SOCIETY OF ACTUARIES

US Population Mortality Rate Study

Variation by Age Group, Cause of Death and Region from 2000-2015

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Revisions Subsequent to Initial Release

5/18/17: Wording in first paragraph of Section 5.1.2 modified slightly; labels for Figures 9-24 corrected.

Executive Summary

This report covers US regional population mortality experience during the period 2000-2015. The Society of Actuaries pursued the research as part of its ongoing longevity and mortality research initiatives. The purpose of the research is to produce an overview of the differences and similarities in mortality by age group, time, cause of death and region (geographic and urban-rural) to better aid in the understanding of future expected mortality rates and the management of public programs and policy.

Age Groups

Age groups 15-24, 45-54 and 65-74 are analyzed in this study. The selected age groups provide a sample of low, middle and older age mortality of the US population. This set of age groups comprises about one third of the population and one quarter of the deaths during the period studied. Age group analysis is preferred to all ages combined because mortality patterns vary significantly by age. Studying mortality by age group avoids the potential loss of observing key patterns that can get diluted when causes of death are analyzed for all ages combined.

Leading Causes of Death

The top five leading causes of death associated with each age group are studied. External causes of death are more prevalent at younger ages and natural causes of death are more prevalent for older ages. Because of this, the top five causes of death vary by age group.

External causes of death (accidents, assault and self-harm) in the top five causes of death for age group 15-24 are 73.7% of total mortality. Externally caused deaths (accidents and self-harm) in the top five for age group 45-54 are a combined 14.6%. No external causes of death are in the top five causes of death for age group 65-74.

Each age group has cancer and heart disease in its top five leading causes of death. For age group 45-54 and 65-74, cancer and heart disease, in that order, are the top two causes of death, comprising 47.8% and 58.2%, respectively, of the two age groups. Despite not being the top cause of death in any of our age groups, heart disease is the top cause of death over all ages and is being driven by the ages 85 and older results, which we are not specifically studying in this report.

Variation by Year

All three age groups experienced overall mortality improvement on a national basis for the years being studied, 2000-2015. Ages 15-24, 45-54 and 65-74 had average annual mortality improvement rates of 0.9%, 0.3% and 1.9%, respectively. Each age group had a different mortality rate pattern. The patterns are summarized in Table 1.

Table 1
2000-2015 NATIONAL TOTAL MORTALITY RATE PATTERN

Age Group	Pattern
15-24 Years	Small increase in mortality from 2000 to 2006, then a 20.1% decline to 2013, followed by a 7.3% increase to 2015.
45-54 Years	Small increase from 2000 to peak in 2003, followed by stair-step pattern down to 2015. 2003-2015 peak to trough was a 6.7% decrease.
65-74 Years	Steady continuous cumulative 24.9% decrease from 2000 to 2012, then level to 2015.

Of the natural causes of death (cancer, chronic lower respiratory disease (CLRD), diabetes, heart, liver and stroke) studied in the top five causes of death for any of the age groups, all but liver had mortality improvement from 2000-2015. Trends, increasing or decreasing, over the period were generally consistent for natural causes of death. Cancer and heart, which were in each age group, showed rates of improvement that were successively greater by increasing age group. Cancer mortality rates experienced a consistent continuous decline for the full period, whereas heart disease mortality rates declined until 2012 and then leveled off. Even with this later slowed improvement, heart disease registered a 3.5% average annual improvement rate from 2000-2015 for ages 65-74.

External causes of death had more variation within and across age groups. Accident mortality decreased for ages 15-24, while it increased for ages 46-54. For ages 15-24, this was caused by a decrease in motor vehicle accidents (MVA) that more than offset increases in accidental poisonings. Conversely, age group 45-54 had a smaller decrease of MVA and this was more than offset by an increase of accidental poisonings. Self-harm increased for both age groups 15-24 and 45-54, but the increase was larger for age group 45-54. Both accidents and self-harm experienced upticks of mortality rates in 2015 for both age groups.

Variation by Geographic Region

The ten Department of Health and Human Services (HHS) regions are used for the study of geographic variation. The regions encompass groups of contiguous states in the continental United States plus Alaska and Hawaii.

There are significant mortality variations by region for total mortality (all causes of death combined). The difference between the highest and lowest regions for total mortality for all years 2000-2015 combined was greater for the two lower age groups than ages 65-74. For the first two age groups, the lowest region, Northeast, was about 33% lower than the highest region, Southeast. For ages 65-74, the lowest region, Southwest, was 20% lower than the highest region, South Central.

The rank-order of regional total mortality is relatively consistent across age groups and across time. Notably two regions, Southeast age group 45-54 and South Central age group 65-74, had the highest mortality in every year from 2000-2015. No region had the lowest mortality in all years for any of the age groups.

Based on testing done only for 2015, there is a 95% probability that the difference of total mortality rates between the highest and lowest regions for each age group is not due to chance or random variation. This implies that these regions have statistically significant differences of mortality in 2015. Table 2 summarizes these regions' respective total mortality rates.

Table 2
HIGHEST VS. LOWEST 2015 REGIONAL MORTALITY RATES

	Age Group 15-24		Age Group 45-54		Age Group 65-74	
Rank	Region	Deaths per 100,000	Region	Deaths per 100,000	Region	Deaths per 100,000
Highest	Southeast	80.4	Southeast	485.5	South Central	2,013.4
Lowest	NY-NJ	52.8	NY-NJ	322.0	Southwest	1,547.2

Variation by Urban-Rural Region

There are significant differences of mortality by urban-rural regions. Using the CDC "2013 NCHS Urban-Rural Classification Scheme for Counties," non-metro (rural) mortality was generally higher than metropolitan (urban) mortality. Although there are regional exceptions, rural mortality was higher than urban mortality for all regions combined for each of the three age groups studied. The range of mortality between the high and low region classifications decreased by increasing age group.

Because mortality varies by urban-rural area and the HHS regions have different urban-rural mixes, the region's urban-rural mix may be an explanatory variable of differing HHS regional mortality.

Section 1: Introduction

This report was produced to provide an overview of the differences and similarities in US population mortality by region (geographic and urban-rural) and over time. Understanding trends and regional variations serves to better aid in the understanding of future expected mortality rates and the management of public programs and policy.

The report is arranged as a waterfall of increasing detail regarding the mortality of age groups, causes of death, variation by time and variation by region. For this purpose, specific age groups (Section 2) are analyzed as a preferred alternative to reviewing the mortality of all ages combined. Section 3 provides information about the causes of death studied, which is limited to all causes combined (total mortality) and the top five causes of death for each age group. Section 4 expands the analysis to study the patterns by time for each of the age groups' array of causes of death over 2000-2015. Sections 5 and 6 discuss mortality variation by region. Section 5 adds the dimension of geographical regional variation to Section 4, whereas Section 6 analyzes mortality variation by urban-rural region on a more limited basis. Section 7 details the limitations and restrictions of the report.

In all instances, data to calculate mortality rates is drawn from the Centers for Disease Control and Prevention (CDC) Wide-ranging Online Data for Epidemiologic Research (WONDER) database. The mortality rates shown in Appendix A, Regional Mortality Rates, are the deaths divided by the population for any specific sub-group, e.g., age group, cause of death, year and region.

Section 2: Age Groups

Mortality experience is subdivided into age groups for analysis. Three age groups, 15-24, 45-54 and 65-74, are used for this purpose to reflect the differences in cause of death by age. A sample of age groups rather than all ages combined is preferred to see the differences of mortality patterns by age that gets diluted if evaluated for all ages combined.

The selected age groups provide a cross section of younger, middle age and older age mortality experience that covers about a third of the of US population and about one quarter of the deaths from 2000-2015. Table 3 shows the associated mortality rates and proportion of total population for each age group for all years 2000-2015 combined.

Table 3
2000-2015 AGE GROUP MORTALITY RATE AND POPULATION COVERAGE

Age Group	Population Percentage	Mortality Percentage	Deaths per 100,000
15-24 Years	14%	1%	74.1
45-54 Years	14%	7%	418.3
65-74 Years	7%	17%	1,994.1

Section 3: Leading Causes of Death

The selected top five causes of death for this analysis, shown in Table 4, are relative to their occurrence for each of the three analyzed age groups for the combined experience of all years 2000-2015. These causes of death are directly comparable to the leading causes of death that are listed in numerous CDC sources[i].

The causes of death vary by age group. Their distributions reflect increasing percentages of natural or disease-related causes of death and decreasing percentages of deaths due to external causes, e.g., accidents, assault or self-harm by increasing age group. Accordingly, while accidents comprise 43.9% of age 15-24 deaths, the proportion drops to 10.3% for ages 45-54 and is not one of the top five causes of death for ages 65-74.

Cancer and heart disease are in the top five leading causes of death for each age group and comprise a higher proportion of all deaths with increasing age. Cancer and heart disease deaths are only 8.3% of ages 15-24, while they are 58.2% of ages 65-74. Despite not being the top cause of death in any of our age groups, heart disease is the top cause of death over all ages and is being driven by the ages 85 and older results, which we are not specifically studying in this report.

Table 4
CAUSE OF DEATH (COD) DISTRIBUTION BY AGE GROUP FOR 2000-2015

	Ages 15 - 24		Ages 45 - 54		Ages 65 - 74	
Rank	COD	% of all CODs	COD	% of all CODs	COD	% of all CODs
1	Accidents	43.9	Cancer	27.3	Cancer	34.6
2	Assault	15.8	Heart	20.5	Heart	23.6
3	Self-Harm	14.0	Accidents	10.3	CLRD*	7.5
4	Cancer	5.1	Liver	4.5	Stroke	4.6
5	Heart	3.2	Self-Harm	4.3	Diabetes	3.9
	Subtotal	*82.0*		*66.9*		*74.2*
	*All Other COD***	*18.0*		*33.1*		*25.8*
	Total (All CODs)	100.0		100.0		100.0

* CLRD is Chronic Lower Respiratory Disease.
** All Other COD are not studied in this report.

Section 4: Variation by Year

4.1 Ages 15-24

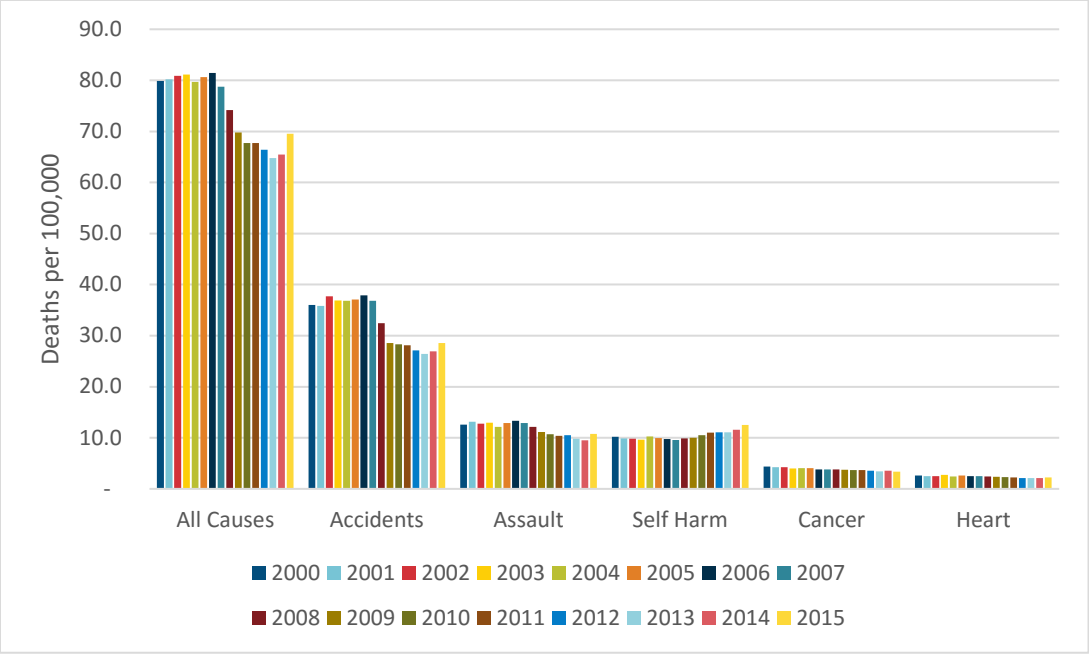
Figure 1, on the next page, shows lower mortality rates in 2015 vs. 2000 for all causes of death (total mortality) and all top five causes of death except for self-harm. External causes of death, accidents, assault and self-harm, vary much more over the time period than cancer and heart disease mortality, which have consistently declining mortality rates.

The total mortality rate declined 13.0% during 2000-2015. After a modest increase from 2000 to a peak in 2006, the total mortality rate declined 19.5% to a low in 2013. After that, increases in accidents, assault and self-harm contributed to a 7.3% increase in the total mortality rate ending between 2013 and 2015.

The mortality rate for accidents declined 20.8% during 2000-2015 with most of the decrease occurring in 2008 and 2009 due to a reduction of motor vehicle accident deaths. The accidents mortality rate increased slightly before 2008 and remained mostly level after 2009 except for recent increases in 2014 and 2015. These increases were due to accelerating accidental poisonings. Assault exhibited a similar pattern, but with a mostly level pattern prior to 2008.

Self-harm showed an increasing trend starting in 2008 that was preceded by a level trend. Though self-harm has a lower mortality rate than accidents, the two causes of death had nearly opposite average annual mortality improvement rates, accidents at 1.5% and self-harm at -1.4%. The increasing self-harm mortality rates caused it to replace assault as the second leading cause of death in 2015.

Figure 1
AGES 15-24 ALL CAUSES OF DEATH AND TOP FIVE COD 2000-2015



COD	Deaths per 100,000		Total	Avg Annual
	2000	2015	Change	Improvement*
All Causes	79.9	69.5	-13.0%	0.9%
Accidents	36.0	28.5	-20.8%	1.5%
Assault	12.6	10.8	-14.4%	1.0%
Self-Harm	10.2	12.5	22.9%	-1.4%
Cancer	4.4	3.4	-23.4%	1.8%
Heart	2.6	2.3	-13.9%	1.0%

*Annual improvement is the geometric average rate of change between 2000 and 2015.

4.2 Ages 45-54

Figure 2, on the next page, shows lower mortality in 2015 vs. 2000 for all causes of death (total mortality), cancer and heart disease, but higher mortality for the other leading causes of death.

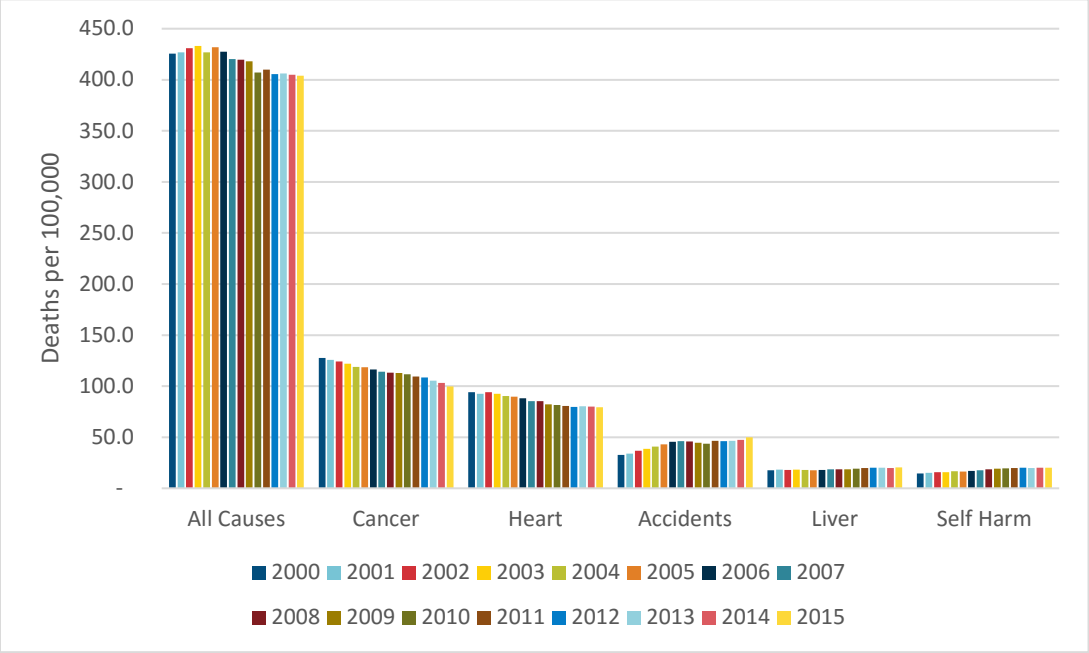
Total mortality decreased 5.1% from 2000-2015. Its peak in 2003 was followed by a slowly descending stair-step type pattern with the periods 2003-2006, 2007-2009 and 2010-2015 each decreasing slightly, but fairly level, within each of the three periods. Strong gains in cancer and heart disease were partially offset by increasing mortality for accidents, liver and self-harm.

Cancer has the most consistent and largest improvement with a steadily declining mortality rate and average annual 1.6% improvement. Heart disease shows similar improvement until it stalls at about 2012 and remains level thereafter. Heart disease had a 1.1% average annual improvement.

Accidents, self-harm and liver all show mortality rate increases in 2015 vs. 2000. Accidents and self-harm have the greatest increases of 52.8% and 40.4%, respectively. Accidents have the most variation over the period. Steady increases until 2007 were followed by a decline into 2010, which was then followed by a return to higher mortality that accelerated into 2015. This resulted from continuously increasing accidental poisonings offset after 2007 with a small decrease in MVAs. The overall increase for accidents translated into the worst average annual mortality improvement rate for this age group, -2.9%. Liver had moderately deteriorating mortality, while self-harm, after starting at the lowest level in 2000, increased more than other causes of death except for accidents, which resulted in the second worst -2.3% average annual mortality improvement rate.

Figure 2

AGES 45-54 ALL CAUSES OF DEATH AND TOP FIVE COD 2000-2015



COD	Deaths per 100,000		Total	Avg Annual
	2000	2015	Change	Improvement*
All Causes	425.6	404.0	-5.1%	0.3%
Cancer	127.5	99.7	-21.8%	1.6%
Heart	94.2	79.3	-15.8%	1.1%
Accidents	32.6	49.8	52.8%	-2.9%
Liver	17.7	20.5	16.3%	-1.0%
Self-Harm	14.4	20.3	40.4%	-2.3%

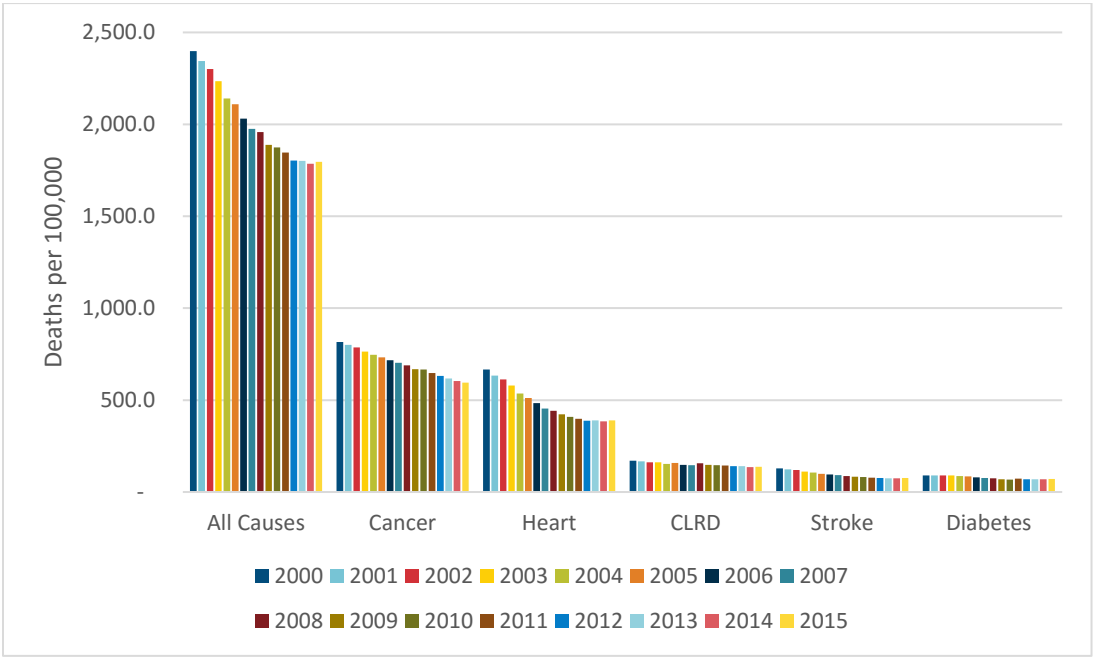
*Annual improvement is the geometric average rate of change between 2000 and 2015.

4.3 Ages 65-74

Figure 3 shows decreasing mortality for all causes of death (total mortality) and each of the top five leading causes of death. The strongest gains are seen by heart disease and stroke where each had an average annual 3.5% mortality improvement rate from 2000-2015.

Total mortality decreased substantially by 25.1% from 2000-2015. Large decreases from each leading cause of death contributed to the overall decrease. The rate of decrease was consistent until about 2012 when it leveled off. At that point through 2015, there was only a further 0.3% decrease in total mortality.

Figure 3
AGES 65-74 ALL CAUSES OF DEATH AND TOP FIVE COD 2000-2015



COD	Deaths per 100,000		Total	Avg Annual
	2000	2015	Change	Improvement*
All Causes	2,399.1	1,796.8	-25.1%	1.9%
Cancer	816.3	594.3	-27.2%	2.1%
Heart	665.6	389.5	-41.5%	3.5%
CLRD	169.4	136.6	-19.4%	1.4%
Stroke	128.6	75.5	-41.3%	3.5%
Diabetes	90.7	70.6	-22.1%	1.7%
*Annual improvement is the geometric average rate of change between 2000 and 2015.				

Although each of the leading causes of death decreased from 2000 to 2015, 2012 was a pivotal point in trend patterns. Table 5 summarizes mortality change before and after this point. Before 2012, each cause of death had generally consistent but different mortality rate decreases. After 2012, mortality improvement stalled for heart disease and stroke and reversed slightly for diabetes. Conversely, cancer and CLRD continued to decline after 2012. Cancer retained the same pace and CLRD slowed to about half of its prior improvement rate.

Table 5

AGES 65-74 CUMULATIVE MORTALITY RATE CHANGE BEFORE AND AFTER 2012

COD	2012 vs. 2000	2015 vs. 2012
All Causes	-25%	0%
Cancer	-23%	-6%
Heart	-42%	0%
CLRD	-17%	-2%
Stroke	-41%	0%
Diabetes	-23%	1%

Section 5: Variation by Geographic Region

Regional patterns of mortality from 2000-2015 are analyzed with respect to each age group, 15-24, 45-54 and 65-74, for total mortality and each of their associated top five leading causes of death. The ten Department of Health and Human Services (HHS) regions are used for the analysis. The states comprising these regions are shown in Figure 4. The names assigned to the regions are used throughout this report to refer to regional mortality experience. The colors associated with the regions in the map below are used through the remainder of this report in all charts and graphs. A tabular listing of the annual mortality rates by age group, cause of death, year and region is provided in Appendix A.

Figure 4

DEPARTMENT OF HEALTH AND HUMAN SERVICES REGIONS

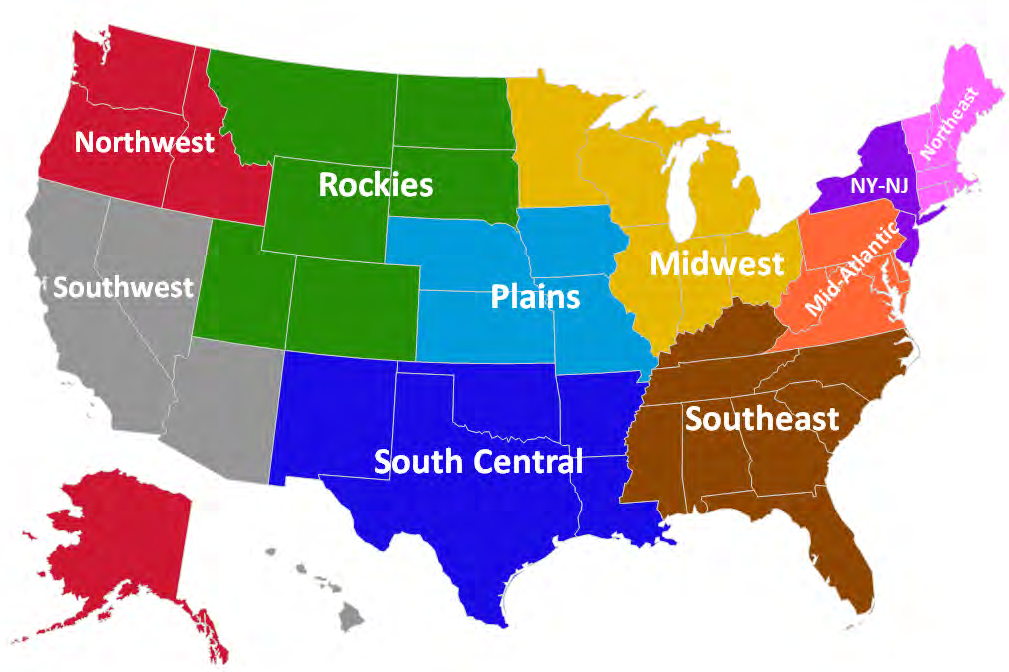


Table 6 provides an overview of average regional rankings and the regional rank standard deviations across all years of total mortality in each age group. For this purpose, each region's average rank and associated standard deviation across all years was determined from Appendix A. Generally, the data indicates regional consistency across age groups (similar average rank by region across ages) and across time (relatively low standard deviations of the annual rankings). The average across all regions of each region's maximum minus minimum age group rank is 1.7. This indicates consistency of regional rank across age groups. The average standard deviation of the three age groups' annual regional rank is 0.7. This indicates consistency of a region's rank over time.

The largest regional difference across age groups is the Rockies. Its ranking improves (mortality decreases) with increasing age. This is caused by self-harm, which is the highest of all regions for ages 15-24 and 45-54. Because self-harm is a greater proportion of age 15-24 mortality than ages 45-54, the difference is more prominent at the lowest age group. Another notable point in the data is Southeast age group 45-54 and South Central age group 65-74. The average ranking of 10.0 for each of these regions in those age groups means they had the highest regional mortality rate in every year from 2000-2015. No region had the lowest mortality in all years for any of the age groups.

Table 6
REGIONAL RANK DATA OF ANNUAL 2000-2015 TOTAL MORTALITY RATES

	Average Annual Regional Rank*			Max - Min Age Group Avg Rank	Standard Deviation of Annual Regional Rank		
Region	Ages 15-24	Ages 45-54	Ages 65-74		Ages 15-24	Ages 45-54	Ages 65-74
Mid-Atlantic	7.0	7.5	7.3	0.5	0.9	0.6	1.1
Midwest	4.9	6.3	6.9	2.0	0.9	0.4	0.4
Northeast	1.3	1.3	3.3	2.0	0.4	0.6	0.8
Northwest	3.7	3.9	4.9	1.3	0.5	1.0	0.2
NY-NJ	1.8	3.1	3.6	1.9	0.4	1.7	0.6
Plains	7.3	6.9	6.9	0.4	0.7	1.3	1.0
Rockies	6.4	2.9	1.8	4.6	1.1	1.2	0.7
South Central	9.3	9.0	10.0	1.0	0.5	0.0	0.0
Southeast	9.7	10.0	8.9	1.1	0.5	0.0	0.3
Southwest	3.7	4.1	1.4	2.8	0.8	0.9	0.5
Average				1.7	0.7	0.8	0.6

* Rank 1 is lowest mortality rate; 10 is highest.

The HHS regions' mortality rates are evaluated for random vs. statistically significant differences as of 2015. Appendix B, 2015 Regional Mortality Rate Confidence Intervals, shows confidence interval bands of regional mortality rates by age group and cause of death. If, for any two regions, one region has a confidence interval minimum that is greater than the confidence interval maximum of the other, there is a 95% probability[ii] that they have statistically significant mortality differences that are not due to chance or random variation. Appendix C, for each age group and cause of death, summarizes whether pairs of regions have statistically significant mortality differences.

Table 7 summarizes the proportion of regional pairs in Appendix C that have at least a 95% probability of statistically significant differences of their mortality rates. Based on total mortality, ages 15-24 have the lowest percentage of regions with statistically different mortality rates, 51%, whereas for ages 45-54 and 65-74, it is 87% and 80%, respectively.

Generally, the confidence intervals are better able to discern differences as the number of deaths increases. Relative to individual causes of death, the low number of deaths for cancer and heart disease for ages 15-24 contributes to their low percentages of statistically different mortality rate occurrences across the regions. The other percentages indicate a substantial proportion of differing regional pairs for each cause of death, ranging from a low of 31% for ages 65-74 diabetes and a high of 78% for ages 65-74 heart disease.

Table 7

PROPORTION OF HHS REGIONAL PAIRS WITH STATISTICALLY DIFFERENT 2015 MORTALITY RATES

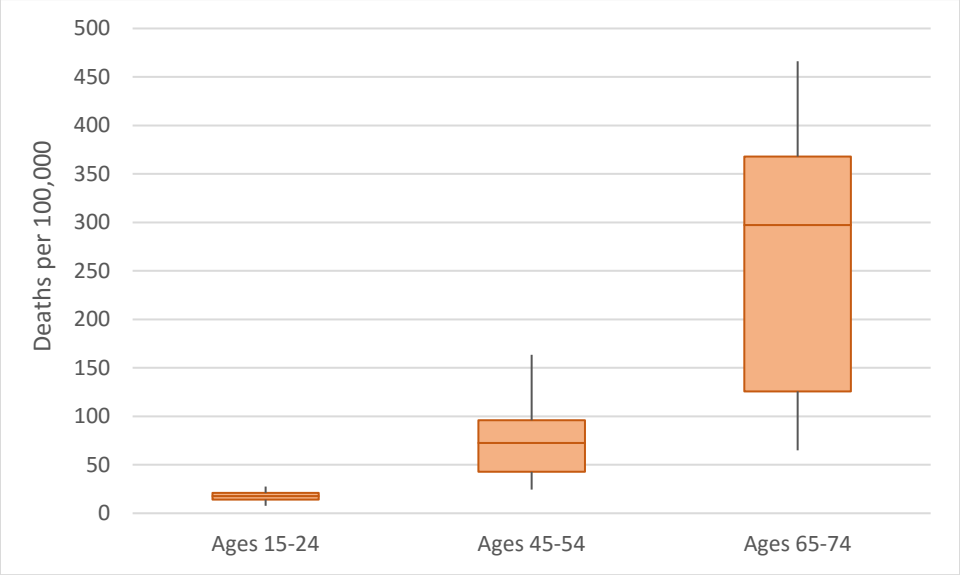
	Ages 15 - 24		Ages 45 - 54		Ages 65 - 74	
Rank	COD	% of HHS Pairs	COD	% of HHS Pairs	COD	% of HHS Pairs
1	Accidents	40	Cancer	60	Cancer	64
2	Assault	60	Heart	73	Heart	78
3	Self-Harm	62	Accidents	44	CLRD*	73
4	Cancer	0	Liver	60	Stroke	60
5	Heart	7	Self-Harm	47	Diabetes	31
	All Causes	51	All Causes	87	All Causes	80

* CLRD is Chronic Lower Respiratory Disease

The difference between pairs of HHS regions that have statistically significant different mortality rates in 2015 varies. For each age group and for all causes of death combined, Figure 5 shows a box and whiskers plot[1] of the range of mortality rate differences, expressed in deaths per 100,000, between these regional pairs. The minimum, the first, second and third quartiles and the maximum all increase by successively higher age group.

Figure 5

HHS REGIONAL PAIRS MORTALITY RATE DIFFERENCES BY NUMBER OF DEATHS*



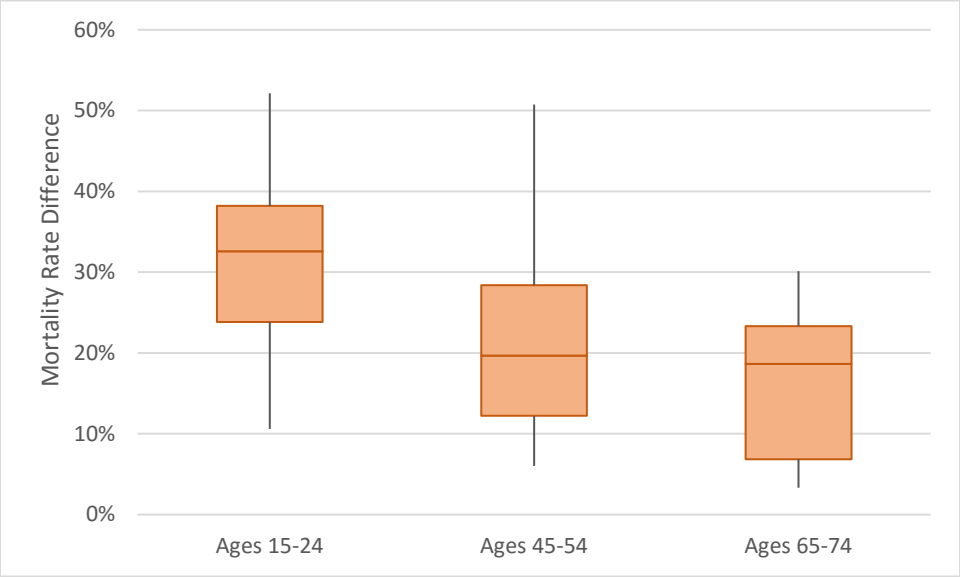
* Based on 2015 mortality rates for all COD combined including only regional pairs with statistically significant mortality rate differences.

[1] A box and whiskers plot shows the minimum, maximum and quartile breakpoints of a set of values. The minimum is the lowest point of the bottom vertical line (whisker). The first quartile is the bottom of the box. The median is the horizontal line in the box. The third quartile is the top of the box. The maximum is the top of the upper whisker.

Figure 6 shows the percentage difference between pairs of regions that have statistically significant mortality rate differences for all causes of death combined. The differences are expressed as the percentage excess of the higher region's mortality rate to the lower region's mortality rate. The percentage increment of the high to low region's minimum, first, second and third quartiles and maximum all decrease by successively higher age group.

Figure 6

HHS REGIONAL PAIRS MORTALITY RATE PERCENTAGE DIFFERENCES*



* Based on 2015 mortality rates for all COD combined including only regional pairs with statistically significant mortality rate differences.

Each age group's total mortality (all causes of death combined) and associated top five causes of death regional mortality patterns for 2000-2015 are discussed below. For each age group, regional patterns for total mortality and their five leading causes of death in rank-order of highest to lowest are presented.

5.1 Ages 15-24

5.1.1 All Causes of Death

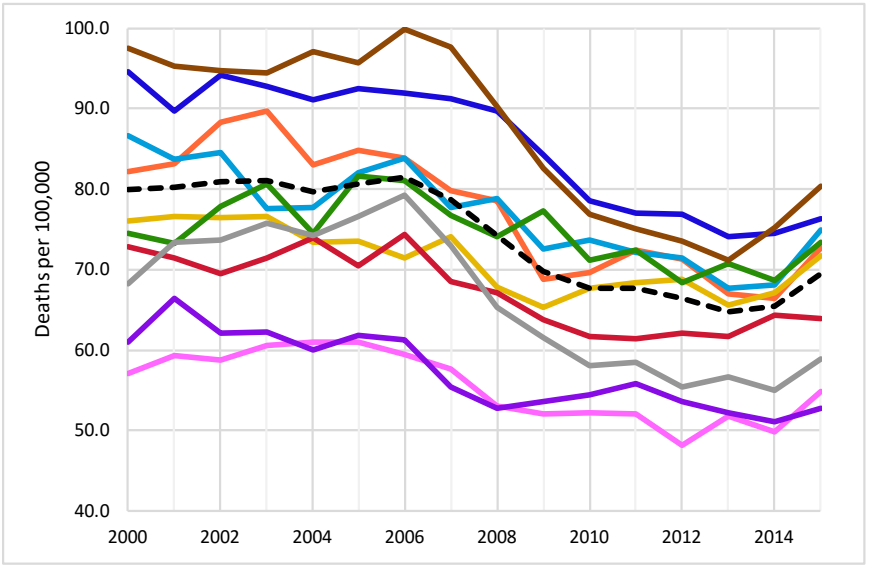
Figure 7 shows flat to rising mortality rates until 2006-2007 with a subsequent decline until a low is reached in 2013-2014, followed by a prominent 2015 uptick of mortality rates in most regions. Because accidents are the dominant cause of death for this age group, this pattern is similar to the pattern for accidents, which is discussed as the next cause of death.

Mortality decreased 20% from the peak in 2003, 81.1 deaths per 100,000, to 2013, 64.8 deaths per 100,000, on a national basis. The Southeast and South Central regions traded spots through the period for the highest mortality averaging 86.1 deaths per 100,000 through the full period. The Northeast and NY-NJ had the lowest mortality averaging 56.3 deaths per 100,000, which was 35% less than the two worst regions.

Despite having the highest mortality rates in all years, the South Central and Southeast had the highest annual mortality improvement, 1.3-1.4%. Because they had relatively better improvement than all other regions and started at a higher mortality rate in 2000, the range from the highest to lowest regions narrowed during the period. The Southeast, 97.5 deaths per 100,000, was 71% higher than the Northeast, 57.1 deaths per 100,000, in 2000. In 2015, the Southeast, 87.0 deaths per 100,000, was 52% higher than NY-NJ, 52.8 deaths per 100,000.

Figure 7

ALL CAUSES OF DEATH - AGES 15-24 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	0.8%	(0.1%)
Midwest	0.4%	(0.5%)
Northeast	0.3%	(0.6%)
Northwest	0.9%	(0.0%)
NY-NJ	1.0%	0.0%
Plains	1.0%	0.0%
Rockies	0.1%	(0.8%)
South Central	1.4%	0.5%
Southeast	1.3%	0.4%
Southwest	1.0%	0.1%
All Regions	0.9%	

*Annual improvement is the geometric average rate of change between 2000 and 2015

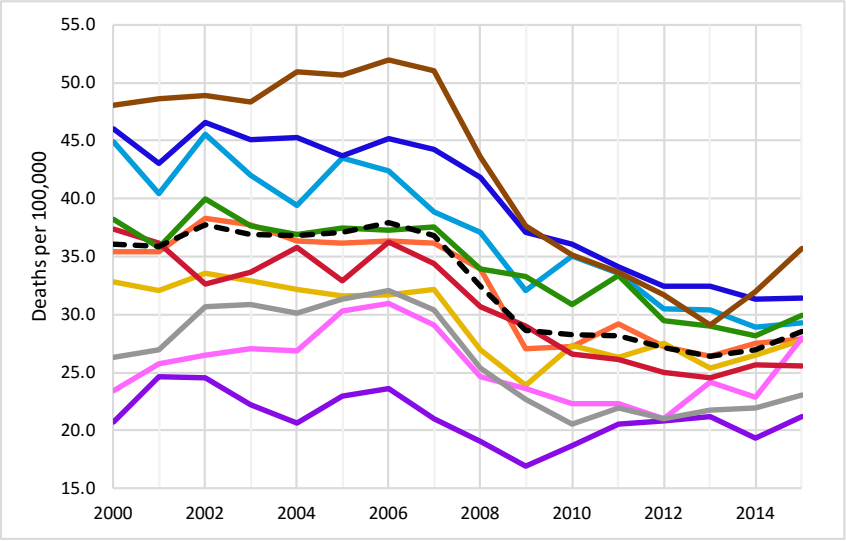
5.1.2 Accidents

Figure 8 shows flat to rising mortality rates to 2006-2007, which then, for most regions, fall significantly until 2012-2013. After that, with a mixture of level and rising regions, the national trend went up in 2014-2015. The Southeast had the highest mortality rate in almost all years, except when the South Central region edged it out in 2010-2013. While these two regions generally had the highest mortality rates through all years, because of the magnitude of the mortality decrease over time, they had the highest mortality improvement rates along with the Northwest region that also experienced a significant mortality decrease, but from a lower starting level in 2000.

The NY-NJ region had the lowest mortality rate in all years. While changing within a narrower range than other regions, it trended down until 2009 with a small increase after that, which produced a small average annual negative mortality improvement, 0.1%, from 2000-2015. The Northeast also experienced a higher mortality rate after starting at a level comparable to NY-NJ in 2000, but rising noticeably in the period up to 2006 and again in 2013 after an earlier decline to a low in 2012. While there are some crossovers of regional mortality rates over time, the regions' rank order is fairly consistent throughout the full period.

Figure 8

ACCIDENTS - AGES 15-24 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	1.6%	0.0%
Midwest	1.1%	(0.4%)
Northeast	(1.2%)	(2.7%)
Northwest	2.5%	1.0%
NY-NJ	(0.1%)	(1.7%)
Plains	2.8%	1.3%
Rockies	1.6%	0.1%
South Central	2.5%	1.0%
Southeast	2.0%	0.4%
Southwest	0.9%	(0.7%)
All Regions	1.5%	

*Annual improvement is the geometric average rate of change between 2000 and 2015

5.1.3 Assault

Figure 9 shows a moderately declining national mortality rate pattern that has little associated regional consistency. The national mortality rate decreased 14% from 12.6 to 10.8 deaths per 100,000 during 2000-2015. The average annual mortality improvement during this period was 1.0%. The great variation of regional mortality rates produced average annual mortality improvements ranging from -1.2% (Northwest) to 2.8% (Southwest).

Regional performance was inconsistent. Three regions in various years had the lowest mortality rates (Northeast, Northwest and Rockies), while four regions in various years had the highest mortality rates (Mid-Atlantic, South Central, Southeast and Southwest).

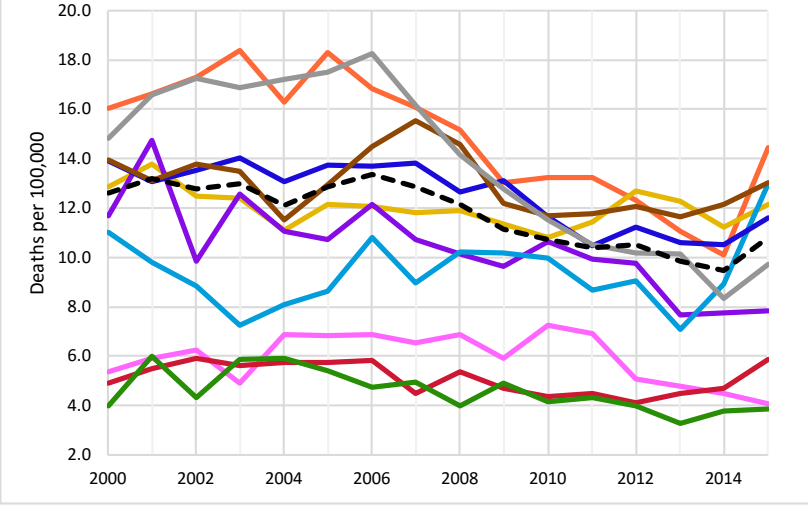
The three regions in the lowest group were distinctly below the other regions throughout the period. But they each had slightly different patterns from 2000-2015. NY-NJ was flat, while the Southeast rose and declined through the period, and the Northwest declined moderately from 2000 and then increased starting in 2012. On an unweighted average basis for all years, these three regions were 56% below the national average, 5.2 vs. 11.7 deaths per 100,000.

The Mid-Atlantic had the highest average mortality rate for 2000-2015, which was 27% higher than the associated national average, 14.9 vs. 11.7 deaths per 100,000. Even though it had the highest average mortality rate, it saw 0.7% average annual mortality improvement. The next worst region, Southwest, followed a similar track as the Mid-Atlantic, until about 2009 when it continued on a strong downtrend and then reversed with a slight mortality rate uptick from 2014 to 2015.

The later years in the period marked a potentially important trend change for a number of the regions. Assault mortality rates increased in every region except the Northeast in 2015 vs. 2014. For some regions, these were particularly sharp increases (Mid-Atlantic and Plains). And for the Plains, the uptrend started earlier in 2013. Its reversal was notable, with an 83% increase in two years, 7.1 vs. 13.0 deaths per 100,000 in 2013 and 2015, respectively.

Figure 9

ASSAULT - AGES 15-24 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	0.7%	(0.3%)
Midwest	0.4%	(0.7%)
Northeast	1.8%	0.8%
Northwest	(1.2%)	(2.2%)
NY-NJ	2.6%	1.6%
Plains	(1.1%)	(2.1%)
Rockies	0.2%	(0.8%)
South Central	1.2%	0.2%
Southeast	0.5%	(0.6%)
Southwest	2.8%	1.7%
All Regions	1.0%	

*Annual improvement is the geometric average rate of change between 2000 and 2015

5.1.4 Self-Harm

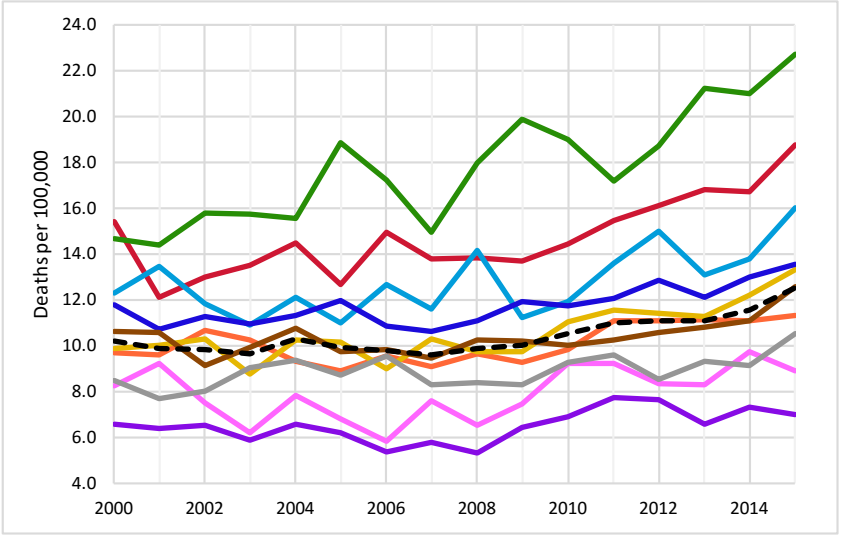
Figure 10 shows all regions experiencing varying degrees of negative mortality improvement from 2000-2015. The national trend was relatively flat until about 2009. The national mortality rate began an increase in 2010 that continued through 2015. During 2009-2015, national mortality increased by 25%, going from 10.0 to 12.5 deaths per 100,000.

The degree of the regional mortality rate increases from 2009 to 2015 varied notably by region. The three worst regions, Rockies, Northwest and Plains had the greatest degree of increasing mortality rates during this period. The Rockies, which had the highest mortality in all years but 2000, saw mortality decrease 14% from 2009 to 2011, but then sustained a 32% increase from 2011 to 2015. Its net increase in mortality rate from 2000-2015 produced the worst regional average annual mortality improvement, -3.0, and saw a 55% mortality rate increase from 15.7 to 22.7 deaths per 100,000.

While the two lowest regions, NY-NJ and Northeast, also had increased mortality rates, the degree was less than the other regions. The lowest region in all years, NY-NJ, had the least mortality increase with -0.4 average annual mortality improvement. In comparison to other regions, this produced a more moderate mortality rate increase of 7% that increased the mortality rate from 6.6 to 7.0 deaths per 100,000. It saw a moderate downtrend from 2000 to about 2008, which then reversed trend from that point for the remainder of the study period.

Figure 10

SELF- HARM - AGES 15-24 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement

	Annual Average*	Region Difference to National
Mid-Atlantic	(1.0%)	0.4%
Midwest	(2.0%)	(0.6%)
Northeast	(0.5%)	0.9%
Northwest	(1.3%)	0.1%
NY-NJ	(0.4%)	1.0%
Plains	(1.8%)	(0.4%)
Rockies	(3.0%)	(1.6%)
South Central	(0.9%)	0.5%
Southeast	(1.1%)	0.3%
Southwest	(1.4%)	(0.1%)
All Regions	(1.4%)	

*Annual improvement is the geometric average rate of change between 2000 and 2015

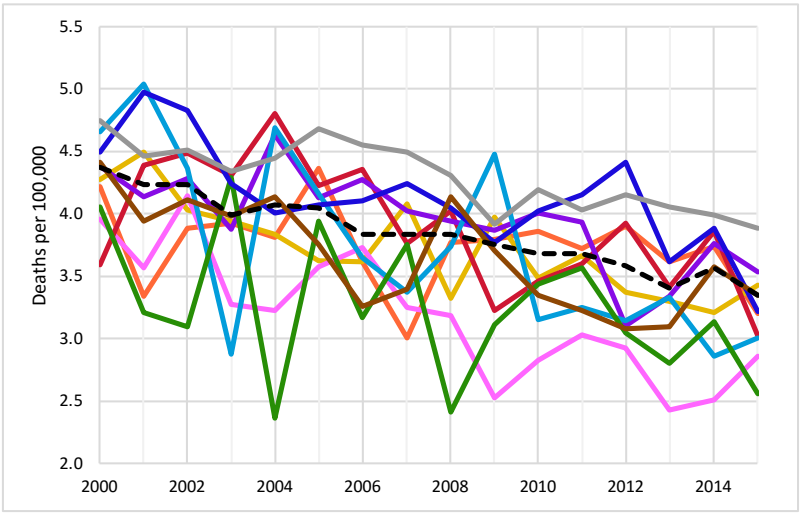
5.1.5 Cancer

Figure 11 shows a general downward trend in cancer mortality rates for all regions, with every region seeing mortality improvement during the period. But, because the mortality rates for this cause and age group are very low, a range of 2.5 to 5.0 deaths per 100,000 during 2000-2015, there is considerable variation within region and annual experience.

No region was clearly higher or lower than another. Four regions were the highest in at least one year and five were the lowest in at least one year. Two regions, Northwest and Plains, were both highest and lowest for at least one year. Only the Midwest and Southeast did not have the highest or lowest ranking in any year.

Figure 11

CANCER - AGES 15-24 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	1.8%	0.1%
Midwest	1.5%	(0.3%)
Northeast	2.1%	0.4%
Northwest	1.1%	(0.6%)
NY-NJ	1.4%	(0.3%)
Plains	2.9%	1.1%
Rockies	3.0%	1.3%
South Central	2.2%	0.4%
Southeast	1.8%	0.1%
Southwest	1.3%	(0.4%)
All Regions	1.8%	

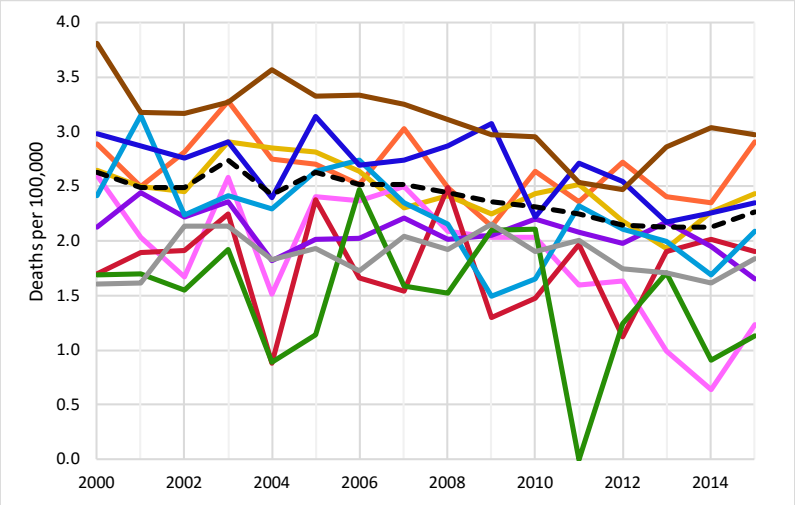
*Annual improvement is the geometric average rate of change between 2000 and 2015

5.1.6 Heart

Figure 12 shows a regional experience characteristic of very low mortality rates. While there is a national trend indicating 1% annual mortality improvement, the regional results are very choppy. Though there are frequent rank shifts resulting from regional seesaw experience, the Southeast had the generally highest mortality rate, and the Rockies and Northwest generally the lowest. Given the overall very low mortality rates, the range between the highest and lowest rate was very narrow.

Figure 12

HEART - AGES 15-24 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	(0.1%)	(1.0%)
Midwest	0.5%	(0.4%)
Northeast	4.9%	3.9%
Northwest	(0.8%)	(1.7%)
NY-NJ	1.7%	0.7%
Plains	1.0%	(0.0%)
Rockies	2.6%	1.7%
South Central	1.6%	0.6%
Southeast	1.6%	0.6%
Southwest	(0.9%)	(1.9%)
All Regions	1.0%	

*Annual improvement is the geometric average rate of change between 2000 and 2015

5.2 Ages 45-54

5.2.1 All Causes of Death

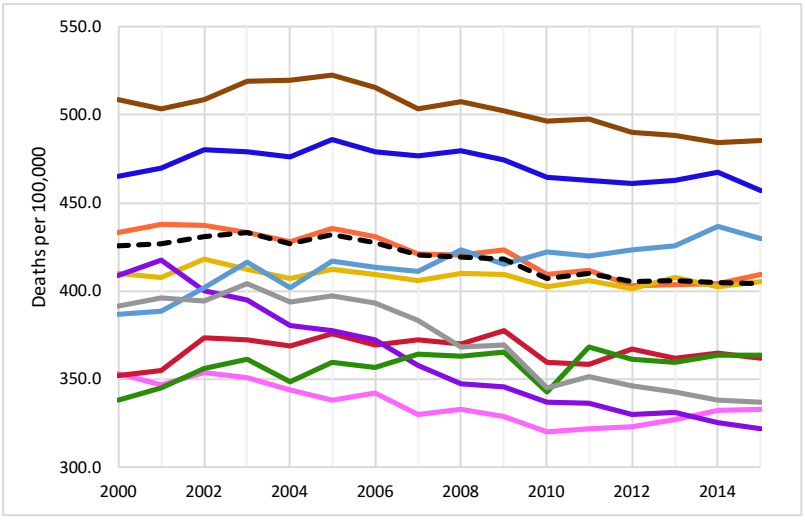
The mortality rate patterns for this age group reflect a mix of mortality due to cancer, heart disease and accidents as the most prevalent causes of death. Figure 13 shows the mortality rates for all causes of death have an overall downward trend for most regions, with an average annual 0.3% national rate of improvement.

The range between the mortality rates in the highest and lowest regions is significant and consistent at the beginning and end of the period. The Southeast, which was the highest in all years, was 50% higher than the lowest region, Rockies in 2000, and 51% higher than NY-NJ in 2015. Averaged for all years, Southeast, 502.7 deaths per 100,000, was 50% higher than the average lowest region, Northeast, which had 335.7 deaths per 100,000

Generally, the regions had consistent mortality rate rankings through the period. Though not universal, low regions stayed in the lower strata and high regions tended to remain higher than others. Exceptions to this were NY-NJ, Plains, Rockies and Southwest. The Plains and Rockies had the highest levels of increasing mortality rates (negative mortality improvement), whereas each of NY-NJ and Southwest had the strongest annual rates of improvement that moved them down to the low end of regional mortality in 2015.

Figure 13

ALL CAUSES OF DEATH- AGES 45-54 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	0.4%	0.0%
Midwest	0.1%	(0.3%)
Northeast	0.4%	0.0%
Northwest	(0.2%)	(0.5%)
NY-NJ	1.6%	1.2%
Plains	(0.7%)	(1.1%)
Rockies	(0.5%)	(0.8%)
South Central	0.1%	(0.2%)
Southeast	0.3%	(0.0%)
Southwest	1.0%	0.7%
All Regions	0.3%	

*Annual improvement is the geometric average rate of change between 2000 and 2015

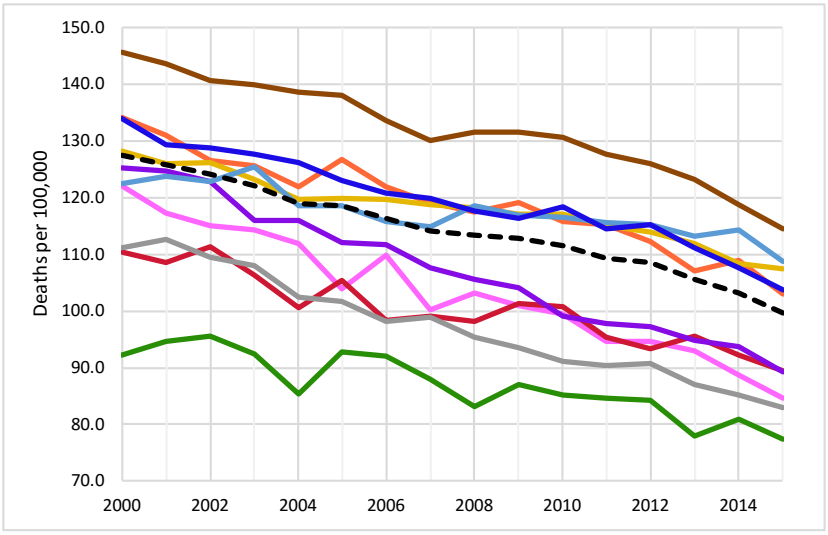
5.2.2 Cancer

Figure 14 shows a general decreasing mortality rate trend for all regions, with the national mortality rate decreasing by 22% from 127.5 to 114.2 deaths per 100,000 during the period. All regions experienced mortality improvement. The Northeast and NY-NJ areas had the greatest degree of improvement, 2.4% and 2.2%, respectively, but neither region had the highest or lowest mortality rate at any point. Though rankings change among regions, there is a fair degree of consistency of their rank within each year.

The Southeast and Rockies were the highest and lowest, respectively, in all years. The spread between them was significant, with the Rockies' mortality being 37% and 32% lower than the Southeast in 2000 and 2015, respectively. Each of these regions stood out from the others. The other regions saw similar decreases, but were clustered closer together. The lowest of these regions, the Southwest, averaged 96.9 deaths per 100,000, which was 19% lower than the corresponding rate for the second highest region for all years, South Central, which had 119.1 deaths per 100,000.

Figure 14

CANCER - AGES 45-54 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	1.7%	0.1%
Midwest	1.2%	(0.4%)
Northeast	2.4%	0.8%
Northwest	1.4%	(0.2%)
NY-NJ	2.2%	0.6%
Plains	0.8%	(0.8%)
Rockies	1.2%	(0.5%)
South Central	1.7%	0.1%
Southeast	1.6%	(0.0%)
Southwest	1.9%	0.3%
All Regions	1.6%	

*Annual improvement is the geometric average rate of change between 2000 and 2015

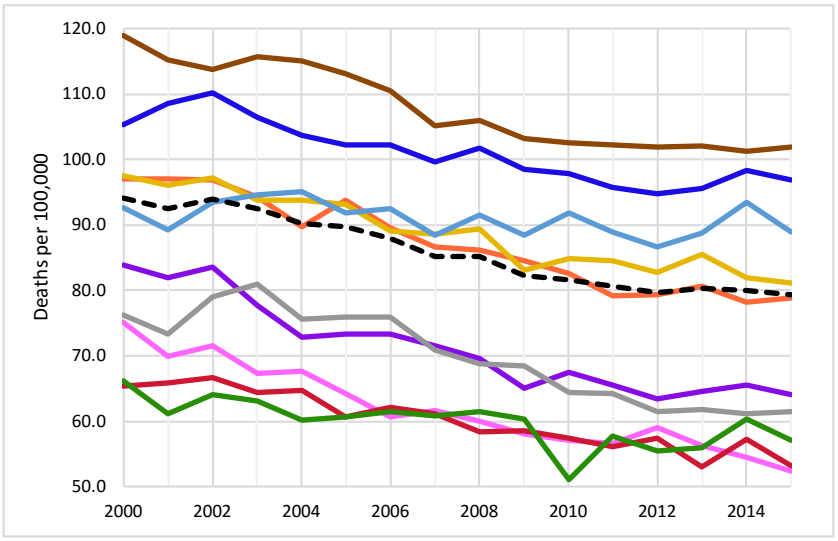
5.2.3 Heart

The mortality rate experience for this age group is relatively consistent in a moderate downward trend for most regions, but from different starting points by region. Figure 15 shows regional experience that clusters in four bands. Most regions stay close in rank to one another for all periods, except for the worst performer, Plains, with 0.3% annual improvement and the best, Northeast, with 2.4% annual improvement. Although results by region vary up and down starting in 2012, the All Regions experience levels off at that point.

The highest region in all years was the Southeast, with an average over all years of 107.6 deaths per 100,000, which was 78% higher than the corresponding unweighted average for the cluster of the three lowest regions, Northwest, Northeast and Rockies, which had 60.5 deaths per 100,000. The range between the highest and lowest regions was relatively consistent for all years. The Southeast in 2000 was 82% higher than the Northwest, and in 2015 the Southeast was 94% higher than the Northeast.

Figure 15

HEART - AGES 45-54 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	1.4%	0.2%
Midwest	1.2%	0.1%
Northeast	2.4%	1.2%
Northwest	1.4%	0.2%
NY-NJ	1.8%	0.6%
Plains	0.3%	(0.9%)
Rockies	1.0%	(0.2%)
South Central	0.6%	(0.6%)
Southeast	1.0%	(0.1%)
Southwest	1.4%	0.3%
All Regions	1.1%	

*Annual improvement is the geometric average rate of change between 2000 and 2015

5.2.4 Accidents

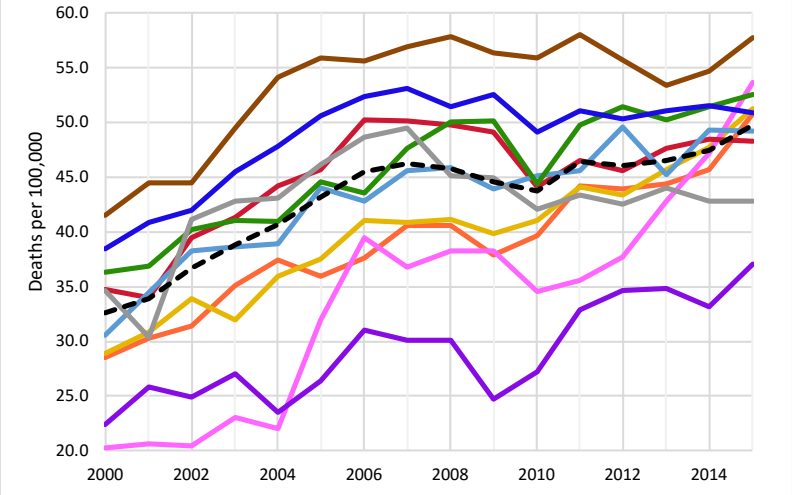
Figure 16 shows significantly rising mortality rates for all regions that generally follows an increasing pattern, until 2007-2008 with a dip in 2009-2010, followed by further increases varying in degree by region. This resulted in higher mortality rates for all regions and a national annual average mortality improvement rate of -2.9%. The mortality rates for this age group are notable for their significant upward trend of substantial magnitude, rising nationally 53% from 32.6 to 49.8 deaths per 100,000 during 2000-2015.

While the regional rank order was fairly consistent over time, the Northeast was a notable exception. It had the lowest mortality rate in 2000, 20.2 deaths per 100,000, but after two strong uptrends in 2004-2006 and 2010-2015, had the second highest rate, 53.7 deaths per 100,000, at the end of the period. The second rise was most notable, rising faster than any other region with a resulting worst 2000-2015, -6.7%, average annual mortality improvement rate.

The region with the highest mortality rate in all years was the Southeast. Its experience roughly paralleled the general national pattern, but at an average mortality rate for all years of 53.6 deaths per 100,000, it was 24% higher than the corresponding national rate of 43.2 deaths per 100,000. With the exception of 2000-2004 when the Northeast was the lowest, NY-NJ had the lowest rates in all other years. It had similar but choppier experience relative to the national trend, with an average 29.2 deaths per 100,000 for all years, which was 32% lower than the national average.

Figure 16

ACCIDENTS - AGES 45-54 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	(3.9%)	(1.1%)
Midwest	(3.9%)	(1.0%)
Northeast	(6.7%)	(3.9%)
Northwest	(2.2%)	0.6%
NY-NJ	(3.4%)	(0.5%)
Plains	(3.2%)	(0.4%)
Rockies	(2.5%)	0.4%
South Central	(1.9%)	1.0%
Southeast	(2.2%)	0.6%
Southwest	(1.4%)	1.4%
All Regions	(2.9%)	

*Annual improvement is the geometric average rate of change between 2000 and 2015

5.2.5 Liver

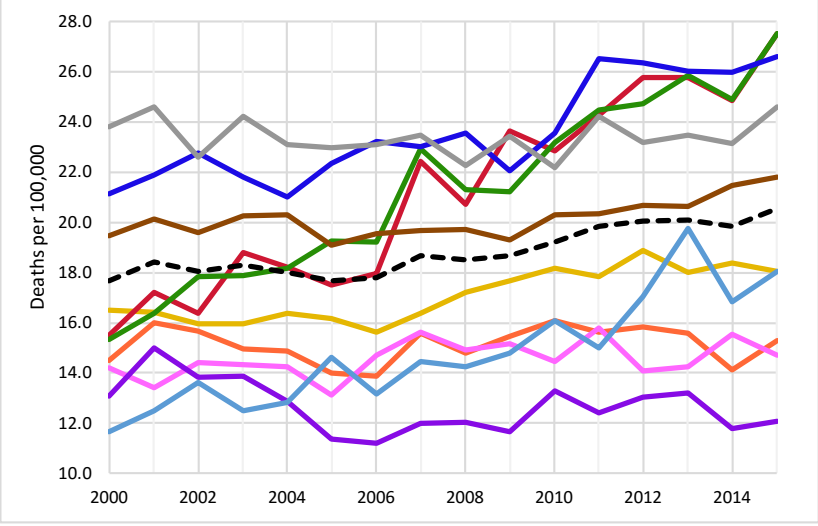
Figure 17 shows all regions but NY-NJ experiencing increased mortality rates over the full period. The national trend is relatively flat until after 2006, when it steadily increases through 2015. During the period 2006 to 2015, national mortality increased 15%, from 17.8 to 20.5 deaths per 100,000.

NY-NJ was the lowest region for all years after 2004. It was the only region whose mortality rate decreased, 8%, over the full period. Its average rate over all years was 33% lower than the comparable national average, 12.7 vs. 18.9 deaths per 100,000. Three other regions had less than a 10% increase in their mortality rates from 2000 to 2015. The Mid-Atlantic and Northeast mortality rates increased by 5% and 4%, respectively, and notched average rates 17% higher than NY-NJ. Although the Southwest also had only a small increase, 3%, during this time, its average level was in sharp contrast to the other two regions. The Southwest had one of the highest rates of mortality that was on average 84% higher than NY-NJ, 23.4 vs. 12.7 deaths per 100,000.

The highest region on average was South Central, which averaged 23.7 deaths per 100,000 in 2000-2015. But, because of varying regional experience, two other regions (Northwest and Southwest) also had the worst mortality rate ranking in at least one of the years. Notably during the period, three regions had significant mortality increases. This caused the Rockies and Northwest to tie for the highest 2015 mortality rate, with a 79% increase from 2000 when they both were in the middle of all regions. The Plains also had a large increase but, starting as the lowest region in 2000, they moved to the middle of the regions by 2015. Their uptrend corresponded to a -3.0 average annual rate of mortality improvement.

Figure 17

LIVER - AGES 45-54 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	(0.4%)	0.7%
Midwest	(0.6%)	0.4%
Northeast	(0.2%)	0.8%
Northwest	(3.9%)	(2.9%)
NY-NJ	0.5%	1.5%
Plains	(3.0%)	(1.9%)
Rockies	(4.0%)	(3.0%)
South Central	(1.5%)	(0.5%)
Southeast	(0.8%)	0.3%
Southwest	(0.2%)	0.8%
All Regions	(1.0%)	

*Annual improvement is the geometric average rate of change between 2000 and 2015

5.2.6 Self-Harm

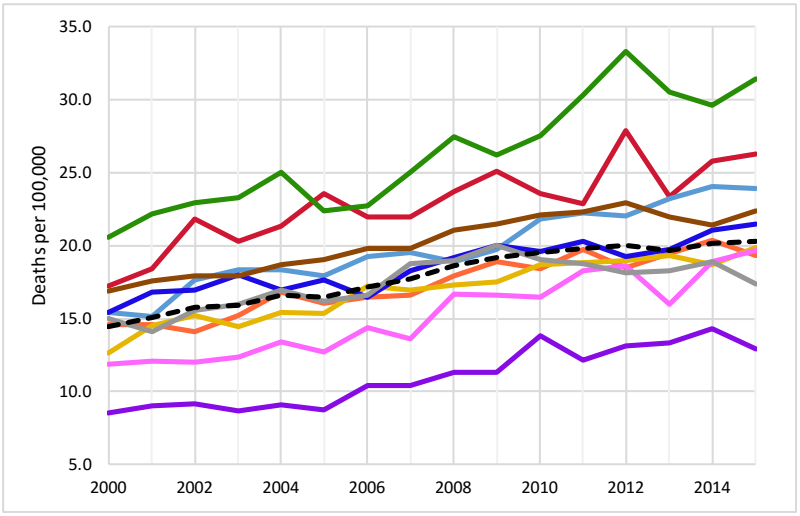
Figure 18 shows a national trend of a consistent rate of increasing mortality rates from 2000 to 2010. During that time, the national mortality rate increased 36% from 14.4 to 19.6 deaths per 100,000. During 2010 to 2015, the trend moderated to a 4% increase, ending at 20.3 deaths per 100,000. Regional performance was similar with every region recording large increases of mortality from 2000 to 2010, with a range of 27% (Mid-Atlantic and South Central) to 62% (NY-NJ). During 2010 to 2015, the range of mortality rate change was -9% (Southwest) to 19% (Northeast).

There was a distinct separation of mortality experience between the highest and lowest regions. The Rockies and, to a lesser degree, the Northwest were noticeably above the other regions. The Rockies had the highest mortality rate in all years but 2005, and had an average mortality rate for 2000-2015 that was 47% higher than the national average, 26.4 vs. 18.0 deaths per 100,000. Both the Rockies and Northwest had sustained increases in mortality from 2010 to 2015 of 14% and 12%, respectively.

NY-NJ had the lowest mortality rate in all years. While it also experienced a large mortality increase, 51%, from 2000 to 2015, its rate of increase matched the general trend enabling it, with the lowest regional rate in 2000 to remain the lowest in all years. Its average mortality rate for 2000 to 2015 was 38% below the national average. Although average experience over the full period placed the Southwest near the middle of all regions, it stood out as having the lowest increase, 16%, for the full period.

Figure 18

SELF-HARM - AGES 45-54 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	(1.9%)	0.4%
Midwest	(3.0%)	(0.8%)
Northeast	(3.4%)	(1.1%)
Northwest	(2.8%)	(0.6%)
NY-NJ	(2.8%)	(0.5%)
Plains	(3.0%)	(0.7%)
Rockies	(2.9%)	(0.6%)
South Central	(2.2%)	0.1%
Southeast	(1.9%)	0.4%
Southwest	(1.0%)	1.3%
All Regions	(2.3%)	

*Annual improvement is the geometric average rate of change between 2000 and 2015

5.3 Ages 65-74

5.3.1 All Causes of Death

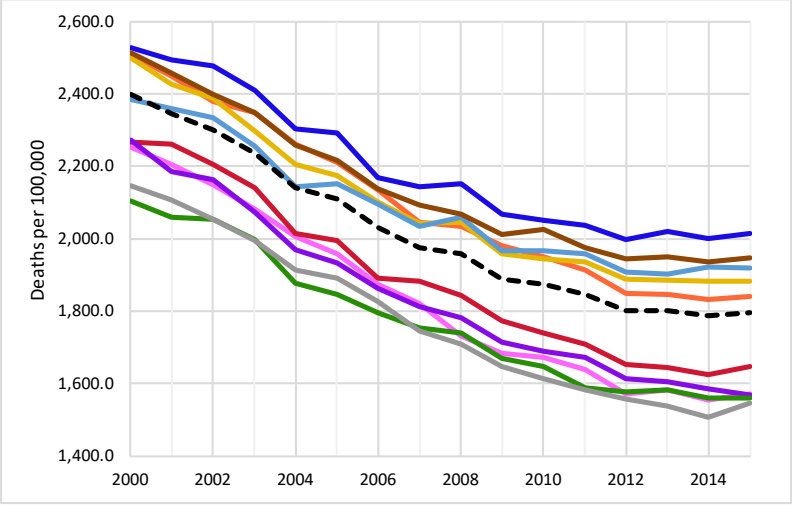
The mortality rate patterns shown in Figure 19 are unusual relative to other age groups and individual causes of death in that the patterns are very similar for all regions. The mortality patterns are largely driven by cancer and heart disease, which combined are 58% of the mortality causes for this age group. The average annual national rate of mortality improvement is 1.9%, with the highest improvement in NY-NJ, 2.4%, and lowest in the Plains, 1.4%. The relatively narrow range of regional mortality improvement causes the regions to generally retain their relative rank to one another throughout the entire period.

The South Central region has the highest mortality rate in all years. Averaged over all years, its mortality rate is 25% higher than the Southwest, which had the lowest average mortality rate of 1,743.5 deaths per 100,000. Because of the high rate of mortality improvement during the period, the average national mortality rate decreased by 25%, from 2,235.0 to 1,796.8 deaths per 100,000.

The regions' mortality rates clustered in two distinct groups, with five regions each above and below the national average. The lower group's average mortality, 1,795.3 deaths per 100,000, was 15% lower than the higher group's mortality, 2,103.5 deaths per 100,000.

Figure 19

ALL CAUSES OF DEATH- AGES 65-74 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	2.0%	0.1%
Midwest	1.9%	(0.0%)
Northeast	2.4%	0.5%
Northwest	2.1%	0.2%
NY-NJ	2.4%	0.5%
Plains	1.4%	(0.5%)
Rockies	2.0%	0.1%
South Central	1.5%	(0.4%)
Southeast	1.7%	(0.2%)
Southwest	2.2%	0.3%
All Regions	1.9%	

*Annual improvement is the geometric average rate of change between 2000 and 2015

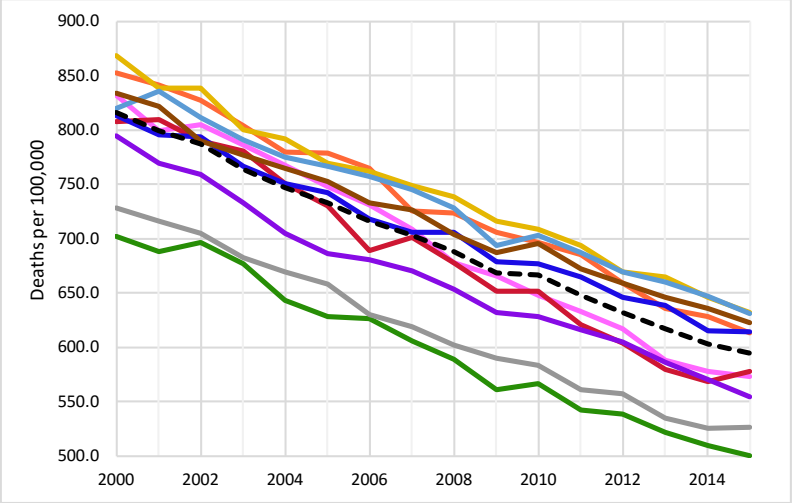
5.3.2 Cancer

Figure 20 shows a consistent downward mortality rate trend for all regions. While each of the regions experience periodic fluctuation from its trend, any deviations from the trend are brief. The combined results of all regions produced a national trend that was nearly a straight line, with 2.1% annual mortality improvement. Regional consistency of the overall trend resulted in a narrow range of regional mortality improvement. The highest level of mortality improvement was the Northeast, 2.5%, and the lowest was the Plains, 1.7%. Mid-Atlantic, Midwest, Plains, Southeast and South Central were in a fairly tight band at the high end of the range of mortality rates. The lowest region in this group, South Central, averaged 699.0 deaths per 100,000 over the full period, which was only 5% lower than the highest region, Midwest, with 735.6 deaths per 100,000.

The Rockies, region with lowest mortality rate in all years, and the Southwest, second lowest in all years, stood significantly apart from other regions. Their annual mortality improvement was close to the national annual improvement rate and, as a result, they maintained a significant gap below other regions through all years. The two regions' average rate across all years, 597.9 deaths per 100,000, was 13% less than the corresponding national rate of 690.0 deaths per 100,000, and 19% less than the average annual rate of the highest region, Midwest, which averaged 735.6 deaths per 100,000.

Figure 20

CANCER - AGES 65-74 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	2.2%	0.1%
Midwest	2.1%	0.0%
Northeast	2.5%	0.4%
Northwest	2.2%	0.1%
NY-NJ	2.4%	0.3%
Plains	1.7%	(0.4%)
Rockies	2.2%	0.1%
South Central	1.9%	(0.2%)
Southeast	1.9%	(0.2%)
Southwest	2.1%	0.1%
All Regions	2.1%	

*Annual improvement is the geometric average rate of change between 2000 and 2015

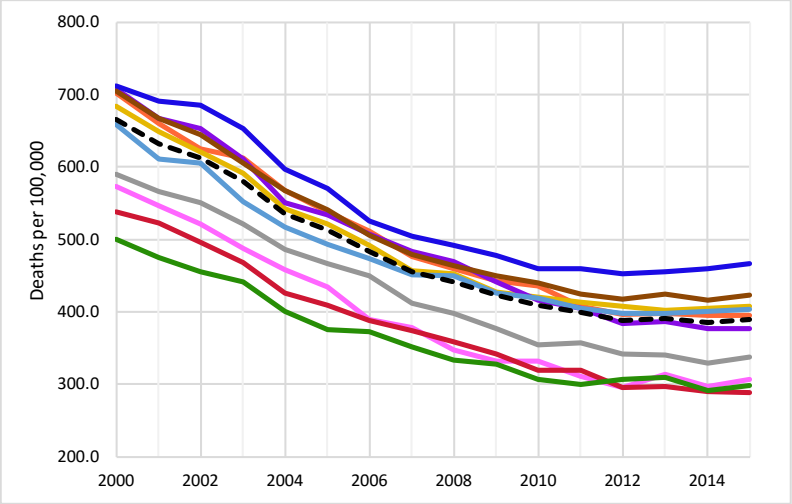
5.3.3 Heart

Figure 21 shows regionally consistent patterns that follow a strong downtrend, which levels off for most regions starting in 2012. Although the improvement appears to be leveling off in 2012, the national 3.5% average annual mortality rate of improvement tied with stroke in this age group as the highest national average annual rate of improvement for all age groups, and their top five leading causes of death.

The range of experience and relative regional rank to one another was fairly consistent for all years. The highest region in all years was South Central, while the lowest in 2000 was the Rockies. Strong improvement by both the Northeast and Northwest allowed those regions to close the gap and be the two lowest regions in 2012-2015. Relative to South Central, the highest region in all years, averaging 530.1 deaths per 100,000, the lowest regions in 2000 (Rockies) and 2015 (Northwest) were 70% and 62% of the South Central, respectively, averaged across all years.

Figure 21

HEART - AGES 65-74 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	3.8%	0.3%
Midwest	3.4%	(0.1%)
Northeast	4.1%	0.6%
Northwest	4.1%	0.6%
NY-NJ	4.1%	0.6%
Plains	3.2%	(0.3%)
Rockies	3.4%	(0.1%)
South Central	2.8%	(0.7%)
Southeast	3.3%	(0.2%)
Southwest	3.6%	0.1%
All Regions	3.5%	

*Annual improvement is the geometric average rate of change between 2000 and 2015

5.3.4 Chronic Lower Respiratory Disease (CLRD)

Figure 22 shows that all regions had mortality improvement, but the strength of their overall downward trend differed by region. The six lowest regions in 2000 were fairly consistent in rank order throughout the period, and with the national mortality trend. The four regions with the highest mortality rates in 2000, Northwest, Rockies, Plains and South Central, saw varying degrees of improvement. Although it started with the highest mortality rate in 2000, the Northwest decreased from 196.8 to 136.2 deaths per 100,000 to record one of the strongest rates of improvement.

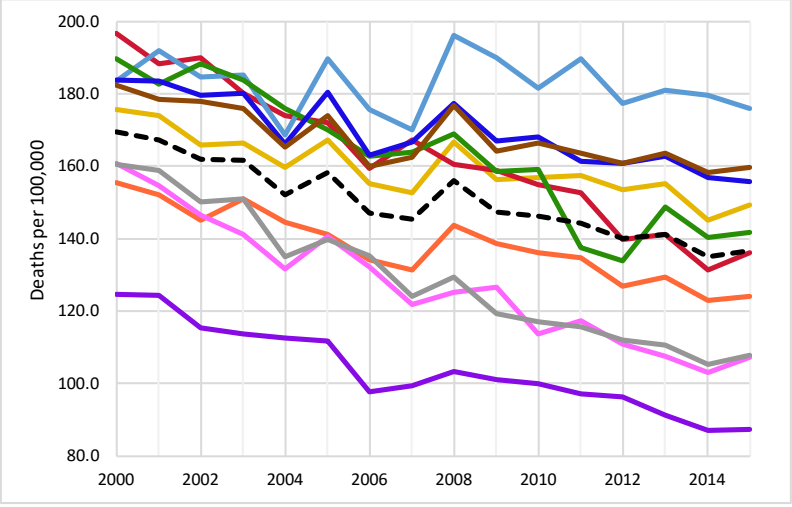
The highest ranking region changed every year from 2000-2004 as the highest mortality rates were fairly close to one another at that point. Starting in 2005, the Plains diverged from the general downward trend of all other regions with subsequent increases and decreases that resulted in the smallest regional annual mortality improvement rate of 0.3%.

The NY-NJ region had the lowest mortality rate in all years, and stood out as an outlier, with mortality averaged over all years, 103.1 deaths per 100,000, 18% lower than the next lowest region, Northeast, which had 125.7 deaths per 100,000. The NY-NJ region was substantially lower, 43%, than the highest region, Plains, which had 182.4 deaths per 100,000 averaged over all years.

There was a wide range between the regions with the lowest and highest mortality rates and that difference increased from 2000 to 2015. The highest region in 2000 (Northwest) was 58% higher than the lowest (NY-NJ) and, in 2015, the highest region (Plains) was 101% higher than NY-NJ.

Figure 22

CLRD - AGES 65-74 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement

	Annual Average*	Region Difference to National
Mid-Atlantic	1.5%	0.1%
Midwest	1.1%	(0.3%)
Northeast	2.7%	1.3%
Northwest	2.4%	1.0%
NY-NJ	2.3%	0.9%
Plains	0.3%	(1.1%)
Rockies	1.9%	0.5%
South Central	1.1%	(0.3%)
Southeast	0.9%	(0.5%)
Southwest	2.6%	1.2%
All Regions	1.4%	

*Annual improvement is the geometric average rate of change between 2000 and 2015

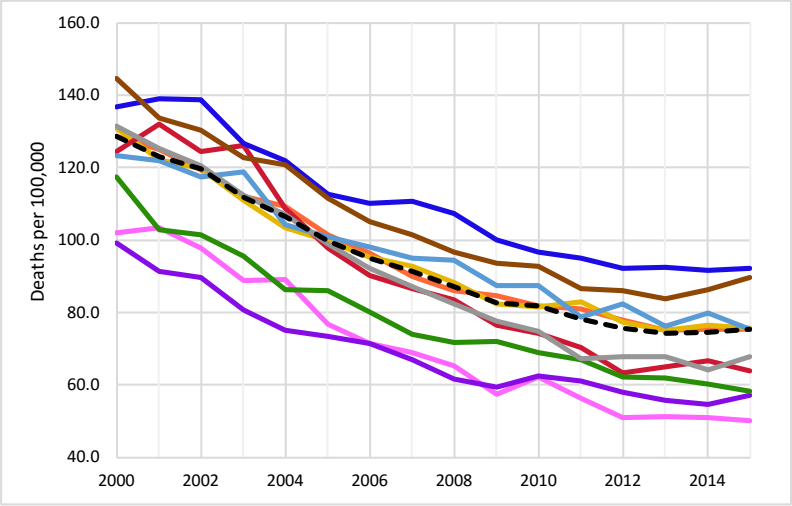
5.3.5 Stroke

Figure 23 shows significant mortality improvement for all regions during the period, which produces a strong downtrend that begins to level off for all regions combined starting at about 2013. Generally, regions' rankings relative to one another are more consistent after 2005 than before that point. While not completely parallel, the tracks of the regions are fairly similar to one another in trend when viewed across all years.

Though regional rankings shift in the earlier years, the overall range of mortality rates grew moderately from 2000 to 2015. In 2000, the low region, NY-NJ with 99.2 deaths per 100,000, was 31% lower than the Southeast, which had 144.6 deaths per 100,000. In 2015, the low region, Northeast with 50.2 deaths per 100,000, was 46% lower than South Central, which had 92.3 deaths per 100,000. The expansion of the range was due to better mortality improvement, 4.6% for the Northeast (lowest ending rate), than South Central, which had the lowest rate of improvement, 2.6%.

Figure 23

STROKE - AGES 65 - 74 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement

	Annual Average*	Region Difference to National
Mid-Atlantic	3.5%	0.0%
Midwest	3.6%	0.1%
Northeast	4.6%	1.1%
Northwest	4.4%	0.9%
NY-NJ	3.6%	0.1%
Plains	3.2%	(0.2%)
Rockies	4.5%	1.1%
South Central	2.6%	(0.9%)
Southeast	3.1%	(0.3%)
Southwest	4.3%	0.8%
All Regions	3.5%	

*Annual improvement is the geometric average rate of change between 2000 and 2015

5.3.6 Diabetes

Figure 24 shows mortality improvement for every region, with the rate of mortality improvement ranging from 0.5% (Plains) to 2.9% (NY-NJ). The national trend reflected consistent improvement until 2010. National mortality rates had a slight reversal in 2011, an increase of 7%, and then decreased 2% from that point to 2015.

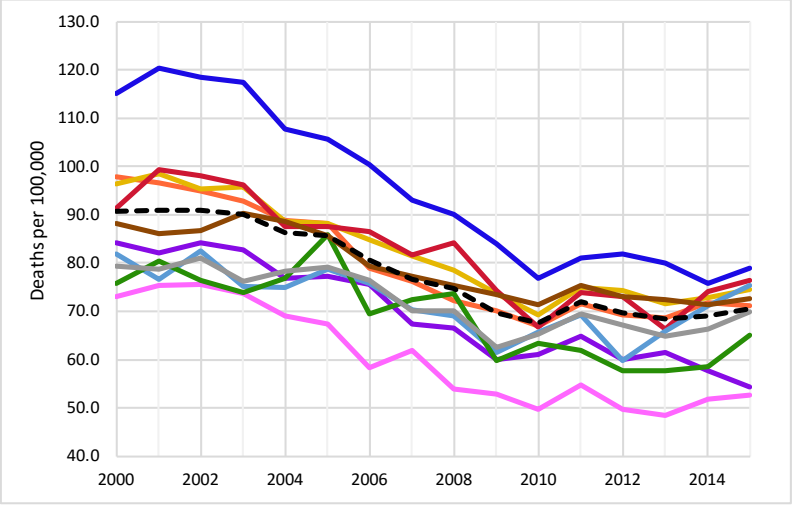
The highest region in terms of mortality rates in all years, South Central, also had a downward trend until 2010. With a subsequent rise and then fall, it ended 2015 near its 2010 level. Its average for 2000 to 2015, 93.3 deaths per 100,000, was 21% higher than the national average of 77.3 deaths per 100,000. While it had the highest mortality, South Central also had the second best average annual mortality improvement rate of 2.5%. Notably, its mortality rate was 18% higher than the next highest region, Mid-Atlantic, in 2000. But by 2015, it was only 3% higher than the next highest region, Northwest.

The Northeast was the lowest region in all years. Like the other regions, it also had a general improvement trend until 2010, which was mostly flat after that point except for a brief uptick of the mortality rate in 2011. Its average mortality rate over the full period, 59.6 deaths per 100,000, was 23% below the national average of 77.3 deaths per 100,000.

The NY-NJ region had the highest average annual mortality improvement, 2.9%, from 2000 to 2015. Although it was the fifth lowest region in 2000, its strong improvement trend placed it in a near tie with the Northeast as the lowest region in 2015, 54.4 (NY-NJ) vs. 52.7 (Northeast) deaths per 100,000. And, whereas all other regions were flat to increasing from 2011 to 2015, a range of -3% to 9% change, the NY-NJ mortality rate decreased 16% during that time.

Figure 24

DIABETES - AGES 65 - 74 ANNUAL MORTALITY RATES AND 2000-2015 IMPROVEMENT BY REGION



2000 - 2015 Mortality Improvement	Annual Average*	Region Difference to National
Mid-Atlantic	2.1%	0.5%
Midwest	1.7%	0.0%
Northeast	2.2%	0.5%
Northwest	1.2%	(0.5%)
NY-NJ	2.9%	1.2%
Plains	0.5%	(1.1%)
Rockies	1.0%	(0.6%)
South Central	2.5%	0.8%
Southeast	1.3%	(0.4%)
Southwest	0.8%	(0.8%)
All Regions	1.7%	

*Annual improvement is the geometric average rate of change between 2000 and 2015

Section 6: Variation by Urban-Rural Region

Metropolitan patterns of mortality are analyzed for age groups 15-24, 45-54 and 65-74, all causes of death (total mortality) and all years 2000-2015 combined. The "2013 NCHS Urban-Rural Classification Scheme for Counties" is used for this purpose[iii]. The scheme, per this cited reference, was developed by the National Center for Health Statistics for use in studying associations between urbanization level of residence and health, and for monitoring the health of urban and rural residents. The scheme assigns each county into one of six metro or non-metro areas. The areas correlate to, but are not directly determined by, population density. The metro (urban) and non-metro (rural) classifications vary in median population density, going from Large Central Metro with the highest density, 2037 people per square mile, to Noncore with the lowest density, 18 people per square mile. Metro and Non-metro areas are referred to as urban and rural regions, respectively, in this report.

Mortality varies by urban-rural region. Table 8 shows summary information by age group of total mortality by these regional classifications. With the exception of small metro for ages 15-24, large fringe metro has the lowest urban-rural mortality rate on a national basis. Further, except for ages 15-24, the mortality rate successively increases for large central metro, medium metro, small metro, micropolitan and noncore.

Table 8

2000-2015 MORTALITY RATES BY URBAN-RURAL REGION (DEATHS PER 100,000)

Ages	Large Central Metro	Large Fringe Metro	Medium Metro	Small Metro	Micropolitan (non-metro)	NonCore (non-metro)	Total
15-24 years	71.7	69.6	72.3	68.6	82.6	109.1	74.1
45-54 years	423.5	346.7	431.9	452.8	477.6	509.7	418.3
65-74 years	1,938.8	1,859.7	1,985.4	2,068.9	2,202.6	2,224.4	1,994.1

Figure 25 shows the combined 2000-2015 metro area relationships for age group total mortality in relation to large fringe metro, which generally has the lowest urban-rural mortality. Generally, the excess of the mortality rate of each of these areas over the large fringe metro rate, as a percentage of the large fringe metro rate, decreases from ages 45-54 to 65-74. Ages 15-24 have the highest age group noncore mortality rate relative to large fringe metro, but has lower percentages than the other age groups for the other urban-rural areas compared to large fringe metro.

Figure 25

2000-2015 URBAN-RURAL MORTALITY RATE COMPARISON TO LARGE FRINGE METRO

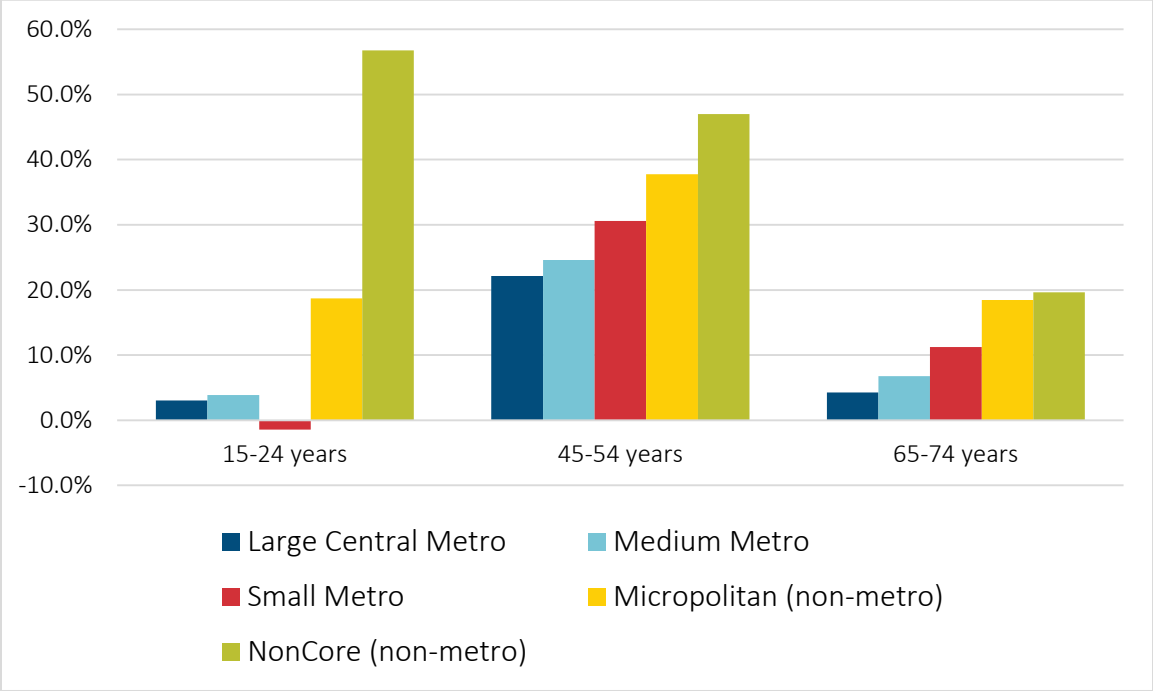


Table 9 shows the 2000-2015 urban-rural mix by HHS region for ages 15-24, 45-54 and 65-74 combined. NY-NJ had the highest combined large central and large fringe metro mix of 80.7%, while the Plains was the lowest, 28.7%. The Plains had the highest combined micropolitan and noncore mix, 33.9%, and the Southwest had the lowest, 3.8%.

Table 9
2000-2015 US URBAN-RURAL POPULATION MIX

Region	Large Central Metro	Large Fringe Metro	Medium Metro	Small Metro	Micropolitan (non-metro)	Noncore (non-metro)
Mid-Atlantic	17.4%	42.5%	17.1%	10.8%	6.1%	6.0%
Midwest	27.2%	25.6%	15.5%	11.8%	12.9%	7.1%
Northeast	15.4%	35.1%	30.9%	6.0%	7.9%	4.7%
Northwest	19.8%	22.8%	23.6%	16.0%	13.0%	4.8%
NY-NJ	40.7%	40.0%	9.6%	4.3%	3.9%	1.6%
Plains	7.0%	21.7%	22.7%	14.7%	15.8%	18.1%
Rockies	13.8%	17.6%	24.1%	17.0%	14.0%	13.4%
South Central	31.9%	14.9%	24.0%	9.8%	11.1%	8.4%
Southeast	19.7%	21.2%	28.8%	10.7%	11.0%	8.6%
Southwest	60.9%	10.9%	19.5%	4.9%	2.9%	0.9%
All Regions	**29.4%**	**24.1%**	**21.1%**	**9.7%**	**9.2%**	**6.5%**

Because mortality varies by urban-rural region and the HHS regions have different urban-rural mixes, the potential of a region's urban-rural mix arises as being an explanatory variable of differing HHS regional mortality. Additional regional detail for these age groups is shown in Appendix D (Combined 2000-2015 Urban-Rural Mortality Rates) and Appendix E (Combined 2000-2015 Regional Urban-Rural Population Mix).

Section 7: Reliance and Limitations

Data to calculate mortality rates are drawn from the Centers for Disease Control and Prevention (CDC) Wide-ranging Online Data for Epidemiologic Research (WONDER) database. There are some very limited instances where the mortality rates understate the actual mortality. This is because death counts of less than ten for regional data are suppressed by WONDER. This report converts suppressed data to zero deaths. This imprecision is immaterial to this research because very small differences of reported to actual mortality do not significantly affect the mortality rate comparisons across regions or time.

Data provided through WONDER is subject to restricted use for health statistical reporting and analysis. This research confines itself to those parameters. While the data may be useful for application in specific purposes, no assessment has been made concerning the applicability of this experience to such other purposes.

Endnotes

[i] CDC Wonder Underlying Cause of Death 1999-2015, https://wonder.cdc.gov/wonder/help/ucd.html#Top15

[ii] Because multiple pairs of regions are compared to one another a statistical adjustment is used to identify with 95% probability whether any pair of regions have statistically significant mortality differences. A Bonferroni adjustment is used where each individual region's confidence interval is derived at one minus the target Type I error percentage (5% for a 95% confidence interval) divided by the total number of regional pairs. Thus each regional confidence interval is calculated at 99.89%. Regional mortality rate confidence interval bands are calculated per the methods described in "Kochanek KD, Murphy SL, Xu JQ, Tejada-Vera B. Deaths: Final data for 2014. National vital statistics reports; vol 65 no 4. Hyattsville, MD: National Center for Health Statistics. 2016." https://www.cdc.gov/nchs/data/nvsr/nvsr65/nvsr65_04.pdf

[iii] Ingram DD, Franco SJ. 2013 NCHS urban–rural classification scheme for counties. National Center for Health Statistics. Vital Health Stat 2(166). 2014. https://www.cdc.gov/nchs/data/series/sr_02/sr02_166.pdf

Appendix A — Regional Mortality Rates

Age Group: 15-24 Years		Deaths per 100,000																		
Cause of Death	**Region**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Trend**	**Avg All Years**	**Rank**
All Causes	Mid-Atlantic	82.1	83.2	88.3	89.8	83.0	84.8	83.8	79.8	78.6	68.8	69.6	72.5	71.3	67.0	66.4	72.7		77.4	8.0
	Midwest	76.0	76.6	76.5	76.6	73.4	73.6	71.5	74.1	67.8	65.3	67.7	68.4	68.8	65.6	67.2	71.8		71.3	5.0
	Northeast	57.1	59.4	58.8	60.6	61.0	61.0	59.4	57.6	53.1	52.1	52.1	52.0	48.2	51.8	49.9	54.8		55.5	1.0
	Northwest	72.9	71.5	69.5	71.5	74.0	70.5	74.4	68.5	67.2	63.8	61.6	61.4	62.1	61.7	64.3	63.9		67.3	4.0
	NY-NJ	61.0	66.5	62.1	62.3	60.1	61.9	61.2	55.4	52.8	53.6	54.5	55.8	53.6	52.1	51.1	52.8		57.2	2.0
	Plains	86.7	83.8	84.6	77.6	77.7	82.1	83.9	77.7	78.9	72.6	73.6	72.2	71.5	67.7	68.1	75.0		77.1	7.0
	Rockies	74.5	73.3	77.9	80.7	74.5	81.6	81.1	76.7	74.0	77.3	71.2	72.4	68.4	70.7	68.7	73.3		74.7	6.0
	South Central	94.6	89.6	94.1	92.8	91.1	92.5	91.9	91.3	89.7	84.2	78.6	77.1	76.9	74.1	74.5	76.3		85.3	9.0
	Southeast	97.5	95.3	94.8	94.5	97.1	95.7	99.9	97.7	90.3	82.6	76.9	75.0	73.6	71.2	75.3	80.4		87.0	10.0
	Southwest	68.3	73.5	73.7	75.8	74.3	76.6	79.2	73.0	65.3	61.5	58.1	58.5	55.5	56.7	54.9	58.9		66.2	3.0
All Causes Total	**All Regions**	**79.9**	**80.2**	**80.9**	**81.1**	**79.7**	**80.7**	**81.4**	**78.8**	**74.2**	**69.8**	**67.7**	**67.7**	**66.4**	**64.8**	**65.5**	**69.5**		**74.1**	
Accidents	Mid-Atlantic	35.4	35.4	38.3	37.8	36.4	36.1	36.3	36.2	33.9	27.0	27.2	29.2	27.2	26.4	27.5	27.8		32.3	6.0
	Midwest	32.8	32.1	33.6	32.9	32.2	31.6	31.7	32.1	26.9	23.9	27.3	26.3	27.5	25.4	26.5	27.8		29.4	4.0
	Northeast	23.5	25.7	26.5	27.1	26.9	30.3	31.0	29.0	24.6	23.6	22.3	22.3	21.0	24.2	22.9	28.0		25.5	2.0
	Northwest	37.4	36.2	32.7	33.7	35.8	32.9	36.3	34.4	30.7	29.0	26.6	26.1	25.0	24.5	25.6	25.5		30.7	5.0
	NY-NJ	20.7	24.7	24.5	22.2	20.6	23.0	23.6	21.0	19.1	16.9	18.7	20.5	20.8	21.2	19.3	21.2		21.1	1.0
	Plains	44.9	40.5	45.5	42.0	39.4	43.5	42.4	38.9	37.1	32.0	35.0	33.5	30.5	30.4	28.9	29.3		37.1	8.0
	Rockies	38.2	35.8	40.0	37.6	36.9	37.5	37.3	37.5	33.9	33.3	30.9	33.4	29.4	29.0	28.2	29.9		34.2	7.0
	South Central	46.0	43.1	46.6	45.1	45.3	43.7	45.2	44.2	41.8	37.1	36.1	34.1	32.4	32.4	31.3	31.4		39.5	9.0
	Southeast	48.1	48.6	48.9	48.3	50.9	50.7	52.0	51.0	43.5	37.6	35.1	33.6	31.7	29.1	32.0	35.6		42.0	10.0
	Southwest	26.3	26.9	30.7	30.9	30.1	31.3	32.1	30.4	25.3	22.6	20.6	21.9	21.0	21.7	22.0	23.1		25.9	3.0
Accidents Total	**All Regions**	**36.0**	**35.8**	**37.7**	**36.9**	**36.8**	**37.1**	**37.9**	**36.8**	**32.5**	**28.6**	**28.3**	**28.2**	**27.1**	**26.4**	**26.9**	**28.5**		**32.5**	
Assault	Mid-Atlantic	16.0	16.6	17.3	18.4	16.3	18.3	16.8	16.1	15.2	13.0	13.2	13.2	12.3	11.1	10.1	14.5		14.9	10.0
	Midwest	12.9	13.8	12.5	12.4	11.1	12.1	12.0	11.8	11.9	11.3	10.8	11.4	12.7	12.3	11.2	12.2		12.0	6.0
	Northeast	5.4	5.9	6.2	4.9	6.9	6.8	6.9	6.5	6.9	5.9	7.2	6.9	5.1	4.8	4.5	4.1		5.9	3.0
	Northwest	4.9	5.5	5.9	5.6	5.7	5.7	5.8	4.5	5.4	4.7	4.4	4.5	4.1	4.5	4.7	5.9		5.1	2.0
	NY-NJ	11.7	14.7	9.8	12.6	11.0	10.7	12.2	10.7	10.1	9.6	10.6	9.9	9.8	7.7	7.8	7.9		10.4	5.0
	Plains	11.0	9.8	8.8	7.2	8.1	8.6	10.8	9.0	10.2	10.2	10.0	8.7	9.1	7.1	8.9	13.0		9.4	4.0
	Rockies	4.0	6.0	4.3	5.9	5.9	5.4	4.7	5.0	4.0	4.9	4.1	4.3	4.0	3.3	3.8	3.9		4.6	1.0
	South Central	13.9	13.0	13.5	14.0	13.1	13.7	13.7	13.8	12.6	13.1	11.7	10.5	11.2	10.6	10.5	11.6		12.5	7.0
	Southeast	14.0	13.1	13.8	13.5	11.5	12.9	14.5	15.5	14.6	12.2	11.7	11.8	12.1	11.7	12.1	13.0		13.0	8.0
	Southwest	14.8	16.6	17.2	16.9	17.2	17.5	18.3	16.2	14.1	12.8	11.5	10.5	10.2	10.1	8.4	9.7		13.8	9.0
Assault Total	**All Regions**	**12.6**	**13.2**	**12.8**	**13.0**	**12.1**	**12.9**	**13.3**	**12.9**	**12.2**	**11.2**	**10.7**	**10.4**	**10.5**	**9.8**	**9.5**	**10.8**		**11.7**	

Appendix A — Regional Mortality Rates (Cont'd)

Age Group: 15-24 Years		Deaths per 100,000																		
Cause of Death	**Region**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Trend**	**Avg All Years**	**Rank**
Self Harm	Mid-Atlantic	9.7	9.6	10.7	10.3	9.3	8.9	9.6	9.1	9.7	9.3	9.9	11.1	11.1	11.1	11.1	11.3		10.1	4.0
	Midwest	9.9	10.0	10.3	8.8	10.3	10.2	9.0	10.3	9.8	9.8	11.0	11.5	11.4	11.3	12.2	13.3		10.6	6.0
	Northeast	8.3	9.2	7.5	6.2	7.9	6.8	5.8	7.6	6.5	7.5	9.2	9.2	8.3	8.3	9.7	8.9		7.9	2.0
	Northwest	15.4	12.1	13.0	13.5	14.5	12.7	14.9	13.8	13.8	13.7	14.4	15.5	16.1	16.8	16.7	18.7		14.8	9.0
	NY-NJ	6.6	6.4	6.5	5.9	6.6	6.2	5.4	5.8	5.3	6.4	6.9	7.7	7.7	6.6	7.3	7.0		6.5	1.0
	Plains	12.3	13.4	11.8	10.9	12.1	11.0	12.7	11.6	14.2	11.2	11.9	13.6	15.0	13.1	13.8	16.0		12.8	8.0
	Rockies	14.7	14.4	15.8	15.7	15.6	18.9	17.2	14.9	18.0	19.9	19.0	17.2	18.7	21.2	21.0	22.7		17.9	10.0
	South Central	11.8	10.7	11.3	10.9	11.3	12.0	10.9	10.6	11.1	11.9	11.8	12.1	12.8	12.1	13.0	13.5		11.8	7.0
	Southeast	10.6	10.6	9.1	9.9	10.8	9.7	9.8	9.5	10.2	10.2	10.0	10.2	10.6	10.8	11.1	12.6		10.4	5.0
	Southwest	8.5	7.7	8.0	9.1	9.4	8.7	9.5	8.3	8.4	8.3	9.3	9.6	8.5	9.3	9.2	10.5		8.9	3.0
Self Harm Total	**All Regions**	**10.2**	**9.9**	**9.8**	**9.6**	**10.3**	**9.9**	**9.8**	**9.6**	**9.9**	**10.0**	**10.5**	**11.0**	**11.1**	**11.1**	**11.5**	**12.5**		**10.4**	
Cancer	Mid-Atlantic	4.2	3.3	3.9	3.9	3.8	4.4	3.6	3.0	3.8	3.8	3.9	3.7	3.9	3.6	3.7	3.2		3.7	6.0
	Midwest	4.3	4.5	4.0	3.9	3.8	3.6	3.6	4.1	3.3	4.0	3.5	3.7	3.4	3.3	3.2	3.4		3.7	4.0
	Northeast	4.0	3.6	4.1	3.3	3.2	3.6	3.7	3.2	3.2	2.5	2.8	3.0	2.9	2.4	2.5	2.9		3.2	1.0
	Northwest	3.6	4.4	4.5	4.3	4.8	4.2	4.4	3.8	4.0	3.2	3.5	3.6	3.9	3.4	3.9	3.0		3.9	7.0
	NY-NJ	4.4	4.1	4.3	3.9	4.6	4.1	4.3	4.0	3.9	3.9	4.0	3.9	3.1	3.3	3.8	3.5		3.9	8.0
	Plains	4.7	5.0	4.4	2.9	4.7	4.2	3.6	3.4	3.7	4.5	3.2	3.2	3.1	3.3	2.9	3.0		3.7	5.0
	Rockies	4.1	3.2	3.1	4.3	2.4	3.9	3.2	3.8	2.4	3.1	3.4	3.6	3.0	2.8	3.1	2.6		3.2	2.0
	South Central	4.5	5.0	4.8	4.2	4.0	4.1	4.1	4.2	4.0	3.8	4.0	4.2	4.4	3.6	3.9	3.2		4.1	9.0
	Southeast	4.4	3.9	4.1	4.0	4.1	3.8	3.3	3.4	4.1	3.7	3.3	3.2	3.1	3.1	3.6	3.3		3.6	3.0
	Southwest	4.7	4.5	4.5	4.3	4.4	4.7	4.6	4.5	4.3	3.9	4.2	4.0	4.2	4.1	4.0	3.9		4.3	10.0
Cancer Total	**All Regions**	**4.4**	**4.2**	**4.2**	**4.0**	**4.1**	**4.0**	**3.8**	**3.8**	**3.8**	**3.8**	**3.7**	**3.7**	**3.6**	**3.4**	**3.6**	**3.4**		**3.8**	
Heart	Mid-Atlantic	2.9	2.5	2.8	3.3	2.7	2.7	2.5	3.0	2.5	2.1	2.6	2.4	2.7	2.4	2.3	2.9		2.6	8.0
	Midwest	2.6	2.5	2.4	2.9	2.9	2.8	2.6	2.3	2.4	2.2	2.4	2.5	2.2	1.9	2.3	2.4		2.5	7.0
	Northeast	2.6	2.0	1.7	2.6	1.5	2.4	2.4	2.5	2.1	2.0	2.0	1.6	1.6	1.0	0.6	1.2		1.9	3.0
	Northwest	1.7	1.9	1.9	2.2	0.9	2.4	1.7	1.5	2.5	1.3	1.5	2.0	1.1	1.9	2.0	1.9		1.8	2.0
	NY-NJ	2.1	2.4	2.2	2.4	1.8	2.0	2.0	2.2	2.0	2.0	2.2	2.1	2.0	2.2	1.9	1.7		2.1	5.0
	Plains	2.4	3.1	2.2	2.4	2.3	2.6	2.7	2.3	2.2	1.5	1.7	2.3	2.1	2.0	1.7	2.1		2.2	6.0
	Rockies	1.7	1.7	1.5	1.9	0.9	1.1	2.5	1.6	1.5	2.1	2.1	0.0	1.2	1.7	0.9	1.1		1.5	1.0
	South Central	3.0	2.9	2.8	2.9	2.4	3.1	2.7	2.7	2.9	3.1	2.2	2.7	2.5	2.2	2.3	2.3		2.7	9.0
	Southeast	3.8	3.2	3.2	3.3	3.6	3.3	3.3	3.3	3.1	3.0	3.0	2.5	2.5	2.9	3.0	3.0		3.1	10.0
	Southwest	1.6	1.6	2.1	2.1	1.8	1.9	1.7	2.0	1.9	2.2	1.9	2.0	1.7	1.7	1.6	1.8		1.9	4.0
Heart Total	**All Regions**	**2.6**	**2.5**	**2.5**	**2.7**	**2.4**	**2.6**	**2.5**	**2.5**	**2.4**	**2.4**	**2.3**	**2.2**	**2.1**	**2.1**	**2.1**	**2.3**		**2.4**	

Appendix A — Regional Mortality Rates (Cont'd)

Age Group: 45-54 Years		Deaths per 100,000																		
Cause of Death	**Region**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Trend**	**Avg All Years**	**Rank**
All Causes	Mid-Atlantic	433.0	437.7	437.3	433.2	427.8	435.6	430.7	421.1	420.6	423.3	409.5	411.8	402.9	403.6	404.1	409.3		421.1	8.0
	Midwest	410.1	407.6	418.1	412.4	407.0	412.5	409.4	405.8	409.8	409.3	402.3	405.9	401.4	407.6	402.3	405.6		407.9	6.0
	Northeast	353.2	347.0	353.9	350.7	344.1	338.1	342.1	329.9	333.1	329.0	320.0	321.7	323.0	326.9	332.1	333.0		335.7	1.0
	Northwest	351.8	354.7	373.5	372.6	368.9	376.0	369.7	372.5	370.1	377.8	359.5	358.6	366.9	361.6	364.7	362.0		366.5	4.0
	NY-NJ	408.8	417.7	400.4	395.0	380.3	377.5	372.4	357.7	347.6	345.4	337.1	336.4	330.0	331.4	325.5	322.0		360.5	3.0
	Plains	386.8	388.7	401.7	416.6	402.2	416.7	413.4	411.4	423.5	415.3	422.3	419.7	423.4	425.9	436.7	430.0		414.9	7.0
	Rockies	338.0	345.1	356.0	361.2	348.3	359.7	356.9	364.3	363.0	365.6	342.7	368.1	361.5	359.5	363.9	363.9		357.6	2.0
	South Central	465.2	469.5	480.0	479.0	476.2	485.8	479.1	476.6	479.6	474.3	464.4	462.7	460.8	462.9	467.1	456.8		471.1	9.0
	Southeast	508.7	503.1	508.6	518.8	519.3	522.4	515.5	503.5	507.4	502.3	496.1	497.5	490.3	488.0	484.3	485.5		502.7	10.0
	Southwest	391.7	396.1	394.4	404.5	393.5	397.6	393.0	383.6	368.3	369.5	344.8	351.5	346.0	342.8	338.4	336.9		370.8	5.0
All Causes Total	**All Regions**	**425.6**	**426.7**	**431.0**	**433.1**	**426.8**	**431.9**	**427.5**	**420.3**	**419.6**	**418.1**	**407.1**	**409.8**	**405.4**	**406.1**	**404.8**	**404.0**		**418.3**	
Cancer	Mid-Atlantic	134.1	131.0	126.6	125.6	122.0	126.8	121.9	119.1	117.5	119.1	115.9	115.2	112.2	107.0	108.9	103.0		118.9	8.0
	Midwest	128.3	126.1	126.1	123.2	119.7	119.9	119.6	118.7	118.3	117.1	117.1	115.0	113.8	111.9	108.4	107.4		118.1	7.0
	Northeast	122.1	117.2	115.1	114.4	111.9	104.0	109.9	100.2	103.2	100.9	99.5	94.5	94.6	93.1	88.7	84.7		103.1	4.0
	Northwest	110.4	108.5	111.4	106.3	100.6	105.4	98.3	99.1	98.2	101.3	100.8	95.4	93.4	95.5	92.1	89.5		100.3	3.0
	NY-NJ	125.2	124.6	122.9	116.1	115.9	112.0	111.8	107.6	105.6	104.1	99.1	97.8	97.2	94.8	93.7	89.4		107.0	5.0
	Plains	122.4	123.8	122.8	125.3	118.6	118.6	115.7	114.8	118.5	116.8	116.6	115.6	115.3	113.3	114.3	108.7		117.5	6.0
	Rockies	92.2	94.6	95.6	92.4	85.3	92.8	92.0	88.0	83.1	87.1	85.3	84.7	84.3	77.9	81.0	77.5		87.0	1.0
	South Central	133.9	129.3	128.8	127.6	126.1	123.0	120.7	119.9	117.6	116.3	118.3	114.4	115.3	111.1	107.5	103.6		119.1	9.0
	Southeast	145.7	143.7	140.6	139.9	138.5	138.1	133.6	130.1	131.6	131.5	130.6	127.7	125.9	123.2	118.7	114.5		131.6	10.0
	Southwest	111.2	112.7	109.6	108.0	102.5	101.6	98.2	98.9	95.3	93.5	91.0	90.3	90.8	87.1	85.1	83.0		96.9	2.0
Cancer Total	**All Regions**	**127.5**	**125.8**	**124.1**	**122.1**	**119.0**	**118.6**	**116.3**	**114.2**	**113.4**	**112.8**	**111.6**	**109.3**	**108.5**	**105.5**	**103.2**	**99.7**		**114.2**	
Heart	Mid-Atlantic	97.1	97.0	96.9	94.2	89.8	93.7	89.6	86.7	86.1	84.5	82.5	79.1	79.3	80.6	78.2	78.8		86.9	6.0
	Midwest	97.5	96.1	97.3	93.8	93.7	93.1	89.1	88.6	89.5	83.0	84.9	84.5	82.8	85.5	81.9	81.1		88.8	7.0
	Northeast	75.1	70.0	71.6	67.3	67.7	64.3	60.7	61.6	60.0	58.1	57.1	56.7	59.1	56.3	54.5	52.5		61.8	3.0
	Northwest	65.3	65.8	66.7	64.3	64.7	60.7	62.2	61.1	58.4	58.5	57.4	56.2	57.5	53.0	57.2	53.2		60.1	2.0
	NY-NJ	83.9	81.9	83.6	77.7	72.8	73.4	73.3	71.6	69.6	65.1	67.4	65.6	63.4	64.6	65.6	64.1		71.2	5.0
	Plains	92.6	89.2	93.5	94.7	95.1	91.8	92.6	88.4	91.5	88.5	91.9	88.9	86.7	88.7	93.5	89.0		91.0	8.0
	Rockies	66.2	61.1	64.1	63.1	60.2	60.7	61.6	60.8	61.6	60.4	51.0	57.7	55.5	55.9	60.4	57.1		59.7	1.0
	South Central	105.3	108.6	110.2	106.5	103.6	102.3	102.3	99.6	101.8	98.5	97.9	95.8	94.7	95.6	98.3	96.9		100.8	9.0
	Southeast	118.9	115.2	113.8	115.7	115.1	113.0	110.4	105.1	106.0	103.2	102.5	102.2	101.9	102.1	101.2	101.8		107.6	10.0
	Southwest	76.2	73.3	79.0	81.0	75.5	76.0	75.9	70.9	68.8	68.5	64.4	64.3	61.5	61.9	61.1	61.4		69.7	4.0
Heart Total	**All Regions**	**94.2**	**92.4**	**93.9**	**92.4**	**90.2**	**89.7**	**88.0**	**85.2**	**85.2**	**82.3**	**81.6**	**80.7**	**79.7**	**80.3**	**80.1**	**79.3**		**85.7**	

Appendix A — Regional Mortality Rates (Cont'd)

Age Group: 45-54 Years		Deaths per 100,000																		
Cause of Death	**Region**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Trend**	**Avg All Years**	**Rank**
Accidents	Mid-Atlantic	28.5	30.2	31.4	35.1	37.4	35.9	37.6	40.5	40.5	37.9	39.6	44.1	43.9	44.4	45.7	50.8		39.1	3.0
	Midwest	28.9	30.8	33.9	31.9	36.0	37.5	41.0	40.9	41.1	39.9	41.1	44.1	43.3	45.7	47.7	51.2		39.8	4.0
	Northeast	20.2	20.6	20.4	23.1	22.0	31.9	39.4	36.8	38.2	38.3	34.6	35.5	37.7	42.8	47.2	53.7		34.2	2.0
	Northwest	34.7	34.0	39.5	41.3	44.2	45.6	50.3	50.1	49.8	49.1	44.1	46.5	45.6	47.6	48.4	48.3		45.1	7.0
	NY-NJ	22.4	25.8	24.9	27.1	23.5	26.4	31.0	30.1	30.1	24.7	27.2	32.9	34.7	34.8	33.2	37.1		29.2	1.0
	Plains	30.6	34.4	38.3	38.7	38.9	44.0	42.8	45.6	45.9	43.9	45.2	45.6	49.5	45.3	49.3	49.2		43.1	6.0
	Rockies	36.3	36.9	40.2	41.0	40.9	44.6	43.5	47.7	50.0	50.2	44.4	49.7	51.4	50.3	51.5	52.5		45.9	8.0
	South Central	38.4	40.9	42.0	45.5	47.8	50.6	52.4	53.1	51.4	52.5	49.1	51.0	50.3	51.1	51.5	50.8		48.9	9.0
	Southeast	41.5	44.4	44.5	49.5	54.1	55.9	55.6	56.9	57.8	56.3	55.9	58.0	55.7	53.4	54.7	57.7		53.6	10.0
	Southwest	34.6	30.3	41.1	42.8	43.0	46.1	48.7	49.5	45.1	44.9	42.0	43.3	42.5	44.0	42.8	42.8		42.9	5.0
Accidents Total	**All Regions**	**32.6**	**33.9**	**36.7**	**38.8**	**40.7**	**43.2**	**45.5**	**46.2**	**45.8**	**44.5**	**43.7**	**46.4**	**46.1**	**46.5**	**47.4**	**49.8**		**43.2**	
Liver	Mid-Atlantic	14.5	16.0	15.7	14.9	14.9	14.0	13.9	15.6	14.8	15.5	16.1	15.6	15.8	15.6	14.1	15.3		15.1	4.0
	Midwest	16.5	16.4	16.0	16.0	16.4	16.2	15.6	16.4	17.2	17.7	18.2	17.8	18.9	18.0	18.4	18.1		17.1	5.0
	Northeast	14.2	13.4	14.4	14.3	14.2	13.1	14.7	15.6	14.9	15.2	14.5	15.8	14.1	14.3	15.5	14.7		14.6	2.0
	Northwest	15.5	17.2	16.4	18.8	18.2	17.5	18.0	22.4	20.7	23.6	22.8	24.3	25.8	25.8	24.8	27.5		21.3	7.0
	NY-NJ	13.1	15.0	13.8	13.9	12.9	11.4	11.2	12.0	12.0	11.7	13.3	12.4	13.0	13.2	11.8	12.1		12.7	1.0
	Plains	11.7	12.5	13.6	12.5	12.8	14.6	13.2	14.5	14.2	14.8	16.1	15.0	17.0	19.8	16.8	18.1		14.8	3.0
	Rockies	15.4	16.4	17.8	17.9	18.2	19.3	19.2	22.9	21.3	21.2	23.2	24.5	24.7	25.9	24.9	27.5		21.4	8.0
	South Central	21.1	21.9	22.8	21.8	21.0	22.4	23.2	23.0	23.5	22.0	23.5	26.5	26.4	26.0	26.0	26.6		23.7	10.0
	Southeast	19.5	20.1	19.6	20.3	20.3	19.1	19.5	19.7	19.7	19.3	20.3	20.3	20.7	20.6	21.5	21.8		20.2	6.0
	Southwest	23.8	24.6	22.6	24.2	23.1	23.0	23.1	23.5	22.3	23.4	22.2	24.2	23.2	23.5	23.1	24.6		23.4	9.0
Liver Total	**All Regions**	**17.7**	**18.4**	**18.0**	**18.3**	**18.0**	**17.7**	**17.8**	**18.7**	**18.5**	**18.7**	**19.2**	**19.8**	**20.1**	**20.1**	**19.9**	**20.5**		**18.9**	
Self Harm	Mid-Atlantic	14.6	14.6	14.1	15.2	16.8	16.0	16.4	16.6	17.9	18.9	18.4	19.7	18.5	19.4	20.4	19.3		17.4	4.0
	Midwest	12.7	14.5	15.2	14.5	15.4	15.3	17.2	16.9	17.3	17.5	18.7	18.9	19.0	19.3	18.7	19.9		17.0	3.0
	Northeast	11.9	12.1	12.0	12.3	13.4	12.7	14.4	13.6	16.7	16.6	16.5	18.3	18.7	16.0	18.9	19.7		15.3	2.0
	Northwest	17.2	18.4	21.8	20.3	21.4	23.5	22.0	22.0	23.7	25.1	23.6	22.9	27.9	23.3	25.8	26.3		22.9	9.0
	NY-NJ	8.5	9.1	9.2	8.7	9.1	8.7	10.4	10.4	11.4	11.3	13.8	12.2	13.1	13.4	14.3	12.9		11.1	1.0
	Plains	15.4	15.2	17.7	18.3	18.4	17.9	19.2	19.5	18.9	19.7	21.8	22.2	22.0	23.2	24.0	23.9		19.9	7.0
	Rockies	20.6	22.2	22.9	23.3	25.0	22.4	22.7	25.0	27.5	26.2	27.5	30.3	33.3	30.5	29.6	31.4		26.4	10.0
	South Central	15.4	16.8	17.0	18.0	16.9	17.6	16.5	18.3	19.1	20.0	19.6	20.3	19.3	19.7	21.0	21.5		18.7	6.0
	Southeast	16.9	17.6	17.9	17.9	18.7	19.1	19.8	19.8	21.1	21.5	22.1	22.3	23.0	21.9	21.4	22.4		20.3	8.0
	Southwest	15.0	14.1	15.6	16.0	17.0	16.2	16.6	18.8	18.9	20.0	19.1	18.8	18.2	18.3	18.9	17.4		17.5	5.0
Self Harm Total	**All Regions**	**14.4**	**15.1**	**15.8**	**15.9**	**16.6**	**16.5**	**17.2**	**17.7**	**18.6**	**19.2**	**19.6**	**19.8**	**20.0**	**19.7**	**20.2**	**20.3**		**18.0**	

Appendix A — Regional Mortality Rates (Cont'd)

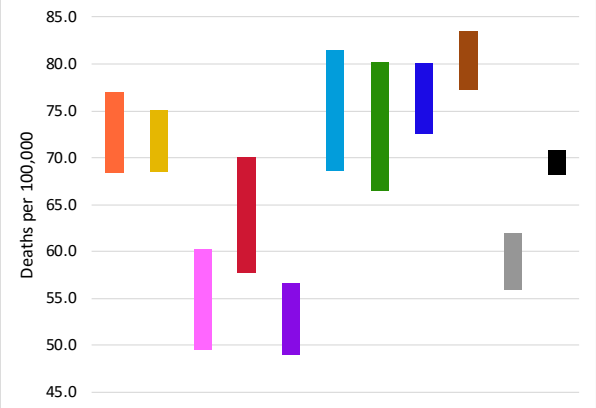
Age Group: 65-74 Years		Deaths per 100,000																		
Cause of Death	**Region**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Trend**	**Avg All Years**	**Rank**
All Causes	Mid-Atlantic	2,508.1	2,448.4	2,379.1	2,348.2	2,260.8	2,210.0	2,134.4	2,046.2	2,033.4	1,979.7	1,951.2	1,914.3	1,849.9	1,846.3	1,833.5	1,840.5		2,076.5	7.0
	Midwest	2,500.1	2,425.7	2,387.5	2,297.5	2,205.0	2,173.7	2,102.3	2,042.0	2,046.7	1,957.4	1,945.5	1,935.7	1,888.4	1,885.2	1,881.6	1,881.7		2,078.4	8.0
	Northeast	2,253.9	2,205.8	2,148.3	2,080.6	2,006.2	1,958.2	1,873.6	1,819.6	1,732.6	1,683.6	1,671.8	1,637.8	1,572.5	1,582.3	1,555.6	1,572.7		1,810.1	3.0
	Northwest	2,266.3	2,260.2	2,204.4	2,141.8	2,013.5	1,995.1	1,892.1	1,881.5	1,842.5	1,772.1	1,739.6	1,709.6	1,651.4	1,643.2	1,624.4	1,647.0		1,851.0	5.0
	NY-NJ	2,273.0	2,186.7	2,162.2	2,073.3	1,970.8	1,934.1	1,863.9	1,811.2	1,780.4	1,714.1	1,689.1	1,672.4	1,613.6	1,605.4	1,586.4	1,569.3		1,827.1	4.0
	Plains	2,385.8	2,360.3	2,334.5	2,255.7	2,143.8	2,151.9	2,095.5	2,034.6	2,059.8	1,965.6	1,967.3	1,958.3	1,907.7	1,902.6	1,923.3	1,919.7		2,072.1	6.0
	Rockies	2,105.2	2,060.5	2,052.8	1,997.3	1,877.9	1,845.1	1,794.5	1,752.3	1,740.1	1,668.2	1,646.5	1,588.3	1,576.1	1,581.7	1,560.4	1,559.1		1,744.8	2.0
	South Central	2,528.0	2,493.0	2,476.6	2,409.3	2,302.4	2,293.5	2,167.4	2,144.8	2,153.0	2,066.5	2,049.7	2,037.5	1,996.7	2,020.4	1,999.5	2,013.4		2,173.2	10.0
	Southeast	2,514.7	2,456.5	2,399.4	2,347.3	2,259.6	2,215.9	2,138.5	2,091.9	2,069.1	2,010.5	2,025.2	1,976.5	1,943.3	1,950.9	1,935.9	1,948.5		2,117.4	9.0
	Southwest	2,147.4	2,107.2	2,055.1	1,996.0	1,914.5	1,890.9	1,826.5	1,744.3	1,708.5	1,647.9	1,612.2	1,582.2	1,557.6	1,538.7	1,508.2	1,547.2		1,743.5	1.0
All Causes Total	**All Regions**	**2,399.1**	**2,344.2**	**2,300.3**	**2,235.0**	**2,141.0**	**2,109.7**	**2,031.4**	**1,976.0**	**1,958.4**	**1,888.7**	**1,875.1**	**1,846.2**	**1,802.5**	**1,802.1**	**1,786.3**	**1,796.8**		**1,994.1**	
Cancer	Mid-Atlantic	852.9	841.3	827.3	804.0	779.7	778.4	765.0	725.4	723.2	706.2	696.7	684.8	659.3	635.9	628.5	613.4		724.3	8.0
	Midwest	868.9	838.8	838.7	799.9	791.8	769.2	762.0	748.6	738.5	716.1	708.8	693.7	669.5	664.7	646.0	632.3		735.6	10.0
	Northeast	832.1	799.1	804.8	786.2	767.9	748.0	731.4	708.2	677.8	665.5	647.9	632.7	616.6	588.4	578.0	573.2		687.5	5.0
	Northwest	807.5	809.4	790.3	780.1	750.5	730.1	689.4	701.1	677.5	651.7	651.2	621.0	603.8	579.7	568.4	578.0		670.5	4.0
	NY-NJ	795.0	769.4	759.2	733.2	704.5	686.3	680.7	670.4	653.7	631.8	628.1	615.6	605.1	586.0	570.1	554.4		659.4	3.0
	Plains	820.0	835.5	811.7	791.1	775.3	766.9	756.9	745.4	728.0	693.3	703.3	687.0	669.5	659.9	646.4	630.9		726.5	9.0
	Rockies	702.4	688.3	696.0	676.7	643.5	628.0	626.0	606.1	589.2	561.3	566.1	542.4	538.4	521.4	509.7	500.1		588.1	1.0
	South Central	813.7	795.4	793.4	766.1	751.1	741.9	717.7	705.9	706.0	678.9	677.1	664.9	646.3	638.8	614.9	614.4		699.0	6.0
	Southeast	833.4	822.1	790.3	776.6	764.3	752.3	732.7	726.6	704.1	686.8	695.8	671.8	659.3	646.2	635.7	622.9		710.8	7.0
	Southwest	728.4	715.8	704.7	682.1	669.3	657.8	629.8	618.4	602.0	590.1	583.5	560.4	556.9	534.6	524.9	525.8		607.6	2.0
Cancer Total	**All Regions**	**816.3**	**799.7**	**787.2**	**763.5**	**746.8**	**733.2**	**716.3**	**702.9**	**688.4**	**668.2**	**666.1**	**647.6**	**632.2**	**616.9**	**603.1**	**594.3**		**690.0**	
Heart	Mid-Atlantic	701.6	660.1	625.5	612.8	567.2	538.8	511.1	477.0	459.8	443.3	435.6	408.1	396.0	397.2	395.6	394.4		492.0	8.0
	Midwest	684.0	649.6	621.0	590.8	542.3	521.4	491.3	456.5	453.2	427.0	421.0	413.3	407.6	402.4	404.9	407.1		485.2	6.0
	Northeast	573.1	546.7	521.4	487.5	458.4	433.9	390.1	378.3	347.8	332.3	331.9	311.0	295.5	314.0	297.1	307.1		386.6	3.0
	Northwest	538.3	522.3	496.7	468.2	426.5	408.8	388.4	374.3	359.3	342.3	319.3	319.6	295.9	297.1	290.4	288.6		368.2	2.0
	NY-NJ	708.1	667.1	653.4	611.2	550.9	534.5	506.9	483.4	469.0	441.9	416.4	405.5	383.3	386.7	376.9	377.5		490.3	7.0
	Plains	658.8	611.6	604.8	552.2	516.7	493.4	473.9	450.7	449.6	425.5	419.5	405.3	397.5	398.1	401.1	403.6		472.6	5.0
	Rockies	500.4	474.7	455.7	440.8	400.6	375.2	372.3	351.1	332.9	328.2	306.8	299.9	306.5	310.0	291.9	298.6		355.1	1.0
	South Central	711.8	691.0	685.0	653.2	597.3	569.7	525.5	504.0	491.2	477.9	459.4	459.7	453.0	455.5	459.0	466.2		530.1	10.0
	Southeast	704.6	666.5	644.3	606.1	567.4	541.3	506.4	479.5	463.3	450.3	440.2	424.5	417.3	423.9	416.8	422.7		498.8	9.0
	Southwest	589.3	566.2	551.2	520.7	486.5	465.9	450.2	411.5	397.7	376.9	354.9	357.3	342.0	340.7	329.2	337.8		417.7	4.0
Heart Total	**All Regions**	**665.6**	**632.6**	**612.0**	**579.8**	**535.7**	**512.3**	**483.0**	**454.8**	**441.4**	**422.8**	**409.2**	**399.0**	**388.3**	**390.3**	**385.2**	**389.5**		**470.8**	

Appendix A — Regional Mortality Rates (Cont'd)

Age Group: 65-74 Years		Deaths per 100,000																		
Cause of Death	**Region**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Trend**	**Avg All Years**	**Rank**
CLRD	Mid-Atlantic	155.4	152.2	145.0	150.9	144.5	141.1	134.3	131.4	143.8	138.5	136.2	134.6	126.9	129.3	123.0	124.2		137.2	4.0
	Midwest	175.6	174.0	165.8	166.4	159.8	167.4	155.1	152.6	166.7	156.3	156.8	157.6	153.4	155.3	145.0	149.3		159.1	6.0
	Northeast	160.9	154.6	146.5	141.1	131.5	140.6	132.2	121.7	125.1	126.4	113.6	117.4	110.8	107.4	103.0	107.1		125.7	2.0
	Northwest	196.8	188.2	190.0	180.2	173.9	172.1	159.4	167.1	160.5	158.9	154.8	152.8	139.7	141.1	131.4	136.2		158.9	5.0
	NY-NJ	124.7	124.3	115.5	113.6	112.6	111.8	97.6	99.5	103.4	101.1	100.0	97.2	96.2	91.2	87.1	87.4		103.1	1.0
	Plains	183.5	191.9	184.7	185.2	168.6	189.7	175.7	170.0	196.3	190.0	181.6	189.7	177.2	180.9	179.5	176.0		182.4	10.0
	Rockies	189.7	182.5	188.2	183.7	176.0	170.1	162.8	163.8	168.9	158.4	159.0	137.6	133.9	148.7	140.3	141.8		159.9	7.0
	South Central	183.9	183.7	179.6	180.2	166.3	180.3	163.1	166.7	177.4	166.9	168.1	161.3	160.8	162.8	156.9	155.8		168.4	9.0
	Southeast	182.4	178.3	177.8	176.0	165.2	174.0	160.0	162.5	176.9	164.2	166.3	163.6	160.9	163.6	158.3	159.6		167.2	8.0
	Southwest	160.7	158.8	150.1	151.1	135.0	139.8	135.2	123.9	129.3	119.3	116.9	115.6	112.1	110.6	105.2	107.9		126.9	3.0
CLRD Total	**All Regions**	**169.4**	**167.3**	**162.0**	**161.7**	**152.1**	**158.4**	**147.0**	**145.5**	**155.9**	**147.5**	**146.3**	**144.3**	**140.0**	**141.2**	**134.9**	**136.6**		**149.4**	
Stroke	Mid-Atlantic	128.8	125.0	119.4	112.0	109.3	101.5	96.3	89.9	86.0	84.7	81.9	81.0	77.9	75.0	75.4	75.4		93.2	7.0
	Midwest	130.9	122.2	119.6	110.9	103.4	99.8	95.4	92.9	88.4	82.4	81.6	82.9	77.3	75.0	76.6	75.5		93.1	6.0
	Northeast	102.0	103.4	97.7	88.8	89.2	76.6	71.6	68.9	65.3	57.3	62.2	56.2	51.1	51.3	51.1	50.2		69.5	2.0
	Northwest	124.6	132.0	124.5	126.3	108.7	97.9	90.1	86.7	83.4	76.5	74.2	70.4	63.4	64.9	66.7	63.9		86.4	4.0
	NY-NJ	99.2	91.4	89.6	80.7	75.2	73.4	71.4	67.1	61.7	59.3	62.4	61.1	58.0	55.8	54.7	57.0		69.0	1.0
	Plains	123.4	121.9	117.5	118.9	104.1	100.8	98.0	94.9	94.5	87.4	87.3	78.8	82.3	76.3	79.9	75.3		94.9	8.0
	Rockies	117.3	103.0	101.6	95.6	86.3	86.1	80.2	74.0	71.7	71.9	68.8	67.0	62.3	62.0	60.2	58.4		76.5	3.0
	South Central	136.8	138.9	138.8	126.6	122.1	112.7	110.1	110.7	107.4	100.1	96.6	95.1	92.3	92.6	91.7	92.3		108.1	10.0
	Southeast	144.6	133.8	130.5	122.9	120.8	111.5	105.1	101.5	96.8	93.6	92.7	86.5	86.0	83.8	86.2	89.6		102.9	9.0
	Southwest	131.4	125.2	120.5	112.4	107.1	99.0	92.3	87.1	82.3	77.6	74.7	67.3	67.7	67.9	64.1	67.9		87.2	5.0
Stroke Total	**All Regions**	**128.6**	**122.9**	**119.6**	**111.9**	**106.6**	**99.8**	**94.9**	**91.4**	**87.3**	**82.8**	**81.7**	**78.2**	**75.7**	**74.2**	**74.5**	**75.5**		**92.0**	
Diabetes	Mid-Atlantic	97.9	96.5	94.8	92.8	88.9	88.2	78.9	76.1	72.1	70.1	66.9	71.6	69.3	68.7	71.9	71.1		78.8	7.0
	Midwest	96.3	98.5	95.3	95.7	88.6	88.1	84.8	81.5	78.5	73.6	69.4	75.0	74.4	71.6	72.9	74.6		81.6	9.0
	Northeast	73.1	75.3	75.7	73.7	69.0	67.5	58.2	62.0	54.0	52.8	49.6	54.8	49.6	48.4	51.7	52.7		59.6	1.0
	Northwest	91.3	99.3	98.1	96.2	87.5	87.5	86.5	81.6	84.1	74.3	66.7	73.9	73.1	66.3	74.1	76.5		80.6	8.0
	NY-NJ	84.2	82.2	84.1	82.7	76.8	77.2	75.6	67.4	66.6	59.9	61.0	64.8	60.0	61.4	57.7	54.4		68.9	3.0
	Plains	81.8	76.6	82.5	75.2	75.0	78.8	75.7	70.3	69.1	61.4	65.7	69.2	59.9	65.8	71.1	75.4		71.8	5.0
	Rockies	75.9	80.3	76.5	74.0	76.8	85.9	69.4	72.3	73.7	59.9	63.3	61.9	57.8	57.8	58.4	65.0		68.0	2.0
	South Central	115.1	120.4	118.6	117.5	107.8	105.6	100.4	93.0	90.1	84.0	76.8	81.1	81.9	80.0	75.9	78.9		93.3	10.0
	Southeast	88.2	86.1	86.7	90.4	88.6	85.6	79.3	77.3	75.4	73.5	71.4	75.3	73.1	72.5	71.4	72.7		78.3	6.0
	Southwest	79.4	78.7	81.0	76.3	78.4	79.1	76.4	70.2	70.1	62.4	65.2	69.4	67.1	64.9	66.2	70.0		71.5	4.0
Diabetes Total	**All Regions**	**90.7**	**91.0**	**90.9**	**90.0**	**86.2**	**85.7**	**80.6**	**76.7**	**74.7**	**69.6**	**67.6**	**72.0**	**69.7**	**68.5**	**69.0**	**70.6**		**77.3**	

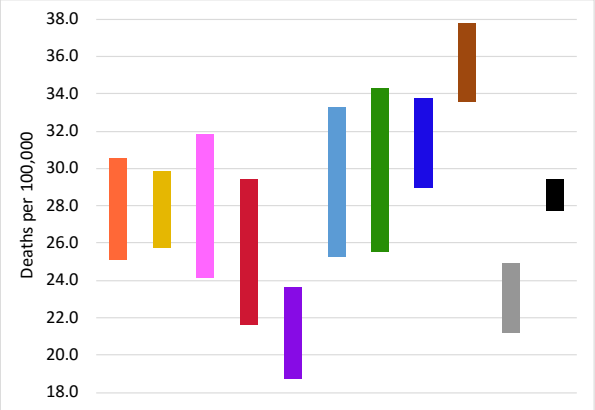
Appendix B — 2015 Regional Mortality Rate Confidence Intervals

Age Group: 15-24 Years
All Causes of Death



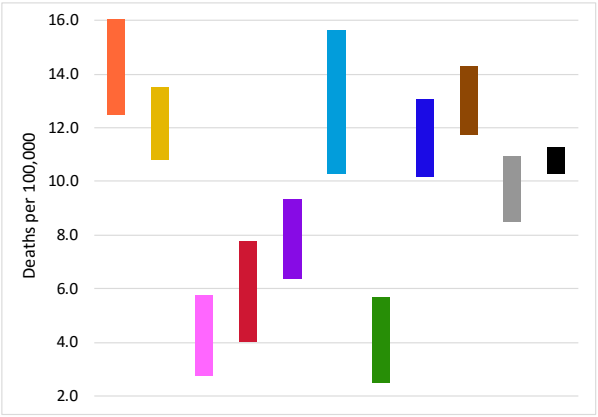
2015 Mortality Rate Confidence Interval	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	68.3	72.7	77.0
Midwest	68.5	71.8	75.1
Northeast	49.4	54.8	60.2
Northwest	57.7	63.9	70.1
NY-NJ	49.0	52.8	56.7
Plains	68.6	75.0	81.4
Rockies	66.5	73.3	80.2
South Central	72.6	76.3	80.1
Southeast	77.2	80.4	83.6
Southwest	55.9	58.9	62.0
All Regions	68.2	69.5	70.8

Age Group: 15-24 Years
Accidents



2015 Mortality Rate Confidence Interval	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	25.1	27.8	30.6
Midwest	25.7	27.8	29.8
Northeast	24.1	28.0	31.8
Northwest	21.6	25.5	29.4
NY-NJ	18.8	21.2	23.6
Plains	25.3	29.3	33.2
Rockies	25.6	29.9	34.3
South Central	29.0	31.4	33.8
Southeast	33.5	35.6	37.8
Southwest	21.2	23.1	25.0
All Regions	27.7	28.5	29.4

Age Group: 15-24 Years
Assault

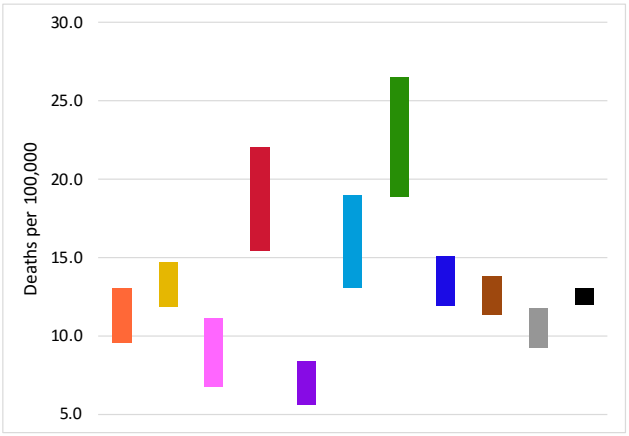


2015 Mortality Rate Confidence Interval	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	12.5	14.5	16.4
Midwest	10.8	12.2	13.5
Northeast	2.8	4.1	5.8
Northwest	4.0	5.9	7.8
NY-NJ	6.4	7.9	9.3
Plains	10.3	13.0	15.6
Rockies	2.5	3.9	5.7
South Central	10.2	11.6	13.1
Southeast	11.7	13.0	14.3
Southwest	8.5	9.7	10.9
All Regions	10.3	10.8	11.3

Regions have a 95% probability of having statistically significant mortality differences not due to chance if their confidence level bands do not share a point on the y axis. A Bonferroni adjustment is used to calculate each region's confidence level band at 99.89%.

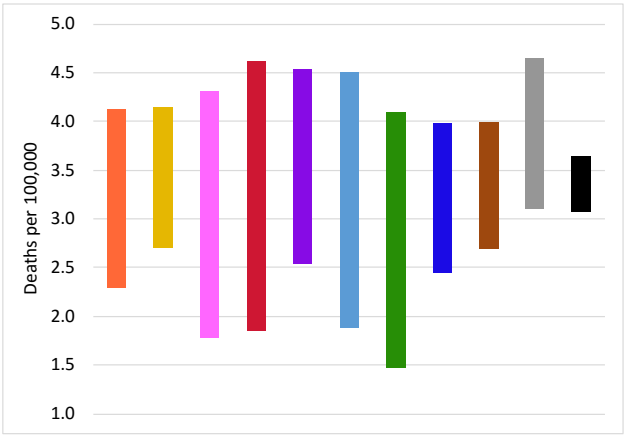
Appendix B — 2015 Regional Mortality Rate Confidence Intervals (Cont'd)

Age Group: 15-24 Years
Self-Harm



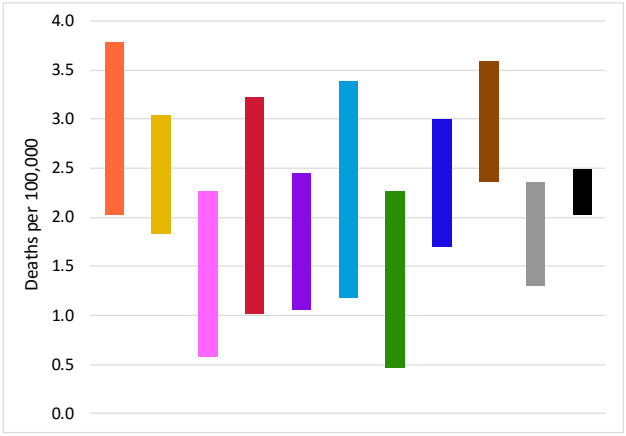
2015 Mortality Rate Confidence Interval	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	9.6	11.3	13.0
Midwest	11.9	13.3	14.7
Northeast	6.7	8.9	11.1
Northwest	15.4	18.7	22.1
NY-NJ	5.6	7.0	8.4
Plains	13.1	16.0	19.0
Rockies	18.9	22.7	26.5
South Central	12.0	13.5	15.1
Southeast	11.3	12.6	13.8
Southwest	9.3	10.5	11.8
All Regions	12.0	12.5	13.1

Age Group: 15-24 Years
Cancer



2015 Mortality Rate Confidence Interval	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	2.3	3.2	4.1
Midwest	2.7	3.4	4.1
Northeast	1.8	2.9	4.3
Northwest	1.9	3.0	4.6
NY-NJ	2.5	3.5	4.5
Plains	1.9	3.0	4.5
Rockies	1.5	2.6	4.1
South Central	2.5	3.2	4.0
Southeast	2.7	3.3	4.0
Southwest	3.1	3.9	4.7
All Regions	3.1	3.4	3.6

Age Group: 15-24 Years
Heart

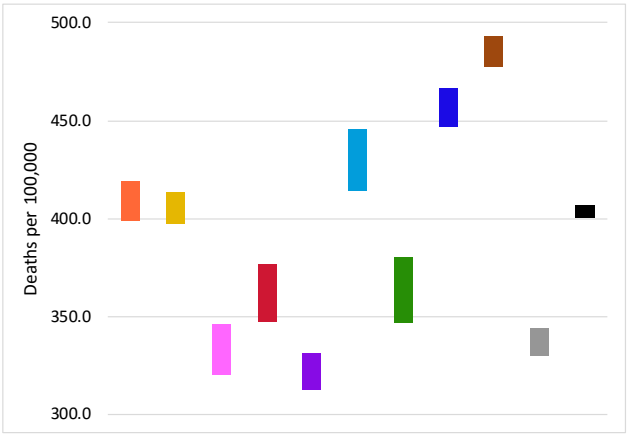


2015 Mortality Rate Confidence Interval	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	2.0	2.9	3.8
Midwest	1.8	2.4	3.0
Northeast	0.6	1.2	2.3
Northwest	1.0	1.9	3.2
NY-NJ	1.1	1.7	2.4
Plains	1.2	2.1	3.4
Rockies	0.5	1.1	2.3
South Central	1.7	2.3	3.0
Southeast	2.4	3.0	3.6
Southwest	1.3	1.8	2.4
All Regions	2.0	2.3	2.5

Regions have a 95% probability of having statistically significant mortality differences not due to chance if their confidence level bands do not share a point on the y axis. A Bonferroni adjustment is used to calculate each region's confidence level band at 99.89%.

Appendix B — 2015 Regional Mortality Rate Confidence Intervals (Cont'd)

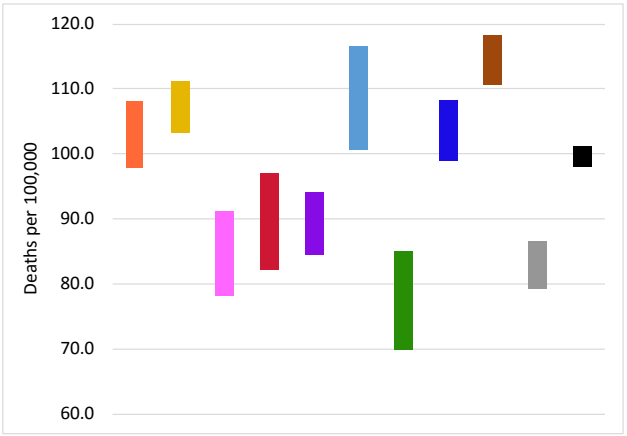
Age Group: 45-54 Years
All Causes of Death



2015 Mortality Rate Confidence Interval

	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	399.1	409.3	419.4
Midwest	397.8	405.6	413.4
Northeast	320.1	333.0	345.8
Northwest	347.2	362.0	376.9
NY-NJ	312.9	322.0	331.2
Plains	414.0	430.0	446.0
Rockies	347.3	363.9	380.5
South Central	447.1	456.8	466.5
Southeast	477.8	485.5	493.2
Southwest	329.5	336.9	344.3
All Regions	400.9	404.0	407.2

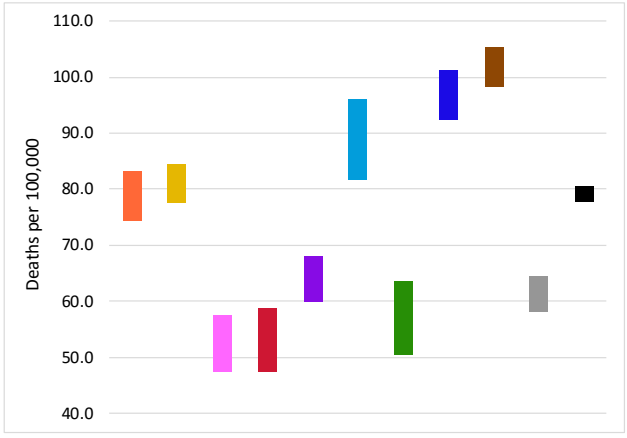
Age Group: 45-54 Years
Cancer



2015 Mortality Rate Confidence Interval

	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	97.9	103.0	108.1
Midwest	103.4	107.4	111.4
Northeast	78.2	84.7	91.1
Northwest	82.1	89.5	96.9
NY-NJ	84.5	89.4	94.2
Plains	100.7	108.7	116.7
Rockies	69.8	77.5	85.1
South Central	99.0	103.6	108.2
Southeast	110.8	114.5	118.3
Southwest	79.3	83.0	86.7
All Regions	98.1	99.7	101.3

Age Group: 45-54 Years
Heart



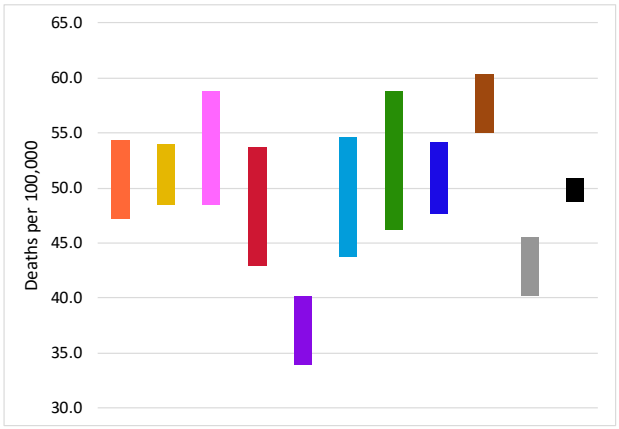
2015 Mortality Rate Confidence Interval

	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	74.4	78.8	83.3
Midwest	77.6	81.1	84.6
Northeast	47.4	52.5	57.6
Northwest	47.5	53.2	58.9
NY-NJ	60.0	64.1	68.1
Plains	81.7	89.0	96.2
Rockies	50.6	57.1	63.7
South Central	92.4	96.9	101.3
Southeast	98.3	101.8	105.4
Southwest	58.3	61.4	64.6
All Regions	77.9	79.3	80.7

Regions have a 95% probability of having statistically significant mortality differences not due to chance if their confidence level bands do not share a point on the y axis. A Bonferroni adjustment is used to calculate each region's confidence level band at 99.89%.

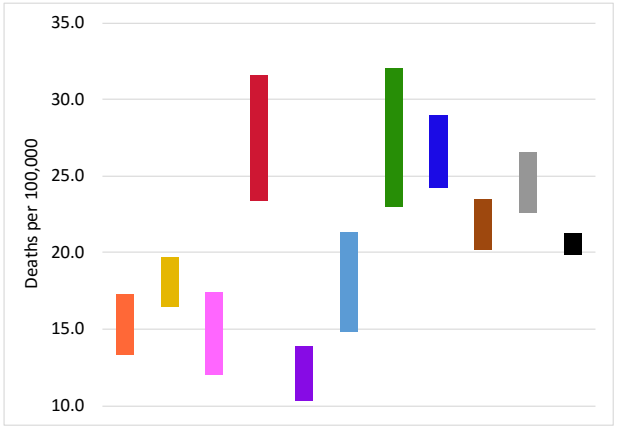
Appendix B — 2015 Regional Mortality Rate Confidence Intervals (Cont'd)

Age Group: 45-54 Years
Accidents



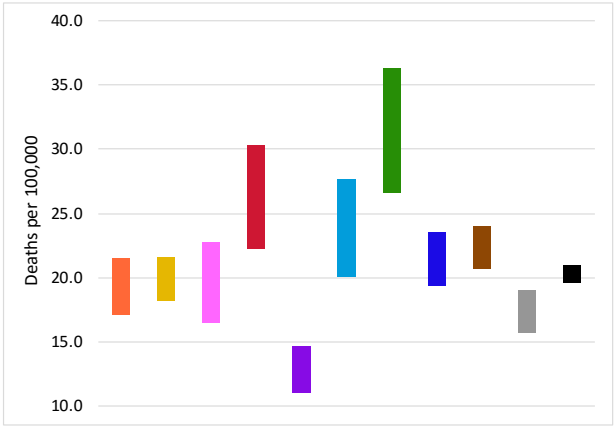
2015 Mortality Rate Confidence Interval	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	47.2	50.8	54.4
Midwest	48.5	51.2	54.0
Northeast	48.5	53.7	58.9
Northwest	42.8	48.3	53.7
NY-NJ	34.0	37.1	40.2
Plains	43.8	49.2	54.6
Rockies	46.2	52.5	58.8
South Central	47.6	50.8	54.1
Southeast	55.1	57.7	60.4
Southwest	40.2	42.8	45.5
All Regions	48.7	49.8	50.9

Age Group: 45-54 Years
Liver



2015 Mortality Rate Confidence Interval	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	13.3	15.3	17.3
Midwest	16.4	18.1	19.7
Northeast	12.0	14.7	17.4
Northwest	23.4	27.5	31.6
NY-NJ	10.3	12.1	13.9
Plains	14.8	18.1	21.3
Rockies	23.0	27.5	32.1
South Central	24.3	26.6	29.0
Southeast	20.2	21.8	23.4
Southwest	22.6	24.6	26.6
All Regions	19.8	20.5	21.3

Age Group: 45-54 Years
Self-Harm

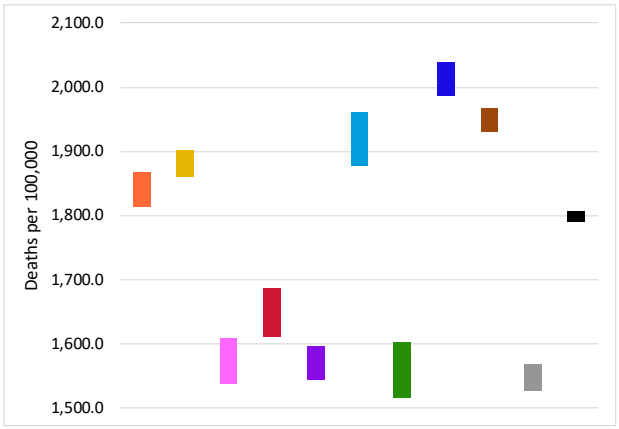


2015 Mortality Rate Confidence Interval	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	17.1	19.3	21.5
Midwest	18.1	19.9	21.6
Northeast	16.5	19.7	22.8
Northwest	22.3	26.3	30.3
NY-NJ	11.0	12.9	14.7
Plains	20.1	23.9	27.7
Rockies	26.6	31.4	36.3
South Central	19.4	21.5	23.5
Southeast	20.7	22.4	24.0
Southwest	15.7	17.4	19.0
All Regions	19.6	20.3	21.0

Regions have a 95% probability of having statistically significant mortality differences not due to chance if their confidence level bands do not share a point on the y axis. A Bonferroni adjustment is used to calculate each region's confidence level band at 99.89%.

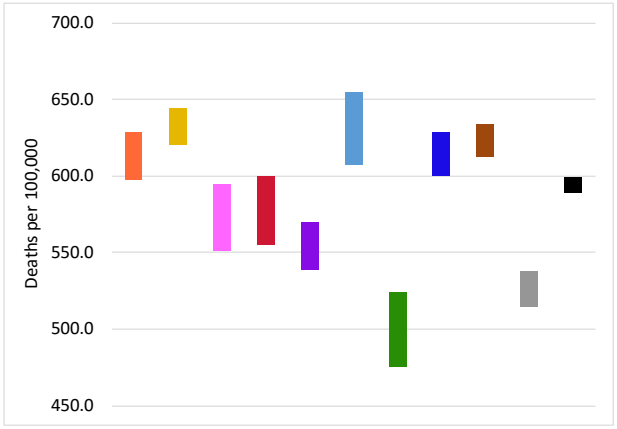
Appendix B — 2015 Regional Mortality Rate Confidence Intervals (Cont'd)

Age Group: 65-74 Years
All Causes of Death



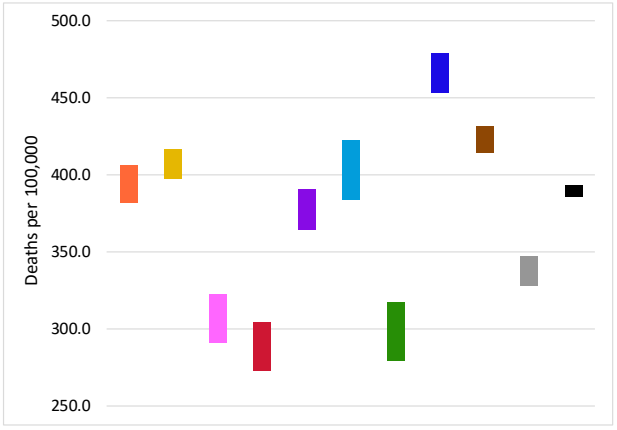
2015 Mortality Rate Confidence Interval	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	1,813.7	1,840.5	1,867.3
Midwest	1,860.6	1,881.7	1,902.8
Northeast	1,537.3	1,572.7	1,608.2
Northwest	1,608.9	1,647.0	1,685.1
NY-NJ	1,542.9	1,569.3	1,595.6
Plains	1,878.4	1,919.7	1,961.1
Rockies	1,516.1	1,559.1	1,602.1
South Central	1,987.1	2,013.4	2,039.7
Southeast	1,930.0	1,948.5	1,967.0
Southwest	1,526.9	1,547.2	1,567.5
All Regions	1,788.4	1,796.8	1,805.1

Age Group: 65-74 Years
Cancer



2015 Mortality Rate Confidence Interval	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	597.9	613.4	628.9
Midwest	620.0	632.3	644.5
Northeast	551.8	573.2	594.6
Northwest	555.4	578.0	600.6
NY-NJ	538.8	554.4	570.1
Plains	607.2	630.9	654.6
Rockies	475.7	500.1	524.4
South Central	599.9	614.4	628.9
Southeast	612.5	622.9	633.4
Southwest	514.0	525.8	537.6
All Regions	589.5	594.3	599.1

Age Group: 65-74 Years
Heart

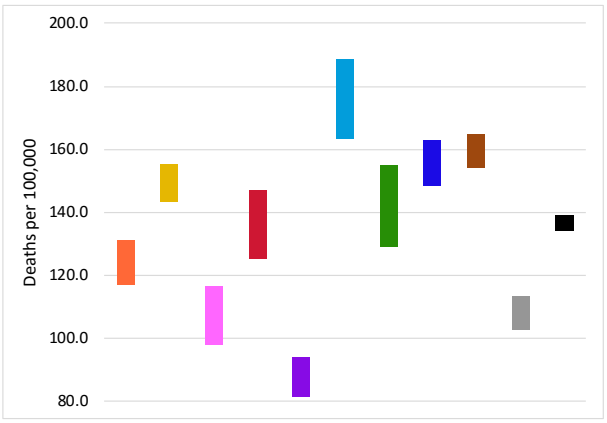


2015 Mortality Rate Confidence Interval	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	382.0	394.4	406.8
Midwest	397.3	407.1	416.9
Northeast	291.4	307.1	322.7
Northwest	272.7	288.6	304.6
NY-NJ	364.6	377.5	390.4
Plains	384.7	403.6	422.6
Rockies	279.8	298.6	317.4
South Central	453.6	466.2	478.9
Southeast	414.1	422.7	431.4
Southwest	328.3	337.8	347.2
All Regions	385.6	389.5	393.4

Regions have a 95% probability of having statistically significant mortality differences not due to chance if their confidence level bands do not share a point on the y axis. A Bonferroni adjustment is used to calculate each region's confidence level band at 99.89%.

Appendix B — 2015 Regional Mortality Rate Confidence Intervals (Cont'd)

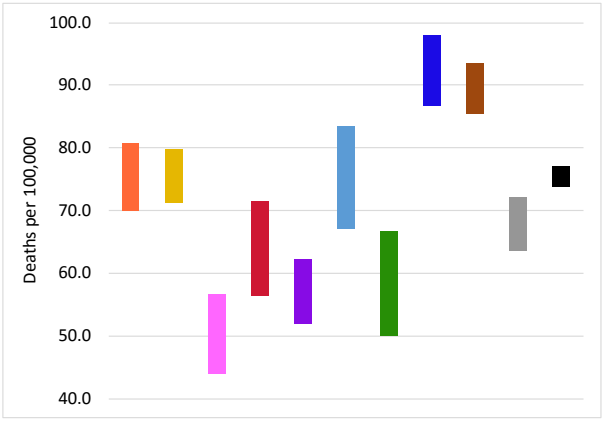
Age Group: 65-74 Years
CLRD (Chronic Lower Respiratory Disease)



2015 Mortality Rate Confidence Interval

	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	117.2	124.2	131.1
Midwest	143.3	149.3	155.2
Northeast	97.9	107.1	116.4
Northwest	125.3	136.2	147.2
NY-NJ	81.2	87.4	93.6
Plains	163.5	176.0	188.5
Rockies	128.8	141.8	154.7
South Central	148.5	155.8	163.1
Southeast	154.3	159.6	164.9
Southwest	102.6	107.9	113.3
All Regions	134.3	136.6	138.9

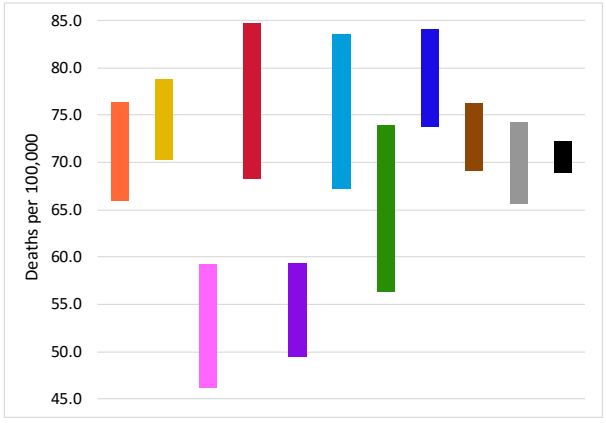
Age Group: 65-74 Years
Stroke



2015 Mortality Rate Confidence Interval

	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	69.9	75.4	80.8
Midwest	71.3	75.5	79.8
Northeast	43.9	50.2	56.6
Northwest	56.4	63.9	71.4
NY-NJ	52.0	57.0	62.0
Plains	67.1	75.3	83.4
Rockies	50.1	58.4	66.7
South Central	86.7	92.3	98.0
Southeast	85.6	89.6	93.5
Southwest	63.7	67.9	72.2
All Regions	73.8	75.5	77.2

Age Group: 65-74 Years
Diabetes



2015 Mortality Rate Confidence Interval

	CI Lower Bound	Deaths per 100,000	CI Upper Bound
Mid-Atlantic	65.8	71.1	76.4
Midwest	70.3	74.6	78.8
Northeast	46.2	52.7	59.2
Northwest	68.3	76.5	84.7
NY-NJ	49.5	54.4	59.3
Plains	67.2	75.4	83.6
Rockies	56.3	65.0	73.8
South Central	73.7	78.9	84.1
Southeast	69.1	72.7	76.3
Southwest	65.7	70.0	74.3
All Regions	69.0	70.6	72.3

Regions have a 95% probability of having statistically significant mortality differences not due to chance if their confidence level bands do not share a point on the y axis. A Bonferroni adjustment is used to calculate each region's confidence level band at 99.89%.

Appendix C — 2015 Regional Pairs Mortality Rate Differences at 95% Confidence Level

Age Group: 15-24 Years
All Causes of Death

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast	*	*								
Northwest										
NY-NJ	*	*		*						
Plains			*		*					
Rockies			*		*					
South Central			*	*	*					
Southeast	*	*	*	*	*					
Southwest	*	*				*	*	*	*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Age Group: 15-24 Years
Accidents

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast										
Northwest										
NY-NJ	*	*	*							
Plains					*					
Rockies					*					
South Central					*					
Southeast	*	*	*	*	*	*				
Southwest	*	*				*	*	*	*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Age Group: 15-24 Years
Assault

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast	*	*								
Northwest	*	*								
NY-NJ	*	*	*							
Plains			*	*	*					
Rockies	*	*			*	*				
South Central			*	*	*		*			
Southeast			*	*	*		*			
Southwest	*		*	*			*		*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Appendix C — 2015 Regional Pairs Mortality Rate Difference at 95% Confidence Level (Cont'd)

Age Group: 15-24 Years
Self-Harm

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast		*								
Northwest	*	*	*							
NY-NJ	*	*		*						
Plains	*		*		*					
Rockies	*	*	*		*					
South Central			*	*	*		*			
Southeast			*	*	*		*			
Southwest		*		*	*	*	*	*		

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Age Group: 15-24 Years
Cancer

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast										
Northwest										
NY-NJ										
Plains										
Rockies										
South Central										
Southeast										
Southwest										

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Age Group: 15-24 Years
Heart

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast										
Northwest										
NY-NJ										
Plains										
Rockies										
South Central										
Southeast			*				*			
Southwest									*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Appendix C — 2015 Regional Pairs Mortality Rate Difference at 95% Confidence Level (Cont'd)

Age Group: 45-54 Years
All Causes of Death

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast	*	*								
Northwest	*	*	*							
NY-NJ	*	*		*						
Plains		*	*	*	*					
Rockies	*	*	*		*	*				
South Central	*	*	*	*	*	*	*			
Southeast	*	*	*	*	*	*	*	*		
Southwest	*	*		*		*	*	*	*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Age Group: 45-54 Years
Cancer

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast	*	*								
Northwest	*	*								
NY-NJ	*	*								
Plains			*	*	*					
Rockies	*	*				*				
South Central			*	*	*		*			
Southeast	*		*	*	*		*	*		
Southwest	*	*				*		*	*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Age Group: 45-54 Years
Heart

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast	*	*								
Northwest	*	*								
NY-NJ	*	*	*	*						
Plains			*	*	*					
Rockies	*	*				*				
South Central	*	*	*	*	*		*			
Southeast	*	*	*	*	*	*	*			
Southwest	*	*	*			*		*	*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Appendix C — 2015 Regional Pairs Mortality Rate Difference at 95% Confidence Level (Cont'd)

Age Group: 45-54 Years
Accidents

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast										
Northwest										
NY-NJ	*	*	*	*						
Plains					*					
Rockies					*					
South Central					*					
Southeast	*	*		*	*	*		*		
Southwest	*	*	*		*		*	*	*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Age Group: 45-54 Years
Liver

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast										
Northwest	*	*	*							
NY-NJ		*		*						
Plains				*	*					
Rockies	*	*	*		*	*				
South Central	*	*	*		*	*				
Southeast	*	*	*		*			*		
Southwest	*	*	*		*	*				

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Age Group: 45-54 Years
Self-Harm

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast										
Northwest	*	*								
NY-NJ	*	*	*	*						
Plains					*					
Rockies	*	*	*		*					
South Central					*		*			
Southeast					*		*			
Southwest				*	*	*	*	*	*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Appendix C — 2015 Regional Pairs Mortality Rate Difference at 95% Confidence Level (Cont'd)

Age Group: 65-74 Years
All Causes of Death

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast	*	*								
Northwest	*	*	*							
NY-NJ	*	*		*						
Plains	*		*	*	*					
Rockies	*	*		*		*				
South Central	*	*	*	*	*	*	*			
Southeast	*	*	*	*	*		*	*		
Southwest	*	*		*		*		*	*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Age Group: 65-74 Years
Cancer

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast	*	*								
Northwest		*								
NY-NJ	*	*								
Plains			*	*	*					
Rockies	*	*	*	*	*	*				
South Central			*		*		*			
Southeast			*	*	*		*			
Southwest	*	*	*	*	*	*		*	*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Age Group: 65-74 Years
Heart

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast	*	*								
Northwest	*	*								
NY-NJ		*	*	*						
Plains			*	*						
Rockies	*	*			*	*				
South Central	*	*	*	*	*	*	*			
Southeast	*		*	*	*		*	*		
Southwest	*	*	*	*	*	*	*	*	*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Appendix C — 2015 Regional Pairs Mortality Rate Difference at 95% Confidence Level (Cont'd)

Age Group: 65-74 Years
CLRD (Chronic Lower Respiratory Disease)

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest	*									
Northeast	*	*								
Northwest			*							
NY-NJ	*	*	*	*						
Plains	*	*	*	*	*					
Rockies			*		*	*				
South Central	*		*	*	*	*				
Southeast	*		*	*	*					
Southwest	*	*		*	*	*	*	*	*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Age Group: 65-74 Years
Stroke

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast	*	*								
Northwest										
NY-NJ	*	*								
Plains			*		*					
Rockies	*	*				*				
South Central	*	*	*	*	*	*	*			
Southeast	*	*	*	*	*	*	*			
Southwest			*		*			*	*	

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Age Group: 65-74 Years
Diabetes

	Mid-Atlantic	Midwest	Northeast	Northwest	NY-NJ	Plains	Rockies	South Central	Southeast	Southwest
Mid-Atlantic										
Midwest										
Northeast	*	*								
Northwest			*							
NY-NJ	*	*		*						
Plains			*		*					
Rockies										
South Central			*		*					
Southeast			*		*					
Southwest			*		*					

* Indicates 95% probability of regional pairs having statistically significant mortality rate differences.

Appendix D — Combined 2000-2015 Urban-Rural Mortality Rates

	Large Central Metro	Large Fringe Metro	Medium Metro	Small Metro	Micropolitan (non-metro)	Non-Core (non-metro)	Total
15-24 years	**71.7**	**69.6**	**72.3**	**68.6**	**82.6**	**109.1**	**74.1**
Mid-Atlantic	94.0	70.5	73.3	63.3	89.2	102.3	77.4
Midwest	80.4	67.1	63.9	59.9	69.9	92.6	71.3
Northeast	52.8	50.4	57.0	60.0	60.8	81.6	55.5
Northwest	55.3	62.6	64.7	69.0	73.3	141.2	67.3
NY-NJ	56.0	58.0	56.1	58.1	58.5	72.9	57.2
Plains	129.0	82.1	65.2	49.1	75.6	98.6	77.1
Rockies	71.5	71.9	59.2	66.4	79.2	129.7	74.7
South Central	79.3	79.4	82.5	86.4	94.5	119.7	85.3
Southeast	82.3	83.9	84.5	77.5	95.2	117.0	87.0
Southwest	62.6	66.6	68.1	76.3	102.3	123.7	66.2
45-54 years	**423.5**	**346.7**	**431.9**	**452.8**	**477.6**	**509.7**	**418.3**
Mid-Atlantic	615.7	335.5	409.1	434.5	471.7	505.8	421.1
Midwest	481.9	328.8	422.7	405.0	404.9	412.3	407.9
Northeast	397.9	306.2	335.6	353.4	330.9	365.5	335.7
Northwest	336.4	331.9	372.2	391.3	424.5	429.4	366.5
NY-NJ	410.0	306.9	367.8	397.0	372.7	398.1	360.5
Plains	611.2	361.3	394.0	393.9	441.0	426.2	414.9
Rockies	431.4	304.2	310.0	382.9	353.9	414.4	357.6
South Central	424.1	389.7	484.7	530.2	572.6	588.4	471.1
Southeast	461.1	419.1	506.1	544.6	598.3	644.7	502.7
Southwest	351.2	346.8	401.4	468.4	484.6	507.3	370.8
65-74 years	**1,938.8**	**1,859.7**	**1,985.4**	**2,068.9**	**2,202.6**	**2,224.4**	**1,994.1**
Mid-Atlantic	2,424.6	1,853.8	2,040.0	2,142.6	2,298.4	2,281.2	2,076.5
Midwest	2,196.8	1,926.1	2,102.5	2,093.4	2,108.5	2,050.2	2,078.4
Northeast	1,888.3	1,753.5	1,814.0	1,788.7	1,841.8	1,919.1	1,810.1
Northwest	1,747.9	1,859.7	1,877.5	1,833.2	1,951.4	1,818.6	1,851.0
NY-NJ	1,809.1	1,743.0	1,998.3	2,048.2	2,108.0	2,063.5	1,827.1
Plains	2,490.0	1,974.7	2,018.8	2,007.9	2,172.9	2,053.5	2,072.1
Rockies	1,864.8	1,630.1	1,589.4	1,811.7	1,746.1	1,869.8	1,744.8
South Central	2,047.9	2,030.3	2,142.8	2,297.8	2,369.8	2,360.3	2,173.2
Southeast	2,024.2	1,933.7	2,013.6	2,143.3	2,453.7	2,567.9	2,117.4
Southwest	1,695.3	1,719.0	1,808.2	1,920.2	1,920.6	1,836.0	1,743.5

Appendix E — Combined 2000-2015 Regional Urban-Rural Population Mix

	Large Central Metro	Large Fringe Metro	Medium Metro	Small Metro	Micropolitan (non-metro)	Non-Core (non-metro)
15-24 years	**30.76%**	**22.59%**	**21.60%**	**9.11%**	**5.62%**	**10.32%**
Mid-Atlantic	19.6%	41.2%	16.5%	5.6%	5.2%	11.9%
Midwest	28.3%	24.2%	16.1%	12.7%	5.9%	12.8%
Northeast	17.8%	34.1%	31.1%	7.2%	4.0%	5.8%
Northwest	19.2%	22.3%	24.7%	13.2%	4.0%	16.6%
NY-NJ	42.9%	37.2%	9.8%	4.0%	1.5%	4.6%
Plains	7.1%	20.0%	23.5%	16.2%	15.4%	17.8%
Rockies	14.7%	15.5%	27.8%	13.8%	11.0%	17.2%
South Central	33.0%	14.0%	24.9%	11.0%	6.9%	10.1%
Southeast	20.4%	20.3%	28.6%	11.2%	8.0%	11.4%
Southwest	61.2%	10.5%	20.4%	2.4%	0.7%	4.7%
45-54 years	**29.39%**	**25.94%**	**20.39%**	**8.88%**	**6.46%**	**8.95%**
Mid-Atlantic	16.2%	45.3%	16.9%	6.0%	5.9%	9.7%
Midwest	27.0%	27.6%	14.9%	12.5%	7.1%	11.0%
Northeast	13.9%	36.1%	31.3%	8.2%	4.8%	5.7%
Northwest	21.5%	24.1%	23.0%	11.6%	4.9%	14.9%
NY-NJ	39.3%	42.1%	9.4%	3.7%	1.5%	4.0%
Plains	7.3%	23.8%	23.1%	14.9%	18.2%	12.8%
Rockies	13.5%	20.5%	21.9%	14.1%	13.9%	16.1%
South Central	33.2%	16.1%	23.1%	10.3%	8.2%	9.1%
Southeast	20.4%	22.6%	27.8%	10.7%	8.6%	9.8%
Southwest	61.5%	11.3%	18.7%	2.9%	0.9%	4.6%
65-74 years	**26.55%**	**23.46%**	**21.32%**	**10.24%**	**8.34%**	**10.08%**
Mid-Atlantic	15.9%	39.4%	18.8%	7.3%	7.7%	11.0%
Midwest	25.3%	24.3%	15.3%	14.3%	9.4%	11.4%
Northeast	13.9%	34.8%	29.7%	8.7%	5.9%	6.9%
Northwest	17.6%	20.9%	22.5%	15.4%	6.3%	17.4%
NY-NJ	39.3%	41.0%	9.4%	4.1%	1.8%	4.4%
Plains	6.5%	21.0%	20.6%	16.4%	23.1%	12.4%
Rockies	12.3%	16.7%	20.1%	14.3%	18.6%	18.1%
South Central	26.4%	14.3%	24.0%	12.9%	12.1%	10.2%
Southeast	16.9%	20.1%	30.7%	11.4%	9.6%	11.2%
Southwest	59.0%	10.9%	18.9%	3.7%	1.3%	6.2%

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