State of Wyoming

Department of Health

Visual Impairment in Wyoming Adults

2008 Behavioral Risk Factor Surveillance System

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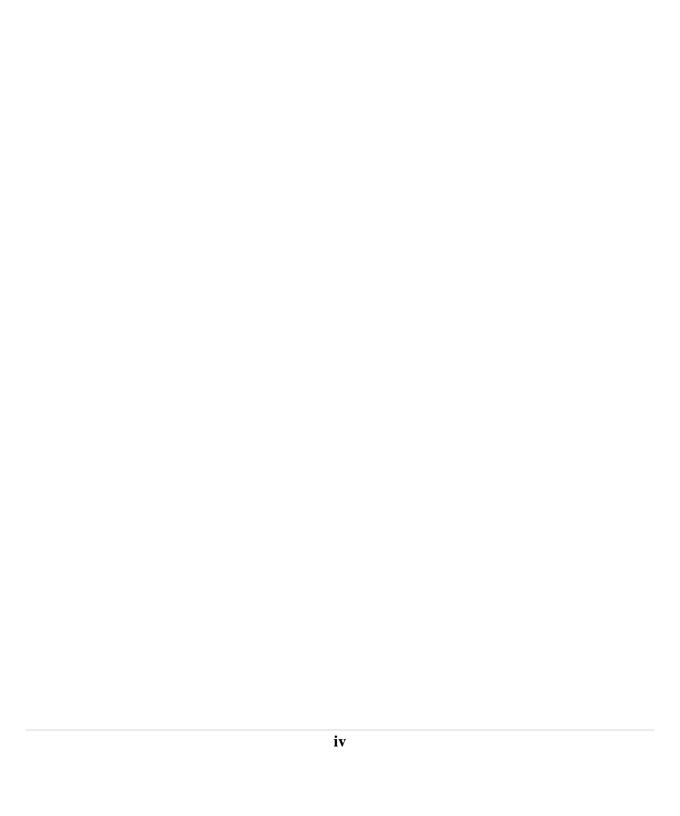Visual Impairment in Wyoming Adults
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For more information about the Behavioral Risk Factor Surveillance System (BRFSS),
visit the Wyoming BRFSS website at www.health.wyo.gov/PHSD/brfss/index.html
or the CDC BRFSS website at www.cdc.gov/brfss.

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Executive Summary

Wyoming included an optional module on Visual Impairment and Access to Eye Care on its Behavioral Risk Factor Surveillance System (BRFSS) in 2008. Nine questions asked of all adults age 40 and older addressed eye problems, eye exams, health care coverage for eye exams, and how well they could see in specific instances. This report covers the results of responses to those questions. A key measure used in this report is "poor vision" or "vision impairment" and is defined as reporting moderate or greater difficulty recognizing a friend across the street or reading print, and includes nine blind respondents. The results include respondents with uncorrected and corrected (e.g., glasses, contact lenses) vision.

Key Findings:

- One in five (20.1%) of Wyoming adults age 40 and older have cataracts, 4.8% have macular degeneration, and 3.5% have glaucoma. These figures represent an estimated 49,000 adults with cataracts, 12,000 with macular degeneration, and 8,600 with glaucoma.
- In terms of the number of eye problems reported, 19.0% reported one, 3.7% reported two and 0.6% reported all three.
- The prevalence of all three eye problems increases greatly with age; among adults age 70 and older, 48% reported one eye problem 14.3% reported two eye problems and 2.6% reported all three.
- An estimated 42,000 Wyoming adults – or 17.0% of all respondents age 40 and older – reported "poor vision" based on the definition above.
- Comparing adults age 40 and older with poor vision with those without poor vision, those with poor vision were significantly more likely to be in fair or poor health (28% vs. 13%), disabled (43% vs. 24%), smoke (22% vs. 15%), use special equipment (15% vs. 7%), be out of work (18% vs. 7% among those not retired, students or homemakers), and report frequent mental distress (12% vs. 6%).
- Over one fourth of adults age 40 and older with poor vision (27.3%) reported they had not had an eye exam in the past two years (this rate was 21.2% for all adults).
- Other groups at high risk of not having a recent eye exam include adults age 40 and older with no health insurance (40.1%), those with no insurance covering eye care (26.1%), the out-of-work (27.2%), with household income below $25,000 (26.9%), and adults age 40-49 years (26.7%).
- Half of all adults age 40 and older reported they did not have health insurance which covered eye care.

Results suggest that eye problems and poor vision are quite common among adults age 40 and older in Wyoming and have significant implications for public health. For example, public health programs that serve this population might want to provide printed materials in large print. These results should be useful to diabetes programs, injury programs that address falls, cardiovascular disease programs, groups addressing cancer screening, and anyone concerned with access to health care.

I.   Introduction

Because our ability to see affects the way we communicate, learn, get around, and earn our livings, poor vision can have a severe adverse affect on people's lives. And unlike measures such as obesity and high blood pressure, poor vision is not precisely defined. Legal blindness, which is a special category of poor vision, is defined as 20/200 or worse vision in the better eye or visual acuity less than six, and often qualifies persons for special services. People with less serious vision problems might be helped if the problem is identified, but there is no consistent definition for such problems. For those persons that glasses or contact lenses do not help, surgery, medication, magnifiers, large print reading material, and other aids may be beneficial and improve quality of life.

Based on data from the 2006 National Health Interview Survey, the American Foundation for the Blind estimates that about 21 million U.S adults age 18 and older have trouble seeing even with glasses or contacts, or they are blind.[1] Lighthouse International defines vision impairment as the inability to recognize a friend across the room, or to read regular newspaper print, or to self report vision as poor or very poor, or report some other trouble seeing, all when wearing glasses or contacts, or be blind in both eyes. They estimate that 17% of all U.S. adults age 45 and older, representing 16.5 million persons, have vision impairment.[2] Prevent Blindness America defines vision impairment as visual acuity of 20/40 or worse in the better eye, even with glasses (including blindness). Using that definition they estimated that 2.8% of Americans age 40 and older had vision impairment in 2002. And in a 2007 study, they estimated the economic cost of vision impairment to be $51.4 billion.[3] It is clear from these statistics that poor vision, however it is defined, affects large numbers of American adults at high economic cost. Visual impairment is one of the ten most frequent causes of disability in the United States.[4]

The leading causes of visual impairment are diabetic retinopathy, age related macular degeneration (AMD), cataracts, and glaucoma. Annual dilated eye exams are recommended for adults with diabetes because early diagnosis and treatment of retinopathy may prevent further vision loss and blindness. Vision is addressed in Healthy People 2020 with one of the objectives to reduce visual impairment, with sub-objectives addressing impairment due to diabetic retinopathy, cataracts, glaucoma, and age related macular degeneration.   Another objective addresses periodic dilated eye exams.

The state-based Behavioral Risk Factor Surveillance System (BRFSS) collects data on health behaviors, health status, chronic conditions, use of preventive health services and is often used to track Healthy People Objectives. In 2008, Wyoming was one of twelve states that included an optional vision module on the BRFSS. This document reports the results of analysis of those data, which include estimates of the number of Wyoming adults who are visually impaired and the prevalence rates of specific vision problems.

II.   Methods

The Wyoming BRFSS (Behavioral Risk Factor Surveillance System) collects data from non-institutionalized adults age 18 and older through monthly random digit dial telephone surveys. The BRFSS is coordinated and partially funded by the Centers for Disease Control and Prevention (CDC) and is conducted in all 50 states. BRFSS uses a two stage disproportionate stratified sampling plan consisting of all households in each state with a land-line telephone. The first stage is the random selection of a possible phone number to reach a household. Once a household is reached (and confirmed), one adult is randomly selected from among the eligible members of the household. BRFSS also uses a two stage plan to weight the data. Data are first weighted to account for the probability of selection into the sample based on the number of different phone numbers into the household, the number of eligible adults in the household, and other factors. The data are further weighted to be representative of the total adult population of Wyoming by age and gender, which adjusts for non-response and non-coverage.

In 2008, 7,999 Wyoming adults were successfully interviewed for the BRFSS. This report is based on data from the 6,148 adults age 40 and older who were asked the nine questions on vision. For the purposes of this report, "poor vision" has been defined as reporting moderate or greater difficulty recognizing a friend across the street or reading print, and includes nine blind respondents. All respondents, with or without correction (e.g., glasses, contact lenses) were included in the analysis.

Data analysis was conducted using Stata software which accounts for the complex sample design of the BRFSS. Respondents with missing values were excluded from the analysis of that variable unless otherwise noted. When the *Findings* include the terms **"more likely" or "higher than"** in comparisons, it indicates a statistically significant association based on the Chi Square test, with P values <0.05. These tests rely heavily on the Confidence Interval (CI), or margin of error, which is the range of values within which the true population prevalence would fall in 95 out of 100 samples taken from the population. Confidence intervals are included in Supplemental Tables on pages 18-21. When more than two groups are compared, and the P value is <0.05 indicating that the difference is unlikely to result from chance alone, the test does not indicate which of the groups are different. In that case, when two groups had 95% confidence intervals that overlapped, indicating that the "true" value could potentially be the same in both groups, the groups were conservatively assumed to have

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statistically similar rates, even when the P value was <0.05 indicating statistical significance. Comparison data were obtained from the 2008 BRFSS public use data set available at www.cdc.gov/brfss by ranking the results for all 12 states that used the module and determining the median and range of values.

As with all survey data, several limitations of these results should be taken into consideration. The data are self-reported and in many cases the validity of the measure on the BRFSS has not been measured. BRFSS data is self-reported and subject to possible intentional (e.g. under-reporting of undesirable behavior) or unintentional misrepresentation. Households without telephones (or only cell phones) were not included. In Wyoming, the rate of phone coverage is high, but more and more people are using cell phones only and have no landline telephone. These people are currently excluded from the survey. Phone coverage may be an issue for deriving accurate estimates when the item of interest is likely to be much higher among those with no phones, such as the homeless. Because the sample frame excludes institutions, adults in nursing homes or other institutions will not be included. Persons who are unable to respond to the survey due to a physical or mental impairment are also excluded. Declining response rates for telephone surveys are another concern, and are calculated using the Council of American Survey Research Organization (CASRO) methods. Median BRFSS response rates nationally have declined from about 70% ten years ago to around 50% in recent years. Wyoming CASRO response rates were 60% for 2003 and 55.3% for 2008. Potential error (or bias) results if the adults not surveyed differ appreciably from those that do participate. However, the BRFSS data have been shown to be comparable to other surveys with higher response rates.[5] While many types of errors cannot easily be measured for a particular survey, the sampling error, which results because only a fraction of the target population answers the questions, can be estimated. The confidence interval estimates the sampling error and provides an indication of the precision of the survey results.

Inquiries: Further information on this analysis or about BRFSS can be obtained by contacting Joe Grandpre, Interim BRFSS Coordinator, Wyoming Department of Health, Qwest Building Suite 510, 6101 Yellowstone Road, Cheyenne, WY 82002 (307-777-6012), joe.grandpre@wyo.gov.

III. RESULTS

A.   Eye Problems

Three eye problems were addressed in the vision module; cataracts, glaucoma, and macular degeneration. Diabetes retinopathy was included in the diabetes module asked of all adults with diabetes. In addition, the number of eye problems among all adults (cataracts, glaucoma, and macular degeneration) was determined and measures were included for adults having any eye problem and the number of problems.

Key findings:

- One in five (20.1%) of Wyoming adults age 40 and older have cataracts, 3.5% have glaucoma, and 4.8% have macular degeneration. These figures represent an estimated 49,000 adults with cataracts, 8,600 with glaucoma, and 12,000 with macular degeneration (Figures 1-3).
- The number of eye problems breaks out to 19.0% reported one, 3.7% reported two and 0.6% reported all three (Figures 4-5).
- The prevalence of the three eye problems increases greatly with age; among adults age 70 years and older, 48% reported one eye problem 14.3% reported two eye problems and 2.6% reported all three. In terms of individual problems, 60.4% of adults age 70 and older reported cataracts, 10.0% reported glaucoma and 14.4% reported macular degeneration. Because of this strong association with age, other measures that are associated with greater age (e.g. poor health) will also tend to be associated with eye problems.
- While 23.3% of all adults age 40 and older reported any eye problem, some notable subgroups reported higher rates: these included adults with diabetes (39%), adults with <$25,000 household income (38%), adults who were the only adult in the household (37%), disabled adults (36%), and those age 45 and older who reported a recent fall (30%; Figure 6).
- There was also a strong association between the different eye problems. For example, 13.4% of adults age 40 and older with cataracts and 23.1% with glaucoma also reported macular degeneration. And 62% of those with glaucoma and 55.7% with macular degeneration also reported cataracts.
- Among adults with cataracts, 44.8% reported they had been removed.
- Among adults age 40 and older with diabetes, 17.4% reported diabetes retinopathy.
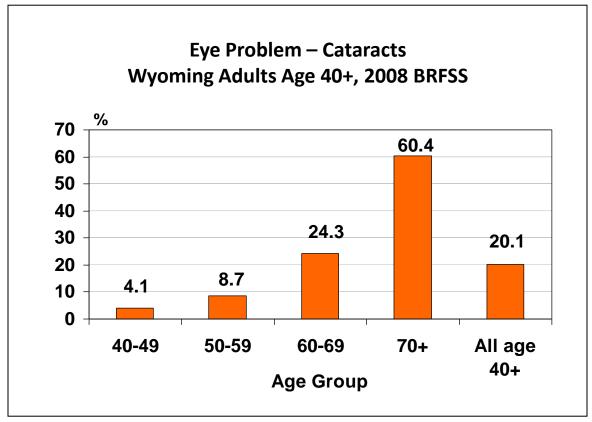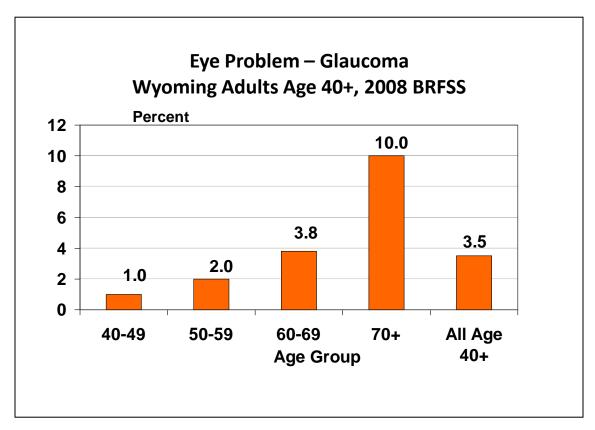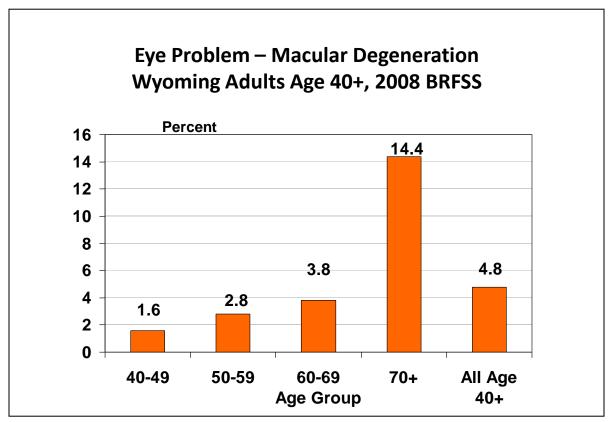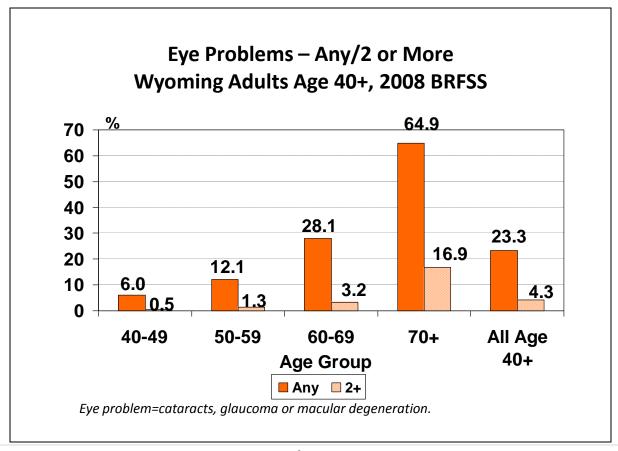
Figure 1.

Eye Problem – Cataracts
Wyoming Adults Age 40+, 2008 BRFSS

Figure 2.

Eye Problem – Glaucoma
Wyoming Adults Age 40+, 2008 BRFSS

Figure 3.

**Eye Problem – Macular Degeneration
Wyoming Adults Age 40+, 2008 BRFSS**

Percent

- 40-49: 1.6
- 50-59: 2.8
- 60-69: 3.8
- 70+: 14.4
- All Age 40+: 4.8

Age Group

Figure 4.

**Eye Problems – Any/2 or More
Wyoming Adults Age 40+, 2008 BRFSS**

%

Age Group	Any	2+
40-49	6.0	0.5
50-59	12.1	1.3
60-69	28.1	3.2
70+	64.9	16.9
All Age 40+	23.3	4.3

■ Any ■ 2+

Eye problem=cataracts, glaucoma or macular degeneration.

Figure 5.

Number of Eye Problems
Wyoming Adults Age 40+, 2008 BRFSS

Age Group	None	1	2	3
40-49	94.0	5.5		0.4
50-59	87.9	10.8		1.2
60-69	71.9	24.9		2.8
70+	35.1	48.0	14.3	
All Age 40+	76.7	19.0	3.7	

Legend: ■ None □ 1 □ 2 ■ 3

Eye problem=cataracts, glaucoma or macular degeneration.

Figure 6.

High Risk Groups for Any Eye Problem
Wyoming Adults Age 40+, 2008 BRFSS

	Percent
Recent fall	29.5
Disabled	36.3
Diabetes	39.3
1 adult in HH	37.1
<$25K income	37.7
Women	26.1
All adults 40+	23.3

Eye problem=cataracts, glaucoma or macular degeneration.

B. Poor vision

For the purposes of this report, poor vision or vision impairment is defined as reporting moderate or greater difficulty recognizing a friend across the street or reading print, and includes nine blind respondents.

Key Findings:

- An estimated 42,000 Wyoming adults – or 17.0% of all respondents age 40 and older – reported poor vision based on this definition (Figure 7).
- More adults reported difficulty with reading (14.7%) than with distance vision (5.8%) and 3.5% reported both.
- Demographic subgroups of adults age 40 and older with the highest rates of poor vision included American Indians (33%), adults unable to work (35%), those with income <$15,000 (29%), Hispanics (24%), those with less than high school education (23%), and those with one adult in the household (21.4%)(Figures 8-9).
- Other groups (age 40 and older) with high rates of poor vision included those reporting macular degeneration (41%), diabetes (27.6%), diabetes retinopathy (42%), fair or poor general health (30.6%), frequent mental distress (29%), disability (27.6%), smokers (22.4%), and respondents reporting being dissatisfied or very dissatisfied with their lives (34%).
- Poor vision was directly associated with the number of eye problems reported, increasing from 15.2% for those reporting none of the three problems, to 18.4%, 38.4% and 55.6% for one, two, and three problems respectively.
- Comparing adults age 40 and older with and without poor vision, those with poor vision were significantly more likely to be in fair or poor health (28% vs. 13%), disabled (43% vs. 24%), use special equipment (15% vs. 7%), be out of work (18% vs. 7% among those not retired, students or homemakers), report a recent fall among those age 45 and older (25% vs. 18%) and report frequent mental distress (12% vs. 6%)(Figure 10).
- More comparisons show that adults with poor vision are more likely to report cardiovascular disease risk factors, chronic diseases, and lack of sleep (Figure 11), lost teeth and not having seen a doctor because of cost (Figure 12) and are less likely to report receipt of recommended preventive services except colon cancer screening (Figure12).
- Logistic regression results indicated that the factors with the highest adjusted odds ratios for predicting poor vision are American Indian ethnicity (OR=2.3) and diabetes (OR=1.8)(Data not shown).
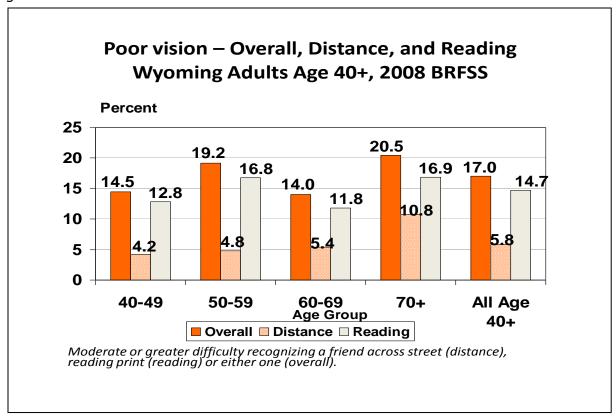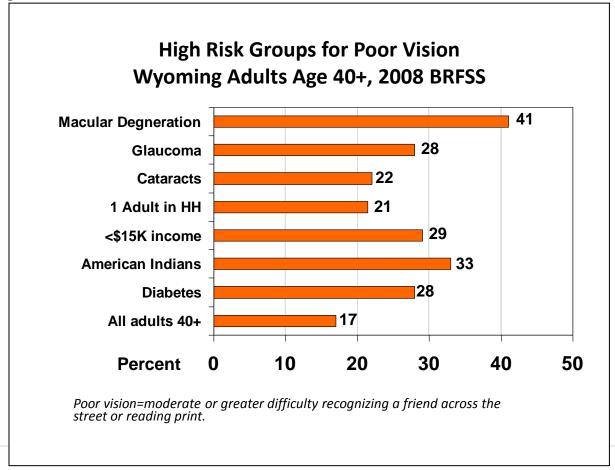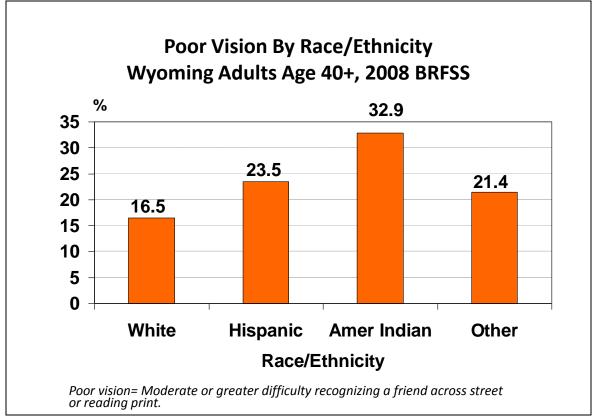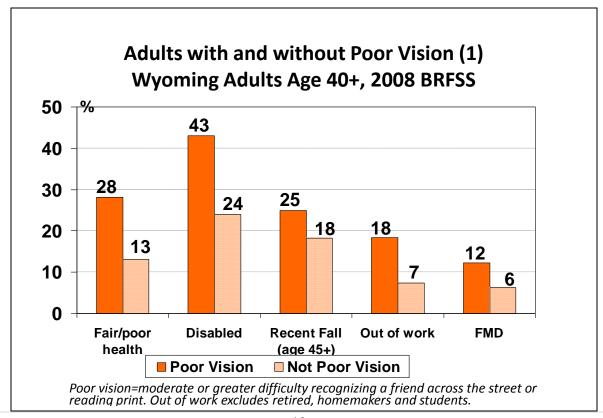
Figure 7.

Poor vision – Overall, Distance, and Reading
Wyoming Adults Age 40+, 2008 BRFSS

Percent

Age Group	Overall	Distance	Reading
40-49	14.5	4.2	12.8
50-59	19.2	4.8	16.8
60-69	14.0	5.4	11.8
70+	20.5	10.8	16.9
All Age 40+	17.0	5.8	14.7

Moderate or greater difficulty recognizing a friend across street (distance), reading print (reading) or either one (overall).

Figure 8.

High Risk Groups for Poor Vision
Wyoming Adults Age 40+, 2008 BRFSS

Group	Percent
Macular Degneration	41
Glaucoma	28
Cataracts	22
1 Adult in HH	21
<$15K income	29
American Indians	33
Diabetes	28
All adults 40+	17

Percent 0 10 20 30 40 50

Poor vision=moderate or greater difficulty recognizing a friend across the street or reading print.

Figure 9.

Poor Vision By Race/Ethnicity
Wyoming Adults Age 40+, 2008 BRFSS

Poor vision= Moderate or greater difficulty recognizing a friend across street or reading print.

Figure 10.

Adults with and without Poor Vision (1)
Wyoming Adults Age 40+, 2008 BRFSS

Poor vision=moderate or greater difficulty recognizing a friend across the street or reading print. Out of work excludes retired, homemakers and students.

Figure 11.

Adults with and without Poor Vision (2)
Wyoming Adults Age 40+, 2008 BRFSS

Poor vision=moderate or greater difficulty recognizing a friend across the street or reading print. Lack of sleep:30 days of insufficient sleep in past 30 days.

Figure 12.

Adults with and without Poor Vision (3)
Wyoming Adults Age 40+, 2008 BRFSS

Poor vision=moderate or greater difficulty recognizing a friend across the street or reading print. Lost 6 teeth for ages 45+; Cost issue: reported there was a time in the past year when they needed to see a doctor but could not due to cost.

C. Eye Examinations

Two separate questions addressed 1) having eyes examined by any doctor or eye care provider and 2) an eye exam in which the pupils were dilated. Separate measures were created for having had the eye exam in the past year, or not having had the exam in two years, which was termed "no recent eye exam" or "no recent dilated eye exam". Respondents who had not had an eye exam in the past year were asked the main reason they had not visited an eye care professional in the past year. Those responses were grouped into "no problem/no reason to go", "hadn't thought of", "cost", and "other". Health insurance coverage for eye care was also addressed in a single yes or no question.

Key findings:

- Three in five (62.2%) of Wyoming adults age 40 and older reported an eye examination in the past year, while 21.2% reported no recent eye exam. Dilated eye exams were less common, with 48.7% having one in the past year and 35.0% reporting no recent dilated eye exam (Figure 13 for No recent eye exams, Supplemental Tables for Eye exams in past year).
- Over one fourth (27.3%) of adults age 40 and older with poor vision reported they had not had an eye exam in the past 2 years (Figure 14).
- Other groups at high risk of not having a recent eye exam include adults age 40 and older with no health insurance (40.1%), those with no insurance covering eye care (26.1%), the out-of-work (27.2%), <$25K household income (26.9%), and adults age 40-49 years (26.7%)(Figure 14).
- Half (50.2%) of all adults age 40 and older reported they did not have health insurance which covered eye care. The rate of having eye care insurance was directly associated with household income (Figure 15).
- Over one third (35%) of adults with poor vision who had not had an eye exam in the past year said the reasons was because they had no problem or reason to go. (This percent was 54% for all adults who had not had an eye exam in the past year and 58% for those who did not have poor vision)(Figure 16).

Figure 13.

No Recent Eye Exam or Dilated Eye Exam
Wyoming Adults Age 40+, 2008 BRFSS

Grouped bar chart, percent (%) by Age Group:

Age Group	Eye Exam	Dilated Eye Exam
40-49	26.7	45.4
50-59	23.0	38.7
60-69	19.1	28.0
70+	12.0	19.6
All Age 40+	21.2	35.0

■ Eye Exam ▨ Dilated Eye Exam

Had not had exam in past 2 years or never had it.

Figure 14.

High Risk Groups for No Recent Eye Exam
Wyoming Adults Age 40+, 2008 BRFSS

Horizontal bar chart, Percent:

Group	Percent
No health insurance	40.1
No vision insurance	26.1
Out of work	27.2
Poor Vision	27.3
<$25K income	26.9
Age 40-49	26.7
All adults 40+	21.2

Figure 15.

Eye Care Insurance
Wyoming Adults Age 40+, 2008 BRFSS

Figure 16.

Reason for No Eye Exam Past Year
Wyoming Adults Age 40+, 2008 BRFSS

Of adults who had not had eye exam in past year.

D.   Comparisons with Other States

Because only twelve states included the vision module in 2008, it is somewhat difficult to make comparisons, but some patterns do emerge. The ranges of values for cataracts (18.4-26.1%) and glaucoma (2.6%-5.8%) are fairly narrow, with Wyoming results (20.1% and 3.5%) near or above the median (22.6% and 4.2%). The range for macular degeneration is also narrow (3.0% - 4.8%) with a median of 4.2% but Wyoming is the state with the 4.8% rate. Ranges for eye exams are wider (55.7%-67.0% for any eye exam and 40.5%-54.5% for dilated eye exams) and the Wyoming rate in each case is near the median. The Wyoming rate for poor vision, reading vision, and distance vision is near the median for all 12 states that participated in the 2008 vision module. The range of rates for reporting insurance that covers eye care ranges from 47.6%-72.1%, with the Wyoming rate of 50.2% only slightly above the poorest rate, and well below the median of 58.9%. It appears that the Wyoming rate for this measure is significantly different from the overall rate for the 12 states of 61.8%.

IV. Discussion

Poor vision seems to be a problem for a significant number of adults age 40 and older in Wyoming, with rates for each 10 year age group at least 14%, an overall rate of 17.0%, and an estimated 42,000 total. Rates for adults with diabetes – which is on the increase along with obesity – are even higher at 27.6%. American Indians are another group that deserves attention, with one third (33%) reporting poor vision. Because most of those who report poor vision indicate problems reading print, these results have broad implications. As one example, health promotion programs targeting adults with diabetes might need to provide materials in large print and use large fonts on material posted on their websites.

Some results merit special attention. One fourth of adults with poor vision (and this excludes blind persons) reported they had not had their eyes checked in the past two years (an estimated 11,000 adults). And over one third of adults with poor vision who had not had an eye exam in the past year, said they had no reason to go, representing an estimated 8,000 adults. In both cases these seem to be people who might benefit from new glasses, contacts, special equipment, or surgery. In the latter case it appears that these respondents did not even recognize they had a vision problem.

One in five adults (21.4%) age 40 and older living in a household as the only adult (and possibly living alone), have poor vision. Coupling this with the result that adults with poor vision are more likely to fall, and one potential issue is highlighted. Add possible problems reading instructions, prescription labels, legal documents, and recipes, and poor vision can be seen to affect other facets of life.

Some potential economic impact of poor vision is implied by these results. Among adults age 40 and older and still in the work force, those with poor vision are more than twice as likely to be out of work as those without poor vision (18% vs. 7%). Unless insurance coverage for eye care is included in health care reform, people without coverage for eye exams may be at risk. And even with coverage, the cost of treatment including surgical and laser techniques and special equipment will add their burden to health care costs. The social cost cannot be measured but can be imagined for people who cannot see to read, watch TV, use a regular computer, or get around easily to visit friends and family. Such adults may become socially isolated and have difficulties with activities of daily living, possibly forcing them into nursing homes or assisted living facilities.

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Supplemental Tables: S-1

	Age (years)	Eye Problems Percent	95% CI	Number	Sample Size
Cataracts	**Total Age 40+**	20.1	19.1-21.1	1,534	6,133
	40-49	4.1	3.1-5.4	57	1,312
	50-59	8.7	7.5-10.2	172	1,875
	60-69	24.3	22.1-26.7	389	1,469
	70+	60.4	57.7-63.2	916	1,477
	P value	<0.0001			
Glaucoma	**Total Age 40+**	3.5	3.1-4.1	258	6,128
	40-49	1.0	0.6-1.7	15	1,311
	50-59	2.0	1.4-2.8	38	1,868
	60-69	3.8	2.9-5.0	59	1,473
	70+	10.0	8.5-11.9	146	1,476
	P value	<0.0001			
Macular degeneration	**Total Age 40+**	4.8	4.3-5.4	354	6,106
	40-49	1.6	1.0-2.4	22	1,304
	50-59	2.8	2.1-3.8	54	1,868
	60-69	3.8	2.9-5.1	56	1,463
	70+	14.4	12.6-16.5	222	1,471
	P value	<0.0001			
Any eye problem	**Total Age 40+**	23.3	22.3-24.4	1,751	6,155
	40-49	6.0	4.8-7.5	85	1,313
	50-59	12.1	10.6-13.8	238	1,878
	60-69	28.1	25.8-30.7	443	1,477
	70+	64.9	62.2-67.6	985	1,487
	P value	<0.0001			
2+ Eye problems	**Total Age 40+**	4.3	3.9-4.9	348	6,155
	40-49	0.5	0.2-1.1	7	1,313
	50-59	1.3	0.8-2.0	24	1,878
	60-69	3.2	2.4-4.3	54	1,477
	70+	16.9	14.9-19.0	263	1,487
	P value	<0.0001			

S-2 Population Group	Poor vision*		Distance		Reading	
	Percent	95% CI	Percent	95% CI	Percent	95% CI
Total	17.0	16.0-18.1	5.8	5.2-6.5	14.7	13.7-15.7
Gender						
Males	16.0	14.4-17.6	4.6	3.7-5.6	14.0	12.6-15.6
Females	18.1	16.7-19.5	7.1	6.2-8.1	15.3	14.0-16.6
P value	0.053		<0.0001		0.002	
Age (years)						
40-49	14.5	12.5-16.8	4.2	3.0-5.7	12.8	10.8-15.0
50-59	19.2	17.3-21.2	4.8	3.8-6.0	16.8	15.1-18.8
60-69	14.0	12.2-16.0	5.4	4.3-6.8	11.8	10.2-13.7
70+	20.5	18.3-22.9	10.8	9.1-12.6	16.9	14.8-19.1
P value	<0.0001		<0.0001		<0.0001	
Race/ethnicity						
White	16.6	15.6-17.7	5.3	4.7-6.0	14.5	13.5-15.6
Hispanic	23.5	17.8-30.4	12.0	7.9-17.8	19.5	14.2-26.2
Other	22.1	15.6-30.3	13.4	8.1-21.2	13.6	9.0-20.1
P value	0.024		<0.0001		0.488	
Income						
<$25K	23.7	21.0-26.6	10.8	8.8-13.2	20.2	17.6-23.0
$25K-$49,999	19.3	17.2-21.6	6.2	5.0-7.7	16.9	14.9-19.1
$50K-$74,999	15.8	13.5-18.4	5.0	3.7-6.8	13.6	11.5-16.1
$75K+	13.0	11.3-14.9	2.9	2.1-3.9	11.4	9.8-13.3
P value	<0.0001		<0.0001		<0.0001	
Diabetes						
Yes	27.6	24.0-31.5	12.4	9.9-15.4	23.1	19.8-26.9
No	15.8	14.7-16.9	5.1	4.4-5.8	13.7	12.7-14.7
P value	<0.0001		<0.0001		<0.0001	
Smoking Status						
Non-Smoker	16.0	14.9-17.1	5.5	4.8-6.3	13.8	12.7-14.9
Current smoker	22.4	19.6-25.5	7.5	5.9-9.7	19.3	16.7-22.2
P value	<0.0001		0.029		0.0001	
Health Status						
Fair or poor	30.6	27.6-33.8	13.0	10.9-15.3	25.8	23.0-28.8
Good or better	14.5	13.5-15.7	4.5	3.9-5.2	12.6	11.6-13.7
P value	<0.0001		<0.0001		<0.0001	
FMD						
Yes	28.8	24.5-33.6	10.4	7.8-13.8	24.9	20.8-29.4
No	16.1	15.0-17.2	5.4	4.8-6.2	13.8	12.8-14.9
P value	<0.0001		0.0001		<0.0001	
Recent fall						
Yes	23.3	20.6-26.3	7.8	6.2-9.7	20.6	18.1-23.5
No	17.0	15.8-18.3	5.9	5.2-6.7	14.6	13.5-15.9
P value	<0.0001		0.037		<0.0001	
Any vision problem						
Yes	22.6	20.5-24.9	11.3	9.8-13.1	18.4	16.4-20.5
No	15.2	14.0-16.4	4.0	3.4-4.7	13.4	12.3-14.6
P value	<0.0001		<0.0001		<0.0001	

*Poor vision is self-reported moderate or greater difficulty recognizing a friend across the street (distance) or reading.

S-3

Population Group	Eye exam in past year		Dilated eye exam/1 yr	
	Percent	**95% CI**	**Percent**	**95% CI**
Total	62.2	60.8-63.5	48.7	47.3-50.1
Gender				
Males	59.5	57.4-61.6	48.0	45.8-50.1
Females	64.7	62.9-66.4	49.5	47.7-51.3
P value	0.0002		0.299	
Age (years)				
40-49	55.1	52.1-58.0	36.3	33.5-39.2
50-59	59.4	57.0-61.8	44.5	42.0-47.0
60-69	63.7	61.0-66.4	54.7	51.9-57.4
70+	76.2	73.8-78.6	69.4	66.7-71.9
P value	<0.0001		<0.0001	
Race/ethnicity				
White	62.4	60.9-63.8	48.7	47.2-50.2
Hispanic	63.8	56.2-70.7	53.8	46.3-61.2
Other	53.0	44.4-61.4	40.8	32.8-49.4
P value	0.071		0.075	
Income				
<$25K	58.0	54.7-61.2	49.2	45.9-52.5
$25K-$49,999	57.6	54.8-60.4	46.7	44.0-49.5
$50K-$74,999	63.1	59.9-66.3	49.9	46.6-53.3
$75K+	65.7	63.2-68.2	47.1	44.5-49.7
P value	<0.0001		0.384	
Population Density				
Counties >50K	64.5	61.9-67.0	51.9	49.2-54.6
Counties 10K-50K	62.8	60.5-65.0	48.3	46.0-50.6
Counties <10,000	59.4	57.0-61.7	46.8	44.4-49.1
P value	0.014		0.018	
Eye care insurance				
Yes	69.1	67.2-71.0	54.5	52.4-56.5
No	55.9	53.9-57.8	43.3	41.4-45.3
P value	<0.0001		<0.0001	
Diabetes				
Yes	69.8	65.7-73.6	65.2	61.1-69.0
No	61.2	59.7-62.7	46.7	45.2-48.2
P value	0.0001		<0.0001	
Poor vision				
Yes	55.2	51.7-58.6	47.9	44.5-51.4
No	63.5	62.0-65.0	48.8	47.2-50.3
P value	<0.0001		0.654	
Any eye problem				
Yes	80.4	78.1-82.4	72.1	69.7-74.4
No	56.7	55.0-58.3	41.5	39.8-43.1
P value	<0.0001		<0.0001	

Population Group		Percent	Eye care insurance 95% CI	Number	Sample Size
Total		50.2	48.8-51.6	2,844	6,028
Gender					
Males		53.2	51.1-55.4	1,221	2,418
Females		47.2	45.4-49.0	1,623	3,610
	P value	<0.0001			
Age (years)					
40-49		55.5	52.5-58.4	699	1,284
50-59		56.2	53.7-58.6	999	1,855
60-69		43.3	40.5-46.1	591	1,443
70+		38.5	35.8-41.2	555	1,446
	P value	<0.0001			
Race/ethnicity					
White		50.3	48.9-51.8	2,630	5,571
Hispanic		46.7	39.3-54.3	97	214
Other		51.8	43.1-60.4	92	180
	P value	0.632			
Income					
<$25K		27.3	24.5-30.3	346	1,223
$25K-$49,999		41.1	38.3-43.8	641	1,543
$50K-$74,999		58.3	55.0-61.5	589	1,051
$75K+		66.0	63.4-68.4	1,015	1,585
	P value	<0.0001			
Population Density					
Counties >50K		51.9	49.2-54.6	826	1,679
Counties 10K-50K		54.6	52.2-56.9	1,128	2,207
Counties <10,000		44.1	41.7-46.5	875	2,103
	P value	<0.0001			
Eye exam past yr. (any)					
Yes		55.5	53.8-57.3	2,029	3,869
No		41.4	39.1-43.8	808	2,133
	P value	<0.0001			
Diabetes status					
Diabetes		44.5	40.4-48.7	303	691
Pre-diabetes		52.1	46.4-57.7	176	364
No diabetes		50.8	49.2-52.3	2,365	4,972
	P value	0.018			
Poor vision					
Yes		48.4	45.0-51.9	471	1,048
No		50.6	49.1-52.2	2,369	4,962
	P value	0.26			
Health Insurance					
Yes		55.2	53.7-56.6	2,784	5,400
No		11.0	8.3-14.4	59	620
	P value	<0.0001			