WEST VIRGINIA'S AGING POPULATION

1950 TO 2013

WEST VIRGINIA Department of Health & Human Resources
BUREAU FOR PUBLIC HEALTH

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West Virginia's Aging Population
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Executive Summary

Dramatic changes have occurred in West Virginia's population from 1950 to 2013, notably changes involving mature adults, those aged 45 years and older. In 1950, the population aged 0-44 years was 1,523,299 residents, and the U.S. Census Bureau estimates that this population will decrease to 823,667 by 2030. The population aged 45 years and older was 482,253 in 2013 and is projected to increase to 896,292 by 2030.

By 2056 the population of U.S. adults aged 65 years and older is projected to become larger than the population aged 17 years and younger. The West Virginia Health Statistics Center (WVHSC) projects that this event will occur about the year 2029 for West Virginia, much earlier than for the rest of the country. West Virginia was ranked #2 in 2014 as the "oldest" state, second only to Florida in the percent of the population aged 65 years and older.

Where once the median age of a West Virginia resident was nearly identical to the median age in the U.S., West Virginia's median age in 2013 was four years greater than the U.S. (43.0 years compared to 38.9 years).

The population of working-age adults (20-64 years) has decreased compared to the population of elderly adults aged 65 years and older. This presents economic challenges for West Virginia for the following reasons: there are fewer working-age adults to earn more wages for the family unit, compared to retirees; there are fewer working-age adults to provide a tax base for the state's economy; and there are fewer working-age adults to provide the support system for their family members aged 65 years and older.

The prevalence of chronic diseases and health risks is much greater among West Virginia's elderly adults, compared to the U.S., and these health risks affect the length of life, as well as the quality of life. West Virginia's prevalence of chronic diseases is often significantly higher than the U.S. Many adults aged 65 years and older indicate that they have a disability, often as a result of chronic disease or illness.

West Virginia's nursing home bed occupancy rate is higher than the U.S., and its ratio of adults aged 65 years and older per bed is higher than the U.S. Providing care to aging West Virginia adults will become a challenge for family caregivers who often assume those responsibilities.

The infrastructure of services provided to the elderly will be a critical need far into the future as the population of West Virginia continues to age, resulting in increasing costs of state and federal programs for the elderly.

Introduction

The West Virginia population is expected to age at a rate that exceeds that of the nation (Christiadi, Deskins & Lego, 2014). Many policy issues, including workforce and health care, are affected by population demographics such as aging. West Virginia's economy is impacted when fewer adults are actively in the workforce, or when the average workforce age is higher. When there is a greater number of elderly in a population, as is the case in West Virginia, the infrastructure of health care systems and services offered to aging adults is affected, including the need for more physicians specializing in chronic disease and geriatric issues, and the need for more nursing/assisted living facilities.

Researching the topic of the aging population in West Virginia results in dozens of documents from various sources (see References). This WVHSC report will review several measures that reflect the population and population changes in West Virginia occurring from 1950 through 2013, particularly focusing on adults aged 65 years and older.

Methodology

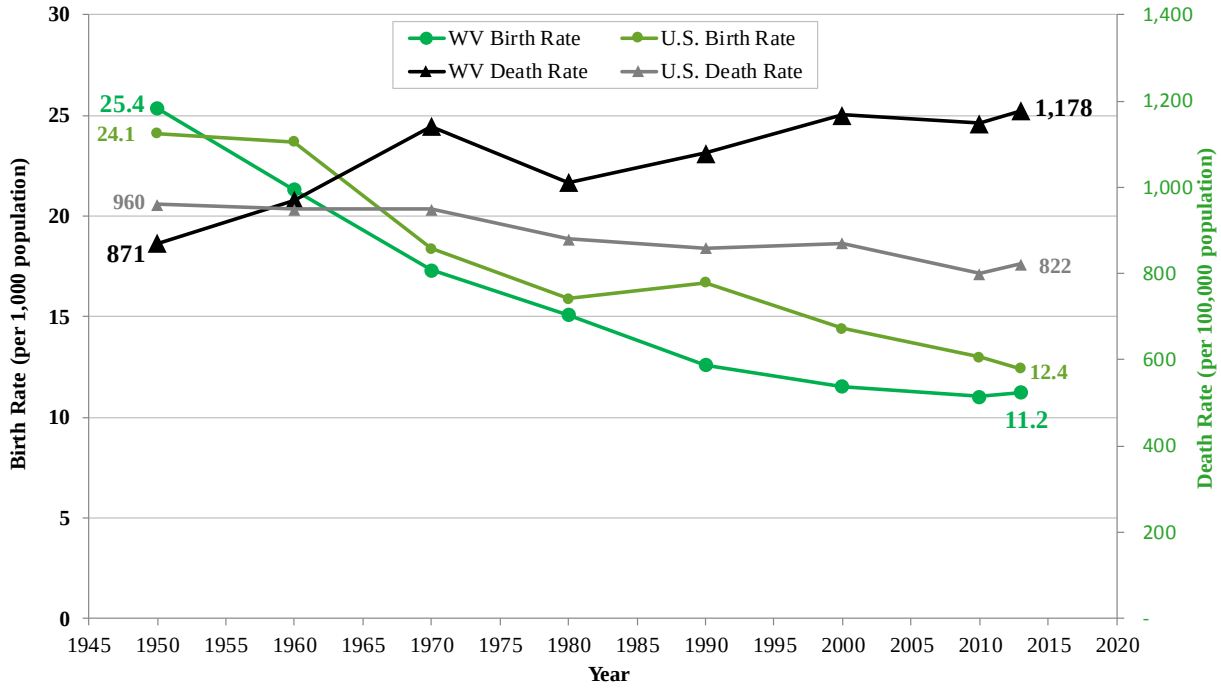
This report utilizes and analyzes population data previously published by the WVHSC and data obtained from the U.S. Census Bureau available through the National Center for Health Statistics (NCHS). Provided through the U.S. Department of Health and Human Services (U.S. DHHS), Centers for Disease Control and Prevention (CDC), the CDC WONDER query system was useful in obtaining data for many measures in this report.

Population Measures

BIRTHS AND DEATHS

Any discussion of population measures should begin by analyzing the components of births and deaths. Figure 1 illustrates the changes in the birth rate and the death rate in West Virginia compared to the rates in the U.S. While the U.S. death rate has steadily declined, the death rate in West Virginia has increased. This finding is not surprising since the proportion of elderly in West Virginia is so much higher than that of the U.S. The U.S and the West Virginia birth rates have both markedly declined, with West Virginia experiencing a sharper decline. West Virginia ranked in the top 10 states having the lowest birth rates in 2013 (U.S. DHHS/CDC/NCHS, 2014a).

Figure 1. Birth Rates, Death Rates, West Virginia Compared to U.S., 1950-2013



Crude birth rate was calculated by dividing the number of live births by population, and crude death rate was calculated by dividing the number of deaths by population.
Data Sources: U.S. data were obtained from U.S. Census Bureau (2004) and U.S. DHHS/CDC (2007-2013); West Virginia data were obtained from the West Virginia Health Statistics Center (1950 to 2016).

CHANGES IN POPULATION SIZE

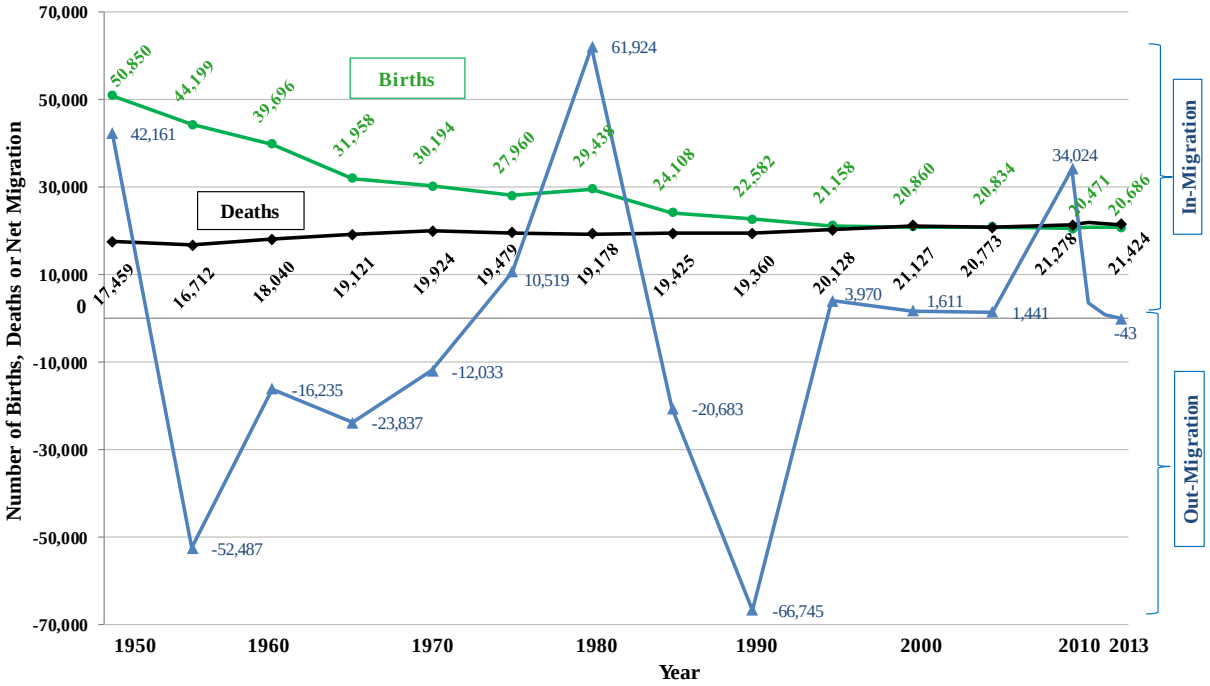
Changes in population size are determined by the changes in natural increase and net migration:

- Natural increase is the difference between the number of births and deaths. When births outnumber deaths the natural increase is positive, and, conversely, when deaths outnumber births the natural increase is negative.
- Net migration is the change in population resulting from in-migration (people moving into the state) and out-migration (people moving out of the state).

Figure 2 illustrates the number of births, number of deaths, and net-migration from 1950 to 2013 in West Virginia. In the late 1990s, the trendline for the number of births began to slip below the trendline for the number of deaths. This clearly reflects the decrease in the birth rate and increase in the death rate in West Virginia (see Figure 1). West Virginia's population can still be maintained or increased as long as there is significant net in-migration (in-migration line staying above zero) and/or a positive natural increase (more births than deaths). For complete analysis of factors that affect population, refer to the West Virginia Vital Statistics 2011 report (WVHSC, 2014).

Changes in net migration are directly related to national and state-level economic changes, such as recessions, availability of jobs, and the collapse or expansion of industries (such as mining and natural gas "fracking"). During the period 1950 to 2013, at least 10 recessions (contractions) have been documented in the U.S. economy (National Bureau of Economic Research, 2010), but it is difficult to determine any correlation between the U.S. recessions and out-migration in West Virginia.

Figure 2. Number of Births, Deaths and Net Migration in West Virginia, 1950-2013

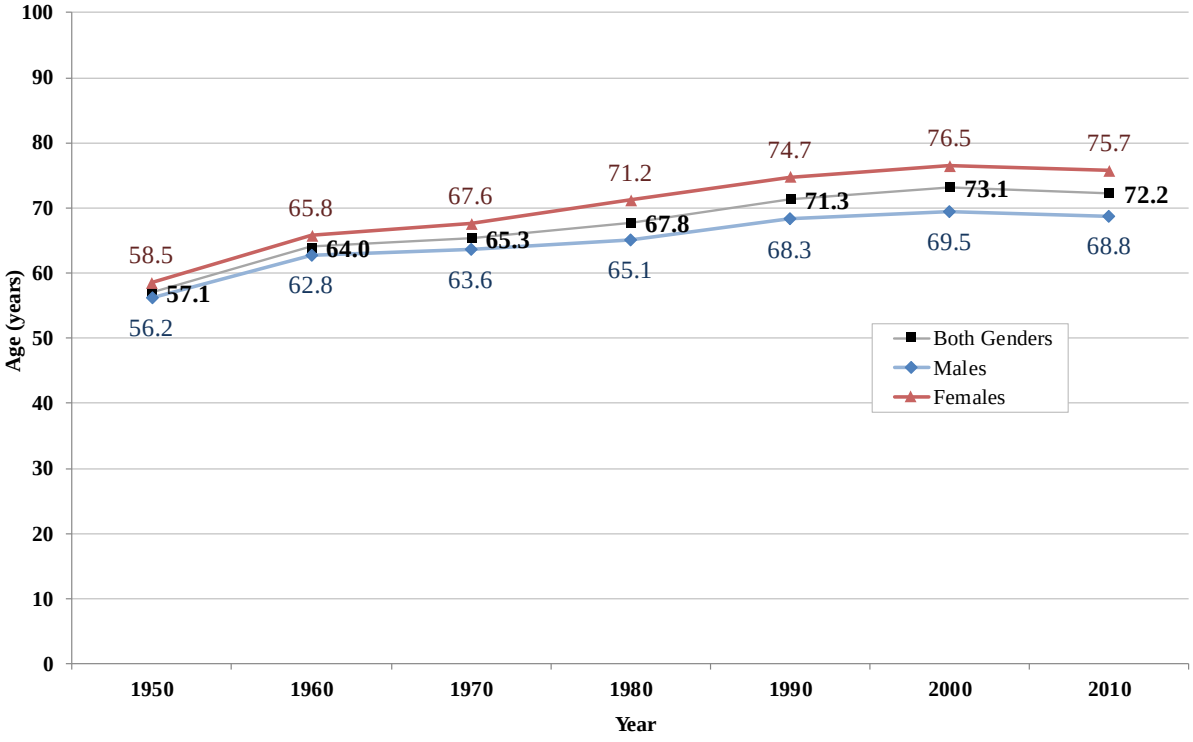


Net migration is the difference between the number of people who moved into West Virginia to become residents (in-migration), and those West Virginia residents who have moved out of the state (out-migration). A positive net migration would be in-migration, and a negative net migration would be out-migration.
Data Sources: West Virginia Health Statistics Center (2014; 1950 to 2016).

AGE-AT-DEATH

Figure 3 illustrates the changes in average age-at-death (AAAD) in West Virginia from 1950 to 2013 (WVHSC, 1950 to 2016). AAAD, the actual age that is recorded on death certificates, has increased dramatically due to improvements in public health efforts. While it is desirable to increase the length of life and quality of life, the fact that West Virginia citizens are living longer poses challenges for state and federal programs that serve older adults. Chronic health conditions and poor health choices (tobacco use, obesity, sedentary lifestyle, and diabetes) are contributing factors to many of the leading causes of death in West Virginia (heart disease, cancer, lung disease, stroke, and diabetes). The increases in AAAD achieved in the decades 1950 to 2000 may not be maintained, as suggested by slight decreases in the AAAD for 2010 in Figure 3.

Figure 3. Average Age-at-Death Among West Virginia Residents, 1950-2010



Data Source: West Virginia Health Statistics Center (1950 to 2016).

LIFE EXPECTANCY

Life expectancy is defined as the number of years a person is expected to live if that person was born in the year of reference, and is usually framed as "life expectancy at birth" (LEB). Average LEB in the U.S. has increased by about 30 years during this last century, so a child born in 1900 might have had a LEB of 47 years, but a child born in 2000 has a LEB of 77 years (Hobbs & Stoops, 2002). This increase in LEB is credited to improvements in public sanitation, personal hygiene, science and medical technology (Hobbs & Stoops, 2002). Life expectancy for West Virginia compared to the U.S. by gender and race over the period of 1949-1951 to 1999-2001 is illustrated in Table 1.

While life expectancy has increased for West Virginia and for the U.S. over the 50 years indicated (ranging from increases of 7-12 years in the various categories), LEB estimates for West Virginia are slightly lower than the U.S. averages. Regardless of race, the life expectancy for males is much lower than for females. By race, the life expectancy for non-white/black males and females is considerably lower than that for white males and females.

Table 1. Life Expectancy at Birth by Gender and Race, West Virginia Compared to U.S.

Region	Time Period: if birth occurred during this period	Life Expectancy at Birth (LEB)			
		White Males	White Females	*Non-White Males / *Black Males	*Non-White Females / *Black Females
WV	1949-1951	65.3	71.1	58.0	63.6
U.S.		66.3	72.0	58.9	62.7
WV	1999-2001	72.8	78.4	69.9	72.7
U.S.		74.7	80.0	68.1	75.1

*In 1949-1951 data, the race categories were *white* or *non-white* but in 1999-2001 data, the race categories were *white*, *black*, or *all races*.
Data Sources: U.S. Census Bureau (1956); U.S. DHHS/CDC/NCHS (2012).

Of the more than 3,100 counties in the U.S., four West Virginia counties (Logan, McDowell, Mingo, and Wyoming) ranked in the bottom 20 counties with the lowest LEB in 2010 (see Table 2). McDowell, Mingo, and Wyoming Counties also had the distinction of being in the bottom 20 counties among all the counties in the U.S. that experienced decreases in LEB among males from 1985 to 2010 (Wang, Schumacher, Levitz, Mokdad & Murray, 2013). Due to lifestyle-related or obesity-related chronic diseases and the threat of pandemic viral diseases, several researchers are predicting that the U.S. life expectancy (at age 65 years) will decline in the near future (Olshansky et al., 2005).

Table 2. Ranking of West Virginia Counties Among U.S. Counties in Life Expectancy at Birth (in years), 2010

By Gender	WV Average	Counties in the Bottom 20 Among all U.S. Counties				County Ranked #1 in U.S.		U.S. Average
		Logan County, WV	McDowell County, WV	Mingo County, WV	Wyoming County, WV			
WV Males	72.6	68.9 (not in the bottom 20 counties)	63.9	67.3	67.5	81.7	Fairfax County, VA	76.1
WV Females	78.1	74.5	72.9	73.9	74.8	85.0	Marin County, CA	80.8

Data Source: Wang, H., Schumacher, A., Levitz, C., Mokdad, A., & Murray, C. (2013).

GENDER

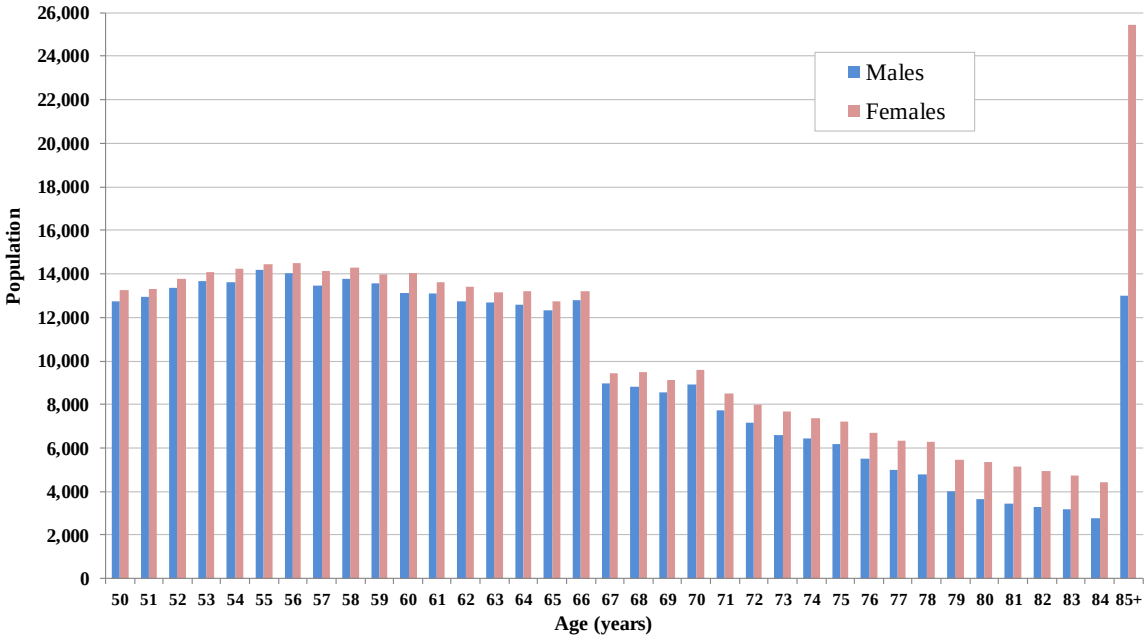
The population distribution by gender of all West Virginia residents has not fluctuated much when comparing 1950 (males 50.18%; females 49.82%) to 2013 (males 49.40%; females 50.60%). As mature adults continue to age, the percentage of males will likely decrease due to lower life expectancy among men compared to women. In 1950, among adults aged 65 years and older in West Virginia, males comprised 50.96% of the population and females 49.04%, compared

to the breakdown in 2013, when males comprised 44.69% and females 55.31%. In West Virginia in 2013, women aged 65 years and older outnumbered men aged 65 years and older by about 34,000, or 177,021 women compared to 143,020 men. Data has been calculated from these sources: U.S. Census, Department of Commerce/Bureau of the Census, 1961; U.S. Census Bureau, 2013b).

Figure 4 presents data for West Virginia adults aged 50 years and older by gender. As expected, the population of females slightly exceeds the population of males due to shorter life expectancy for men. Data for adults aged 85 years and older by single-year-of-age are not available.

At age 67 years, a sharp drop in population count for both genders is illustrated in Figure 4. It is unlikely that out-migration accounted for this sharp decrease. States where out-migration exceeds in-migration over time (as is the case in West Virginia) tend to have older populations, as older people tend to age in place (Uhlenberg, 2002). Another factor that could contribute to this drop is changes in health of older adults due to leaving the workforce. According to several studies and surveys, retiring early increases the risk of premature death, cardiovascular death, dementia, depression and anxiety (Borelli, 2013). Also, many West Virginia adults suffer from chronic health problems, so their poor health may be further compromised by the health risks related to early retirement and may result in early death. However, the single, contributing factor explaining this drop may be traced back to the birth year for those aged 66 years. There were great increases in births in West Virginia in 1946 and 1947 that were sustained for many years, resulting from the post-World War II baby boom (WVHSC, 1947).

Figure 4. Population of West Virginia Adults Aged 50-85 Years and Older by Gender, 2013



Single years of age for adults aged 85 years and older are not available.
Data Source: U.S. Census Bureau (2013b).

Recent analysis by *The Washington Post* (Achenbach & Keating, 2016) indicates that the death rate among white women has increased since 2000, especially among those in small towns or rural areas in the U.S. The contributing factors for this may include higher rates of obesity, smoking, alcohol abuse, or drug use. The analysis suggests that any longevity advantage that white women had over white men, or black women or men, is eroding.

RACE

The population by race also has not experienced much change, although the methodology for collecting this data has changed (U.S. Census Bureau, 1950 to 2013). In 1950, the race category white comprised 94.25% of the West Virginia population, compared to the percentage of 5.75% for nonwhite. The change in the U.S. Census 2000 allowed selection of single or multiple races from these choices: White; Black/African American; American Indian and Alaska Native; Asian; Native Hawaiian and Other Pacific Islander. In 2013, the percentage of West Virginia population designated as white was 93.8% and the percent nonwhite was 6.2% (for comparison purposes, all races other than white were collectively considered nonwhite).

Table 3 provides more information concerning the population aged 65 years and older by race, 2010. Census data prior to 2000 did not provide clear delineations concerning ethnicity. The U.S. Census data for 2000 revealed 0.7% (WVHSC, 1950 to 2016) of West Virginia residents were of Hispanic origin, and this increased to 1.3% in 2013 (WVHSC, 1950-2016), compared to the U.S. prevalence of 17.1% in 2013 (U.S. Census Bureau, 2013a). About 0.5% of West Virginia residents aged 65 years and older in 2010 were of Hispanic origin (U.S. Census Bureau, 2014d). See Table 1 for analysis of LEB and differences by race.

Table 3. Percent of Population Aged 65 Years and Older by Race, 2010

Race Category	U.S. (%)	West Virginia (%)	Population Size, West Virginia
White	84.8	96.7	287,447
Black or African American	8.5	2.2	6,472
American Indian and Alaska Native	0.5	0.1	439
Asian	3.4	0.4	1,123
Native Hawaiian and Other Pacific Islander	0.1	<0.1	28
Some Other Race	1.7	<0.1	128
Two or More Races	1.0	0.6	1,767

Data Source: U.S. Census Bureau (2014d).

AGE

Table 4 presents median age by gender and by decade in West Virginia compared to the U.S. West Virginia's median age was similar to the U.S. median age in 1950 and even lower than the U.S. median age in 1960. Decade by decade, as median age has increased across the country, the median age in West Virginia has pulled further ahead of the U.S. median age to the point where the West Virginia median age was about four years greater than the U.S. This finding applies to the total population as well as for males and females.

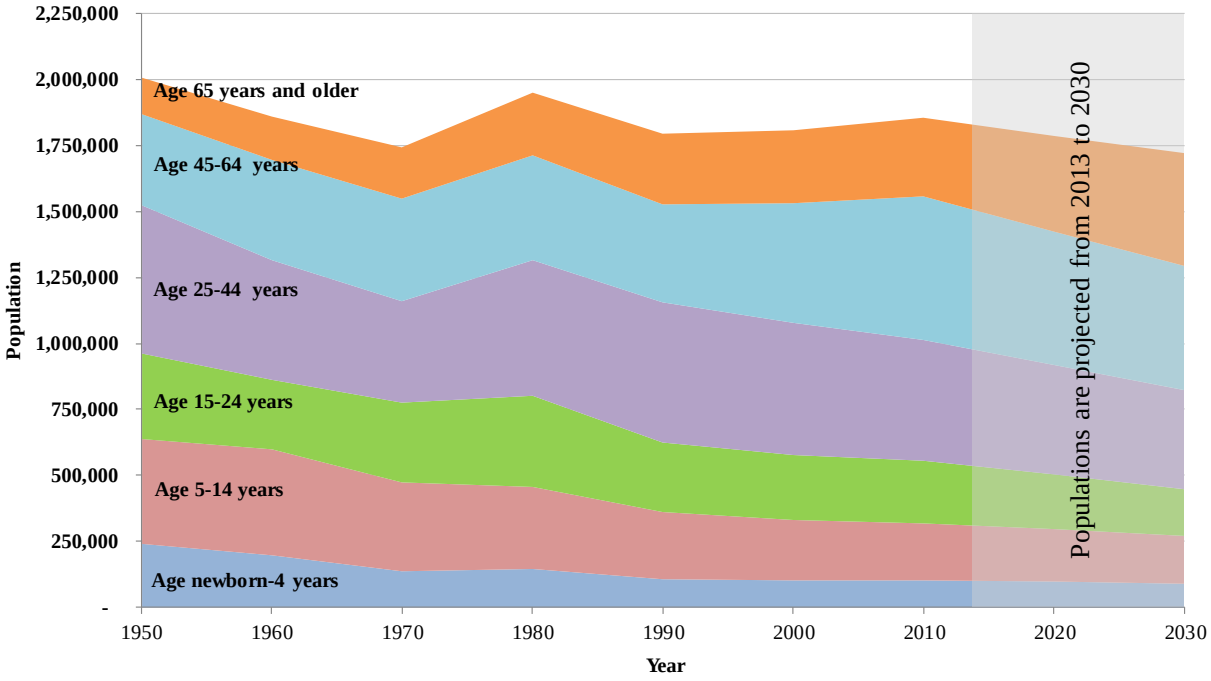
Table 4. Median Age by Gender, West Virginia and United States, 1950-2013

Year	Total		Male		Female	
	WV	U.S.	WV	U.S.	WV	U.S.
1950	25.1	25.2	25.2	24.9	25.0	25.5
1960	28.5	29.5	27.6	28.7	29.2	30.3
1970	30.0	28.1	28.4	27.5	31.5	28.8
1980	30.4	30.0	29.1	28.8	31.7	31.2
1990	35.4	32.9	34.0	31.7	36.7	34.1
2000	38.0	35.3	37.5	34.0	40.2	36.5
2010	41.3	37.2	40.1	35.8	42.6	38.5
2013	41.9	37.6	40.6	36.2	43.0	38.9

Data Sources: West Virginia Health Statistics Center (2003); U.S. Census Bureau (2012); U.S. Census Bureau (2013a).

Analyzing population distribution by age group in West Virginia indicates important changes over the past 60 years. Figure 5 illustrates how the total population of West Virginia has declined, plus how the population has changed in broad age-range categories. From 1950 to 2013, there were declines in the populations of those aged 0-4 years, aged 5-14 years, aged 15-24 years, and aged 25-44 years. Population increases were seen among adults aged 45-64 years and adults aged 65 years and older during this time period. Figure 5 also provides population projections to 2030, predicting that the same trends of declines among younger population groups and increases in older population groups will continue if all things affecting population remain constant.

Figure 5. West Virginia Population by Age Groups, 1950 to 2030 (projected)



Data for 2020 projections were created by averaging the 2010 Census data with the 2030 projections, to smooth the graph lines.
Data Sources: U.S. Census Bureau/Department of Commerce (1961); U.S. Census Bureau (accessed February 2, 2016); West Virginia Health Statistics Center (2003).

Table 5 and Figure 6 show population changes by 5-year age groups, comparing 1950 to 2013, and also showing projections to 2030. The population projections to 2030 indicate that the total West Virginia population is expected to decline. It appears that the population aged 40-44 years will remain steady (6.1% in 1950 compared to 5.9% in 2030 projections), but population groups younger than age 40-44 years have and will consistently decline and population groups older than age 40-44 years have and will continue to increase.

In 1950, the population aged 0-44 years was 1,523,299 residents, and the population aged 45 years and older was 482,253. Compare this to the 2030 projected population aged 0-44 years of 823,667 and the population aged 45 years and older of 896,292.

Only six states lost population from July 1, 2013, to July 1, 2014: West Virginia (-0.18%, losing about 3,300 residents), Illinois (-0.08%), Connecticut (-0.07%), Alaska (-0.07%), New Mexico (-0.06%) and Vermont (-0.05%). States whose population increased at the greatest rates during this time were North Dakota (+2.2%), Nevada (+1.7%), Texas (+1.7%), Colorado (+1.6%), District of Columbia (+1.5%), and Florida (+1.5%), reported from U.S. Census Bureau (2014b).

During the years 1950 to 2013, only two states lost population: West Virginia losing 8% and District of Columbia losing 19%. All other states had increases ranging from a modest 17% increase in North Dakota to the largest increase of 1600% increase in Nevada. The U.S. population doubled, with an increase of 108%, from 152 million (U.S. Census Bureau, 2000) to 316 million (U.S. Census Bureau, 2013a).

Table 5. West Virginia Population by 5-Year Age Groups
1950, 2013, and Projected to 2030

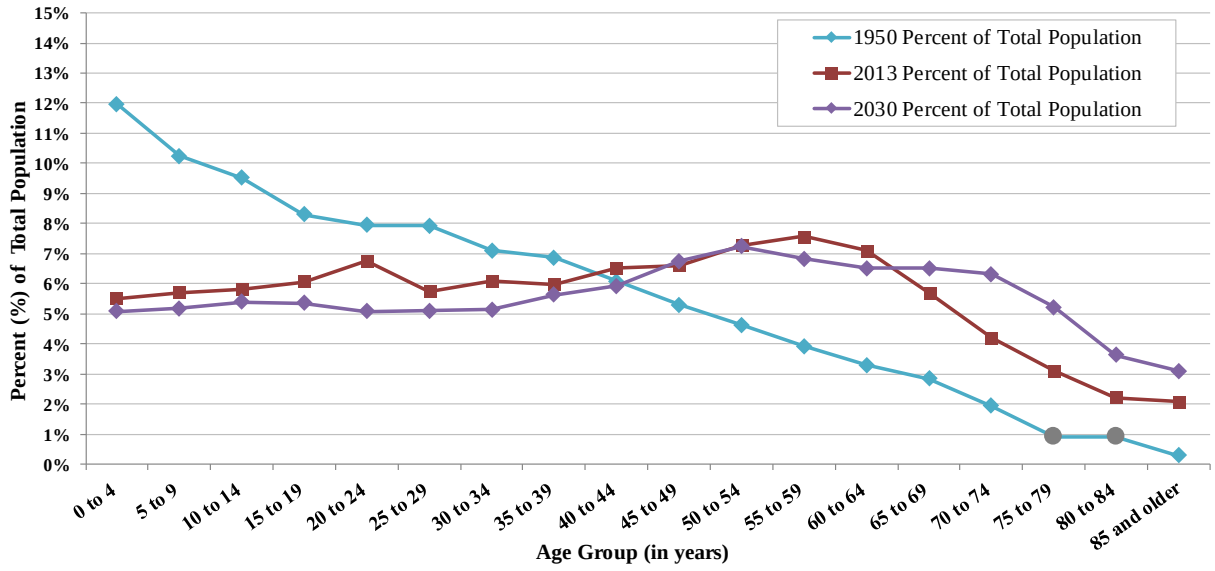
Age Groups	1950	% of Total Population	2013	% of Total Population	Projected to 2030	% of Total Population
0 to 4 years	240,107	12.0%	102,194	5.5%	87,391	5.1%
5 to 9 years	205,390	10.2%	105,727	5.7%	89,179	5.2%
10 to 14 years	190,979	9.5%	108,079	5.8%	92,759	5.4%
15 to 19 years	166,440	8.3%	112,270	6.1%	92,238	5.4%
20 to 24 years	159,550	8.0%	125,324	6.8%	87,248	5.1%
25 to 29 years	158,798	7.9%	106,482	5.7%	87,795	5.1%
30 to 34 years	142,373	7.1%	112,923	6.1%	88,306	5.1%
35 to 39 years	137,686	6.9%	111,035	6.0%	96,886	5.6%
40 to 44 years	121,976	6.1%	120,591	6.5%	101,865	5.9%
45 to 49 years	106,102	5.3%	122,742	6.6%	116,150	6.8%
50 to 54 years	92,863	4.6%	134,966	7.3%	124,432	7.2%
55 to 59 years	78,814	3.9%	140,266	7.6%	117,389	6.8%
60 to 64 years	65,948	3.3%	131,664	7.1%	111,878	6.5%
65 to 69 years	56,835	2.8%	105,373	5.7%	111,956	6.5%
70 to 74 years	38,699	1.9%	77,973	4.2%	108,752	6.3%
75 to 79 years	37,010	1.8%	57,389	3.1%	89,887	5.2%
80 to 84 years			40,902	2.2%	62,473	3.6%
85 years and older	5,982	0.3%	38,404	2.1%	53,375	3.1%
Total Population	2,005,552	100.0%	1,854,304	100.0%	1,719,959	100.0%

Population data for 1950 provided one age group for adults aged 75-84 years, but this age group was split into two groups, 75-79 and 80-84, for later publications.

Data Sources: U.S. Census Bureau (1968); U.S. Census Bureau (1950 to 2013); U.S. Census Bureau (accessed February 2, 2016).

If these estimates indicated in Table 5 hold true for West Virginia, the population estimate for adults aged 85 years and older may increase nine-fold from 5,982 in 1950 to 53,375 in 2030; the population estimate for adults aged 75 years and older may increase five-fold from 42,992 in 1950 to 205,735 in 2030; and the population estimate for adults aged 65 years and older may increase three-fold from 138,526 in 1950 to 426,443 in 2030.

Figure 6. West Virginia Population by 5-Year Age Groups 1950, 2013, and Projected to 2030



Population data for 1950 provided one age group for age 75-84 years, but this age group was split into two groups, 75-79 and 80-84, for later publications. To smooth the graph line, a "Percent of Total Population" value of 0.9% was used for 1950 age groups 75-84 years and 85-84 years (indicated in gray markers). See also Table 5.
Data Sources: U.S. Census Bureau (1968); U.S. Census Bureau (1950 to 2013); U.S. Census Bureau (accessed February 2, 2016).

POPULATION SIZE OF ADULTS AGED 65 YEARS AND OLDER

In a recent report on adults aged 65 years and older (U.S. Census Bureau, 2014d), the U.S. population of adults aged 65 years and older in 2010 was 40,267,984, and West Virginia's corresponding population was 297,404. West Virginia was cited with the following distinctions:

- West Virginia was second only to Florida in the high percentage of its population aged 65 years and older.
- West Virginia ranked lowest among all states in the percent of adults aged 65 years and older who participate in the labor force: West Virginia at 11.5%, compared to Alaska ranking highest at 23.6%.
- In 2010, 13.0% of the U.S. population was in the age group 65 years and older and West Virginia was cited as having 94.5% of its counties (52 out of 55) exceed that average (West Virginia's average was 16.0%).
- In 2010, 1.8% of the U.S. population was in the age group 85 years and older and West Virginia's average was 1.9%. More than two-thirds of West Virginia's counties (37 out of 55) exceeded the 1.8% (U.S. Census Bureau, 2011).

There is no doubt that West Virginia is a leader among other states in having a population that is declining and aging. Paramount to addressing these challenges will be long-range planning and support of infrastructures to serve the aging population.

Baby boomers, those born in the U.S. from mid-year 1946 to mid-year 1964 (Hogan, Perez & Bell, 2008), were between the ages of 49 and 67 years in the year 2013. The phenomenon of the post-World War II baby boom resulted from a sustained and significant increase in the U.S. birth rate over those years. In 2011, the first baby boomers reached age 65 years, resulting in a dramatic rise in the Old Age Dependency Ratio (OADR) for the U.S. (Colby & Ortman, 2014). By 2056, the population of U.S. adults aged 65 years and older is projected to become larger than the population aged 17 years and younger (Colby & Ortman, 2014). The WVHSC projects that this event will occur about the year 2029 for West Virginia, much earlier than for the rest of the country (WVHSC, 1990 to 2016). Refer to the Current Population Report, *The Baby Boom Cohort in the United States: 2012 to 2060* (Colby & Ortman, 2014) for detailed analysis of the baby boomer population.

Table 6 provides population changes at the county level for West Virginia from 1950 to 2013, and also percent change during that time for the age group of adults 65 years and older. The total county populations decreased in 37 counties, but in all 55 counties the population of adults aged 65 years and older increased, ranging from an increase of 11% in McDowell County, to an increase of 422% in Berkeley County. In general, population has increased in West Virginia's Eastern Panhandle (Berkeley, Jefferson, and Morgan Counties) due to an in-migration of residents from Maryland, Virginia, and Washington, D.C., encouraged by lower cost of living (Sartarelli, Deskins, & Lego, 2014).

Table 6. County Population Change from 1950 to 2013

Total and for Adults Aged 65 Years and Older, West Virginia

County	Total Population		Population of Adults Age 65 and Older		
	1950	2013	1950	2013	% Change from 1950 to 2013
Barbour	19,745	16,770	1,859	2,989	61%
Berkeley	30,359	108,706	2,681	13,990	422%
Boone	33,173	24,224	1,479	3,816	158%
Braxton	18,082	14,502	1,770	2,831	60%
Brooke	26,904	23,737	1,774	4,886	175%
Cabell	108,035	97,133	8,260	16,177	96%
Calhoun	10,259	7,564	894	1,526	71%
Clay	14,961	9,244	878	1,681	91%
Doddridge	9,026	8,344	993	1,403	41%
Fayette	82,443	45,599	4,109	8,256	101%
Gilmer	9,746	8,672	905	1,264	40%
Grant	8,756	11,759	744	2,481	233%
Greenbrier	39,295	35,644	2,815	7,367	162%
Hampshire	12,577	23,445	1,192	4,429	272%
Hancock	34,388	30,291	1,894	5,951	214%
Hardy	10,032	13,920	880	2,679	204%
Harrison	85,296	68,972	7,061	11,977	70%
Jackson	15,299	29,178	1,657	5,442	228%
Jefferson	17,184	55,073	1,592	7,464	369%
Kanawha	239,629	191,275	12,467	33,816	171%
Lewis	21,074	16,452	2,692	3,111	16%
Lincoln	22,466	21,559	1,455	3,588	147%
Logan	77,391	35,987	2,525	5,929	135%
Marion	71,521	56,868	5,688	10,118	78%
Marshall	36,893	32,459	3,232	6,189	91%
Mason	23,537	27,126	2,049	5,042	146%
McDowell	98,887	20,876	3,299	3,664	11%
Mercer	75,013	61,984	4,628	11,734	154%
Mineral	22,333	27,704	1,780	5,300	198%
Mingo	47,409	25,900	1,986	3,899	96%
Monongalia	60,797	102,274	4,215	10,802	156%
Monroe	13,123	13,483	1,482	2,958	100%
Morgan	8,276	17,498	752	3,537	370%
Nicholas	27,696	25,965	1,716	4,807	180%
Ohio	71,672	43,727	7,168	8,379	17%
Pendleton	9,313	7,471	837	1,787	114%
Pleasants	6,369	7,577	649	1,371	111%
Pocahontas	12,480	8,669	1,103	1,876	70%
Preston	31,399	33,859	2,618	5,746	119%
Putnam	21,021	56,650	1,464	8,961	512%
Raleigh	96,273	78,833	4,099	13,772	236%
Randolph	30,558	29,415	2,450	5,695	132%
Ritchie	12,535	10,073	1,678	1,955	17%
Roane	18,408	14,656	1,688	2,781	65%
Summers	19,183	13,563	1,535	2,774	81%
Taylor	18,422	16,973	1,727	2,970	72%
Tucker	10,600	6,968	1,025	1,521	48%
Tyler	10,535	8,995	1,433	1,798	25%
Upshur	19,242	24,665	1,957	4,379	124%
Wayne	38,696	41,437	2,627	7,421	182%
Webster	17,888	8,893	1,022	1,803	76%
Wetzel	20,154	16,204	1,910	3,413	79%
Wirt	5,119	5,901	598	1,051	76%
Wood	66,540	86,569	6,264	15,636	150%
Wyoming	37,540	23,019	1,271	3,849	203%
West Virginia	**2,005,552**	**1,854,304**	**138,526**	**320,041**	**131%**

Data Sources: U.S. Census Bureau/Department of Commerce (1961); U.S. Census Bureau (2013b).

OLD AGE DEPENDENCY RATIO

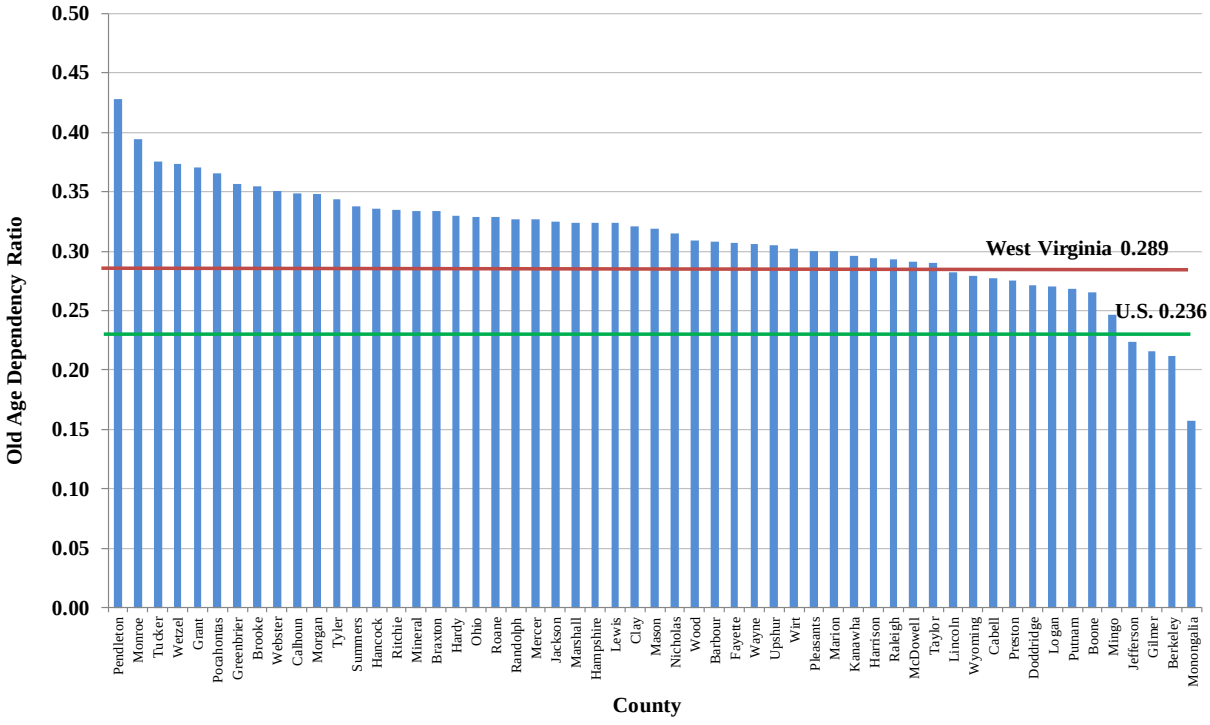
One interesting way to analyze age distributions is the concept of old age dependency ratio, or OADR. There are several ways to define this ratio, but the following formula is used by several organizations including the U.S. Social Security Administration (U.S. Social Security Administration, n.d.; Organisation for Economic Co-operation and Development, 2007):

$$\text{OADR} = \frac{\text{population age 65 years and older}}{\text{population age 20-64 years}}$$

Typically, those adults aged 20-64 years are wage-earners, tax-payers, and the family members who can provide the support system for the aging population. Taxes are assessed on workers and the tax base is decreased when those workers reach retirement age (compare pre-retirement income to post-retirement income). When the OADR is high, the result may be a less robust economy and tax base and greater challenges for infrastructure that supports the aging population. Figure 7 provides West Virginia OADR by county, calculated from 2013 census data. Bear in mind that OADR is not affected by the size of the county population, but rather it is a ratio of two population measures of the county. The OADR ranges from a low of 0.157 in Monongalia County to a high of 0.428 in Pendleton County, with the average West Virginia OADR of 0.289 compared to the average U.S. OADR of 0.236. The West Virginia OADR increased from 0.13 in 1950 to 0.29 in 2013, representing an increase in the population aged 65 years and older, and a decrease in the population aged 20-64 years.

West Virginia's OADR could be decreased by increasing the number of births in West Virginia, however, this would be a long-term strategy and would not affect the OADR until those births were reflected in adults aged 20 years and older who remained residents of West Virginia.

Figure 7. Old Age Dependency Ratio by County in West Virginia, 2013

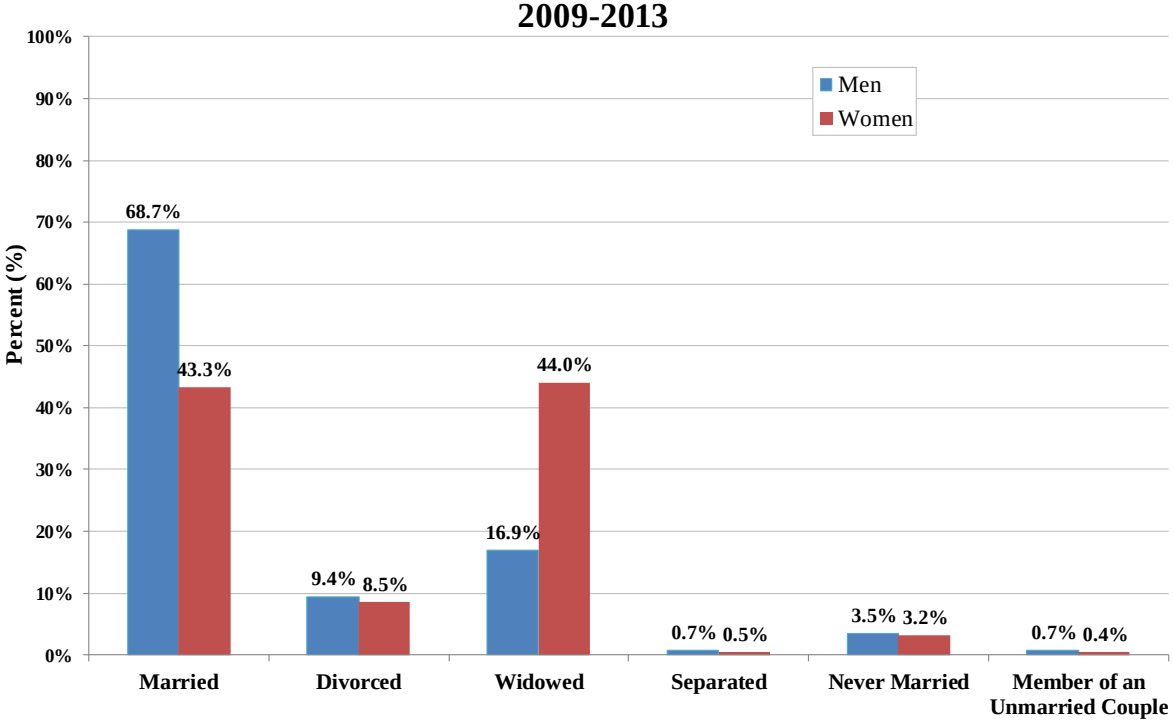


Old Age Dependency Ratio (OADR) is defined as the population aged 65 years and older divided by the population aged 20-64 years.
Data Source: U.S. Census Bureau (2013b)

FAMILY AND HOME

Figure 8 provides information about the marital status of West Virginia adults aged 65 years and older. Research indicates that adults who are married live longer than their single counter-parts and the advantages are even greater among men who are married (Juntti, 2015). New research by Siegler, Brummett, Martin, and Helms (2013) indicates that having a partner during midlife (ages 40's, 50's and 60's) is protective in decreasing mortality risk. Being single or losing a partner without replacement was related to increased mortality and the likelihood that one would not survive to be elderly (Siegler et al., 2013). In 2013 among West Virginia adults aged 65 years and older, the AAAD among married or widowed adults was 81 years; for never-married adults it was 78 years; and for divorced adults it was 75 years (WVHSC, 2009-2013).

Figure 8. Marital Status of West Virginia Adults Aged 65 Years and Older 2009-2013



The percentage represents the percentage within the larger group of men or women.
Data Source: West Virginia Health Statistics Center (2009-2013), from Behavioral Risk Factor Surveillance System.

In 2009-2013, 29.5% of West Virginia households contained one or more adults aged 65 years and older, compared to the U.S. average of 25.5% (U.S. Census Bureau, 2009-2013). In 2013, West Virginia's nursing home occupancy rate ranked 40th, moderately high (among all the states and the District of Columbia) at 87.5%, and the U.S. average was 80.8% (U.S. DHHS/CDC/NCHS, 2014b). In 2013, there were 10,888 certified nursing home beds in West Virginia, and comparing West Virginia to the U.S. in ratio of adults aged 65 and older per certified nursing home bed, West Virginia's ratio was 28.7 adults/bed, compared to U.S. of 25.9 adults/bed (calculated from these sources: U.S. DHHS/CDC/NCHS, 2014b; U.S. Census Bureau, 2010-2014).

Among grandparents who are the heads of the households in West Virginia, 59.3% responded that they are responsible for raising grandchildren under age 18 years in their home. West Virginia ranked 13th highest among all states and District of Columbia in this measure (U.S. Census Bureau, 2010-2014).

HEALTH ISSUES

While this report is not intended to provide an exhaustive discussion of the quality of life or health status of the aging population, it is well-documented that the West Virginia population of adults aged 65 years and older has higher prevalence of chronic diseases compared to the U.S. (U.S. DHHS/CDC, 2013; West Virginia Department of Health and Human Resources, 2004). Eight of the 11 leading causes of death in West Virginia in 2011 (WVHSC, 2014) were diseases most prevalent in the elderly: heart disease, cancers, lung diseases, cerebrovascular disease (stroke), diabetes, Alzheimer's, flu/pneumonia, and kidney disease. In 2011, West Virginia ranked #2 (among all states and territories) in adult current cigarette smoking (WVHSC, 2007, 2012, 2013, 2014, 2016). Note that cigarette smoking is linked to these leading causes of death (U.S. DHHS/CDC, 2015b). Smoking is linked to two additional leading causes of death: dementia and Alzheimer's (Cataldo, Prochaska & Glantz, 2010). In all cases, the West Virginia death rates are higher than death rates in the U.S. (WVHSC, 2014).

Table 7 provides data from the 2013 West Virginia Behavioral Risk Factor Surveillance System (WVBRFSS) on the prevalence of chronic health conditions or risk factors among West Virginia adults aged 65 years and older. The prevalence of chronic diseases among adults aged 65 years and older in West Virginia was significantly higher than the U.S. prevalence in 15 of the 29 categories.

Analysis of health issues among the elderly is also revealing mortality risks by multi-morbidity, or persons living with more than one chronic illness. One study by DuGoff, Canudas-Romo, Buttorff, Leff, and Anderson (2014) concludes that with each chronic condition, an average of 1.8 years of life are lost among those adults aged 67 years and older. According to the researchers, 60% of Americans who are aged 67 and older have three or more chronic illnesses. The prevalence of co-morbidity in West Virginia appears to be increasing for several conditions among the adult population, when comparing WVBRFSS 2005 to 2010 (WVHSC, 2007, 2012, 2013, 2014, 2016).

The most recent National Health Interview Survey report for 2014 (U.S. DHHS/CDC, 2016) revealed the high prevalence of adults (aged 18 years and older) who have multiple chronic conditions (MCC). Adults who reported a diagnosis of two or more of these conditions (arthritis, asthma, cancer, COPD, coronary heart disease, diabetes, hepatitis, hypertension, stroke, or weak or failing kidneys) were categorized as having MCC. West Virginia ranked third with a prevalence of 34.6% among all the states plus District of Columbia, significantly higher than the national average of 25.7%. West Virginia was placed in the East South Central region of the U.S. for the survey, where the prevalence of MCC was 72.3% among adults aged 65 years and older. MCC presents challenges due to costs associated with treating multiple conditions, complications with pharmaceutical interactions and side effects, and the need to coordinate care involving multiple health care providers (Parekh, Goodman, Gordon, & Koh, 2011).

Table 7. Prevalence of Chronic Diseases and Other Risk Factors Among Adults Aged 65 Years and Older in West Virginia and the U.S., 2013				
Health Issue or Risk Factor (in order as the topic appears in WVBRFSS report)	**Measure**	**WV prevalence (%)**	**U.S. prevalence (%)**	**Is WV significantly higher than U.S.?**
Health Status	fair or poor health	38.0	26.1	Y
Physical Inactivity	no leisure-time physical activity	38.4	33.1	Y
Nutrition	fewer than 5 servings per day of fruits and vegetables	90.2	83.4	Y
Obesity and Overweight	overweight (BMI 25.0-29.9)	37.5	39.5	N
	obesity (BMI≥30.0)	29.1	26.5	N
Tobacco Use	current cigarette smoking (some days or every day)	11.2	8.8	Y
	males: current smokeless tobacco use (some days or every day)	8.3	3.2	Y
Hypertension	hypertension diagnosed by a doctor or health care provider	68.9	63.0	Y
Cholesterol	high cholesterol diagnosed by a doctor or health care provider	55.0	55.8	N
Oral Health (2012 data)	no visit to a dentist in the past 12 months	50.4	34.0	Y
	6 or more permanent teeth missing	65.1	39.6	Y
Immunization	no influenza vaccine in past 12 months	26.1	38.4	Y
	no pneumonia vaccine	30.5	31.6	N
Colorectal Cancer Screening (2012 data)	no sigmoidoscopy or no colonoscopy in the past 10 years	35.3	27.3	Y
Prostate Cancer Screening: Males (2012 data)	no digital rectal exam in past 12 months	59.1	U.S. data not available	
	no PSA test in past 12 months	45.6	43.3	N
Breast and Cervical Cancer Screening: Females (2012 data)	no clinical breast exam in past 12 months	48.3	44.0	N
	no mammogram in past 2 years	25.3	22.2	N
	no PAP test in past 3 years	40.3	38.1	N
Cardiovascular Disease	experienced a heart attack/MI	19.4	12.3	Y
	experienced angina/coronary heart	17.1	12.3	Y
	experienced a stroke	8.9	7.7	N
Diabetes	diabetes diagnosed by a doctor or health care provider	25.0	22.2	N
Cancer (skin cancer or any cancer)	cancer diagnosed by a doctor or health care provider	30.4	31.0	N
Respiratory Disease	COPD diagnosed by a doctor or health care provider	18.1	12.2	Y
Asthma	current asthma diagnosed by a doctor or health care provider	8.8	8.3	N
Arthritis	arthritis diagnosed by a doctor or health care provider	61.1	52.7	Y
Disability	limited by physical, mental or emotional problems	34.0	29.2	Y
Kidney Disease	kidney disease diagnosed by a doctor or health care provider	6.5	5.6	N

The prevalences above are obtained from analysis of the West Virginia (see Data Source below) and the U.S. Behavioral Risk Factor Surveillance System (unpublished data). Risk factors indicated in bold are those that are causes or contributing factors to the leading causes of death as indicated in West Virginia Vital Statistics, 2013 (West Virginia Health Statistics Center, 1950 to 2016). For some measures above, only 2012 data were available. Significance indicates that the West Virginia prevalence was significantly higher than the U.S. prevalence (all states plus District of Columbia). U.S. prevalence represents the mean.
Data Source: West Virginia Health Statistics Center (2007, 2012, 2013, 2014, 2016).

A new report analyzes the workforce supply and demand for health care professionals in West Virginia (West Virginia Rural Health Association, 2015). Federal programs like the National Health Service Corps and the State Loan Repayment Program offer incentives for physicians to work in areas that have shortages of health professionals, or that are medically underserved, however these recruitment programs are still not meeting West Virginia's needs. The report provides county-level analysis of current supply and future health care needs for physicians in orthopedic surgery, endocrinology, gastroenterology, nephrology, cardiology, oncology, and primary care. The Miliken Institute Chronic Disease Index ranks West Virginia 50th in its high rate of adults who have seven chronic conditions (diabetes, hypertension, stroke, heart disease, cancers, pulmonary conditions, and mental disorders), many of which are age-related. Further analysis indicated that the overall economic cost of treating these chronic conditions in West Virginia is about $10.5 billion annually and could rise to $28.2 billion without intervention (West Virginia Rural Health Association, 2015).

DISABILITY IN WEST VIRGINIA

In its 2013 Long-Term Disability Claims Review, the Council for Disability Awareness (2013) found that about 90% of disabilities are caused by illnesses rather than accidents. In 2009-2013 among civilian, non-institutionalized adults in West Virginia who were aged 65 years and older, 44.3% indicated they had a disability, compared to the rural U.S. average of 37.1% (U.S. Census Bureau, 2009-2013). Table 8 provides comparison of West Virginia to the U.S. in types of disabilities among adults aged 65 years and older. In all cases, the percentage of disability is greater among the West Virginia population. Many of the chronic conditions listed in Table 7 may be manifested in these types of disabilities.

West Virginia ranked among the top four states in high prevalence of adults (18 years and older) who reported from the 2013 BRFSS that they had any of the following disabilities: vision, cognition, mobility, self-care, or independent living). West Virginia's prevalence was 29.8%, significantly higher than the U.S. prevalence of 22.2% (U.S. DHHS/CDC, 2015a).

Table 8. Percentage of Disabilities Among Adults Aged 65 Years and Older, West Virginia Compared to U.S.						
United States (among rural populations of less than 50,000)				**West Virginia**		
	Total	**With Disability**		**Total**	**With Disability**	
Population aged 65 years and over	9,335,656	3,465,465	37.1%	296,063	131,087	**44.3%**
With a hearing difficulty: deafness or having serious difficulty hearing		1,603,091	17.2%		58,154	**19.6%**
With a vision difficulty: blindness or having serious difficulty seeing even when wearing glasses		642,598	6.9%		27,122	**9.2%**
With a cognitive difficulty: having serious difficulty concentrating, remembering, or making decisions		842,023	9.0%		34,165	**11.5%**
With an ambulatory difficulty: having serious difficulty walking or climbing stairs		2,146,970	23.0%		87,242	**29.5%**
With a self-care difficulty: having difficulty bathing or dressing		736,153	7.9%		31,441	**10.6%**
With an independent living difficulty: because of a physical, mental, or emotional problem, having difficulty doing errands alone such as visiting a doctor's office or shopping		1,334,010	14.3%		56,393	**19.0%**

Data Source: U.S. Census Bureau (2009-2013). Rural U.S. population was selected for comparison due to the fact that the vast majority of West Virginia's population lives in cities/communities with less than 50,000 population. Population subtotals and percents will not add up due to overlapping disability categories. Survey respondents could choose more than one disability category.

A new measure to quantify the burden of disability is disability-adjusted life years (DALY), which combines years of life lost with years lived with a disability. DALYs for specific diseases not only quantify the years lost to premature death, but years of healthy life lost due to living with an illness or disease. A study by McKenna, Michaud, Murray & Marks (2005) revealed that many of the leading causes of DALYs in the U.S. are ischemic heart disease, cancers (lung/trachea/bronchial, colon/rectum, prostate, and breast), cerebrovascular disease (stroke), COPD, diabetes, osteoarthritis, dementia/degenerative/neurological disorders, and lower respiratory infections. These are diseases that develop more commonly in the aging population.

State data for Alzheimer's Disease/Dementia (AD/D) in 2015 includes these estimates for West Virginia (Alzheimer's Association, 2015):

- West Virginia could have as many as 44,000 residents with AD/D by the year 2025, a 22% increase, up from 36,000 residents reported in 2015.
- West Virginia's annual mortality rate of 31.8 (deaths per 100,000 population) was the 17th highest rate (among all states and District of Columbia) due to AD/D.
- Analysis of caregiver and health care costs indicates that there were 108,000 caregivers, providing 123,000,000 hours of unpaid care, valued at $1,499,000,000, and the higher costs of health care for these caregivers amount to about $75,000,000 annually.
- About 30% of AD/D patients also suffer from coronary heart disease, 29% have diabetes, 22% have congestive heart failure, 17% suffer chronic kidney disease, 17% have COPD, 14% have had a stroke, and 9% have had cancer.

Care for the elderly, chronically ill, and disabled often falls to family members. Most caregivers are informal caregivers, that is, a spouse, partner, family member, friend, or neighbor, compared to formal caregivers who are employed for this service. The value of services by unpaid family caregivers was estimated to be about $470 billion in 2013, and is a greater cost than services from formal caregivers. Unpaid family care will likely continue to be the largest source of long-term care services in the U.S. in the future. Female caregivers, more than male caregivers, are more likely to suffer work-related changes that may result in loss of income, such as changes in work schedule, lost wages, lost benefits, foregoing promotions, or taking a less-demanding job. More details on unpaid family care include the following (Family Caregiver Alliance, 2016):

- About 34% of caregivers are caring for someone aged 65 years and older. The average age among these caregivers is 63 years, and one-third of these caregivers report being in fair-to-poor health.
- The average age of caregivers is 49 years.
- The average age of care recipients is 69 years.
- The average length of care is 4 years.
- Nearly 75% of all caregivers are female, and may spend as much as 50% more time providing care than males.
- The economic value of unpaid family care for those suffering from AD/D is estimated to be nearly half of all unpaid family care.

The family caregiver ratio is the ratio of potential caregivers aged 45-64 years for every person in the high-risk years of 80 and older. In 2010, this ratio was 6.8 in West Virginia, but is projected to decrease to 2.9 in 2050 (Eldercare Workforce Alliance, 2014).

Conclusions

The population in West Virginia has changed dramatically during the period 1950 to 2013, and the population of adults aged 65 years and older has been affected in several ways:

- West Virginia's birth rate has declined at a steeper rate compared to the U.S., and West Virginia's death rate has increased, while the U.S. death rate has fallen slightly (see Figure 1).
- Deaths outnumber births and out-migration exceeds in-migration, all resulting in a smaller total population and also one that is aging faster than the U.S. (see Figure 2).
- Median age and life expectancy at birth have all increased (see Table 1, Table 2, and Table 4). Average age-at-death increased slightly, but seems to be leveling off since 2000 (see Figure 3).
- Aging baby boomers are reflected in the population of West Virginia adults born from 1946 to 1964 (see Figure 4).
- About 96.7% of adults aged 65 years and older in West Virginia are White, about 2.2% are Black/African American, and all other races combined make-up about 1% (see Table 3).
- All 55 counties in West Virginia have experienced increases in the percentage of population aged 65 years and older, comparing 1950 to 2013 (see Table 6).

- Population decreases have been seen among the younger age groups of 0-4 years, 5-14 years, 15-24 years, and 25-44 years, while increases have been seen in the older age groups of 45-64 years, 65 years and older (see Figure 5, Table 5, and Figure 6).
- As a result of this progression in the aging population, West Virginia ranks #2 as the "oldest" state, second only to Florida in the percent of the population aged 65 years and older (U.S. Census Bureau, 2014c). West Virginia's economic health is closely tied to its workforce. The old age dependency ratio, or OADR, is one measure that illustrates the divergence of the populations of residents aged 20-64 years and those aged 65 years and older. The average West Virginia OADR is greater than the average U.S. OADR (see Figure 7).
- Not surprisingly, more West Virginia women aged 65 years and older indicate they are widowed, compared to men in this age category (see Figure 8).
- About 1 in 3 households in West Virginia includes at least one adult aged 65 years and older, and West Virginia has higher prevalence of chronic diseases and disability among the elderly compared to the U.S. (see Table 7 and Table 8). The populations of aging, chronically ill, and disabled West Virginia adults are vulnerable in situations that challenge their daily routines. Threat preparedness plans (including threat of natural disaster) for West Virginia should include widespread communications to reach these groups and their caregivers.
- Providing care to aging West Virginia adults will become a challenge for family caregivers who often assume those responsibilities. The infrastructure of services provided to the elderly will be a critical need far into the future as the population of West Virginia continues to age, resulting in increasing costs of state and federal programs for the elderly.

Other Resources Addressing Aging West Virginians

Other resources specific to West Virginia involving aging populations are listed below:

- The Elder Economic Security Standard™ Index for West Virginia, 2010. www.umb.edu/editor_uploads/images/WVElderIndexFINAL.pdf
- Health Care in West Virginia: A Workforce Supply and Demand Analysis Report, 2015. http://wvrha.org/wp-content/uploads/2015/12/2015-Draft-WV-Workforce-9-28-15.pdf
- A Look at West Virginia's Aging Population, 1950-2000, HSC Statistical Brief #10, October 2003. www.wvdhhr.org/bph/hsc/statserv/Pub.asp?ID=51
- A Look at West Virginia's Population by Decade, 1950-2000, HSC Statistical Brief #8, May 2002. www.wvdhhr.org/bph/hsc/statserv/Pub.asp?ID=49
- Older West Virginians: Health Highlights, June 2012. www.wvdhhr.org/bph/hsc/Pubs/Other/Aging2011/OlderWV_Health_Highlights.pdf
- Policy Academy State Profile: West Virginia Population, October 2012. www.aoa.acl.gov/AoA_Programs/HPW/Behavioral/docs2/West%20Virginia%20Epi%20Profile%20Final.pdf
- The State of Older Adults in West Virginia, July 2012. www.wvpel.org/downloads/State%20of%20Older%20Adults%20Ec%20Sec%20in%20WV%20July%202012.pdf
- West Virginia Aging Health Status Report, January 2004. www.wvdhhr.org/bph/oehp/hp/aging/aging%20report.pdf
- West Virginia Bureau of Senior Services http://www.wvseniorservices.gov/
- West Virginia Indicators: Aging & Work, February 2008. www.bc.edu/content/dam/files/research_sites/agingandwork/pdf/publications/states/WestVirginia.pdf
- 2012 West Virginia State Health Profile. www.dhhr.wv.gov/publichealthquality/statepublichealthassessment/Documents/2012%20State%20Health%20Profile%20Final%20May%202013.pdf

Other topics include the graying of America, migration or aging-in-place, morbidity versus mortality, decreased life expectancy due to death from chronic diseases, successful aging, income and poverty among the aging, aging and health.

Limitations

WVBRFSS data is obtained from the sample of civilian, noninstitutionalized adults aged 18 years and older, who reside in households with telephones or who are pulled from cell phone samples. Self-reported data is subject to recall and response bias. Timely reporting of mortality data for West Virginia residents is limited by reports obtained from other sources concerning deaths that occur out of state.

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