The Prevalence and Characteristics of People Aged 18 to 64 Years Reporting Blindness and Low Vision, United States and State of South Carolina, 2019, Behavioral Risk Factor Surveillance System

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Message from Lee Nasehi and Acknowledgements

Dear Friends and Colleagues,

In early 2022, VisionServe Alliance launched the Big Data Project, Phase One, which focused on Aging and Vision Loss (age 65+) across the nation. This report represents the launch of Phase Two of the Big Data Project, focused on the comparison of Working Age Adults (aged 18-64) who are visually impaired and working to those who are visually impaired and not working.

Understanding the prevalence of vision impairment among people of working age (ages 18 to 64 years), the circumstances they experience, and the distribution across employment categories is useful to improve opportunities to promote work as well as improve overall health and quality of life of working aged people.

This report combines two briefings. Section 1 contains the United States briefing, comprised of narrative and data charts outlining the collective prevalence of people with blindness and low vision, including social, economic, and health characteristics. Section 2 contains similar data and narrative specific to your state. The combined report will provide instant ability to compare the state's data to the national data, as well as to narrative insights.

We are deeply grateful to The VanNasdale Group LLC, specifically, Dr. Dean VanNasdale and Dr. John Crews, for their commitment to making the Big Data Project a reality, addressing a long-standing void in the field of vision rehabilitation. Thank you.

We also gratefully acknowledge these organizations for their generous sponsorship of the research and this resulting report, the Lavelle Fund for the Blind, National Industries for the Blind (NIB), National Association for the Employment of People Who are Blind (NAEPB), Alphapointe, Envision, Inc., Association for the Blind and Visually Impaired South Carolina, and Lions Vision Services.

Your questions and comments are welcome at info@visionservealliance.org. Thank you for your interest in and support of the Big Data Project Phase 2: Working Age Adults.

Respectfully,

Lee Nasehi

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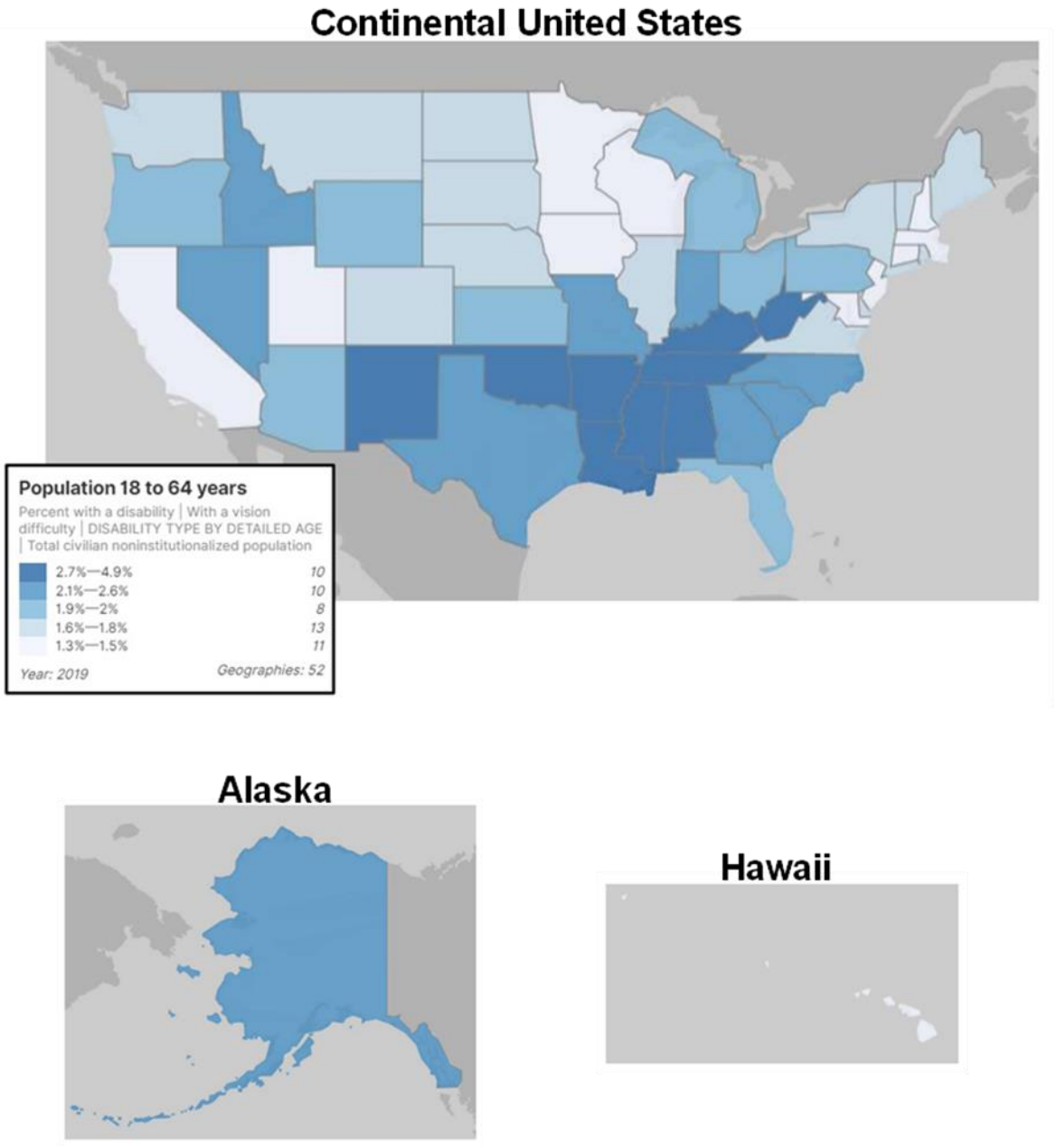

See Appendix B, Prevalence of vision impairment by state by quintile, for additional information.

Executive Summary

In the United States, about 8.7 million people (about 4.7%) of the population between the ages of 18 and 64 years report blindness and low vision in response to the question, “Are you blind or do you have serious difficulty seeing even when wearing glasses?” Of those, 43.6% report they are working, and 10.5% report they are out of work. Of the remaining population, 8.1% are homemakers, 3.9% are students, and 5.1% are retired. Most troubling, however, is that 28.9% report they are unable to work.

This distribution of workforce participation stands in stark contrast to working-aged people without vision impairment, where 70.4% are working, 5.9% are out of work, and 6.3% are unable to work. Multiple factors contribute to the capacity/decision to participate in the labor force. Some barriers include difficulties with transportation or employer attitudes. Additional barriers may be defined by social and health factors, including income, education, and the prevalence and effects of chronic health conditions. Many of these factors are subsumed under the concept of Social Determinants of Health.

In this report, we examine the population of working-aged people with vision impairment in eight categories defined by the Behavioral Risk Factors Surveillance System (BRFSS): working for wages, self-employed, out of work less than one year, out of work one year or more, homemaker, student, retiree, and unable to work.

The findings of this investigation demonstrate that people with vision impairment, including those who are working, experience disproportionately lower levels of education and income, and they experience disproportionally higher prevalence of chronic conditions, poorer health, and poorer health-related quality of life. People with vision impairment working for wages, those self-employed, and students, while substantially better than those not working, report high prevalence of diabetes, depression, and hearing impairment, at levels much higher than the general population. Many of those who work continue to work with serious health concerns. Among people working for wages and those self-employed, a third (32% and 33% respectively) report fair/poor health. Fifty percent of those out of work (less than a year or more than one year) report fair/poor health. Thirty-six percent of people working for wages and 47% of those self-employed report incomes below $25,000, although 20-24% of workers report incomes greater than $75,000. Lower incomes suggest that some people are not working full-time or are underemployed.

With the exception of students, those who are not in the labor force report greater prevalence of health conditions that may prevent or limit work. Twenty-four to 29% of homemakers and retirees, respectively, report diabetes, and 7 to 10% report kidney disease, and 38% report depression. For homemakers and retirees, 57 to 60% fair/poor health.

Within the 29% of the working-age population unable to work, thirty-five percent have not completed high school, and 28% report annual incomes of less than $10,000. In addition, 33.8% report diabetes, 14.2% report kidney disease, and 62.7% report depression. Three-quarters of people unable to work report fair/poor health. As a

group, those unable to work report substantial excess disability with 75% reporting serious difficulty walking or climbing stairs.

The findings in this report are designed to be used to inform policy and practice decision-making. More robust vision rehabilitation programs, more responsive public policies that allow people to move into and out of the labor force, and aggressive, innovative health promotion programs may have the potential to ameliorate some of these serious disparities.

Introduction

In the United States, 8.7 million people between the ages 18- and 64-years report blindness and low vision in response to the question “Are you blind or do you have serious difficulty seeing even when wearing glasses?” Of that population, 43.6% report they are working, 10.5% report they are out of work, 17.1% are not in the labor force (students, homemakers, and retirees), and 28.9% indicate they are unable to work. These estimates are derived from the 2019 Behavioral Risk Factor Surveillance System (BRFSS). Another 4 million people aged 65 years and older (7.3% of the age 65 years and over population) are estimated to be blind or have low vision in response to the same question.

In a 2016 study, Varma and colleagues examined six major population-based studies and estimated that 12.44 million people aged 40 years and over had vision impairment, including 1.02 million people with legal blindness (with a prevalence of 0.68%), 3.22 million people visually impaired based on their best corrected, better seeing eye, and 8.2 million people with vision impairment due to uncorrected refractive error.[1] Like other studies, Varma’s investigation found the prevalence of vision impairment increased with age and increased among racial/ethnic minorities.[2] Varma also projected that the population of people experiencing vision impairment would double by 2050, reaching over 25 million people.

Purpose

In this investigation, we seek to better understand the social, economic, and health characteristics of people aged 18 to 64 years who report blindness and low vision in each of the eight labor force categories, including those who are working, not working, or out of the labor force. In addition, the aim of this study is to better understand the prevalence of chronic conditions, quality of life, and disability characteristics in each category. These findings may inform the development of policies and interventions to improve work opportunities. Public policy and evidence-based interventions to promote health and autonomy focus on the gap between people with and without vision impairment as well as the gap between those who are working and those who are not. These disparities define remarkably complex concerns that require thoughtful, nuanced, and evidence-based responses.

First, we examine the work participation among people with and without blindness and low vision and illustrate broadly how the social, economic, and health indicators differ between those with and without vision impairment. Second, once that landscape is established, we examine social, economic, and health factors among working-aged people with blindness and low vision in each of eight work categories.

This report provides analysis at the national level. State level data provides further insight into the complex factors that encourage or discourage work. One perspective informs the other.

Part 1

Work Force Participation among People with and without Blindness and Low Vision

Table 1 illustrates the distribution and estimated population of people with and without vision impairment in each of eight employment categories: employed for wages, self-employed, out of work for less than one year, out of work one year or more, a homemaker, a student, retired, and unable to work. People with vision impairment are less likely to work (43.6%) compared to people without vision impairment (70.4%). Similarly, people with vision impairment are more likely to be unemployed (10.5%) compared to people without vision impairment (5.9%). People with vision impairment are more likely to report being a homemaker or being retired and less likely to be a student than people without vision impairment. The most striking and troubling finding is that 28.9% of working-aged people with vision impairment compared to 6.3% of people without vision impairment report they are unable to work.

Table 1. Percent and Estimated Population of People with and without Blindness and Low Vision Aged 18-64 Years by Labor Force Participation, United States, 2019, Behavioral Risk Factor Surveillance System.

Category	Blindness and Low Vision		No Blindness or Low Vision	
Labor Force Participation	**Percent**	**Estimated Population**	**Percent**	**Estimated Population**
Employed for wages	36.0%	3,243,968	59.7%	105,316,352
Self-employed	7.6%	659,024	10.7%	18,798,419
Out of work for 1 year of more	6.0%	522,845	2.6%	4,620,767
Out of work less than 1 year	4.5%	388,520	3.3%	5,821,283
Unable to work	28.9%	2,523,275	6.3%	11,062,381
Homemaker	8.1%	705,077	6.1%	10,827,272
Student	3.9%	339,432	7.2%	12,672,918
Retired	5.1%	441,365	4.2%	7,369,608
Total	100.0%	8,723,507	100%	176,494,002

Characteristics of Working Aged People with and without Vision Impairment

While the factors explaining workforce participation among people with vision impairment are complex and layered, some insight can be gleaned by comparing broad differences in social, economic, and health circumstances with people not reporting blindness and low vision.

The framework of Social Determinants of Health (SDOH) has been employed to explain differing health outcomes based on disparities in income, education, and geographic location.[3,4] SDOH suggest that upstream factors related to poorer education and poverty often produce poorer health outcomes and decreased workforce participation as downstream effects. Conversely, people with higher education and higher incomes generally report better overall health. Table 2 examines several factors related to the SDOH model: education and household income as upstream factors and self-reported health, chronic conditions, and disability measures as downstream effects. Some of these factors may explain the disproportionate low workforce participation among working-aged people with vision impairment.

Sixty-one percent of working aged people with vision impairment compared 38.8% of people without vision impairment report having a high school degree or less. People with vision impairment are almost three times as likely as people without vision impairment to have less than a high school degree. Moreover, people without vision impairment are about three times as likely to have a college degree (29.7% vs 11.4%). Education often predicts income. Forty-two percent of people with vision impairment compared to 15.2% of people without vision impairment report annual household income of less than $20,000, while 13.9% of people with vision impairment compared to 40.9% of people without vision impairment report incomes of more than $75,000.

The disparities in the prevalence of chronic conditions and self-reported health mirror the patterns established by education and income. People with vision impairment are more likely than people without vision impairment to report serious chronic conditions, including hearing impairment (16.2% vs 3.4%), diabetes (19.5% vs 7.2%), depression (41.3% vs 19.3%), kidney disease (7.1% vs 1.9%), and stroke (9.1% vs 1.8%). Perhaps as a consequence, 50% of those with vision impairment report fair/poor health compared to 15.4% of those without vision impairment.

Although it is not possible to assert a causal pathway across these socioeconomic and chronic conditions, the well-established patterns appear to contribute to substantial excess disability among people with vision impairment. In particular, people with vision impairment report greater difficulty walking/climbing stairs (40.7% vs 8.9%) and running errands (29.2% vs 5.5%). A portion of these mobility limitations might reasonably be attributed to a lack of orientation and mobility training, although the survey does not reveal that information.

Table 2. Selected Social, Health, and Economic Characteristics of People Aged 18-64 Years with and without Blindness and Low Vision, United States, 2019, Behavioral Risk Factor Surveillance System.

Category	Blindness and Low Vision	No Vision Impairment
Education		
Less than High School	28.9%	11.5%
High School	31.8%	27.3%
Some College	27.8%	31.4%
College Graduate	11.5%	29.7%
Income		
Less than $20,000	41.9%	15.2%
$20,000 to less than $50,000	35.9%	28.9%
$50,000 to less than $75,000	8.4%	15.0%
More than $75,000	13.9%	40.9%
Health Conditions		
Hearing Impairment	16.2%	3.4%
Diabetes	19.5%	7.2%
Depression	41.3%	19.3%
Kidney Disease	7.1%	1.9%
Stroke	9.1%	1.8%
Self-Reported Health		
Fair/Poor	49.9%	15.4%
Disability Measures		
Walking/ Climbing Stairs	40.7%	8.9%
Cognition	42.4%	11.0%
Running Errands	29.2%	5.5%

*95% Confidence Interval (CI) are reported in the Appendix.

Part 2

Social, Economic, and Health Characteristics of People with Blindness and Low Vision, Aged 18-64

While there are great disparities between people with and without vision impairment, there are also substantial differences among each of the workforce participation categories. Here, we examine education, income, six chronic health conditions, four measures of Health-Related Quality of Life, and four measures of disability across eight employment categories. The patterns of these factors begin to tell a complex and compelling story about the circumstances of each group, and our findings may identify possibilities to improve work opportunities. For this investigation, we examined nearly 60 variables from the BRFSS. Detailed tables in the Appendix illustrate each variable with confidence intervals. This discussion addresses some key factors that inform social and health wellbeing.

People with Blindness and Low Vision who are Working and Out of Work

In this section, we examine four categories of people who are working or out of work, and in the following section we examine four categories of people who are not in the labor force.

Among people aged 18-64 years with blindness and low vision, 36.0% report they are employed for wages and another 7.6% report they are self-employed — totaling about 44% of the population. See Table 3. The BRFSS does not capture information about full- or part-time work. Most people who report working for wages are aged 18-44 years, and most are female. (See Appendix A.) Those self-employed are equally divided among 18- to 44-year-olds and 45- to 64-year-olds, but most self-employed workers are male.

In addition, 4.5% of people aged 18-64 years with blindness and low vision report they have been out of work less than a year, and another 6.0% report being out of work more than one year.

People who are working are more likely to report higher levels of education than those who are out of work, as one would reasonably expect. Seventeen percent of people working for others report being college graduates compared to 7% of those out of work more than a year. Similarly, 21% of those working for wages have less than a high school degree compared to 37% of those who have been out of work more than a year. OBJ

Education and Household Income

Table 3. Education Levels among People with Blindness and Low Vision who are Working and Out of Work, United States, 2019 BRFSS

Category	Working		Out of Work	
	Working for wages	Self Employed	Out of Work Less than 1 Year	Out of Work 1 Year of More
8th Grade or less	9.4%	10.4%	13.1%	10.9%
Some High School	11.7%	14.0%	16.4%	25.9%
High School Graduate	30.8%	31.8%	37.1%	30.8%
Some College/ Technical School	30.9%	30.8%	25.1%	25.0%
College Graduate	17.2%	13.1%	8.4%	7.4%

While education is associated with greater work opportunities and stability, income reflects employment circumstances. Surprisingly, however, people with blindness and low vision who are working report remarkably low household incomes: 36% of people working for wages and 47% of those self-employed report household incomes of less than $25,000.

Among people out of work less than one year, 25% report household incomes of less than $10,000, and 33% of those out of work more than one year report incomes less and $10,000; in fact, 72% of this latter group report income less than $25,000.

Table 4. Household Income among People with Blindness and Low Vision who are Working and Out of Work, United States, 2019 BRFSS

Category	Working		Out of Work	
	Working for wages	Self-Employed	Out of Work Less than 1 Year	Out of Work 1 year or more
Less than $10,000	4.2%	12.0%	24.9%	33.1%
$10,000 to less than $15,000	7.1%	5.4%	7.5%	11.8%
$15,000 to less than $25,000	25.0%	29.9%	29.5%	27.3%
$25,000 to less than $50,000	28.3%	23.9%	20.6%	18.2%
$50,000 to less than $75,000	11.8%	9.6%	5.7%	3.0%
More than $75,000	23.6%	19.3%	11.8%	6.5%

Health and Chronic Conditions

Lower levels of education and lower income levels tend to predict poorer overall health. The BRFSS asks participants whether they have been told they have any of thirteen chronic conditions. Table 4 shows the prevalence of six chronic conditions that may influence the capacity to work: diabetes, depression, stroke, any cancer, kidney disease, and hearing impairment.

About 10% of people working for wages and who are self-employed report having diabetes. Twenty-nine percent of those working for wages and 24% of those self-employed report depression. Between 8 and 10% report any cancer. Among this younger population, 11% of those working for wages and 16% of those who are self-employed report severe hearing impairment.

Among those Out of Work, the prevalence of chronic health conditions is higher. Fifteen to 20% report diabetes, and 41-48% report depression. The prevalence of stroke tends to be higher, and kidney disease is substantially higher. The causal pathway from stroke and diabetes to vision impairment is well understood, and high prevalence of depression may be a consequence of poorer health and lack of employment.

Table 5. Selected Chronic Conditions Reported among People with Blindness and Low Vision who are Working and Out of Work, United States, 2019 BRFSS

Category	Working		Out of Work	
	Working for Wages	Self-Employed	Out of Work Less than 1 Year	Out of Work 1 Year or More
Diabetes	9.5%	10.2%	15.4%	20.1%
Depression	29.4%	24.2%	41.3%	47.9%
Stroke	3.3%	3.8%	9.2%	5.0%
Any Cancer	7.8%	10.1%	9.1%	7.2%
Kidney Disease	2.8%	3.4%	4.0%	7.6%
Severe Hearing Impairment	11.3%	16.4%	12.9%	17.4%

Health-Related Quality of Life

The BRFSS employs a set of four Health-Related Quality of Life (HRQoL) questions. The HRQoL module is a well-regarded measure of quality of life that characterizes overall physical and mental health[5,6]One question asks respondents to characterize their health status; response categories are excellent, very good, good, fair, and poor. Three other questions ask respondents about the number of days of poor physical health, poor mental health, and activity limitation in the previous month. Those

questions include: 1) “Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?” 2) “Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?” and 3) “During the past 30 days, for about how many days did your poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?” Table 5 shows the percentage of people reporting 14 or more days of poor health related quality of life out of the previous 30 days.

The findings among those working and out of work reflect that same pattern of increased risks as demonstrated in education, income, and chronic conditions. About 32 to 33% of people with blindness and low vision who are working report fair or poor health, and 47-54% of those out of work report fair or poor overall health.

Seventeen to 19% of workers report 14 or more days in the last 30 of poor physical health compared to 30 to 37% among non-workers.

About 24 to 29% of workers report depression, with 22 to 25% of workers indicating fourteen or more days in the last 30 with poor mental health. Similarly, about 41 to 48% of people out of work report depression, and that finding, likewise, is confirmed with 34 to 36% of people out of work reporting frequent poor mental health days.

Frequent days of activity limitation are substantially greater among people who report being out of work. Eleven percent and 13% of those working for wages and those self-employed, respectively report frequent activity limitations compared to 29% for those out of work less than a year and 36% among those out of work more than a year.

People with blindness and vision impairment who are working appear to work despite poor health and mental health concerns. Those who are out of work report poorer health and frequent days of activity limitations that may limit the ability to obtain or sustain work.

Table 6. Health-Related Quality of Life among People with Blindness and Low Vision who are Working and Out of Work, United States, 2019 BRFSS

Category	Working		Out of Work	
	Working for Wages	Self-Employed	Out of Work Less than 1 Year	Out of Work 1 Year or More
Fair/ Poor Health	31.7%	33.1%	49.6%	53.9%
14 or more days of physical health not good	16.5%	19.0%	29.8%	37.0%
14 or more days of mental health not good	24.7%	22.1%	33.6%	36.4%
14 or more days of activity limitation	10.5%	13.3%	28.5%	36.4%

Disability Measures

The American Community Survey developed six standard disability questions incorporated into the Census, which were also included in the core of the BRFSS in 2013.[7] One question addresses vision, “Are you blind or do you have serious difficulty seeing even when wearing glasses?” requiring a binary response of yes or no. A positive response to this question serves as the case definition for this study. The second question asks, “Are you deaf or do you have serious difficulty hearing?” Reponses to this question are shown in Table 4 above. Other questions ask about:

- mobility: “Do you have serious difficulty walking or climbing stairs?”
- cognition: “Because of a physical, mental or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?”
- self-care tasks: “Do you have difficulty dressing or bathing?”

The final question asks, “Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting the doctor’s office or shopping?” See Table 7.

Table 7. Disability Measures among People with Blindness and Low Vision who are Working and Out of Work, United States, 2019 BRFSS.

Category	Working		Out of Work	
	Working for wages	Self-Employed	Out of Work Less than 1 Year	Out of Work 1 Year or More
Walking/Climbing Stairs	19.2%	20.7%	30.5%	42.6%
Concentrating/ Remembering	30.7%	31.4%	42.1%	49.6%
Bathing/Dressing	5.1%	5.4%	11.9%	20.7%
Running Errands	10.9%	12.1%	22.2%	37.1%

Part 3

People with Blindness and Low Vision Who Are Not in the Work Force

Forty-seven percent of working aged people with blindness and low vision are not in the labor force. Seventeen percent are homemakers (8.1%), retirees (5.1%), and students (3.9%). Twenty-nine percent of respondents report they are unable to work. In this section, we describe people in each labor force category using the same metric as those who are working and not working.

Education

Whether employed or not, working-aged people with vision impairment report disproportionately lower educational achievement compared to the general population. Among people who are blind and have low vision, educational levels are associated with their labor force participation, that is, those working report higher education than those who are not in the labor force.

Homemakers, 97% of whom are female, report the lowest level of education with 52% having less than a high school degree. Students report the highest education; since the survey includes people aged 18 years and over, some students may be in high school. The BRFSS does not ask whether people are full- or part-time students. Nevertheless, 7% report some high school; 37% have completed high school; and 17% have graduated from college. Five percent of people in the 18-64 age group report being retired. Interestingly, 10% of retirees are aged 18 to 44 years. The educational level of retirees generally mirrors those who are working: about a fourth have less than a high school degree; 29% have completed high school; and 47% have some college or a college degree.

The precise reasons why people indicate they are unable to work are unknown, but the patterns across social and health factors begin to tell a compelling story. Thirty-six percent of people who reported they are unable to work have less than a high school degree; a third have completed high school; and 30% have completed some college or have a college degree.

Table 8. Education Levels among People with Blindness and Low Vision who Not in the Labor Market, United States, 2019 BRFSS

Category	Out of the Labor Force			Unable to Work
	Homemaker	Retired	Student	
8th Grade or less	25.0%	12.6%	0.1%	12.8%
Some High School	26.6%	11.7%	7.0%	22.7%
High School Graduate	24.4%	28.7%	37.4%	34.2%
Some College/ Technical School	20.6%	32.6%	38.8%	23.9%
College Graduate	3.3%	14.5%	16.7%	6.4%

Income

People with blindness and low vision who are not in the labor force report extremely low household incomes. Sixty percent of homemakers and 54% of retirees report household income of less than $25,000. Forty percent of students report incomes of less than $25,000, but 25% report incomes greater than$75,000. A remarkable 71% of people who are in the Unable to Work category report incomes less than $25,000, with 28% having incomes less than $10,000.

Table 9. Household Income among People with Blindness and Low Vision who Report Being Out of the Labor Force or Unable to Work, United States, 2019 BRFSS

Category	Out of the Labor Force			Unable to Work
	Homemaker	Retired	Student	
Less than $10,000	15.6%	12.0%	7.6%	28.3%
$10,000 to less than $15,000	12.0%	10.5%	11.2%	10.9%
$15,000 to less than $25,000	32.0%	32.1%	21.0%	32.1%
$25,000 to less than $50,000	21.4%	23.1%	27.2%	14.1%
$50,000 to less than $75,000	13.8%	8.2%	8.2%	3.3%
More than $75,000	5.0%	13.1%	24.7%	2.3%

Chronic Conditions

Working-aged people with blindness and low vision report disproportionately greater chronic conditions compared to people without vision impairment. Except for students, those not in the labor force report substantially greater prevalence of chronic conditions, potentially compromising function, and autonomy. The rate of depression is high for each group: 38% of homemakers and retirees, 26% of students, and 63% of those unable to work responded positively to questions about depression. Kidney disease is also disproportionately higher, especially among retirees and those unable to work. Twenty to twenty-five percent of students, retirees, and those unable to work report severe hearing loss.

Table 10. Selected Chronic Conditions among People with Blindness and Low Vision who Report Being Out of the Labor Force or Unable to Work, United States, 2019 BRFSS

Category	Out of the Labor Force			Unable to Work
	Homemaker	Retired	Student	
Diabetes	23.6%	29.4%	5.5%	33.8%
Depression	38.3%	37.6%	25.9%	62.7%
Stroke	2.5%	13.9%	3.2%	20.5%
Any Cancer	8.4%	16.5%	7.9%	18.6%
Kidney Disease	6.6%	9.8%	2.3%	14.2%
Severe Hearing Impairment	10.1%	25.2%	19.7%	22.3%

Health-Related Quality of Life

In many respects, Health Related Quality of Life Measures illustrate the potential upstream effects of lower education, lower incomes, and chronic conditions. Fifty-seven percent of Homemakers and 60% of retirees report fair/poor health. Students with vision impairment are generally younger, and less likely to report poorer health; however, compared to their non-visually impaired peers, they disproportionately experience poorer health.

Thirty-four percent of homemakers, who experience relatively high prevalence of chronic conditions, report frequent unhealthy days. Thirty-eight percent of Homemakers report depression, 36% report 14 or more days of poor mental health out of the last 30, and 24% of Homemakers report frequent activity limitations.

Those who responded that they are Unable to Work report lower education and substantially lower incomes. Perhaps as a consequence of poverty, they report very high prevalence of chronic conditions, which are mirrored in poorer health related quality of life. Three-quarters of people who report that they are Unable to Work report fair/poor health. Among the eight labor force categories, they report the highest prevalence of frequent poor physical health (62%), frequent poor mental health (52%), and frequent activity limitations (56%).

Table 11. Health-Related Quality of Life among People with Blindness and Low Vision who Report Being Out of the Labor Force or Unable to Work, United States, 2019 BRFSS

Category Reporting Difficulty	Out of the Labor Force			Unable to Work
	Homemaker	Retired	Student	
Fair/ Poor Health	56.9%	60.4%	24.2%	76.0%
14 or more days of physical health not good	33.6%	45.3%	12.6%	62.0%
14 or more days of mental health not good	35.6%	33.4%	31.3%	51.8%
14 or more days of activity limitation	24.2%	35.6%	14.6%	56.2%

Disability Measures

The four disability measures in Table 12 reflect some of the potential reasons people may be forced out of the labor market. Walking/climbing stairs is a general measure of mobility, but it may more accurately reflect a lack of mobility training. Sixty percent of retirees and 75% of those unable to work report serious difficulty walking and climbing stairs. A surprisingly high prevalence of thirty-one to 50% of workers and those out of work report difficulty concentrating and remembering.[8] Those out of the labor force, including students, report a range of 35 to 37% with "serious difficulty, concentrating, remembering, or making decisions." Sixty-two percent of those Unable to Work report difficulty with concentrating and remembering.

Table 12. Disability Measures among People with Blindness and Low Vision who Report Being Out of the Labor Force or Unable to Work, United States, 2019 BRFSS

Category Reporting Difficulty	Out of the Labor Force			Unable to Work
	Homemakers	Retirees	Students	
Walking/Climbing Stairs	36.2%	60.4%	15.6%	75.0%
Concentrating/ Remembering	37.7%	35.4%	36.3%	61.5%
Bathing/ Dressing	7.3%	27.4%	2.8%	38.3%
Running Errands	30.7%	38.3%	15.1%	55.8%

Discussion

In the US, about 8.7 million people between the ages of 18- and 64-years report blindness and low vision in response to the question, “Are you blind or do you have serious difficulty seeing even when wearing glasses?” Of those, 43.6% indicate they are working, and another 10.5% report being out of work. Seventeen percent are not in the labor force because they are students, retirees, and homemakers. Almost a third (28.9%) of working aged people with blindness and low vision report they are unable to work.

This analysis focuses on the social, economic, and health characteristics of those aged 18 to 64 years because the primary purpose of the BRFSS is to inform health policy. Other surveys address topics related to social participation and quality of life measures. The overarching theme of this analysis is that working aged people often face economic and social barriers described under the rubric of Social Determinants of Health; that is upstream factors, such as income, education, and geographic location, which contribute to downstream health effects. Many people, working or not, report low household income, and they report a disproportionately lower level of education. While 43.6% of working-aged people with vision impairment are working, 36.3% of them have household incomes less than $25,000, and 23.6% report incomes greater than $75,000. The disparity in income may be underemployment or part-time employment. Among those who report unable to work, 71.3% report incomes below $25,000.

In addition, working aged people with vision impairment report disproportionately higher prevalence of chronic conditions compared to people without vision impairment. Among people with vision impairment, chronic conditions are substantially higher among those out of the labor force, except among students.

Limitations

Every surveillance system has limitations, and responses generate further questions not asked in the survey. The BRFSS is designed to inform broad health policy, not address the needs of a specific group. That said, the survey provides considerable national- and state-level insight into the circumstances of working-aged people who are blind and have low vision. The BRFSS provides eight categories of workforce participation, as this analysis has examined. The survey does not ask about full-time or part-time employment. Therefore, it is difficult to interpret reported levels of household income. If people are working part-time, income would be expected to be lower. The survey does not indicate whether employees are satisfied with their work or potentially underemployed, and the survey does not ask whether respondents are looking for work. In addition, the survey does not include questions about receiving rehabilitation services.

Moreover, there are social desirability factors related to some responses. For example, it may be more socially desirable to indicate that one is retired or a homemaker than indicate unemployed. The category Unable to Work accounting for 29% of the working aged population requires thoughtful consideration. Overall, this

group reports substantial limitations in terms of income and education, and this group is much more likely to report chronic conditions and disability. For some people who receive SSDI or SSI income, a government survey asking about work might respond "unable to work" for fear of losing income.

The survey also does not indicate barriers or facilitators to work—transportation or eligibility for SSI/SSDI, for example—although the health status of working-aged people informs an avenue to improve overall health with the potential to improve work opportunities.

Methods

The Behavioral Risk Factor Surveillance System conducted by the U.S. Centers for Disease Control and Prevention (CDC) gathers health and health behavior data in each of the states and territories. Conducted since 1984, the BRFSS represents the world's largest and oldest telephone survey, sampling over 440,000 people annually. For additional details, see BRFSS here. Data are collected from January to December using standard methods, and data are made publicly available about five months after data collection is completed. In 2013, the BRFSS added a standard set of disability questions to the core. The vision question asks, "Are you blind or do you have serious difficult seeing even while wearing glasses?" This question serves as the case definition of vision impairment for this study, and is the same question used by the American Community Survey in the Census data.

Using BRFSS data, it is possible to construct a profile of each state addressing demographic characteristics (age, sex, race/ethnicity, and education), reported chronic conditions (heart attack, coronary heart disease, stroke, COPD, diabetes, and arthritis), health-related quality of life (HRQoL), disability, and factors related to Social Determinants of Health among people with and without vision impairment. An analysis of these factors identifies state level disparities between people with and without vision impairment. Moreover, an analysis of aggregated national level BRFSS data allows for an understanding of how each state compares with national averages across these factors.

To account for the complex sampling weights used in the 2019 BRFSS survey, all analysis was run in SAS callable SUDAAN. To be included in the analysis subjects must be between the ages of 18 and 64 years and respond to the vision impairment, age, and employment questions. The response rate was 95.9%. The final sample size is 248,719. This includes 236,859 subjects without vision impairment and 11,860 subjects with vision impairment.

The American Community Survey (ACS) from the U.S. Census collects data on social, economic, and demographic characteristics, including housing, employment status, income/poverty, and level of education. In addition, the ACS collects data on

race/ethnicity, sex, marital status, and living arrangements. Although the ACS does not collect information about health and health behaviors, it asks the same six disability

questions as the BRFSS, including vision, hearing, cognition, walking, bathing, and doing errands. The function of the ACS is to provide information for decision makers to allocate federal resources. The granularity of the data makes it possible to construct county, state, and national profiles regarding social, economic, and demographic factors (see more ACS information here). The unique feature of the ACS is that the prevalence of vision impairment can be estimated at the county level, and maps can be constructed to illustrate the distribution of vision impairment within and across states.

The descriptive tables in the appendices show the estimated point prevalence as well as the 95% Confidence Interval (CI) for each variable. Ninety-five percent CI means that we are 95% certain that the true value resides within the estimated parameters. Confidence intervals for some variables are wide in large part because the sample size is small. By combining multiple years of data, the CI would likely be reduced. Caution should be exercised in interpreting these findings.

Most large population-based surveys are limited because they rely on self-reported information from survey respondents. Multiple questions regarding vision have been employed in national surveys, and each question yields a different population estimate.[2,9] The ACS and the BRFSS, for example, ask the question "Are you blind or do you have serious difficulty seeing even when wearing glasses?" The narrow focus of this question creates a low prevalence of vision impairment. The BRFSS, for example, yields a prevalence of vision impairment of about 4.7% among the aged 18-64 years population in the US. Despite the use of the same questions, prevalence estimates from the BRFSS and the ACS differ largely because the sampling frame is not the same.

There is no widely accepted gold standard vision question used in national surveys. However, considerable effort has been made through the BRFSS and ACS to provide state and county level estimates of the prevalence of blindness and low vision. The analysis is complicated by the lack of standard questions employed in surveys, differing sampling frames, and often by the lack of scaled response categories. Across thirteen federally funded national population-based surveys, for example, about 100 questions capture dimensions of vision impairment.[9] Some questions measure different concepts, for example, seeing and reading newspaper print. Different questions, of course, yield different population estimates. Because of the lack of conceptual clarity, it is not possible to reliably compare findings across surveys.

A more recent study published in 2021 by Rein and his colleagues used a different approach and estimated the prevalence of vision impairment across multiple surveys, including the ACS, the BRFSS, multiple years of the National Health Interview Survey (NHIS), multiple years of the National Health and Nutrition Examination Survey (NHANES), and National Survey of Children's Health.[2] The ACS and the BRFSS asked many of the same questions, but the sampling frame differed. The NHIS, like the ACS

and BRFSS, asked self-reported subjective measures of vision, and the NHANES provided clinical measured acuity and fields. The estimates differed because the questions differed, but the patterns of increased vision impairment among older age groups, racial/ethnic minorities, and those living in poverty were consistent across surveys.

This report was prepared by the VanNasdale Group, LLC. Questions regarding the methods and findings for this study should be directed to John E. Crews, DPA (johncrews@bellsouth.net) or Dean VanNasdale, OD, PhD (thevannasdalegroup@gmail.com).

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Appendix A. Health Characteristics of People Aged 18-64 Years with Vision Impairment

Table 1. Health Characteristics of People Aged 18-64 Years with Vision Impairment by Employment and Health Status, BRFSS 2019

Table 3. Health Characteristics of People Aged 18-64 Years with Vision Impairment by Employment and Health Status. Includes Overall Health Characteristics for Visually Impaired and Not Visually Impaired, BRFSS 2019		Vision Impairment									No Vision Impairment
		Working		Not Working		Unable	Out of Labor Market			Overall	Overall
		Employed for wages	Self-employed	Out of work for 1 year or more	Out of work for less than 1 year	Unable to work	A homemaker	A student	Retired		
		% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Demographics											
Age Group	% 18-44 (95% CI)	58.4 (55.4, 61.3)	49.7 (43.7, 55.7)	41.6 (34.9, 48.6)	48.7 (40.9, 56.5)	21.3 (18.8, 24.0)	40.9 (33.0, 49.3)	93.0 (87.1, 96.3)	9.8 (5.1, 18.1)	43.1 (41.2, 44.9)	59.6 (59.2, 59.9)
	% 45-64 (95% CI)	41.6 (38.7, 44.6)	50.3 (44.3, 56.3)	58.4 (51.4, 65.1)	51.3 (43.5, 59.1)	78.7 (76.0, 81.2)	59.1 (50.7, 67.0)	7.0 (3.7, 12.9)	90.2 (81.9, 94.9)	56.9 (55.1, 58.8)	40.4 (40.1, 40.8)
Sex	% Male (95% CI)	46.5 (43.5, 49.6)	62.1 (56.2, 67.6)	45.6 (39.0, 52.2)	46.8 (39.1, 54.7)	42.3 (39.5, 45.1)	2.8 (1.6, 5.0)	41.1 (31.4, 51.5)	57.5 (51.5, 63.3)	43.2 (41.5, 45.0)	50.2 (49.8, 50.6)
	% Female (95% CI)	53.5 (50.4, 56.5)	37.9 (32.4, 43.8)	54.4 (47.8, 61.0)	53.2 (45.3, 60.9)	57.7 (54.9, 60.5)	97.2 (95.0, 98.4)	58.9 (48.5, 68.6)	42.5 (36.7, 48.5)	56.8 (55.0, 58.5)	49.8 (49.4, 50.2)
Marital Status	% Married (95% CI)	36.4 (33.5, 39.3)	40.2 (34.5, 46.1)	29.9 (24.0, 36.6)	31.6 (24.6, 39.4)	28.6 (26.2, 31.1)	63.3 (54.9, 71.0)	9.4 (5.7, 15.1)	39.8 (33.7, 46.3)	35.1 (33.4, 36.9)	49.8 (49.4, 50.2)
	% Not Married/Separated (95% CI)	63.6 (60.7, 66.5)	59.8 (53.9, 65.5)	70.1 (63.4, 76.0)	68.4 (60.6, 75.4)	71.4 (68.9, 73.8)	36.7 (29.0, 45.1)	90.6 (84.9, 94.3)	60.2 (53.7, 66.3)	64.9 (63.1, 66.6)	50.2 (49.8, 50.6)
Race/ethnicity categories	% White only, non-Hispanic (95% CI)	41.5 (38.6, 44.4)	46.4 (40.4, 52.5)	43.1 (36.8, 49.6)	36.0 (29.4, 43.3)	51.5 (48.6, 54.4)	33.4 (26.5, 41.1)	33.2 (25.0, 42.6)	53.1 (46.6, 59.5)	44.2 (42.5, 45.9)	59.5 (59.1, 59.8)
	% Black only, non-Hispanic (95% CI)	16.8 (14.4, 19.4)	14.7 (10.1, 21.0)	22.9 (17.4, 29.5)	20.8 (14.9, 28.2)	22.1 (19.8, 24.6)	5.1 (2.9, 8.9)	22.4 (15.1, 31.9)	17.3 (13.1, 22.4)	18.0 (16.6, 19.4)	11.9 (11.6, 12.2)
	% American Indian or Alaskan Native only, non-Hispanic (95% CI)	1.7 (1.2, 2.5)	1.9 (1.0, 3.4)	2.1 (1.2, 3.6)	1.6 (0.8, 3.2)	2.6 (1.8, 3.8)	1.5 (0.9, 2.4)	1.5 (0.6, 3.4)	3.0 (1.3, 7.2)	2.0 (1.7, 2.5)	1.0 (1.0, 1.1)
	% Asian only, non-Hispanic (95% CI)	4.3 (2.5, 7.1)	3.0 (1.4, 6.1)	1.2 (0.3, 4.3)	8.3 (3.5, 18.4)	1.2 (0.5, 2.6)	2.5 (0.5, 11.5)	7.0 (3.4, 13.9)	2.2 (0.5, 8.1)	3.1 (2.3, 4.3)	6.0 (5.8, 6.3)
	% Hispanic (95% CI)	33.4 (30.3, 36.5)	31.6 (26.0, 37.7)	29.0 (22.7, 36.1)	31.4 (24.5, 39.2)	19.0 (16.3, 22.0)	55.7 (46.9, 64.1)	32.8 (23.1, 44.1)	20.2 (14.7, 27.1)	29.9 (28.0, 31.8)	19.4 (19.0, 19.7)
Education	% Never attended school or only kindergarten (95% CI)	0.8 (0.5, 1.3)	0.9 (0.4, 2.4)	0.9 (0.3, 2.6)	0.1 (0.0, 0.5)	0.7 (0.3, 1.6)	0.9 (0.3, 2.8)	0.0 (., .)	0.3 (0.1, 0.9)	0.7 (0.5, 1.0)	0.2 (0.2, 0.3)
	% Grades 1 through 8 (95% CI)	8.6 (6.8, 10.8)	9.5 (6.5, 13.7)	10.0 (6.2, 15.6)	13.0 (8.2, 20.0)	12.1 (10.1, 14.5)	24.1 (15.3, 36.0)	0.1 (0.0, 0.5)	12.3 (7.4, 19.6)	11.1 (9.7, 12.6)	3.7 (3.6, 3.9)
	% Some high school (95% CI)	11.7 (9.6, 14.1)	14.0 (10.4, 18.5)	25.9 (19.9, 33.0)	16.4 (11.3, 23.3)	22.7 (20.3, 25.3)	26.6 (19.2, 35.8)	7.0 (3.6, 13.2)	11.7 (8.1, 16.5)	17.1 (15.7, 18.6)	7.6 (7.3, 7.8)
	% High school graduate (95% CI)	30.8 (28.1, 33.7)	31.8 (26.2, 37.9)	30.8 (25.4, 36.8)	37.1 (30.1, 44.6)	34.2 (31.7, 36.8)	24.4 (19.2, 30.5)	37.4 (28.5, 47.2)	28.7 (24.0, 33.9)	31.8 (30.2, 33.4)	27.3 (27.0, 27.7)
	% Some college or technical school (95% CI)	30.9 (28.0, 34.1)	30.8 (25.4, 36.7)	25.0 (20.0, 30.7)	25.1 (18.4, 33.2)	23.9 (21.6, 26.4)	20.6 (15.2, 27.4)	38.8 (30.1, 48.4)	32.6 (27.0, 38.9)	27.8 (26.2, 29.5)	31.4 (31.0, 31.8)
	% College graduate (95% CI)	17.2 (15.5, 19.0)	13.1 (10.2, 16.6)	7.4 (4.4, 12.2)	8.4 (5.2, 13.1)	6.4 (5.3, 7.6)	3.3 (2.2, 4.8)	16.7 (9.2, 28.4)	14.5 (11.6, 17.9)	11.5 (10.6, 12.4)	29.7 (29.4, 30.1)

Household Income	% Less than $10,000 (95% CI)	4.2 (3.2, 5.5)	12.0 (8.2, 17.2)	33.1 (26.5, 40.5)	24.9 (18.8, 32.2)	28.3 (25.3, 31.6)	15.6 (11.5, 20.8)	7.6 (4.6, 12.4)	12.0 (8.3, 16.9)	15.5 (14.2, 16.9)	5.3 (5.1, 5.5)
	% $10,000 to less than $15,000 (95% CI)	7.1 (5.3, 9.4)	5.4 (3.6, 7.9)	11.8 (8.5, 16.3)	7.5 (4.8, 11.6)	19.9 (17.5, 22.5)	12.0 (7.4, 18.9)	11.2 (3.6, 30.2)	10.5 (7.3, 14.8)	11.5 (10.3, 12.8)	3.8 (3.6, 4.0)
	% $15,000 to less than $20,000 (95% CI)	12.3 (10.1, 14.9)	17.5 (12.2, 24.4)	19.1 (13.8, 25.8)	16.7 (11.7, 23.3)	16.4 (14.4, 18.6)	15.3 (9.6, 23.5)	7.7 (4.3, 13.3)	19.1 (13.2, 26.8)	14.9 (13.5, 16.3)	6.1 (5.9, 6.3)
	% $20,000 to less than $25,000 (95% CI)	12.7 (10.7, 14.9)	12.4 (9.0, 16.8)	8.2 (5.5, 12.1)	12.8 (8.5, 18.6)	15.7 (13.5, 18.2)	16.7 (10.4, 25.6)	13.3 (8.1, 21.3)	13.0 (9.4, 17.7)	13.6 (12.3, 14.9)	8.0 (7.8, 8.2)
	% $25,000 to less than $35,000 (95% CI)	14.4 (12.1, 17.0)	11.9 (8.5, 16.4)	8.9 (5.4, 14.3)	12.8 (8.2, 19.4)	8.6 (6.9, 10.6)	9.2 (5.7, 14.7)	10.9 (6.2, 18.5)	9.5 (6.7, 13.4)	11.4 (10.2, 12.7)	8.9 (8.7, 9.2)
	% $35,000 to less than $50,000 (95% CI)	13.9 (12.1, 16.0)	12.0 (8.5, 16.8)	9.3 (5.3, 15.6)	7.8 (4.3, 13.7)	5.5 (4.2, 7.2)	12.2 (7.7, 19.0)	16.3 (9.7, 26.1)	13.6 (9.3, 19.5)	10.9 (9.8, 12.1)	12.0 (11.8, 12.3)
	% $50,000 to less than $75,000 (95% CI)	11.8 (10.1, 13.7)	9.6 (6.4, 14.2)	3.0 (1.6, 5.6)	5.7 (2.8, 11.1)	3.3 (2.5, 4.4)	13.8 (5.1, 32.6)	8.2 (3.2, 19.5)	9.2 (6.1, 13.5)	8.4 (7.1, 9.9)	15.0 (14.7, 15.3)
	% $75,000 or more (95% CI)	23.6 (20.9, 26.6)	19.3 (14.5, 25.1)	6.5 (3.3, 12.4)	11.8 (6.7, 19.8)	2.3 (1.6, 3.2)	5.0 (3.0, 8.4)	24.7 (15.7, 36.7)	13.1 (9.7, 17.5)	13.9 (12.6, 15.4)	40.9 (40.5, 41.3)
Chronic Conditions											
Diabetes	% yes (95% CI)	9.5 (7.9, 11.2)	10.2 (7.3, 14.1)	20.1 (15.0, 26.4)	15.4 (9.5, 23.9)	33.8 (31.2, 36.6)	23.6 (14.5, 35.9)	5.5 (2.6, 11.6)	29.4 (24.4, 35.0)	19.5 (18.0, 21.0)	7.2 (7.0, 7.4)
Depression	% yes (95% CI)	29.4 (26.6, 32.4)	24.2 (19.8, 29.3)	47.9 (41.2, 54.6)	41.3 (34.0, 49.0)	62.7 (59.8, 65.4)	38.3 (29.3, 48.2)	25.9 (19.5, 33.5)	37.6 (31.5, 44.0)	41.3 (39.5, 43.1)	19.3 (19.0, 19.6)
Stroke	% yes (95% CI)	3.3 (2.5, 4.4)	3.8 (2.3, 6.4)	5.0 (3.4, 7.2)	9.2 (5.3, 15.4)	20.5 (18.3, 22.9)	2.5 (1.3, 4.6)	3.2 (0.9, 10.0)	13.9 (10.6, 18.1)	9.1 (8.3, 10.1)	1.8 (1.7, 1.9)
Angina or coronary heart disease	% yes (95% CI)	3.1 (2.3, 4.2)	3.7 (1.9, 7.2)	5.9 (3.9, 8.6)	5.4 (2.9, 10.0)	15.1 (13.2, 17.2)	6.4 (4.2, 9.6)	1.3 (0.4, 4.1)	10.2 (7.0, 14.8)	7.4 (6.6, 8.2)	1.8 (1.8, 1.9)
Asthma	% yes (95% CI)	20.5 (18.1, 23.2)	20.0 (15.5, 25.5)	26.2 (21.2, 32.0)	22.6 (17.0, 29.4)	36.5 (33.7, 39.3)	29.7 (20.7, 40.5)	19.6 (13.8, 26.9)	19.2 (15.5, 23.6)	26.2 (24.6, 27.9)	14.9 (14.6, 15.2)
High blood cholesterol	% yes (95% CI)	28.7 (25.9, 31.8)	28.3 (23.1, 34.0)	45.3 (38.3, 52.5)	37.8 (29.5, 47.0)	55.3 (52.4, 58.3)	38.2 (28.4, 49.0)	12.2 (6.9, 20.6)	48.6 (42.2, 54.9)	39.5 (37.7, 41.4)	24.8 (24.5, 25.2)
Any cancer	% yes (95% CI)	7.8 (6.3, 9.5)	10.1 (6.8, 14.7)	7.2 (5.0, 10.1)	9.1 (5.6, 14.4)	18.6 (16.6, 20.9)	8.4 (4.9, 14.0)	7.9 (3.6, 16.5)	16.5 (13.1, 20.6)	11.6 (10.6, 12.7)	6.7 (6.5, 6.9)
Arthritis	% yes (95% CI)	24.4 (22.1, 26.9)	24.3 (19.7, 29.6)	35.7 (29.9, 41.8)	31.8 (24.7, 40.0)	63.9 (61.1, 66.7)	32.0 (24.6, 40.5)	8.4 (4.8, 14.2)	56.2 (49.8, 62.4)	38.4 (36.8, 40.1)	17.4 (17.2, 17.7)
Do arthritis or joint symptoms now affect whether you work, the type of work you do or the amount of work you do? (Out of those with arthritis)	% yes (95% CI)	56.5 (51.2, 61.7)	66.6 (53.9, 77.2)	67.6 (58.7, 75.4)	67.7 (49.5, 81.8)	70.9 (67.7, 74.0)	63.9 (50.9, 75.2)	55.2 (28.8, 78.9)	47.7 (40.2, 55.4)	64.8 (62.4, 67.2)	40.7 (39.9, 41.5)
Self-Reported Health											
Fair or Poor Health	% yes (95% CI)	31.7 (28.7, 34.8)	33.1 (28.0, 38.6)	53.9 (47.1, 60.5)	49.6 (41.8, 57.5)	76.0 (73.6, 78.2)	56.9 (48.4, 65.0)	24.2 (15.7, 35.5)	60.4 (54.6, 65.9)	49.9 (48.1, 51.7)	15.4 (15.1, 15.6)
HRQoL											
Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?	% 14 or more days (95% CI)	16.5 (14.4, 18.9)	19.0 (15.0, 23.9)	37.0 (31.0, 43.3)	29.8 (23.2, 37.4)	62.0 (59.0, 64.8)	33.6 (24.1, 44.6)	12.6 (8.0, 19.3)	45.3 (39.0, 51.6)	34.1 (32.4, 35.9)	10.2 (10.0, 10.4)
Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?	% 14 or more days (95% CI)	24.7 (22.1, 27.5)	22.1 (17.8, 27.0)	36.4 (30.3, 43.0)	33.6 (26.8, 41.1)	51.8 (48.9, 54.7)	35.6 (26.0, 46.6)	31.3 (23.5, 40.2)	33.4 (27.3, 40.3)	35.0 (33.2, 36.8)	14.3 (14.0, 14.6)
During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?	% 14 or more days (95% CI)	10.5 (8.7, 12.6)	13.3 (9.9, 17.6)	36.4 (30.3, 43.0)	28.5 (22.2, 35.8)	56.2 (53.3, 59.1)	24.2 (16.9, 33.2)	14.6 (8.5, 23.9)	35.6 (29.4, 42.3)	28.6 (27.1, 30.2)	7.7 (7.5, 7.9)
Disability Measures											
Do you have serious difficulty walking or climbing stairs?	% yes (95% CI)	19.2 (16.9, 21.7)	20.7 (16.2, 26.0)	42.6 (36.2, 49.1)	30.5 (23.9, 38.1)	75.0 (72.3, 77.6)	36.2 (27.1, 46.5)	15.6 (10.1, 23.4)	60.4 (54.5, 66.1)	40.7 (39.0, 42.5)	8.9 (8.7, 9.1)
Are you deaf or do you have serious difficulty hearing?	% yes (95% CI)	11.3 (9.7, 13.3)	16.4 (11.9, 22.0)	17.4 (12.9, 23.1)	12.9 (8.9, 18.3)	22.3 (20.1, 24.6)	10.1 (7.3, 13.8)	19.7 (10.9, 33.1)	25.2 (20.4, 30.7)	16.2 (15.1, 17.5)	3.4 (3.3, 3.6)
Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?	% yes (95% CI)	30.7 (27.9, 33.7)	31.4 (25.8, 37.5)	49.6 (42.9, 56.4)	42.1 (34.6, 50.0)	61.5 (58.7, 64.3)	37.7 (28.7, 47.6)	36.3 (28.3, 45.1)	35.4 (29.4, 41.8)	42.4 (40.6, 44.2)	11.0 (10.8, 11.2)

Do you have difficulty dressing or bathing?	% yes (95% CI)	5.1 (3.8, 6.8)	5.4 (3.5, 8.2)	20.7 (15.9, 26.4)	11.9 (7.7, 18.0)	38.3 (35.5, 41.2)	7.3 (5.0, 10.6)	2.8 (1.4, 5.9)	27.4 (21.3, 34.5)	17.2 (15.9, 18.5)	2.8 (2.7, 2.9)
Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor's office or shopping?	% yes (95% CI)	10.9 (9.1, 13.1)	12.1 (9.0, 15.9)	37.1 (30.8, 43.9)	22.2 (16.6, 28.9)	55.8 (53.0, 58.7)	30.7 (21.2, 42.2)	15.1 (10.0, 22.1)	38.3 (32.0, 45.1)	29.2 (27.5, 30.9)	5.5 (5.4, 5.7)
SDOH											
Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare, or Indian Health Service?	% yes (95% CI)	73.7 (70.5, 76.7)	61.8 (55.6, 67.6)	72.0 (64.9, 78.2)	67.2 (59.8, 73.8)	87.6 (85.5, 89.5)	77.6 (69.8, 83.8)	74.8 (63.2, 83.8)	90.5 (86.2, 93.5)	77.7 (76.0, 79.3)	84.7 (84.4, 85.0)
Do you have at least one person you think of as your personal doctor or health care provider?	% yes (95% CI)	63.0 (59.9, 66.0)	57.4 (51.4, 63.2)	66.9 (59.8, 73.3)	63.1 (55.4, 70.2)	83.7 (81.2, 86.0)	72.8 (62.0, 81.5)	58.7 (48.3, 68.5)	87.7 (83.5, 90.9)	70.7 (68.9, 72.5)	72.3 (72.0, 72.7)
About how long has it been since you last visited a doctor for a routine checkup? [A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition.]	% Within past year (95% CI)	66.3 (63.1, 69.4)	63.3 (57.6, 68.6)	70.0 (62.8, 76.3)	68.1 (60.7, 74.7)	85.3 (83.0, 87.3)	67.6 (56.9, 76.7)	64.0 (53.1, 73.7)	87.2 (83.0, 90.6)	72.9 (71.1, 74.7)	72.2 (71.8, 72.5)
	% Within past 2 years (95% CI)	13.4 (11.2, 16.1)	9.4 (7.1, 12.3)	10.6 (7.4, 14.8)	13.3 (9.1, 18.9)	6.7 (5.4, 8.5)	16.2 (8.2, 29.2)	10.4 (6.3, 16.7)	5.0 (3.2, 8.0)	10.7 (9.4, 12.2)	13.0 (12.8, 13.3)
	% Within past 5 years (95% CI)	9.6 (7.8, 11.7)	12.9 (9.4, 17.5)	9.8 (5.4, 17.0)	9.5 (6.2, 14.4)	4.6 (3.4, 6.3)	6.5 (4.2, 10.1)	18.6 (10.3, 31.1)	3.9 (2.3, 6.5)	8.2 (7.2, 9.4)	7.5 (7.3, 7.7)
	% 5 or more years ago (95% CI)	8.9 (7.1, 11.0)	12.4 (9.3, 16.5)	8.9 (5.5, 14.1)	8.4 (4.9, 14.1)	2.9 (2.2, 3.7)	8.8 (4.7, 15.7)	3.6 (1.4, 9.3)	3.8 (2.1, 7.0)	6.9 (6.0, 8.0)	6.3 (6.1, 6.5)
	% Never (95% CI)	1.8 (0.9, 3.4)	2.0 (1.2, 3.4)	0.8 (0.1, 4.1)	0.7 (0.3, 1.6)	0.5 (0.2, 1.1)	1.0 (0.3, 2.8)	3.4 (1.1, 10.2)	0.0 (., .)	1.2 (0.8, 1.8)	1.0 (0.9, 1.1)
Health Behavior											
BMI	% Underweight (95% CI)	2.4 (1.4, 3.9)	2.8 (1.6, 4.8)	1.9 (0.9, 4.0)	1.4 (0.6, 3.1)	3.2 (2.3, 4.4)	4.2 (1.4, 12.1)	3.3 (1.2, 8.8)	2.0 (1.0, 3.9)	2.7 (2.1, 3.5)	1.9 (1.8, 2.0)
	% Normal weight (95% CI)	28.0 (25.1, 31.2)	33.6 (27.7, 40.0)	26.0 (20.7, 32.0)	38.3 (30.6, 46.8)	23.2 (20.9, 25.6)	22.4 (16.9, 28.9)	45.9 (36.6, 55.5)	21.6 (17.2, 26.8)	27.3 (25.7, 28.9)	31.9 (31.5, 32.2)
	% Overweight (95% CI)	31.8 (29.0, 34.7)	34.7 (28.9, 41.0)	32.0 (26.1, 38.6)	28.1 (21.5, 35.9)	29.0 (26.3, 31.8)	29.3 (21.6, 38.4)	28.2 (20.8, 37.1)	32.4 (26.0, 39.6)	30.8 (29.1, 32.5)	34.5 (34.2, 34.9)
	% Obese (95% CI)	37.8 (34.8, 40.9)	28.9 (23.9, 34.5)	40.1 (33.4, 47.2)	32.2 (24.6, 40.9)	44.6 (41.8, 47.5)	44.2 (33.9, 54.9)	22.6 (16.4, 30.2)	44.0 (37.8, 50.3)	39.2 (37.4, 41.1)	31.7 (31.4, 32.1)
During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?	% yes (95% CI)	66.4 (63.4, 69.2)	66.3 (60.4, 71.8)	56.0 (49.2, 62.7)	65.3 (57.3, 72.4)	48.8 (45.9, 51.7)	59.7 (50.9, 68.0)	77.6 (69.2, 84.2)	64.0 (58.2, 69.4)	60.4 (58.6, 62.1)	75.9 (75.5, 76.2)
Current smoker	% yes (95% CI)	23.7 (21.3, 26.4)	35.3 (29.7, 41.2)	43.6 (36.9, 50.5)	37.0 (29.9, 44.8)	40.4 (37.6, 43.3)	28.1 (21.2, 36.3)	12.3 (7.9, 18.5)	25.3 (20.7, 30.4)	31.2 (29.6, 32.9)	16.4 (16.1, 16.7)
Binge drinkers (males having five or more drinks on one occasion, females having four or more drinks on one occasion)	% yes (95% CI)	27.3 (24.4, 30.5)	26.5 (21.6, 32.0)	11.7 (7.9, 17.0)	18.8 (13.3, 25.9)	11.7 (9.6, 14.2)	7.6 (4.5, 12.6)	23.1 (16.8, 30.8)	12.3 (9.3, 16.3)	18.9 (17.4, 20.4)	20.1 (19.8, 20.4)

Appendix B. Prevalence of Vision Impairment by State by Quintile

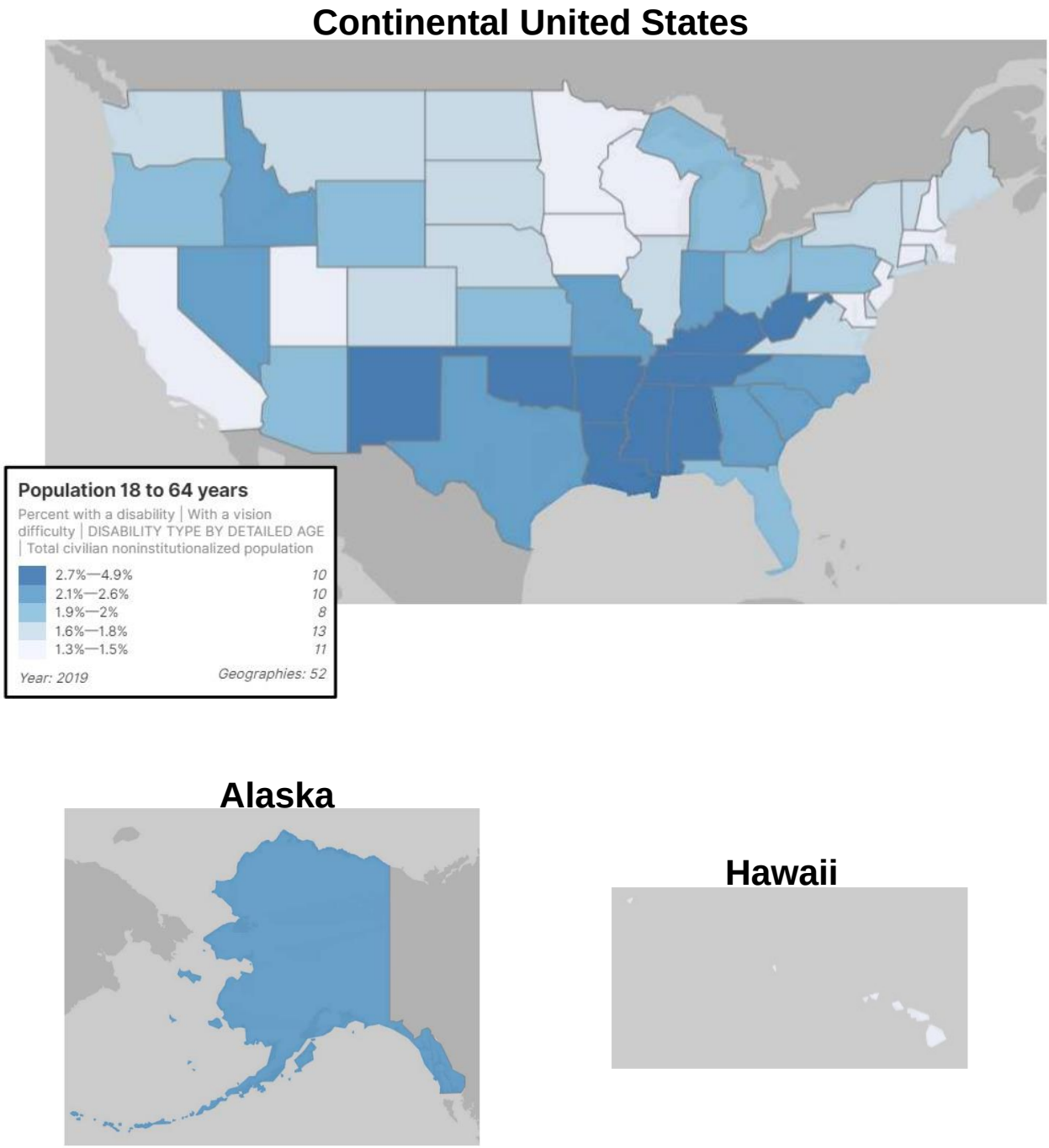

Figure 1. Prevalence of vision impairment by state by quintile, United States, 2019, American Community Survey

Table 1. Tabular representation of Figure 1, Prevalence of Vision Impairment by State by Quintile, United States, 2019, ACS

Quintile	Number of States/Territories	United States (total = 52) (listed from high to low in each quintile)
1st (2.7% - 4.9%)	10	Puerto Rico, West Virginia, Kentucky, Mississippi, Arkansas, Louisiana, Oklahoma, Alabama, New Mexico, Tennessee
2nd (2.1% - 2.6%)	10	South Carolina, Nevada, District of Columbia, Georgia, Idaho, Missouri, North Carolina, Alaska, Indiana, Texas
3rd (1.9% - 2%)	8	Arizona, Florida, Kansas, Ohio, Michigan, Oregon, Pennsylvania, Wyoming
4th (1.6% - 1.8%)	13	Delaware, Maine, South Dakota, Virginia, Montana, Rhode Island, Vermont, Washington, Colorado, Illinois, Nebraska, New York, North Dakota
5th (1.3% - 1.5%)	11	California, Connecticut, Iowa, Maryland, New Hampshire, New Jersey, Massachusetts, Utah, Wisconsin, Hawaii, Minnesota

Appendix C. State prevalence rates

Table 1. State Prevalence Rates - Highest to Lowest

State	VI Prevalence	Margin of Error
Puerto Rico	4.9	0.1
West Virginia	3.5	0.2
Kentucky	3.2	0.1
Mississippi	3.2	0.1
Arkansas	3.1	0.1
Louisiana	3.1	0.1
Oklahoma	3.1	0.1
Alabama	2.7	0.1
New Mexico	2.7	0.1
Tennessee	2.7	0.1
South Carolina	2.6	0.1
Nevada	2.5	0.1
District of Columbia	2.4	0.2
Georgia	2.2	0.1
Idaho	2.2	0.1
Missouri	2.2	0.1
North Carolina	2.2	0.1
Alaska	2.1	0.1
Indiana	2.1	0.1
Texas	2.1	0.1
Arizona	2.0	0.1
Florida	2.0	0.1
Kansas	2.0	0.1
Ohio	2.0	0.1
Michigan	1.9	0.1
Oregon	1.9	0.1
Pennsylvania	1.9	0.1
Wyoming	1.9	0.2
Delaware	1.8	0.1
Maine	1.8	0.1
South Dakota	1.8	0.1
Virginia	1.8	0.1
Montana	1.7	0.1
Rhode Island	1.7	0.1
Vermont	1.7	0.1
Washington	1.7	0.1
Colorado	1.6	0.1

Illinois	1.6	0.1
Nebraska	1.6	0.1
New York	1.6	0.1
North Dakota	1.6	0.1
California	1.5	0.1
Connecticut	1.5	0.1
Iowa	1.5	0.1
Maryland	1.5	0.1
New Hampshire	1.5	0.1
New Jersey	1.5	0.1
Massachusetts	1.4	0.1
Utah	1.4	0.1
Wisconsin	1.4	0.1
Hawaii	1.3	0.1
Minnesota	1.3	0.1

Table 2. State Prevalence Rates - Alphabetic

State	VI Prevalence	Margin of Error
Alabama	2.7	0.1
Alaska	2.1	0.1
Arizona	2.0	0.1
Arkansas	3.1	0.1
California	1.5	0.1
Colorado	1.6	0.1
Connecticut	1.5	0.1
Delaware	1.8	0.1
District of Columbia	2.4	0.2
Florida	2.0	0.1
Georgia	2.2	0.1
Hawaii	1.3	0.1
Idaho	2.2	0.1
Illinois	1.6	0.1
Indiana	2.1	0.1
Iowa	1.5	0.1
Kansas	2.0	0.1
Kentucky	3.2	0.1
Louisiana	3.1	0.1
Maine	1.8	0.1
Maryland	1.5	0.1
Massachusetts	1.4	0.1
Michigan	1.9	0.1

Minnesota	1.3	0.1
Mississippi	3.2	0.1
Missouri	2.2	0.1
Montana	1.7	0.1
Nebraska	1.6	0.1
Nevada	2.5	0.1
New Hampshire	1.5	0.1
New Jersey	1.5	0.1
New Mexico	2.7	0.1
New York	1.6	0.1
North Carolina	2.2	0.1
North Dakota	1.6	0.1
Ohio	2.0	0.1
Oklahoma	3.1	0.1
Oregon	1.9	0.1
Pennsylvania	1.9	0.1
Puerto Rico	4.9	0.1
Rhode Island	1.7	0.1
South Carolina	2.6	0.1
South Dakota	1.8	0.1
Tennessee	2.7	0.1
Texas	2.1	0.1
Utah	1.4	0.1
Vermont	1.7	0.1
Virginia	1.8	0.1
Washington	1.7	0.1
West Virginia	3.5	0.2
Wisconsin	1.4	0.1
Wyoming	1.9	0.2

Section 2: South Carolina

The Prevalence and Characteristics of People Aged 18 to 64 Years Reporting Blindness and Low Vision, South Carolina, 2019, Behavioral Risk Factor Surveillance System

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The Prevalence and Characteristics of People Aged 18 to 64 Years Reporting Blindness and Low Vision, South Carolina, 2019, Behavioral Risk Factor Surveillance System

Introduction

In the United States, 8.7 million people between the ages 18 and 64 years report blindness and low vision in response to the question “Are you blind or do you have serious difficulty seeing even when wearing glasses?” Of that population, 43.6% report they are working, 10.5% report they are out of work, 17.1% are not in the labor force (students, homemakers, and retirees), and 28.9% indicate they are unable to work. These estimates are derived from the 2019 administration of the Behavioral Risk Factor Surveillance System (BRFSS). Another 4 million people aged 65 years and older (7.3% of the age 65 years and over population) were estimated to be blind or have low vision in response to the same question.

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Purpose

In this investigation, we wish to better understand the social, economic, and health characteristics of people reporting blindness and low vision aged 18 to 64 years in each of the eight labor force categories, including those who are working, not working, or out of the labor force. In addition, the aim of this study is to better understand the prevalence of chronic conditions, quality of life, and disability characteristics in each category. These findings may inform the development of policies and interventions to improve work opportunities. The concern of public policy and evidence-based interventions to promote health and autonomy focuses on the gap between people with and without vision impairment as well as the gap between those who are working and those who are not. These disparities define remarkably complex concerns that require thoughtful, nuanced, and evidence-based responses.

This report provides analysis of South Carolina state level data to provide insight into the complex factors that encourage or discourage work.

In South Carolina, 208,019 people ages 18-64 years respond yes to the question, “Are you blind or do you have serious difficulty seeing?” Of those, 38.2% report they are working, compared to 69% to people who are not blind or have low vision. Moreover, 39.1% of people with vision impairment report they are unable to work, compared to 8.2% of people without vision impairment. Generally, people who report blindness and low vision also report overall fair/poor health, 46.4% compared to

14.9% of those without vision impairment. Within the population of people with blindness and low vision, lower education and lower incomes are associated with those who are not in the labor market (those unable to work, homemakers, and retirees). That pattern of disparity is repeated in the prevalence of chronic conditions, poor health related quality of life, and disability measures.

This report provides analysis of South Carolina state level data to provide insight into the complex factors that encourage or discourage work.

Organization

This report is divided into three parts: Part 1 describes the distribution of employment categories and the social/economic/health characteristics of people aged 18 to 64 years with and without vision impairment in South Carolina. Part 2 describes the social, economic and health characteristics of people who are working or who report being unemployed for less or more than a year. Part 3 describes these same characteristics among people who are not participating in the labor force, including homemakers, retirees, students, and those unable to work. The Methods section describes the data sources—the Behavioral Risk Factor Surveillance System and the American Community Survey--, analytical approach, and strengths and limitations of the investigation. In addition, Appendix A provides tabular information including point estimates and confidence intervals for all the variables examined in this study. And Appendix B provides estimates of county level prevalence of vision impairment as well as a state map that illustrates the prevalence of vision impairment by quintiles.

Part 1

Work Force Participation among People with and without Blindness and Low Vision, South Carolina

Table 1. Percent and Estimated Population of People with and without Blindness and Low Vision Aged 18-64 Years by Labor Force Participation, South Carolina, 2019 Behavioral Risk Factor Surveillance System.

Category	Blindness and Low Vision		No Blindness or Low Vision	
Employed for wages	30.2%	62,909	59.0%	1,587,877
Self-Employed	8.0%	16,734	10.0%	267,981
Out of work for 1 year of more	4.8%	9,947	3.3%	88,841
Out of work less than 1 year	3.9%	8,117	3.2%	85,964
Unable to work	39.1%	81,304	8.2%	219,279
Homemaker	4.4%	9,171	4.4%	118,391
Student	3.3%	6,808	6.7%	179,630
Retired	6.3%	13,027	5.3%	141,649
Total	100.0%	208,019	100.0%	2,689,612

Characteristics of Working Aged People with and without Vision Impairment

Broadly, the social, economic, and health circumstances of people with blindness and low vision differ from those without vision impairment. Table 2 compares factors that may influence work and autonomy, including education, income, chronic conditions, and disability measures.

Table 2. Selected Social, Health, and Economic Characteristics of People Aged 18-64 Years with and without Blindness and Low Vision, United States, 2019, Behavioral Risk Factor Surveillance System.

Category	Blindness and Low Vision	No Vision Impairment
Education		
Less than High School	30.9%	11.1%
High School	37.7%	29.7%
Some College	21.4%	33.1%
College Graduate	9.9%	26.1%
Income		
Less than $35,000	67.4%	32.9%
$35,000 or more	32.6%	67.1%
Health Conditions		
Hearing Impairment	14.9%	3.3%
Diabetes	19.4%	8.8%
Depression	43.1%	20.1%
Kidney Disease	6.7%	2.5%
Stroke	11.0%	2.5%
Self-Reported Health		
Fair/Poor	46.4%	14.9%
Disability Measures		
Walking/ Climbing Stairs	43.8%	10.2%
Cognition	50.7%	12.1%
Running Errands	35.4%	5.6%

*95% Confidence Interval (CI) are reported in Appendix A

Part 2

Social, Economic, and Health Characteristics of People with Blindness and Low Vision who are Working or Out of Work, Aged 18-64

Table 3. Education Levels among People with Blindness and Low Vision who are Working and Out of Work, South Carolina, 2019 BRFSS

Category	Working		Out of Work	
	Working for wages	**Self Employed**	**Out of Work Less than 1 Year**	**Out of Work 1 Year of More**
	Working for wages	Self Employed	Out of Work Less than 1 Year	Out of Work 1 Year of More
Less than High School	23.2%	47.0%	10.4%	12.7%
High School Graduate	34.6%	26.7%	64.9%	45.1%
Some College/ Technical School	18.6%	23.2%	24.7%	36.0%
College Graduate	23.6%	3.1%	---*	6.3%

*Insufficient sample size to estimate prevalence.

Table 4. Household Income among People with Blindness and Low Vision who are Working and Out of Work, South Carolina, 2019 BRFSS

Category	Working		Out of Work	
	Working for wages	**Self-Employed**	**Out of Work Less than 1 Year**	**Out of Work 1 year or more**
Less than $35,000	47.7%	56.9%	86.9%	93.0%
$35,000 or more	52.3%	43.1%	13.1%	7.0%

*Insufficient sample size to estimate prevalence.

Health and Chronic Conditions

Table 5. Selected Chronic Conditions Reported among People with Blindness and Low Vision who are Working and Out of Work, South Carolina, 2019 BRFSS

Category	Working		Out of Work	
	Working for Wages	Self-Employed	Out of Work Less than 1 Year	Out of Work 1 Year or More
Diabetes	6.2%	14.7%	---*	28.6%
Depression	26.2%	16.2%	51.7%	43.3%
Stroke	1.0%	14.2%	7.4%	11.7%
Any Cancer	10.1%	2.1%	14.0%	---
Kidney Disease	1.6%	---	7.4%	17.1%
Severe Hearing Impairment	5.7%	4.7%	14.7%	24.1%

*Sample size insufficient to make estimate

Health-Related Quality of Life

Table 6. Health-Related Quality of Life among People with Blindness and Low Vision who are Working and Out of Work, South Carolina, 2019 BRFSS

Category	Working		Out of Work	
	Working for Wages	Self-Employed	Out of Work Less than 1 Year	Out of Work 1 Year or More
Fair/ Poor Health	32.8%	40.3%	39.2%	71.2%
14 or more days of physical health not good	12.6%	27.1%	44.3%	30.8%
14 or more days of mental health not good	23.5%	15.0%	59.2%	38.0%
14 or more days of activity limitation	2.8%	7.8%	12.6%	48.7%

Disability Measures

Table 7. Disability Measures among People with Blindness and Low Vision who are Working and Out of Work, South Carolina, 2019 BRFSS.

Category	Working		Out of Work	
	Working for wages	Self-Employed	Out of Work Less than 1 Year	Out of Work 1 Year or More
Walking/Climbing Stairs	14.6%	24.4%	33.9%	76.1%
Concentrating/ Remembering	30.1%	35.2%	46.4%	51.5%
Bathing/Dressing	3.2%	7.2%	12.6%	40.8%
Running Errands	9.0%	18.9%	32.6%	54.8%

Part 3

People with Blindness and Low Vision Who Are Not in the Work Force

Education

Table 8. Education Levels among People with Blindness and Low Vision who Not in the Labor Market, South Carolina, 2019 BRFSS

Category	Out of the Labor Force			Unable to Work
	Homemaker	Retired	Student	
Less than High School	24.8%	7.3%	19.7%	43.4%
High School Graduate	49.7%	34.5%	34.1%	38.3%
Some College/ Technical School	23.1%	47.6%	39.4%	15.1%
College Graduate	2.4%	10.6%	6.8%	3.3%

Income

Table 9. Household Income among People with Blindness and Low Vision who Report Being Out of the Labor Force or Unable to Work, South Carolina, 2019 BRFSS

Category	Out of the Labor Force			Unable to Work
	Homemaker	Retired	Student	
Less than $35,000	51.4%	47.5%	49.5%	89.9%
$35,000 or more	48.6%	52.5%	50.5%	10.1%

Chronic Conditions

Table 10. Selected Chronic Conditions among People with Blindness and Low Vision who Report Being Out of the Labor Force or Unable to Work, South Carolina, 2019 BRFSS

Category	Out of the Labor Force			Unable to Work
	Homemaker	Retired	Student	
Diabetes	23.0%	17.6%	---*	31.3%
Depression	58.4%	37.3%	39.7%	60.5%
Stroke	11.6%	12.8%	---	18.8%
Any Cancer	22.9%	2.1%	---	11.2%
Kidney Disease	---	3.7%	15.6%	11.2%
Severe Hearing Impairment	2.4%	39.3%	---	21.8%

*Insufficient sample size to estimate prevalence.

Health-Related Quality of Life

Table 11. Health-Related Quality of Life among People with Blindness and Low Vision who Report Being Out of the Labor Force or Unable to Work, South Carolina, 2019 BRFSS

Category	Out of the Labor Force			Unable to Work
	Homemaker	Retired	Student	
Fair/ Poor Health	21.2%	55.8%	31.5%	58.5%
14 or more days of physical health not good	53.1%	32.9%	11.8%	56.2%
14 or more days of mental health not good	61.9%	28.6%	73.5%	52.2%
14 or more days of activity limitation	20.9%	31.8%	27.0%	61.5%

Disability Measures

Table 12. Disability Measures among People with Blindness and Low Vision who Report Being Out of the Labor Force or Unable to Work, Carolina, 2019 BRFSS

Category Reporting Difficulty	Out of the Labor Force			Unable to Work
	Homemakers	Retirees	Students	
Walking/Climbing Stairs	23.0%	60.2%	---*	70.6%
Concentrating/ Remembering	61.7%	48.9%	81.8%	66.3%
Bathing/ Dressing	22.4%	12.4%	---	36.4%
Running Errands	44.6%	32.8%	15.6%	58.1%

*Insufficient sample size to estimate prevalence.

Methods

The Behavioral Risk Factor Surveillance System conducted by the U.S. Centers for Disease Control and Prevention (CDC) gathers health and health behavior data in each of the states and territories. Conducted since 1984, the BRFSS represents the world's largest and oldest telephone survey, sampling over 440,000 people annually. For additional details, see BRFSS here. Data are collected from January to December using standard methods, and data are made publicly available about five months after data collection is completed. In 2013, the BRFSS added a standard set of disability questions to the core. The vision question asks, "Are you blind or do you have serious difficult seeing even while wearing glasses?" This question serves as the case definition of vision impairment for this study, and is the same question used by the American Community Survey in the Census data.

Using BRFSS data, it is possible to construct a profile of each state addressing demographic characteristics (age, sex, race/ethnicity, and education), reported chronic conditions (heart attack, coronary heart disease, stroke, COPD, diabetes, and arthritis), health-related quality of life (HRQoL), disability, and factors related to Social Determinants of Health among people with and without vision impairment. An analysis of these factors identifies state level disparities between people with and without vision impairment. Moreover, an analysis of aggregated national level BRFSS data allows for an understanding of how each state compares with national averages across these factors.

To account for the complex sampling weights used in the 2019 BRFSS survey, all analysis was run in SAS callable SUDAAN. To be included in the analysis subjects must be between the ages of 18 and 64 years and respond to the vision impairment, age, and employment questions. The response rate was 95.9%. The final sample size is 248,719. This includes 236,859 subjects without vision impairment and 11,860 subjects with vision impairment.

States vary in the number of people sampled in the BRFSS. Therefore, the sample size for the people who report vision impairment is often small, and the sample size decreases once the data are stratified by employment characteristics. This limitation is revealed in the wide confidence intervals, and in some cases, the sample size is too small to make an estimate. Combining multiple years of the BRFSS would increase the sample size and likely reduce the estimated confidence intervals.

The American Community Survey (ACS) from the U.S. Census collects data on social, economic, and demographic characteristics, including housing, employment status, income/poverty, and level of education. In addition, the ACS collects data on race/ethnicity, sex, marital status, and living arrangements. Although the ACS does not collect information about health and health behaviors, it asks the same six disability questions as the BRFSS, including vision, hearing, cognition, walking, bathing, and doing errands. The function of the ACS is to provide information for decision makers to allocate federal resources. The granularity of the data makes it possible to construct

county, state, and national profiles regarding social, economic, and demographic factors (see more ACS information here). The unique feature of the ACS is that the prevalence of vision impairment can be estimated at the county level, and maps can be constructed to illustrate the distribution of vision impairment within and across states. The prevalence rates for disability measures generated from the ACS tend to be lower than those estimated by the BRFSS. The reasons for the differences are unclear, except to note that the sampling frame of the ACS differs from the BRFSS. Some scholars have suggested that reweighting the data from the two surveys can reconcile differences.[1] It is important to carefully interpret the patterns in the prevalence rates from each survey.

The descriptive tables in the appendices show the estimated point prevalence as well as the 95% Confidence Interval (CI) for each variable. Ninety-five percent CI means that we are 95% certain that the true value resides within the estimated parameters. Confidence intervals for some variables are wide in large part because the sample size is small. By combining multiple years of data, the CI would likely be reduced. Caution should be exercised in interpreting these findings.

Most large population-based surveys are limited because they rely on self-reported information from survey respondents. Multiple questions regarding vision have been employed in national surveys, and each question yields a different population estimate.[2,3] The ACS and the BRFSS, for example, ask the question "Are you blind or do you have serious difficulty seeing even when wearing glasses?" The narrow focus of this question creates a low prevalence of vision impairment. The BRFSS, for example, yields a prevalence of vision impairment of about 4.7% among the aged 18-64 years population in the US. Despite the use of the same questions, prevalence estimates from the BRFSS and the ACS differ largely because the sampling frame is not the same.

There is no widely accepted gold standard vision question used in national surveys. However, considerable effort has been made through the BRFSS and ACS to provide state and county level estimates of the prevalence of blindness and low vision. The analysis is complicated by the lack of standard questions employed in surveys, differing sampling frames, and often by the lack of scaled response categories. Across thirteen federally funded national population-based surveys, for example, about 100 questions capture dimensions of vision impairment.[2] Some questions measure different concepts, for example, seeing and reading newspaper print. Different questions, of course, yield different population estimates. Because of the lack of conceptual clarity, it is not possible to reliably compare findings across surveys.

A more recent study published in 2021 by Rein and his colleagues used a different approach and estimated the prevalence of vision impairment across multiple surveys, including the ACS, the BRFSS, multiple years of the National Health Interview Survey (NHIS), multiple years of the National Health and Nutrition Examination Survey (NHANES), and National Survey of Children's Health.[3] The ACS and the BRFSS asked

many of the same questions but the sampling frame differed. The NHIS, like the ACS and BRFSS, asked self-reported subjective measures of vision, and the NHANES provided clinical measured acuity and fields. The estimates differed because the questions differed, but the patterns of increased vision impairment among older age groups, racial/ethnic minorities, and those living in poverty were consistent across surveys.

This report was prepared by the VanNasdale Group, LLC. Questions regarding the methods and findings for this study should be directed to John E. Crews, DPA (johncrews@bellsouth.net) or Dean VanNasdale, OD, PhD (thevannasdalegroup@gmail.com).

Methods References

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Association for the Blind and Visually Impaired South Carolina

Lions Vision Services

Appendix A. South Carolina, 2019, BRFSS

Table 1. Prevalence and Population of People aged 18-64 with and without Vision Impairment by Employment Status, South Carolina, BRFSS 2019

Categories		Working		Not Working		Unable	Out of Labor Market			Totals
		Employed for wages	Self-employed	Out of work for 1 year or more	Out of work for less than 1 year	Unable to work	A Homemaker	A Student	Retired	
VI	Percent Distribution (95% CI)	30 (23.2, 38.4)	8.0 (4.9, 12.9)	4.8 (2.5, 9.1)	3.9 (2.0, 7.6)	39.1 (31.7, 47.0)	4.4 (2.3, 8.3)	3.3 (1.5, 7.0)	6.3 (3.7, 10.4)	100
	Estimated population	62,909	16,734	9,947	8,117	81,304	9,171	6,808	1,3027	208,019
	Sample Size	70	18	14	10	108	11	7	22	260
No VI	Percent Distribution (95% CI)	59.0 (57.0, 61.0)	10.0 (8.7, 11.4)	3.3 (2.6, 4.1)	3.2 (2.5, 4.0)	8.2 (7.2, 9.3)	4.4 (3.6, 5.3)	6.7 (5.6, 7.9)	5.3 (4.5, 6.1)	100
	Estimated population	1,587,877	267,981	88,841	85,964	219,279	118,391	179,630	141,649	2,689,612
	Sample Size	2,105	355	123	106	347	145	160	287	3,628

Table 2. Employment and Health Status of People Aged 18-64 Years with Vision Impairment by Social and Health Characteristics, South Carolina, BRFSS 2019

Vision Impaired		Working		Not Working		Unable	Out of Labor Market		
		Employed for wages	Self-employed	Out of work for 1 year or more	Out of work for less than 1 year	Unable to work	A Homemaker	A Student	Retired
		% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Age Group	**18-44**	47.0 (35.0, 59.3)	6.6 (2.8, 14.7)	6.0 (2.2, 15.1)	5.2 (2.0, 12.7)	22.5 (14.4, 33.3)	6.6 (2.9, 14.3)	5.8 (2.5, 13.1)	0.4 (0.0, 2.5)
	45-64	15.1 (9.6, 23.1)	9.3 (5.2, 16.3)	3.7 (1.7, 7.8)	2.7 (1.1, 6.8)	54.1 (44.1, 63.7)	2.4 (0.9, 6.5)	1. 0 (0.1, 6.6)	11.6 (6.8, 19.1)
Sex	**Male**	33.7 (22.4, 47.3)	14.6 (8.3, 24.4)	3.1 (1.4, 7.0)	3.1 (1.0, 9.5)	32.8 (23.0, 44.5)	0.7 (0.1, 5.1)	1.5 (0.2, 9.9)	10.3 (5.5, 18.6)
	Female	27.6 (19.3, 37.7)	3.1 (1.2, 7.6)	6.0 (2.5, 13.6)	4.5 (1.9, 10.1)	43.8 (33.8, 54.3)	7.2 (3.6, 13.7)	4.6 (2.0, 10.4)	3.2 (1.2, 8.2)
Marital Status	**Married**	30.6 (19.5, 44.5)	7.0 (2.8, 16.1)	4.9 (1.2, 17.8)	1.9 (0.4, 7.9)	34.1 (21.3, 49.7)	7.8 (3.2, 18.1)	1.7 (0.2, 11.4)	12.0 (5.7, 23.6)
	Not Married/ Separated	30.3 (21.6, 40.5)	8.5 (4.8, 14.9)	4.7 (2.3, 9.7)	4.8 (2.2, 9.9)	40.8 (32.1, 50.2)	3.0 (1.2, 7.4)	3.9 (1.7, 9.0)	3.9 (1.9, 8.0)
Race/ Ethnicity	**White only, non-Hispanic**	24.1 (16.8, 33.4)	9.4 (4.9, 17.2)	4.5 (1.8, 10.9)	5.1 (2.4, 10.7)	39.0 (29.8, 48.9)	5.3 (2.3, 11.4)	4.7 (1.8, 11.4)	7.9 (3.9, 15.4)
	Black only, non-Hispanic	35.4 (22.9, 50.1)	5.8 (2.2, 14.0)	5.8 (2.1, 15.1)	3.3 (0.8, 11.9)	45.3 (32.1, 59.2)	0.0 (., .)	0.0 (., .)	4.5 (1.9, 10.2)
	Hispanic	37.9 (14.6, 68.6)	16.0 (3.9, 47.4)	0.0 (., .)	0.0 (., .)	12.3 (2.8, 40.4)	25.3 (6.7, 61.3)	8.5 (1.2, 42.2)	0.0 (., .)

Education	**Did not graduate High School**	22.7 (10.7, 41.7)	12. 2 (5.6, 24.8)	2.0 (0.5, 7.0)	1.3 (0.2, 8.9)	54.7 (38.1, 70.3)	3.5 (0.9, 13.3)	2. 1 (0.3, 13.5)	1.5 (0.2, 9.8)
	Graduated High School	27.8 (17.0, 42.0)	5.7 (2.3, 13.3)	5.7 (1.8, 16.7)	6.7 (2.7, 15.5)	39.6 (28.6, 51.8)	5.8 (2.3, 14.1)	3.0 (0.7, 11.7)	5.7 (2.5, 12.8)
	Attended College or Technical School	26.4 (16.5, 39.3)	8.8 (3.4, 20.9)	8.1 (3.0, 20.0)	4.5 (1.4, 13.6)	27.5 (17.6, 40.4)	4.8 (1.4, 15.1)	6.0 (1.9, 17.2)	14.0 (6.2, 28.7)
	Graduated from College or Technical	71.7 (54.8, 84.1)	2.5 (0.3, 16.2)	3.0 (0.7, 11.8)	0.0 (., .)	12.8 (5.7, 26.2)	1.0 (0.1, 7.3)	2.2 (0.3, 14.5)	6.7 (2.5, 16.7)
Household Income	**Less than $35,000**	25.0 (17.0, 35.1)	5.9 (2.5, 13.1)	7.3 (3.6, 14.2)	5.0 (2.1, 11.6)	47.3 (37.4, 57.4)	2.1 (0.6, 7.3)	2.6 (0.8, 7.9)	4.8 (2.4, 9.6)
	$35,000 or greater	56.5 (40.9, 70.9)	9.2 (3.5, 21.9)	1.1 (0.2, 7.7)	1.6 (0.2, 10.4)	11.0 (5.2, 21.7)	4.2 (1.2, 13.4)	5.5 (1.6, 17.7)	11.0 (4.5, 24.7)

Table 3. Health Characteristics of People Aged 18-64 Years with Vision Impairment by Employment and Health Status. Includes Overall Health Characteristics for Visually Impaired and Not Visually Impaired, South Carolina, BRFSS 2019

Categories		Working		Not Working		Unable	Out of Labor Market			Overall
		Employed for wages	Self-employed	Out of work for 1 year or more	Out of work for less than 1 year	Unable to work	A Home-maker	A Student	Retired	
Age Group	**% 18-44 (95% CI)**	73.7 (60.2, 83.8)	39.0 (18.4, 64.5)	59.2 (29.3, 83.5)	63.0 (31.3, 86.4)	27.2 (17.7, 39.4)	70.8 (40.0, 89.8)	84.4 (38.9, 97.9)	2.7 (0.4, 17.5)	47.4 (39.6, 55.3)
	% 45-64 (95% CI)	26.3 (16.2, 39.8)	61.0 (35.5, 81.6)	40.8 (16.5, 70.7)	37.0 (13.6, 68.7)	72.8 (60.6, 82.3)	29.2 (10.2, 60.0)	15.6 (2.1, 61.1)	97.3 (82.5, 99.6)	52.6 (44.7, 60.4)
Sex	**% Male (95% CI)**	48.0 (32.7, 63.6)	77.9 (54.4, 91.3)	28.3 (10.7, 56.5)	34.7 (11.3, 69.0)	36.1 (25.5, 48.4)	7.3 (1.0, 38.5)	19.7 (2.8, 67.6)	70.9 (43.2, 88.6)	43.0 (35.4, 50.9)
	% Female (95% CI)	52.0 (36.4, 67.3)	22.1 (8.7, 45.6)	71.7 (43.5, 89.3)	65.3 (31.0, 88.7)	63.9 (51.6, 74.5)	92.7 (61.5, 99.0)	80.3 (32.4, 97.2)	29.1 (11.4, 56.8)	57.0 (49.1, 64.6)
Marital Status	**% Married (95% CI)**	29.7 (18.4, 44.2)	25.4 (10.5, 49.8)	30.3 (8.2, 67.8)	14.0 (3.0, 46.2)	25.9 (15.7, 39.5)	52.2 (22.9, 80.1)	15.6 (2.1, 61.1)	56.1 (30.9, 78.6)	29.5 (22.9, 37.1)
	% Not Married/ Separated (95% CI)	70.3 (55.8, 81.6)	74.6 (50.2, 89.5)	69.7 (32.2, 91.8)	86.0 (53.8, 97.0)	74.1 (60.5, 84.3)	47.8 (19.9, 77.1)	84.4 (38.9, 97.9)	43.9 (21.4, 69.1)	70.5 (62.9, 77.1)
Race/ ethnicity categories	**% White only, non-Hispanic (95% CI)**	43.9 (29.8, 59.1)	61.7 (36.5, 81.8)	49.8 (20.0, 79.7)	66.9 (29.7, 90.6)	51.8 (39.1, 64.3)	70.6 (32.4, 92.3)	86.5 (42.1, 98.3)	69.3 (42.8, 87.2)	53.6 (45.5, 61.5)
	% Black only, non-Hispanic (95% CI)	50.1 (34.9, 65.3)	29.3 (11.9, 55.8)	50.2 (20.3, 80.0)	33.1 (9.4, 70.3)	46.8 (34.4, 59.7)	0.0 (., .)	0.0 (., .)	30.7 (12.8, 57.2)	41.7 (33.9, 50.0)
	% Hispanic (95% CI)	6.0 (2.1, 15.6)	9.1 (2.2, 30.7)	0.0 (., .)	0.0 (., .)	1.4 (0.3, 5.7)	29.4 (7.7, 67.6)	13.5 (1.7, 57.9)	0.0 (., .)	4.6 (2.5, 8.4)

Education	**% Did not graduate High School (95% CI)**	23.2 (11.1, 42.1)	47.0 (24.5, 70.7)	12. (3.2, 38.9)	10.4 (1.4, 48.5)	43.4 (31.0, 56.6)	24.8 (6.4, 61.4)	19.7 (2.8, 67.6)	7.3 1.0, 37.5)	30.9 (23.5, 39.5)
	% Graduated High School (95% CI)	34.6 (21.1, 51.3)	26.7 11.0, 51.6)	45.1 (17.0, 76.6)	64.9 32.3, 87.7)	38.3 (27.5, 50.4)	49.7 (21.2, 78.4)	34.1 (8.5, 74.3)	34.5 15.2, 60.9)	37.7 30.5, 45.6)
	% Attended College or Technical School (95% CI)	18.6 (11.0, 29.9)	23.2 8.9, 48.4)	36.0 (12.9, 68.1)	24.7 (7.3, 57.8)	15.1 9.3, 23.6)	23.1 (6.6, 56.1)	39.4 (12.0, 75.5)	47. (23.7, 72.8)	21.4 (16.4, 27.4)
	% Graduated from College or Technical (95% CI)	23.6 (13.7, 37.4)	3.1 (0.4, 19.7)	6. (1.4, 24.3)	0. (., .)	3.3 (1.5, 7.0)	2. (0.3, 16.1)	6.8 (0.9, 38.0)	10. (3.8, 26.2)	9.9 (6.6, 14.7)
Household Income	**% Less than $35,000 (95% CI)**	47.7 (32.6, 63.3)	56.9 (26.7, 82.7)	93. (62.1, 99.1)	86.9 (43.6, 98.3)	89.9 (80.1, 95.2)	51.4 (15.3, 86.1)	49.5 (15.2, 84.2)	47.5 (22.2, 74.1)	67. (58.5, 75.1)
	% $35,000 or greater (95% CI)	52.3 (36.7, 67.4)	43. (17.3, 73.3)	7.0 (0.9, 37.9)	13.1 (1.7, 56.4)	10.1 (4.8, 19.9)	48.6 (13.9, 84.7)	50.5 (15.8, 84.8)	52.5 (25.9, 77.8)	32. (24.9, 41.5)
Diabetes	**% Yes (95% CI)**	8.2 (3.6, 17.4)	14. (4.0, 41.5)	28.6 (10.2, 58.4)	0.0 (., .)	31.3 (20.9, 44.0)	23.0 (6.7, 55.5)	0.0 (., .)	17.6 5.9, 42.3)	19.4 (14.2, 25.9)
Depression	**% Yes (95% CI)**	26.2 (16.0, 39.7)	16.2 (4.4, 45.2)	43.3 (16.9, 74.1)	51.7 (19.7, 82.3)	60.5 (47.5, 72.2)	58.4 (26.9, 84.3)	39.7 (12.2, 75.7)	37.3 (17.5, 62.6)	43.1 (35.7, 50.9)
Stroke	**% Yes (95% CI)**	0.9 (0.1, 6.2)	14.2 (3.2, 45.1)	11.7 (3.2, 34.5)	7.4 (1.0, 39.2)	18.8 (10.8, 30.8)	11.6 (1.6, 51.1)	0.0 (., .)	12.8 (3.7, 35.6)	11.0 (7.1, 16.8)

Angina or coronary heart disease	**% Yes (95% CI)**	3.4 (1.0, 10.8)	2.1 (0.3, 13.7)	4.6 (0.6, 28.1)	12.6 (2.8, 41.6)	9.1 (4.6, 17.3)	13.1 (1.8, 55.0)	0.0 (., .)	5.5 (0.7, 30.8)	6.3 3.9, 10.2)
Asthma	**% Yes (95% CI)**	14.2 (7.6, 25.0)	24. (9.6, 49.3)	31.5 (10.2, 65.1)	12.6 (2.8, 41.6)	37.0 (25.3, 50.4)	35.5 (12.1, 68.7)	11.8 (1.5, 53.0)	17.5 (5.5, 43.6)	25.7 (19.5, 33.2)
High blood cholesterol	**% Yes (95% CI)**	22.4 (12.9, 36.0)	41.7 19.7, 67.6)	23.1 (7.9, 51.2)	33.0 (8.8, 71.5)	47. (35.0, 60.2)	34.0 (10.7, 69.0)	0.0 (., .)	52.3 (27.4, 76.2)	36. (28.9, 44.2)
Any cancer	**% Yes (95% CI)**	10.1 (4.0, 23.5)	2. (0.3, 13.7)	0.0 (., .)	14.0 (3.1, 45.4)	12.8 (6.7, 23.1)	22.9 (6.7, 55.2)	0.0 (., .)	2. (0.4, 9.9)	9.9 (6.2, 15.3)
Heart attack (Myocardial Infarction)	**% Yes (95% CI)**	0.4 (0.1, 3.1)	10.2 (1.5, 46.3)	9.0 (2.0, 32.2)	36.8 (11.5, 72.5)	15.6 (8.0, 28.2)	17. (3.9, 51.8)	0.0 (., .)	15.9 (5.0, 40.5)	10.7 (6.7, 16.7)
Chronic obstructive pulmonary disease, C.O.P.D., emphysema or chronic bronchitis	**% Yes (95% CI)**	5.7 (1.8, 16.2)	2.1 (0.3, 13.7)	22. (5.2, 60.2)	5.2 (0.7, 30.6)	38.1 (26.7, 51.0)	11.6 (1.6, 51.1)	0.0 (., .)	19.7 (6.0, 48.3)	19.7 (14.2, 26.7)
Kidney Disease	**% Yes (95% CI)**	1.6 (0.3, 8.0)	0.0 (., .)	17.1 (2.5, 62.6)	7.4 (1.0, 39.2)	11.2 (5.5, 21.6)	0.0 (., .)	15.6 (2.1, 61.1)	3.7 (0.8, 15.7)	6.7 (3.8, 11.5)
Arthritis	**% Yes (95% CI)**	31.2 (18.3, 47.8)	34. (16.2, 57.9)	64.3 (32.1, 87.3)	50.2 (19.6, 80.7)	62.9 49.4, 74.6)	30.5 (9.6, 64.5)	47.1 (15.6, 81.1)	64.1 (37.2, 84.3)	48.6 (40.8, 56.5)
Do arthritis or joint symptoms now affect whether you work, the type of work you do or the amount of work you do? (Out of those with arthritis)	**% Yes (95% CI)**	36.3 (16.1, 63.0)	77.2 (39.3, 94.6)	55.0 (17.0, 88.0)	47.9 (12.8, 85.2)	76.6 (63.0, 86.2)	37.9 (4.9, 87.8)	33.1 (4.2, 84.9)	60.4 (25.9, 87.0)	61.9 (50.3, 72.4)

Fair or Poor Health	**% Yes (95% CI)**	32.8 (19.5, 49.5)	40.3 (19.9, 64.7)	71.2 (36.4, 91.4)	39.2 (14.4, 71.2)	58.5 (45.5, 70.4)	21.2 (5.9, 53.6)	31.5 (7.7, 71.8)	55.8 (30.0, 78.7)	46.4 (38.7, 54.2)
Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?	**% 14 or more days (95% CI)**	12.6 (6.1, 24.2)	27.1 (10.7, 53.5)	30.8 (10.7, 62.5)	44.3 (16.4, 76.4)	56.2 (42.8, 68.7)	53.1 (20.8, 82.9)	11.8 (1.5, 53.0)	32.9 (14.3, 58.9)	36.0 (29.0, 43.8)
Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?	**% 14 or more days (95% CI)**	23.5 (12.5, 39.9)	15.0 (3.7, 44.7)	38.0 (13.7, 70.3)	59.2 (25.7, 85.9)	52.2 (38.9, 65.1)	61.9 (27.8, 87.3)	73.5 (31.6, 94.3)	28.6 (11.8, 54.6)	39.9 32.3, 48.0)
During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self- care, work, or recreation?	**% 14 or more days (95% CI)**	2. (0.6, 12.9)	7.8 (1.7, 29.3)	48.7 (20.0, 78.3)	12. (2.8, 41.6)	61.5 (48.6, 73.0)	20.9 (5.8, 53.3)	27.0 (6.4, 66.7)	31.8 (13.4, 58.5)	31.7 (24.7, 39.5)
Do you have serious difficulty walking or climbing stairs?	**% Yes (95% CI)**	14.6 (7.8, 25.7)	24.4 (9.5, 49.7)	76.1 (39.1, 94.0)	33.9 (9.8, 70.6)	70.6 (56.8, 81.4)	23.0 (6.7, 55.5)	0.0 (., .)	60.2 (33.8, 81.7)	43.8 (36.4, 51.6)
Are you deaf or do you have serious difficulty hearing?	**% Yes (95% CI)**	5.7 (2.5, 12.5)	4.7 (0.6, 27.0)	24.1 (5.3, 64.3)	14.7 (2.1, 58.2)	21.8 (13.3, 33.6)	2.4 (0.3, 16.1)	0.0 (., .)	39.3 (17.2, 66.7)	14.9 (10.3, 21.0)

Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?	**% Yes (95% CI)**	30.1 (18.1, 45.7)	35.2 (14.8, 62.9)	51.5 (21.2, 80.8)	46.4 (17.2, 78.3)	66.3 (53.8, 76.9)	61.7 (29.0, 86.4)	81.8 (45.3, 96.1)	48.9 (24.3, 74.0)	50.7 (42.7, 58.7)
Do you have difficulty dressing or bathing?	**% Yes (95% CI)**	3.2 (1.0, 10.2)	7.2 (1.6, 27.5)	40.8 (14.8, 73.3)	12.6 (2.8, 41.6)	36.4 (25.5, 48.9)	22.4 (5.0, 61.2)	0.0 (., .)	12.4 (3.2, 37.5)	20.1 (14.8, 26.8)
Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor's office or shopping?	**% Yes (95% CI)**	9.0 (4.3, 17.8)	18.9 (5.4, 48.7)	54.8 (24.4, 82.1)	32.6 (10.8, 66.0)	58.1 (45.4, 69.8)	44.6 (18.0, 74.7)	15.6 (2.1, 61.1)	32.8 (14.0, 59.4)	35.4 (28.4, 43.2)
Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare, or Indian Health Service?	**% Yes (95% CI)**	79.3 (62.6, 89.8)	45.2 (23.3, 69.1)	88.2 (66.0, 96.6)	55.5 (24.8, 82.5)	91.8 (83.2, 96.2)	65.1 (32.6, 87.8)	84. 4 (38.9, 97.9)	84.9 (56.0, 96.1)	80.8 (74.0, 86.2)
Do you have at least one person you think of as your personal doctor or health care provider?	**% Yes (95% CI)**	65.6 (47.3, 80.2)	45.3 (23.5, 68.9)	87.4 (62.7, 96.6)	53.0 (22.6, 81.2)	83.7 (73.6, 90.5)	53.1 (23.4, 80.8)	42.3 (13.8, 77.0)	91.5 (63.9, 98.5)	71.8 (63.7, 78.7)

About how long has it been since you last visited a doctor for a routine checkup? [A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition.]	**% Within past year (anytime less than 12 months ago) (95% CI)**	63.9 (46.2, 78.5)	43.0 (21.9, 66.9)	97.8 (85.1, 99.7)	48.3 (17.7, 80.3)	92.9 (84.3, 97.0)	69.2 (33.0, 91.1)	57.2 (18.8, 88.5)	71.3 (40.4, 90.1)	75.1 (66.9, 81.8)
	% Greater than 1 year (95% CI)	36.1 (21.5, 53.8)	57.0 (33.1, 78.1)	2.2 (0.3, 14.9)	51.7 (19.7, 82.3)	7.1 (3.0, 15.7)	30.8 (8.9, 67.0)	42.8 (11.5, 81.2)	28.7 (9.9, 59.6)	24.9 (18.2, 33.1)
BMI	**% Underweight (95% CI)**	6.0 (1.5, 21.4)	0.0 (., .)	0.0 (., .)	0.0 (., .)	2.6 (0.9, 7.2)	0.0 (., .)	0.0 (., .)	1.3 (0.2, 9.1)	2.9 (1.1, 7.2)
	% Normal weight (95% CI)	35.8 (21.9, 52.5)	42.4 (20.8, 67.3)	0.0 (., .)	20.9 (4.9, 57.6)	22.4 (13.1, 35.6)	59.3 (26.2, 85.6)	49.4 (16.8, 82.4)	23.1 (9.0, 47.7)	29.0 (22.1, 37.0)
	% Overweight (95% CI)	26.1 (14.7, 42.0)	37.3 (17.0, 63.2)	26.2 (6.3, 65.1)	45.8 (15.9, 79.1)	24.1 (15.5, 35.3)	21.4 (4.5, 61.0)	38.3 (11.2, 75.4)	32.7 (13.0, 61.3)	27.6 (21.2, 35.1)
	% Obese (95% CI)	32.1 (20.3, 46.7)	20.4 (6.5, 48.5)	73.8 (34.9, 93.7)	33.2 (10.9, 67.1)	50.9 (38.2, 63.5)	19.4 (5.3, 50.9)	12.3 (1.6, 54.4)	42.9 (19.4, 70.2)	40.5 (33.0, 48.5)
During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?	**% Yes (95% CI)**	59.9 (43.4, 74.5)	63.2 (37.9, 82.9)	25.5 (9.5, 52.5)	73.4 (42.1, 91.3)	42.6 (30.4, 55.7)	70.7 (37.0, 90.9)	100.0 (., .)	48.6 (24.3, 73.6)	53.3 (45.3, 61.2)
Current smoker	**% Yes (95% CI)**	27.7 (15.3, 44.9)	45.7 (23.3, 70.0)	13.0 (3.8, 36.4)	24.8 (7.3, 57.9)	31.9 (22.2, 43.5)	40.1 (15.0, 71.8)	11.8 (1.5, 53.0)	26.5 (9.9, 54.3)	30.0 (23.4, 37.6)

Binge drinkers (males having five or more drinks on one occasion, females having four or more drinks on one occasion)	**% Yes (95% CI)**	23.2 (10.8, 42.9)	49.4 (25.4, 73.6)	6.4 (1.2, 28.2)	0.0 (., .)	8.8 (4.5, 16.6)	0.0 (., .)	38.3 (10.6, 76.6)	11.3 (2.0, 45.0)	16.1 (10.8, 23.4)

Appendix B. Prevalence of Vision Impairment by Quintile

Figure 1. Prevalence of Vision Impairment by County by Quintile, South Carolina, 2019, American Community Survey

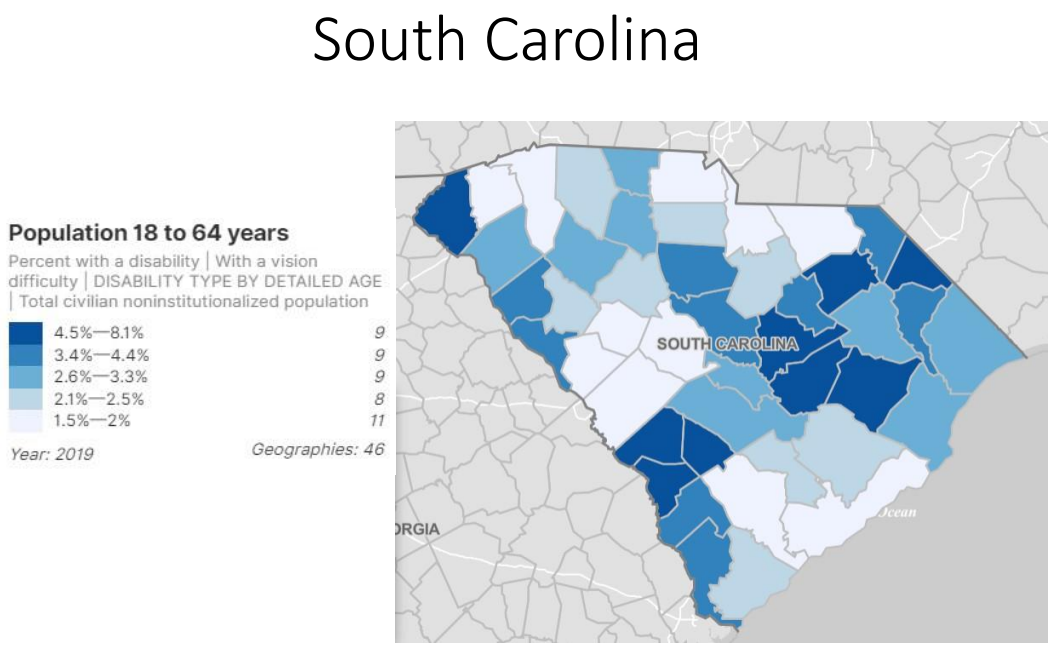

Table 1. Tabular representation of Figure 1, Prevalence of Vision Impairment by County by Quintile, South Carolina, 2019, ACS

Quintile	Number of Counties	South Carolina Counties (total = 62) (listed from high to low in each quintile)
1st (4.5% - 8.1%)	9	Allendale, Barnwell, Clarendon, Williamsburg, Sumter, Bamberg, Dillon, Darlington, Oconee
2nd (3.4% - 4.4%)	9	Fairfield, Marlboro, Lee, Marion, Jasper, Hampton, McCormick, Richland, Abbeville
3rd (2.6% - 3.3%)	9	Florence, Laurens, Anderson, Union, Cherokee, Horry, Georgetown, Calhoun, Orangeburg
4th (2.1% - 2.5%)	8	Kershaw, Dorchester, Chester, Greenwood, Beaufort, Berkeley, Spartanburg, Newberry
5th (1.5% - 2.0%)	11	Aiken, Greenville, Lancaster, Lexington, Pickens, Saluda, Charleston, Edgefield, York Chesterfield, Colleton

Appendix C. Prevalence of Vision Impairment by County

Table 1. Prevalence of Vision Impairment by County Ranked Highest to Lowest, South Carolina, 2019, American Community Survey.

County	VI Prevalence	Quintile	Margin of Error
Allendale County, South Carolina	8.1	1st	3.4
Barnwell County, South Carolina	7.5	1st	1.9
Clarendon County, South Carolina	6.4	1st	1.3
Williamsburg County, South Carolina	5.6	1st	1.3
Sumter County, South Carolina	5.2	1st	0.9
Bamberg County, South Carolina	5.1	1st	2.1
Dillon County, South Carolina	5.1	1st	1.8
Darlington County, South Carolina	4.6	1st	0.8
Oconee County, South Carolina	4.5	1st	0.9
Fairfield County, South Carolina	4.4	2nd	2
Marlboro County, South Carolina	4.2	2nd	1.4
Lee County, South Carolina	4.1	2nd	2.2
Marion County, South Carolina	4	2nd	1.2
Jasper County, South Carolina	3.9	2nd	1.4
Hampton County, South Carolina	3.6	2nd	1.2
McCormick County, South Carolina	3.6	2nd	2.2
Richland County, South Carolina	3.6	2nd	0.4
Abbeville County, South Carolina	3.4	2nd	1.2
Florence County, South Carolina	3.3	3rd	0.4
Laurens County, South Carolina	3.1	3rd	0.6
Anderson County, South Carolina	3	3rd	0.4
Union County, South Carolina	3	3rd	0.9
Cherokee County, South Carolina	2.9	3rd	0.7
Horry County, South Carolina	2.9	3rd	0.3
Georgetown County, South Carolina	2.8	3rd	0.7
Calhoun County, South Carolina	2.6	3rd	1.3
Orangeburg County, South Carolina	2.6	3rd	0.6
Kershaw County, South Carolina	2.5	4th	0.5
Dorchester County, South Carolina	2.4	4th	0.4
Chester County, South Carolina	2.3	4th	0.7
Greenwood County, South Carolina	2.3	4th	0.6
Beaufort County, South Carolina	2.2	4th	0.7
Berkeley County, South Carolina	2.2	4th	0.3
Spartanburg County, South Carolina	2.2	4th	0.3
Newberry County, South Carolina	2.1	4th	0.8
Aiken County, South Carolina	2	5th	0.4

Greenville County, South Carolina	2	5th	0.2
Lancaster County, South Carolina	2	5th	0.5
Lexington County, South Carolina	2	5th	0.2
Pickens County, South Carolina	2	5th	0.4
Saluda County, South Carolina	1.9	5th	0.8
Charleston County, South Carolina	1.8	5th	0.2
Edgefield County, South Carolina	1.8	5th	0.9
York County, South Carolina	1.6	5th	0.2
Chesterfield County, South Carolina	1.5	5th	0.5
Colleton County, South Carolina	1.5	5th	0.6

Table 2. Prevalence of Vision Impairment by County, South Carolina, 2019, American Community Survey.

County	VI Prevalence	Margin of Error
Abbeville County, South Carolina	3.4	1.2
Aiken County, South Carolina	2	0.4
Allendale County, South Carolina	8.1	3.4
Anderson County, South Carolina	3	0.4
Bamberg County, South Carolina	5.1	2.1
Barnwell County, South Carolina	7.5	1.9
Beaufort County, South Carolina	2.2	0.7
Berkeley County, South Carolina	2.2	0.3
Calhoun County, South Carolina	2.6	1.3
Charleston County, South Carolina	1.8	0.2
Cherokee County, South Carolina	2.9	0.7
Chester County, South Carolina	2.3	0.7
Chesterfield County, South Carolina	1.5	0.5
Clarendon County, South Carolina	6.4	1.3
Colleton County, South Carolina	1.5	0.6
Darlington County, South Carolina	4.6	0.8
Dillon County, South Carolina	5.1	1.8
Dorchester County, South Carolina	2.4	0.4
Edgefield County, South Carolina	1.8	0.9
Fairfield County, South Carolina	4.4	2
Florence County, South Carolina	3.3	0.4
Georgetown County, South Carolina	2.8	0.7
Greenville County, South Carolina	2	0.2
Greenwood County, South Carolina	2.3	0.6
Hampton County, South Carolina	3.6	1.2
Horry County, South Carolina	2.9	0.3
Jasper County, South Carolina	3.9	1.4
Kershaw County, South Carolina	2.5	0.5
Lancaster County, South Carolina	2	0.5
Laurens County, South Carolina	3.1	0.6
Lee County, South Carolina	4.1	2.2
Lexington County, South Carolina	2	0.2
McCormick County, South Carolina	3.6	2.2
Marion County, South Carolina	4	1.2
Marlboro County, South Carolina	4.2	1.4
Newberry County, South Carolina	2.1	0.8
Oconee County, South Carolina	4.5	0.9
Orangeburg County, South Carolina	2.6	0.6
Pickens County, South Carolina	2	0.4

Richland County, South Carolina	3.6	0.4
Saluda County, South Carolina	1.9	0.8
Spartanburg County, South Carolina	2.2	0.3
Sumter County, South Carolina	5.2	0.9
Union County, South Carolina	3	0.9
Williamsburg County, South Carolina	5.6	1.3
York County, South Carolina	1.6	0.2

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