

Progress in Reducing Mortality Among Persons 65 to 74 Years of Age in Wisconsin

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ABSTRACT

Objectives: To assess progress in reducing mortality between 1980 and 1999 among Wisconsin residents aged 65-74, to identify disparities, and to propose future goals.

Methods: Mortality rates for 1980-1984 were compared to those from 1995-1999 using data obtained from the Centers for Disease Control and Prevention's WONDER database. Percent change in rates were calculated and projected to 2010, and annual numbers of lives saved were estimated.

Results: The mortality rate for persons aged 65-74 has decreased 12.4%—17.5% in men and 6.3% in women. However, no reductions were observed for blacks. An estimated 1325 fewer deaths occur each year, with white men accounting for >80% of these savings. Mortality rates decreased for heart disease (-38%) and stroke (-26%), but increased for cancer (+6%).

Conclusions: Significant progress has been made in reducing mortality among Wisconsin residents aged 65-74, but not among blacks. Most of the progress is due to decreased deaths from heart disease and stroke, particularly for white men.

INTRODUCTION

The United States is in the midst of a profound demographic change: the rapid aging of its population. In 2000, about 1 of every 8 Americans or nearly 35 million people in the United States were 65 years of age or older. Demographers estimate that by the year 2030 this proportion will grow to 1 in 5.¹

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While the average age of the population continues to increase, the average length of life has risen as well. Life expectancy at birth has increased from 47.3 years in 1900 to 73.7 years in 1980 to 76.7 years in 1999.² Gaps exist between females and males and between whites and blacks, although these disparities have been diminishing. In 1980, life expectancy at birth was 77.4 years for females and 70.0 years for males, a differential of 7.4 years. In 1999 this gap decreased to 5.5 years: 79.4 years for females and 73.9 years for males. For black women, life expectancy was 5.6 years less than for white women in 1980, compared to 5.2 years in 1999. For black men compared to white men, this differential decreased slightly in that time, from 6.9 years to 6.8 years.

Progress in extending life expectancy may be considered as reduction of premature death. It has been suggested that this progress results in a "rectangularization" of the mortality curve, with disability and death compressed to a later period in life.³ This implies a postponement of the onset or ultimate mortality from, primarily, chronic disease.⁴ While the average life expectancy at birth in 1999 was 76.7 years, this measure is affected by infant mortality and early death from acute illness and trauma. For those individuals who had reached 65 years of age in 1999, the calculated remaining years of life was 17.7 years: 16.1 years for males and 19.1 years for females.² Therefore, the death of persons between 65 and 74 may be considered premature. Examination of mortality trends among persons in this age group may help identify emerging health issues, reveal disparities, and assess beneficial effects of past interventions for the prevention, treatment, and management of the common chronic diseases of aging.

The aims of this study are to identify progress made in reducing mortality among Wisconsin residents aged 65-74 by assessing trends in overall and cause-specific mortality rates between 1980 and 1999, to determine whether all-cause mortality trends within demographic subgroups in Wisconsin are consistent with overall

trends in the United States, to explore disparities in mortality rates between gender and racial categories, and, finally, to project goals of reducing mortality for *Wisconsin Healthier People 2010*.

METHODS

Mortality data for persons 65-74 for the period 1980-1999 were obtained from the Centers for Disease Control and Prevention (CDC) WONDER database, a Web-based information and interactive query system.^{5,6} Progress in reducing mortality in Wisconsin and the United States was evaluated using crude, age-specific mortality rates. All rates are presented as deaths per 100,000 individuals. To differentiate between random fluctuation and true temporal trends, 5-year moving averages were calculated.⁷ The baseline period of 1980-1984 was compared to the most recent period for which data were available, 1995-1999. The percent change between 2 rates was calculated as the difference between the 5-year average rate of the most recent period (1995-1999) and the baseline period (1980-1984) divided by the baseline rate (1980-1984).

The number of expected deaths were calculated by indirect methods and compared with the observed deaths to estimate the annual number of lives saved. The rate of the baseline period (1980-1984) was multiplied by the average annual population of the most recent period (1995-1999) to calculate the number of expected deaths. The number of observed deaths was subtracted from the number of expected deaths to estimate the number of lives saved annually. Chi square tests were used to assess statistical significance.⁸

Data on causes of death were obtained from WONDER using International Classification of Diseases codes (ICD-9 for 1980-1998 and ICD-10 for 1999).⁹ Causes of death were ranked, with the top 3 assessed for changes in rates between 1980-1984 and 1995-1999. ICD-9 (and ICD-10) codes used included 410-414, 402 and 429.2 (I00-I09, I11, I13, I20-I51) for heart disease, 140-208 (C00-C97) for malignant neoplasms, and 430-438 (I60-I69) for cerebrovascular diseases. Numbers of expected deaths and annual number of lives saved for these leading causes of death were calculated as described above.

To further explore differences in the mortality rates, data were stratified by gender and race. Due to limitations of this data source, analysis by race/ethnicity was limited to blacks and whites as no data were available for Asian/Pacific Islanders, Native Americans, or Hispanics. Rate ratios were calculated for 1980-1984 and 1995-1999 to illustrate differences between black and white mortality rates.

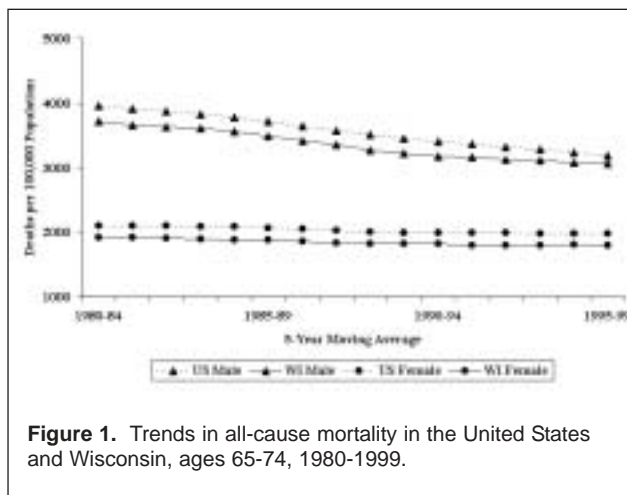


Figure 1. Trends in all-cause mortality in the United States and Wisconsin, ages 65-74, 1980-1999.

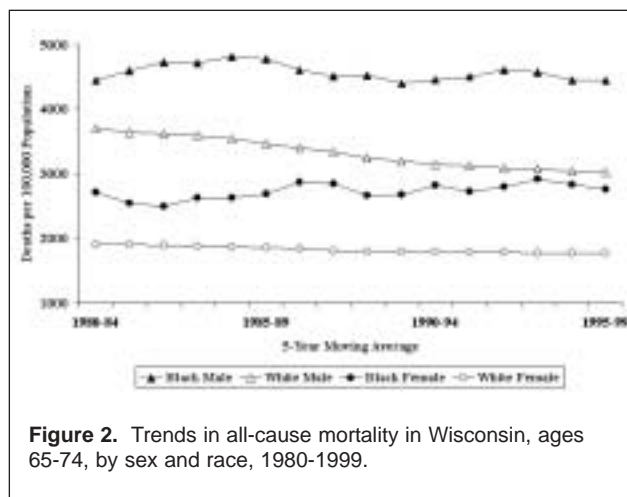


Figure 2. Trends in all-cause mortality in Wisconsin, ages 65-74, by sex and race, 1980-1999.

Goals for further reduction in all-cause mortality rates and goals for reduction of health disparities were set by forecasting future trends. The estimated annual percent change (EAPC) in all-cause mortality rates was calculated by averaging each year-to-year change observed between 1980 and 1999.¹⁰ This EAPC was then used to project rates to the year 2010 by linear extrapolation.

RESULTS

Figure 1 illustrates the trends in all-cause mortality rates for persons aged 65-74 years of age in Wisconsin and the United States between 1980-1984 and 1995-1999. Mortality rates in Wisconsin and the United States have declined for both genders, but more markedly for males than females. Wisconsin rates have been consistently lower than those for the United States, both for males and females. The Wisconsin overall annual mortality rate per 100,000 population for this age group has decreased 12.4%, from 2718 in 1980-

Table 1. Trends in All-Cause Mortality in Wisconsin, Ages 65-74, by Gender and Race, 1980-1984 to 1995-1999

Group	Average Annual Deaths					Change in Death Rate	Lives Saved (Lost) Annually‡
	1980-1984		1995-1999				
	Rate*	#	Rate*	#	# Expected†		
WI Total	2718	9251	2381	8502	9827	-12%	1325
Black Males	4445	98	4449	181	181	0%	0
White Males	3703	5490	3026	4801	5874	-18%	1073
Black Females	2715	79	2762	139	136	+2%	(3)
White Females	1907	3534	1771	3300	3555	-7%	255

*Deaths per 100,000 population

†Number of deaths expected annually during 1995-1999 if death rate had remained at 1980-1984 level.

‡Number of lives saved annually during 1995-1999 compared to 1980-1984 baseline.

Table 2. Trends in Leading Causes of Mortality in Wisconsin, Ages 65-74, 1980-1984 to 1995-1999

Cause	Average Annual Deaths					Change in Death Rate	Lives Saved (Lost) Annually ‡
	1980-1984		1995-1999				
	Rate*	#	Rate*	#	# Expected†		
Heart Disease	1125	3830	700	2501	4018	-38%	1517
Cancer	794	2704	841	3003	2836	+6%	(167)
Stroke	185	631	137	490	662	-26%	172

*Deaths per 100,000 population

†Number of deaths expected annually during 1995-1999 if death rate had remained at 1980-1984 level.

‡Number of lives saved annually during 1995-1999 compared to 1980-1984 baseline.

1984 to 2381 in 1995-1999 ($P<0.0001$). The rate for males decreased 17.7% from 3735 to 3074 ($P<0.0001$), while the rate for females decreased 6.3% from 1927 to 1805 ($P=0.002$). The rate ratio between male and female mortality has decreased from 1.9 in 1980-1984 to 1.7 in 1995-1999 ($P<0.001$).

These significant reductions in mortality rates have occurred in whites, but not in blacks (Figure 2). For blacks of both genders there has been virtually no change in mortality between 1980-1984 and 1995-1999. Mortality rates have been consistently higher for black men than for white men, and higher for black women than for white women. Between 1980-1984 and 1995-1999 the ratio of black to white mortality rates increased from 1.2 to 1.5 for men and from 1.4 to 1.6 for women. By 1995-1999 mortality rates were 47% higher in black men compared to white men (4449 vs 3026), and 56% higher in black women than white women (2762 vs 1771).

The 12.4% reduction in all-cause mortality rate for 65-74 year olds in Wisconsin between 1980-1984 and 1995-1999 has yielded an estimated savings of 1325 lives per year ($P<0.0001$) (Table 1). The vast majority of lives saved have been those of white men ($P<0.0001$) and, to a lesser extent, white women ($P=0.05$). No progress in overall number of lives saved in this age group has been made among blacks.

The leading causes of death among persons aged 65-74 in Wisconsin changed between 1980-1984 and 1995-1999 (Table 2). Deaths from heart disease were the leading cause in 1980-1984 followed by cancer and stroke. By 1995-1999 cancer had replaced heart disease as the leading cause of mortality. Substantial reductions were observed in the mortality rates for heart disease (-38%) and stroke (-26%), while the death rate from cancer increased by 6%.

Changes in cause-specific mortality are shown in Figure 3. Mortality rates for heart disease have decreased for both men and women and in both blacks and whites. Cancer death rates have increased for all groups except black men, but black men were the only group with an increased rate from stroke.

The EAPC in all-cause mortality rates using the 15 5-year moving averages between 1980-1984 and 1995-1999 was calculated to be -0.9% per year. The overall mortality rate for this age group is projected to be 2160 per 100,000 by 2010, a further 9.3% reduction from the rate in 1995-1999.

DISCUSSION

Significant progress has been made over the past 20 years in reducing mortality among Wisconsin residents aged 65-74, although mortality rates among blacks have not decreased and remain higher than for whites.

Mortality rates still remain higher for males than for females, although this gap is narrowing. Chronic diseases are the major causes of death among the elderly population in Wisconsin. Most of the progress in reducing mortality rates is due to decreased deaths from heart disease and stroke, particularly in white men. Over the past 2 decades, cancer has replaced heart disease as the leading cause of death among men and women aged 65-74. Overall, mortality rates for both heart disease and stroke have decreased substantially, although mortality from stroke has increased in black males. Cancer rates have increased, particularly among women. Black males, however, experienced a decrease in cancer mortality. Further studies are needed to understand the reasons behind these findings and the implications for future progress in mortality reduction.

Analysis of differences in mortality rates by race and ethnicity was limited to blacks and whites due to limitations of the data source. Our results indicate that the disparity in all-cause mortality between black and white males increased between 1980-1984 and 1995-1999 due to differential progress in reducing mortality. Disparities identified between blacks and whites probably reflect differing distribution of risk factors for premature death such as cigarette smoking, weight, diabetes, hypertension, and socioeconomic status.¹¹ Furthermore, differences exist in the detection and treatment of risk factors, and in access to quality medical care.¹² Targeted efforts and resource allocation to reduce mortality rates in black men and women are warranted to minimize these disparities.

Some discontinuities in the time series trends for causes of death may exist due to variation in reporting on death certificates, and from the reclassification of diseases and changes in the coding rules. ICD-10 codes were used for 1999, so data from that year may not be strictly comparable with the ICD-9 data used for 1980-1998. As this change affects only the data from 1 year, there should be no appreciable impact on this study's findings.

Methods and assumptions used to forecast mortality rates vary considerably.¹³ The method we employed, EAPC with linear extrapolation, is appropriate because of the steady year-to-year decline in mortality rates during the past 20 years. We have predicted that future all-cause mortality rates will decrease at roughly the same average rate as observed over the past 20 years. These projections assume that the factors responsible for the declining rates will continue, such as lifestyle changes and improvements in the diagnosis, treatment, and management of chronic diseases affecting the el-

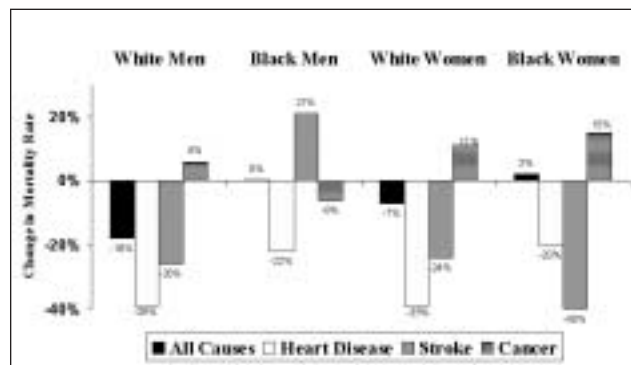


Figure 3. Changes in cause-specific mortality rates in Wisconsin, by sex and race, ages 65-74, 1980-1984 to 1995-1999.

derly. The observed decrease in mortality due to heart disease may be due largely to improvements in the treatment of myocardial infarction and to secondary prevention rather than to a decline in new events.¹⁴ For rates to continue to decline, improvements need to be made in primary prevention as well as more timely access to medical care.

Knowledge of past mortality trends, identification of gender and racial disparities, and predictions for further reductions can be used by policymakers to set specific objectives for the year 2010. Strategies aimed at further reducing mortality among persons 65-74 years of age and for eliminating disparities must consider the socioeconomic, behavioral, and medical determinants of death from specific causes. As mortality rates continue to decline, concerns about diminished quality of life among a growing number of the elderly surviving with potentially debilitating diseases will also need to be addressed.

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