Aging in Arizona

Health Status of Older Arizonans

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Executive Summary

Aging in Arizona: Health Status of Older Arizonans provides a comprehensive view of the health status, morbidity, and mortality among Arizonans 65 years of age and older. Designed to be a resource for those tasked with developing and implementing health policy for an increasingly aged populace, this report draws from multiple resources on the health, illness, and mortality of Arizona's older adults. Population estimates and projections were used to examine Arizona's current population composition by age and race/ethnicity as well as to estimate how Arizona's population structure will change over the next 40 years. Next, the health behaviors and chronic disease burden experienced by Arizona's seniors were examined using the 2012 Behavioral Risk Factor Surveillance System (BRFSS). Moving from population prevalence of health-related behaviors and morbidities to healthcare utilization among Arizona's aging adults, 2012 Hospital Discharge Data (HDD) was used to summarize emergency room (ER) and inpatient discharges by first-listed diagnosis separated by gender. Finally, the leading causes of death for Arizonans age 65 and older were identified separately by gender in 2012, with recent trends (2002 – 2012) in the leading causes of deaths also being analyzed.

Based on a number of social and epidemiological factors, the coming half century will see an unprecedented shift in the age structure of our society. In Arizona, the total population is expected to increase about 80 percent from 6,401,568 in 2010 to a projected 11,562,584 in 2050, while the number of Arizonans age 65 and older is expected to increase 174 percent from 883,014 in 2010 to 2,422,186 in 2050. As the proportion of Arizonans age 65 and over increases, so will the racial/ethnic diversity of our population as a whole. The increasing number and proportion of older adults in our state will necessitate the strategic planning of cost-effective health and social services to properly care for our older population.

Understanding the health of Arizona's current elderly population provides guidance in preparing for the coming growth of our older population. Compared to older adults nationally, a smaller percentage of Arizona's older population reported prior year flu shots, and this held true for prior year checkups among Arizona's older males. A significantly lower proportion of older Arizonans had been diagnosed with diabetes than nationally, but a greater percentage of Arizona males reported a skin cancer diagnosis than comparably aged males nationally. Comparisons of older adults within Arizona by gender revealed that Arizona's elderly males have a higher prevalence of heart attack and skin cancer diagnoses than Arizona's older females, but elderly females had a greater percentage reporting being diagnosed with asthma. These results suggest that focusing on increasing access to preventative health checkups and flu shots for older Arizonans should become a priority, as should greater attention to cardiovascular health and skin protection among aging men, and treatment of asthma among older women.

Focusing on the current utilization of emergency room (ER) and inpatient hospital services provides another lens to view our current population of older adults and to prepare for their progression in the coming years. According to hospital discharge records from Arizona's

Hospital Discharge Data (HDD), the demographic characteristics of aging Arizonans being discharged from hospitals becomes less diverse with age, reflecting that minority groups have worse health and experience mortality earlier in life than White non-Hispanics, and that female life expectancy tends to be greater than male life expectancy. Among older Arizonans, the overall counts of ER and inpatient discharges were higher for adults in the youngest old (ages 65 – 74), but the rate of discharges increased for the oldest Arizonans (age 85 and older), and in some cases, this increase was substantial. The overall rate of discharges was more than 100% higher for Arizonans in the oldest versus the youngest age group, and this held true for both ER and inpatient discharges. The results indicate that Arizona's older White females experience some of the most severe morbidities and chronic diseases associated with aging and warrant increased attention when developing future policy concerning health and aging. On the other hand, attention to the socioeconomic factors associated with health disparities and earlier mortality among racial/ethnic minorities should become a focus for those developing general policies aimed at promoting health for all Arizonans.

Finally, increasing the quality of life for Arizona's older adults now and into the future requires addressing existing causes and patterns of mortality among the state's aging population. Chronic diseases that are currently most detrimental to the oldest Arizonans, exemplified by Alzheimer's disease among females, will become increasingly problematic as the population of older Arizonans expands. Alternatively, the mortality rates for a number of the leading causes of death have decreased substantially among Arizona's older adults, namely atherosclerotic heart disease and cardiovascular disease among both men and women, stroke among women, and both lung and prostate cancer among men. The decrease in leading causes of death that are somewhat preventable and treatable foretell the increased burden that will be exerted in the future by Alzheimer's disease and dementia, which currently have no known cure. While continuing to reduce the number of deaths caused by the current leading causes of death, it is crucial to begin preparing Arizona's healthcare infrastructure to handle the coming influx of older adults experiencing cognitive diseases.

Overall, the findings of this report suggest that as Arizona's older population grows in both size and proportion of the overall population, primary prevention strategies focused on reducing socioeconomic health disparities and increasing the availability and success of physical, intellectual, and social activities will become increasingly important as means of reducing the population health burden of chronic diseases associated with aging. Further developing our capacity to provide health services to older adults also will increase in importance, but the ability to prevent the development of costly chronic diseases and morbidities associated with aging will be the most successful method of reducing the overall costs of maintaining a healthy aging population.

1. Introduction

1.1 Overview of Aging in Arizona

The current state of health and longevity among aging adults is unprecedented, providing realities that are both exciting and troublesome. Due mainly to broad public health initiatives, the major causes of death in developed countries have shifted from infectious to chronic diseases over the past century. As chronic diseases typically manifest among older adults, this transition has increased overall life expectancies, meaning a greater proportion of the population is living longer than ever before (CDC 2013). Coupled with increasing longevity, birth rates in the United States spiked after World War II but decreased sharply by the mid-1970s (CDC 2003). The combination of increased longevity and changing birth rates has caused our population's age-structure to shift, increasing the proportion of older adults experiencing the costs of chronic diseases, while simultaneously decreasing the number of younger working adults who contribute to Social Security and welfare systems through wage deductions. As the baby boom generation is just beginning to reach older adulthood, the impact of these population dynamics has yet to be fully realized.

Arizona's population of older adults represents a diverse set of perspectives coming from a wide variety of backgrounds. With increased longevity and the ability to be productive for more years of life than previous generations, Arizona's aging adults are an increasingly valuable resource. At the same time, health problems associated with aging present difficult realities that Arizonans must face together. In coming years, the composition of Arizona's older adult population will shift, increasing in overall numbers, representing a larger proportion of our population, and becoming more racially/ethnically diverse than at present. To prepare for the changing landscape of Arizona's older adults, it is imperative to understand the existing health characteristics of Arizona's older adult population.

1.2 Methodology

This report aims to provide relevant information on the current state of health among Arizona's older adults to those tasked with the planning and development of the public policy, healthcare infrastructure, and social support systems needed to address the changing needs of Arizona's older adults. To aid in these efforts, we provide analysis of Arizona's changing population structure, the prevalence of common chronic diseases among aging Arizonans, trends in utilization of emergency room and inpatient hospital services by older adults, and finally trends in mortality among older Arizonans. It is our hope to support the healthy aging of Arizona's older adults by providing information important to those working with and for Arizona's seniors.

This report summarizes data from multiple sources and across multiple years. Population projections were developed by the Arizona Department of Administration's (ADOA) Office of Employment and Population Statistics (http://azstats.gov/population-estimates.aspx). Information

on the prevalence of health behaviors and common chronic diseases was derived from the Behavioral Risk Factor Surveillance System (BRFSS), a survey conducted in Arizona and across the United States that provides population-level estimates of important health indictors. Counts of hospital emergency room and inpatient healthcare utilization were drawn from the Arizona Department of Health Services' (ADHS) Hospital Discharge Data (HDD). Finally, morality rates were calculated using data from the ADHS Office of Vital Records death database.

Each section of this report includes a thorough introduction of the topic being discussed, complete descriptions of the data and analytic methods used, descriptions of the demographic characteristics of those included in each study (excluding the population projections section), analysis of the results, and a brief discussion of the results. The separate sections were designed so users could interpret each section independently without needing to reference other sections. It is our hope to benefit the health of all Arizonans through providing information to assist the coordinated planning of programs and interventions designed to effectively address the realities of our aging population.

2. Population Projections

2.1. Introduction

Two essential tasks involved in planning health policy and social services for Arizona's aging adults are the assessment of Arizona's current population age structure and the development of projections describing the characteristics of Arizona's future population. In 2010, about 14 percent of Arizonans were 65 years of age or older, with about 83 percent of these residents being White non-Hispanic. Changes in aspects of fertility, mortality, and immigration will affect the age-structure of Arizona's population, placing increasing stress on welfare systems designed to care for older adults. For example, the entire population of Arizona is projected to increase by more than 80 percent from the 6,401,568 residents estimated to have lived in Arizona on July 1st, 2010 to a projected 11,562,584 by 2050. The number of Arizonans age 65 and older is expected to increase 174 percent from 883,014 in 2010 to 2,422,186 in 2050. The age structure of our population also will shift, increasing the proportion of adults age 65 and older in the population to an estimated 21 percent of the entire population. This will be accompanied by a decrease in the proportion of working-age Arizonans who help support older adults in numerous ways including paying taxes on wages that help fund Social Security and Medicare. Along with an increase in the overall number and proportion of residents represented by adults age 65 and older, Arizona's population will become more heterogeneous and diverse in terms of race/ethnicity. The interplay of these factors presents a difficult scenario for those tasked with planning health policy to accommodate the changing characteristics of Arizona's older adult population.

2.2 Methodology

The population projections used in this report were developed by the Arizona Department of Administration's Office of Employment and Population Statistics (http://azstats.gov/population-estimates.aspx). Using adjusted 2010 census counts as a baseline, the cohort-component method was used to create population projections by age, sex, race, and ethnic group for each year from 2011 through 2050. The cohort-component method of population projection is designed to estimate projected populations by taking into account multiple inputs to population change including current population, rates of fertility, mortality, and migration, as well as special populations such as military and college students.

The ADOA population projections were aggregated every 10 years to create projected population estimates by age and racial/ethnic group. These estimates were used to compare the racial/ethnic distribution of Arizona's total population to the population of adults age 65 and older. Population pyramids were created to visually compare the population distribution of Arizonans by 5-year age group and sex for 2010 and 2050, and dependency ratios were used to compare the number of economically inactive residents to the number of economically active residents (calculated as the sum of Arizona residents age 0 – 14 and age 65 and older divided by the number of Arizona residents age 15 – 64).

2.3 Results

Table 1 provides counts from the Arizona July 1st, 2010 population estimates and population projections for each decade from 2020 – 2050 separately for all Arizonans and for Arizonans ages 65 and older by race/ethnicity. Beginning with the projected population for all Arizona residents, Arizona's overall population is expected to increase 81 percent from the 6,401,568 residents estimated in 2010 to a projected 11,562,584 in 2050. Compared to the population as a whole, the population of older adults is expected to increase at a much faster pace. By 2050, Arizona's older adult population is projected to be 2,422,186, a 174 percent increase from the 883,014 measured in 2010.

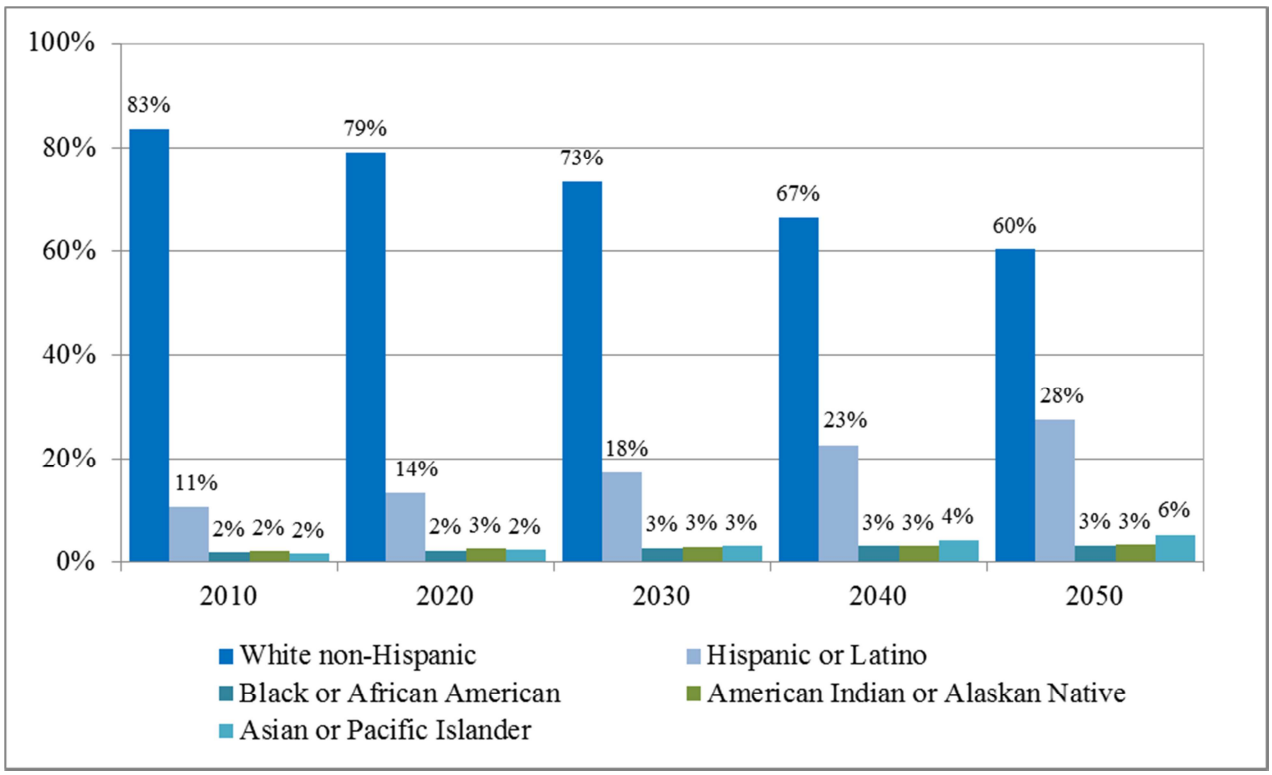
Table 1. Projection of Arizona's Total Population and Population age 65 and Older by Race/Ethnicity, 2010 – 2050

Arizona Population	2010		2020		2030		2040		2050	
Race/Ethnicity	Population Estimate	%	Population Projection	%	Population Projection	%	Population Projection	%	Population Projection	%
White non-Hispanic	3,824,322	60%	4,148,309	55%	4,525,074	51%	4,827,968	47%	5,070,854	44%
Hispanic or Latino	1,839,016	29%	2,421,104	32%	3,197,808	36%	4,037,115	40%	4,911,772	42%
Black or African American	259,432	4%	312,413	4%	378,459	4%	443,674	4%	507,959	4%
American Indian or Alaskan Native	297,038	5%	345,293	5%	393,011	4%	434,629	4%	472,728	4%
Asian or Pacific Islander	181,760	3%	258,044	3%	358,293	4%	475,022	5%	599,271	5%
Total	6,401,568		7,485,163		8,852,645		10,218,407		11,562,584	
Percent Change from 2010			17%		38%		60%		81%	
Arizona Population 65 and older	2010		2020		2030		2040		2050	
Race/Ethnicity	Population Estimate	%	Population Projection	%	Population Projection	%	Population Projection	%	Population Projection	%
White non-Hispanic	736,572	83%	1,028,631	79%	1,331,559	73%	1,433,756	67%	1,460,620	60%
Hispanic or Latino	94,706	11%	176,710	14%	317,485	18%	490,430	23%	666,309	28%
Black or African American	17,349	2%	29,815	2%	50,243	3%	66,464	3%	79,718	3%
American Indian or Alaskan Native	20,047	2%	34,006	3%	55,140	3%	69,576	3%	81,764	3%
Asian or Pacific Islander	14,339	2%	31,579	2%	59,084	3%	95,565	4%	133,775	6%
Total	883,014		1,300,742		1,813,511		2,155,790		2,422,186	
Percent Change from 2010			47%		105%		144%		174%	
Proportion of population age 65+	14%		17%		20%		21%		21%	

In addition to a disproportionate increase in the growth of Arizonans age 65 and older, the racial/ethnic distribution of Arizona's older adult population is projected to undergo substantial change. Arizona's older resident population was fairly homogenous in terms of race/ethnicity in 2010, with about 83 percent of Arizona's older adult residents being White non-Hispanic. About 11 percent of Arizona residents age 65 and older in 2010 were Hispanic or Latino, with Blacks or African Americans, American Indians or Alaskan Natives, and Asians or Pacific Islanders each accounting for about 2 percent of the total population of Arizona's older adults.

The observed racial/ethnic status of Arizona's older adults in 2010 stands in contrast to the projected racial/ethnic composition of Arizona's older adults in 2050. As displayed in Table 1 and Figure 1, the proportion of older Arizonans who are White non-Hispanic is expected to decrease 23 percent from 2010 to 2050, with the proportion of the population being Hispanic or Latino increasing by 17 percent. The percentage of Arizona's older adult population who are Asian or Pacific Islander, Black or African American, and American Indian or Pacific Islander also is expected to increase, but at a much lower rate than that of Hispanics.

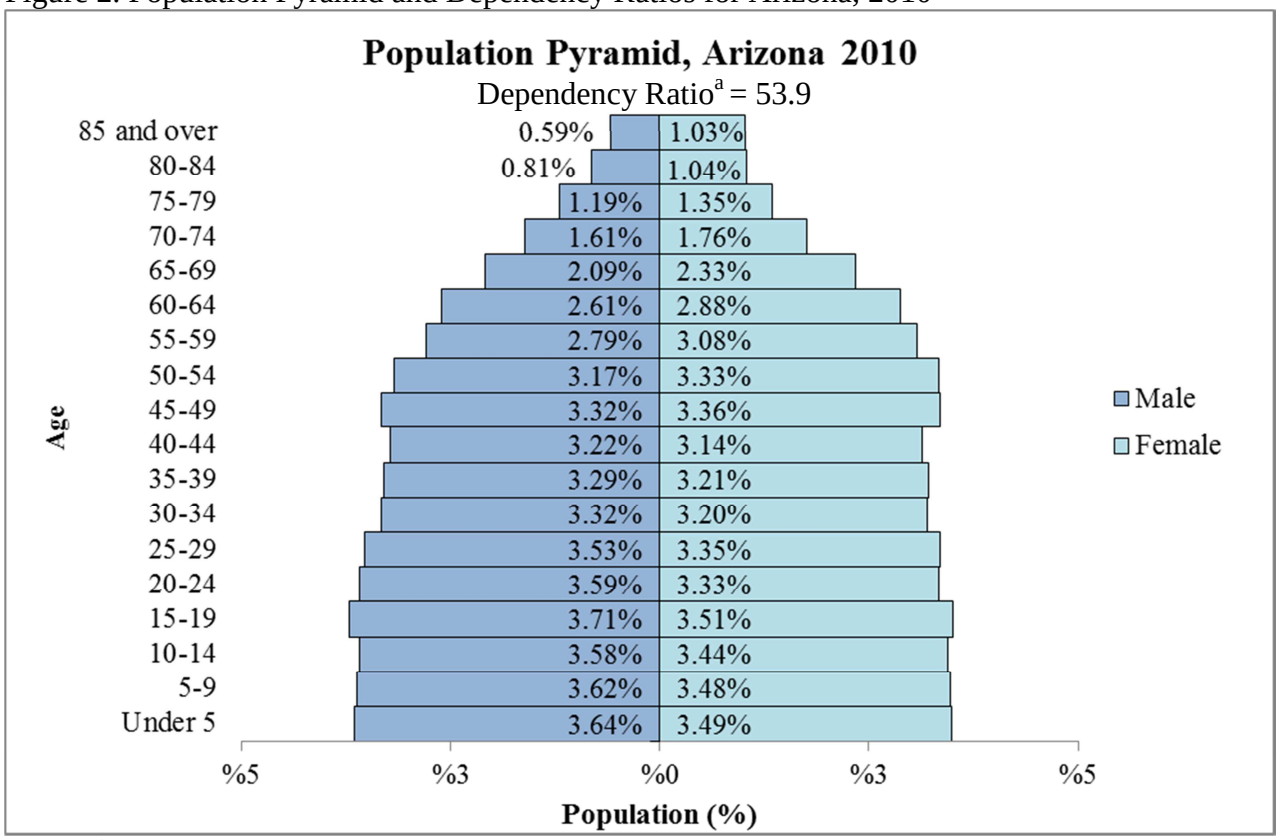
Figure 1. Projections of Arizona's Population of Adults Age 65 and Older by Race/Ethnicity, 2010 – 2050



Finally, Figures 2 and 3 provide representation of Arizona's population age distribution by gender and age-group for 2010 and 2050. Included in the figures are the dependency ratios for 2010 and 2050, expressing the ratio of dependent individuals (the young and old who typically do not work) to working members of society (those aged 15 – 64 who typically do work).

In 2010, the population pyramid can be described as roughly stationary, meaning birth rates have remained stable over recent years (indicated by the fairly even distribution of population by age group and gender from age 5 and under to age 50 – 54) and that death rates among older adults were relatively low. The dependency ratio in 2010 was fairly balanced at 53.9, meaning for every 100 working individuals there were about 54 individuals who were likely not working.

Figure 2. Population Pyramid and Dependency Ratios for Arizona, 2010

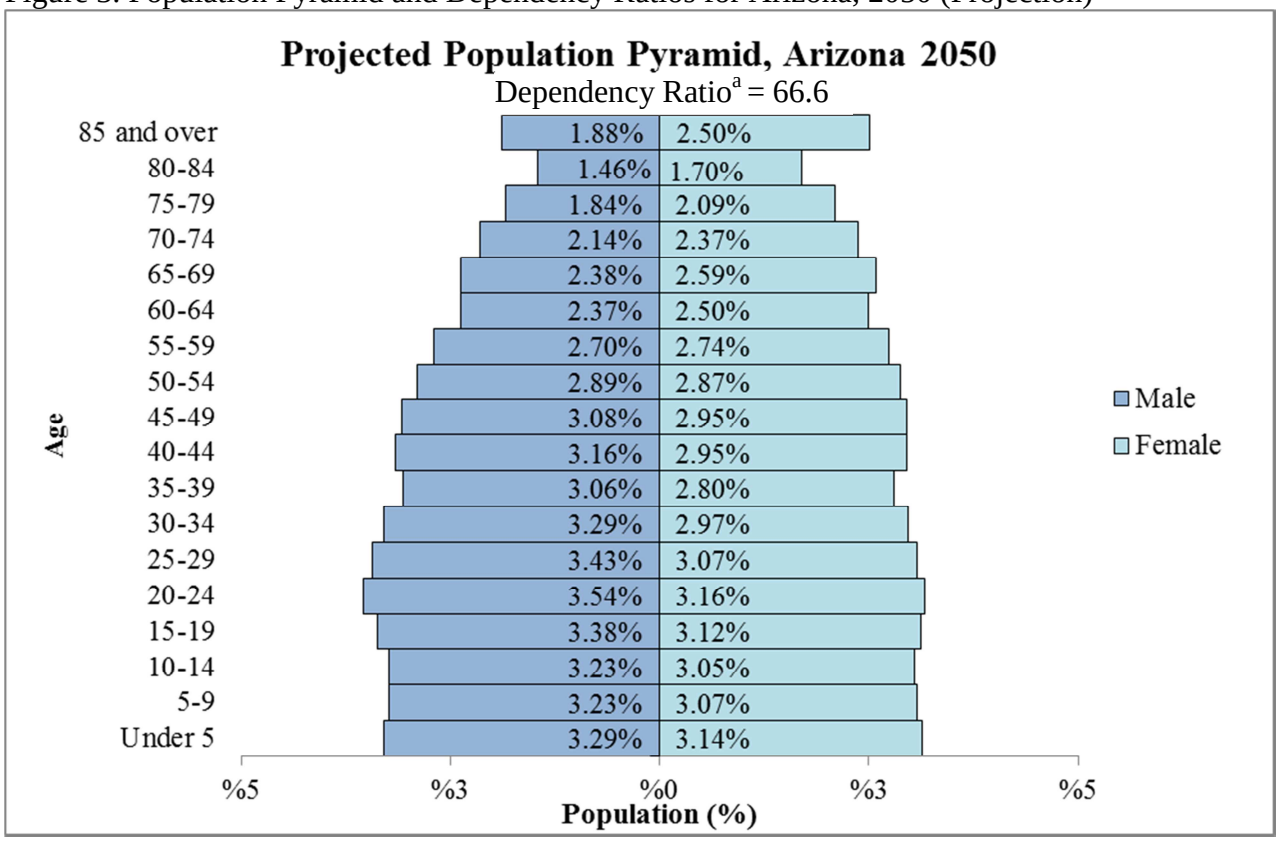


Notes: [a] Dependency ratio = (Arizona residents 0 – 14 years + Arizona residents 65 + years)/ Arizona residents 15 – 64.

In comparison, the population pyramid representing Arizona's projected population age composition in 2050 can be described as contractive, meaning the birth rate (represented by those under the age of 5) is low (compared to 2010), and the dependency ratio is high. In 2050, it is projected that there will be nearly 67 individuals dependent on the wages and taxes of every 100 working individuals in Arizona.

Looking closer at the distribution of Arizonans age 65 and older in 2010 and 2050, it is clear that a greater proportion of the population will be age 65 and older in 2050 than were in 2010. Specifically, the proportion of adults age 65 and older in 2010 was about 14 percent while the projected proportion of the population ages 65 and older in 2050 will be about 21 percent. This is especially transparent at the oldest ages, with the percent of the population represented by men and women age 85 and older in 2050 being 2.7 percent greater than in 2010. This means that by 2050, not only will a greater proportion of Arizona's population be among Arizona's older adults, but also that a greater proportion of Arizona's older adult population will be represented in the oldest age groups.

Figure 3. Population Pyramid and Dependency Ratios for Arizona, 2050 (Projection)



Notes: [a] Dependency ratio = (Arizona residents 0 – 14 years + Arizona residents 65 + years)/ Arizona residents 15 – 64.

2.4 Conclusion

Based on the population projections analyzed here, Arizona can expect a rapidly increasing number of residents age 65 and older who will come to account for a greater proportion of the overall population than they currently do. This increasing percentage of Arizonans age 65 and older will be more racially and ethnically diverse than the current population of older adults, meaning specialized courses of intervention and treatment will need to be developed to address health outcomes that disproportionately affect Hispanic and Latino older adults.

The confluence of these forces requires targeted and effective policies that will help reduce the costs of the healthcare burden posed by a greater proportion of adults living with chronic diseases associated with aging. To help guide these discussions, this report attempts to describe the current health of Arizona's older adult population, the patterns of their interactions with the healthcare system, and the common causes of mortality they must face. In doing so, we hope to offer useful information to support the progression of health and wellness among Arizona's aging population.

3. Health Behaviors and Chronic Diseases among Aging Arizonans

3.1 Introduction

Estimating the population prevalence of health risk factors and common chronic diseases is a crucial step in the planning of targeted and effective healthcare policy. The use of survey methodology provides an accurate and cost-effective means of estimating the population prevalence of health indicators without the burden of interviewing every state resident. The Behavioral Risk Factor Surveillance System (BRFSS) is a survey conducted in Arizona and across the United States to provide population-level estimates of important health indictors. To better understand the health behaviors of Arizona's aging population, the 2012 Arizona BRFSS survey was used to estimate the percentage of Arizona adults age 65 and older with health-related behaviors known to either harm or protect health, including exercise and obesity, routine checkups, smoking, and heavy drinking. The percentage of Arizonans living with common morbidities and chronic disease including poor mental or physical health, mobility limitations, cardiovascular diseases, cerebrovascular diseases, cancers, and pulmonary diseases was also estimated and compared to national estimates.

3.2 Methodology

The BRFSS, a telephone survey that uses random-digit dialing of both landlines and cellphones, is conducted in all 50 U.S. states as well as the District of Columbia and 3 U.S. territories (http://www.cdc.gov/brfss/about/brfss_faq.htm). The Centers for Disease Control (CDC) partners with U.S. states and territories to conduct the BRFSS survey. The survey is designed to measure the prevalence of behavioral risk factors of adults age 18 and older at the household level and to provide estimates of morbidity prevalence that are both nationally and locally representative of non-institutionalized adult populations. Sampling at the household level means older adults living in retirement facilities or nursing homes are not included in the BRFSS population. More detailed information on the survey design and execution can be found at the following address: http://www.cdc.gov/brfss/annual_data/2012/pdf/Overview_2012.pdf.

To examine health behaviors and chronic diseases among Arizona's non-institutionalized older adults, data collected in the 2012 BRFSS was restricted to adults age 65 and older. Demographic and socioeconomic characteristics of Arizona's older adult population are reported initially. Arizona's older adult residents were compared to the national population of adults age 65 and older on a number of health behaviors including physical activity or exercise within the past month, being either overweight or obese (having a body mass index (BMI) of 25 or greater), having routine health checkups, dental checkups, and receiving a flu shot in the past year. For males, having received a prostate specific antigen (PSA) test in the past year, and for females, having received a breast exam in the past year, also are examined. Additional measures included being a current smoker and engaging in heavy drinking (> 2 drinks a day for males and > 1 drink a day for females). Indicators of broad health status included poor mental or physical health for all of the past 30 days, activity limitations, and use of special equipment. Common chronic

diseases examined included any of the following conditions: angina or coronary heart disease, heart attack, stroke, diabetes, skin cancer, non-skin cancer, asthma, and chronic obstructive pulmonary disease (COPD). Weighted percentages were produced for Arizona and the U.S. for each health indicator, then the standard error of the weighted percent was used to construct 95% confidence intervals. For each indicator, the confidence interval around the estimated percentage for Arizonans was compared to the estimate and confidence interval for the U.S. In this method, if the 95% confidence interval for Arizona and the U.S. did not overlap, it can be stated that there was a statistically significant difference between Arizona and the U.S. on the given indicator. The weighted estimates and confidence intervals were calculated separately by gender to account for health disparities between genders that widen with age and also allowing for comparison of older adults within Arizona by gender.

3.3 Results

Socioeconomic and Demographic Characteristics

Table 2 provides the number of unweighted completed BRFSS interviews, weighted frequencies, percentages, and standard errors for the sociodemographic characteristics of Arizona residents age 65 and older in 2012. It was estimated that about 55 percent of Arizona's population of non-institutionalized older adults were female. About 82 percent of Arizona residents age 65 and over were White non-Hispanic and about 10 percent were Hispanic, with Asians/Pacific Islanders, American Indians, or adults of other racial/ethnic backgrounds, each accounting for approximately 1.5 percent of Arizona's older population each. Concerning education, 11 percent of older Arizonans had less than a high school education, about 26 percent had earned a high school degree, and more than 60 percent reported having either attended college/technical school without earning a degree or had graduated from college/technical school. The majority of Arizonans age 65 and older were retired (72.8%), about 9 percent were employed, about 7 percent reported employment as homemakers, or being self-employed, out of work, unable to work, or students, representing a small proportion of older Arizonans. Likely related to the high percentage of retired older Arizonans, Arizonans making less than $25,000 per year (26.2%) accounted for the greatest percentage of any income group. For other income groups, the remaining Arizonans were distributed fairly evenly, with 11 to 15 percent of respondents falling within each group. A large percentage of respondents (20.6%) reported their income as either unknown or had refused to answer the income question.

Health Behaviors among Arizona's Older Adults

The current health behaviors of Arizona's older adult population are leading indicators of morbidities and chronic diseases that can result from health maintenance behavior. Table 3 provides estimates of 10 health-related behaviors, which are then depicted in Figures 4 through 6. Comparing Arizona's older adult males to older males nationally, Arizona males were generally comparable to males of the same age nationally, excluding their use of preventative health services. More than 72 percent of Arizona's older males reported having some physical activity or exercise within the past month, but nearly 70 percent of Arizona's males 65 and older had a BMI of 25 or greater, indicating being either overweight or obese. Within a year of being interviewed, nearly 80 percent of Arizona's older males had a routine health checkup, about 50

Table 2. Arizona Behavioral Risk Factor Surveillance System (BRFSS) Estimates of Sociodemographics among Adults age 65 and Older, 2012

		Freq	Weighted Freq	Weighted %	SE of Weighted %
Gender	Male	1,064	410,268	45.46	1.48
	Female	1,678	492,224	54.54	1.48
Race	White Non-Hispanic	2,295	736,896	81.65	1.33
	Black	22	13,989	1.55	0.40
	Asian/PI	16	10,908	1.21	0.48
	American Indian	39	13,435	1.49	0.39
	Other	53	11,660	1.29	0.28
	Hispanic	253	93,673	10.38	1.12
	Missing	64	21,930	2.43	0.47
Education	Did not graduate high school	251	97,425	10.80	1.09
	Graduated high school	769	236,005	26.15	1.27
	Attended college/tech school	828	337,190	37.36	1.46
	College/tech school graduate	881	223,680	24.78	1.12
	Refused	13	8,191	0.91	0.42
Employment	Employed for wages	212	82,912	9.19	0.89
	Self employed	118	38,683	4.29	0.59
	Out of work	42	18,633	2.06	0.45
	Homemaker	202	70,230	7.78	0.82
	Student	3	1,123	0.12	0.08
	Retired	2,037	656,737	72.77	1.34
	Unable to Work	112	30,407	3.37	0.56
	Refused	16	3,766	0.42	0.16
Income	<$25,000	830	236,537	26.21	1.28
	$25,000-$34,999	340	102,437	11.35	0.87
	$35,000-$49,999	412	140,826	15.60	1.09
	$50,000-$74,999	327	119,016	13.19	1.02
	$75,000+	330	117,382	13.01	0.95
	Unknown/Refused	503	186,294	20.64	1.89

Notes: Mean age for resident males 65 and over = 73.9 years, mean age for resident females = 74.4 years.

percent had received a flu shot, nearly 65 percent had a dental checkup, and about 80 percent had a PSA test. As identified in Figure 4, a significantly lower percentage of Arizona males reported having routine health checkups and flu shots in the prior year than comparably aged males nationally. Nearly 10 percent of Arizona's males age 65 and older reported being a current smoker, only 3.8 percent reported having more than two drinks every day, and nearly 90 percent reported always wearing a seatbelt when they drive.

Regarding Arizona's females, about 70 percent of Arizona's older females reported having some exercise or physical activity in the past 30 days and just over 50 percent had a BMI identifying them as either overweight or obese. A significantly lower percentage of Arizona's older females had a BMI identifying them as either overweight or obese (Est. = 53.4%, 95% C.I. = .50-.57) than older females nationally (Est. = 60.0%, 95% C.I. = .59-.61). In the year prior to

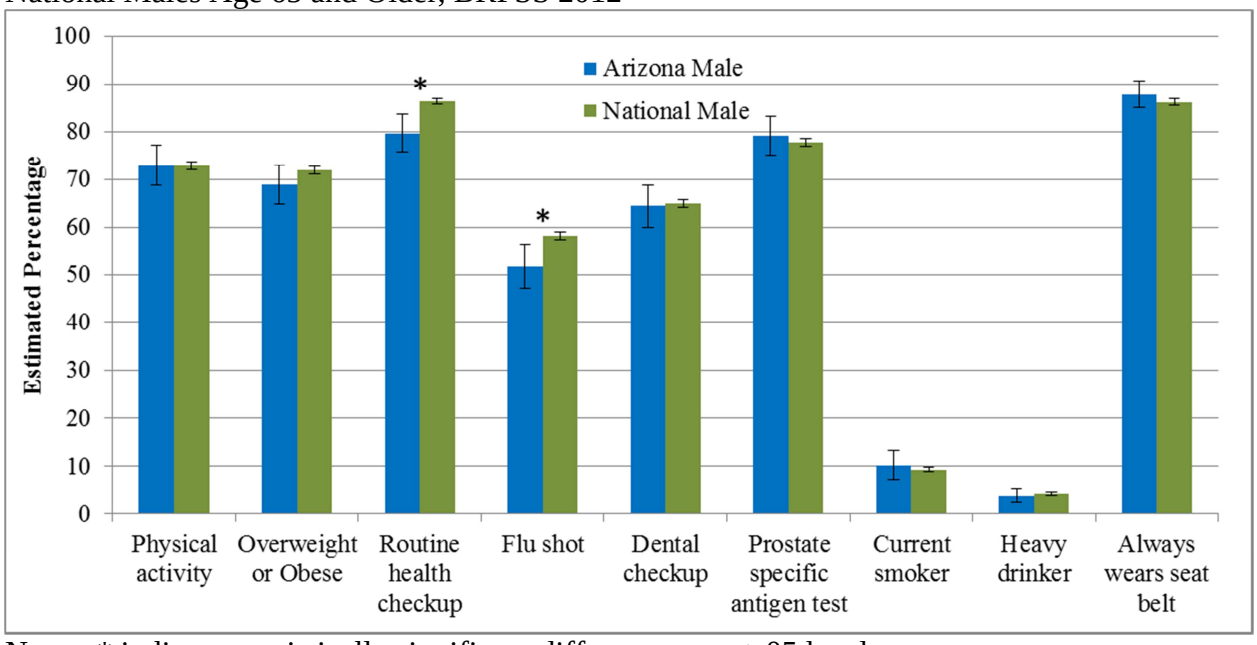
Table 3. Arizona Behavioral Risk Factor Surveillance System (BRFSS) Estimates of Health Behaviors among Adults age 65 and Older, 2012

	Arizona male			National male			Arizona female			National female		
	Est	SE	95% CI	Est	SE	95% CI	Est	SE	95% CI	Est	SE	95% CI
Physical activity past 30 days	72.9%	.02	.69-.77	72.8%	.00	.72-.74	69.4%	.02	.66-.73	65.5%	.00	.65-.66
Overweight or obese[a]	68.8%	.02	.65-.73	71.9%	.00	.71-.73	53.4%	.02	.50-.57	60.0%	.00	.59-.61
Health checkup past year	79.6%	.02	.76-.84	86.4%	.00	.86-.87	84.9%	.01	.82-.87	87.7%	.00	.87-.88
Flu shot within past year	51.7%	.02	.47-.56	58.2%	.00	.57-.59	52.8%	.02	.49-.57	59.4%	.00	.59-.60
Dental checkup past year	64.4%	.02	.60-.69	64.9%	.00	.64-.66	66.6%	.02	.63-.70	67.4%	.00	.67-.68
PSA[b] test past year	79.1%	.02	.75-.83	77.7%	.00	.77-.78	-	-	-	-	-	-
Breast exam past year	-	-	-	-	-	-	62.5%	.02	.59-.66	63.1%	.00	.62-.64
Current smoker	10.1%	.02	.07-.13	9.4%	.00	.09-.10	9.0%	.01	.07-.11	8.0%	.00	.08-.08
Heavy drinker[c]	3.8%	.01	.02-.05	4.2%	.00	.04-.05	4.5%	.01	.03-.06	3.5%	.00	.03-.04
Always wears seat belt	87.8%	.01	.85-.91	86.2%	.00	.86-.87	92.4%	.01	.91-.94	92.9%	.00	.93-.93

Notes: [a] (BMI) greater than or equal to 25 (overweight or obese); [b] Prostate specific antigen; [c] (Men > 2 drinks per day, Women > 1 drink per day).

interview, nearly 85 percent of Arizona's females age 65 and older had a routine health check-up, about 53 percent had a flu shot, around 67 percent had a dental checkup, and about 63 percent had a breast exam. Similar to Arizona's older males, a significantly lower percentage of Arizona's females reported receiving a flu shot in the past year (Est. = 52.8%, 95% C.I. = .49-.57) than comparably aged females nationally (Est. = 59.4%, 95% C.I. = .59-.60). Nine percent or Arizona's older females reported being a current smoker, about 5 percent were classified as heavy drinkers, and more than 90 percent reported always wearing a seatbelt when in an automobile.

Figure 4. Estimates of Population Health Behaviors with 95% Confidence Intervals, Arizona and National Males Age 65 and Older, BRFSS 2012



Notes: * indicates statistically significant difference at $p < .05$ level.

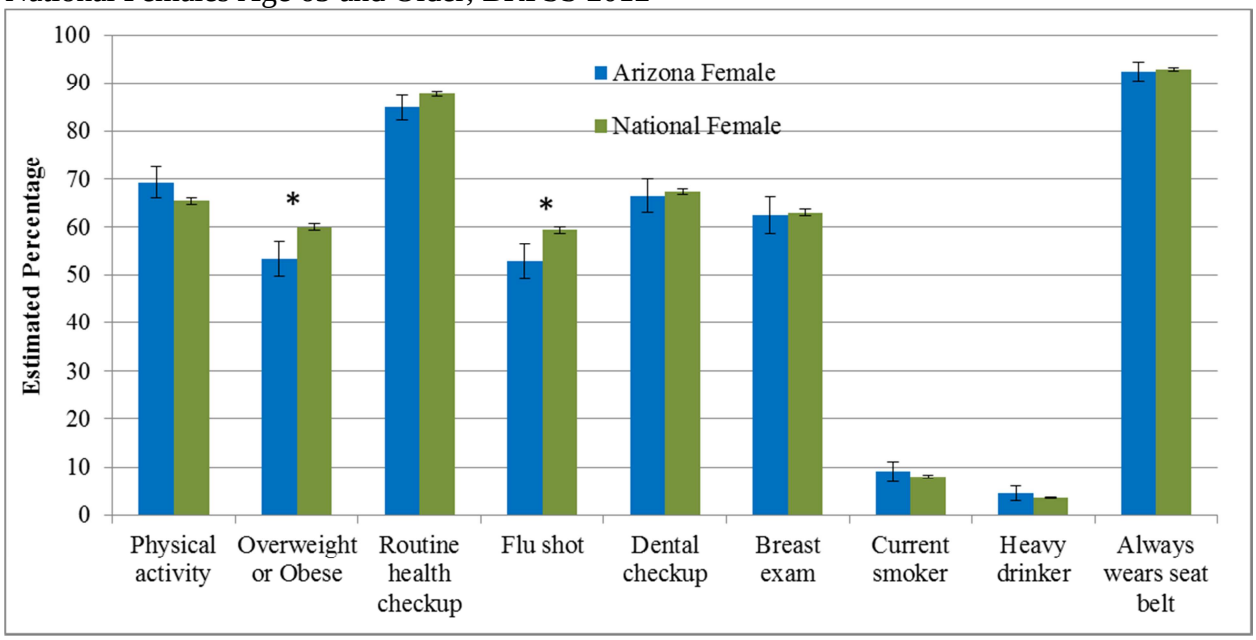
When comparing Arizona's older males to Arizona's older females, the only difference that was statistically significant was for the percentage classified as overweight or obese based on BMI. A significantly higher percentage of Arizona's males age 65 and older were either overweight or obese (Est. = 68.8%, 95% C.I. = .65-.73) than Arizona's older females (Est. = 53.4%, 95% C.I. = .50-.57). While statistically significant, BMI is a crude measure of one's body composition that does not account for factors such as muscle mass or bone density that may vary by gender. Though this difference does raise some concern that Arizona's older males may be at risk for weight-related health issues, it also should be interpreted cautiously due to the imprecision of BMI as a measure of healthy weight, which may differ for males and females.

Morbidity among Arizonans Age 65 and Older

Table 4 provides weighted estimated percentages with standard errors for 12 common morbidities faced by older adults reported for Arizona and the U.S. by gender. These estimates are included in Figure 7 for males, Figure 8 for females, and Figure 9 compares Arizona's older males to Arizona's older females.

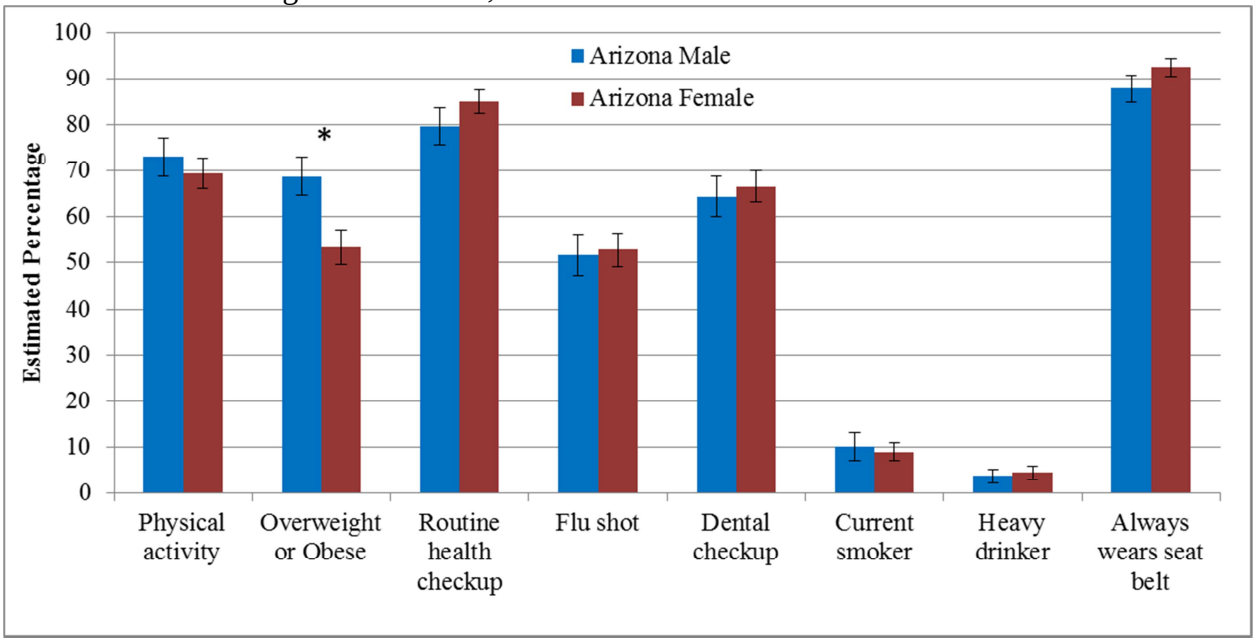
Beginning with Arizona males age 65 and older in 2012, about 4 percent reported having poor mental health all 30 days prior to being interviewed. In contrast, approximately 28 percent of Arizona males age 65 and older reported experiencing poor physical health all 30 days prior to being interviewed. About 29 percent of Arizona's older males reported activity limitations due to health problems (physical, mental, or emotional), and about 14 percent reported health problems requiring the use of special equipment such as a cane, wheelchair, or special bed. The estimates for Arizona males on these health indicators were similar to national estimates.

Figure 5. Estimates of Population Morbidity with 95% Confidence Intervals, Arizona and National Females Age 65 and Older, BRFSS 2012



Notes: * indicates statistically significant difference at $p < .05$ level.

Figure 6. Estimates of Population Health Behaviors with 95% Confidence Intervals, Arizona Males and Females Age 65 and Older, BRFSS 2012



Notes: * indicates statistically significant difference at $p < .05$ level.

Moving to specific chronic diseases among Arizona's older male population, about 15 percent of Arizona males age 65 and older reported being diagnosed with angina or coronary heart disease, and about 16 percent reported having a heart attack. More than 6 percent of Arizona males reported being diagnosed as having a stroke. Nearly 20 percent of Arizona males age 65 and older reported having diabetes (Est. = 19.5%, 95% C.I. = .16-.23), which was significantly lower than the percent of males age 65 and over reporting diabetes nationally (Est. = 24.2%, 95% C.I. = .23-.25).

A significantly greater percentage of Arizona's older males reported having skin cancer (Est. = 25.1%, 95% C.I. =.21-.29) than the national average (Est. = 19.8%, 95% C.I. =.19-.20), but percentages for cancers other than skin were similar (Arizona male = 17.6%, national male = 17.8%). Regarding pulmonary issues, about 8 percent of Arizona's older males reported being diagnosed with asthma and 11 percent reported being diagnosed with chronic obstructive pulmonary disease (COPD).

Morbidity among Arizona's Females age 65 and Older

Arizona's population of females age 65 and older had a significantly lower percentage reporting poor mental health 30 days prior to interview (Arizona Est. = 2.4%, 95% C.I. =.01-.03; U.S. Est. = 3.9%, 95% C.I. =.04-.04), which was also true for poor physical health (Arizona Est. = 19.4%, 95% C.I. =.15-.24; U.S. Est. = 25.1%, 95% C.I. =.24-.26). About 29 percent of Arizona's older females reported some activity limitations, and nearly 19 percent reported the need to use special equipment.

Table 4. Arizona Behavioral Risk Factor Surveillance System (BRFSS) Estimates of Population Morbidity, 2012

	Arizona male			National male			Arizona female			National female		
	Est	SE	95% CI	Est	SE	95% CI	Est	SE	95% CI	Est	SE	95% CI
Poor mental health	3.6%	.01	.02-.05	3.4%	.00	.03-.04	2.4%	.00	.01-.03	3.9%	.00	.04-.04
Poor phsyical health	27.6%	.04	.20-.35	27.5%	.01	.26-.29	19.4%	.02	.15-.24	25.1%	.00	.24-.26
Activity Limitations	28.5%	.02	.25-.33	28.3%	.00	.27-.29	29.4%	.02	.26-.33	30.2%	.00	.30-.31
Require Special Equipment	14.0%	.01	.11-.17	15.3%	.00	.15-.16	18.6%	.01	.16-.22	20.3%	.00	.20-.21
Angina or CHD[a]	14.9%	.02	.12-.18	17.0%	.00	.16-.18	10.2%	.01	.08-.13	9.6%	.00	.09-.10
Heart Attack	16.3%	.02	.13-.20	16.2%	.00	.16-.17	9.4%	.01	.07-.12	8.1%	.00	.08-.08
Stroke	6.4%	.01	.04-.08	7.7%	.00	.07-.08	6.3%	.01	.04-.08	6.9%	.00	.07-.07
Diabetes	19.5%	.02	.16-.23	24.2%	.00	.23-.25	15.9%	.01	.13-.19	19.4%	.00	.19-.20
Skin Cancer	25.1%	.02	.21-.29	19.8%	.00	.19-.20	17.4%	.01	.15-.20	14.4%	.00	.14-.15
Non-skin cancer	17.6%	.02	.14-.21	17.8%	.00	.17-.18	16.9%	.01	.14-.20	16.0%	.00	.16-.17
Ashtma	8.5%	.01	.06-.11	9.0%	.00	.08-.09	13.8%	.01	.11-.17	12.7%	.00	.12-.13
COPD[b]	10.9%	.01	.08-.14	10.8%	.00	.10-.11	12.7%	.01	.10-.15	12.3%	.00	.12-.13

Notes: [a] Coronary heart disease; [b] Chronic obstructive pulmonary disease.

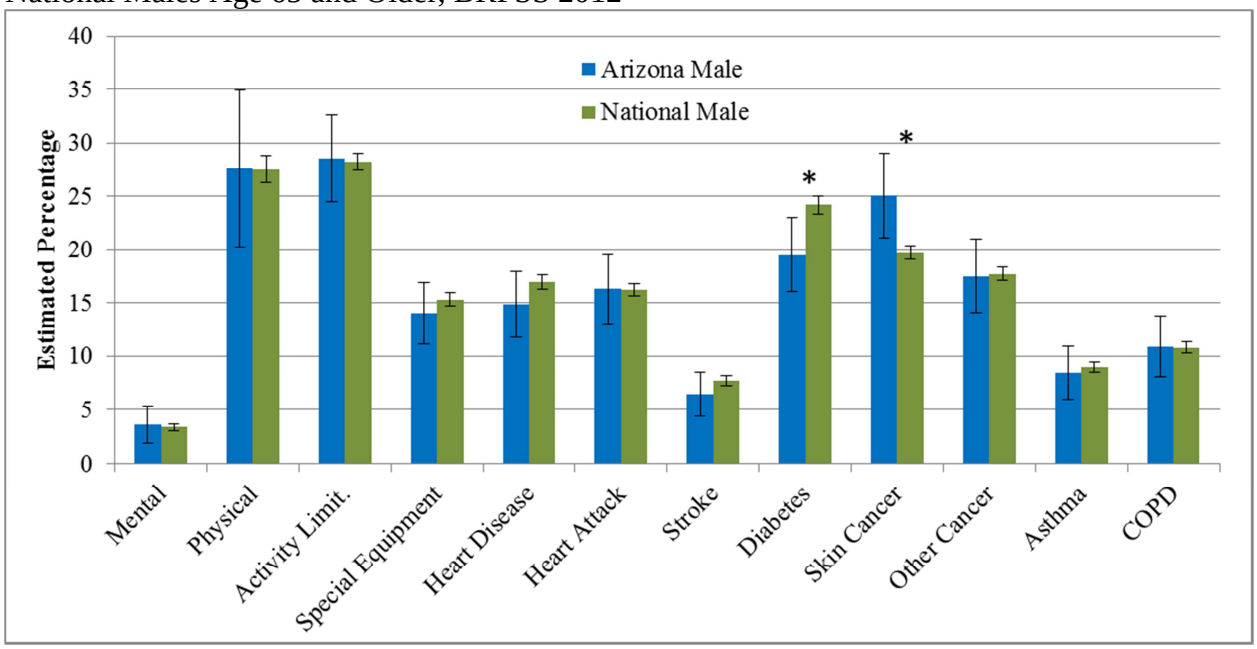
For the specific chronic diseases being examined, about 10 percent of Arizona's female population age 65 and older reported being diagnosed with angina or coronary heart disease and about 9 percent reported having been diagnosed as having had a heart attack. Less than 6 percent of Arizona's older females reported having a prior stroke, with nearly 16 percent reporting being diagnosed with diabetes.

The prevalence of diabetes among Arizona females age 65 and older (Est. = 15.9%, 95% C.I. =.13-.19) was significantly lower than for comparable females nationally (Est. = 19.4%, 95% C.I. =.19-.20). The percentage of Arizona's females reporting skin cancer (17.4%) was higher than the national average (14.4%), but this difference was not statistically significant. The prevalence of being diagnosed with a non-skin cancer was similar among Arizona's older females (16.9%) and females of similar ages nationally (16.0%). About 14 percent of Arizona's older female population reported being diagnosed with asthma and nearly 13 percent reported a diagnosis of chronic obstructive pulmonary disease (COPD).

Comparing Arizona's Male and Female Aging Adults

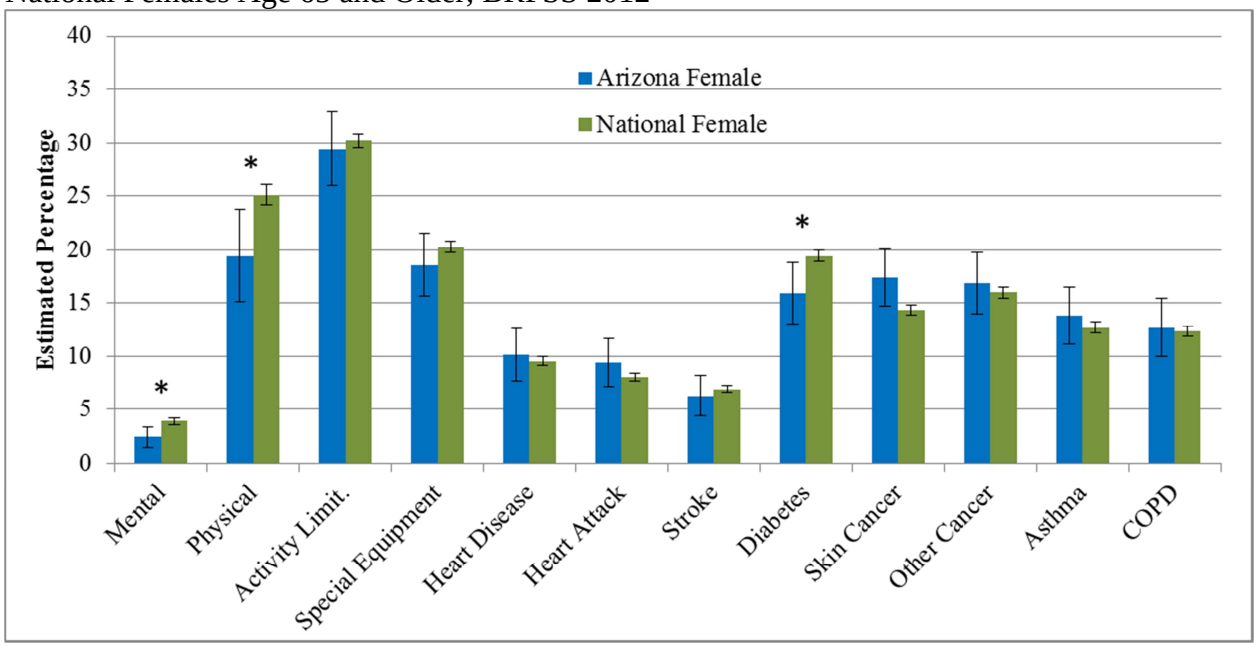
There was a significant difference between males and females for only 3 of the 12 indicators of morbidity examined among Arizona's aging adults. A significantly higher percentage of males reported being diagnosed with having a heart attack (Est. = 16.3%, 95% C.I. =.13-.20) than did females (Est. = 9.41%, 95% C.I. =.07-.12). A greater percentage of Arizona's older males (Est. = 25.1%, 95% C.I. =.21-.29) reported a diagnosis of skin cancer than Arizona's older females (Est. = 17.4%, 95% C.I. =.15-.20). Finally, among adults age 65 and older, Arizona females had a significantly greater percentage reporting asthma (Est. = 13.8%, 95% C.I. =.11-.17) than Arizona's males (Est. = 8.5%, 95% C.I. =.06-.11).

Figure 7. Estimates of Population Morbidity with 95% Confidence Intervals, Arizona and National Males Age 65 and Older, BRFSS 2012



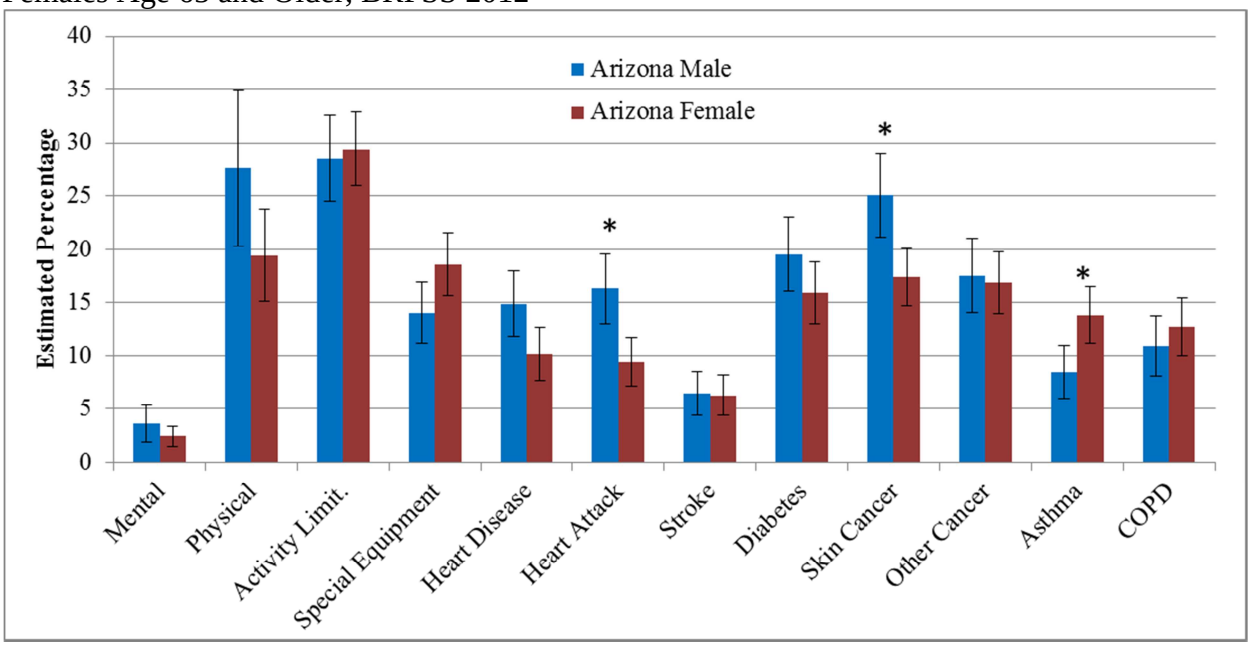
Notes: * indicates statistically significant difference at $p < .05$ level.

Figure 8. Estimates of Population Morbidity with 95% Confidence Intervals, Arizona and National Females Age 65 and Older, BRFSS 2012



Notes: * indicates statistically significant difference at $p < .05$ level.

Figure 9. Estimates of Population Morbidity with 95% Confidence Intervals, Arizona Males and Females Age 65 and Older, BRFSS 2012



Notes: * indicates statistically significant difference at $p < .05$ level.

3.4 Conclusion

Analysis of the BRFSS survey provided information that will aid in the development of health policies driving community interventions to produce more favorable health outcomes for Arizona's aging population. Regarding health behaviors, Arizona's older adults were comparable to similarly aged adults nationally, excluding routine health checkups for males and receiving flu shots for both males and females. These preventative health services play an important role in health maintenance, and increasing older Arizonan's access and use of these services should be a priority of Arizona's health community. While a significantly higher percentage of older Arizonan males were either overweight or obese than were Arizona's older females, the difference here may be based on inconsistencies across genders in the validity of BMI.

Compared to national estimates for older adults, Arizona's aging population has both strengths and limitations in terms of morbidities and chronic diseases. For example, Arizona's population of older males had a significantly lower prevalence of diabetes in 2012 than the national average, although our resident older males had a significantly greater prevalence of skin cancer than older males nationally. Arizona's resident females had a significantly lower occurrence of mental health problems, physical health problems, and diagnosis of diabetes than older females nationally, and had similar outcomes on the remaining health indicators. When comparing Arizona's resident males to Arizona's resident females, Arizona's older males had a significantly higher percentage of heart attack and skin cancer diagnoses than resident females, but a greater percent of Arizona's females reported having asthma. These differences suggest that Arizona's older male population may benefit from targeted interventions regarding heart and skin health, and Arizona's female population may benefit from attention to pulmonary health and asthma.

4. Emergency Room and Hospital Inpatient Discharges among Aging Arizonans

4.1 Introduction

Hospital Discharge Data (HDD) provides a useful source of information on a population's utilization of hospital emergency room (ER) and inpatient healthcare services. Among the uses of HDD data are the surveillance of injury and chronic disease, allowing for informed planning of public health policy and legislation. While HDD data does not include other information on healthcare utilization such as data from primary care physicians or urgent care clinics, HDD does provide a snapshot of Arizona's usage of emergency health services as well as treatment for more complicated and severe health problems occurring in an inpatient setting. These healthcare settings are especially important to Arizona's aging population as the impact of accidents, infectious diseases, and chronic diseases can become both more common and severe with age.

4.2 Methodology

The Arizona Department of Health Services (ADHS) collects hospital discharge records for inpatient and ER department visits from all Arizona licensed hospitals. This collection is required by Arizona Revised Statute (A.R.S.) § 36-125-05, and Arizona Administrative Code Title 9, Chapter 11, Articles 4 and 5. The records are collected twice each year based on patient discharge date, January 1 through June 30 discharges comprising the first data reporting and July 1 through December 31 comprising the second. Approximately 3 million discharge records are collected annually. Accuracy and completeness in reporting are required and enforced. All Arizona licensed hospitals (i.e. regulated by the Arizona Department of Health Services) are required to report. Therefore, hospitals such as Veteran's Administration, Department of Defense, and those located on tribal land are not included in the reporting.

This report examines 2012 HDD data for Arizona residents age 65 and older. A discharge occurs when a person admitted to a hospital ER or for inpatient care leaves that hospital. A person admitted more than once in a given calendar year will be counted multiple times, meaning the numbers in this report are for discharges, not persons. Discharge rates were calculated as the number of discharges for a given event divided by Arizona's population within that age group. All rates represent the number of discharges per 10,000 residents and the age group. The population denominators used to calculate rates can be found at the ADHS Health Status and Vital Statistics website (http://www.azdhs.gov/plan/menu/info/pop/pop12/pd12.htm).

Demographic characteristics including gender, race/ethnicity, marital status, and source of payment were summarized for all ER and inpatient discharges occurring among Arizona residents age 65 and older in 2012. The first-listed diagnosis reported for a discharge was categorized and reported by common condition, meaning that less-common disorders may not have been summarized in this report. Counts are reported for all Arizona residents age 65 and older as well as by three age groups: 65 – 74 years, 75 – 84 years, and 85 years and older.

4.3 Results

Demographic Characteristics

Table 5 provides demographic information on Arizona residents age 65 and older who were discharged from an ER or as a hospital inpatient in 2012. Beginning with ER discharges among Arizonans age 65 and older, there were 286,938 total ER discharges, with adults ages 65-84 accounting for about 81 percent of all ER discharges. Concerning costs, the average overall cost of an ER discharge for an Arizonan age 65 and older in 2012 was $6,175 and the average cost for an inpatient hospital discharge for the same group was $53,956. Interestingly, the average cost of an ER discharge slightly increased with age group, but for inpatient discharges, price per discharge decreased substantially with age. By gender, females accounted for 168,254, or roughly 59 percent, of all ER discharges. Considering age group, females accounted for 57 percent, 58 percent, and 65 percent of ER discharges among adults age 65 – 74, 75 – 84, and 85 and older, respectively. White non-Hispanics accounted for 81 percent (233,013) of all ER discharges, with an increasing percentage of White non-Hispanics in each increasing age group. The majority of Arizonans age 65 and older discharged from an ER were married (51 percent),

Table 5. Demographic Characteristics of Arizona Resident Emergency Room Discharges and Emergency Room Discharge Rates for adults Age 65 and Older by Age Group, 2012

	Emergency Room Discharges				Inpatient Discharges			
	Total	65 - 74 Years	75 - 84 Years	85 + Years	Total	65 - 74 Years	75 - 84 Years	85 + Years
Total discharges	286,938	131,827	101,434	53,677	239,851	104,501	88,068	47,282
Average cost per discharge ($)	6,175	5,999	6,268	6,431	49,920	54,842	49,626	39,590
Gender								
Female	168,254	74,750	58,843	34,661	128,513	52,687	46,825	29,001
Male	118,681	57,074	42,591	19,016	111,338	51,814	41,243	18,281
Race/Ethnicity								
American Indian or Alaska Native	5,317	2,783	1,934	600	4,433	2,231	1,639	563
Asian or Pacific Islander	2,869	1,513	982	374	2,430	1,109	939	382
Black or African American	7,794	4,470	2,489	835	5,744	2,953	2,059	732
Hispanic or Latino	35,884	18,920	12,272	4,692	24,055	11,686	8,831	3,538
White non-Hispanic	233,013	103,074	83,052	46,887	200,931	85,463	73,778	41,690
Other	146	87	43	16	210	100	69	41
Refused	1,915	980	662	273	2,048	959	753	336
Marital Status								
Single	35,366	21,756	9,921	3,689	27,394	15,752	8,271	3,371
Married	145,342	74,950	52,792	17,600	123,392	61,218	46,689	15,485
Separated	1,585	1,117	369	99	1,083	699	305	79
Divorced	25,108	15,519	7,393	2,196	20,235	12,168	6,236	1,831
Widowed	78,144	17,826	30,525	29,793	65,977	13,951	25,931	26,095
Unknown	1,393	659	434	300	1,769	713	635	421
Not Applicable	0	0	0	0	0*	0	0*	0
Payee								
Self	4,248	2,491	1,258	499	1,562	840	514	208
Private insurance (indemnity, HMO, PPO)	21,791	14,513	5,371	1,907	13,296	9,283	2,852	1,161
AHCCCS Medicaid/AHCCCS HCG	4,488	2,737	1,336	415	3,582	1,906	1,243	433
Medicare	191,113	83,790	68,566	38,757	167,455	70,713	61,905	34,837
Other	65,298	28,296	24,903	12,099	53,956	21,759	21,554	10,643

Notes: * Cell suppressed due to non-zero count less than 6.

but when taken by age group, 57 percent of adults age 65-75 were married and 14 percent widowed, but only 33 percent of adults age 85 and older were married while 56 percent were widowed. The majority (67 percent) of ER discharges were paid for by Medicare, with this percentage increasing by age group. In 2012, there were 239,851 total inpatient discharges of Arizonans age 65 and older. Arizonans age 65 – 74 accounted for 44 percent, those age 75 -84 accounted for 37 percent, and those age 85 and older accounted for 20 percent of inpatient discharges, respectively. Females accounted for 128,513, or roughly 54 percent, of all inpatient discharges. This percentage of female inpatient discharges increased with each age group. White non-Hispanics accounted for 84 percent (200,931) of all inpatient discharges, which again increased with age group.

Among all Arizonans age 65 and older, the majority of inpatient discharges were to those who were married (51 percent), but when taken by age group, adults age 65-75 were about 59 percent married and about 13 percent widowed, but only 33 percent of adults age 85 and over were married while 55 percent were widowed. The majority (70 percent) of inpatient discharges were paid for by Medicare, with this percentage increasing slightly with increasing age group.

First-listed Diagnosis for Emergency Room Discharges

Table 6 contains counts and rates of ER discharges of Arizona residents age 65 and older by age-group in 2012. There was a total of 286,938 ER discharges among Arizona residents age 65 and older, meaning there were approximately 3,051 ER discharges for every 10,000 elderly residents in Arizona. For ER discharges, the two largest groups of conditions identified as the first-listed diagnosis were symptoms, signs, and ill-defined conditions (n = 88,513), followed by injury and poisoning (n = 59,288). These two categories of conditions accounted for 51.5 percent of the 286,398 total ER discharges for Arizonans age 65 and older.

Examining the difference in ER discharge rates among Arizona's youngest and oldest old reveals the health burdens endured by those in the latest years of life. The overall rate of ER discharges among Arizonans age 85 and older (4,949.1/10,000) was 102 percent greater than the rate of ER discharges for all causes among residents age 65-74 (2,447.0/10,000). Specific causes that had especially high discharge rates when comparing the oldest to the youngest old were fractures, which were 206 percent greater for adults age 85 and older (253.4/10,000) than for adults age 65-74 (82.8/10,000), discharges related to the circulatory system (including heart disease), which were 137 percent greater for the oldest Arizonans (467.3/10,000) than for those age 65-74 (197.3/10,000), and endocrine nutritional metabolic and immunity diseases, which were 108 percent greater for Arizona's oldest old (135.4/10,000) than for Arizona's youngest old (65.0/10,000).

First-listed Diagnosis for Inpatient Discharges

Table 7 contains counts and rates of inpatient discharges of Arizona residents age 65 and older by age group in 2012. In 2012, 239,851 Arizona residents age 65 and older were discharged from Arizona hospitals as inpatients. Arizonan adults age 65-74 accounted for the largest proportion of inpatient discharges (43.6 percent), followed by adults age 75-84 (36.7 percent), and those age

Table 6. Emergency Room Discharges and Emergency Room Discharge Rates among Arizona Residents Age 65 and Older by First-listed Diagnosis and Age Group, 2012

	Emergency Room Discharges				Emergency Room Discharge Rates			
	Total	65 - 74 Years	75 - 84 Years	85 Years and Over	Total	65 - 74 Years	75 - 84 Years	85 Years and Over
Total, all causes	286,938	131,827	101,434	53,677	3050.9	2447.0	3458.0	4949.1
Infectious and parasitic diseases	2,615	1,313	892	410	27.8	24.4	30.4	37.8
Septicemia	244	83	101	60	2.6	1.5	3.4	5.5
Enterocolitis due to Clostridium difficile	118	54	41	23	1.3	1.0	1.4	2.1
Neoplasms	839	418	293	128	8.9	7.8	10.0	11.8
Malignant neoplasms	642	315	230	97	6.8	5.8	7.8	8.9
Large intestine	26	12	8	6	0.3	0.2	0.3	0.6
Prostate	43	17	18	8	0.5	0.3	0.6	0.7
Trachea bronchus and lung	142	72	54	16	1.5	1.3	1.8	1.5
Breast	40†	19	13	*	0.4	0.4	0.4	**
Benign neoplasms	75	41	19	15	0.8	0.8	0.6	1.4
Endocrine nutritional metabolic and immunity diseases	7,851	3,503	2,879	1,469	83.5	65.0	98.1	135.4
Diabetes mellitus	2,474	1,262	909	303	26.3	23.4	31.0	27.9
Volume depletion	64	27	18	19	0.7	0.5	0.6	1.8
Morbid obesity	0†	*	0	0	**	**	0.0	0.0
Diseases of the blood and blood forming organs	1,603	647	622	334	17.0	12.0	21.2	30.8
Mental disorders	5,294	2,801	1,655	838	56.3	52.0	56.4	77.3
Psychoses	1,991	800	698	493	21.2	14.9	23.8	45.5
Alcoholic psychoses	100†	86	15	*	1.1	1.6	0.5	**
Drug psychoses	233	134	82	17	2.5	2.5	2.8	1.6
Schizophrenic disorders	70†	57	8	0	0.7	1.1	0.3	0.0
Manic-depressive disorders	156	121	29	6	1.7	2.2	1.0	0.6
Neurotic disorders	3,303	2,001	957	345	35.1	37.1	32.6	31.8
Anxiety states	1,368	760	442	166	14.5	14.1	15.1	15.3
Depression	505	289	157	59	5.4	5.4	5.4	5.4
Drug dependence	30†	20	*	*	0.3	0.4	**	**
Nondependent abuse of drugs	593	441	123	29	6.3	8.2	4.2	2.7
Alcohol dependence syndrome	210†	173	29	*	2.2	3.2	1.0	**
Diseases of the nervous system	9,834	5,301	3,176	1,357	104.6	98.4	108.3	125.1
Diseases of the circulatory system	25,381	10,630	9,683	5,068	269.9	197.3	330.1	467.3
Heart disease	10,818	4,522	4,065	2,231	115.0	83.9	138.6	205.7
Acute myocardial infarction	689	296	229	164	7.3	5.5	7.8	15.1
Coronary artherosclerosis	933	474	332	127	9.9	8.8	11.3	11.7
Other ischemic heart disease	787	385	259	143	8.4	7.1	8.8	13.2
Cardiac dysrythmias	5,778	2,502	2,212	1,064	61.4	46.4	75.4	98.1
Cardiac arrest	1,242	483	472	287	13.2	9.0	16.1	26.5
Congestive heart failure	1,771	549	691	531	18.8	10.2	23.6	49.0
Cerebrovascular disease	3,280	1,297	1,277	706	34.9	24.1	43.5	65.1
Diseases of the respiratory system	16,880	8,662	5,756	2,462	179.5	160.8	196.2	227.0
Acute bronchitis and bronchiolitis	2,271	1,157	781	333	24.1	21.5	26.6	30.7
Pneumonia	2,920	1,355	1,053	512	31.0	25.2	35.9	47.2
Chronic bronchitis	3,084	1,617	1,078	389	32.8	30.0	36.8	35.9
Asthma	1,282	753	403	126	13.6	14.0	13.7	11.6
Diseases of the digestive system	15,674	7,257	5,583	2,834	166.7	134.7	190.3	261.3
Appendicitis	123	86	27	10	1.3	1.6	0.9	0.9
Noninfectious enteritis and colitis	1,845	962	621	262	19.6	17.9	21.2	24.2
Diverticula of intestine	1,471	865	471	135	15.6	16.1	16.1	12.4
Cholelithiasis	738	432	223	83	7.8	8.0	7.6	7.7
Diseases of the genitourinary system	16,502	7,608	5,801	3,093	175.5	141.2	197.8	285.2
Calculus of kidney and ureter	2,164	1,546	523	95	23.0	28.7	17.8	8.8
Diseases of the skin and subcutaneous tissue	6,703	3,485	2,178	1,040	71.3	64.7	74.3	95.9
Cellulitis and abscess	4,301	2,239	1,387	675	45.7	41.6	47.3	62.2
Diseases of the musculoskeletal system	24,241	11,371	8,633	4,237	257.7	211.1	294.3	390.7
Osteoarthrosis and allied disorders	714	281	271	162	7.6	5.2	9.2	14.9
Invertebral disc disorders	554	288	189	77	5.9	5.3	6.4	7.1
Congenital anomalies	50†	28	16	*	0.5	0.5	0.5	**
Symptoms signs and ill-defined conditions	88,513	40,652	31,955	15,906	941.1	754.6	1089.4	1466.6
Injury and poisoning	59,288	25,524	20,347	13,417	630.4	473.8	693.7	1237.1
Fractures, all sites	11,065	4,462	3,855	2,748	117.6	82.8	131.4	253.4
Fracture of neck of femur	489	117	171	201	5.2	2.2	5.8	18.5
Poisonings	1,408	803	440	165	15.0	14.9	15.0	15.2

Notes: * Cell suppressed due to non-zero count less than 6; ** Cell suppressed due to rate/ratio/percent based on non-zero count less than 6; † Sum rounded to nearest tens unit due to non-zero addend less than 6; [1]Rates calculated using female-specific population denominator.

Table 7. Inpatient Discharges and Inpatient Discharge Rates among Arizona Residents Age 65 and Older by First-listed Diagnosis and Age Group, 2012

	Inpatient Discharges				Inpatient Discharge Rates			
	Total	65 - 74 Years	75 - 84 Years	85 Years and Over	Total	65 - 74 Years	75 - 84 Years	85 Years and Over
Total, all causes	239,851	104,501	88,068	47,282	2550.2	1939.8	3002.4	4359.5
Infectious and parasitic diseases	15,794	6,446	5,893	3,455	27.8	24.4	30.4	37.8
Septicemia	12,040	4,876	4,498	2,666	2.6	1.5	3.4	5.5
Enterocolitis due to Clostridium difficile	1,650	603	641	406	1.3	1.0	1.4	2.1
Neoplasms	11,383	6,341	3,779	1,263	8.9	7.8	10.0	11.8
Malignant neoplasms	9,786	5,458	3,234	1,094	6.8	5.8	7.8	8.9
Large intestine	1,440	667	511	262	0.3	0.2	0.3	0.6
Prostate	683	587	78	18	0.5	0.3	0.6	0.7
Trachea bronchus and lung	1,521	793	593	135	1.5	1.3	1.8	1.5
Breast	441	273	120	48	0.4	0.4	0.4	**
Benign neoplasms	1,033	618	333	82	0.8	0.8	0.6	1.4
Endocrine nutritional metabolic and immunity diseases	7,575	3,562	2,588	1,425	83.5	65.0	98.1	135.4
Diabetes mellitus	2,612	1,439	850	323	26.3	23.4	31.0	27.9
Volume depletion	42	15	17	10	0.7	0.5	0.6	1.8
Morbid obesity	200†	190	*	0	**	**	0.0	0.0
Diseases of the blood and blood forming organs	2,940	1,219	1,090	631	17.0	12.0	21.2	30.8
Mental disorders	3,567	2,023	1,046	498	56.3	52.0	56.4	77.3
Psychoses	2,904	1,652	827	425	21.2	14.9	23.8	45.5
Alcoholic psychoses	316	250	56	10	1.1	1.6	0.5	**
Drug psychoses	219	122	63	34	2.5	2.5	2.8	1.6
Schizophrenic disorders	190†	155	34	*	0.7	1.1	0.3	0.0
Manic-depressive disorders	1,270	862	305	103	1.7	2.2	1.0	0.6
Neurotic disorders	662	371	218	73	35.1	37.1	32.6	31.8
Anxiety states	126	63	53	10	14.5	14.1	15.1	15.3
Depression	199	108	63	28	5.4	5.4	5.4	5.4
Drug dependence	20†	12	*	0	0.3	0.4	**	**
Nondependent abuse of drugs	50†	31	17	*	6.3	8.2	4.2	2.7
Alcohol dependence syndrome	120†	97	21	*	2.2	3.2	1.0	**
Diseases of the nervous system	4,980	2,069	1,920	991	104.6	98.4	108.3	125.1
Diseases of the circulatory system	57,032	22,851	22,018	12,163	269.9	197.3	330.1	467.3
Heart disease	36,907	14,935	14,132	7,840	115.0	83.9	138.6	205.7
Acute myocardial infarction	6,039	2,632	2,182	1,225	7.3	5.5	7.8	15.1
Coronary artherosclerosis	5,069	2,802	1,852	415	9.9	8.8	11.3	11.7
Other ischemic heart disease	465	211	169	85	8.4	7.1	8.8	13.2
Cardiac dysrythmias	10,544	4,115	4,131	2,298	61.4	46.4	75.4	98.1
Cardiac arrest	95	33	46	16	13.2	9.0	16.1	26.5
Congestive heart failure	1,548	478	585	485	18.8	10.2	23.6	49.0
Cerebrovascular disease	11,592	4,271	4,613	2,708	34.9	24.1	43.5	65.1
Diseases of the respiratory system	26,434	10,934	9,967	5,533	179.5	160.8	196.2	227.0
Acute bronchitis and bronchiolitis	594	197	208	189	24.1	21.5	26.6	30.7
Pneumonia	9,068	3,256	3,487	2,325	31.0	25.2	35.9	47.2
Chronic bronchitis	6,107	2,918	2,345	844	32.8	30.0	36.8	35.9
Asthma	1,322	681	444	197	13.6	14.0	13.7	11.6
Diseases of the digestive system	24,626	11,143	8,933	4,550	166.7	134.7	190.3	261.3
Appendicitis	559	337	170	52	1.3	1.6	0.9	0.9
Noninfectious enteritis and colitis	2,298	1,023	851	424	19.6	17.9	21.2	24.2
Diverticula of intestine	2,956	1,207	1,145	604	15.6	16.1	16.1	12.4
Cholelithiasis	2,382	1,119	854	409	7.8	8.0	7.6	7.7
Diseases of the genitourinary system	14,391	5,494	5,406	3,491	175.5	141.2	197.8	285.2
Calculus of kidney and ureter	989	605	290	94	23.0	28.7	17.8	8.8
Diseases of the skin and subcutaneous tissue	4,493	1,932	1,550	1,011	71.3	64.7	74.3	95.9
Cellulitis and abscess	3,807	1,633	1,332	842	45.7	41.6	47.3	62.2
Diseases of the musculoskeletal system	21,039	12,370	7,009	1,660	257.7	211.1	294.3	390.7
Osteoarthrosis and allied disorders	12,438	7,740	4,112	586	7.6	5.2	9.2	14.9
Invertebral disc disorders	1,447	968	388	91	5.9	5.3	6.4	7.1
Congenital anomalies	207	129	66	12	0.5	0.5	0.5	**
Symptoms signs and ill-defined conditions	9,627	4,029	3,566	2,032	941.1	754.6	1,089.4	1,466.6
Injury and poisoning	25,082	9,877	9,096	6,109	630.4	473.8	693.7	1,237.1
Fractures, all sites	10,993	3,011	4,012	3,970	117.6	82.8	131.4	253.4
Fracture of neck of femur	5,218	1,056	1,921	2,241	5.2	2.2	5.8	18.5
Poisonings	903	526	282	95	15.0	14.9	15.0	15.2

Notes: * Cell suppressed due to non-zero count less than 6; ** Cell suppressed due to rate/ratio/percent based on non-zero count less than 6; † Sum rounded to nearest tens unit due to non-zero addend less than 6.

85 and older (19.7 percent). Taking into account the size of the underlying population of each age group, adults age 85 and older had the greatest inpatient discharge rate (4,359.5/10,000), followed by those age 75-84 (3,002.4/10,000), and finally adults age 65 – 74 (1,939.8/10,000). Unlike ER discharges in which either ambiguous symptoms or acute injury accounted for the largest number of discharges, the single highest first-listed principal diagnosis for inpatient discharges were diseases of specific body systems, including the circulatory (n = 57,032), respiratory (n = 57,032), digestive (n = 24,626), and musculoskeletal (n = 21,039) systems.

A number of inpatient discharge rates were drastically greater for the oldest Arizonans compared to those ages 65-74. For the first-listed diagnosis of all fractures, the rate for the oldest old (206.6/10,000) was 829 percent greater than the rate for the youngest old (19.6/10,000). Inpatient discharges for diseases of the genitourinary system were 216 percent greater for Arizonans age 85 and older (321.9/10,000) than for Arizonans ages 65-74 (102.0/10,000). For disease of the circulatory system including heart disease, the inpatient discharge rate of the oldest Arizonans (510.2/10,000) was 151 percent higher than was the inpatient discharge rate of adults ages 65 – 74 (203.0/10,000). Finally, inpatient hospitalizations for pneumonia were 255 percent greater for Arizona's oldest old (214.4/10,000) as compared to Arizona's youngest old (60.4/10,000).

4.4 Conclusion

Analysis of demographic characteristics and first-listed diagnoses on ER and inpatient HDD data provides a useful snapshot of the impact of aging on those utilizing the healthcare system in Arizona. According to the HDD data, the demographic characteristics of aging Arizonans being discharged from hospitals becomes less diverse with age, meaning that adults in older age groups were more likely to be White non-Hispanic and female. These results reflect that minority groups have worse health and experience mortality earlier in life than White non-Hispanics, and that female life expectancy tends to be greater than male life expectancy. The fact that females tend to live longer than males helps explain the fact that the number of hospital discharges to widowed Arizonans increases with age. Another fact associated with the increased rate of inpatient and ER discharges among the oldest Arizonans is that morbidity rates increase in the latest years of life, which are disproportionately experienced by White non-Hispanic females. These Arizonans experience some of the most severe morbidities associated with aging and chronic disease and warrant increased attention when developing future policy concerning health and aging.

Examining first-listed diagnosis on HDD ER and inpatient discharges gives us information on what specific morbidities are being experienced by Arizona's aging population. Among older Arizonans, the overall counts of ER and inpatient discharges were higher for adults in the youngest old (ages 65 – 74), but the rate of discharges increased for the oldest Arizonans (age 85 and older), and in some cases, this increase was substantial. The overall rate of ER discharges was more than 100 percent higher for Arizonans in the oldest versus the youngest age group, and this held true for both ER and inpatient discharges. Specific morbidities were especially prevalent among Arizona's oldest adults, with both ER and inpatient discharges reflecting higher rates of fractures and many chronic diseases including those of the circulatory and genitourinary

systems. These results help to better explain the healthcare needs of Arizona's aging population. While the overall numbers of older adults being discharged from Arizona's hospitals tended to be the greatest among the youngest old, Arizona's oldest old are those who most often experience health issues requiring hospitalization. With the projected increase in Arizona's elderly population, the burdens faced by Arizona's residents and their healthcare providers will pose a greater burden on Arizona's residents and healthcare system.

5. Patterns of Mortality among Aging Arizonans

5.1 Introduction

Consistent with national trends, Arizona's older adult population is both increasing in number and coming to represent a greater proportion of the total population. As the number and proportion of older Arizonans increase, it becomes ever more important to understand the leading causes of mortality among this age group. To illustrate the impact of longer lifespans on mortality, from 2002 and 2012, deaths among residents 65 years and older increased 16 percent. Deaths among persons in the oldest portion of this population, residents 85 years and older, showed the highest percent increase of 33.5 percent. Analyzing how chronic diseases, infectious diseases, and other causes of death influence patterns of mortality among older adults provides information that can be used to plan for the increasing societal costs associated with the mortality of an aging population.

5.2 Methodology

To investigate patterns of morality among Arizona's older adults, we examined the leading causes of death among Arizonans age 65 and older, both as a whole as well as by age group (65 – 74 years, 75 – 84 years, and 85 + years) and gender. Initially, demographic characteristics of decedents were reported and include race/ethnicity, educational attainment, marital status, and urban or rural residence location (urban counties include Maricopa, Pinal, Pima, and Yuma counties and rural counties include Apache, Cochise, Coconino, Gila, Graham, Greenlee, La Paz, Mohave, Navajo, Santa Cruz, and Yavapai counties). Next, mortality counts and rates among Arizonans age 65 and older in 2012 based on combined causes of death (common descriptions capturing broad disease categories such as diseases of the heart, all cancers, and chronic lower respiratory diseases) were compared to national death counts from 2011, which were the most recent available national death data. Individual causes of death represented by single ICD-10 codes were then used to assess the specific causes responsible for the greatest number of deaths and highest mortality rates among Arizona's older adults. Finally, trends in the leading specific causes of death identified for older Arizonans in 2012 were examined from 2002 – 2012.

Data in this section reported for Arizonans were collected from information reported on death certificates submitted to the Arizona Office of Vital Records by funeral directors, medical examiners, coroners, and physicians. Cause-of-death classifications are in accordance with the *International Statistical Classification of Diseases and Related Health Problems, 10th Revision* (ICD-10), 2008 Edition. Leading causes of death among Arizona residents 65 years and older were compiled based on 2012 death data and individual ICD-10 codes. Population denominators used to calculate death rates were produced by the Arizona Department of Health Services' (ADHS) Population Health and Vital Statistics Section in collaboration with the Arizona Department of Economic Security (AZDES) and the Office of Employment and Population Statistics within the Arizona Department of Administration (ADOA).

5.3 Results

Overall Mortality Rates and Demographic Characteristics

Table 8 presents the total mortality counts, rates, and demographic statistics for deaths among Arizonans who died in 2012 by gender and age group. In 2012, 48,459 Arizona residents died, with about 72 percent (n = 34,959) of these deaths occurring to Arizonans 65 years and older. The overall mortality rate was 3,490.1 per 100,000 resident females age 65 and older and 3,987.4 per 100,000 males. With each increasing age group, the mortality rate increased at an exponential rate for both males and females. Additional analyses (not shown here) revealed that among Arizona adults age 65 years and older in 2012, the average age at death was 81.6 years, with the mean age at death being 80.0 years for males and 83.0 years for females. Notably, 40.6 percent of the roughly 35,000 Arizonans age 65 and over who died in 2012 were 85 years and older, a 5.3 percent increase from 2002.

In 2012, Arizona resident females represented 51 percent (n = 17,856) of deaths among persons 65 years and older. The largest proportion of deaths among women 65 years and older was among women 85 years and older (n=8,522, 47.7 percent). Arizona resident males represented 49 percent (n = 17,101) of deaths among Arizonans 65 years and older in 2012. Sixty percent of the 14,186 death among Arizonans age 85 and older in 2012 were to females. Interestingly, deaths among elderly men were more evenly distributed than deaths among elderly women. Unlike resident women, the largest proportion of deaths among men occurred among men 65 -74 years (n = 6,427, 37.5 percent).

For both males and females, the vast majority of deaths among older Arizona residents occurred to White non-Hispanics. For both genders and all age groups, more than 80% of deaths in 2012 were to White non-Hispanics. With increasing age, the race/ethnicity of decedents become even more homogenous, with deaths to all racial/ethnic minorities representing only 15 percent of all deaths among Arizonans age 85 and older in 2012.

Among older Arizonans who died in 2012, males tended to have somewhat higher educational attainment than females. For example, about 43 percent (n = 7,631) of decedent females had earned a high school diploma and about 36 percent reported having some college education (n = 6,386). For male decedents age 65 and older, 32 percent reported earning a high school degree (n = 5,436) and 49 percent reported having attended some college (n = 8,124).

Concerning marital status, widows represented the largest proportion of deaths among resident females 65 years and older (58.6 percent) while married males represented the largest proportion of resident males (57.4 percent). The majority of widowed females were 85 years and older, reaffirming the relatively long lifespan of females compared to males.

Finally, the majority of Arizona residents age 65 and older who died in 2012 lived in areas defined as urban. For both male and female decedents, about 80 percent resided in urban settings.

Table 8. Deaths[a] among Arizona Residents 65 Years and Older by Gender and Age Group, 2012

	Females				Males			
	65 – 74 Years	75 – 84 Years	85 + Years	Total	65 – 74 Years	75 – 84 Years	85 + Years	Total
Total Deaths	3,662	5,672	8,522	17,856	5,010	6,427	5,664	17,101
Overall Mortality Rate	1,286.7	3,582.2	12,409.0	3,490.1	1,971.6	4,761.1	14,237.8	3,987.4
Race and Ethnicity								
Asian and Pacific Islander	48	78	86	212	58	48	39	145
American Indian/Alaskan Native	128	142	138	408	135	140	74	349
Black/African American	121	150	144	415	165	139	65	369
Hispanic/Latino	394	622	681	1,697	531	641	466	1,638
White Non-Hispanic	2971	4680	7473	15,124	4,121	5,459	5,020	14,600
Educational Attainment								
No High School Diploma	618	1,143	1,743	3,504	807	1,208	1,126	3,141
High School Diploma	1,405	2,437	3,789	7,631	1,669	1,984	1,783	5,436
Some College	1,557	1,984	2,845	6,386	2,355	3,094	2,675	8,124
Unknown or Missing	81	108	145	335	178	140	80	400
Marital Status								
Married	1,586	1,755	988	4,329	2,959	4,078	2,786	9,823
Widowed	931	2,867	6,681	10,479	415	1,233	2,412	4,060
Divorced	922	856	623	2,401	1,224	846	331	2,401
Never Married	193	177	216	586	312	206	120	638
Unknown or Missing	30	17	14	61	98	64	15	179
Location								
Urban	2,871	4,565	7,064	14,500	3,761	4,970	4,593	13,324
Rural	789	1,098	1,450	3,337	1,214	1,440	1,066	3,720
Unknown/Other	2	9	8	19	35	17	5	57

Notes: [a] Based on death certificates submitted to the Arizona Office of Vital Records.

Combined Leading Causes of Death

Table 9 lists the ten leading combined causes of death among persons 65 years and older in Arizona for 2012 and for the United States in 2011 (2011 national data was preliminary and national data for 2012 was not yet available; Hoyert and Xu 2012).

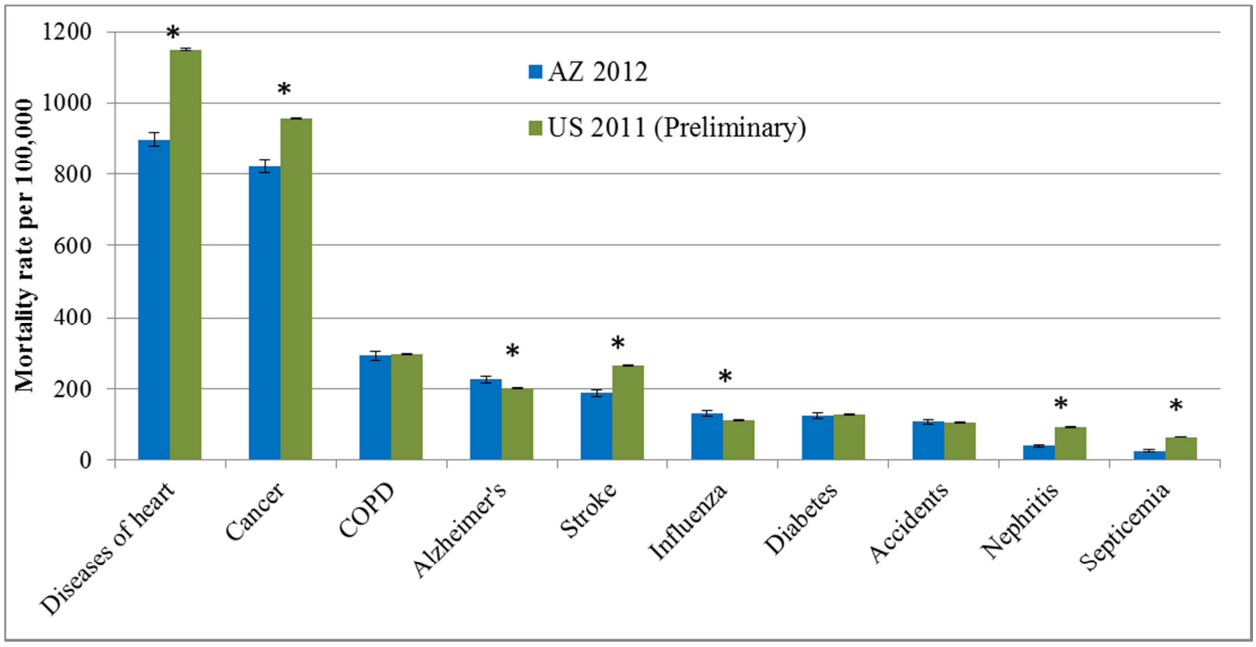
Both for Arizona in 2012 and for the U.S. for 2011, diseases of the heart, malignant neoplasms, and chronic lower respiratory diseases were the three leading causes of death. Heart disease and cancer have consistently been the two leading causes of death in the U.S. since 1935 (Hoyert 2012). Alzheimer's disease was the 4th leading cause of death among Arizona's elderly adults, where Alzheimer's disease was ranked as the 5th leading cause of death for elderly adults nationally. Cerebrovascular diseases including stroke were the 5th leading cause of death for older Arizonans in 2012, where this group of diseases was ranked 4th for older adults nationally in 2011. Influenza and pneumonia were the 6th leading cause, and diabetes was the 7th leading cause of death for Arizonans age 65 and older in 2012, where the order of rankings for these disease grouping were opposite for similarly aged adults nationally. Accidents, nephritis, and septicemia were the 8th, 9th, and 10th leading causes of death for both Arizonan elderly in 2012 and national elderly in 2011.

Table 9. Deaths and Death Rates[a] for the Ten Leading Causes of Death[b] among Adults Age 65 and Older, Arizona 2012 and United States 2011 (Preliminary)

		Arizona 2012			National 2011 (prelim)		
Rank[c] (AZ)	Rank (US)	Count	Rate	SE	Count	Rate	SE
…	… All causes	34,958	3,716.9	19.9	1,830,553	4,422.3	3.3
1	1 Diseases of heart	8,449	898.3	9.8	476,220	1,150.5	1.7
2	2 Malignant neoplasms	7,729	821.8	9.3	396,126	957.0	1.5
3	3 Chronic lower respiratory diseases	2,746	292.0	5.6	122,381	295.6	0.8
4	5 Alzheimer's disease	2,129	226.4	4.9	83,746	202.3	0.7
5	4 Cerebrovascular diseases	1,774	188.6	4.5	109,393	264.3	0.8
6	7 Influenza and pneumonia	1,210	128.7	3.7	45,321	109.5	0.5
7	6 Diabetes Mellitus	1,148	122.1	3.6	52,068	125.8	0.6
8	8 Accidents (unintentional injuries)	999	106.2	3.4	42,635	103.0	0.5
9	9 Nephritis, nephrotic syndrome and nephrosis	373	39.7	2.1	37,927	91.6	0.5
10	10 Septicemia	238	25.3	1.6	26,596	64.3	0.4

Notes: [a] Rates per 100,000 population in specified group; [b] Diseases of heart: I00–I09, I11, I13, I20–I51;Malignant neoplasms: C00–C97, Chronic lower respiratory diseases: J40–J47;Cerebrovascular diseases: I60–I69;Alzheimer's disease: G30; Diabetes mellitus: E10–E14; Influenza and pneumonia: J09–J18; Accidents (unintentional injuries): V01–X59, Y85–Y86; Nephritis, nephrotic syndrome and nephrosis: N00–N07,N17–N19,N25–N27;Septicemia: A40–A41; [c] Rank based on number of deaths in Arizona; Adapted from *Deaths: Preliminary Data for* 2011: NVSR v61(6), p.31 October 10, 2012.

Figure 10. Death Rates and 95% Confidence Intervals for 10 Leading Causes of Death among Adults age 65 and Older, Arizona 2012 and United States 2011 (Preliminary)



Notes: * Indicates significant difference in rate at $p < .05$.

Figure 10 depicts the combined cause mortality rates and 95 percent confidence intervals for Arizona's older adults in 2012 and comparably aged adults nationally in 2011. As indicated by the asterisks, a number of mortality rates for Arizona's older adults in 2012 were significantly different than national estimates taken from 2011 data. Mortality rates for diseases of the heart, malignant neoplasms (cancer), cerebrovascular disease (stroke), nephritis (kidney disease), and septicemia (blood infection) were all significantly lower among Arizona's older adults in 2012 than they were among older adults nationally in 2011. Only the mortality rates for Alzheimer's disease and influenza and pneumonia were higher among Arizona's older adults in 2012 than for comparably-aged adults nationally in 2011.

Specific Leading Causes of Death

This section presents the ten leading causes of death for Arizona residents 65 years and older in 2012 by gender. As previously mentioned, leading causes of death among residents 65 years and older are generally consistent with national data.

Table 10 presents the ten specific leading causes of death for all Arizona residents 65 years and older in 2012 by age group. When comparing the specific leading causes of death to the grouped leading causes of death among Arizonans age 65 and older in 2012, there is a number of interesting findings. First, a number of specific causes of death that are components of the grouped leading causes of death are indicated, including atherosclerotic heart disease, acute myocardial infarction, and atherosclerotic cardiovascular disease (diseases of the heart), and both malignant neoplasms of the bronchus and lung and of the pancreas (malignant neoplasms). Second, dementia is identified as the 5th leading cause of death among Arizona's elderly in 2012, but this classification is not included in the grouped leading causes of death originally identified by the National Center for Health Statistics (Hoyert and Xu 2012). Finally, other ill-defined and unspecified causes of mortality are identified as the 9th specific leading cause of death among Arizona's older adults in 2012, but this classification is not mentioned in the NCHS-defined grouped leading causes.

Focusing on the specific leading causes of death among Arizona's elderly in 2012, the mortality rates for each specific cause are strikingly higher for Arizona's older adults (age 85 and older). For example, the morality rate for atherosclerotic heart disease is more than 13 times higher for Arizonans age 85 and older than for Arizonans age 65-74. Another example is for Alzheimer's disease and dementia, with mortality rates almost 55 and 59 times higher among Arizonans age 85 and over than for those age 65 – 74, respectively. The large discrepancies between age groups in mortality rates for these causes of death indicate the rapidly increasing toll that select chronic diseases take on adults among the oldest old.

Table 10: Specific Leading Causes of Deaths[a] Among All Arizona Residents, 2012

	65 - 74 Years	75 - 84 Years	85 Years and Over	**All Adults 65+**
Counts by Cause of Death				
Atherosclerotic heart disease	551	949	1,462	2,962
Chronic Obstructive Pulmonary Disease	613	867	679	2,159
Malignant neoplasm of bronchus and lung	905	867	333	2,105
Alzheimer's Disease	120	624	1,329	2,073
Dementia	98	469	1,160	1,727
Acute Myocardial Infarction	307	442	520	1,269
Atherosclerotic Cardiovascular Disease	410	379	431	1,220
Stroke	126	360	556	1,042
Other Ill-Defined and Unspecified causes of mortality	89	159	423	671
Malignant neoplasm of pancreas	240	221	121	582
Total	**3,459**	**5,337**	**7,014**	**15,810**
Mortality Rates[b]				
Atherosclerotic heart disease	102.3	323.5	1,348.0	314.9
Chronic Obstructive Pulmonary Disease	113.8	295.6	626.1	229.6
Malignant neoplasm of bronchus and lung	168.0	295.6	307.0	223.8
Alzheimer's Disease	22.3	212.7	1,225.4	220.4
Dementia	18.2	159.9	1,069.5	183.6
Acute Myocardial Infarction	57.0	150.7	479.5	134.9
Atherosclerotic Cardiovascular Disease	76.1	129.2	397.4	129.7
Stroke	23.4	122.7	512.6	110.8
Other Ill-Defined and Unspecified causes of mortality	16.5	54.2	390.0	71.3
Malignant neoplasm of pancreas	44.6	75.3	111.6	61.9

Notes: [a] Leading Causes of Death are conditions defined by the International Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), 2008; [b] Age-specific and crude mortality rates represent the number of deaths per 100,000 persons 65 years of age and older.

Individual Leading Causes of Death by Gender and Age Group

Table 11 presents the number of deaths and mortality rates for the ten leading causes of death among Arizona resident females 65 years and older during 2012. In 2012, deaths from Alzheimer's disease ranked first among all causes occurring among elderly females. Among females 85 years and older, 68 percent of deaths were from Alzheimer's disease. Dementia ranked third, accounting for 225.4 deaths per 100,000 resident females 65 years and older. Proportionately, this represents 6.45 percent of deaths among resident females 65 years and over. Deaths from breast cancer ranked ninth and were evenly distributed across age groups.

Table 12 presents the number of deaths and mortality rates for the top ten leading causes of death among Arizona resident males 65 years and older during 2012. The first three leading causes of death (atherosclerotic heart disease, lung cancer, and chronic obstructive pulmonary disease) among Arizona resident males 65 years and older were identical with published national data and consistently remain among the leading causes. Three conditions - Alzheimer's disease, prostate cancer, and Parkinson's disease - are specifically noted. In 2012, Alzheimer's disease ranked fourth, representing 167.2 deaths per 100,000 resident males 65 years and older. The mortality rate for Alzheimer's disease was 36.9 percent lower for males than for females. Prostate cancer ranked eighth. The largest number of males who died from prostate cancer were from 75 to 84 years of age (n = 206), but males 85 years and older had the highest mortality rate due to prostate cancer (460 deaths per 100,000). Finally, males 85 years and older had the highest rate of morality due to Parkinson's disease, but the age group with the greatest number of deaths due to Parkinson's diseases was males 75-84 years of age.

Table 11. Specific Leading Causes of Death among Arizona Resident Females[a] 65 Years and Older, 2012

	65 - 74 Years	75 - 84 Years	85 Years and Over	**All Females 65+**
Counts by Cause of Death				
Alzheimer's Disease	62	368	926	1,356
Atherosclerotic Heart Disease	156	374	780	1,310
Dementia	51	285	817	1,153
Chronic Obstructive Pulmonary Disease (COPD)	306	414	383	1,103
Malignant Neoplasm of Bronchus and Lung (Lung Cancer)	411	388	165	964
Stroke	51	188	383	622
Acute Myocardial Infarction	100	202	303	605
Atherosclerotic Cardiovascular Disease	125	157	249	531
Malignant Neoplasm of Breast (Breast Cancer)	165	145	120	430
Other Ill-Defined and Unspecified Causes of Mortality	35	91	286	412
Total	**1,462**	**2,612**	**4,412**	**8,486**
Mortality Rates[b]				
Alzheimer's Disease	21.8	232.4	1,348.4	265.0
Atherosclerotic Heart Disease	54.8	236.2	1,135.8	256.0
Dementia	17.9	180.0	1,189.6	225.4
Chronic Obstructive Pulmonary Disease (COPD)	107.5	261.5	557.7	215.6
Malignant Neoplasm of Bronchus and Lung (Lung Cancer)	144.4	245.0	240.3	188.4
Stroke	17.9	118.7	557.7	121.6
Acute Myocardial Infarction	35.1	127.6	441.2	118.3
Atherosclerotic Cardiovascular Disease	43.9	99.2	362.6	103.8
Malignant Neoplasm of Breast (Breast Cancer)	58.0	91.6	174.7	84.0
Other Ill-Defined and Unspecified Causes of Mortality	12.3	57.5	416.4	80.5

Notes: [a] Leading Causes of Death are conditions defined by the International Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), 2008; [b] Age-specific and crude mortality rates represent the number of deaths per 100,000 persons 65 years of age and older.

Mortality Trends among Arizona Resident Females Age 65 and Older

Table 13 presents the 2012 leading causes of death as mortality trends for resident females 65 years and older from 2002 to 2012, with trends in the mortality rates among females from 2002 – 2012 depicted in Figure 11.

Overall, the number of deaths among females age 65 and older increased 14 percent from 2002 (n = 15,614) to 2012 (n = 17,856). The greatest percent increase in number of deaths occurred to females 85 years and over, displaying a 30 percent increase from 2002 (n = 6,549) to 2012 (n = 8,522). Of specific mention are the increases in the number and rate of deaths from Alzheimer's disease, dementia, and ill-defined/unspecified causes. Alzheimer's disease became the leading cause of death among Arizona's older female residents in 2010 when 1,505 deaths were reported. From 2002 to 2012, there was a 20 percent increase in the number of deaths due to Alzheimer's, but more troublesome, the mortality rate for Alzheimer's disease among females 65 and older increased 55 percent during the same period.

Table 12. Specific Leading Causes of Death among Arizona Resident Males[a] 65 Years and Older, 2012

	65 - 74 Years	75 - 84 Years	85 Years and Over	**All Males 65+**
Counts by Cause of Death				
Atherosclerotic Heart Disease	395	575	682	1,652
Malignant Neoplasm of Bronchus and Lung- (Lung Cancer)	494	479	168	1,141
Chronic Obstructive Pulmonary Disease - (COPD)	307	453	296	1,056
Alzheimer's Disease	58	256	403	717
Atherosclerotic Cardiovascular Disease	285	222	182	689
Acute Myocardial Infarction	207	240	217	664
Dementia	47	184	343	574
Malignant Neoplasm of Prostate - (Prostate Cancer)	124	206	183	513
Stroke	75	172	173	420
Parkinson's Disease	59	160	139	358
Total	**2,051**	**2,947**	**2,786**	**7,784**
Mortality Rates[b]				
Atherosclerotic Heart Disease	155.4	426.0	1,714.4	385.2
Malignant Neoplasm of Bronchus and Lung- (Lung Cancer)	194.4	354.8	422.3	266.0
Chronic Obstructive Pulmonary Disease - (COPD)	120.8	335.6	744.1	246.2
Alzheimer's Disease	22.8	189.6	1,013.0	167.2
Atherosclerotic Cardiovascular Disease	112.2	164.5	457.5	160.7
Acute Myocardial Infarction	81.5	177.8	545.5	154.8
Dementia	18.5	136.3	862.2	133.8
Malignant Neoplasm of Prostate - (Prostate Cancer)	48.8	152.6	460.0	119.6
Stroke	29.5	127.4	434.9	97.9
Parkinson's Disease	23.2	118.5	349.4	83.5

Notes: [a] Leading Causes of Death are conditions defined by the International Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), 2008; [b] Age-specific and crude mortality rates represent the number of deaths per 100,000 persons 65 years of age and older.

Similarly, the number of deaths reported from dementia increased by 84 percent during the period, representing a 43 percent increase in the mortality rate due to dementia. Also noteworthy is the disturbing increase in the number of deaths from ill-defined/unspecified causes, representing a 1,426 percent increase from 2002 (n = 27) to 2012 (n = 412).

Countering these results are several significant decreases for the period. Reductions in the number of deaths associated with three diseases are noteworthy: 1) a 51 percent decrease in the mortality rate from acute myocardial infarction, 2) a 42 percent decrease in the mortality rate from atherosclerotic cardiovascular disease, and 3) a 41 percent decrease in the mortality rate from stroke among females 65 years and over.

Mortality Trends among Arizona Resident Males Age 65 and Over

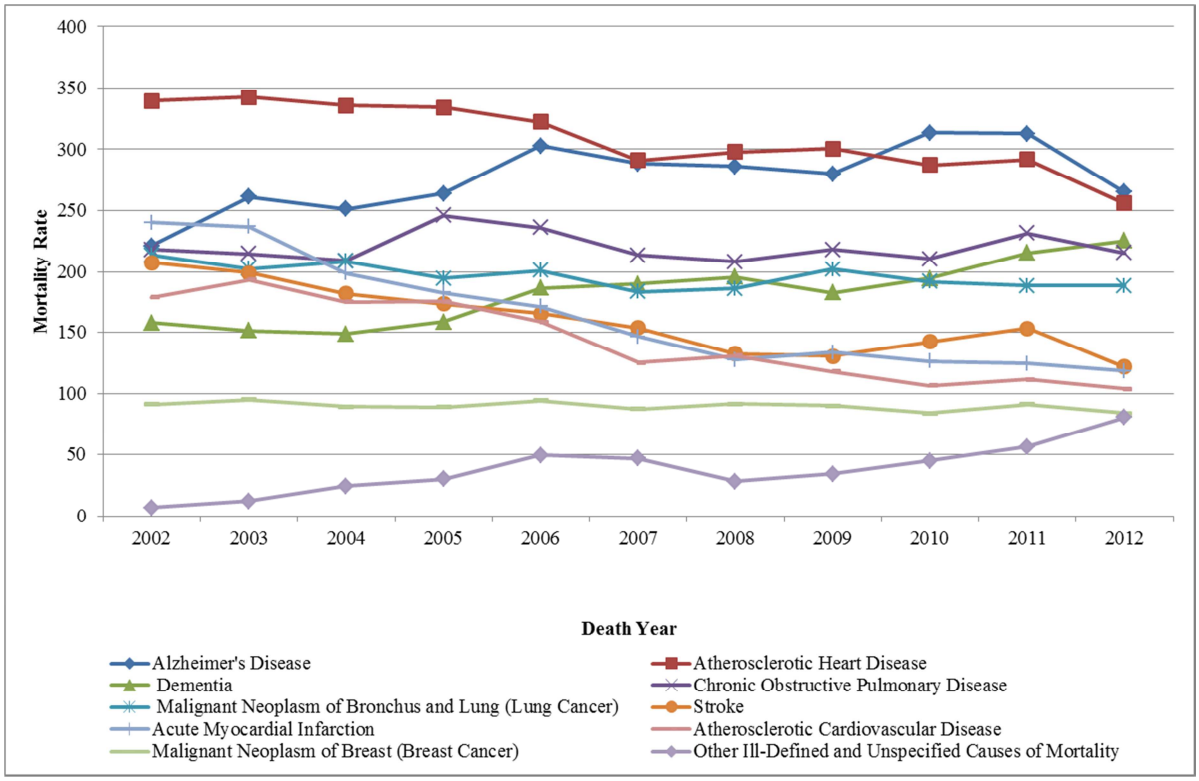
Based on the leading causes of death in 2012, Table 14 and Figure 12 present mortality trends for resident males 65 years and older from 2002 to 2012. From 2002 – 2012, the greatest number of deaths occurred among males ages 75 - 84 years of age (n = 68,426), although males ages 85 and older experienced the greatest percent increase (39 percent) in number of deaths over this period (2002 n = 4,080, 2012 n = 5,664) .

Table 13. Specific Leading Causes of Death[a] among Arizona Resident Females, 65 Years and Older, 2002 - 2012

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	**Total**	**Percent Change 2002 - 2012**
Counts by Age Group													
65-74 Years	3,057	3,059	3,116	3,229	3,159	3,039	3,266	3,357	3,293	3,411	3,662	35,648	**20**
75-84 Years	6,008	6,015	5,813	6,012	6,118	5,844	5,656	5,636	5,524	5,652	5,672	63,950	**-6**
85 Years and Over	6,549	6,823	6,786	7,379	7,506	7,612	7,670	7,671	8,129	8,749	8,522	83,396	**30**
Total (All Females 65 Years and Older)	15,614	15,897	15,715	16,620	16,783	16,495	16,592	16,664	16,946	17,812	17,856	182,994	**14**
Counts by Cause of Death													
Alzheimer's Disease	877	1,066	1,053	1,149	1,338	1,330	1,342	1,325	1,505	1,512	1,356	13,853	**55**
Atherosclerotic Heart Disease	1,346	1,396	1,407	1,453	1,424	1,343	1,397	1,423	1,379	1,410	1,310	15,288	**-3**
Dementia	626	618	624	690	825	876	917	865	934	1,041	1,153	9,169	**84**
Chronic Obstructive Pulmonary Disease (COPD)	865	876	877	1,070	1,043	986	977	1,033	1,011	1,119	1,103	10,960	**28**
Malignant Neoplasm of Bronchus and Lung (Lung Cancer)	846	825	875	846	888	847	873	956	921	910	964	9,751	**14**
Stroke	823	811	763	755	731	710	621	618	683	741	622	7,878	**-24**
Acute Myocardial Infarction	953	965	833	795	756	676	598	632	606	601	605	8,020	**-37**
Atherosclerotic Cardiovascular Disease	709	789	734	764	701	577	613	558	510	539	531	7,025	**-25**
Malignant Neoplasm of Breast (Breast Cancer)	361	387	374	387	416	403	429	425	402	441	430	4,455	**19**
Other Ill-Defined and Unspecified Causes of Mortality	27	50	102	131	219	217	133	163	216	272	412	1,942	**1,426**
Total	7,433	7,783	7,642	8,040	8,341	7,965	7,900	7,998	8,167	8,586	8,486	88,341	**14**
Mortality Rates[b]													
Alzheimer's Disease	221.3	261.5	251.2	264.1	302.8	288.2	286.1	280.0	313.5	312.7	265.0		**20**
Atherosclerotic Heart Disease	339.6	342.4	335.6	334.0	322.2	291.0	297.9	300.7	287.2	291.7	256.0		**-25**
Dementia	158.0	151.6	148.8	158.6	186.7	189.8	195.5	182.8	194.5	215.3	225.4		**43**
Chronic Obstructive Pulmonary Disease (COPD)	218.3	214.9	209.2	245.9	236.0	213.6	208.3	218.3	210.6	231.5	215.6		**-1**
Malignant Neoplasm of Bronchus and Lung (Lung Cancer)	213.5	202.4	208.7	194.5	200.9	183.5	186.1	202.0	191.8	188.2	188.4		**-12**
Stroke	207.7	198.9	182.0	173.5	165.4	153.8	132.4	130.6	142.3	153.3	121.6		**-41**
Acute Myocardial Infarction	240.5	236.7	198.7	182.7	171.1	146.5	127.5	133.6	126.2	124.3	118.3		**-51**
Atherosclerotic Cardiovascular Disease	178.9	193.5	175.1	175.6	158.6	125.0	130.7	117.9	106.2	111.5	103.8		**-42**
Malignant Neoplasm of Breast (Breast Cancer)	91.1	94.9	89.2	89.0	94.1	87.3	91.5	89.8	83.7	91.2	84.0		**-8**
Other Ill-Defined and Unspecified Causes of Mortality	6.8	12.3	24.3	30.1	49.6	47.0	28.4	34.4	45.0	56.3	80.5		**1,082**

Notes: [a] Leading Causes of Death are conditions identified as the top conditions for 2012 and defined by the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10), 2008 Edition; [b] Age-specific crude mortality rates represent the number of deaths per 100,000 resident females, 65 years of age and over.

Figure 11. Specific Leading Causes of Death Among Arizona Resident Females, 65 Years and Older, 2002 – 2012



The greatest increase in mortality rate of all the causes examined was for dementia, representing a 54 percent increase from 2002 (87.1 per 100,000) to 2012 (133.8 per 100,000). Similarly, the number of deaths from Alzheimer's disease rose 72 percent during the period, representing a 27 percent increase in the Alzheimer's mortality rate. The mortality rate increased slightly for Parkinson's disease from 2002 (78.8 per 100,000) to 2012 (83.5 per 100,000).

Contrary to previously mentioned increases, there were several noteworthy decreases. While rates for all causes considered diseases of the heart showed significant reductions, the largest decrease was a 53 percent decrease in the rate of death from acute myocardial infarction, followed by a 26 percent decrease in the rate of death from atherosclerotic cardiovascular disease. Finally, the rate of death from stroke declined by 41 percent for resident males 65 years and over during the period.

Table 14. Specific Leading Causes of Death[a] among Arizona Resident Males, 65 Years and Older, 2002 – 2012

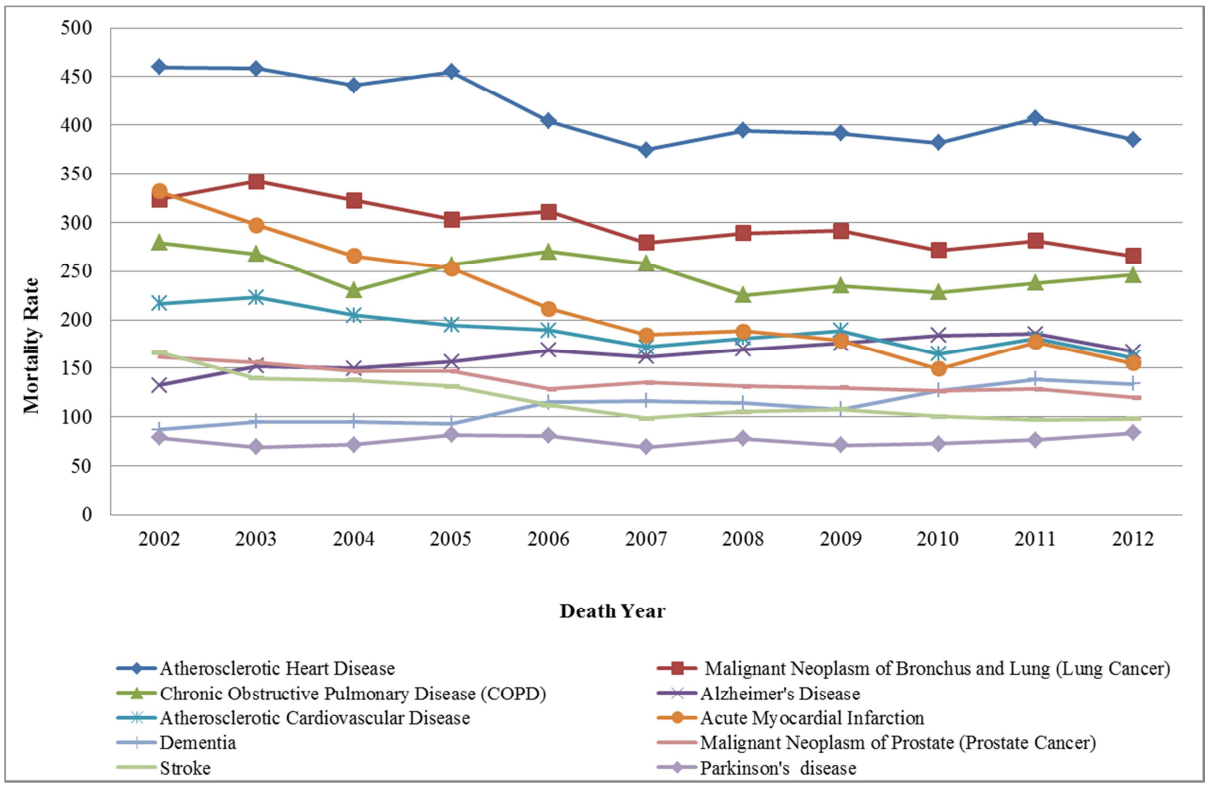
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total	Percent Change 2002 - 2012
Counts by Age Group													
65-74 Years	4,256	4,211	4,164	4,345	4,298	4,225	4,365	4,481	4,622	4,767	5,010	48,744	**18**
75-84 Years	6,172	6,298	6,064	6,383	6,204	6,046	6,259	6,068	6,163	6,342	6,427	68,426	**4**
85 Years and Over	4,080	4,057	4,176	4,473	4,620	4,604	4,917	4,960	5,228	5,423	5,664	52,202	**39**
Total (All Males 65 Years and Older)	14,508	14,566	14,404	15,201	15,122	14,875	15,541	15,509	16,013	16,532	17,101	169,372	**18**
Counts by Cause of Death													
Atherosclerotic Heart Disease	1,452	1,490	1,485	1,590	1,441	1,401	1,500	1,502	1,534	1,645	1,652	16,692	**14**
Malignant Neoplasm of Bronchus and Lung (Lung Cancer)	1,022	1,111	1,086	1,060	1,109	1,046	1,100	1,119	1,091	1,138	1,141	12,023	**12**
Chronic Obstructive Pulmonary Disease (COPD)	883	870	776	897	964	967	858	903	917	963	1,056	10,054	**20**
Alzheimer's Disease	417	494	504	547	601	605	644	674	738	749	717	6,690	**72**
Atherosclerotic Cardiovascular Disease	684	724	690	679	674	643	688	724	661	731	689	7,587	**1**
Acute Myocardial Infarction	1,047	966	896	883	753	690	717	685	599	717	664	8,617	**-37**
Dementia	275	309	321	325	409	435	433	414	509	560	574	4,564	**109**
Malignant Neoplasm of Prostate (Prostate Cancer)	510	507	495	512	458	505	500	498	508	519	513	5,525	**1**
Stroke	525	454	464	458	399	368	401	414	403	393	420	4,699	**-20**
Parkinson's Disease	249	224	241	285	287	259	296	273	290	309	358	3,071	**44**
Total	7,064	7,149	6,958	7,236	7,095	6,919	7,137	7,206	7,250	7,724	7,784	79,522	**10**
Mortality Rates[b]													
Atherosclerotic Heart Disease	459.6	458.4	440.8	454.9	404.0	374.3	394.0	391.1	381.9	406.7	385.2		**-16**
Malignant Neoplasm of Bronchus and Lung (Lung Cancer)	323.5	341.8	322.4	303.3	311.0	279.5	289.0	291.4	271.6	281.3	266.0		-18
Chronic Obstructive Pulmonary Disease (COPD)	279.5	267.7	230.3	256.6	270.3	258.4	225.4	235.1	228.3	238.1	246.2		-12
Alzheimer's Disease	132.0	152.0	149.6	156.5	168.5	161.6	169.2	175.5	183.7	185.2	167.2		27
Atherosclerotic Cardiovascular Disease	216.5	222.7	204.8	194.3	189.0	171.8	180.7	188.5	164.6	180.7	160.7		-26
Acute Myocardial Infarction	331.4	297.2	266.0	252.6	211.1	184.4	188.3	178.4	149.1	177.3	154.8		**-53**
Dementia	87.1	95.1	95.3	93.0	114.7	116.2	113.7	107.8	126.7	138.4	133.8		**54**
Malignant Neoplasm of Prostate (Prostate Cancer)	161.4	156.0	146.9	146.5	128.4	134.9	131.3	129.7	126.5	128.3	119.6		**-26**
Stroke	166.2	139.7	137.7	131.0	111.9	98.3	105.3	107.8	100.3	97.2	97.9		**-41**
Parkinson's disease	78.8	68.9	71.5	81.5	80.5	69.2	77.8	71.1	72.2	76.4	83.5		**6**
Total	2,236.1	2,199.5	2,065.4	2,070.1	1,989.4	1,848.7	1,874.8	1,876.3	1,804.9	1,909.5	1,815.0		**-19**

Notes: [a] Leading Causes of Death are conditions identified as the top conditions for 2012 and defined by the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10), 2008 Edition; [b] Age-specific crude mortality rates represent the number of deaths per 100,000 resident females, 65 years of age and older.

5.4 Conclusion

Mortality analyses of Arizona's resident population of older adults reveals changes in mortality trends that can be used to inform and influence public policy as well as track the success of public health initiatives. Chronic diseases that are most detrimental to the oldest Arizonans, exemplified by Alzheimer's disease among females, will become increasingly problematic as the population of older Arizonans expands. Alzheimer's is currently an incurable disease that has few clear causal factors other than age, meaning our healthcare, welfare, and social support systems must prepare for the increasing monetary and social costs associated with caring for older adults experiencing Alzheimer's disease. On the other hand, the mortality rates for a number of the leading causes of death have decreased substantially among Arizona's older adults, namely atherosclerotic heart and cardiovascular disease among both men and women, stroke among women, and both lung and prostate cancer among men. These successes indicate that interventions designed to help older adults lead healthier lives and seek medical treatment when necessary have proven successful for chronic diseases that are somewhat preventable. Even the decrease in leading causes of death such as heart disease and cancer foretell the increased burden that will be exerted in the future by Alzheimer's disease and dementia. Being spared by chronic diseases such as heart disease and cancer that typically cause mortality in the

Figure 12. Specific Leading Causes of Death Among Arizona Resident Males, 65 Years and Older, 2002 2012



earlier stages of old age increases the likelihood of developing Alzheimer's disease. While cognitive decline is an inevitable outcome of the aging process, multiple health-related factors including nutrition, physical activity, and tobacco and alcohol use have been related to cognitive decline (Alwin and Hofer 2008). By focusing on the prevention of age-related cognitive decline now, we can help to reduce the expense and difficulties we certainly will face as our population ages.

6. Conclusion

As the health and wellness of older Arizonans is the product of multiple components, developing informational resources to assist in the promotion of healthy aging of Arizona's older adults must also draw from various sources. This report has taken a holistic approach to defining health among Arizona's older adults, examining the role older adults play in the composition of our populace now and in the coming future, the demographic characteristics of our older population, as well as measures of health-related behaviors and the prevalence with common morbidities and chronic diseases. Hospital discharge data was used to assess how Arizona's older population utilize emergency and inpatient hospital care, and finally current patterns and recent trends in mortality were provided to understand the leading causes of death in Arizona's older population. Each of these data sources were analyzed with a focus on the coming population shift when Arizona's older adults will come to represent a greater proportion of the population.

As population projections highlighted, older adults will come to account for a greater proportion of our growing population in the future, making our ability to account for the health needs of this segment of the population even more critical. Arizona's older adults were shown to have health behaviors similar to comparably aged adults nationally, but differed from national estimates on some chronic diseases, specifically a lower prevalence of diabetes, a lower percentage of women with consistent mental and physical health issues, and a higher percentage of men reporting being diagnosed with skin cancer. Indicators of health care utilization showed that that rate of both emergency room and inpatient visits increased with age, with fractures being the most common first-listed diagnosis among Arizona's adults age 85 and over. While frailty may be somewhat inevitable as a result of the body's biological senescence with age, programs that encourage seniors to participate in physical activities and to make changes to their living environments to reduce the risk of falls can help reduce the number of fractures among aging adults.

The most exceptional trend observed in mortality among Arizona's older population is the increasing number of deaths related to cognitive aging. For both males and females, the mortality rate for Alzheimer's disease increased more than 20 percent and the mortality rate for dementia increased more than 40 percent from 2002 to 2012. Arizona's older females bear the greatest burden of memory-related diseases, with both Alzheimer's and dementia being in the top 3 causes of death for females 65 and over in 2012. As male longevity increases and mortality rates from heart disease and cancers continue to decrease, it can be expected that males will come to share increasingly in the proportion of all deaths due to memory-related disease.

It again should be noted that the leading causes of death for males and females and subsequent trends were identified differently than other reports of mortality counts and rates. As shown in Tables 9 – 14, heart disease and cancer continue to be the overall leading causes of death for Arizonans age 65 and older, and this holds true for both males and females. Heart disease and cancer represent the greatest disease burden our older population must face, with memory-related diseases representing the causes of death that will claim the most rapidly increasing proportion of older Arizonans over the coming half-century.

Finally, the role of this report was to summarize the current and future state of health among Arizona's older adults. The information summarized herein represents only one step in the process of public health promotion. It is our hope that those tasked with the development of health policy to serve the needs of Arizona's seniors will take the results of this report into account when deciding how to effectively plan and fund social services, community programs, and health delivery systems. The great increases in human health and longevity in the early 20th Century were related largely to public health programs that focused on the primary prevention of disease. In the 21st Century, a large body of research is emerging that suggests a healthy diet, physical activity, social engagement, and intellectual and creative pursuits can help prevent the development of a host of morbidities among older adults, reduce the impact of these diseases once they have developed, and reduce the risk of mortality due to these chronic diseases (Ford et al. 2011; Michael et al. 1999; National Institute on Aging 2008; Savica and Petersen 2011). Health-related behaviors present a great opportunity for those developing and implementing health policy aimed at increasing the health and wellbeing of seniors, as programs that promote these activities among seniors are relatively inexpensive compared to the costs of treating chronic diseases within the health care system. With that being said, more fundamental determinants of health such as access to socioeconomic resources including education, solid job opportunities, income equality, and strong social ties will persistently reduce our ability to prevent the development of morbidities across the lifecourse. To most effectively prevent the development of chronic diseases and disabilities associated with aging, policy makers must focus both on the larger socioeconomic determinants of health as well as the development and maintenance of healthy habits and behaviors at the individual level.

Appendix A – Glossary

Baby boom generation – Individuals born between 1946 and 1964.

Behavioral Risk Factor Surveillance System (BRFSS) – A nationally representative telephone survey designed to measure the prevalence of behavioral risk factors and morbidities of non-institutionalized adults age 18 and over.

Body mass index (BMI) – A measure of body fat based on height and weight that applies to adult men and women. Calculated as weight in pounds divided by height in inches squared multiplied by a factor of 703 (mass (lb)/(height(in))^2 X 703).

Chronic disease – Long-lasting diseases that can be controlled but not cured including heart disease, stroke, cancer, diabetes, and arthritis.

Dependency ratio – A comparison of the number of economically inactive residents to the number of economically active residents (calculated as the sum of adults age 0 – 14 and age 65 and older divided by the number of adults age 15 – 64).

Elderly – An individual age 65 or older.

Fertility – The production of offspring.

First-listed diagnosis – The primary condition for which the patient required healthcare.

Health behaviors – Activities or habits of an individual that are not directly related to health care but that can potentially influence later health outcomes. Examples include physical activity and exercise, diet, smoking, and alcohol use.

Hospital Discharge Data (HDD) - Discharge records for inpatient and ER department visits from all Arizona licensed hospitals. Hospitals such as Veteran's Administration, Department of Defense, and those located on tribal land are not included in the reporting.

Morbidity –A general term used to describe any disease or disability.

Mortality – Loss of life; death.

Mortality rate – The number of deaths in the population divided by the total population for a specific time span. Usually expressed in units per 1,000, 10,000, or 100,000 individuals.

Population projection – Methods and techniques used to predict future populations. The cohort-component method of population projection takes into account multiple inputs to population change including current population, rates of fertility, mortality, and migration, as well as special populations such as military and college students.

Population pyramid – A graphical representation of a population's age and sex distribution.

Prevalence – Broadly the commonality of a given condition in the population. Usually expressed as a proportion of the population with a given health condition.

Primary prevention – Public health efforts to prevent the development of disease before symptom onset.

Proportion – A type of ratio in which the numerator is included in the population defined by the denominator. A proportion is often multiplied by 100 and expressed as a percentage.

Rate – A *rate* is a ratio in which those in the numerator are also in the denominator, and those in the denominator are "at risk" of being in the numerator. The denominator is the sum of "at risk" person-time or, by convention, the count of individuals "at risk" in a given time period.

Ratio – A *ratio* is any division of one number by another; the numerator and denominator do not have to be mutually exclusive.

Socioeconomic status – A multifaceted construct representing one's access to various resources. This construct often includes indicators such as income, assets, education, occupational prestige, and social involvement.

Appendix B - Bibliography

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