



Calculating the potential of a premium vision benefit

How the vision plan ROI estimator was developed

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What's inside

03 | Introduction and summary

04 | Determining workforce demographics

05 | The impact of systemic diseases

08 | Eye diseases

15 | Summing it up — total ROI

17 | Sources



Introduction

Benefits are more competitive than ever—and HR professionals are looking for value.

Vision benefits that cover comprehensive eye exams and quality eye care can reduce medical costs and boost employee productivity – helping to improve an employer’s bottom line, while helping employees to see and feel their best.

Most HR professionals recognize that vision benefits are of even greater importance with the aging workforce, which suffers disproportionately from eye disease, vision conditions and overall health conditions (like diabetes and high blood pressure) that are closely connected to the eyes. There is lower awareness, however, that certain other growing groups within the workforce – including ethnic minority populations (Hispanic, African American and Asian American) and women – also have a disproportionately high prevalence of several of these issues.

Despite the overall acknowledgment that vision benefits have a high ROI compared to other benefits, no resources existed to help HR professionals comprehensively calculate the potential cost avoidance possible for their employees taking advantage of a premium vision plan.

About the Vision Plan ROI Estimator

The Vision Plan ROI Estimator (davisvision.com/medicalsavings) was developed by analyzing existing data on the prevalence of various eye diseases and conditions among specific populations, as well as published research on cost avoidance. It accomplishes the following:

- Provides specific prevalence of the following among a company’s workforce based on its makeup of age, gender and ethnicity:
 - Systemic diseases (that can be diagnosed through an eye exam)
 - Eye diseases
 - Vision problems
- Presents cost avoidance possible based on medical costs and productivity loss associated with each disease or condition.
- Offers the potential ROI an employer could see by offering a premium* vision plan to employees.

This paper details source information and medical-based rationale that form the basis of the calculator.

In this paper:

- The importance of offering premium vision benefits to employees
- The impact of systemic diseases, eye diseases and vision problems in regard to medical costs and employee productivity
- How the vision plan ROI estimator can help determine the potential ROI an employer could see by offering premium vision benefits

*The distinction of a “premium” vision plan is an important one, since vision plans can vary in the types of products and services covered and the frequency with which they are offered. For the purposes of the calculator, a “premium vision plan” was chosen because it can have the greatest impact on an employee’s health and productivity. This level of coverage would include a comprehensive eye exam offered yearly and coverage of or discounts on lens enhancements, such as photochromics and anti-reflective lenses, which address factors, such as glare, that can impact the overall quality of vision.

Determining workforce demographics

Because eye and overall health risks are impacted by age, gender and ethnicity, the makeup of a workforce, according to these factors, can impact the prevalence of systemic diseases, eye diseases and vision problems likely to be seen within that workforce. For the most accurate calculations using prevalence rates based on these factors, HR professionals need to provide an indication of their workforce demographics.

HR professionals using the calculator are asked to supply their location by state and their number of employees. The calculator is intended to examine the impact of a premium vision plan for full-time equivalents; however, HR professionals can also consider their base of retirees and explore the impact of a premium vision plan and its potential return for this group as well. If employers have multiple locations, they can simply select the location with the highest number of employees or choose "National" for an average.

The calculator multiplies the number of employees entered across a grid (see Workforce demographic

makeup table below) representing the percent makeup of the workforce population by age, gender and ethnicity for the entered state.

To create the grids, data representing the number of employees by age and gender for a particular state (based on U.S. Civilian Labor Force data) was multiplied by the percent breakdown by ethnicity for that state according to U.S. Census Bureau figures. This was done because Civilian Labor Force data is not consistently available by ethnicity at the state level due to the smaller sample size available when analyzing data at this level.

Once the HR professional enters the total number of employees, this number is multiplied by the "Workforce Demographic Makeup" buckets in the chart to create a "Your Workforce" chart. This chart represents the likely number of the employees the organization has in each demographic bucket.

The HR professional then has the opportunity to adjust the data based on the specifics of his or her company's workforce, or can leave it as-is and move on to the next part of the calculator.

Workforce demographic makeup

National demographics (over 18)

	18–44	45–64	65+	Total
Total	57.43%	37.36%	5.22%	100%
White males	19.88%	14.38%	2.34%	36.6%
White females	16.54%	12.47%	1.83%	30.84%
Black males	3.08%	1.71%	0.18%	4.97%
Black females	3.41%	1.95%	0.22%	5.58%
Asian males	1.58%	0.93%	0.13%	2.64%
Asian females	1.36%	0.87%	0.10%	2.33%
Hispanic males	5.61%	2.42%	0.20%	8.23%
Hispanic females	4.02%	1.86%	0.15%	6.03%
Other males	1.06%	0.40%	0.05%	1.50%
Other females	0.89%	0.35%	0.04%	1.28%

The impact of systemic diseases

An eye exam can provide early detection of many systemic diseases, allowing for prevention or earlier treatment to help reduce medical costs and productivity loss down the road.

Americans are more likely to see their eye care professional for an eye exam than their general health care provider for a physical, so offering vision coverage is a helpful way to keep tabs on an employee's overall health.

The calculator reviews the ability of an eye exam to impact three systemic conditions:

- Prediabetes
- Undiagnosed diabetes
- Undiagnosed high blood pressure

The prevalence of prediabetes and diabetes were pulled from an analysis of the raw data available through the Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS).¹ The analysis involved sorting data to find the prevalence rate of each condition by age, gender and ethnicity. In categories where sample size was not sufficient (primarily "Other" for ethnicity), an average for all ethnicities by age and gender was applied. Prevalence of diabetes was used as a baseline to establish prevalence of undiagnosed diabetes.

Americans are more likely to see their eye care professional for an eye exam than their general health care provider for a physical.

Since 27.8 percent of those with diabetes don't know they have it, the calculator multiplies the prevalence of diabetes times this number.

Prevalence of diagnosed high blood pressure was also pulled as a baseline to establish prevalence of undiagnosed high blood pressure.²

Since only 77.7 percent of hypertensive male patients and 84.6 percent of hypertensive female patients are aware they have the disease,³ prevalence of undiagnosed high blood pressure was calculated by multiplying the prevalence of high blood pressure among male populations times 22.3 percent and female populations times 15.4 percent.



PREDIABETES

Because blurred vision is one of the first signs of diabetes, eye care professionals are often the first health professionals to see patients in the “prediabetic” state, while lifestyle changes can still be made to keep the disease from progressing.

Of course, not all prediabetic employees diagnosed by their eye doctor will take steps to manage their health condition. Research from the CDC shows that 76 percent of people who learn they are prediabetic take steps such as moderate weight loss and regular exercise to reduce their risk of developing the disease.⁴ Taking such steps can reduce the incidence of diabetes by up to 34 percent, according to a Diabetes Prevention Program Research Group study.⁵

Based on this, the calculator assumes that 26 percent (76 percent x 34 percent) of employees diagnosed as prediabetic by their eye doctor will take steps to avoid the disease and be successful – thereby also avoiding the staggering medical costs and productivity loss that go with it.

Considering that 20 percent of health care dollars are spent on diabetes care,⁶ being able to prevent prediabetic employees from becoming diabetic is a powerful strategy in a company’s efforts to reduce overall medical costs and associated productivity loss.

Health care-related costs of having diabetes were pulled from the U.S. Agency for Healthcare Research and Quality Medical Expenditure Panel Survey (MEPS),⁷ and were specific to age, gender and/or race. Health care-related costs encompass hospital outpatient or office-based provider visits, hospital inpatient stays, emergency room visits, prescribed medicines, home health and other medical services.

Productivity loss totals were based on absenteeism and presenteeism costs possible by diagnosing prediabetes and avoiding diabetes. These costs were pulled from an American Diabetes Association study and were specific to gender.⁸



Nearly 3 in 10 people with diabetes don’t know they have it.

More than 1 in 4 employees diagnosed with prediabetes will successfully take steps to avoid diabetes.

Systemic diseases

National prevalence rates of conditions potentially impacted by a premium vision plan

Prediabetes	8.47%
Undiagnosed diabetes	2.93%
Undiagnosed high blood pressure	6.13%

UNDIAGNOSED DIABETES

Of the 29.1 million people in the U.S. with diabetes, 27.8 percent are undiagnosed, according to the CDC.⁹ Blurry vision is one of the first signs of diabetes, so eye doctors are often the first health professionals to diagnose the disease – and play an important role in encouraging the patient’s overall management of the disease.

The calculator assumes that employees with undiagnosed diabetes who have a premium vision benefit will be seeing their eye doctor regularly, so will be diagnosed with the disease and encouraged to keep their diabetes under control. Better managing diabetes can lower health care costs by a minimum of \$804 per person per year, according to a study published in the Journal of Managed Care Pharmacy.¹⁰ Better managing the disease will also help employees avoid the most extreme productivity-related issues, leading to job loss, and avoid the cost of unemployment associated with diabetes. The calculator pulls these costs from an American Diabetes Association study.⁸

People with diabetes should see their eye doctor regularly to keep tabs on eye health issues that can be caused or worsened by the disease, including diabetic retinopathy and cataract. People with diabetes are also more susceptible to damage from ultraviolet (UV) rays and are more sensitive to glare – making UV- and glare-blocking eyewear important. Cost savings from early intervention for cataract, diabetic retinopathy and issues with light and glare are addressed in later sections of the calculator.



20% of health care dollars are spent on diabetes care, making prevention key in reducing medical costs.

\$804

Better management of diabetes can lower health costs by a minimum of \$804 per person per year.

UNDIAGNOSED HIGH BLOOD PRESSURE

Eye doctors can see evidence of high blood pressure in the eye during an eye exam by observing the thickening of blood vessels there and looking for other signs of damage. Because of this, high blood pressure can be detected through an eye exam, and employees can be encouraged to take steps to manage the disease overall, helping reduce medical costs and lost productivity. This avenue to diagnosis is important for HR managers to consider for employees, since approximately one in four males and one in six females don't know they have it.³ Even if diagnosed, not all employees with high blood pressure will be successful in controlling it. According to the American Heart Association, 54 percent of adults with high blood pressure are able to get it under control.¹¹ Given this, the calculator assumes that employees with undiagnosed high blood pressure will be seeing their eye doctor regularly and will be diagnosed and encouraged to manage their disease. Assuming that 54 percent will be successful, the calculator projects that, for these employees, the most extreme health-related costs (emergency room visits) related to high blood pressure can be avoided and productivity can be improved.



If properly diagnosed, 54% of adults with high blood pressure are able to get it under control

Eye diseases

Adult eye diseases can lead to serious vision loss, high medical costs and lost productivity. Comprehensive eye exams can help detect these diseases in their early stages. Since several eye diseases can progress before changes in vision are noticeable, it is important to see an eye doctor regularly – not just when experiencing a vision problem. By that time, it could be too late to reverse damage. Eye diseases are on the rise¹² – especially with the aging population in the workforce – but regular eye exams and protective eyewear can help reduce the chance of severe vision loss and the steep costs that go with it. The calculator reviews the ability of an eye exam and proper vision wear to impact four of the most common eye diseases (and a precondition to one of these):

- Cataracts
- Diabetic retinopathy
- Elevated Intraocular Pressure (IOP)
- Glaucoma



Prevalence of cataracts, diabetic retinopathy and glaucoma were pulled from an analysis of raw data available through the BRFSS.^{1,13} This analysis involved sorting data to find the prevalence rate of each eye health issue by age, gender and ethnicity. In categories where sample size was not sufficient by one of these categories, an average for all ethnicities by age was applied.

CATARACTS

A cataract is a clouding of the eye's lens. As employees age, they will be at heightened risk for cataracts, which can negatively impact their work performance. Exposure to UV rays can contribute to the development of cataracts – making UV-blocking eyewear especially important for at-risk employees. The World Health Organization reports that an estimated 20 percent of all cataracts are caused by extended exposure to UV rays.

The calculator assumes that, through a premium vision plan, employees with cataract will have access to regular eye care to ensure they are being advised on their surgical options, and that they are wearing the right eyewear (UV- and glare-blocking) to delay progression of cataract and maximize available vision.

An estimated 20% of all cataracts are caused by extended UV exposure.

Eye diseases

National prevalence rates of conditions potentially impacted by a premium vision plan

Cataract	13.71%
Diabetic retinopathy	19.88%
Elevated intraocular pressure	6.58%
Glaucoma	4.84%

According to research published in a Bulletin of the World Health Organization, cost avoidance of I\$770* per year is possible with appropriate treatment of cataract – in this case, proper cataract surgeries.¹⁵ The calculator uses this figure to represent cost avoidance possible for employees with cataract that have a vision plan.

I\$770

A cost avoidance of I\$770 per year is possible with the appropriate treatment of cataracts.

DIABETIC RETINOPATHY

Diabetic retinopathy is the most common diabetic eye disease and a leading cause of blindness in American adults.¹⁶ When blood sugar remains elevated, it can cause blood vessels of the retina in the eye to swell and leak fluid, or for abnormal new blood vessels to grow on the surface of the retina. The retina is the light-sensitive tissue at the back of the eye, necessary for good vision. Damage to the retina can begin before people notice a change to their vision – so regular visits to the eye doctor are important for early detection and treatment to avoid developing more advanced stages of diabetic retinopathy and the vision loss that comes with it.

The calculator assumes diabetic employees will have access to regular eye care through a premium vision benefit, and will avoid the medical costs associated with diabetic eye disease. Diabetes is responsible for 21 percent of all ophthalmic health care expenditures, according to the American Diabetes Association.¹⁷ Health care costs for diabetic retinopathy referenced in the calculator were determined by taking 21 percent of the average yearly per person costs for all ophthalmic disorders, based on the U.S. Agency for Healthcare Research and Quality Medical Expenditure Panel Survey.⁷

ELEVATED INTRAOCULAR PRESSURE

Elevated intraocular pressure can be one of the first symptoms of glaucoma and can be detected through routine tests performed during an eye exam. With treatments as simple as eye drops, pressure can be kept from further increasing and leading to glaucoma.

The calculator assumes that a workforce could avoid the medical costs associated with glaucoma (except for maintenance drugs) through early detection of elevated intraocular pressure.

Health care costs associated with glaucoma were pulled from the MEPS and were specific to age, gender and/or ethnicity. They encompass hospital outpatient or office-based provider visits and "any service," but not prescription drugs, since these may still be necessary to keep pressure in check.

According to a 2016 study, 1.36 as many people have elevated intraocular pressure as glaucoma.¹⁴ To determine the prevalence rate for IOP, the calculator multiplies the prevalence of glaucoma by 1.36.



Diabetes is responsible for 21% of all ophthalmic health care expenditures.

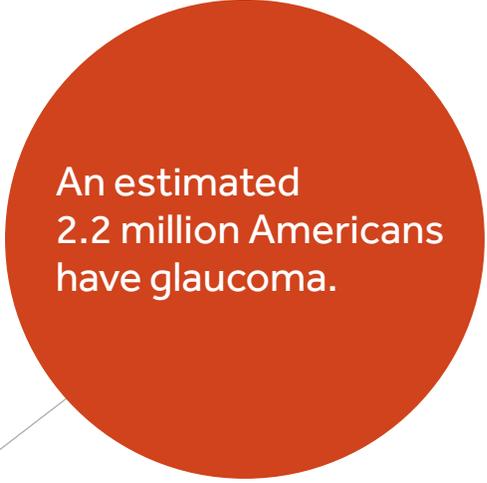
GLAUCOMA

Glaucoma is a group of eye diseases caused by damage to the optic nerve. It leads to loss of peripheral or side vision that can eventually progress to blindness. Since vision loss from glaucoma begins with peripheral or side vision, people may compensate for this unconsciously by turning their heads to the side and may not notice anything until significant vision is lost.

Glaucoma cannot be prevented – but early detection can help control the disease and medical costs. Proper management and treatments, as simple as using drops, can help keep glaucoma from advancing.

An estimated 2.2 million Americans have glaucoma.¹⁴ Because of the aging population, prevalence of glaucoma is expected to increase sharply. By 2032, glaucoma is expected to affect 50 percent more Americans than it does today.¹⁸ While it tends to impact older Americans more often than the young, young adults can get glaucoma, too. African Americans in particular are susceptible at a younger age, according to the Glaucoma Research Foundation.

Research shows that glaucoma treatment becomes much more expensive as the disease progresses, suggesting that earlier screening and treatment cuts down on associated costs despite a longer period of treatment.¹⁹ According to a study comparing treatment costs associated with screening for glaucoma vs. not screening, earlier intervention can lead to an average annual savings of \$857 per year per employee with glaucoma.²⁰ The calculator multiplies this amount times the number of employees an organization is likely to have with glaucoma to determine the potential annual cost avoidance.



An estimated
2.2 million Americans
have glaucoma.



Vision problems

More than four out of five adults wear some kind of vision correction to compensate for common vision problems.²¹ And just about everyone will need some form of correction after age 40, when presbyopia affects up-close vision. If prescriptions are not up-to-date, or problems from eyestrain and glare are causing blurred vision and headaches, then employees are not seeing their best, and the impact on productivity can be significant.



More than 4 in 5
adults use some kind
of vision correction.

The calculator reviews the ability of an eye exam and proper vision wear to impact the following vision problems:

- Trouble seeing up close
- Trouble seeing far away
- Eyestrain and fatigue
- Debilitating headaches from light and glare

Prevalence of trouble seeing up-close and trouble seeing far away were pulled from an analysis of the raw data available through the BRFSS.¹³ These prevalence rates were not based on the number of people having

conditions that can cause trouble seeing up-close and far-away, but rather those who noticed a problem with their vision in these areas. This is an important distinction because – with proper vision correction – people with myopia, hyperopia and presbyopia can see just as well as people who do not require vision correction. Unfortunately, many people do not have up-to-date prescriptions, or have other issues that could be addressed through regular visits to their eye care professional, and therefore do not see well up-close or far away even if they are currently wearing vision correction.

For trouble seeing up-close, prevalence rates were based on a positive response to the question, “How much difficulty, if any, do you have reading print in newspaper, magazine, recipe, menu, or numbers on the telephone?” For trouble seeing far away, prevalence rates were based on a positive response to the question, “How much difficulty, if any, do you have in recognizing a friend across the street?” In both cases, respondents were instructed, “If you wear glasses or contact lenses, answer questions as if you were wearing them.”

The analysis involved sorting data to find the prevalence rate by age, gender and ethnicity. In categories where sample size was not sufficient by ethnicity (primarily the “Other” category), an average for all ethnicities by age and gender was applied.

Even slightly miscorrected vision can reduce productivity by as much as 20%.

Prevalence of eyestrain and fatigue and headaches were pulled from analysis of raw data available through the 2012 Transitions Employee Perceptions of Vision Benefits survey, an annual survey that measures consumers' awareness of eye health factors and the steps they are taking – or not taking – to maintain healthy sight.²² The analysis involved sorting data to find the prevalence rate of each problem at the national level by gender.

Trouble seeing up close and far away

Many people have trouble seeing up close — even if they wear eyeglasses or contacts to correct their vision. Conditions that contribute to this include far-sightedness or astigmatism, which tend to develop earlier in life. Another condition is presbyopia, which usually occurs after age 40 and can make near vision difficult. Many people also have problems such as myopia (near-sightedness) or astigmatism that can contribute to trouble seeing far away.

All of these problems can be resolved with proper vision correction – but many people have prescriptions that are out of date. Plus, early presbyopes often wait to see their eye doctor or rely on over-the-counter eyewear that doesn't always fully correct their vision.

According to a University of Alabama study, even when vision is miscorrected so slightly that the person does NOT notice, productivity loss may be as high as 20 percent. Because an employee's productivity is impacted by a range of factors, the study suggests 2.5 percent as a more conservative estimate for productivity increase with proper vision correction²³

Data from the Centers for Disease Control and Prevention shows that on average, more than one in three people notices trouble seeing up-close reading print in newspapers, magazines, recipes, menus or numbers on the telephone. The data also shows that 16 percent of people notice trouble seeing far away, or recognizing a friend across the street – even when wearing glasses or contacts.¹³

The calculator pulls prevalence rates based on this data for a workforce and assumes productivity could be improved by 2.5 percent for these individuals. This percentage is multiplied by the average yearly productivity per employee times the number of employees within the designated workforce likely to have trouble seeing up-close or far away. The average yearly productivity of male and female employees was based on the median salaries for male and female full-time, year-round employees according to the Bureau of Labor Statistics.



Eyestrain and fatigue

Eyestrain and fatigue are caused by intense focusing of the eyes. This can occur when reading up-close or working on digital devices for an extended period of time. It can also result from the eye trying to adjust to glare or bright light outdoors. Harmful blue light, indoors and out, has also been linked to eyestrain and fatigue. Certain lens options, like photochromic and anti-reflective lenses, can help reduce eyestrain and fatigue by minimizing reflections and glare.

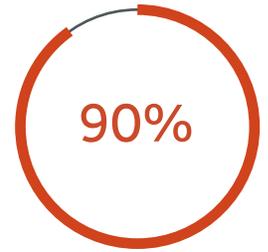
Research shows 40 percent of female and 50 percent of male employees with eyestrain and fatigue admit that they take at least one break per day to rest their eyes, with the average number of breaks being a little more than three.²² The calculator assumes employees with eyestrain and fatigue who take breaks can save the equivalent of three, 20-second breaks per day (a little more than a half day per year) by taking advantage of a vision benefit that covers glare-blocking eyewear.

Debilitating headaches

Almost everyone experiences headaches, which can be distracting and outright debilitating – leading to absenteeism and difficulties concentrating on the job. Of those who report headaches, nearly one in four cites glare or light as a main cause.²² Wearing glareblocking eyewear can reduce eyestrain and fatigue, helping prevent headaches on the job and at home.

While 90 percent of employees say headaches affect their work performance, only 33 percent tell their employers,²⁴ so it is likely a much bigger issue than most employers realize. Headaches cost the nation \$17 billion dollars in absenteeism, lost productivity and medical expenses, according to the National Headache Foundation.

In a study published in the Journal of the American Medical Association, researchers uncovered that 5.4 percent of the U.S. workforce reports headaches severe enough to result in lost productive time during a two-week period, causing these employees to lose about 3.5 hours in productivity every week.²⁵ The calculator assumes employers will avoid this loss by offering glare-blocking eyewear through a premium vision benefit. The calculator multiplies this potential savings by the number of employees the employer is likely to have who experience light- or glare-related headaches serious enough to cause productivity loss.



9 in 10 workers say headaches affect their performance, but few tell their employers.



90% of employees who work two or more hours per day on a computer suffer from digital eyestrain

Vision problems

National prevalence rates of conditions potentially impacted by a premium vision plan

Trouble seeing up close	38.15%
Eyestrain and fatigue	20.5%
Trouble seeing far away	16.17%
Debilitating headaches from light and glare	0.54%

40% of female and 50% of male employees with eyestrain and fatigue admit they take at least one break per day to rest their eyes.

Summing it up — total ROI

The calculator concludes with an executive summary that calculates all potential cost avoidance through use of a premium vision benefit related to systemic diseases, eye diseases and vision problems covered in this paper.

Overall, the calculator assumes an employer is offering a premium vision plan, which would cover the following:

- **An annual eye exam**, which will not only allow employees to maintain their proper eyeglass prescription, but will also serve as a way to detect potential eye and systemic diseases – before they become a health care burden.

The exam should cover pupil dilation to give the eye doctor a clear view of the back of the eye, where signs of disease may be present.

- **Advanced eyewear enhancements for optimal vision and protection.** These lens enhancements help alleviate problems such as eyestrain, fatigue and headaches that are addressed in the calculator and can lead to decreased performance at work. For example, photochromic lenses – like Transitions® lenses and anti-reflective lenses – can minimize glare and reflections, helping to reduce eyestrain and fatigue.

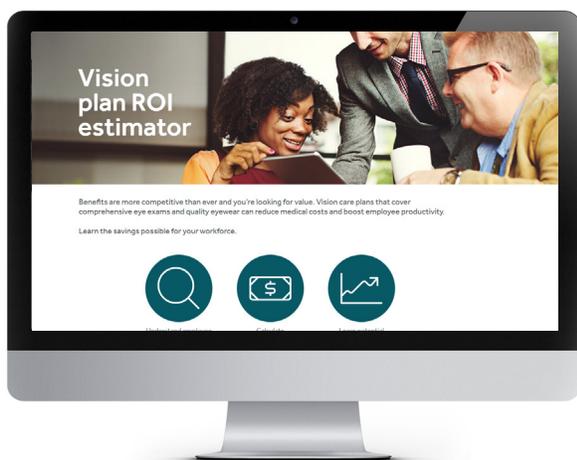
In an office, these products can help eliminate reflections from office lighting, an important option considering that nearly 90 percent of those who spend two or more hours per day working at a computer suffer from digital eyestrain.²⁶ Outdoors, photochromics also offer protection from damaging UV rays, which can lead to serious eye problems such as cataract and macular degeneration.

These lenses can also offer protection from harmful blue light, indoors and out.

A premium vision plan costs employers between \$70-\$110 per year per employee,²⁷ highly affordable compared to the nearly \$4,300 annual dollars spent on medical premiums.²⁸

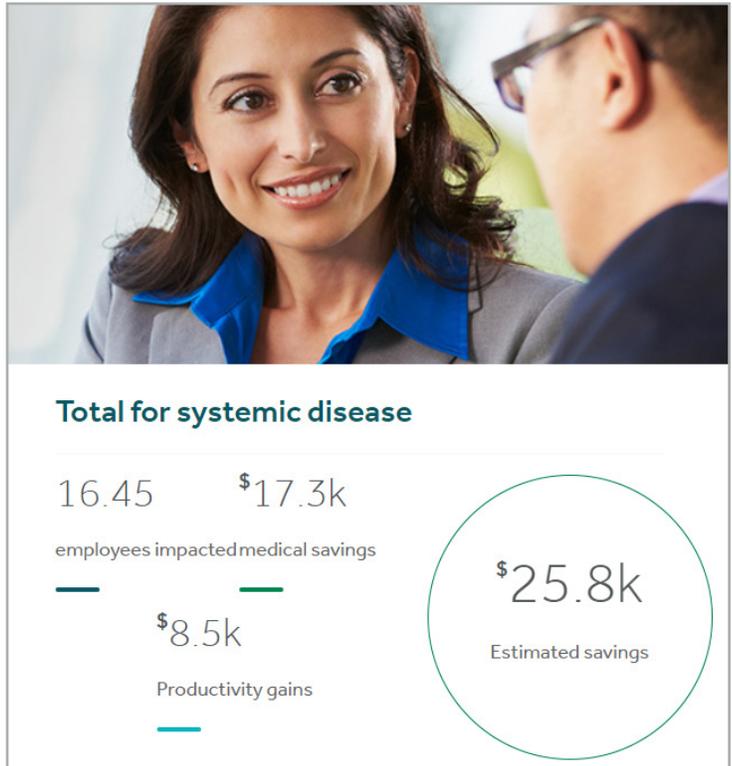
To provide an example of potential results, at the time of this paper's publishing, the calculator showed that an employer who spends \$80 per employee on a premium vision plan and has 500 employees representing national averages of the demographic makeup could see a potential cost avoidance for their workforce of:

The medical cost savings presented in the calculator are medical costs, not premium dollars. This medical cost



avoidance translates into very tangible savings for employers who are self-insured – and also represents significant savings to employers who are fully insured in the form of reduced plan premiums.

While the ROI for both medical costs and productivity gains will vary from employer to employer – based on the workforce make-up in terms of age, gender and ethnicity, as well as region (state) and vision plan investment annually – a total ROI of approximately 10.6 to one can be expected. Given the impact on health care costs of systemic diseases, such as such as diabetes and hypertension, detectable through an eye exam, and eye diseases themselves, the worthwhile investment of early detection is not surprising. Additionally, the impact of vision on productivity is difficult to ignore, and research demonstrates the cost implications of lost productivity. This new tool can be used as a resource for HR professionals to justify the value of investing in a premium vision plan and helping their employees to see and feel their best.



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