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Population Projection Methodology

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I. INTRODUCTION

This monograph is an explanation of the methods and procedures employed in generating Ohio's population projections. The report includes the decisions made in data collection, projection method, as well as fertility, mortality, and migration assumptions.

All input data -- base year population by age/sex, institutional population by age/sex, age-specific fertility rates by county, census survival rates by county, estimated and projected migration rates and age/sex proportion of migration by county -- were calculated and prepared using Microsoft Excel® software.

The projections were completed using Microsoft Excel software. All calculations and output were generated on a main template spreadsheet, with input data supplied from individual county files (see Appendix 2). The state level projections were accomplished by aggregating the 88 county projections as the control total, and then performing the state level projection, constraining the calculation results to the control total.

The resulting projection figures are incorporated in Population Projections for Ohio and Counties by Age and Sex: 2010 to 2040. The projection and input files are available at the Ohio Department Services Agency web site at www.development.ohio.ohio.gov/research. Hard copies are available also, for the cost of the diskettes. Also available on the website, in print and diskette are: (1) projected numbers of births, deaths, net migration by sex, and projected sex-specific natural and net increase rates (Appendix 3); (2) projected age-specific birth and fertility rates (Appendix 4); (3) projected age/sex-specific migration numbers and rates (Appendix 5). All of the above information is available by county.

II. METHODOLOGICAL OVERVIEW

Projection Model

Populations of 2010-2040 for the State of Ohio and its 88 counties were projected using a demographic based cohort-component projection model. The basic logic of this model is that future population is a function of present (baseline) population plus the three components of demographic change: births, deaths, and migration. Computations are carried out individually to reflect variations in birth, death, and migration rates for each cohort. The base formula used in the projection model to express this function is:

$$\text{Population}^{t+5} = \text{Population}^t + {}^{t+5}\text{Birth}^t - {}^{t+5}\text{Death}^t + {}^{t+5}\text{Net Migration}^t$$

Where t = time, in years.

The birth component is calculated by multiplying the base-year female population age 15-19 through 40-44 by the projected Age-Specific Fertility Rates (ASFRs), summing the six products (six female age groups), then multiplying by five (the period of the projection is five years). The result of this calculation is the number of births projected to occur over the projection period.

The death component is calculated by multiplying each age/sex specific baseline-year cohort population by the projected five-year survival rate. This calculation results in the number of survivors of that cohort to the projected year.

The actual number of projected deaths can be calculated, then, as the difference between the base population minus the survived (or expected) population, although number of deaths do not enter directly into the calculation of projected population.

The migration component is calculated for each county by multiplying the expected population by the appropriate projected county total net migration rate.

The county total net migration rates are projected based on the historical (1970-2010) net migration rates, as well as the most recent (2000-2010) gross migration trend from Internal Revenue Service (IRS) migration data. Both migration data sets are available by county.

The county age/sex-specific migrants are calculated by multiplying each county's 2000-2010 age/sex proportionate rates of migration by the appropriate projected county total net migration.

Use of the following formulas are explained and documented in the following text.

a. Projected Sex-Specific Population Aged 0-4 Years Old:

$${}_4\hat{M}_0^{y+5} = (B^t * 0.51115) * {}_4S_0^t * (1 + {}_4M_0^t)$$

$${}_4\hat{F}_0^{y+5} = (B^t * 0.48885) * {}_4S_0^t * (1 + {}_4M_0^t)$$

Where,

${}_4\hat{M}_0^{y+5}$ and ${}_4\hat{F}_0^{y+5}$ are the projected male and female populations 0-4 years old in the projected year **y+5**;

B^t is total births in the 5-year time interval t ;

${}_4S_0^t$ is the survival rate for persons age 0-4 (by sex) in the 5-year time interval t ;

${}_4M_0^t$ is the net migration rate for persons 0-4 years old (by sex) in the 5-year time interval t ;

0.488 is the ratio of male-to-total births; and,

0.512 is the ratio of female-to-total births (birth ratios based on Ohio live births, 2000-2010).

b. Projected Population Age 5-84 Years Old:

$${}_5\hat{P}_{i+1}^{y+5} = {}_5P_i^y * {}_5S_i^t * (1 + {}_5M_i^t)$$

Where,

${}_5\hat{P}_{i+1}^{y+5}$ is the projected population of 5-year age interval $i+1$ (by sex), in the projected year $y+5$;

${}_5P_i^t$ is the population of 5-year age interval i (by sex), in year y ;

${}_5S_i^t$ is the survival rate for persons in the 5-year age interval i (by sex) for the 5-year time interval t ;

${}_5M_i^t$ is the net migration rate for persons in the 5-year age interval i (by sex) for the 5-year time interval t .

c. Projected Population Age 85 and Over:

$${}_{\infty}P_{85}^{y+5} = ({}_5P_{80}^y + {}_{\infty}P_{85}^y) * {}_{85}S_{80}^t * (1 + {}_{\infty}M_{85}^t)$$

Where,

${}_{\infty}P_{85}^{y+5}$ is the projected population age **85 and over** (by sex) in the projected year $y+5$;

${}_5P_{80}^y$ and ${}_{\infty}P_{85}^y$ are the total populations age **80-84 and 85 and over** (by sex) in year y ;

${}_{85}S_{80}^t$ is the survival rate for age group 80 and over surviving to 85 and over in the

5-year time interval t (by sex);

${}_{\infty}M_{85}^t$ is the total net migration rate for persons age **85 and over** (by sex) in the five-year time interval t.

Appendix 1 shows a flow chart describing the population projection procedure in its entirety.

Deriving Base-Line Rates

Several tests were done at the state level to determine which fertility and mortality rates should be used in this projection series.

Projected 2000-2005 and 2005-2010 county births were forced to align with the 2000-2005 and 2005-2010 registered county births recorded with the Ohio Department of Health (Appendix 6). This was accomplished by adjusting the projected fertility rates until the projected births matched the registered births. The result showed that, for obtaining a better match between the projected and registered births, a linear extrapolation of the Age-Specific Fertility Rates (ASFRs) for 2000-2005 and 2005-2010 could be used to derive projected ASFRs and Total Fertility Rates (TFRs). Therefore, this linear method was used for most of the counties. However, for eleven counties, a percent adjustment was made to the linear extrapolations to get projected ASFRs and TFRs. Those eleven counties are: Clinton, Geauga, Paulding, Preble, Licking, Lawrence, Warren, Mercer*, Meigs*, Noble*, and Van Wert* counties. In the counties with “*”, the percent adjustment was used for only part of the age groups or part of the projected years. The state level projected ASFRs and TFRs were used for the counties of Athens, Franklin and Wood.

Projected 2000-2005 and 2005-2010 county deaths were forced to align, respectively, with the 2000-2005 and 2005-2010 registered county deaths, recorded with the Ohio Department of Health (Appendix 7). The projected deaths were calculated by different survival rate methods, such as the census survival rate method and the life table survival rate method. By comparing the projected deaths with the registered deaths, the census survival rate method was chosen because of the better match.

Projected 2005 and 2010 state populations were forced to align, respectively, with 2005 estimates and 2010 Census county population counts produced by the U.S. Bureau of the Census (see Appendix 8). This was accomplished by using different migration rates until the projections matched the state total estimate and census population counts. By comparing the projected population with the estimate and census population, a projected migration model which combined the historical migration rates and the last ten years' (2000-2010) IRS migration trends was chosen because of the better match.

Projecting future trends of these three components from the base year (2010) is an important aspect of the methodology. Assumptions concerning fertility, mortality and migration trends at both state and county levels are discussed separately in this report.

III. BASE AND INSTITUTIONAL POPULATIONS

Base Population

The base year for the population projections is 2010. Specifically, the base time is April 1, 2010 - the official day of the census enumeration. All projected figures stem from that date.

Five-year age cohorts by sex, ranging from 0-4 years of age to 80-84 and 85+ at the county level were drawn from the 2010 Census of Population and Housing, Summary File 1 {Source: Census of Population and Housing, 2010: SF 1 (Ohio) [machine-readable data files] / prepared by the Census Bureau. Washington, D.C.: the Bureau [producer and distributor], 2011. Tables P12, P12A, P12B, PCT13, PCT13A & PCT13B}.

Institutional Population

The calculation of sub-state projections customarily requires special treatment of institutional populations such as universities, prisons and military installations. It is important to separate these institutional populations from the county residents, since their fertility and migration patterns are vastly different.

These special populations usually are replaced periodically by other individuals of the same age group. For this reason, it is expected that the age and sex composition of these groups will remain approximately the same over the projected period. Not isolating the populations in these institutions would pose several problems:

1. If these individuals are “survived” – i.e., survival rates applied to them so as to age them to the subsequent age group, as they are to county residents, an inaccurate migration and cohort population would result in the next projected period for the subsequent age cohort;
2. Applying standard fertility rates to female university students would produce unrealistically high county birth figures, since births to students are relatively rare.

To circumvent these potential errors, institutional populations of each county were extracted from the 2010 Census counts by age and sex. These populations subsequently were projected separately from the resident population. After calculating mortality, fertility

and migration for the county resident population, the institutional populations were added into the county populations by age and sex for each projected period. The assumption was that these groups will remain consistent in age/sex structure composition, unlike the general population.

Projected Institutional Population

The projection of institutional populations within a context of an aging population presented a problematic situation. Institutional populations, to a certain extent, reflect the age structure at that point in time. In 2000, the population most “at risk” of being a student, inmate, or member of the Armed Forces (18-24 years old) was disproportionately large, commonly known as the "baby boom" population. Over the projected time period, this population is replaced by a significantly smaller population.

On the other hand, more recent population information indicates a higher or lower institutional participation rate of the population at risk. The state total institutional population has increased or decreased. To average both the influences of aging and the increasing institutionalization rate, two assumptions were made, as follows:

1. The projected institutional populations would remain at the 2010 proportionate rates of institutional population to county population, by age and sex, but would not remain at the 2010 proportionate numbers of institutional population to county population, by age and sex. These proportionate rates were applied to the county-level projected populations at each five-year time interval to derive county total institutional population by age and sex. This assumption will result in more projected institutional persons for older age groups than for younger age groups because of the aging of the population.

2. The increased or decreased of the institutional population will be decided by the change of the institutional population between 2000 and 2010 by each county for each five year period throughout the projection period. This assumption would allow for increasing/decreasing institutional populations in the future.

The following is the formula to project and add the institutional population into the total population by age/sex:

$${}_5TP^{y+5}_i = {}_5UGQ^{y+5}_i + GQ^{2010} * \chi^n * {}_5GQP0^{00-10}_i$$

Where,

${}_5TP^{y+5}_i$ is the projected total population for the year **y+5** and the 5-year age group *i*, where **y** can take a value from 2010 to 2035 and *i* can take a value from 0-4 to 80-84 age group;

${}_5UGQ^{y+5}_i$ is the projected population without institutional population for the year **y+5**

and the 5-year age group i ;

GQ^{2000} is the total institutional population for the year 2000;

x is the rate of change in institutional population for each projection period; and

n represents the number of the projection period, which can change from 1 to 6;

${}_5GQP^{90-00}_i$ is the proportion of institutional population for each age/sex group to the total for the time period 2000-2010.

IV. FERTILITY

Fertility Assumptions

Generally speaking, the fertility trend for Ohio from 2000 to 2010 increased slightly in total fertility rates (total fertility rate of 1,954 for 2000-2005 and 1,972 for 2005-2010). This slight increase is due to countervailing increases in fertility rates for the 25-29, 35-39 and 40-44 age groups, and declines in the fertility rates for the female age groups 15-19, 20-24 and 30-34 (See Table 1). As a result, Ohio's fertility rates were projected to increase slightly for the entire 2010 to 2040 projection time frame. Ohio's total fertility rate (births per thousand women age 15 to 49) is projected to increase from 1,981 (2010-2015) to 2,027 (2035-2040) (see Table 1).

TABLE 1

ESTIMATED & PROJECTED AGE-SPECIFIC
FERTILITY RATES AND TOTAL FERTILITY RATES:
OHIO, 1980-1985 TO 2035-2040

AGE	ESTIMATED ASFR			PROJECTED ASFR				
	00-05	05-10	10-15	15-20	20-25	25-30	30-35	35-40
15-19	0.040	0.039	0.038	0.038	0.038	0.037	0.037	0.036
20-24	0.107	0.103	0.101	0.098	0.096	0.094	0.092	0.089
25-29	0.112	0.118	0.122	0.125	0.128	0.132	0.135	0.139
30-34	0.090	0.089	0.089	0.088	0.088	0.087	0.087	0.086
35-39	0.035	0.038	0.039	0.040	0.042	0.043	0.044	0.046
40-44	0.007	0.007	0.008	0.008	0.008	0.009	0.009	0.009
TFR	1,954	1,972	1,981	1,990	1,999	2,009	2,018	2,027

Data source: Ohio Development Services Agency, Office of Research (JH),
P.O. Box 1001, Columbus, Ohio 43216-1001, March, 2013

The projected total number of Ohio births, however, will increase from 704,313 (2010-2015) to 731,079 (2035-2040) due, in large part, to the assumption that the relatively large female cohort comprised of the children of the “baby boomers” – commonly referred to as the “baby boomlet”-- will continue the recent trend of delaying childbearing until into their thirties. Table 2 below shows Ohio's five year total births and age-specific births over the projected years.

TABLE 2
PROJECTED FIVE-YEAR TOTAL & AGE-SPECIFIC BIRTHS:
OHIO, 2010-2015 to 2035-2040

AGE	10-15	15-20	20-25	25-30	30-35	35-40
15-19	71,133	68,608	65,796	66,254	66,472	67,271
20-24	177,317	178,981	169,495	164,256	167,530	164,218
25-29	217,905	220,797	232,156	231,933	237,505	251,893
30-34	152,760	156,497	154,234	156,799	151,435	151,224
35-39	70,351	69,014	73,628	75,429	79,624	79,846
40-44	14,846	14,398	14,193	15,231	15,691	16,628
TOTAL	704,313	708,294	709,503	709,902	718,257	731,079

Data source: Ohio Development Services Agency, Office of Research (JH),
P.O. Box 1001, Columbus, Ohio 43216-1001, March, 2013

Age-specific fertility rates (ASFR) are used in this series to project future birth rates and births. ASFRs are determined for each five-year female age group between 15-19 to 40-44, and are calculated by dividing the number of live births to women in the appropriate five-year age groups by the number of females within that age group.

A linear extrapolation based on the ASFRs of 2000-2005 and 2005-2010 was used to produce projected ASFRs:

Estimated ASFRs: ${}_{x+5}ASFR_x^t = {}_{x+5}B_x^t / {}_{x+5}F_x^t$

Projected ASFRs: ${}^5_{x+5}ASFR_x^t = {}^{05}_{x+5}ASFR_x^{00} * [1 + ({}^{10}_5ASFR_x^{05} - {}^{05}_5ASFR_x^{00}) / 2 * n]$

Where,

ASFR is the age-specific fertility rate;

x and x+5 is a five-year female cohort beginning with initial age x, to x+5;

t is time in single years;

${}_{x+5}B_x^t$ is the average number of births to a stationary female five-year age cohort (e.g., average births [${}_{x+5}B_x^t$] to females 20-24 years old in the time period 2000-05 is the average of births to females 20-24 years old in 2001, 2002...2005);

F is the female population within the five-year age cohort;

${}^{95}_{i+5}ASFR_x^{95}$ and ${}^{95}_{x+5}ASFR_x^{90}$ are single-year age-specific fertility rates for the years 2005-2010 and 2000-095 by county;

n is the number of projection periods from 2010, 1 being 2015, 2 being 2020, etc..

The 2005-2010 ASFRs were used for the entire projection period for eleven counties: Clinton, Geauga, Paulding, Preble, Licking, Lawrence, Warren, Mercer*, Meigs*, Noble* and Van Wert*. The 2005-2010 ASFRs for were used for part of female age groups or part of the projected years for the last four counties with the “*”. The 2005-2010 ASFRs for these counties were so high that a decision was made not to allow them to increase further. The state level ASFRs were used for the counties of Athens, Franklin and Wood because the option to remove an unquantifiable number of 15 to 24 year-old females, in order to bring the ASFRs to reasonable values, may have been more problematic.

Appendix 9 shows the estimated ASFRs and TFRs for the periods 2000-2005, while Appendix 10 shows the 2005-2010 by county.

Total births for each five-year period can be projected based on the projected ASFRs and the female populations of each childbearing age group:

$${}^{t+5}B^t = {}^{t+5}_{49} \acute{O}_{15}^t [({}^{t+5}_{x+5}ASFR_x^t * 5 * {}_{x+5}F_t^y)]$$

Where,

${}^{t+5}B^t$ is the total projected births for the five-year time interval **t**;

${}^{t+5}_{49} \acute{O}_{15}^t$ is the sum of births for each female childbearing age group (15-19 to 45-49) in the five-year time interval **t**;

${}^{t+5}_5\text{ASFR}_x^t$ is the single-year age-specific fertility rate for females age x to $x+5$ in the projected five-year time interval t ; and

${}_5F_i^y$ is the female population within the five-year age cohort i in year y ;

multiplication by 5 translates single-year ASFRs to five-year ASFRs.

The input data used to derive county-level ASFRs for 2000-2005 and 2005-2010 include:

1. April 1, 2000 to March 30, 2005 and April 1, 2005 to March 30, 2010 live births, by age of mother, and her county of residence (Ohio Department of Health, 2000 to 2010). County births for 2000-05 are registered counts. All of the registered births were assigned according to the county of the mother's residence as opposed to the county of birth (Ohio Department of Health). This safeguards against over-representation in urban counties with hospitals serving neighboring rural county clients. Although occurring in Ohio, births to mothers who are residents of other states are excluded from the resident data; while births and deaths in other states, of Ohio residents, are included;
2. 2000 Census counts of females and group quarter populations, by county and age groups between 15 and 44 years (STF2B, Ohio, 2000, U.S. Bureau of the Census);
3. 2010 Census counts of females and group quarter populations, by county and age groups between 15 and 44 years (SF 1, Ohio, 2010, U.S. Bureau of the Census);
4. Estimates of females by county and age groups between 15 and 44 years old, for the years 2000-05 (National Cancer Institute Experimental County Estimates: 2000 to 2005, U.S. Bureau of the Census).

Female group quarter populations 15 to 44 years old for the 2000-2005 time period were estimated as the average of 2000 and 2010 census group quarters, then removed from the 2000-20055 female populations for the purpose of calculating ASFRs for 2000-2005 and 2005-2010.

V. MORTALITY

Mortality Assumptions

In this projection series, age-specific survival rates (ASSR) for 2000-2005 were calculated for each individual county based on recent death and population information. The county ASSRs for 2000-2005 were then used to project deaths for each county over the projection period. County-specific 2000-2005 national census survival rates were used for each projection period because these rates are more recent and, therefore, may reflect future survival rates better than survival rates taken from an earlier period.

Using the 2000-2005 national census survival rates produces generally lower death rates than using life table survival rates over the next 25 years. These lower mortality rates produce larger expected population numbers, especially for the age group 65 and over, given a non-mobile population. Since Ohio infant mortality rates presently are substantially lower than the national average, there is not as much difference in the initial and terminal survival rates for persons 0-4 years old as might otherwise be expected. Although the 2000-2005 national census survival rates are higher than 2000 life table survival rates, the total number of deaths for the state will increase somewhat during the projection period simply because of the growing elderly population. The projected total number of deaths for the state is 616,852 for 2010-2015 and goes up to 808,158 for 2035-2040.

2000-2005 Revised Census Survival Rates

Projected mortality is measured inversely as survival rates. The most recent survival rates available were put into the projection program to calculate the mortality component. Survival rates express survival from a younger age to an older age and, therefore, are defined in terms of two ages, hence two time references--the initial age and date and the terminal age and date. For example, the expected population of persons 5-9 years old in 2010 is the product of persons 0-4 years old in 2005 multiplied by the 5-year survival rate for persons 0-4 years-old. The term "expected population" refers to the number of survivors in a stationary, or non-mobile, population. The most common form of survival rate employed in population studies is a 5-year age group and a 5-year time period. The general formula used to derive expected populations is:

$${}_{x+5}E_x^{t+5} = {}_xP_{x-5}^t * {}_xS_{x-5}^5$$

Where,

${}_{x+5}E_x^{t+5}$ = expected population of the five-year age cohort, ages x to x+5, in projected year t+5;

${}_xP_{x-5}^t$ = the 5-year age cohort, ages x-5 to x, in initial year t;

${}_xS_{x-5}^5$ = the five-year survival rate for the 5-year age/sex cohort, ages x-5 to x.

There are two ways to calculate survival rates (Shryock, 1976). One method is called Life Table Survival Rates and uses life table functions to produce survival rates:

Life Table Survival Rates: ${}_5S_x^5 = {}_5L_{x+5} / {}_5L_x$

For the population 85 and over, the **T** function of the life table is used:

$${}_5S_{80}^5 = {}_{\infty}L_{85} / {}_{\infty}L_{80}$$

Where **L** is a life table function which represents the number of person-years that would be lived within the indicated age interval; **T** is a life table function also and represents the total number of person-years that would be lived after the beginning of the indicated age interval; and **S** is the survival rate which expresses survival from a younger age to an older age.

A complete life table readily permits calculation of survival rates. The 1990, 2000 and 2010 survival rates were calculated by sex and five-year age group from 1990, 2000 and 2010 Ohio life table L_x functions (see Appendix 11). All the Life Tables were constructed using the method suggested by T.N.E. Greville (Shryock and Siegel, 1973: 444-445). In the application of this method, the following definitions are used:

(1) ${}_4m_0$ = Deaths Infant / Births

Elsewhere: ${}_5m_x = {}_5\text{Deaths}_x / {}_5\text{Population}_x$

(2) ${}_4q_0 = {}_4m_0$

${}_{\infty}q_{85} = 1.000$ elsewhere,

${}_5q_x = ({}_5m_x) / [1/n + {}_5m_x * (0.5 + n / 12 ({}_5m_x - 0.095))]$

(3) ${}_4l_0 = 100000$

Elsewhere: ${}_5l_x = {}_5l_{x-5} - {}_5d_{x-5}$

(4) ${}_5d_x = {}_5q_x * {}_5l_x$

$$(5) {}_5L_x = [({}_5l_x + {}_5L_{x-5}) / 2] * 5$$

Elsewhere: ${}_∞l_{85} = {}_∞d_{85} / {}_∞m_{85}$

$$(6) {}_5T_x = {}_5T_{x-5} + {}_5l_x$$

Where **x to x+5** is the period of life between two exact ages -- for instance, "20-25"; **q** represents the probability that a person at his **xth** birthday will die before reaching his **x+5th** birthday; **l** is the number of persons who reach the beginning of the age interval each year; **d** is the number dying during the age interval; **L** is the number of person-years that would be lived within the indicated age interval; **T** is the total number of person-years that would be lived after the beginning of the indicated age interval.

A second series of survival rates, called national census survival rates, employs life table concepts, but does not involve the actual use of life table functions in their calculation. National census survival rates essentially represent the ratio of the population in a given age group in one census to the population in the same age cohort at the previous census. National census survival rates measure mortality, but the population involved must be a closed one, i.e., there is no migration during the intercensal period.

For the purpose of this study, revised national census survival rates were produced. The step-by-step procedures for this method follow:

$$(1) Est^{2005}_x = Population^{2000}_x + {}^{2005}Birth^{2000}_x - {}^{2005}Death^{2000}_x$$

where $Population^{2000}_x = Census^{2000}_x - GQ^{2000}_x$

$$(2) {}_xS^{00-05} = Est^{2005}_{x+5} / Population^{2000}_x$$

Where,

x represents a five-year age/sex group;

Est is the estimated population;

Census represents the census enumerated population;

GQ is the census institutional population;

${}_xS^{00-05}$ are survival rates by age/sex group for the period from 2000-2005.

National census survival rates cannot be calculated for 2000-2005, simply because

there was no census in 2005. The 2000-2005 national census survival rates, therefore, are used in this projection based on a test using life table survival rates and national census survival rates. This test consisted of projecting Ohio's 2000 population by age/sex forward to 2010, using both survival rate methods separately, then comparing the resulting figures to the enumerated 2010 cohort populations. The results show that the projected 2010 populations derived from the national census survival rates are closer to the 2010 Census figures than projections using the life table survival rates.

Therefore, the projected deaths by age/sex groups for each five-year period were produced with the following equation:

$${}_{x+5}D_x = {}_{x+5}P_x - ({}_{x+5}P_x * {}_{x+5}S_x)$$

Where,

${}_{x+5}D_x$ is the number of deaths for the age/sex group x to x+5;

${}_{x+5}P_x$ represents the population of the age/sex group x to x+5; and

${}_{x+5}S_x$ is the survival rate for the age/sex group x to x+5.

VI. MIGRATION

In this projection series, the migration projections were done for Ohio and each county separately. Projected migration trends are based on the most current migration data available and five critical assumptions. This section of the documentation is an explanation of the assumptions and methods employed in making migration projections. This section includes two parts: the first part outlines our migration assumptions; the second part describes the methods employed in projecting migration rates.

Migration Assumptions

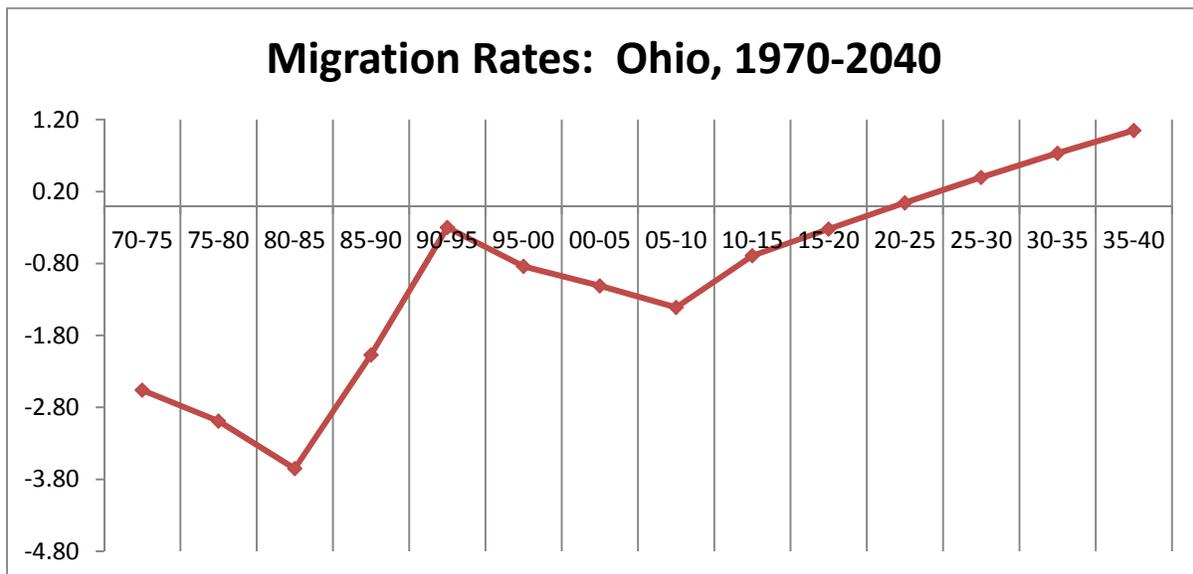
Ohio experienced a net loss of 288,117 persons through migration between 2000 and 2010. The migratory loss between 1980 and 1990 was 621,000 persons, which is the second largest migratory loss in Ohio's history. The largest migratory loss was 635,700

between 1970 and 1980. The net loss through migration between 1990 and 2000 is 63,777 persons. The smaller migration losses reflect Ohio's improved economic and employment conditions in the early 1990's. Therefore, projected Ohio and county net migration continue an improving trend over the projected time period. The projected state migration rates change from -0.7 percent for 2010-2015 period to 1.1 percent for the 2035-2040 period (see Table 3 and Figure 1).

TABLE 3
PROJECTED NET MIGRATION & RATE:
OHIO, 2010-2015 TO 2035-2040

YEAR	NET MIGRATION	RATE
00-05	-78,205	-0.69%
05-10	36,267	0.32%
10-15	4,906	0.04%
15-20	44,712	0.40%
20-25	82,331	0.73%
25-30	117,976	1.05%

Data source: Ohio Development Services Agency, Office of Research (JH), P.O. Box 1001, Columbus, Ohio 43216-1001, March, 2013



Note: The migration rates from 1970-75 to 2005-2010 are the IRS migration rates from the Bureau of Census. The migration rates from 2010-2015 to 2035-2040 are the projected migration rates based on this projection.

Assumptions concerning migration trends from 2010 to 2040 for both state and county levels are discussed below. There were four basic assumptions made for projecting future migration trends.

Assumption 1: Ohio and counties' future migration rates will follow recent historical (1970-2010) and the most current migration trends.

This is a standard projection assumption, based on the logic that the best predictor of short-term future events are the most recent past events. The use of annual Internal Revenue Service data, which provide county-to-county matched filer records for the years 2000-2001 through 2009-2010 allows for the development of a recent migration trend line, to which derived residual migration rates can be applied to provide estimates of age/sex mobility. (Internal Revenue Service, Department of the Treasury, Washington, D.C.) (Appendix 12, 13, 14, 15).

Past migration trends for Ohio and each Ohio county are represented by a linear regression line between the initial and terminal periods, calculated by using the migration rates from the previous three decades for each particular county. For Ohio and some Ohio counties with small or moderate changes in migration, future migration rates were adjusted on the past thirty years' (1980-2010) migration trends. For counties with rapid increases or decreases in net migration, forty year (1970-2010) migration trends were used for adjustment.

Assumption 2: Population movement occurs within a complex socio-economic environment, and economic conditions create impetus for people to move. Ohio and counties' future net migration rates will vary in curvilinear fashion, in a pattern consistent with an assumed 10-year economic cycle.

Changes in migratory flow to and from Ohio coincided with the national economic cycle over the last several decades. Out-migration from Ohio tends to increase during the lowest "trough" years of recession, then lessens during the years of recovery and expansion. Compared with out-migration, in-migration has remained quite stable. Since the 1960s decade, state out-migration has, with rare exception, surpassed in-migration, resulting in a sustained net negative migration.

The association between a near decade-long economic cycle and changing out-migration volume is assumed to continue throughout the projected time period. The assumed resulting effect is that the state's net migration rate will change in a non-linear fashion.

The effect or the degree of the effect of economic cycles, however, has varied by county. Some Ohio county migratory flows have been affected strongly by the economic dynamics, while others have experienced little or no migratory change due to cyclic economic change. Future net migration rates, therefore, are projected to change in curvilinear fashion for the first group of counties, but projected to change in a linear fashion for the group of counties with migratory flows minimally affected by economic dynamics.

Assumption 3: Projected migration rates will be more similar to most recent, rather than historical, migration trends for most Ohio counties.

After a long period (about thirty years) of migratory loss, a bottoming-out phenomenon has occurred in Ohio, especially among the counties in metropolitan areas of Ohio. In those areas, most counties had smaller migratory losses and, in some cases, migratory gains. This trend has been confirmed by the Census Bureau's county population estimates for the 2000s. Based on this data, migration rates have been projected to follow from the most recent, 2000s migration rates.

Migration rates for most Ohio counties have been adjusted by using the IRS's annual "migration" data for the 2000s. Among those counties, the migration rates of some counties have been adjusted to above the linear regression line (which reflect the long term or historical migration trends). The migration rates of the other counties were judged to be so high as to be unsustainable and, so, were lowered to below the regression line.

Assumption 4: Ohio will have fewer out migrants because of the decreased supply of both young and female laborers.

Over the last two decades, two factors drove the enormous growth in the size of Ohio's labor force: the entry of the full, 20-year-wide baby boom cohort into the work force, and the increasing participation of women in the labor force. Slower growth lies ahead as the smaller "baby bust" generation enters its working years, and as female labor force participation rates approach those of men.

The number of young people and females who will be available to replace the growing number of older retirees will be reduced over the projected years, creating a higher potential for in-state employment. The "baby boomers" also age out of the most mobile 20-39 year-old age groups. If the smaller cohorts temporally following the baby boom migrate *at similar rates*, the absolute number of migrants will decline. So, it is expected that there will be fewer out migrants over the projection period.

Migration Projection Methodology

The migration component was calculated for each county by multiplying the total county base-year population by the appropriate projected county total net migration rate. Ohio and counties' projected migration rates were based on 2000-2010 gross migration information, as well as the recent historical net migration rates for each county (1980-2000 for most of the Ohio counties and 1970-2000 for the remainder of counties). The projected net migration rates, however, will vary in a curvilinear pattern consistent with an assumed ten-year economic cycle.

Each age-sex group's net migration was held constant in proportion to the county's net migration. This proportion was established on the proportion of cohort migrants to county total migrants during 2000-2010 (Ohio and Counties Net Migration by Age and Sex, 2000-2010, The Office of Strategic Research).

The migration projections were done for the state and each Ohio county separately. Appendix 16 is a sample of the numerical and graphical migration projections for Ohio and its counties. A step-by-step procedure, consistent with the above assumptions, is outlined below:

1. Obtain a regression line. In this study, the relationship between independent variable x (projected year) and dependent variable y (migration rate) is expressed in the linear regression formula: $Y = a + bX$

To obtain migration rates (y values) for each projected year (x values), a and b values must be calculated first by using previous migration rates. The six previous migration rates (the rates for 1980-1985, 1985-1990 ...2000-2010) were employed to calculate a and b values. The migration rates for 1970-1975 and 1975-1980 also went into the calculation for counties with relatively extreme increases or decreases in net migration.

Next, each x value (interval between the base and the projected years) was put into the regression equation to obtain the y values (migration rates). For example, the projected migration rate for 2010-2015 is obtained by setting x equal to 30 (2010-1980=30 years) into the regression equation.

In this study, the b value (regression coefficient) indicates how much the dependent variable (migration rate) changes as the independent variable (years) changes. As used, the regression line estimates the direction (up or down) of the migration trend as well as the degree of migration rate change (slope of the line).

2. Obtain projected migration rates. Since the future migration rates for Ohio and most of Ohio's counties are assumed to change in a non-linear fashion, the projected migration rates will be distributed above the regression line in those five-year periods corresponding to assumed economic cycle peaks, and below in those five-year periods corresponding to economic cycle troughs.

Most of Ohio's counties experienced high out-migration to low in-migration (a larger negative value or smaller positive value) for the period 2000-2005, associated with the early-'90s recession. As the economy recovered and began its mid-2000s expansion, these counties experienced low out-migration to high in-migration (a smaller negative value or larger positive value).

Therefore, the estimated migration rates for 2000-2005 and 2005-2010 were used as the high (2000-05) and low (2005-2010) points. The third point is the projected migration rate for the period 2035-2040 (the last y value). A line was drawn between the high point (the y value for 2000-05) and the third point. The y values for each x values for 2010-2015, 2020-2025 and 2030-2035 are located on this line, which shows the migration rates for the projected economic peak years. Another straight line was drawn between the low point (the y value of 2005-2010) and the third point. The y values for each x values for 2015-2020 and 2025-2030 are located on this line, which show the migration rates for the projected recession years.

3. An adjustment of the migration rates was done based on gross migration rates from the end of the 2000s. The projected 2010-2015 county migration rates were forced to align line with the net migration rates of the late 1990's and the estimated 2001 migration rates from the U.S. Bureau of Census. This was accomplished by adjusting the projected target (2035-2040) migration rates until the projected 2010-2015 migration rates matched the most recent migration rates, as well as the estimated 2012 migration rates.

4. Projected migration rates were then reviewed to assure that none surpassed the maximum negative migration rates from the past thirty years. The migration rates for 2000-2005 and 2005-2010 are assumed the largest ones; migration rates of the subsequent projected years are then attenuated, positioned closer and closer to the regression line as time periods move forward. This manner of adjusting the projected rates is the operationalization of our third assumption that future migration rates for Ohio counties will change in a curvilinear fashion, but more and more close to the mean of the trend (the regression line).

5. Age-Sex Cohort Net Migration. Age and sex group migration is dependent on the changing values of the county net migration rates. Each age-sex group's net migration was held constant in proportion to the county's net migration, based on the proportion of cohort migrants to county total migrants during 2000-2010 (Ohio and Counties Net Migration by Age and Sex, 2000-2010, The Office of Strategic Research, Ohio Department of Development).

VII. DATA SOURCES

The following data were used as input to the calculation program:

- 2000 and 2010 male and female population in five-year age groups, Census of Population and Housing, 2000 and 2010, U.S. Bureau of the Census;
- 2000 and 2010 male and female institutional population in five-year age groups, Census of Population and Housing, 2000 and 2010, U.S. Bureau of the Census;
- 2005 estimated population by age, sex, and county, 2006, Population Division, U.S. Bureau of the Census;
- "Student Inventory Data", 2000 and 2010, Ohio Board of Regents, Columbus, Ohio;
- Live resident births from 2000 and 2010 by single year, county and sex, Vital Statistics (Births), 2000 and 2010, Systems File Specification, Ohio Department of Health, Data Services Division;
- 2000-2005 and 2005-2010 Age-Specific Fertility Rates by county, The Office of Research, Ohio Development Services Agency, Columbus, Ohio, 2012;
- Resident deaths, 2000 and 2010 by single year, county, and sex Vital Statistics (Deaths), 2000 and 2010, Systems File Specification, Ohio Department of Health, Data Services Division;
- Revised National Census 2000-2005 Age/Sex-Specific Survival Rates by county, The Office of Research, Ohio Development Services Agency, Columbus, Ohio, 2012;
- IRS state and county migration flows, 2000 and 2010, Internal Revenue Service (IRS), U.S. Bureau of the Census;
- Estimated 2000 and 2010 age/sex-specific net migration rates and proportion of migrants, "Net Migration: Ohio and Counties, By Age, Sex and Race: 2000 and 2010 ", The Office of Research, Ohio Development Services Agency, Columbus, Ohio, 2012;
- "Ohio and Counties, Net Migration By Age and Sex: 1990 to 2000", Ohio Data Users Center, Ohio Department of Development, Columbus, Ohio, 1995;
- "Ohio and Counties, Net Migration By Age and Sex: 1980 to 1990", Ohio Data Users

Center, Ohio Department of Development, Columbus, Ohio, 1995;

-- "Net Migration of the Population, 1970-80, by Age, Sex, and Color: Part 2-- North Central States", Economic Research Service, U.S. Department of Agriculture, Institute for Behavioral Research, University of Georgia and Research Applied to National Needs, National Science Foundation, The University of Georgia Printing Department, Athens, Georgia, 1985;

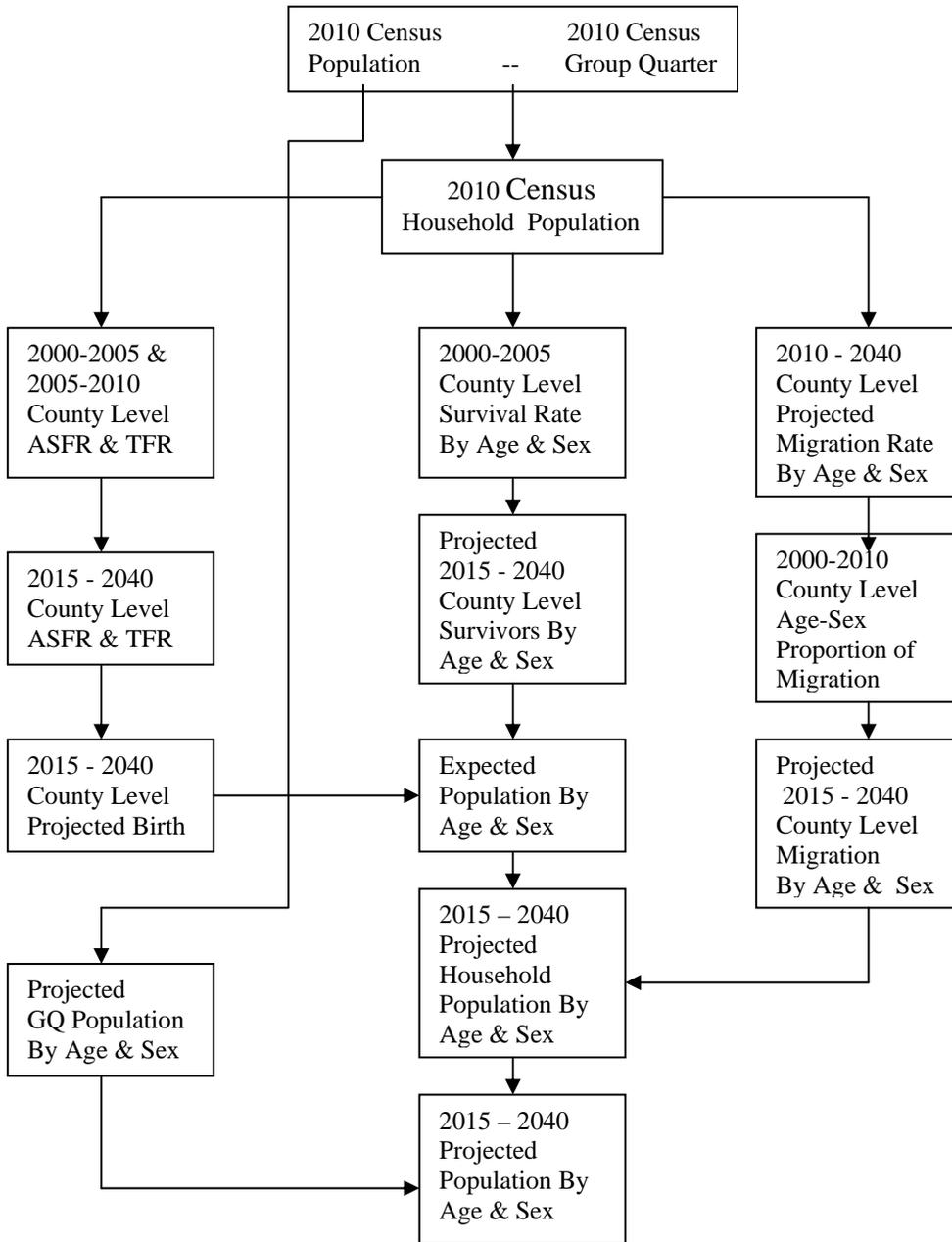
-- "Net Migration of the Population, 1960-1970", Economic Research Service, U.S. Department of Agriculture, Research Foundation, Oklahoma State University and Area Redevelopment Administration, U.S. Department of Commerce, Washington, D.C., U.S. Government Printing Office, 1975;

-- Projected 2010-2015 to 2035-2040 Net Migration Rates by County, The Office of Research, Ohio Development Services Agency, Columbus, Ohio, 2012.

APPENDIX

APPENDIX 1

Basic Population Projection Flow Chart: 2000-2040



APPENDIX 2

PROJECTION INPUT DATA: OHIO

AGE COHORTS	Total Population (2010)		Group Quarter (2010)		Migration-Prop. (2000-2010)		Survival Rate (adjusted) (2000-2005)		Age-specific Fertility Rate			GQ. Proportion Based on 2010:	
	Male	Female	Male	Female	Male	Female	Male	Female	AGE	2000-05	2005-10	Male	Female
0-4	367,479	353,377	447	424	0.0364	0.0219	0.9924	0.9896	15-19	0.0399	0.0390	0.0022	0.0021
5-9	382,641	365,248	388	293	-0.0030	-0.0139	0.9992	0.9994	20-24	0.1072	0.1028	0.0019	0.0014
10-14	396,152	378,547	869	510	-0.0470	-0.0388	0.9989	0.9993	25-29	0.1117	0.1184	0.0043	0.0025
15-19	420,975	402,707	32,202	33,005	0.1092	0.1201	0.9959	0.9983	30-34	0.0900	0.0891	0.1577	0.1616
20-24	384,202	378,914	36,663	26,214	0.3035	0.2029	0.9937	0.9977	35-39	0.0351	0.0378	0.1795	0.1284
25-29	357,837	360,793	14,255	2,894	0.1621	0.0491	0.9935	0.9974	40-44	0.0069	0.0075	0.0698	0.0142
30-34	344,087	347,242	12,261	2,314	-0.0287	-0.0173	0.9922	0.9960				0.0600	0.0113
35-39	356,420	362,042	10,673	2,180	0.0051	0.0158	0.9897	0.9942				0.0523	0.0107
40-44	377,896	383,473	9,897	2,366	0.0033	0.0182	0.9843	0.9908	YEAR	Migration		0.0485	0.0116
45-49	420,425	434,709	10,456	2,724	-0.0140	0.0119	0.9779	0.9873		Rate		0.0512	0.0133
50-54	434,740	452,317	9,743	3,096	-0.0269	0.0032	0.9693	0.9815	90-95	-0.0030		0.0477	0.0152
55-59	383,440	403,417	7,082	3,026	-0.0149	0.0094	0.9593	0.9733	95-00	-0.0084		0.0347	0.0148
60-64	320,421	344,988	5,671	3,218	0.0156	0.0264	0.9320	0.9548	00-05	-0.0031		0.0278	0.0158
65-69	223,797	255,067	3,725	3,355	0.0105	0.0142	0.8938	0.9268	05-10	0.0025		0.0182	0.0164
70-74	167,142	204,228	3,611	4,314	-0.0020	-0.0060	0.8280	0.8788	10-15	0.0022		0.0177	0.0211
75-79	126,706	170,813	3,543	6,499	-0.0330	-0.0307	0.7619	0.8200	15-20	0.0061		0.0173	0.0318
80-84	95,450	148,383	4,319	10,430	-0.0195	-0.0378	0.6874	0.7409	20-25	0.0053		0.0211	0.0511
85+	72,346	158,083	6,837	26,762	0.1329	0.0620	0.5775	0.5294	25-30	0.0088		0.0335	0.1310
SUB TOTAL	5,632,156	5,904,348	TOTAL G.Q:		306,266		IRS mig #:		2000-05	2005-10			
TOTAL		11,536,504	PROPORTION:		2.65%				-126275	-161842			

APPENDIX 3

**PROJECTIONS OF BIRTHS, DEATHS, AND NATURAL INCREASE BY SEX,
AGE-SPECIFIC BIRTHS AND FERTILITY RATES AND TOTAL FERTILITY RATES****

OHIO

YEAR	BIRTHS			DEATHS		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
10-15	704,313	361,587	342,726	616,852	317,599	299,252
15-20	708,273	363,620	344,653	649,515	339,894	309,621
20-25	709,397	364,197	345,200	693,764	365,686	328,078
25-30	709,732	364,369	345,362	741,284	390,356	350,928
30-35	718,028	368,628	349,400	783,580	409,432	374,148
35-40	730,837	375,204	355,632	808,097	419,219	388,878

YEAR	NATURAL INCREASE RATE			NET MIGRANTS	TOTAL POPULATION*	NET INCREASE
	TOTAL	MALE	FEMALE			
10-15	0.78%	0.81%	0.75%	-78,500	11,549,124	0.11%
15-20	0.52%	0.43%	0.61%	-36,668	11,574,872	0.22%
20-25	0.14%	-0.03%	0.30%	4,499	11,598,662	0.21%
25-30	-0.28%	-0.48%	-0.10%	44,336	11,615,103	0.14%
30-35	-0.58%	-0.75%	-0.42%	81,902	11,635,111	0.17%
35-40	-0.68%	-0.80%	-0.57%	117,500	11,679,008	0.38%

*: The Total population numbers in this column may be slightly different from the numbers in the projection sheet due to rounding.

APPENDIX 4

PROJECTED AGE-SPECIFIC FERTILITY RATES AND BIRTHS: OHIO, 2010-2040:

PROJECTED AGE-SPECIFIC FERTILITY RATES:

AGE	Projected Year:					
	10-15	15-20	20-25	25-30	30-35	35-40
15-19	0.038	0.038	0.038	0.037	0.037	0.036
20-24	0.101	0.098	0.096	0.094	0.092	0.089
25-29	0.122	0.125	0.128	0.132	0.135	0.139
30-34	0.089	0.088	0.088	0.087	0.087	0.086
35-39	0.039	0.040	0.042	0.043	0.044	0.046
40-44	0.008	0.008	0.008	0.009	0.009	0.009
TFR**	396	398	400	402	404	405

PROJECTED AGE-SPECIFIC BIRTHS:

AGE	Projected Year:					
	10-15	15-20	20-25	25-30	30-35	35-40
15-19	71,133	68,596	65,781	66,243	66,457	67,256
20-24	177,317	178,972	169,427	164,206	167,469	164,169
25-29	217,905	220,799	232,132	231,843	237,420	251,804
30-34	152,760	156,495	154,239	156,780	151,379	151,167
35-39	70,351	69,012	73,626	75,430	79,613	79,814
40-44	14,846	14,398	14,193	15,230	15,691	16,626
TOTAL	704,313	708,273	709,397	709,732	718,028	730,837

NOTE: The ASFRs and TFRs are for single year; The Age-Spec. Births are for five years.

**: The total fertility rate (TFR) is the sum of the age-specific fertility rates times 1000.

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Research Office of Ohio Department Services Agency
May 2013

APPENDIX 5

**DEVELOPMENT SERVICES AGENCY
MIGRATION PROJECTIONS BY AGE AND SEX**

OHIO													
AGE COHORTS	2010-2015		2015-2020		2020-2025		2025-2030		2030-2035		2035-2040		
	NET MIGRANTS		NET MIGRANTS		NET MIGRANTS		NET MIGRANTS		NET MIGRANTS		NET MIGRANTS		
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	
0-4	69	992	-1,333	-805	-4	-57	1,612	973	-72	-1,035	4,271	2,578	
5-9	3,705	3,110	110	510	-212	-178	-133	-617	-3,866	-3,245	-352	-1,635	
10-14	-8,357	-9,252	1,724	1,423	479	530	-2,085	-1,721	8,719	9,653	-5,526	-4,560	
15-19	-24,324	-16,478	-4,004	-4,405	1,394	945	4,841	5,326	25,378	17,192	12,831	14,114	
20-24	-14,110	-4,785	-11,128	-7,440	809	274	13,456	8,996	14,722	4,992	35,661	23,842	
25-29	1,515	1,132	-5,942	-1,801	-87	-65	7,185	2,178	-1,580	-1,181	19,042	5,772	
30-34	-267	-1,163	1,054	634	15	67	-1,274	-766	279	1,213	-3,378	-2,031	
35-39	-284	-1,499	-186	-580	16	86	225	701	296	1,564	597	1,858	
40-44	1,084	-1,015	-122	-666	-62	58	147	806	-1,131	1,059	390	2,135	
45-49	2,176	-306	514	-435	-125	18	-621	527	-2,270	319	-1,646	1,395	
50-54	1,293	-750	986	-117	-74	43	-1,193	142	-1,349	782	-3,160	376	
55-59	-1,154	-2,114	546	-343	66	121	-661	415	1,204	2,205	-1,751	1,100	
60-64	-896	-1,235	-571	-967	51	71	690	1,170	935	1,288	1,830	3,100	
65-69	107	408	-385	-520	-6	-23	466	629	-111	-426	1,235	1,667	
70-74	2,599	2,437	72	221	-149	-140	-87	-267	-2,711	-2,543	-232	-708	
75-79	1,681	3,109	1,210	1,125	-96	-178	-1,463	-1,361	-1,753	-3,244	-3,876	-3,607	
80-84	-5,126	-2,261	714	1,387	294	130	-864	-1,676	5,348	2,359	-2,289	-4,443	
85+	-5,823	-2,718	-4,872	-2,274	334	156	5,890	2,749	6,075	2,835	15,611	7,286	
SUBTOTAL	-46,114	-32,385	-21,613	-15,054	2,643	1,856	26,133	18,203	48,113	33,789	69,259	48,241	
TOTAL		-78,500		-36,668		4,499		44,336		81,902		117,500	

AGE COHORTS	10-15		15-20		20-25		25-30		30-35		35-40	
	MIGRATION RATE		MIGRATION RATE		MIGRATION RATE		MIGRATION RATE		MIGRATION RATE		MIGRATION RATE	
	MALE	FEMALE										
0-4	0.02%	0.28%	-0.39%	-0.22%	0.00%	-0.02%	0.47%	0.27%	-0.02%	-0.28%	1.21%	0.70%
5-9	1.01%	0.88%	0.03%	0.14%	-0.06%	-0.05%	-0.04%	-0.17%	-1.12%	-0.91%	-0.10%	-0.45%
10-14	-2.19%	-2.54%	0.47%	0.40%	0.14%	0.15%	-0.61%	-0.48%	2.54%	2.71%	-1.62%	-1.28%
15-19	-6.18%	-4.37%	-1.08%	-1.24%	0.38%	0.27%	1.43%	1.49%	7.52%	4.73%	3.67%	3.84%
20-24	-3.65%	-1.30%	-3.03%	-2.07%	0.22%	0.08%	3.64%	2.52%	4.30%	1.37%	9.89%	6.42%
25-29	0.44%	0.32%	-1.61%	-0.50%	-0.02%	-0.02%	1.97%	0.62%	-0.42%	-0.34%	5.37%	1.58%
30-34	-0.08%	-0.33%	0.31%	0.18%	0.00%	0.02%	-0.36%	-0.22%	0.08%	0.35%	-0.90%	-0.56%
35-39	-0.09%	-0.44%	-0.06%	-0.16%	0.00%	0.02%	0.06%	0.20%	0.09%	0.44%	0.16%	0.53%
40-44	0.32%	-0.28%	-0.04%	-0.20%	-0.02%	0.02%	0.04%	0.23%	-0.32%	0.30%	0.11%	0.62%
45-49	0.60%	-0.08%	0.15%	-0.12%	-0.04%	0.01%	-0.19%	0.15%	-0.69%	0.09%	-0.48%	0.40%
50-54	0.33%	-0.18%	0.28%	-0.03%	-0.02%	0.01%	-0.39%	0.04%	-0.43%	0.24%	-1.00%	0.11%
55-59	-0.28%	-0.48%	0.14%	-0.08%	0.02%	0.03%	-0.21%	0.12%	0.41%	0.66%	-0.58%	0.33%
60-64	-0.26%	-0.32%	-0.15%	-0.23%	0.01%	0.02%	0.22%	0.34%	0.32%	0.37%	0.67%	1.01%
65-69	0.04%	0.13%	-0.12%	-0.15%	0.00%	-0.01%	0.15%	0.17%	-0.04%	-0.12%	0.48%	0.56%
70-74	1.43%	1.10%	0.03%	0.08%	-0.06%	-0.05%	-0.03%	-0.08%	-1.02%	-0.75%	-0.10%	-0.25%
75-79	1.35%	1.90%	0.86%	0.61%	-0.05%	-0.08%	-0.74%	-0.54%	-0.82%	-1.28%	-1.94%	-1.38%
80-84	-6.05%	-1.86%	0.82%	1.12%	0.30%	0.09%	-0.71%	-0.99%	3.98%	1.41%	-1.57%	-2.19%
85+	-6.44%	-1.91%	-5.14%	-1.66%	0.33%	0.11%	5.08%	1.89%	4.33%	1.91%	9.45%	3.83%
SUBTOTAL	-0.84%	-0.56%	-0.39%	-0.26%	0.05%	0.03%	0.48%	0.31%	0.89%	0.58%	1.28%	0.83%
TOTAL		-0.69%		-0.32%		0.04%		0.39%		0.73%		1.05%

Prepared by:

Dr. Jian He, State Demographer
Research Office of Ohio Department Services Agency
May 2013

Note: Migration rate is calculated using NET migration counts of each age/sex group to Expected population of related age/sex group.
Expected population is calculated using population of base year times survival rates.
Full explanation can be found in " Detailed Methodology Report".

APPENDIX 6

**TOTAL BIRTHS OF 1980-1985, 1985-1990, 1990-1995, 1995-2000, 2000-2005, 2005-2010
OHIO AND COUNTIES**

County Name	Births 1980-85	Births 1985-90	Births 1990-95	Births 1995-00	Births 2000-05	Births 2005-10	County Name	Births 1980-85	Births 1985-90	Births 1990-95	Births 1995-00	Births 2000-05	Births 2005-10
OHIO	814,670	802,130	804,899	762,003	744,835	733,489	LAWRENCE	4,748	4,239	4,176	3,771	3,614	3,794
UNKNOW			1	41		37	LICKING	9,140	8,934	9,010	9,652	10,127	10,228
ADAMS	1,899	1,799	1,827	1,868	1,929	1,889	LOGAN	3,066	3,036	3,325	3,201	3,078	3,046
ALLEN	8,929	8,648	8,158	7,566	7,347	6,958	LORAIN	20,387	19,761	20,587	19,352	18,197	17,697
ASHLAND	3,612	3,226	3,288	3,343	3,369	3,320	LUCAS	37,432	38,850	37,551	32,622	31,640	30,998
ASHTABULA	7,514	7,375	6,950	6,568	6,228	6,217	MADISON	2,493	2,485	2,688	2,510	2,409	2,422
ATHENS	3,878	3,360	3,295	3,050	3,068	2,820	MAHONING	19,316	17,243	17,864	15,514	13,572	12,804
AUGLAIZE	3,828	3,562	3,307	3,025	2,989	3,029	MARION	5,152	4,829	4,584	4,100	3,939	4,072
BELMONT	5,262	4,486	4,042	3,499	3,437	3,538	MEDINA	8,597	8,234	8,801	9,449	10,304	9,435
BROWN	2,592	2,565	2,702	2,772	2,836	2,729	MEIGS	1,713	1,548	1,422	1,339	1,416	1,302
BUTLER	20,189	20,572	21,792	22,752	23,843	24,834	MERCER	3,644	3,396	3,213	2,950	2,742	2,754
CARROLL	1,805	1,821	1,613	1,560	1,594	1,641	MIAMI	6,647	6,415	6,382	6,252	6,136	6,122
CHAMPAIGN	2,528	2,356	2,420	2,508	2,509	2,404	MONROE	1,070	947	819	759	760	776
CLARK	11,044	10,473	10,293	9,551	8,987	8,906	MONTGOMERY	44,412	44,852	43,521	39,005	36,430	35,452
CLERMONT	11,995	11,978	12,706	12,986	13,540	13,435	MORGAN	1,126	1,026	932	873	884	824
CLINTON	2,714	2,570	2,563	2,933	2,938	2,740	MORROW	2,000	1,951	2,023	1,942	2,154	2,056
COLUMBIANA	8,047	7,440	7,149	6,548	6,064	5,951	MUSKINGUM	6,590	6,109	5,951	5,768	5,326	5,428
COSHOCTON	2,800	2,545	2,354	2,218	2,360	2,173	NOBLE	964	818	714	664	682	768
CRAWFORD	3,687	3,480	3,122	3,010	2,837	2,501	OTTAWA	2,780	2,475	2,327	2,121	2,067	2,002
CUYAHOGA	106,713	108,434	109,714	96,522	86,101	80,014	PAULDING	1,706	1,444	1,253	1,107	1,120	1,242
DARKE	4,060	3,857	3,595	3,496	3,338	3,357	PERRY	2,595	2,296	2,426	2,519	2,279	2,272
DEFIANCE	3,264	2,920	2,590	2,619	2,455	2,500	PICKAWAY	3,026	3,080	3,193	3,055	3,001	3,115
DELAWARE	3,967	4,337	4,770	6,396	11,150	11,510	PIKE	1,788	1,777	1,862	1,822	1,942	1,913
ERIE	5,743	5,463	5,317	4,878	4,502	4,087	PORTAGE	9,968	9,339	9,384	8,961	8,218	7,869
FAIRFIELD	6,685	6,648	7,223	8,217	8,440	8,631	PREBLE	2,743	2,713	2,471	2,553	2,432	2,439
FAYETTE	2,052	1,934	1,883	1,879	1,916	1,959	PUTNAM	3,209	3,011	2,794	2,469	2,367	2,494
FRANKLIN	71,219	77,178	82,175	81,071	86,177	91,030	RICHLAND	9,480	8,983	8,860	8,434	7,889	7,702
FULTON	3,079	2,872	2,837	2,820	2,639	2,643	ROSS	4,703	4,441	4,533	4,639	4,470	4,555
GALLIA	2,333	2,115	2,091	1,968	1,951	2,044	SANDUSKY	5,088	4,583	4,426	4,177	4,113	3,855
GEAUGA	5,584	5,987	5,974	5,957	5,473	4,729	SCIOTO	6,365	5,457	5,298	5,300	4,900	4,824
GREENE	9,261	8,684	8,671	8,369	8,752	8,876	SENECA	4,944	4,375	4,164	3,727	3,646	3,404
GUERNSEY	3,340	2,754	2,766	2,726	2,535	2,439	SHELBY	3,796	3,500	3,623	3,545	3,631	3,437
HAMILTON	70,211	71,301	67,838	61,045	58,043	57,567	STARK	26,885	25,735	25,935	24,163	22,397	21,848
HANCOCK	5,029	5,009	5,016	4,706	4,687	4,683	SUMMIT	36,539	35,879	38,190	36,224	33,703	32,086
HARDIN	2,324	2,048	2,040	2,042	1,911	1,994	TRUMBULL	16,734	15,340	15,112	13,745	12,205	11,575
HARRISON	1,142	932	949	852	862	876	TUSCARAWAS	6,514	5,922	5,881	5,930	5,948	5,820
HENRY	2,354	2,214	2,044	1,939	1,881	1,790	UNION	2,351	2,331	2,422	2,774	3,254	3,304
HIGHLAND	2,559	2,503	2,615	2,807	2,999	2,889	VAN WERT	2,273	2,068	1,970	1,798	1,780	1,843
HOCKING	1,856	1,768	1,771	1,760	1,827	1,731	VINTON	835	817	907	858	851	843
HOLMES	3,382	3,664	3,897	4,277	4,108	4,031	WARREN	7,606	8,174	8,982	10,590	13,282	13,277
HURON	4,493	4,548	4,565	4,480	4,274	4,094	WASHINGTON	4,656	4,168	4,139	3,760	3,429	3,204
JACKSON	2,344	2,192	2,128	2,204	2,229	2,175	WAYNE	8,224	8,055	8,042	7,975	8,015	7,818
JEFFERSON	5,508	4,700	4,393	3,911	3,422	3,501	WILLIAMS	2,961	2,687	2,544	2,357	2,183	2,232
KNOX	3,288	2,921	3,157	3,256	3,600	3,713	WOOD	7,631	7,360	7,056	6,796	6,823	6,814
LAKE	14,782	14,604	14,431	13,470	12,884	12,338	WYANDOT	1,878	1,604	1,510	1,416	1,449	1,401

Data Source: Vital Statistics, Annual Report, Births and Deaths: 1980-2010, Ohio Department of Health.

APPENDIX 7

**TOTAL DEATHS OF 1980-1985, 1985-1990, 1990-1995, 1995-2000, 2000-2005, 2005-2010
OHIO AND COUNTIES**

County Name	Deaths 1980-85	Deaths 1985-90	Deaths 1990-95	Deaths 1995-00	Deaths 2000-05	Deaths 2005-10	County Name	Deaths 1980-85	Deaths 1985-90	Deaths 1990-95	Deaths 1995-00	Deaths 2000-05	Deaths 2005-10
OHIO	483,624	495,598	503,997	530,815	539,729	538,197	LAWRENCE	3,170	3,254	3,305	3,432	3,659	3,590
UNKNOW			12	37			LICKING	5,266	5,354	5,703	6,251	6,557	6,789
ADAMS	1,303	1,290	1,340	1,452	1,511	1,513	LOGAN	2,023	2,072	2,191	2,346	2,266	2,241
ALLEN	4,863	5,081	5,051	5,318	5,339	5,183	LORAIN	9,857	10,612	11,372	12,060	12,737	13,075
ASHLAND	1,966	2,089	2,160	2,447	2,421	2,537	LUCAS	23,028	22,546	22,239	22,576	22,211	21,343
ASHTABULA	4,756	5,093	5,245	5,403	5,437	5,510	MADISON	1,427	1,434	1,476	1,679	1,779	1,776
ATHENS	2,210	2,184	2,191	2,376	2,301	2,301	MAHONING	15,107	15,163	15,393	16,007	15,185	14,984
AUGLAIZE	1,930	1,935	2,032	2,248	2,245	2,385	MARION	2,908	3,132	3,089	3,192	3,214	3,310
BELMONT	4,525	4,557	4,505	4,543	4,536	4,438	MEDINA	3,557	3,849	4,293	4,938	5,524	5,947
BROWN	1,517	1,578	1,724	1,892	1,992	2,229	MEIGS	1,195	1,307	1,256	1,370	1,301	1,373
BUTLER	9,695	10,812	11,128	12,498	13,539	14,215	MERCER	1,584	1,539	1,736	1,765	1,837	1,937
CARROLL	1,091	1,075	1,224	1,274	1,334	1,404	MIAMI	3,910	4,023	4,076	4,417	4,537	4,636
CHAMPAIGN	1,552	1,511	1,693	1,810	1,890	1,916	MONROE	776	848	803	911	868	870
CLARK	7,347	7,365	7,574	8,021	8,246	7,981	MONTGOMERY	24,224	25,554	25,808	27,585	27,527	27,280
CLERMONT	4,292	4,866	5,437	6,139	6,629	7,205	MORGAN	766	785	791	834	808	801
CLINTON	1,665	1,715	1,645	1,778	1,870	1,956	MORROW	997	1,031	1,110	1,164	1,350	1,420
COLUMBIANA	5,787	5,614	5,615	5,934	5,979	5,837	MUSKINGUM	4,273	4,180	4,185	4,481	4,262	4,399
COSHOCTON	1,762	1,778	1,857	2,011	1,917	1,877	NOBLE	617	566	528	564	608	655
CRAWFORD	2,482	2,375	2,499	2,598	2,486	2,437	OTTAWA	1,904	1,945	2,053	2,098	2,220	2,324
CUYAHOGA	78,634	77,978	76,563	75,996	74,955	69,186	PAULDING	796	877	803	890	855	926
DARKE	2,521	2,642	2,686	2,671	2,796	2,741	PERRY	1,538	1,526	1,509	1,685	1,582	1,624
DEFIANCE	1,465	1,631	1,575	1,630	1,641	1,791	PICKAWAY	1,701	1,818	1,951	2,161	2,245	2,405
DELAWARE	2,018	2,172	2,266	2,674	3,510	4,055	PIKE	1,196	1,180	1,283	1,525	1,547	1,644
ERIE	3,480	3,646	3,746	4,079	4,121	4,290	PORTAGE	4,322	4,506	4,812	5,307	5,795	6,138
FAIRFIELD	3,714	3,972	4,271	4,652	5,212	5,547	PREBLE	1,548	1,640	1,706	1,747	1,891	2,008
FAYETTE	1,438	1,528	1,622	1,699	1,662	1,631	PUTNAM	1,246	1,345	1,373	1,444	1,477	1,434
FRANKLIN	33,749	35,771	36,640	39,844	41,230	41,654	RICHLAND	5,464	5,672	5,823	6,379	6,131	6,278
FULTON	1,470	1,549	1,593	1,760	1,784	1,875	ROSS	3,113	3,050	3,312	3,448	3,645	3,707
GALLIA	1,398	1,496	1,482	1,600	1,633	1,675	SANDUSKY	2,658	2,691	2,882	3,035	3,073	3,164
GEAUGA	2,346	2,528	2,732	3,091	3,433	3,581	SCIOTO	4,747	4,717	4,703	4,796	4,783	4,576
GREENE	3,980	4,500	5,009	5,562	5,817	6,139	SENECA	2,556	2,592	2,728	2,745	2,769	2,868
GUERNSEY	2,317	2,145	2,184	2,269	2,135	2,156	SHELBY	1,665	1,766	1,678	1,910	2,029	1,971
HAMILTON	42,240	42,076	41,579	42,241	40,937	38,976	STARK	17,169	17,821	18,165	18,819	19,250	19,405
HANCOCK	2,655	2,757	2,788	3,055	3,129	3,171	SUMMIT	24,523	24,303	24,818	26,025	26,997	26,540
HARDIN	1,497	1,493	1,516	1,553	1,567	1,560	TRUMBULL	10,385	10,764	11,164	11,908	12,050	12,205
HARRISON	948	1,006	1,033	997	1,071	994	TUSCARAWAS	4,439	4,399	4,446	4,584	4,593	4,661
HENRY	1,269	1,302	1,282	1,364	1,314	1,277	UNION	1,213	1,303	1,319	1,387	1,460	1,564
HIGHLAND	1,835	1,850	1,855	2,091	2,211	2,227	VAN WERT	1,406	1,492	1,412	1,532	1,514	1,505
HOCKING	1,206	1,235	1,250	1,348	1,431	1,465	VINTON	544	567	611	647	605	658
HOLMES	990	1,130	1,193	1,258	1,370	1,369	WARREN	3,303	3,817	4,103	4,870	5,777	6,561
HURON	2,271	2,449	2,440	2,554	2,640	2,705	WASHINGTON	2,906	2,940	3,024	3,294	3,403	3,376
JACKSON	1,801	1,615	1,700	1,772	1,796	1,881	WAYNE	3,615	4,022	4,136	4,677	4,741	4,965
JEFFERSON	4,864	4,922	4,757	5,015	4,986	4,847	WILLIAMS	1,505	1,636	1,662	1,728	1,795	1,862
KNOX	2,217	2,357	2,413	2,698	2,777	2,806	WOOD	3,658	3,856	4,076	4,313	4,607	4,783
LAKE	7,603	8,301	8,804	9,838	10,655	10,985	WYANDOT	1,150	1,135	1,180	1,199	1,194	1,127

Note: The number of 2000-05 is the sum of the numbers of 3/4 of 2000 +2001+2002+2003+2004 + 1/4 of 2005,
The number of 2005-2010 is the sum of the numbers of 3/4 of 2005 +2006+2007+2008+2009 + 1/4 of 2010,

Data Source: Vital Statistics, Annual Report, Births and Deaths: 1980-2010, Ohio Department of Health.

APPENDIX 8

**TOTAL: GROUP QUARTER, and HOUSEHOLD POPULATIONS
OHIO AND COUNTIES: 1990, 2000 and 2010**

County Name	Total Population 1990	Group Quarter 1990	Household Population 1990	Total Population 2000	Group Quarter 2000	Household Population 2000	Total Population 2010	Group Quarter 2010	Household Population 2010	County Name	Total Population 1990	Group Quarter 1990	Household Population 1990	Total Population 2000	Group Quarter 2000	Household Population 2000	Total Population 2010	Group Quarter 2010	Household Population 2010
OHIO	10,847,115	261,451	10,585,664	11,353,140	299,121	11,054,019	11,536,504	306,266	11,230,238	LAWRENCE	61,834	683	61,151	62,319	618	61,701	62,450	669	61,781
ADAMS	25,371	373	24,998	27,330	342	26,988	28,550	338	28,212	LICKING	128,300	3,297	125,003	145,491	3,255	142,236	166,492	3,448	163,044
ALLEN	109,755	5,032	104,723	108,473	6,113	102,360	106,331	5,934	100,397	LOGAN	42,310	529	41,781	46,005	585	45,420	45,858	450	45,408
ASHLAND	47,507	1,938	45,569	52,523	2,228	50,295	53,139	2,144	50,995	LORAIN	271,126	5,963	265,163	284,664	8,484	276,180	301,356	9,332	292,024
ASHTABULA	99,821	1,892	97,929	102,728	1,765	100,963	101,497	3,190	98,307	LUCAS	462,361	7,937	454,424	455,054	8,896	446,158	441,815	10,715	431,100
ATHENS	59,549	8,646	50,903	62,223	8,238	53,985	64,757	9,345	55,412	MADISON	37,068	4,221	32,847	40,213	4,426	35,787	43,435	5,238	38,197
AUGLAIZE	44,585	551	44,034	46,611	1,101	45,510	45,949	525	45,424	MAHONING	264,806	4,607	260,199	257,555	7,247	250,308	238,823	7,925	230,898
BELMONT	71,074	1,042	70,032	70,226	3,148	67,078	70,400	3,834	66,566	MARION	64,274	2,641	61,633	66,217	4,658	61,559	66,501	5,457	61,044
BROWN	34,966	443	34,523	42,285	453	41,832	44,846	575	44,271	MEDINA	122,354	1,281	121,073	151,095	1,519	149,576	172,332	1,198	171,134
BUTLER	291,479	11,205	280,274	332,807	11,247	321,560	368,130	10,953	357,177	MEIGS	22,987	257	22,730	23,072	232	22,840	23,770	212	23,558
CARROLL	26,521	464	26,057	28,836	366	28,470	28,836	405	28,431	MERCER	39,443	515	38,928	40,924	519	40,405	40,814	439	40,375
CHAMPAIGN	36,019	596	35,423	38,890	680	38,210	40,097	793	39,304	MIAMI	93,182	836	92,346	98,868	1,399	97,469	102,506	1,055	101,451
CLARK	147,548	3,977	143,571	144,742	3,917	140,825	138,333	2,798	135,535	MONROE	15,497	167	15,330	15,180	144	15,036	14,642	165	14,477
CLERMONT	150,187	1,265	148,922	177,977	1,465	176,512	197,363	1,717	195,646	MONTGOMERY	573,809	11,089	562,720	559,062	15,607	543,455	535,153	14,142	521,011
CLINTON	35,415	843	34,572	40,543	1,002	39,541	42,040	1,145	40,895	MORGAN	14,194	251	13,943	14,897	185	14,712	15,054	188	14,866
COLUMBIANA	108,276	1,063	107,213	112,075	3,764	108,311	107,841	3,944	103,897	MORROW	27,749	250	27,499	31,628	371	31,257	34,827	366	34,461
COSHOCTON	35,427	505	34,922	36,655	464	36,191	36,901	428	36,473	MUSKINGUM	82,068	1,890	80,178	84,585	2,474	82,111	86,074	1,898	84,176
CRAWFORD	47,870	540	47,330	46,966	609	46,357	43,784	579	43,205	NOBLE	11,336	156	11,180	14,058	2,214	11,844	14,645	2,672	11,973
CUYAHOGA	1,412,140	24,081	1,388,059	1,393,978	30,178	1,363,800	1,280,122	29,251	1,250,871	OTTAWA	40,029	554	39,475	40,985	637	40,348	41,428	489	40,939
DARKE	53,619	951	52,668	53,309	954	52,355	52,959	606	52,353	PAULDING	20,488	136	20,352	20,293	125	20,168	19,614	85	19,529
DEFIANCE	39,350	743	38,607	39,500	605	38,895	39,037	720	38,317	PERRY	31,557	307	31,250	34,078	293	33,785	36,058	307	35,751
DELAWARE	66,929	2,719	64,210	109,989	2,727	107,262	174,214	2,368	171,846	PICKAWAY	48,255	5,830	42,425	52,727	6,497	46,230	55,698	4,455	51,243
ERIE	76,779	1,223	75,556	79,551	1,868	77,683	77,079	1,677	75,402	PIKE	24,249	455	23,794	27,695	484	27,211	28,709	496	28,213
FAIRFIELD	103,461	2,497	100,964	122,759	2,591	120,168	146,156	2,872	143,284	PORTAGE	142,585	8,777	133,808	152,061	7,552	144,509	161,419	7,914	153,505
FAYETTE	27,466	523	26,943	28,433	650	27,783	29,030	593	28,437	PREBLE	40,113	391	39,722	42,337	489	41,848	42,270	386	41,884
FRANKLIN	961,437	25,317	936,120	1,068,978	22,106	1,046,872	1,163,414	25,224	1,138,190	PUTNAM	33,819	392	33,427	34,726	460	34,266	34,499	303	34,196
FULTON	38,498	382	38,116	42,084	430	41,654	42,698	391	42,307	RICHLAND	126,137	3,639	122,498	128,852	6,460	122,392	124,475	7,263	117,212
GALLIA	30,954	1,060	29,894	31,069	945	30,124	30,934	921	30,013	ROSS	69,330	5,667	63,663	73,345	5,429	67,916	78,064	6,353	71,711
GEAUGA	81,129	844	80,285	90,895	1,047	89,848	93,389	864	92,525	SANDUSKY	61,963	1,014	60,949	61,792	1,017	60,775	60,944	901	60,043
GREENE	136,731	6,394	130,337	147,886	7,781	140,105	161,573	8,775	152,798	SCIOTO	80,327	3,436	76,891	79,195	3,425	75,770	79,499	3,642	75,857
GUERNSEY	39,024	809	38,215	40,792	507	40,285	40,087	510	39,577	SENECA	59,733	1,970	57,763	58,683	1,658	57,025	56,745	2,534	54,211
HAMILTON	866,228	20,349	845,879	845,303	18,974	826,329	802,374	19,511	782,863	SHELBY	44,915	751	44,164	47,910	665	47,245	49,423	589	48,834
HANCOCK	65,536	1,217	64,319	71,295	1,728	69,567	74,782	1,694	73,088	STARK	367,585	7,913	359,672	378,098	8,933	369,165	375,586	9,264	366,322
HARDIN	31,111	1,855	29,256	31,945	1,915	30,030	32,058	2,259	29,799	SUMMIT	514,990	7,926	507,064	542,899	9,144	533,755	541,781	9,967	531,814
HARRISON	16,085	270	15,815	15,856	271	15,585	15,864	232	15,632	TRUMBULL	227,813	2,260	225,553	225,116	4,088	221,028	210,312	3,821	206,491
HENRY	29,108	556	28,552	29,210	579	28,631	28,215	346	27,869	TUSCARAWAS	84,090	1,047	83,043	90,914	1,163	89,751	92,582	1,250	91,332
HIGHLAND	35,728	442	35,286	40,875	426	40,449	43,589	484	43,105	UNION	31,969	1,838	30,131	40,909	2,181	38,728	52,300	2,932	49,368
HOCKING	25,533	626	24,907	28,241	725	27,516	29,380	718	28,662	VAN WERT	30,464	438	30,026	29,659	464	29,195	28,744	396	28,348
HOLMES	32,849	966	31,883	38,943	911	38,032	42,366	765	41,601	VINTON	11,098	112	10,986	12,806	140	12,666	13,435	68	13,367
HURON	56,240	505	55,735	59,487	579	58,908	59,626	578	59,048	WARREN	113,909	4,251	109,658	158,383	6,384	151,999	212,693	5,985	206,708
JACKSON	30,230	358	29,872	32,641	438	32,203	33,225	325	32,900	WASHINGTON	62,254	1,546	60,708	63,251	1,727	61,524	61,778	1,781	59,997
JEFFERSON	80,298	1,645	78,653	73,894	2,104	71,790	69,709	2,212	67,497	WAYNE	101,461	3,017	98,444	111,564	3,261	108,303	114,520	3,231	111,289
KNOX	47,473	3,126	44,347	54,500	3,462	51,038	60,921	3,485	57,436	WILLIAMS	36,956	383	36,573	39,188	1,083	38,105	37,642	990	36,652
LAKE	215,499	2,190	213,309	227,511	2,900	224,611	230,041	2,786	227,255	WOOD	113,269	8,367	104,902	121,065	7,781	113,284	125,488	6,230	119,258
										WYANDOT	22,254	441	21,813	22,908	445	22,463	22,615	251	22,364

Source: Census of Population: 1990, 2000 and 2010, U.S. Department of Commerce, Bureau of the Census.

APPENDIX 9

ESTIMATED ASFR*s AND TFR**s: OHIO & COUNTIES, 2000-2005

County Name	ASFR 15-19	ASFR 20-24	ASFR 25-29	ASFR 30-34	ASFR 35-39	ASFR 40-44	TFR (5 year)	County Name	ASFR 15-19	ASFR 20-24	ASFR 25-29	ASFR 30-34	ASFR 35-39	ASFR 40-44	TFR (5 year)
OHIO	0.0399	0.1072	0.1117	0.0900	0.0351	0.0069	1954	LAWRENCE	0.0469	0.1364	0.1087	0.0494	0.0170	0.0037	1810
ADAMS	0.0565	0.1757	0.1270	0.0590	0.0206	0.0038	2214	LICKING	0.0409	0.1236	0.1246	0.0929	0.0343	0.0053	2108
ALLEN	0.0543	0.1437	0.1405	0.0774	0.0248	0.0048	2227	LOGAN	0.0426	0.1642	0.1329	0.0743	0.0250	0.0052	2221
ASHLAND	0.0274	0.1071	0.1396	0.0838	0.0306	0.0092	1989	LORAIN	0.0376	0.1094	0.1152	0.0937	0.0374	0.0065	1999
ASHTABULA	0.0474	0.1468	0.1145	0.0721	0.0264	0.0063	2068	LUCAS	0.0502	0.1092	0.1115	0.0863	0.0305	0.0063	1970
ATHENS	0.0158	0.0305	0.0860	0.0723	0.0282	0.0050	1189	MADISON	0.0439	0.1403	0.1248	0.0797	0.0315	0.0050	2126
AUGLAIZE	0.0299	0.1495	0.1443	0.0897	0.0267	0.0054	2228	MAHONING	0.0377	0.0982	0.1062	0.0825	0.0340	0.0056	1820
BELMONT	0.0366	0.1289	0.1053	0.0661	0.0237	0.0047	1826	MARION	0.0584	0.1558	0.1151	0.0620	0.0175	0.0050	2069
BROWN	0.0431	0.1729	0.1224	0.0649	0.0199	0.0050	2141	MEDINA	0.0178	0.0901	0.1394	0.1268	0.0469	0.0090	2150
BUTLER	0.0365	0.0870	0.1231	0.0992	0.0356	0.0063	1938	MEIGS	0.0554	0.1682	0.1079	0.0570	0.0155	0.0037	2039
CARROLL	0.0331	0.1258	0.1344	0.0747	0.0230	0.0051	1980	MERCER	0.0279	0.1357	0.1653	0.1115	0.0340	0.0051	2397
CHAMPAIGN	0.0459	0.1526	0.1258	0.0742	0.0247	0.0029	2131	MIAMI	0.0395	0.1403	0.1188	0.0885	0.0258	0.0050	2090
CLARK	0.0533	0.1348	0.1098	0.0676	0.0237	0.0050	1971	MONROE	0.0345	0.1528	0.0945	0.0638	0.0265	0.0069	1895
CLERMONT	0.0407	0.1323	0.1277	0.0975	0.0398	0.0072	2226	MONTGOMERY	0.0459	0.1106	0.1083	0.0799	0.0317	0.0061	1912
CLINTON	0.0543	0.1475	0.1241	0.0696	0.0260	0.0055	2136	MORGAN	0.0490	0.1760	0.1179	0.0576	0.0145	0.0062	2105
COLUMBIANA	0.0386	0.1268	0.1151	0.0729	0.0250	0.0043	1914	MORROW	0.0366	0.1690	0.1366	0.0804	0.0281	0.0058	2282
COSHOCTON	0.0472	0.1828	0.1210	0.0698	0.0252	0.0041	2250	MUSKINGUM	0.0477	0.1386	0.1073	0.0635	0.0210	0.0042	1911
CRAWFORD	0.0478	0.1699	0.1168	0.0621	0.0213	0.0036	2107	NOBLE	0.0327	0.1490	0.1172	0.0633	0.0216	0.0062	1951
CUYAHOGA	0.0440	0.0991	0.0930	0.0915	0.0417	0.0088	1891	OTTAWA	0.0314	0.1199	0.1243	0.0847	0.0277	0.0048	1964
DARKE	0.0366	0.1469	0.1427	0.0824	0.0260	0.0038	2192	PAULDING	0.0368	0.1452	0.1144	0.0534	0.0184	0.0044	1863
DEFIANCE	0.0362	0.1406	0.1268	0.0744	0.0213	0.0042	2017	PERRY	0.0466	0.1682	0.1172	0.0648	0.0229	0.0042	2120
DELAWARE	0.0188	0.0772	0.1669	0.1812	0.0637	0.0119	2599	PICKAWAY	0.0439	0.1408	0.1305	0.0695	0.0239	0.0047	2066
ERIE	0.0420	0.1240	0.1159	0.0868	0.0270	0.0038	1998	PIKE	0.0611	0.1787	0.1135	0.0545	0.0149	0.0044	2135
FAIRFIELD	0.0315	0.1322	0.1294	0.0967	0.0332	0.0076	2153	PORTAGE	0.0199	0.0500	0.1010	0.0863	0.0328	0.0052	1475
FAYETTE	0.0635	0.1626	0.1176	0.0686	0.0224	0.0038	2192	PREBLE	0.0406	0.1413	0.1181	0.0676	0.0234	0.0040	1975
FRANKLIN	0.0454	0.0916	0.0994	0.0957	0.0421	0.0088	1915	PUTNAM	0.0248	0.1271	0.1683	0.1114	0.0354	0.0059	2364
FULTON	0.0295	0.1333	0.1328	0.0961	0.0270	0.0045	2115	RICHLAND	0.0514	0.1467	0.1269	0.0723	0.0282	0.0057	2156
GALLIA	0.0504	0.1455	0.1154	0.0596	0.0175	0.0043	1963	ROSS	0.0512	0.1593	0.1141	0.0612	0.0205	0.0041	2052
GEAUGA	0.0098	0.1100	0.1394	0.1406	0.0619	0.0115	2366	SANDUSKY	0.0467	0.1647	0.1280	0.0816	0.0249	0.0035	2247
GREENE	0.0200	0.0651	0.1135	0.0980	0.0350	0.0084	1700	SCIOTO	0.0575	0.1459	0.1032	0.0541	0.0157	0.0027	1895
GUERNSEY	0.0459	0.1585	0.1088	0.0760	0.0224	0.0062	2088	SENECA	0.0402	0.1191	0.1366	0.0754	0.0244	0.0048	2002
HAMILTON	0.0486	0.1016	0.0976	0.0932	0.0416	0.0086	1955	SHELBY	0.0500	0.1590	0.1511	0.0889	0.0322	0.0064	2438
HANCOCK	0.0332	0.0985	0.1272	0.0889	0.0316	0.0051	1922	STARK	0.0371	0.1098	0.1162	0.0858	0.0302	0.0056	1923
HARDIN	0.0347	0.0755	0.1155	0.0684	0.0211	0.0071	1611	SUMMIT	0.0367	0.0965	0.1028	0.0966	0.0390	0.0070	1893
HARRISON	0.0413	0.1501	0.1183	0.0629	0.0244	0.0026	1998	TRUMBULL	0.0400	0.1198	0.1062	0.0777	0.0291	0.0051	1890
HENRY	0.0321	0.1548	0.1484	0.0834	0.0229	0.0040	2228	TUSCARAWAS	0.0388	0.1527	0.1334	0.0811	0.0271	0.0047	2189
HIGHLAND	0.0529	0.1813	0.1308	0.0715	0.0242	0.0050	2329	UNION	0.0336	0.1169	0.1170	0.0897	0.0329	0.0067	1984
HOCKING	0.0516	0.1777	0.1185	0.0631	0.0191	0.0030	2165	VAN WERT	0.0369	0.1578	0.1259	0.0774	0.0179	0.0040	2100
HOLMES	0.0142	0.1701	0.2055	0.1530	0.0685	0.0221	3167	VINTON	0.0576	0.1741	0.1101	0.0538	0.0170	0.0033	2079
HURON	0.0501	0.1506	0.1414	0.0787	0.0274	0.0042	2262	WARREN	0.0280	0.1221	0.1464	0.1379	0.0492	0.0087	2461
JACKSON	0.0640	0.1677	0.1151	0.0551	0.0173	0.0030	2111	WASHINGTON	0.0346	0.1129	0.1177	0.0700	0.0206	0.0054	1806
JEFFERSON	0.0323	0.0988	0.0952	0.0655	0.0221	0.0043	1591	WAYNE	0.0238	0.1284	0.1502	0.1077	0.0352	0.0087	2270
KNOX	0.0293	0.0952	0.1392	0.0838	0.0360	0.0095	1965	WILLIAMS	0.0469	0.1436	0.1086	0.0646	0.0180	0.0021	1919
LAKE	0.0229	0.0848	0.1127	0.1016	0.0404	0.0072	1848	WOOD	0.0178	0.0434	0.1125	0.0996	0.0357	0.0055	1573
								WYANDOT	0.0354	0.1591	0.1327	0.0731	0.0299	0.0027	2164

- Note:
1. ASFR*: For single year of each age group.
 2. TFR**: For five year (2000-05 here). The total fertility rate (TFR) is the sum of the age-specific fertility rate times 5000
 3. Birth of mother aged 15-19 includes the birth of mother aged under 15 years old.
 4. Birth of mother aged 40-44 includes the birth of mother aged over 44 years old.
 5. ASFRs were calculated by using the average birthes of 2001-2005, as well as the average population of census 2000 and estimate 20
 6. The estimate population of 2005 is calculate by: (census 2000 + Census 2010)/2.

Sources: Ohio Dept. of Health, Division of Vital Statistics, birth files for 2000-2010 [machine-readable data files]
 Prepared by: Dr. Jian He, State Demographer, Research Office of Ohio Department Services Agency, June 2013.

APPENDIX 10

ESTIMATED ASFR*s AND TFR**s: OHIO & COUNTIES, 2005-2010

County Name	ASFR 15-19	ASFR 20-24	ASFR 25-29	ASFR 30-34	ASFR 35-39	ASFR 40-44	TFR 5 year	County Name	ASFR 15-19	ASFR 20-24	ASFR 25-29	ASFR 30-34	ASFR 35-39	ASFR 40-44	TFR (5 year)
OHIO	0.0390	0.1028	0.1184	0.0891	0.0378	0.0075	1972	LAWRENCE	0.0475	0.1480	0.1148	0.0620	0.0217	0.0035	1987
ADAMS	0.0568	0.1654	0.1251	0.0723	0.0253	0.0044	2246	LICKING	0.0358	0.1186	0.1317	0.0872	0.0354	0.0062	2074
ALLEN	0.0520	0.1324	0.1390	0.0765	0.0299	0.0055	2176	LOGAN	0.0474	0.1645	0.1401	0.0775	0.0242	0.0054	2296
ASHLAND	0.0235	0.1025	0.1488	0.0910	0.0326	0.0076	2030	LORAIN	0.0360	0.1050	0.1236	0.0920	0.0392	0.0067	2012
ASHTABULA	0.0438	0.1482	0.1308	0.0770	0.0315	0.0068	2191	LUCAS	0.0492	0.1056	0.1185	0.0845	0.0344	0.0069	1995
ATHENS	0.0146	0.0250	0.0848	0.0637	0.0307	0.0087	1137	MADISON	0.0395	0.1419	0.1332	0.0836	0.0356	0.0063	2201
AUGLAIZE	0.0357	0.1489	0.1629	0.0896	0.0294	0.0060	2363	MAHONING	0.0400	0.0973	0.1091	0.0817	0.0347	0.0064	1845
BELMONT	0.0384	0.1356	0.1171	0.0656	0.0239	0.0043	1925	MARION	0.0644	0.1659	0.1190	0.0604	0.0198	0.0040	2168
BROWN	0.0421	0.1550	0.1365	0.0660	0.0207	0.0038	2120	MEDINA	0.0176	0.0825	0.1298	0.1172	0.0456	0.0084	2006
BUTLER	0.0377	0.0879	0.1298	0.0999	0.0394	0.0069	2008	MEIGS	0.0465	0.1514	0.1058	0.0514	0.0195	0.0050	1898
CARROLL	0.0348	0.1480	0.1427	0.0761	0.0293	0.0072	2190	MERCER	0.0261	0.1364	0.1826	0.1182	0.0293	0.0072	2500
CHAMPAIGN	0.0402	0.1420	0.1315	0.0705	0.0269	0.0067	2089	MIAMI	0.0388	0.1319	0.1382	0.0836	0.0282	0.0057	2132
CLARK	0.0556	0.1359	0.1222	0.0678	0.0246	0.0047	2055	MONROE	0.0282	0.1493	0.1369	0.0666	0.0218	0.0079	2054
CLERMONT	0.0375	0.1256	0.1382	0.0982	0.0416	0.0081	2246	MONTGOMERY	0.0461	0.1082	0.1180	0.0813	0.0334	0.0062	1965
CLINTON	0.0462	0.1375	0.1290	0.0644	0.0265	0.0058	2047	MORGAN	0.0330	0.1610	0.1177	0.0562	0.0231	0.0070	1990
COLUMBIANA	0.0410	0.1318	0.1245	0.0724	0.0262	0.0051	2005	MORROW	0.0415	0.1489	0.1264	0.0752	0.0337	0.0059	2158
COSHOCTON	0.0400	0.1529	0.1312	0.0633	0.0241	0.0056	2086	MUSKINGUM	0.0465	0.1410	0.1192	0.0631	0.0244	0.0037	1990
CRAWFORD	0.0491	0.1422	0.1143	0.0676	0.0207	0.0041	1991	NOBLE	0.0406	0.1589	0.1393	0.0660	0.0261	0.0034	2171
CUYAHOGA	0.0430	0.0949	0.0968	0.0885	0.0440	0.0091	1881	OTTAWA	0.0304	0.1086	0.1450	0.0825	0.0312	0.0054	2015
DARKE	0.0406	0.1516	0.1554	0.0777	0.0327	0.0069	2325	PAULDING	0.0360	0.1563	0.1474	0.0698	0.0261	0.0060	2208
DEFIANCE	0.0424	0.1236	0.1422	0.0837	0.0275	0.0057	2126	PERRY	0.0463	0.1572	0.1351	0.0642	0.0242	0.0055	2163
DELAWARE	0.0148	0.0719	0.1497	0.1553	0.0625	0.0125	2333	PICKAWAY	0.0428	0.1313	0.1337	0.0782	0.0294	0.0036	2095
ERIE	0.0382	0.1215	0.1120	0.0763	0.0277	0.0055	1906	PIKE	0.0655	0.1740	0.1166	0.0561	0.0253	0.0032	2204
FAIRFIELD	0.0300	0.1273	0.1362	0.0872	0.0324	0.0070	2101	PORTAGE	0.0174	0.0442	0.1039	0.0866	0.0353	0.0062	1468
FAYETTE	0.0615	0.1723	0.1257	0.0689	0.0234	0.0038	2278	PREBLE	0.0410	0.1379	0.1358	0.0703	0.0252	0.0031	2066
FRANKLIN	0.0455	0.0863	0.1054	0.0986	0.0474	0.0107	1970	PUTNAM	0.0274	0.1177	0.1978	0.1291	0.0355	0.0078	2576
FULTON	0.0316	0.1302	0.1503	0.0859	0.0308	0.0065	2177	RICHLAND	0.0557	0.1506	0.1307	0.0745	0.0282	0.0059	2227
GALLIA	0.0522	0.1554	0.1250	0.0635	0.0273	0.0054	2144	ROSS	0.0593	0.1536	0.1242	0.0643	0.0206	0.0038	2129
GEAUGA	0.0103	0.0894	0.1416	0.1256	0.0640	0.0128	2218	SANDUSKY	0.0459	0.1524	0.1322	0.0753	0.0309	0.0038	2202
GREENE	0.0209	0.0602	0.1150	0.0921	0.0385	0.0072	1670	SCIOTO	0.0534	0.1470	0.1117	0.0517	0.0181	0.0032	1925
GUERNSEY	0.0418	0.1687	0.1160	0.0585	0.0279	0.0042	2085	SENECA	0.0339	0.1106	0.1400	0.0757	0.0280	0.0052	1967
HAMILTON	0.0453	0.0987	0.1091	0.0965	0.0450	0.0089	2017	SHELBY	0.0477	0.1557	0.1599	0.0871	0.0254	0.0058	2408
HANCOCK	0.0346	0.0922	0.1266	0.0896	0.0327	0.0051	1904	STARK	0.0357	0.1060	0.1252	0.0832	0.0330	0.0062	1946
HARDIN	0.0325	0.0779	0.1268	0.0739	0.0339	0.0061	1756	SUMMIT	0.0355	0.0905	0.1079	0.0911	0.0407	0.0078	1867
HARRISON	0.0470	0.1510	0.1186	0.0729	0.0203	0.0082	2091	TRUMBULL	0.0383	0.1186	0.1157	0.0756	0.0306	0.0061	1925
HENRY	0.0328	0.1400	0.1567	0.0878	0.0229	0.0052	2227	TUSCARAWAS	0.0360	0.1501	0.1397	0.0804	0.0288	0.0054	2202
HIGHLAND	0.0547	0.1728	0.1313	0.0677	0.0239	0.0045	2274	UNION	0.0274	0.0935	0.1163	0.0866	0.0334	0.0065	1818
HOCKING	0.0499	0.1568	0.1244	0.0564	0.0260	0.0037	2086	VAN WERT	0.0388	0.1535	0.1575	0.0754	0.0245	0.0043	2270
HOLMES	0.0171	0.1597	0.2063	0.1476	0.0660	0.0204	3086	VINTON	0.0497	0.1880	0.1202	0.0584	0.0220	0.0055	2219
HURON	0.0485	0.1517	0.1476	0.0782	0.0280	0.0052	2296	WARREN	0.0224	0.1054	0.1475	0.1252	0.0487	0.0098	2295
JACKSON	0.0568	0.1693	0.1221	0.0518	0.0218	0.0030	2123	WASHINGTON	0.0356	0.1069	0.1220	0.0656	0.0220	0.0030	1776
JEFFERSON	0.0372	0.0877	0.1152	0.0674	0.0260	0.0060	1698	WAYNE	0.0264	0.1162	0.1584	0.1060	0.0408	0.0082	2280
KNOX	0.0272	0.0941	0.1449	0.0874	0.0354	0.0067	1978	WILLIAMS	0.0465	0.1579	0.1274	0.0656	0.0216	0.0036	2113
LAKE	0.0229	0.0871	0.1148	0.0977	0.0434	0.0083	1871	WOOD	0.0166	0.0423	0.1196	0.0969	0.0371	0.0073	1600
								WYANDOT	0.0417	0.1532	0.1510	0.0671	0.0235	0.0028	2196

- Note:
1. ASFR*: For single year of each age group.
 2. TFR**: For five year (2005-10 here). The total fertility rate (TFR) is the sum of the age-specific fertility rate times 5000.
 3. Birth of mother aged 15-19 includes the birth of mother aged under 15 years old.
 4. Birth of mother aged 40-44 includes the birth of mother aged over 44 years old.
 5. ASFRs were calculated by using the average birthes of 2006-2010, as well as the average population of census 2010 and estimate 2005.
 6. The estimate population of 2005 is calculate by: (census 2000 + Census 2010)/2.

Sources: Ohio Dept. of Health, Division of Vital Statistics, birth files for 2000-2010 [machine-readable data files]
 Prepared by: Dr. Jian He, State Demographer, Research Office of Ohio Department Services Agency, June 2013.

Table 11

Ohio' Life Table for the years of 1990, 2000 and 2010

Males

Age	Population 1990	Population 2000	Population 2010	Deaths 1990	Deaths 2000	Deaths 2010	Ex 1990	Ex 2000	Ex 2010	Sx 1990	Sx 2000	Sx 2010
0-4	401,862	384,844	367,032	991	817	574	71.5	73.1	75.0	0.9933	0.9942	0.9957
5-9	406,238	416,666	382,253	88	85	57	67.4	68.9	70.6	0.9987	0.9989	0.9992
10-14	391,635	423,561	395,283	118	96	74	62.5	63.9	65.6	0.9965	0.9971	0.9975
15-19	376,537	387,023	388,773	411	364	317	57.6	59.0	60.7	0.9936	0.9942	0.9944
20-24	362,765	329,995	347,539	539	453	494	52.9	54.3	55.9	0.9927	0.9933	0.9926
25-29	414,326	353,429	343,582	594	460	530	48.2	49.6	51.3	0.9919	0.9925	0.9919
30-34	442,854	378,573	331,826	813	640	563	43.6	44.9	46.7	0.9895	0.9903	0.9904
35-39	411,442	423,204	345,747	983	929	746	39.0	40.3	42.1	0.9861	0.9873	0.9867
40-44	367,206	442,741	367,999	1,184	1,295	1,175	34.4	35.7	37.5	0.9798	0.9825	0.9802
45-49	287,989	403,080	409,969	1,419	1,674	1,978	29.9	31.2	33.0	0.9698	0.9753	0.9716
50-54	244,683	352,581	424,997	1,800	2,065	2,861	25.6	26.8	28.8	0.9539	0.9617	0.9603
55-59	227,449	262,547	376,358	2,637	2,575	3,573	21.5	22.5	24.7	0.9283	0.9356	0.9464
60-64	229,619	211,816	314,750	4,206	3,598	3,961	17.6	18.5	20.8	0.8876	0.8921	0.9220
65-69	204,462	180,793	220,072	6,103	5,275	4,424	14.0	14.9	17.0	0.8246	0.8351	0.8788
70-74	148,726	165,199	163,531	7,215	7,216	5,250	10.9	11.9	13.5	0.7369	0.7664	0.8064
75-79	98,074	125,340	123,163	7,497	8,073	6,870	8.3	9.2	10.4	0.6196	0.6676	0.7070
80-84	52,436	71,742	91,131	6,433	7,352	7,869	6.0	6.8	8.0	0.4918	0.5339	0.5797
85 +	29,272	40,459	65,509	7,247	8,410	10,799	4.0	4.8	6.1	0.3597	0.4173	0.4874

Females

Age	Population 1990	Population 2000	Population 2010	Deaths 1990	Deaths 2000	Deaths 2010	Ex 1990	Ex 2000	Ex 2010	Sx 1990	Sx 2000	Sx 2010
0-4	382,794	369,325	352,953	750	630	751	77.3	78.0	79.2	0.9947	0.9944	0.9944
5-9	388,270	399,031	364,955	61	62	45	73.0	73.7	75.0	0.9992	0.9994	0.9994
10-14	372,916	402,238	378,037	65	70	52	68.1	68.7	70.1	0.9985	0.9988	0.9988
15-19	362,354	371,482	369,702	155	146	122	63.1	63.8	65.1	0.9978	0.9980	0.9980
20-24	379,677	343,075	352,700	180	141	166	58.3	58.9	60.2	0.9975	0.9973	0.9973
25-29	439,873	367,154	357,899	233	201	220	53.4	54.0	55.4	0.9969	0.9965	0.9965
30-34	470,428	391,375	344,928	339	285	267	48.5	49.2	50.5	0.9956	0.9952	0.9952
35-39	432,420	445,318	359,862	455	505	418	43.7	44.3	45.7	0.9932	0.9923	0.9923
40-44	388,593	464,775	381,107	644	735	738	38.9	39.6	41.0	0.9889	0.9878	0.9878
45-49	307,010	421,557	431,985	860	1,027	1,284	34.2	34.9	36.3	0.9819	0.9828	0.9828
50-54	265,796	371,599	449,221	1,203	1,327	1,781	29.7	30.3	31.9	0.9718	0.9764	0.9764
55-59	251,283	285,266	400,391	1,748	1,804	2,234	25.3	25.8	27.4	0.9568	0.9667	0.9667
60-64	262,373	238,887	341,770	2,819	2,552	2,731	21.1	21.5	23.1	0.9327	0.9473	0.9473
65-69	254,813	215,743	251,712	4,399	3,956	3,462	17.1	17.5	19.0	0.8926	0.9130	0.9130
70-74	203,885	213,061	199,914	5,833	5,967	4,583	13.5	14.0	15.2	0.8338	0.8572	0.8572
75-79	156,448	184,837	164,314	7,048	7,657	6,508	10.2	10.7	11.7	0.7386	0.7721	0.7721
80-84	99,482	122,745	137,953	7,968	8,995	9,139	7.1	7.6	8.8	0.5577	0.6118	0.6118
85 +	69,674	92,958	131,321	15,757	18,727	21,026	4.4	5.0	6.2	0.4141	0.5101	0.5101

- Note:
1. Population is the Household Population of the each census.
 2. Death are the total death from (4/1/2005 to 3/31/2010)/5;
 3. **Ex** Means expectation of life (average number of years lived) after exact age x;
 4. **Sx** means survival rates of each age group x.

Prepared by: Dr. Jian He, State Demographer, Research Office of Ohio Department Services Agency, June 2013.

APPENDIX 12

ESTIMATED IN-MIGRATION NUMBERS BY COUNTY, 2000-2010

County Name	Year-over-year Matched Exemptions										In 2000-2010
	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	
Total	443,028	445,664	431,015	429,334	421,697	429,371	409,715	413,610	395,199	373,941	4,192,574
Adams	1,421	1,437	1,493	1,499	1,042	1,022	961	1,050	927	929	11,781
Allen	3,359	3,379	3,236	3,038	3,238	3,063	3,070	3,342	3,028	2,768	31,521
Ashland	2,339	2,416	2,480	2,393	2,231	2,242	2,103	2,123	2,000	1,861	22,188
Ashtabula	3,135	3,338	3,320	3,204	3,198	3,024	2,852	2,766	2,764	2,678	30,279
Athens	2,908	2,903	2,881	2,443	2,419	2,384	2,398	2,456	2,392	2,232	25,416
Auglaize	1,884	1,921	1,798	1,859	1,910	1,844	1,802	1,906	1,771	1,585	18,280
Belmont	1,914	2,397	2,041	2,111	1,944	1,981	1,870	1,951	2,058	1,731	19,998
Brown	2,414	2,577	2,477	2,440	2,224	2,321	2,233	2,348	2,107	2,232	23,373
Butler	17,842	17,583	16,988	17,483	17,630	18,815	17,621	17,328	16,179	16,150	173,619
Carroll	1,730	1,805	1,695	1,654	1,277	1,376	1,288	1,340	1,194	1,177	14,536
Champaign	2,435	2,591	2,481	2,326	1,973	1,997	1,728	1,998	1,698	1,586	20,813
Clark	4,766	5,027	4,565	4,618	4,466	4,646	3,999	4,375	4,050	3,925	44,437
Clermont	12,806	12,196	11,478	12,058	10,194	10,429	9,813	9,588	8,478	8,660	105,700
Clinton	2,634	2,581	2,541	2,671	2,305	2,745	2,252	2,335	2,017	1,720	23,801
Columbiana	3,266	3,478	3,235	3,214	2,970	3,189	2,894	2,911	2,826	2,858	30,841
Coshocton	1,619	1,538	1,565	1,440	1,019	1,116	986	1,097	1,088	1,000	12,468
Crawford	2,012	2,057	1,763	1,874	1,673	1,718	1,763	1,740	1,562	1,567	17,729
Cuyahoga	30,372	30,087	28,730	28,228	28,222	28,272	28,420	28,685	28,055	25,750	284,821
Darke	1,685	1,662	1,749	1,684	1,637	1,615	1,581	1,690	1,619	1,570	16,492
Defiance	1,746	1,575	1,508	1,586	1,493	1,673	1,519	1,502	1,476	1,346	15,424
Delaware	18,332	19,726	17,251	17,220	13,527	12,970	11,582	11,517	10,389	10,719	143,233

APPENDIX 12

ESTIMATED IN-MIGRATION NUMBERS BY COUNTY, 2000-2010

County Name	Year-over-year Matched Exemptions										In 2000-2010
	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	
Erie	3,103	3,038	2,988	3,071	2,956	3,078	2,888	3,066	2,686	2,711	29,585
Fairfield	10,430	10,361	10,453	10,552	8,351	8,205	7,738	7,507	7,524	7,223	88,344
Fayette	1,266	1,333	1,268	1,324	1,378	1,284	1,335	1,345	1,222	1,218	12,973
Franklin	46,951	45,195	43,587	42,787	43,106	45,226	44,834	46,057	45,514	40,803	444,060
Fulton	1,820	1,934	1,854	1,998	1,852	1,948	1,770	1,889	1,676	1,493	18,234
Gallia	1,300	1,252	1,206	1,149	985	1,071	998	1,053	925	915	10,854
Geauga	4,056	4,313	4,498	3,811	4,053	3,986	3,635	3,412	3,236	3,099	38,099
Greene	10,219	10,800	10,555	11,086	10,245	10,807	10,488	10,124	9,842	9,057	103,223
Guernsey	1,531	1,645	1,524	1,445	1,247	1,365	1,371	1,260	1,211	1,151	13,750
Hamilton	25,865	25,496	23,744	24,172	24,160	25,210	24,436	25,761	26,134	24,275	249,253
Hancock	3,367	3,318	3,176	3,200	3,130	3,363	3,352	3,190	3,064	2,686	31,846
Hardin	1,275	1,333	1,250	1,419	1,153	1,233	1,152	1,317	1,223	1,179	12,534
Harrison	769	807	775	677	717	671	661	593	641	603	6,914
Henry	1,202	1,304	1,072	1,192	1,192	1,284	1,019	1,079	1,020	901	11,265
Highland	2,099	2,129	1,941	1,961	2,070	2,175	2,222	2,149	1,877	1,798	20,421
Hocking	1,468	1,560	1,448	1,480	1,329	1,245	1,364	1,284	1,247	1,244	13,669
Holmes	1,185	1,114	1,062	1,088	991	948	853	932	997	1,022	10,192
Huron	2,635	2,738	2,586	2,580	2,590	2,523	2,433	2,443	2,130	2,208	24,866
Jackson	1,348	1,427	1,350	1,379	1,309	1,188	1,192	1,327	1,252	1,214	12,986
Jefferson	1,800	1,881	1,937	1,990	1,984	1,732	1,738	1,930	1,781	1,811	18,584
Knox	2,814	2,822	2,782	2,698	2,467	2,512	2,354	2,369	2,219	2,083	25,120
Lake	7,742	7,838	7,263	7,724	7,762	7,955	7,779	8,030	7,245	7,109	76,447
Lawrence	2,150	2,223	2,290	2,169	2,227	2,222	1,977	2,119	1,998	1,828	21,203

APPENDIX 12

ESTIMATED IN-MIGRATION NUMBERS BY COUNTY, 2000-2010

County Name	Year-over-year Matched Exemptions										In 2000-2010
	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	
Licking	6,472	6,500	7,002	6,764	7,707	7,637	6,959	7,067	6,627	6,423	69,158
Logan	2,027	2,026	2,009	1,951	1,872	1,988	1,944	1,918	1,812	1,542	19,089
Lorain	9,448	10,146	10,261	10,639	10,989	10,707	10,135	10,089	9,153	8,905	100,472
Lucas	13,605	12,816	12,870	11,717	12,123	12,122	11,214	11,337	11,385	10,351	119,540
Madison	2,007	2,287	2,183	2,147	2,474	2,369	2,237	2,294	2,179	2,035	22,212
Mahoning	6,708	6,526	6,515	6,395	6,446	6,732	6,139	6,466	6,389	5,923	64,239
Marion	2,216	2,242	2,153	1,983	2,003	1,984	1,884	2,210	2,006	1,944	20,625
Medina	8,737	9,315	8,982	9,157	8,950	9,000	8,152	7,973	7,668	6,961	84,895
Meigs	683	789	714	729	806	784	765	792	816	664	7,542
Mercer	1,230	1,192	1,265	1,188	1,218	1,258	1,150	1,112	1,105	1,017	11,735
Miami	4,530	4,288	4,571	4,438	4,550	4,694	4,309	4,421	4,163	3,802	43,766
Monroe	534	541	555	607	394	444	435	502	467	405	4,884
Montgomery	20,064	19,963	19,878	18,988	19,112	18,853	18,624	18,269	18,394	18,312	190,457
Morgan	710	704	805	870	631	522	492	493	482	461	6,170
Morrow	1,891	1,848	2,012	1,950	1,839	1,738	1,856	1,590	1,695	1,481	17,900
Muskingum	2,690	2,744	2,495	2,568	2,478	2,690	2,369	2,362	2,480	2,482	25,358
Noble	331	374	360	356	387	517	429	414	419	464	4,051
Ottawa	1,837	1,864	1,995	1,918	1,899	1,913	1,820	1,716	1,748	1,664	18,374
Paulding	662	628	685	650	764	771	598	671	728	636	6,793
Perry	1,213	1,217	1,366	1,238	1,555	1,588	1,405	1,701	1,365	1,406	14,054
Pickaway	2,561	2,729	2,591	2,675	2,955	3,166	2,921	2,938	2,778	2,639	27,953
Pike	1,693	1,817	1,756	1,728	998	1,135	980	1,141	1,036	1,090	13,374
Portage	7,434	7,643	7,518	7,420	7,211	7,449	7,569	7,406	6,920	6,210	72,780

APPENDIX 12

ESTIMATED IN-MIGRATION NUMBERS BY COUNTY, 2000-2010

Name	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	2000-2010
Preble	1,762	1,800	1,610	1,595	1,825	1,878	1,743	1,785	1,537	1,515	17,050
Putnam	884	962	965	882	986	907	941	898	849	837	9,111
Richland	3,732	4,026	3,830	3,758	3,795	3,792	3,572	3,513	3,500	3,311	36,829
Ross	2,611	2,553	2,352	2,240	2,608	2,603	2,634	2,513	2,329	2,197	24,640
Sandusky	2,059	2,198	1,954	2,137	2,026	2,107	2,072	1,989	1,906	1,842	20,290
Scioto	1,889	2,008	1,844	1,862	1,848	1,844	1,781	1,877	2,001	1,980	18,934
Seneca	1,766	1,826	1,806	1,796	1,774	1,927	1,966	1,813	1,667	1,727	18,068
Shelby	1,811	1,752	1,736	1,597	1,850	1,799	1,787	1,839	1,705	1,460	17,336
Stark	10,309	9,993	9,633	9,932	10,109	10,521	10,001	10,021	8,990	8,885	98,394
Summit	18,825	18,440	17,511	17,837	18,428	18,914	17,369	17,267	16,121	15,820	176,532
Trumbull	5,888	5,814	5,533	5,338	5,511	5,575	5,220	5,437	5,528	5,241	55,085
Tuscarawas	2,831	2,884	2,555	2,798	2,701	2,889	2,875	2,765	2,584	2,468	27,350
Union	2,470	2,191	2,330	2,277	2,876	3,095	2,767	3,027	2,641	2,286	25,960
Van Wert	840	842	917	863	884	1,019	770	866	835	773	8,609
Vinton	591	571	508	485	630	659	620	560	574	513	5,711
Warren	13,341	14,498	14,424	14,720	15,477	14,957	14,131	13,408	12,297	11,729	138,982
Washington	2,092	2,274	2,197	2,219	2,003	2,007	1,999	2,019	1,940	1,761	20,511
Wayne	4,106	4,122	3,922	3,879	4,092	4,020	3,765	4,009	3,538	3,306	38,759
Williams	1,371	1,362	1,287	1,349	1,346	1,423	1,374	1,205	1,169	1,094	12,980
Wood	6,775	6,319	6,739	6,782	6,747	6,772	6,659	6,657	6,416	5,903	65,769
Wyandot	778	895	937	917	974	929	959	976	915	801	9,081

Note: Exemptions are not equivalent to people because not every one files a tax return, and some persons may take more than one exemption

Data Source: The Internal Service (IRS), Statistics of Income Division.

Prepared by: Dr. Jian He, State Demographer, Research Office of Ohio Department Services Agency, June 2013.

APPENDIX 13

ESTIMATED OUT-MIGRATION NUMBERS BY COUNTY, 2000-2010

County Name	Year-over-year Matched Exemptions										Out 2000-2010
	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	
Total	468,827	469,557	450,790	453,876	453,963	463,957	444,011	446,398	423,092	406,047	4,480,518
Adams	1,312	1,217	1,215	1,338	977	1,024	1,029	1,048	1,040	857	11,057
Allen	3,981	3,954	3,573	3,728	3,788	3,812	3,587	3,855	3,789	3,489	37,556
Ashland	2,307	2,492	2,249	2,484	2,146	2,048	1,859	2,118	2,065	1,967	21,735
Ashtabula	3,593	3,539	3,357	3,406	3,242	3,512	3,165	3,403	3,220	2,883	33,320
Athens	2,867	2,842	2,605	2,592	2,622	2,652	2,565	2,687	2,615	2,445	26,492
Auglaize	2,000	2,136	1,934	1,929	1,801	2,151	1,904	1,825	1,992	1,716	19,388
Belmont	2,269	2,018	2,030	2,033	1,976	1,999	1,938	2,049	1,853	1,739	19,904
Brown	2,352	2,223	2,280	2,317	2,185	2,275	2,127	2,330	2,089	2,079	22,257
Butler	17,143	17,111	16,015	16,299	15,915	16,514	15,723	16,801	15,856	15,721	163,098
Carroll	1,550	1,660	1,523	1,722	1,392	1,364	1,463	1,349	1,260	1,164	14,447
Champaign	2,457	2,504	2,360	2,404	1,923	1,860	1,734	1,885	1,827	1,794	20,748
Clark	5,520	5,564	5,245	5,093	4,855	4,873	4,946	4,937	4,392	4,348	49,773
Clermont	12,021	11,290	10,486	10,612	9,361	9,496	9,132	9,302	8,768	8,521	98,989
Clinton	2,535	2,523	2,369	2,465	2,215	2,184	2,367	2,279	2,283	2,292	23,512
Columbiana	3,787	3,629	3,347	3,489	3,488	3,245	3,350	3,412	3,053	2,887	33,687
Coshocton	1,529	1,493	1,463	1,488	1,200	1,220	1,195	1,342	1,127	1,025	13,082
Crawford	2,326	2,343	2,070	2,019	1,873	2,232	1,931	1,999	1,759	1,736	20,288
Cuyahoga	42,279	42,474	41,581	41,557	43,446	44,787	41,330	40,434	36,405	35,522	409,815
Darke	2,045	1,861	1,805	1,734	1,890	1,976	1,843	1,852	1,843	1,602	18,451
Defiance	1,977	1,898	1,813	1,839	1,707	1,705	1,782	1,618	1,651	1,480	17,470
Delaware	10,974	11,561	10,198	10,495	8,188	8,855	8,442	8,603	8,357	8,126	93,799

APPENDIX 13

ESTIMATED OUT-MIGRATION NUMBERS BY COUNTY, 2000-2010

Name	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	2000-2010
Erie	3,446	3,589	3,237	3,182	3,460	3,354	3,212	3,179	3,307	2,783	32,749
Fairfield	7,764	8,027	7,538	7,760	6,702	6,987	6,844	6,989	6,647	6,660	71,918
Fayette	1,482	1,422	1,322	1,428	1,312	1,298	1,315	1,419	1,336	1,148	13,482
Franklin	51,029	52,640	51,107	51,234	50,447	50,574	49,234	48,046	46,532	45,696	496,539
Fulton	1,980	1,963	1,936	1,788	1,925	2,157	1,939	2,065	1,878	1,736	19,367
Gallia	1,297	1,195	1,220	1,202	1,011	1,049	1,018	981	966	859	10,798
Geauga	4,105	4,017	3,707	3,838	3,842	3,943	3,593	3,449	3,375	3,079	36,948
Greene	10,476	10,485	10,202	10,191	10,689	10,661	10,661	10,387	10,007	9,593	103,352
Guernsey	1,533	1,516	1,385	1,521	1,400	1,481	1,395	1,393	1,369	1,266	14,259
Hamilton	33,940	36,108	34,735	35,209	34,579	34,112	32,123	31,877	29,413	29,370	331,466
Hancock	3,160	3,104	3,217	3,173	3,396	3,262	3,308	3,514	3,110	3,167	32,411
Hardin	1,582	1,412	1,410	1,271	1,305	1,367	1,268	1,388	1,349	1,103	13,455
Harrison	787	714	664	711	673	735	649	656	656	616	6,861
Henry	1,331	1,236	1,192	1,301	1,267	1,387	1,459	1,270	1,317	1,079	12,839
Highland	1,937	1,810	1,831	1,725	2,085	1,910	2,099	2,287	2,023	1,732	19,439
Hocking	1,392	1,396	1,359	1,406	1,308	1,289	1,167	1,153	1,290	1,235	12,995
Holmes	1,077	1,130	1,242	1,105	1,137	1,172	1,263	1,186	1,139	1,160	11,611
Huron	3,132	2,809	2,763	2,809	2,670	2,830	2,719	2,640	2,570	2,445	27,387
Jackson	1,361	1,211	1,316	1,231	1,164	1,299	1,162	1,261	1,224	1,003	12,232
Jefferson	2,209	2,242	2,005	2,077	2,314	2,060	2,148	1,932	1,944	1,853	20,784
Knox	2,259	2,233	2,334	2,231	2,101	2,345	2,039	2,111	2,156	1,849	21,658
Lake	8,203	8,218	7,974	7,536	8,150	8,114	7,581	7,508	7,335	7,052	77,671
Lawrence	2,292	2,172	1,928	2,008	1,848	2,049	2,066	2,055	1,883	1,899	20,200

APPENDIX 13

ESTIMATED OUT-MIGRATION NUMBERS BY COUNTY, 2000-2010

County Name	Year-over-year Matched Exemptions										Out 2000-2010
	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	
Licking	5,948	5,931	5,851	5,717	6,511	6,813	6,236	6,704	6,342	6,059	62,112
Logan	2,141	1,965	2,029	2,025	2,017	2,235	1,835	2,058	1,964	1,680	19,949
Lorain	9,689	9,709	8,536	9,391	9,612	10,130	9,467	9,496	8,916	8,786	93,732
Lucas	15,909	15,852	15,359	15,534	15,746	15,806	15,000	14,995	14,150	13,371	151,722
Madison	2,219	2,297	2,142	1,982	2,275	2,221	2,005	2,288	2,142	1,995	21,566
Mahoning	8,094	8,188	7,212	7,351	7,724	7,841	8,005	7,878	7,404	6,971	76,668
Marion	2,480	2,402	2,166	2,247	2,222	2,278	2,203	2,205	2,285	2,036	22,524
Medina	7,059	7,005	7,003	7,251	7,696	7,757	7,386	7,027	6,611	6,459	71,254
Meigs	723	698	687	787	758	805	750	802	662	671	7,343
Mercer	1,513	1,296	1,349	1,319	1,315	1,338	1,266	1,253	1,367	1,212	13,228
Miami	4,600	4,347	4,432	4,194	4,230	4,726	4,570	4,441	4,426	4,125	44,091
Monroe	548	619	572	559	518	527	499	463	516	481	5,302
Montgomery	24,666	23,793	22,610	22,485	22,662	23,179	22,539	22,636	21,046	19,778	225,394
Morgan	698	730	757	776	675	596	536	598	464	451	6,281
Morrow	1,465	1,655	1,662	1,605	1,715	1,619	1,563	1,620	1,646	1,561	16,111
Muskingum	2,791	2,725	2,557	2,578	2,563	2,562	2,656	2,764	2,685	2,289	26,170
Noble	397	359	303	379	415	407	478	415	413	418	3,984
Ottawa	1,773	1,803	1,780	1,824	1,821	1,945	1,822	1,932	1,682	1,642	18,024
Paulding	820	820	883	861	830	902	742	834	777	719	8,188
Perry	1,209	1,188	1,180	1,224	1,560	1,501	1,408	1,413	1,485	1,397	13,565
Pickaway	2,691	2,449	2,684	2,394	2,338	2,564	2,431	2,693	2,626	2,335	25,205
Pike	1,703	1,634	1,585	1,730	1,214	1,009	1,070	991	1,132	1,056	13,124
Portage	7,498	7,470	7,128	7,316	7,306	7,777	7,169	7,208	6,718	6,778	72,368

APPENDIX 13

ESTIMATED OUT-MIGRATION NUMBERS BY COUNTY, 2000-2010

County Name	Year-over-year Matched Exemptions										Out 2000-2010
	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	
Preble	1,800	1,734	1,696	1,654	1,863	1,918	1,922	1,641	1,765	1,612	17,605
Putnam	1,078	1,207	1,017	1,154	1,041	1,117	1,088	1,146	1,130	1,093	11,071
Richland	4,443	4,431	4,279	4,134	4,265	4,596	4,358	4,531	4,065	4,252	43,354
Ross	2,385	2,347	2,418	2,296	2,491	2,508	2,466	2,547	2,445	2,267	24,170
Sandusky	2,318	2,355	2,302	2,168	2,299	2,277	2,426	2,470	2,199	2,035	22,849
Scioto	2,332	2,317	2,226	2,234	1,964	1,988	1,890	1,861	2,010	1,801	20,623
Seneca	2,120	2,264	2,075	2,116	2,251	2,272	2,193	2,185	2,102	2,092	21,670
Shelby	1,846	1,956	1,891	1,946	1,981	2,008	1,935	1,962	1,873	1,863	19,261
Stark	11,411	10,986	10,587	10,555	10,927	11,049	10,425	10,594	10,480	9,907	106,921
Summit	19,875	19,733	18,929	19,244	19,767	20,430	19,579	19,582	18,117	17,427	192,683
Trumbull	6,803	6,843	6,633	6,280	6,719	6,811	6,761	6,871	6,274	5,963	65,958
Tuscarawas	2,946	2,785	2,678	2,736	3,088	3,170	2,813	2,870	2,727	2,672	28,485
Union	1,762	2,091	1,952	1,956	2,330	2,400	2,360	2,725	2,407	2,330	22,313
Van Wert	1,033	967	980	928	1,024	1,050	996	1,062	1,114	994	10,148
Vinton	499	519	460	479	609	582	622	672	563	573	5,578
Warren	9,071	9,338	9,514	10,092	10,610	12,008	11,314	11,423	10,962	10,829	105,161
Washington	2,407	2,408	2,218	2,202	2,403	2,279	2,171	2,245	2,057	1,936	22,326
Wayne	4,346	4,288	4,316	4,280	4,276	4,188	4,220	4,107	3,991	3,848	41,860
Williams	1,532	1,557	1,523	1,433	1,563	1,560	1,473	1,480	1,531	1,381	15,033
Wood	6,648	6,568	6,520	6,571	6,716	6,941	6,669	6,813	6,829	6,241	66,516
Wyandot	940	947	967	909	1,078	1,048	1,020	1,023	922	885	9,739

Note: Exemptions are not equivalent to people because not every one files a tax return, and some persons may take more than one exemption.

Data Source: The Internal Service (IRS), Statistics of Income Division.

Prepared by: Dr. Jian He, State Demographer, Research Office of Ohio Department Services Agency, June 2013.

APPENDIX 14

ESTIMATED NET-MIGRATION NUMBERS BY COUNTY, 2000-2010

County Name	Year-over-year Matched Exemptions										Net 2000-2010
	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	
Total	-25,799	-23,893	-19,775	-24,542	-32,266	-34,586	-34,296	-32,788	-27,893	-32,106	-287,944
Adams	109	220	278	161	65	-2	-68	2	-113	72	724
Allen	-622	-575	-337	-690	-550	-749	-517	-513	-761	-721	-6,035
Ashland	32	-76	231	-91	85	194	244	5	-65	-106	453
Ashtabula	-458	-201	-37	-202	-44	-488	-313	-637	-456	-205	-3,041
Athens	41	61	276	-149	-203	-268	-167	-231	-223	-213	-1,076
Auglaize	-116	-215	-136	-70	109	-307	-102	81	-221	-131	-1,108
Belmont	-355	379	11	78	-32	-18	-68	-98	205	-8	94
Brown	62	354	197	123	39	46	106	18	18	153	1,116
Butler	699	472	973	1,184	1,715	2,301	1,898	527	323	429	10,521
Carroll	180	145	172	-68	-115	12	-175	-9	-66	13	89
Champaign	-22	87	121	-78	50	137	-6	113	-129	-208	65
Clark	-754	-537	-680	-475	-389	-227	-947	-562	-342	-423	-5,336
Clermont	785	906	992	1,446	833	933	681	286	-290	139	6,711
Clinton	99	58	172	206	90	561	-115	56	-266	-572	289
Columbiana	-521	-151	-112	-275	-518	-56	-456	-501	-227	-29	-2,846
Coshocton	90	45	102	-48	-181	-104	-209	-245	-39	-25	-614
Crawford	-314	-286	-307	-145	-200	-514	-168	-259	-197	-169	-2,559
Cuyahoga	-11,907	-12,387	-12,851	-13,329	-15,224	-16,515	-12,910	-11,749	-8,350	-9,772	-124,994
Darke	-360	-199	-56	-50	-253	-361	-262	-162	-224	-32	-1,959
Defiance	-231	-323	-305	-253	-214	-32	-263	-116	-175	-134	-2,046
Delaware	7,358	8,165	7,053	6,725	5,339	4,115	3,140	2,914	2,032	2,593	49,434

APPENDIX 14

ESTIMATED NET-MIGRATION NUMBERS BY COUNTY, 2000-2010

County Name	Year-over-year Matched Exemptions										Net 2000-2010
	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	
Erie	-343	-551	-249	-111	-504	-276	-324	-113	-621	-72	-3,164
Fairfield	2,666	2,334	2,915	2,792	1,649	1,218	894	518	877	563	16,426
Fayette	-216	-89	-54	-104	66	-14	20	-74	-114	70	-509
Franklin	-4,078	-7,445	-7,520	-8,447	-7,341	-5,348	-4,400	-1,989	-1,018	-4,893	-52,479
Fulton	-160	-29	-82	210	-73	-209	-169	-176	-202	-243	-1,133
Gallia	3	57	-14	-53	-26	22	-20	72	-41	56	56
Geauga	-49	296	791	-27	211	43	42	-37	-139	20	1,151
Greene	-257	315	353	895	-444	146	-173	-263	-165	-536	-129
Guernsey	-2	129	139	-76	-153	-116	-24	-133	-158	-115	-509
Hamilton	-8,075	-10,612	-10,991	-11,037	-10,419	-8,902	-7,687	-6,116	-3,279	-5,095	-82,213
Hancock	207	214	-41	27	-266	101	44	-324	-46	-481	-565
Hardin	-307	-79	-160	148	-152	-134	-116	-71	-126	76	-921
Harrison	-18	93	111	-34	44	-64	12	-63	-15	-13	53
Henry	-129	68	-120	-109	-75	-103	-440	-191	-297	-178	-1,574
Highland	162	319	110	236	-15	265	123	-138	-146	66	982
Hocking	76	164	89	74	21	-44	197	131	-43	9	674
Holmes	108	-16	-180	-17	-146	-224	-410	-254	-142	-138	-1,419
Huron	-497	-71	-177	-229	-80	-307	-286	-197	-440	-237	-2,521
Jackson	-13	216	34	148	145	-111	30	66	28	211	754
Jefferson	-409	-361	-68	-87	-330	-328	-410	-2	-163	-42	-2,200
Knox	555	589	448	467	366	167	315	258	63	234	3,462
Lake	-461	-380	-711	188	-388	-159	198	522	-90	57	-1,224
Lawrence	-142	51	362	161	379	173	-89	64	115	-71	1,003

APPENDIX 14

ESTIMATED NET-MIGRATION NUMBERS BY COUNTY, 2000-2010

County Name	Year-over-year Matched Exemptions										Net 2000-2010
	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	
Licking	524	569	1,151	1,047	1,196	824	723	363	285	364	7,046
Logan	-114	61	-20	-74	-145	-247	109	-140	-152	-138	-860
Lorain	-241	437	1,725	1,248	1,377	577	668	593	237	119	6,740
Lucas	-2,304	-3,036	-2,489	-3,817	-3,623	-3,684	-3,786	-3,658	-2,765	-3,020	-32,182
Madison	-212	-10	41	165	199	148	232	6	37	40	646
Mahoning	-1,386	-1,662	-697	-956	-1,278	-1,109	-1,866	-1,412	-1,015	-1,048	-12,429
Marion	-264	-160	-13	-264	-219	-294	-319	5	-279	-92	-1,899
Medina	1,678	2,310	1,979	1,906	1,254	1,243	766	946	1,057	502	13,641
Meigs	-40	91	27	-58	48	-21	15	-10	154	-7	199
Mercer	-283	-104	-84	-131	-97	-80	-116	-141	-262	-195	-1,493
Miami	-70	-59	139	244	320	-32	-261	-20	-263	-323	-325
Monroe	-14	-78	-17	48	-124	-83	-64	39	-49	-76	-418
Montgomery	-4,602	-3,830	-2,732	-3,497	-3,550	-4,326	-3,915	-4,367	-2,652	-1,466	-34,937
Morgan	12	-26	48	94	-44	-74	-44	-105	18	10	-111
Morrow	426	193	350	345	124	119	293	-30	49	-80	1,789
Muskingum	-101	19	-62	-10	-85	128	-287	-402	-205	193	-812
Noble	-66	15	57	-23	-28	110	-49	-1	6	46	67
Ottawa	64	61	215	94	78	-32	-2	-216	66	22	350
Paulding	-158	-192	-198	-211	-66	-131	-144	-163	-49	-83	-1,395
Perry	4	29	186	14	-5	87	-3	288	-120	9	489
Pickaway	-130	280	-93	281	617	602	490	245	152	304	2,748
Pike	-10	183	171	-2	-216	126	-90	150	-96	34	250
Portage	-64	173	390	104	-95	-328	400	198	202	-568	412
Preble	-38	66	-86	-59	-38	-40	-179	144	-228	-97	-555

APPENDIX 14

ESTIMATED NET-MIGRATION NUMBERS BY COUNTY, 2000-2010

County	Year-over-year Matched Exemptions										Net
Name	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	2000-2010
Putnam	-194	-245	-52	-272	-55	-210	-147	-248	-281	-256	-1,960
Richland	-711	-405	-449	-376	-470	-804	-786	-1,018	-565	-941	-6,525
Ross	226	206	-66	-56	117	95	168	-34	-116	-70	470
Sandusky	-259	-157	-348	-31	-273	-170	-354	-481	-293	-193	-2,559
Scioto	-443	-309	-382	-372	-116	-144	-109	16	-9	179	-1,689
Seneca	-354	-438	-269	-320	-477	-345	-227	-372	-435	-365	-3,602
Shelby	-35	-204	-155	-349	-131	-209	-148	-123	-168	-403	-1,925
Stark	-1,102	-993	-954	-623	-818	-528	-424	-573	-1,490	-1,022	-8,527
Summit	-1,050	-1,293	-1,418	-1,407	-1,339	-1,516	-2,210	-2,315	-1,996	-1,607	-16,151
Trumbull	-915	-1,029	-1,100	-942	-1,208	-1,236	-1,541	-1,434	-746	-722	-10,873
Tuscarawas	-115	99	-123	62	-387	-281	62	-105	-143	-204	-1,135
Union	708	100	378	321	546	695	407	302	234	-44	3,647
Van Wert	-193	-125	-63	-65	-140	-31	-226	-196	-279	-221	-1,539
Vinton	92	52	48	6	21	77	-2	-112	11	-60	133
Warren	4,270	5,160	4,910	4,628	4,867	2,949	2,817	1,985	1,335	900	33,821
Washington	-315	-134	-21	17	-400	-272	-172	-226	-117	-175	-1,815
Wayne	-240	-166	-394	-401	-184	-168	-455	-98	-453	-542	-3,101
Williams	-161	-195	-236	-84	-217	-137	-99	-275	-362	-287	-2,053
Wood	127	-249	219	211	31	-169	-10	-156	-413	-338	-747
Wyandot	-162	-52	-30	8	-104	-119	-61	-47	-7	-84	-658

Note: Exemptions are not equivalent to people because not every one files a tax return, and some persons may take more than one exemption.

Data Source: The Internal Service (IRS), Statistics of Income Division.

Prepared by: Dr. Jian He, State Demographer, Research Office of Ohio Department Services Agency, June 2013.

APPENDIX 15

ESTIMATED GROSS-MIGRATION NUMBERS BY COUNTY, 2000-2010

County Name	Year-over-year Matched Exemptions										Gross 2000-2010
	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	
Total	911,855	915,221	881,805	883,210	875,660	893,328	853,726	860,008	818,291	779,988	8,673,092
Adams	2,733	2,654	2,708	2,837	2,019	2,046	1,990	2,098	1,967	1,786	22,838
Allen	7,340	7,333	6,809	6,766	7,026	6,875	6,657	7,197	6,817	6,257	69,077
Ashland	4,646	4,908	4,729	4,877	4,377	4,290	3,962	4,241	4,065	3,828	43,923
Ashtabula	6,728	6,877	6,677	6,610	6,440	6,536	6,017	6,169	5,984	5,561	63,599
Athens	5,775	5,745	5,486	5,035	5,041	5,036	4,963	5,143	5,007	4,677	51,908
Auglaize	3,884	4,057	3,732	3,788	3,711	3,995	3,706	3,731	3,763	3,301	37,668
Belmont	4,183	4,415	4,071	4,144	3,920	3,980	3,808	4,000	3,911	3,470	39,902
Brown	4,766	4,800	4,757	4,757	4,409	4,596	4,360	4,678	4,196	4,311	45,630
Butler	34,985	34,694	33,003	33,782	33,545	35,329	33,344	34,129	32,035	31,871	336,717
Carroll	3,280	3,465	3,218	3,376	2,669	2,740	2,751	2,689	2,454	2,341	28,983
Champaign	4,892	5,095	4,841	4,730	3,896	3,857	3,462	3,883	3,525	3,380	41,561
Clark	10,286	10,591	9,810	9,711	9,321	9,519	8,945	9,312	8,442	8,273	94,210
Clermont	24,827	23,486	21,964	22,670	19,555	19,925	18,945	18,890	17,246	17,181	204,689
Clinton	5,169	5,104	4,910	5,136	4,520	4,929	4,619	4,614	4,300	4,012	47,313
Columbiana	7,053	7,107	6,582	6,703	6,458	6,434	6,244	6,323	5,879	5,745	64,528
Coshocton	3,148	3,031	3,028	2,928	2,219	2,336	2,181	2,439	2,215	2,025	25,550
Crawford	4,338	4,400	3,833	3,893	3,546	3,950	3,694	3,739	3,321	3,303	38,017
Cuyahoga	72,651	72,561	70,311	69,785	71,668	73,059	69,750	69,119	64,460	61,272	694,636
Darke	3,730	3,523	3,554	3,418	3,527	3,591	3,424	3,542	3,462	3,172	34,943
Defiance	3,723	3,473	3,321	3,425	3,200	3,378	3,301	3,120	3,127	2,826	32,894
Delaware	29,306	31,287	27,449	27,715	21,715	21,825	20,024	20,120	18,746	18,845	237,032

APPENDIX 15

ESTIMATED GROSS-MIGRATION NUMBERS BY COUNTY, 2000-2010

County Name	Year-over-year Matched Exemptions										Gross 2000-2010
	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	
Erie	6,549	6,627	6,225	6,253	6,416	6,432	6,100	6,245	5,993	5,494	62,334
Fairfield	18,194	18,388	17,991	18,312	15,053	15,192	14,582	14,496	14,171	13,883	160,262
Fayette	2,748	2,755	2,590	2,752	2,690	2,582	2,650	2,764	2,558	2,366	26,455
Franklin	97,980	97,835	94,694	94,021	93,553	95,800	94,068	94,103	92,046	86,499	940,599
Fulton	3,800	3,897	3,790	3,786	3,777	4,105	3,709	3,954	3,554	3,229	37,601
Gallia	2,597	2,447	2,426	2,351	1,996	2,120	2,016	2,034	1,891	1,774	21,652
Geauga	8,161	8,330	8,205	7,649	7,895	7,929	7,228	6,861	6,611	6,178	75,047
Greene	20,695	21,285	20,757	21,277	20,934	21,468	21,149	20,511	19,849	18,650	206,575
Guernsey	3,064	3,161	2,909	2,966	2,647	2,846	2,766	2,653	2,580	2,417	28,009
Hamilton	59,805	61,604	58,479	59,381	58,739	59,322	56,559	57,638	55,547	53,645	580,719
Hancock	6,527	6,422	6,393	6,373	6,526	6,625	6,660	6,704	6,174	5,853	64,257
Hardin	2,857	2,745	2,660	2,690	2,458	2,600	2,420	2,705	2,572	2,282	25,989
Harrison	1,556	1,521	1,439	1,388	1,390	1,406	1,310	1,249	1,297	1,219	13,775
Henry	2,533	2,540	2,264	2,493	2,459	2,671	2,478	2,349	2,337	1,980	24,104
Highland	4,036	3,939	3,772	3,686	4,155	4,085	4,321	4,436	3,900	3,530	39,860
Hocking	2,860	2,956	2,807	2,886	2,637	2,534	2,531	2,437	2,537	2,479	26,664
Holmes	2,262	2,244	2,304	2,193	2,128	2,120	2,116	2,118	2,136	2,182	21,803
Huron	5,767	5,547	5,349	5,389	5,260	5,353	5,152	5,083	4,700	4,653	52,253
Jackson	2,709	2,638	2,666	2,610	2,473	2,487	2,354	2,588	2,476	2,217	25,218
Jefferson	4,009	4,123	3,942	4,067	4,298	3,792	3,886	3,862	3,725	3,664	39,368
Knox	5,073	5,055	5,116	4,929	4,568	4,857	4,393	4,480	4,375	3,932	46,778
Lake	15,945	16,056	15,237	15,260	15,912	16,069	15,360	15,538	14,580	14,161	154,118
Lawrence	4,442	4,395	4,218	4,177	4,075	4,271	4,043	4,174	3,881	3,727	41,403

APPENDIX 15

ESTIMATED GROSS-MIGRATION NUMBERS BY COUNTY, 2000-2010

County Name	Year-over-year Matched Exemptions										Gross 2000-2010
	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	
Licking	12,420	12,431	12,853	12,481	14,218	14,450	13,195	13,771	12,969	12,482	131,270
Logan	4,168	3,991	4,038	3,976	3,889	4,223	3,779	3,976	3,776	3,222	39,038
Lorain	19,137	19,855	18,797	20,030	20,601	20,837	19,602	19,585	18,069	17,691	194,204
Lucas	29,514	28,668	28,229	27,251	27,869	27,928	26,214	26,332	25,535	23,722	271,262
Madison	4,226	4,584	4,325	4,129	4,749	4,590	4,242	4,582	4,321	4,030	43,778
Mahoning	14,802	14,714	13,727	13,746	14,170	14,573	14,144	14,344	13,793	12,894	140,907
Marion	4,696	4,644	4,319	4,230	4,225	4,262	4,087	4,415	4,291	3,980	43,149
Medina	15,796	16,320	15,985	16,408	16,646	16,757	15,538	15,000	14,279	13,420	156,149
Meigs	1,406	1,487	1,401	1,516	1,564	1,589	1,515	1,594	1,478	1,335	14,885
Mercer	2,743	2,488	2,614	2,507	2,533	2,596	2,416	2,365	2,472	2,229	24,963
Miami	9,130	8,635	9,003	8,632	8,780	9,420	8,879	8,862	8,589	7,927	87,857
Monroe	1,082	1,160	1,127	1,166	912	971	934	965	983	886	10,186
Montgomery	44,730	43,756	42,488	41,473	41,774	42,032	41,163	40,905	39,440	38,090	415,851
Morgan	1,408	1,434	1,562	1,646	1,306	1,118	1,028	1,091	946	912	12,451
Morrow	3,356	3,503	3,674	3,555	3,554	3,357	3,419	3,210	3,341	3,042	34,011
Muskingum	5,481	5,469	5,052	5,146	5,041	5,252	5,025	5,126	5,165	4,771	51,528
Noble	728	733	663	735	802	924	907	829	832	882	8,035
Ottawa	3,610	3,667	3,775	3,742	3,720	3,858	3,642	3,648	3,430	3,306	36,398
Paulding	1,482	1,448	1,568	1,511	1,594	1,673	1,340	1,505	1,505	1,355	14,981
Perry	2,422	2,405	2,546	2,462	3,115	3,089	2,813	3,114	2,850	2,803	27,619
Pickaway	5,252	5,178	5,275	5,069	5,293	5,730	5,352	5,631	5,404	4,974	53,158
Pike	3,396	3,451	3,341	3,458	2,212	2,144	2,050	2,132	2,168	2,146	26,498
Portage	14,932	15,113	14,646	14,736	14,517	15,226	14,738	14,614	13,638	12,988	145,148

APPENDIX 15

ESTIMATED GROSS-MIGRATION NUMBERS BY COUNTY, 2000-2010

County Name	Year-over-year Matched Exemptions										Gross 2000-2010
	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	
Preble	3,562	3,534	3,306	3,249	3,688	3,796	3,665	3,426	3,302	3,127	34,655
Putnam	1,962	2,169	1,982	2,036	2,027	2,024	2,029	2,044	1,979	1,930	20,182
Richland	8,175	8,457	8,109	7,892	8,060	8,388	7,930	8,044	7,565	7,563	80,183
Ross	4,996	4,900	4,770	4,536	5,099	5,111	5,100	5,060	4,774	4,464	48,810
Sandusky	4,377	4,553	4,256	4,305	4,325	4,384	4,498	4,459	4,105	3,877	43,139
Scioto	4,221	4,325	4,070	4,096	3,812	3,832	3,671	3,738	4,011	3,781	39,557
Seneca	3,886	4,090	3,881	3,912	4,025	4,199	4,159	3,998	3,769	3,819	39,738
Shelby	3,657	3,708	3,627	3,543	3,831	3,807	3,722	3,801	3,578	3,323	36,597
Stark	21,720	20,979	20,220	20,487	21,036	21,570	20,426	20,615	19,470	18,792	205,315
Summit	38,700	38,173	36,440	37,081	38,195	39,344	36,948	36,849	34,238	33,247	369,215
Trumbull	12,691	12,657	12,166	11,618	12,230	12,386	11,981	12,308	11,802	11,204	121,043
Tuscarawas	5,777	5,669	5,233	5,534	5,789	6,059	5,688	5,635	5,311	5,140	55,835
Union	4,232	4,282	4,282	4,233	5,206	5,495	5,127	5,752	5,048	4,616	48,273
Van Wert	1,873	1,809	1,897	1,791	1,908	2,069	1,766	1,928	1,949	1,767	18,757
Vinton	1,090	1,090	968	964	1,239	1,241	1,242	1,232	1,137	1,086	11,289
Warren	22,412	23,836	23,938	24,812	26,087	26,965	25,445	24,831	23,259	22,558	244,143
Washington	4,499	4,682	4,415	4,421	4,406	4,286	4,170	4,264	3,997	3,697	42,837
Wayne	8,452	8,410	8,238	8,159	8,368	8,208	7,985	8,116	7,529	7,154	80,619
Williams	2,903	2,919	2,810	2,782	2,909	2,983	2,847	2,685	2,700	2,475	28,013
Wood	13,423	12,887	13,259	13,353	13,463	13,713	13,328	13,470	13,245	12,144	132,285
Wyandot	1,718	1,842	1,904	1,826	2,052	1,977	1,979	1,999	1,837	1,686	18,820

Note: Exemptions are not equivalent to people because not every one files a tax return, and some persons may take more than one exemption.

Data Source: The Internal Service (IRS), Statistics of Income Division.

Prepared by: Dr. Jian He, State Demographer, Research Office of Ohio Department Services Agency, June 2013.

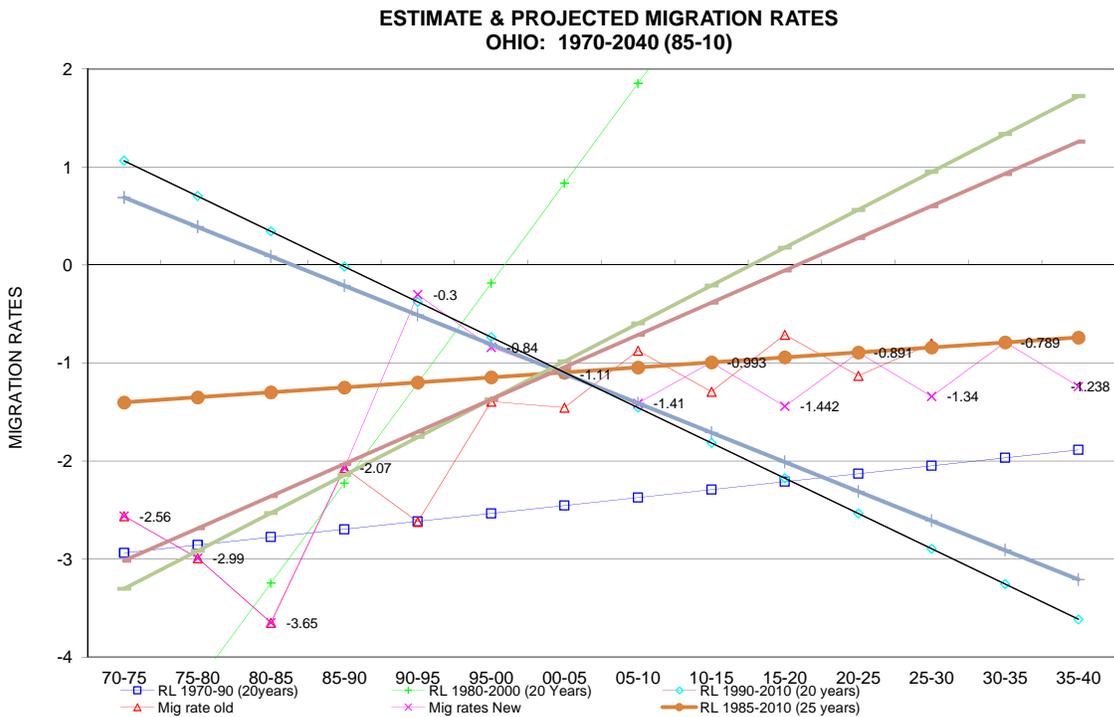
APPENDIX 16

NUMERICAL AND GRAPHICAL MIGRATION PROJECTIONS

County: OHIO (regression line: 1985-2010)										
Y	X	Year	Migration Rates*					Constant	Std Err of Y Est	R Squared
			Low	Sum	Middle	High	Sum_PM			
0.00	0	70-75	-2.56	-2.5600	-2.5600	-2.5600	-2.5600	-1.401		
0.00	5	75-80	-2.99	-2.9900	-2.9900	-2.9900	-2.9900			
0.00	10	80-85	-3.65	-3.6500	-3.6500	-3.6500	-3.6500			
0.00	15	85-90	-2.07	-2.0700	-2.0700	-2.0700	-2.0700			
0.00	20	90-95	-0.30	0.0000	0.0000	0.0000	0.0000			
0.00	25	95-00	-0.84	0.0000	0.0000	0.0000	0.0000			
0.00	30	00-05	-1.11		-0.1100	0.8900	-0.3113			
0.00	35	05-10	-1.41		-0.4100	0.5900	0.2536			
0.00	40	10-15	0.00		1.0000	2.0000	0.2240			
0.00	45	15-20	-0.50		0.5000	1.5000	0.6069			
0.00	50	20-25	0.00		1.0000	2.0000	0.5315			
0.00	55	25-30	-0.50		0.5000	1.5000	0.0088			
0.00	60	30-35	0.00							
0.00	65	35-40	-0.50							

*: The rates of 1970-2010 are Estimate rates; the rates of 2010-2040 are projected rates.

* Regression Line based on the rates of 1990-2010



Data Source: The Internal Service (IRS), Statistics of Income Division.

Prepared by: Dr. Jian He, State Demographer, Research Office of Ohio Department Services Agency, June 2013.

APPENDIX 17

AGE AND SEX CONSTRUCTION OF POPULATION PROJECTIONS

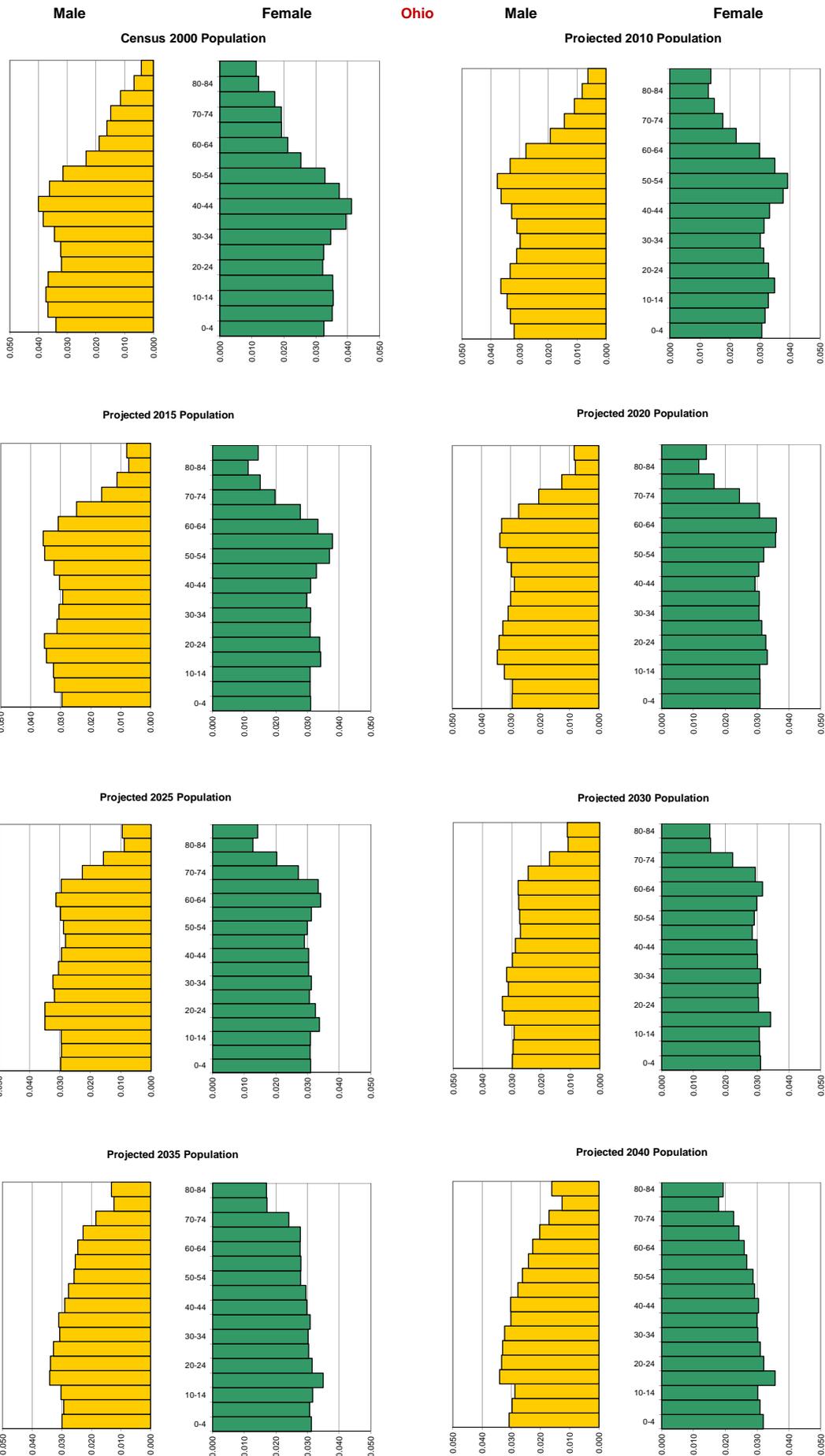
COUNTY: **Ohio**

AGE COHORTS	2015			2020			2025		
	TOTAL POP	MALE POP	FEMALE POP	TOTAL POP	MALE POP	FEMALE POP	TOTAL POP	MALE POP	FEMALE POP
0-4	6.1%	3.0%	3.1%	6.1%	3.0%	3.1%	6.1%	3.0%	3.1%
5-9	6.3%	3.2%	3.1%	6.0%	2.9%	3.1%	6.0%	2.9%	3.1%
10-14	6.3%	3.2%	3.1%	6.3%	3.2%	3.1%	6.0%	2.9%	3.1%
15-19	6.9%	3.5%	3.4%	6.8%	3.5%	3.3%	6.9%	3.5%	3.4%
20-24	6.9%	3.5%	3.4%	6.7%	3.4%	3.3%	6.7%	3.5%	3.3%
25-29	6.2%	3.1%	3.1%	6.4%	3.3%	3.1%	6.2%	3.2%	3.1%
30-34	6.2%	3.1%	3.1%	6.2%	3.1%	3.1%	6.3%	3.2%	3.1%
35-39	5.9%	2.9%	3.0%	6.1%	3.0%	3.1%	6.1%	3.0%	3.0%
40-44	6.1%	3.0%	3.1%	5.8%	2.9%	2.9%	6.0%	2.9%	3.0%
45-49	6.5%	3.2%	3.3%	6.0%	3.0%	3.1%	5.7%	2.8%	2.9%
50-54	7.2%	3.5%	3.7%	6.3%	3.1%	3.2%	5.9%	2.9%	3.0%
55-59	7.4%	3.6%	3.8%	7.0%	3.4%	3.6%	6.1%	3.0%	3.1%
60-64	6.4%	3.1%	3.3%	6.9%	3.3%	3.6%	6.5%	3.1%	3.4%
65-69	5.2%	2.5%	2.8%	5.8%	2.7%	3.1%	6.3%	2.9%	3.3%
70-74	3.6%	1.6%	2.0%	4.5%	2.0%	2.4%	5.0%	2.3%	2.7%
75-79	2.6%	1.1%	1.5%	2.9%	1.3%	1.7%	3.6%	1.6%	2.0%
80-84	1.9%	0.7%	1.1%	2.0%	0.8%	1.2%	2.2%	0.9%	1.3%
85+	2.2%	0.8%	1.4%	2.2%	0.8%	1.4%	2.4%	0.9%	1.4%

AGE COHORTS	2030			2035			2040		
	TOTAL POP	MALE POP	FEMALE POP	TOTAL POP	MALE POP	FEMALE POP	TOTAL POP	MALE POP	FEMALE POP
0-4	6.1%	3.0%	3.1%	6.1%	3.0%	3.1%	6.3%	3.1%	3.2%
5-9	6.0%	3.0%	3.1%	6.0%	2.9%	3.1%	6.1%	3.0%	3.1%
10-14	6.0%	2.9%	3.1%	6.2%	3.0%	3.2%	5.9%	2.9%	3.0%
15-19	6.7%	3.3%	3.4%	6.9%	3.4%	3.5%	7.0%	3.4%	3.6%
20-24	7.0%	3.6%	3.4%	6.8%	3.4%	3.4%	7.4%	3.7%	3.6%
25-29	6.4%	3.3%	3.0%	6.5%	3.4%	3.1%	6.5%	3.3%	3.2%
30-34	6.1%	3.1%	3.0%	6.3%	3.3%	3.0%	6.4%	3.3%	3.1%
35-39	6.3%	3.2%	3.1%	6.1%	3.1%	3.0%	6.3%	3.2%	3.0%
40-44	6.0%	3.0%	3.0%	6.2%	3.1%	3.1%	6.0%	3.0%	3.0%
45-49	5.9%	2.9%	3.0%	5.9%	2.9%	3.0%	6.1%	3.0%	3.0%
50-54	5.6%	2.7%	2.8%	5.7%	2.8%	3.0%	5.7%	2.8%	2.9%
55-59	5.6%	2.7%	2.9%	5.4%	2.6%	2.8%	5.5%	2.6%	2.9%
60-64	5.8%	2.8%	3.0%	5.3%	2.5%	2.8%	5.1%	2.4%	2.7%
65-69	6.0%	2.8%	3.2%	5.2%	2.5%	2.8%	4.9%	2.3%	2.6%
70-74	5.4%	2.4%	2.9%	5.1%	2.3%	2.8%	4.5%	2.0%	2.4%
75-79	3.9%	1.7%	2.2%	4.3%	1.9%	2.4%	4.0%	1.7%	2.3%
80-84	2.6%	1.1%	1.5%	3.0%	1.2%	1.7%	3.1%	1.3%	1.8%
85+	2.6%	1.1%	1.5%	3.0%	1.3%	1.7%	3.5%	1.6%	1.9%

Prepared by: Dr. Jian He, State Demographer,
 Research Office of Ohio Department Services Agency, June 2013.

Population Pyramids



Appendix 18

POPULATION PYRAMID NUMBERS

AGE GROUP	2000		2010		AGE	2015		2020		2025	
	MALE	FEMALE	MALE	FEMALE		MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
0-4	0.034	0.033	0.032	0.031	0-4	0.030	0.031	0.030	0.031	0.030	0.031
5-9	0.037	0.035	0.033	0.032	5-9	0.032	0.031	0.029	0.031	0.029	0.031
10-14	0.037	0.035	0.034	0.033	10-14	0.032	0.031	0.032	0.031	0.029	0.031
15-19	0.037	0.035	0.036	0.035	15-19	0.035	0.034	0.035	0.033	0.035	0.034
20-24	0.032	0.032	0.033	0.033	20-24	0.035	0.034	0.034	0.033	0.035	0.033
25-29	0.032	0.033	0.031	0.031	25-29	0.031	0.031	0.033	0.031	0.032	0.031
30-34	0.034	0.035	0.030	0.030	30-34	0.031	0.031	0.031	0.031	0.032	0.031
35-39	0.038	0.039	0.031	0.031	35-39	0.029	0.030	0.030	0.031	0.030	0.030
40-44	0.040	0.041	0.033	0.033	40-44	0.030	0.031	0.029	0.029	0.029	0.030
45-49	0.036	0.037	0.036	0.038	45-49	0.032	0.033	0.030	0.031	0.028	0.029
50-54	0.032	0.033	0.038	0.039	50-54	0.035	0.037	0.031	0.032	0.029	0.030
55-59	0.023	0.025	0.033	0.035	55-59	0.036	0.038	0.034	0.036	0.030	0.031
60-64	0.019	0.021	0.028	0.030	60-64	0.031	0.033	0.033	0.036	0.031	0.034
65-69	0.016	0.019	0.019	0.022	65-69	0.025	0.028	0.027	0.031	0.029	0.033
70-74	0.015	0.019	0.014	0.018	70-74	0.016	0.020	0.020	0.024	0.023	0.027
75-79	0.011	0.017	0.011	0.015	75-79	0.011	0.015	0.013	0.017	0.016	0.020
80-84	0.007	0.012	0.008	0.013	80-84	0.007	0.011	0.008	0.012	0.009	0.013
85+	0.004	0.011	0.006	0.014	85+	0.008	0.014	0.008	0.014	0.009	0.014

AGE GROUP	2000		2010		AGE	2030		2035		2040	
	MALE	FEMALE	MALE	FEMALE		MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
0-4	385,231	369,699	367,479	353,377	0-4	0.030	0.031	0.030	0.031	0.031	0.032
5-9	417,023	399,323	382,641	365,248	5-9	0.030	0.031	0.029	0.031	0.030	0.031
10-14	424,906	402,905	396,152	378,547	10-14	0.029	0.031	0.030	0.032	0.029	0.030
15-19	416,085	400,783	420,975	402,707	15-19	0.033	0.034	0.034	0.035	0.034	0.036
20-24	363,689	365,239	384,202	378,914	20-24	0.036	0.034	0.034	0.034	0.037	0.036
25-29	366,452	369,130	357,837	360,793	25-29	0.033	0.030	0.034	0.031	0.033	0.032
30-34	390,689	393,623	344,087	347,242	30-34	0.031	0.030	0.033	0.030	0.033	0.031
35-39	435,881	447,890	356,420	362,042	35-39	0.032	0.031	0.031	0.030	0.032	0.030
40-44	454,202	467,343	377,896	383,473	40-44	0.030	0.030	0.031	0.031	0.030	0.030
45-49	411,052	423,779	420,425	434,709	45-49	0.029	0.030	0.029	0.030	0.030	0.030
50-54	357,926	373,627	434,740	452,317	50-54	0.027	0.028	0.028	0.030	0.028	0.029
55-59	265,926	287,248	383,440	403,417	55-59	0.027	0.029	0.026	0.028	0.026	0.029
60-64	214,641	241,091	320,421	344,988	60-64	0.028	0.030	0.025	0.028	0.024	0.027
65-69	183,727	218,941	223,797	255,067	65-69	0.028	0.032	0.025	0.028	0.023	0.026
70-74	169,083	218,501	167,142	204,228	70-74	0.024	0.029	0.023	0.028	0.020	0.024
75-79	130,350	195,118	126,706	170,813	75-79	0.017	0.022	0.019	0.024	0.017	0.023
80-84	77,227	138,014	95,450	148,383	80-84	0.011	0.015	0.012	0.017	0.013	0.018
85+	48,172	128,624	72,346	158,083	85+	0.011	0.015	0.013	0.017	0.016	0.019

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