Methodology Note
Southeastern Wisconsin Regional Planning Commission, County Age-Sex Projections, 2010-2050: Historical and Projected Rates

Survival Rates & Life Expectancies

The process of projecting survival rates and life expectancies for each county and the region began with a review of the 10-year mortality experience from Census 2000 to Census 2010. Data on deaths by 5-year birth cohort and sex for the 10-year intercensal period were obtained for each of the seven counties from the Wisconsin Department of Health Services. Following methods developed by demographers at the state Department of Administration (DOA), base survival rates for each age-sex cohort were first computed for the 10-year period and then converted to 5-year rates centered on April 1, 2005 for each county.

To project the survival rates forward, the sex- and age-specific survival rates that were calculated for the Department of Administration's state-level preliminary projections, completed in June 2012 for the 2010-2040 period, were first extended for two more five-year intervals to 2050. The DOA projections, in turn, relied on the projected life table values that the U.S. Census Bureau had completed as part of their most recent national projections series, released in 2008. Conceptually, the projected survival rates and the resulting life expectancies follow the assumption that "As goes the nation, so goes the state; as goes the state, so go the counties." The ratios of the state's projected age-sex survival rates at the midpoint of each five-year interval to the base 2005 rates were multiplied by each county's base age-sex-specific survival rates in order to create county age-sex-specific projected survival rates. Unlike the 2004 SEWRPC projections, the county results of projected survivors were not controlled to a region-wide calculation; thus, they were treated as independent geographies in this vintage of computations.

Using standard life table procedures to convert the starting and ending survival rates to life expectancies at birth, the life expectancies for each county and the region were calculated to be:

Life Expectancy at Birth, SEWRPC Counties and Region

	Males			Females		
County	2010	2050	Change	2010	2050	Change
Kenosha	75.9	81.2	5.3	80.4	84.7	4.3
Milwaukee	74.2	79.3	5.1	80.3	85.3	5.0
Ozaukee	79.2	85.5	6.3	83.0	87.8	4.8
Racine	76.8	82.8	6.0	82.2	87.8	5.6
Walworth	77.2	82.4	5.2	81.1	85.2	4.1
Washington	78.7	84.6	5.9	83.0	88.3	5.2
Waukesha	78.7	84.2	5.5	82.8	87.4	4.6
Region	**76.4**	**82.0**	**5.5**	**81.3**	**86.2**	**4.9**

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Fertility Rates

Because of the accelerated schedule for producing the SEWRPC age-sex projections this cycle, it was necessary to draw on a narrower set of birth data than in previous projection rounds. In general, it is advisable to use three years of births by age of mother surrounding the most recent Census; that is, 1.5 years before and 1.5 years after the enumeration date. SEWRPC's desire to produce county age-sex projections in 2012, coupled with lags in final resident birth reporting by the state's Department of Health Services, reduced the viable period for computing age-specific fertility rates (ASFRs) to one year: from October 1, 2009 to September 30, 2010. While the use of 1-year rates is not ideal, the relatively large size of the seven counties in SEWRPC's region makes the use of a twelve-month segment of fertility data adequate.

Comparable 12-month ASFRs and total fertility rates (TFRs) for 1990 and 2000 were also computed to provide a time-series perspective.

The TFRs for all counties except Milwaukee increased from 1990 to 2000, and all seven declined from 2000 to 2010. However, it is important to recognize that rates for 2010 are "recessionary rates." Like the nation and the state, the number of births and the associated rates have been depressed by the economic downturn that began in late 2007. Nationally, births fell from a peak of 4.3 million in 2007 to 4.0 million in 2010, with the total fertility rate declining from 2.12 to 1.93; statewide, births fell from 72,745 in 2007 to 68,345 in 2010, with a corresponding decline in TFR from 2.00 to 1.89. For the seven-county region, births decreased from 27,763 to 25,957 over the four-year period.

Base Total Fertility Rates, SEWRPC Counties and Region

				Change	
County	1990	2000	2010	1990-2000	2000-2010
Kenosha	2.011	2.069	1.905	0.057	-0.163
Milwaukee	2.099	2.081	1.979	-0.018	-0.103
Ozaukee	1.789	1.862	1.819	0.073	-0.044
Racine	2.027	2.192	2.158	0.165	-0.034
Walworth	1.627	1.792	1.760	0.165	-0.033
Washington	1.828	2.009	1.963	0.181	-0.047
Waukesha	1.748	1.952	1.871	0.205	-0.081
Region	**1.978**	**2.041**	**1.949**	**0.063**	**-0.093**

Note: based on 1-year birth data around each Census date, using age groups 15-19 through 40-44

In sum, the number of births and the fertility rate are sensitive to economic downturns and upturns. Furthermore, large-scale surveys in the past two years of women's and men's planned fertility indicate that the relatively low birth rates are a product of births being deferred, not foregone. In other words, we should expect a rebound in births and fertility rates for the nation, state and the SEWRPC region as the economy improves through the current decade.

Historically, fertility rates in smaller geographical areas move in unison with the patterns that are seen in larger geographic areas. In order to project the fertility rates for the region's counties, we relied on the projected rates from the state's 2010-2040 projections, released in 2012, which in turn followed the pattern of the national middle-series fertility rates that the Census Bureau has forecast through 2100.

The state's projected fertility rates assume a "birth bump" in the 2010-2015 interval that will bring the TFR back to pre-recession levels.

To develop the historical comparison, the region-wide ASFRs were computed for 1990, 2000 and 2010. In order to smooth variations, the ratios of the SEWRPC-to-Wisconsin ASFRs were calculated for these three time points and averaged. Then, to project the regional ASFRs forward, these averaged ratios were multiplied by the projected state ASFRs (the state series was extended to 2050, using the same ratio method as used from 2010 through 2040). While most projected ASFRs, and the aggregate TFRs, looked reasonable through 2050, the ASFR for ages 30-34 accelerated more than could be reasonably assumed to occur across the 40-year projections time frame, based on a review of historic ASFRs for the previous thirty years. These particular age-specific rates were smoothed by moving the predicted ASFR for 2040 to 2050, and the intervening values from 2015 to 2045 were interpolated.

With the regional projected ASFRs and TFRs completed, the process was repeated for every county. However, because of extensive variability from the 1990 to 2000 ASFRs at the county level, only the 2000 and 2010 county-to-SEWRPC ratios were computed and averaged. Similar to the initial regional ASFR projections, some rates looked inconsistently high when compared to recent history; these rates were smoothed in a manner similar to the region-wide age 30-34 ASFRs.

Over the course of the 40-year projection period, the age-specific fertility rates for younger age cohorts are expected to decline while those for older cohorts will rise. This pattern follows the trend of the past 20 years. The ASFRs for women ages 15-19 and 20-24 peaked in Wisconsin around 1991 and 1992 and have declined steadily since then. Similarly, the ASFR for age 25-29 has declined generally, with an occasional minimal increase interrupting the downward trend. Conversely, the ASFRs for 30-34, 35-39 and 40-44 have all risen steadily, again with only minor instances of a decline in one or two years. The SEWRPC regional ASFRs at 1990, 2000 and 2010 have followed this pattern. Finally, most of the counties also exhibited this same configuration.

Net Migration and Rates (Base Rates only)[1]

Net migration in the region during the 2000 – 2010 intercensal period was notably different from the generally positive migration of the 1990s. All counties except Milwaukee gained migrants in the 1990s; both Milwaukee and Racine counties experienced net out-migration in the 2000s, and the remaining five counties, while continuing to have net in-migration, saw numeric declines in comparison to the 1990-2000 period.

[1] In the area of migration, SEWRPC requested only base net migration rates by age and sex, not projected rates. They chose to undertake a number of their own scenarios for projecting net migration.

Net Migrants, 2000 - 2010, by Sex and County,
With 1990 – 2000 Comparison

	2000-2010, by Sex			1990-2000
County	Males	Females	Total	Total
Kenosha	3,331	4,535	7,866	12,005
Milwaukee	-28,568	-28,459	-57,027	-83,341
Ozaukee	464	1,429	1,893	5,642
Racine	-2,067	-1,865	-3,932	2,683
Walworth	3,122	3,606	6,728	14,397
Washington	3,417	4,814	8,231	15,000
Waukesha	5,671	9,941	15,612	37,462
Region	**-14,630**	**-5,999**	**-20,629**	**3,848**

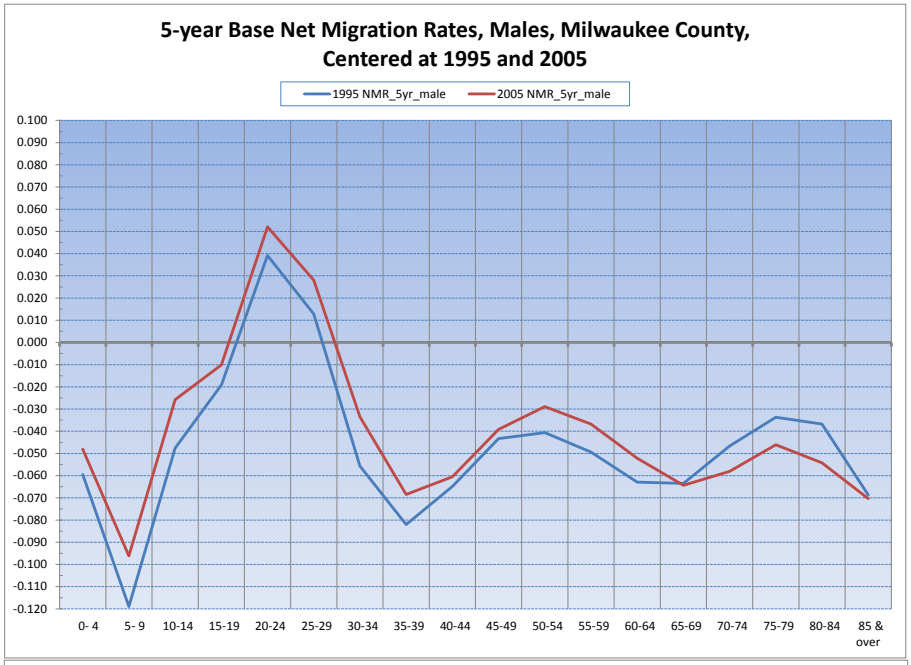
Note: Data are for intercensal periods (April 1, 1990-March 31, 2000 and April 1, 2000 – March 31, 2010), based on vital statistics calculations.

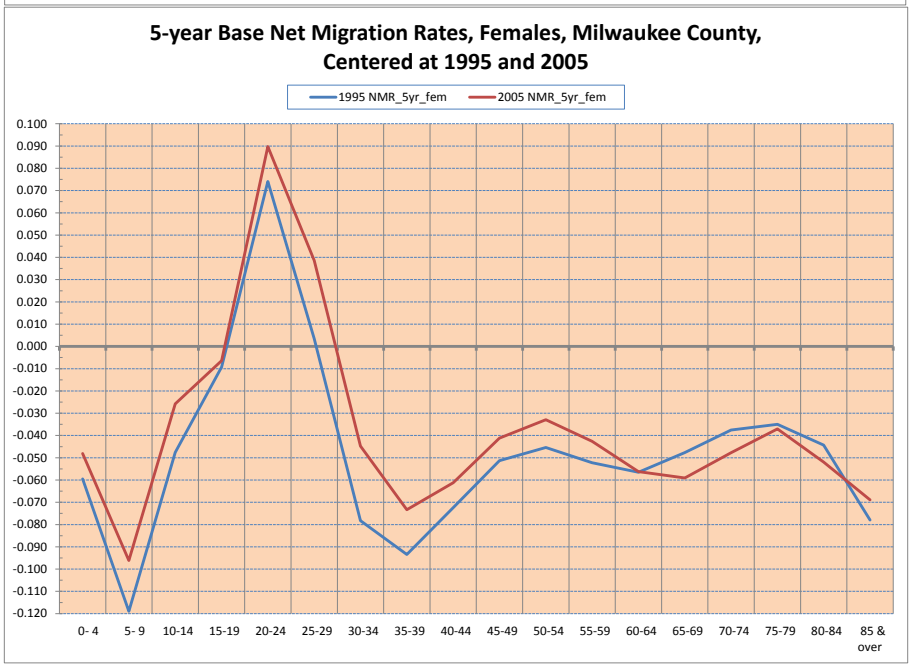
A similar pattern may be discerned in the region's age-specific net migrants for the 2000s as compared to the 1990s: generally, age ranges that exhibited net out-migration in the 1990s had more pronounced negative net migration in the 2000s, and the gaining age cohorts were more muted in their increases in the 2000 – 2010 decade than the prior one. Furthermore, in three cohorts (ages 25-29, 45-49 and 85 and over), the direction of net migration reversed from positive to negative.

Net Migrants, 2000 – 2010, by Sex and Age Group for SEWRPC Region,
With 1990 – 2000 Comparison

	2000-2010, by Sex			1990-2000
Age Group	Males	Females	Total	Total
0-4	-1,670	-1,310	-2,980	-1,424
5-9	1,376	951	2,327	3,895
10-14	4,071	3,844	7,915	7,028
15-19	825	-14	811	3,416
20-24	-5,651	-3,239	-8,890	-3,815
25-29	-3,581	1,660	-1,921	2,459
30-34	2,650	3,109	5,759	6,291
35-39	692	924	1616	4,738
40-44	4	54	58	880
45-49	-244	-640	-884	373
50-54	-461	-811	-1272	-1,960
55-59	-1,722	-1,873	-3,595	-3,592
60-64	-3,065	-3,674	-6,739	-5,950
65-69	-3,835	-3,355	-7,190	-5,629
70-74	-2,723	-1,556	-4,279	-3,327
75-79	-855	-306	-1161	-565
80-84	-195	538	343	726
85&over	-246	-301	-547	304
TOTAL	**-14,630**	**-5,999**	**-20,629**	**3,848**

While data for the region are presented above as an illustrative summary, each county has its own "migration signature," exhibiting a distinct net migration pattern that forms the basis for future projected migrants. For example, the charts below compare the net migration rates by age and sex, centered on the midpoint of the 1990s and 2000s, for Milwaukee County. Note that the pattern by age from one decade to another is very similar; what changes is the amplitude.





To generate the base net migration rates for to be used for the 2010-2050 projections, each county's net migration by sex and five-year age cohort in the 2000 – 2010 decade was initially calculated. These 10-year rates were then converted to 5-year rates using the "adjacent cohort" technique that was developed by Richard Irwin of the Census Bureau in the 1970s. For the purposes of projections, the rates

among the youngest three age cohorts (ages 0-4, 5-9 and 10-14) are averaged between males and females, following the assumption that these youth are generally not free to migrate on their own, and thus differential rates in a projections scenario would be implausible.