-171 and Summary File data bases from the 2000 Census of Population and Housing (US Bureau of the Census 2001a,2001b). Population data for 2000 were used as the starting base because they provide the last complete count information available.

The development of 2000 Census-based baseline populations is essential if baseline rates of fertility, mortality, and especially migration are to be computed and the projections are to provide meaningful comparisons with population values for past time periods and projections. As described below, ensuring relative comparability of such baseline populations was more difficult than in the past.

The baseline populations for these projections consist of four groups. These are an Anglo, Black, Hispanic, and an Other population group. In general these consist of Non-Hispanic Whites (referred to hereafter as Anglos), Non-Hispanic Blacks or African Americans, Hispanics of all races, and persons in all other non-Hispanic racial groups referred to as the Other population group. However, because the 2000 Census allowed respondents to indicate more than one racial identity decisions had to be made about the classification of persons in 126 race categories (63 racial combinations each for Hispanic and Non-Hispanic ethnic groups). This required an extensive evaluation of several classification alternatives which are described in general terms below. A more complete description of this evaluation is provided in Appendix A.

In general, the results of the 2000 Census showed a relatively small percent of persons in Texas (about 2.5 percent) indicated they were members of 2 or more racial heritages suggesting that most persons (97.5 percent) identified with a single racial group. Similarly, an examination of Hispanic populations indicated that they showed racial identification patterns similar to those in 1990 (i.e. nearly all identified themselves as either White or in the Other racial group).

Given these patterns, Hispanics from all racial groups were placed in the single group of Hispanics of all races. Thus persons in 63 of the 126 categories were classified as Hispanic. Within the 63 non-Hispanic categories, more than 97.5 percent identified themselves as in one of the single racial/ethnic group of: Non-Hispanic White; Non-Hispanic Black; Non-Hispanic Asian; Non-Hispanic American Indian or Alaskan Native; Non-Hispanic Native Hawaiian or other Pacific Islander, or Non-Hispanic Other. Persons in these groups were classified as in previous projections with Non-Hispanic Whites being placed in the Anglo category, Non-Hispanic Blacks in the Black group, and all other persons placed in the Other population group. This allowed for classification of 6 of the 63 Non-Hispanic groups. Forty-two non-Hispanic categories consisted of persons indicating identification with 3 or more racial groups. Given that persons in these 42 groups accounted for less than one-tenth of one percent of the Texas population and that there is no agreed upon procedure for allocating these persons to single racial groups, they were allocated to the Other population category. The above procedures provided for the classification of persons in the 63 racial groupings in the Hispanic category and for persons in 48 of the 63 non-Hispanic racial groupings.

The remaining 15 non-Hispanic categories involved two-race combinations. Persons in the six two-group categories of the combination of base groups with the Other race category were allocated to the Other population category (i.e. that is persons in the American Indian or Alaskan Native and Asian; American Indian or Alaskan Native and Native Hawaiian or Pacific Islander; American Indian or Alaskan Native and Other; Asian and Native Hawaiian or Pacific Islander; Asian and Other; and Native Hawaiian or Pacific Islander and Other groups were allocated to the Other population category). Based on examinations of several alternatives as described in Appendix A and an assessment of other literature on racial/ethnic identification, all two race combinations involving Blacks (including persons who identified themselves as Black and White) were placed in the Black category and the remaining four two-race combinations involving Whites were placed in the White category.

The use of these classifications allowed for the creation of 4 mutually exclusive groups (i.e., Anglo, Black, Hispanic, and Other) that are quite comparable to those used in 1990. However it must be recognized that complete comparability between pre-2000 Census and 2000 Census data is not possible (again see Appendix A).

The potential projection of two other subgroups was examined but a decision made not to include separate projections for these groups in this set of projections. These were an Asian and a multi-race group. They were not included because of the small number of persons in these groups in many counties and, in the case of multiple race groups, a lack of historical data for rate computations. The creation of projections for these groups will be considered for future projections.

It was also necessary to adjust the base population for "special populations". Special populations are populations who reside in an area, usually in institutional settings, who do not generally experience the same demographic processes over time as the indigenous population in the area. Rather, they tend to come into and leave an area at fixed intervals. Examples of such populations are college populations, prison populations, military base populations, and other persons in institutional settings. Because their movement into and out of an area is a function of events (e.g., enrollment, graduation, incarceration) which are not determined by local socioeconomic conditions, special populations must be removed from the base populations of projection areas before birth, death and migration rates are applied to the base population. If special populations of substantial size are not removed, they will create distortions in age and other characteristics of the population that will remain in the population through the cohort aging process and create inaccuracies in the projections. Special populations are, therefore, generally removed from the cohort base, the base cohorts projected forward and a separate projection of the special population for the projection date is added to the projected base cohorts to obtain the projection of the total population.

In Texas, several continuing special population groups are especially large and must be removed from base populations. These are college and university populations, state prison populations, military populations, and populations in other State institutions. In the projections presented here, each of these groups was removed from the base population of the counties in which they are located by subtracting these special populations from the 2000 population reported in the Census for these counties. Since these special populations must be subtracted from base populations that are age, sex and race/ethnicity specific, it was necessary to obtain age, sex and racial/ethnic detail for the special populations. This was done for the college populations by obtaining information on college enrollment for each public college and university in the State for 2007 by age, sex and race/ethnicity from the Texas Higher Education Coordinating Board. For prisons, information on the age, sex and race/ethnicity of prisoners in each institution in 2007 was obtained from the Texas Department of Criminal Justice. For both college enrollments and prisons, the most recent projected values from the appropriate agencies (Texas Higher Education Coordinating Board and the Texas Department of Criminal Justice) for the periods after 2000 were incorporated in the projections. For other institutions, information on age, sex and race/ethnicity were obtained from the group quarters data from the 2000 Census and updated with post-2000 Census data.

Given the distributions of the special populations by age, sex and race/ethnicity, it was then possible to subtract the special populations from the baseline 2000 Census cohorts to obtain a baseline set of cohorts free from the influence of special populations. These procedures for baseline cohorts were completed for all counties in the State. However, following standard practice, special populations were removed from the base population only when they made up five percent or more of the population of the area. For counties with special populations of sufficient size, the baseline cohorts without special populations are projected forward and projections of special populations for the projection years are added to the projections for the baseline cohorts to obtain projections of the total population.

Determination of Baseline Fertility, Mortality and Migration Rates

Baseline rates for fertility and mortality are identical to those used in the 2006 projections as are the migration rates for the 0.0, 0.5, and 1.0 scenarios. However, projection values under the 0.0, 0.5, and 1.0 scenario will differ slightly from those in the 2006 projections because of projected changes in special populations. Therefore, the rates are as described below.

Fertility Rates

Age, sex and race/ethnicity specific fertility rates were computed using births by age, sex and race/ethnicity and place of residence of the mother. The numerators for such rates are the average number of births for 1999, 2000 and 2001 for mothers in each age, sex and race/ethnicity group and the denominators are the population counts by age, sex and race/ethnicity in 2000. Birth data to compute the rates were obtained from the Texas Department of Health and data on women by age (10-49 years) and race/ethnicity were obtained from the 2000 Census of Population. These data showed total fertility rates for Anglos, Blacks, Hispanics and the Other racial/ethnic group in 2000 that were 1.92, 2.05, 2.85 and 1.89 respectively.

Mortality Rates

To obtain baseline mortality measures, survival rates by single years of age, for both sexes and for each of the racial/ethnic groups were needed. Survival rates for Anglos, Blacks, Hispanics, and the Other racial/ethnic category were computed using death data from the Texas Department of Health for 1999, 2000 and 2001.

Migration Rates

Migration is the most difficult component process to project and for which to obtain baseline rates. For the Texas State Population Estimates and Projections Program's projections, rates were derived using a standard residual migration formula. Thus, births and deaths by age, sex and race/ethnicity cohort were added or subtracted (as appropriate) to the 1990 population to produce an expected 2000 and for post-2000 projections expected populations for later periods. This expected population was compared to the actual Census count to estimate net migration for 1990-2000 and subsequently for later post-2000 time periods.

Projection of Trends in Fertility, Mortality and Migration

An examination of post-2000 patterns in 2004 revealed that the projections of future survival rates for persons 75 years of age or older were underestimated and fertility rates for Anglos and Hispanics were assumed to decline too rapidly. These (2008) projections show the same fertility and mortality (survival) rates for future periods as used in the 2004 projections. Long-term target levels remained as in the 2001 projections but fertility and survival levels found to prevail for 2000-2004 were assumed to continue to 2005 and trended linearly after that to targeted levels for 2030 and thereafter.

Projections of Fertility

To project future rates of fertility, county and State-level projections were assumed to follow historical patterns and trends. Trends in fertility were based on 1990 to 2001 trends in fertility. Evaluation of these age and race/ethnicity-specific fertility rates in Texas showed patterns of slightly increased fertility among Anglos from 1990-2000. Rates for Blacks showed a decrease of nearly 14 percent from 1990 to 2000. Hispanics showed a decline of more than 6 percent in fertility from 1990 to 2000. Anglo total fertility rates were 1.80 in 1990 and increased to 1.92 by 2000. The rates of the Other racial/ethnic group decreased from a total fertility rate of 2.04 in 1990 to 1.89 in 2000. The Black total fertility rate decreased from 2.38 in 1990 to 2.05 by 2000. The total fertility rate of Hispanics showed a decline from 3.05 in 1990 to 2.85 in 2000.

Given these patterns and the well established long-term pattern of decline in fertility in other developed nations (Frejka and Kingkade, 2001) and the decline in fertility among Black, Hispanics and Others from 1990 to 2000, rates were trended downward for the projection period with a lower limit set to be equal to the average fertility for low-fertility European counties in 2000, rates many believe are at levels unlikely to be reduced further (Frejka and Kingkade, 2001). For all groups 2000 rates were trended to 2000-2004 levels and were assumed to reach target levels indicated below. For Anglos, the 2000 total fertility rate of 1.92 was assumed to reach the total fertility levels of 1.60 by 2030, and remain at that level for the remainder of the projection period. For the Other population group, fertility is assumed to be reduced to 1.6 by 2030, and remain at that level. Black rates are assumed to show declines from a total fertility rate of 2.05 in 2000 to 1.60 in 2030 and later. Hispanic fertility is assumed to decline from 2.85 in 2000 to 2.35 in 2030, and 2.20 in 2040. Total fertility levels were interpolated for intermediate years between the target years and age and race/ethnicity specific rates for women 10-49 years of age developed for each TFR for each year assuming the age structure of fertility for 2000. This produced State-level age and race/ethnicity specific birth rates for each year from 2000 through 2040.

For the projections reported here, single-years of age, sex and race/ethnicity specific fertility rates and total fertility rates for 2000 were computed for counties using the data and procedures described above. The counties' trends in fertility for the projection period from 2000 to 2040 were then projected by assuming that the county's future fertility would follow the State trend.

Specifically, this involved computing a ratio between the age and race/ethnicity specific birth rate for each age and racial/ethnic group for each county and the comparable State age and race/ethnicity specific birth rate for 1999-2001. This ratio for each age and race/ethnicity specific birth rate for each county was then multiplied by the projected State rate for each of the projection years with the State rates used in the multiplication being those with the trends noted above.

Projections of Mortality

The projections of mortality for the projection period were made with county and state rates being assumed to follow national trends for the projection period and 1999-2001 county and state age, sex and race/ethnicity survival rates being ratioed to national age, sex, and race/ethnicity specific survival rates. The national rates were obtained from the Population Projections Branch of the U.S. Bureau of the Census and reflect recent longterm projections of mortality (Hollmann et al., 2000; U.S. Bureau of the Census, 1996; 2000).

Survival rates were ratioed to the projected survival rates for the Nation. The national projections used show a life expectancy for Anglo males of 73 in 1990, and 81 by 2050. For Anglo females the values were 80 and 86. The values for Black males were 66 and 71 and for females were 74 and 79. The life expectancies for Hispanics were 75 and 81 for Hispanic males and 83 and 87 for Hispanic females. For Others the values were 78 years for males for 1990 and 85 for 2050, and 85 and 91 for females. Life table survival rates for the State and counties for 2000 were ratioed to national rates for 2000 and these rates applied to projected national rates for each year from 2000 through 2040.

Projections of Migration

The migration component is the most difficult to project. For the Texas State Population Projection Program's projections, the age, sex and race/ethnicity specific net migration rates (calculated in the manner described above) were used to arrive at four alternative scenarios (described in the following pages) by systematically altering the assumptions related to the entire set of age, sex, and race/ethnicity specific net migration rates. No attempt was made to develop separate scenarios for specific age groups or to formulate scenarios using different assumptions for each of the racial/ethnic groups.

Special Considerations in the Projection of Component Rates

The computation and projection of fertility and migration rates at the county level is sometimes problematic for counties with small population bases. Given the use of 4 racial/ethnic groups, 2 sexes and 85 age groups, a total of 680 cells of data were employed for each county. In counties with small populations in which either the baseline population used as the denominator to compute rates and/or the number of events used in the numerator (i.e., births or net migrants) was too small to produce reliable and reasonable rates, it was necessary to develop a means of obtaining reasonable rates.

In order to obtain reasonable rates for counties for which problems were identified, rates for larger groupings of areas with characteristics similar to the counties for which alternative rates were necessary were used to develop homogenous groupings of areas. Council of Government Regions and county types within regions were used. All counties within Council of Government (COG) regions were thus divided into four groups-- metropolitan central city counties, metropolitan suburban counties, nonmetropolitan counties that are adjacent to metropolitan counties, and nonmetropolitan counties that are not adjacent to metropolitan counties. The rates for these groupings were used because analyses across time have indicated that the rates for these 4 types show substantial homogeneity across areas within each grouping but substantial differences among the groupings. Rates were completed for each of these four county types within each region and for the four types for the State as a whole (by using the aggregate populations of counties within each type within each region and/or the total State population by type).

For counties with problematic rates, rates for the county type of which the county was a member for the COG region where the county was located were substituted only for the problematic rates for those age, sex, and race/ethnicity groups for which the rates computed with the county's own population data were deemed to be problematic. For a few regions for a few racial/ethnic groups, even the COG rates were problematic. In such cases, the State rate for the county type was substituted for the county rate. Finally, in a very few cases even the state-level status was not acceptable and the overall state rate for the racial/ethnic group was used. It is important to stress that this procedure does not result in the rates for all age and sex groups for a given racial/ethnic group being replaced by regional or State averages. Rather, replacements are made for only those rates for age, sex, and racial/ethnic cohorts within counties which had problematic values. Thus, county-level differentials in demographic patterns are maintained in the population projections.

Counties were deemed to have unreasonable age-specific fertility rates if they exceeded the mean rates for an age race/ethnicity group for the county type of which they were a part by more than two standard deviations or were greater than 25 percent for any single year for any age, sex and race/ethnicity group. State-level age specific fertility rates for the county types were used for substitutions for fertility because of instability even in COG level rates. In addition, data on the fertility levels of women in the Other group indicated that only a few counties had age-specific rates that were sufficiently stable to be used in the projections. For all other counties, the age and race/ethnicity specific rates used for the Other racial/ethnic group were the State-level age, sex and race/ethnicity specific rates for the Other race/ethnicity group.

Migration rates are more variable across areas such that the use of means was not possible and would have improperly altered rates for rapidly and slow growing areas. Limits were used instead of statistical means. These limits were based on the upper and lower limits seen as feasible for migration. Unreasonable migration rates were designated as those in which per-person-per-year rates were 0.10 or greater (a rate that allows up to 10% migration per single-year age group per year). Since migration rates can have either positive or negative values, this allowed migration rates to vary between 0.10 and 0.10 per-person-per-year for each age, sex and race/ethnicity cohort. The counties identified as having problematic fertility and/or migration rates were largely nonmetropolitan, most with relatively small populations.

Although the procedure described above was generally adequate for rate adjustments, for some counties the migration rates were problematic in yet another manner. The use of historical rates often resulted in substantially higher rates of net migration for one sex than the other. Such an imbalance cannot be expected to continue over the entire projection period. The ratio of male rates relative to female rates for each age was examined by computing means for each ratio and analyzing standard deviations for such means. From this analysis, it was decided that a ratio greater than 2 should result in a replacement of the migration rate. Given this, rates were adjusted to be no larger than twice the ratio of male to female rates or visa versa at the COG and State levels within county types for the same age, sex, and race/ethnicity group (i.e., metropolitan central city, metropolitan suburban, nonmetropolitan adjacent, and nonmetropolitan nonadjacent). If the ratio of male to female migration rates for a county of a given type for any age exceeded this limit for the COG type, its rate for that age, sex, and race/ethnicity was replaced with that for the county type for the COG. If the COG's rate for the county type was still problematic, the rate for that county type for the State as a whole was substituted for the county rate. Again, as for fertility and mortality rates, for a very few rates for a few areas even state-level county-type specific rates were unacceptable and state-level rates by age, sex, and race/ethnicity were used. The use of this procedure resulted in substantially more balanced sex ratios in the final projections.

The Computation and Selection of Future Projection Scenarios

In this section, both the assumptions underlying the projection scenarios and the final computational procedures are described. For both, the emphasis is placed on the logic underlying the scenarios and procedures rather than on the detailed computational processes. Those interested in greater detail may consult several readily available references on the subject (Murdock et al., 1987; Pittenger, 1976; Murdock and Ellis, 1991; Smith, Tayman and Swanson, 2001) or may contact the personnel involved in the Projection Program in the State Demographer's Office in the Institute for Demographic and Socioeconomic Research at the University of Texas at San Antonio.

The Projection Scenarios

Four projection scenarios which produce four alternative sets of population values for the State and each county are presented in these projections. These scenarios assume the same set of mortality and fertility assumptions in each scenario but differ in their assumptions relative to net migration. The net migration assumptions made for three scenarios are derived from 1990-2000 patterns which have been altered relative to expected future population trends. This is done by systematically and uniformly altering the adjusted (as noted above) 1990-2000 net migration rates by age, sex and race/ethnicity. The scenarios so produced are referred to as the zero migration (0.0) scenario, the one-half 1990-2000 (0.5) scenario, and the 1990-2000 (1.0) scenario. The fourth scenario uses 2000 to 2007 estimates of net migration with the 2007 population values being taken from the Texas State Data Center age, sex and race/ethnicity estimates.

The Zero Migration (0.0) Scenario

The zero scenario is a scenario which assumes that immigration and outmigration are equal (i.e., net migration is zero) resulting in growth only through natural increase (the excess or deficit of births relative to deaths). This scenario is commonly used as a base in population projections and is useful in indicating what an area's indigenous growth (growth due only to natural increase) will be over time. In general, this scenario produces

the lowest population projection for counties with historical patterns of population growth through net immigration and the highest population projection for counties with historical patterns of population decline through net outmigration.

The One-Half 1990-2000 Migration (0.5) Scenario

This scenario has been prepared as an approximate average of the zero (0.0) and 1990-2000 (1.0) scenarios. It assumes rates of net migration one-half of those of the 1990s. The reason for including this scenario is that many counties in the State are unlikely to continue to experience the overall levels of relative extensive growth of the 1990s. A scenario which projects rates of population growth that are approximately an average of the zero and the 1990-2000 scenarios is one that suggests slower than 1990-2000 but steady growth.

The 1990-2000 Migration (1.0) Scenario

The 1990-2000 scenario assumes that the trends in the age, sex and race/ethnicity net migration rates of the 1990s will characterize those occurring in the future of Texas. The 1990s was a period characterized by rapid growth. It is seen here as the high growth alternative because its overall total decade pattern is one of substantial growth (i.e., 22.8% for the 1990-2000 decade for the State). Because growth was so extensive during the 1990s it is likely to be unsustainable over time and thus this scenario is presented here as a high growth alternative. For counties that experienced net outmigration during the 1990s, this scenario produces continued decline.

The 2000-2004 Migration Scenario

The 2000-2004 migration scenario was produced in 2006 and takes account of migration trends between 2000-2004. Because migration in the 2000-2007 period was influenced by the one-time event of substantially elevated migration after Hurricane Katrina struck the Central Gulf Coast in 2005, The Office of the State Demographer has decided to retain the 2000-2004 migration scenario as an alternative to the 2000-2007 scenario that may more accurately convey trends in the state and in impacted counties in the first decade in the century. An analysis of substantial differences between the two scenarios will be posted on this website shortly.

The 2000-2007 Migration Scenario

The 2000-2007 projection scenario provides a scenario that takes into account post-2000 population trends. In the State overall and in some counties the post-2000 period has resulted in reduced levels of net migration. In other counties post-2000 net migration rates have been greater than those of the 1990s. Under this scenario the 2000-2007 age, sex and race/ethnicity specific migration rates are assumed to prevail from 2000 through 2040. This scenario allows those users who believe that the 2000-2007 period has produced fundamental long-term changes in population patterns to ascertain the likely future size and characteristics of the population.

Computation of Future Populations

Given the projected rates and scenarios noted above, the computation of the projected population was completed using standard cohort-component techniques as described above with all computations being completed on an individual year and age basis for each sex and racial/ethnic group. Base population values for 2000 were used as the starting values and populations were projected for each year from 2001-2040. Because of the need to ensure that the sum of county projections produces reasonable future populations for the State as a whole, the State's future population by age, sex and race/ethnicity was first independently projected under each of the scenarios described above. County base cohorts were projected to the projection date and projected special populations added to the projected base populations for the appropriate counties. Projected populations of colleges and universities for future years were taken from projections by the Texas Higher Education Coordinating Board (2007), values for existing prison populations and correspondence concerning plans for future prison facilities were acquired as of August 2008 from the Texas Department of Criminal Justice. All other institutions were maintained at 2000 levels as indicated in the 2000 Census. The State-level projections were then used as control totals for the sum of county projections for each age, sex and racial/ethnic group. The projections so produced and controlled for each scenario are those provided here as projections of the population of the State and of each county in the State.

Recommended Scenario

Many users want to know which projection scenario to use for various forms of analysis and thus we generally recommend a specific scenario for use in most counties. At the same time, it is important to note that other scenarios may be more appropriate for a given county for a given period of time.

From our analyses of these projection scenarios, we believe that the 0.5 scenario continues to be the most appropriate scenario for most counties for use in long-term planning. This recommendation is made for several reasons.

First, the 1990-2000 period was one of expansive growth in the Texas economy. The early years of the 21st century have been far more varied. A general slowdown in the U.S. and Texas economies between 2000 and 2005 slowed population growth in many parts of the state. Between 2005 and 2008, Texas again became a national leader in both job and population growth. The Texas economy performed exceptionally well as the nation's economy faltered in 2007 and early 2008, contributing to high rates of domestic in-migration to the state in these years. At this writing in December 2008, the immediate future of job growth and consequent population growth is far from clear. It seems unwise to use the rapid growth of the 1990s as the baseline for the future given this evidence of more erratic growth in the post-census period.

Second, the 2000 Census count showed a substantially larger U.S. and Texas population than was anticipated. One of these reasons was an apparent small net overcount of total population in census 2000, compared to a net undercount in the 1990 Census (U.S. Bureau of the Census 2003). Since residual migration measures assign coverage improvement to the migration component, it is likely that the migration rates for some groups, for some periods, and for some counties for the 1990 to 2000 period are too high. This consideration would suggest the advisability of use of a more moderate rate of growth scenario than the 1.0 scenario.

Third, although the scenarios use trends in births and deaths, they assume constant levels of migration. Such an assumption is used because of the lack of historical data of sufficient specificity to trend these rates over time. Our analyses of such rates suggest that it is unlikely that such trends (especially in some key groups) will continue at the level of the 1990s. At the same time, the overall direction of trends and differences among racial/ethnic groups seem likely to continue suggesting the need for the use of a scenario that is based on 1990-2000 trends in migration but shows slower growth--the 0.5 scenario.

As noted above, we recommend the 0.5 scenario for the long-term planning purposes for which these projections are produced. However, for those who intend to use the projections for relatively short-term (i.e., 3-10 year) planning purposes or who believe that the more recent period is indicative of long-term trends, either the 2000-2004 or the 2000-2007 scenario may be preferable.

The 2000 to 2004 scenario derives its migration factors from population trends from a period of relatively slow job growth in many areas of the state. For the period from 2004 to 2007, by contrast, domestic migration to the state was relatively strong, reflecting the influence of both the generally robust employment growth in the state in this period, and increased migration from the Gulf Coast states impacted by Hurricane Katrina after August 2005. Katrina-related migration led to modest increases in population in the state, particularly in the largest metropolitan counties of Harris, Dallas, and Bexar. Precise storm-related impacts are difficult to quantify and localize. The impact of migration factors influenced by Katrina-induced population growth on the later years of the 2000-2007 scenario compared to the 2000-2004 scenario on these counties may be substantial. The 2000-2004 scenario may be considered as an alternate to the 2000-2007 scenario where a shorter-term projection is needed.

Data Available from the Projections

The data produced in the process of completing the projections presented here and the data summarizing the projections themselves are extensive. The amount of data available for the State and each of 254 counties for three scenarios of growth, for each year from 2000 through 2040 for each of 85 age groups for 2 sexes and 4 racial/ethnic groups is too voluminous to be provided in its entirety in printed form. Thus, data are provided in several different forms to address the needs of different user groups.

This publication describes the projection methodology and provides several appendices showing the base populations for the State for 2000, and the base rates for fertility, mortality and migration for 2000 for the State. Due to the volume of data involved, rates for other years and areas will be provided only on request.

Because of the volume of data, printed data are provided only on request. The fully detailed projections of the population in each age, sex and racial/ethnic group for each county and the State for each year from 2000 through 2040 are available in electronic forms for the State and all counties in the State.

To obtain the printed copy of this report or to obtain computerized forms of the data users should contact:

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All data are available on a cost-recovery basis.

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Appendices

- **Appendix A:**
Comparing Race/Ethnicity Between the 2000 Census and Earlier Censuses
- **Appendix B:**
Baseline Population Rates by Age, Sex and Race/Ethnicity for 2000 for the State of Texas
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- **Appendix G:**
Baseline Migration Rates (per person per year) by Age, Sex and Race/Ethnicity for 2000-2007 for the State of Texas

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