

Improving the Nation's Vision Health

A Coordinated Public Health Approach



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Executive Summary

Blindness and vision impairment are major public health problems causing a substantial human and economic toll on individuals and society including significant suffering, disability, loss of productivity, and diminished quality of life for millions of people. More than 3.4 million (3%) Americans 40 years and older are either blind or are visually impaired and millions more are at risk for developing vision impairment and blindness. Vision impairment often affects people's ability to drive, read, learn, watch television, or simply attend to common household or personal tasks. Reduced vision among mature adults has been shown to result in social isolation, increased risk of falling and resultant hip fractures, depression, family stress, and ultimately a greater tendency to be disabled or to die prematurely.

Vision disability is one of the top 10 disabilities among adults 18 years and older and the single most prevalent disabling condition among children.

Despite this recognition and a wide spectrum of organizations committed to improving vision health numerous challenges continue to encumber efforts to increase the use of and availability of evidence-based, cost-effective interventions to prevent vision loss. There remains an urgent need to improve coordination between the public health capacity for addressing vision health and other public health programs. Given that the prevalence of age-related eye diseases is expected to double over the next three decades, it is essential that opportunities for enhanced vision health be fully explored and implemented.

To address this growing concern, the Centers for Disease Control and Prevention (CDC) accepted this compelling and urgent challenge. Through its Vision Health Initiative (VHI) and diverse stakeholders, CDC commenced the development of a coordinated national public health framework to prevent vision impairment and blindness. Recognizing that vision impairment continues to erode the quality of life for significant numbers of individuals nationwide, especially those most vulnerable in our society including the economically disenfranchised, children, the elderly, and ethnic minorities, this initiative is intended to function as a catalyst for bringing vision health into the public health arena, and to aid the public health community in its efforts to improve the nation's vision health.

The core elements of the coordinated public health approach to improving the nation's vision health include: engaging key national partners, collaborating with state and local health departments, implementing vision surveillance and evaluation systems, eliminating eye health disparities by focusing on at-risk populations, integrating vision health interventions into existing public health programs including systems and policy changes that support vision health, addressing the role of behavior in protecting and optimizing vision health, assuring professional workforce development, and

establishing an applied public health research agenda for vision health.

Improving the Nation's Vision Health: A Coordinated Public Health Approach provides comprehensive and coordinated vision health strategies and activities that have been organized around assessment, application, and action principles. Together these serve to provide forward momentum at this critical juncture in time. Strategies identified will: build on existing data sources to improve vision loss and eye disease data collection; explore innovative mechanisms to collect vision data; assess the total impact of blindness and vision impairment throughout the life span; provide a more thorough understanding of the application of behavior change models to improve utilization of vision care and modify provider practice; enhance the roles of existing health programs; and, assess and encourage appropriate modifications to health care systems to better meet the vision health needs of all Americans.

By 2030, the number of blind and visually impaired people is predicted to double. Preparing now to prevent this expected increase in morbidity and its associated costs is imperative.

Implementing this ambitious framework will require dedication and active participation from all sectors and stakeholders. To meet the challenges outlined in this report, health disparities must be addressed, communities must be involved, measurable impacts must be evaluated, and finite resources must be used wisely. The collective efforts and resources of public health professionals, local, state, and federal governments, health care providers, nonprofit organizations, community-based organizations, academic institutions, businesses, and consumers are paramount to influencing vision care at the individual, community, and societal levels. This proposed framework provides a platform for discussion across different sectors and is intended to foster productive dialogue about specific priorities and activities that should be included in a national vision health action plan. Furthermore, it follows a logic model that is intended to produce long-term outcomes of improved prevention and control of eye diseases and vision loss, increased access to vision care, improved quality of life for the visually impaired and disabled, and vision health promotion throughout all life stages.

CDC stands ready to join with others committed to vision health to create a more effective multilevel network for vision loss prevention and apply its strengths and available resources toward the accomplishments of these vision health strategies and activities through convening, assisting through collaboration, and leading.

Ultimately, a clear vision is needed to promote and sustain the nation's vision health efforts. Together, we can assure the attainment of that vision and thereby greatly influence the vision health and quality of life for all people.

Introduction

Vision impairments and blindness present substantial social and economic burdens on individuals and society including significant suffering, disability, loss of productivity and diminished quality of life for millions of people. It has been estimated that at least half of all blindness can be prevented through timely diagnosis and treatment.¹ Despite effective evidence-based interventions and a broad range of federal, state, and local agencies and nongovernmental organizations' dedication to improving vision, this problem continues. Future efforts aimed at reducing this public health dilemma will require improved collaboration and coordination to maximize the impact of the efforts of all parties.

The goal for the public health approach, consistent with the Healthy People 2010 goal to "Improve the vision health of the nation through prevention, early detection, treatment, and rehabilitation," is to provide a framework to coordinate vision health initiatives across the public health infrastructure and vision community system.

Pooling of knowledge, efforts, resources, and the experiences and abilities of public health professionals, local, state, and federal governments, health care providers, professional organizations, community organizations, businesses, and consumers is fundamental to this effort.

The importance of vision and eye health has been recognized with the introduction of vision objectives in *Healthy People 2010* (see Appendix B), a national disease prevention initiative that identifies opportunities to improve the health of all Americans.² Furthermore, the National Commission of Prevention Priorities has identified vision screening among adults aged 65 years and older as one of the top 10 priority areas for effective clinical preventive services that can be offered in medical settings.³ To meet these vision objectives, it is essential to build on existing vision health and other health programs, resources, and priorities to create a more coordinated public health approach that not only conveys the urgency of the problem to decision makers and the public but also includes strategies to reach different age groups and high-risk populations.

The Centers for Disease Control and Prevention (CDC), through its Vision Health Initiative (VHI) located within the Division of Diabetes Translation (DDT), has begun the effort by involving a wide range of stakeholders in the design of a coordinated public health framework to prevent blindness and vision impairment. It is intended that this report will assist CDC and other public health champions in developing and implementing more comprehensive and detailed strategies that will reduce the burden of vision impairment and eye diseases for all Americans during the next decade and beyond.

The impetus for developing these integrated and coordinated vision health strategies emerged from a series of events: the 2002 CDC Small Expert Panel Meeting; the National Eye Health Education Program; the Healthy People 2010 Focus Area Progress Review Vision and Hearing Meeting; and the Prevent Blindness America Action Plan.



The Burden of Vision Loss

More than 3.4 million (3%) Americans 40 years and older are either legally blind (*having visual acuity [VA] of 20/200 or worse or a visual field of less than 20 degrees*) or are visually impaired (*having VA of 20/40 or less*) and millions more are at risk for developing vision impairment and blindness.⁴ Despite cost-effective interventions to prevent vision loss, many individuals do not benefit from available early detection and timely treatments.

By 2030, the number of blind and visually impaired people is predicted to double. Preparing now to prevent this expected increase in morbidity and its associated costs is imperative.

The leading causes of blindness and vision impairment in the United States are primarily age-related eye diseases.^{5,6,7} Over the next three decades, prevention of vision impairment from eye diseases will be an even more important concern as the prevalence of adult vision impairment and age-related eye disease in America (Table 1) is estimated to double due to our rapidly aging U.S. population, and the increasing epidemic of diabetes and other chronic diseases (Table 2).⁶

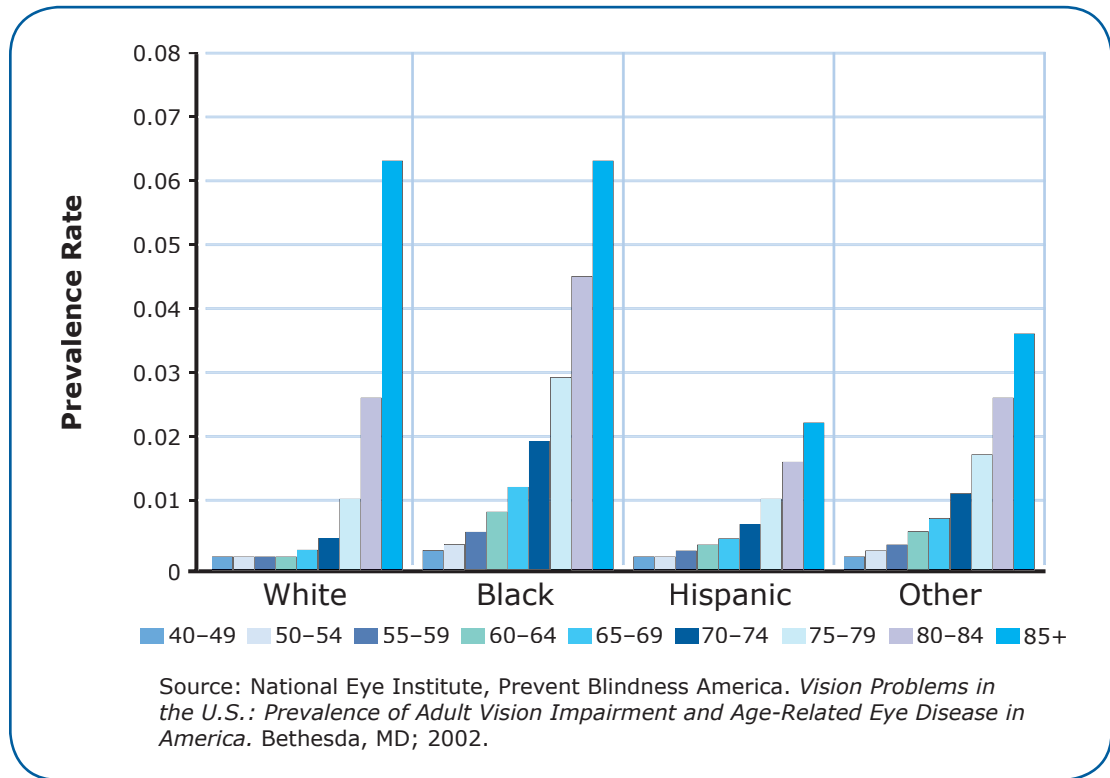


Table 1. Estimated specific prevalence rates for blindness among Americans 40 years and older, by age group and race/ethnicity.

	Current Estimates (in millions)	2020 Projections (in millions)
Advanced Age-Related Macular Degeneration (With Associated Vision Loss)	1.8*	2.9
Glaucoma	2.2	3.3
Diabetic Retinopathy	4.1	7.2
Cataract	20.5	30.1

* Another 7.3 million people are at substantial risk for vision loss from AMD.
Source: National Eye Institute. *Archives of Ophthalmology*. 122(4):444-676.
Available from URL: http://www.nei.nih.gov/eyedata/pbd_tables.asp.

Table 2. Eye disease prevalence and projections. (Number of adults age 40 years and older in the U.S.)

Vision disability is one of the top 10 disabilities among adults aged 18 years and older (Table 3). The fear of vision impairment or vision disability is justifiable when one considers that loss of vision often correlates with a loss of independence. Vision impairment cannot easily be overcome and often affects people’s ability to drive, read, watch television, or simply attend to common household or personal tasks. Reduced vision among mature adults has been shown to result in social isolation, increased risk of falling and resultant hip fractures, depression, family stress, and ultimately a greater tendency to be disabled or die prematurely.⁸

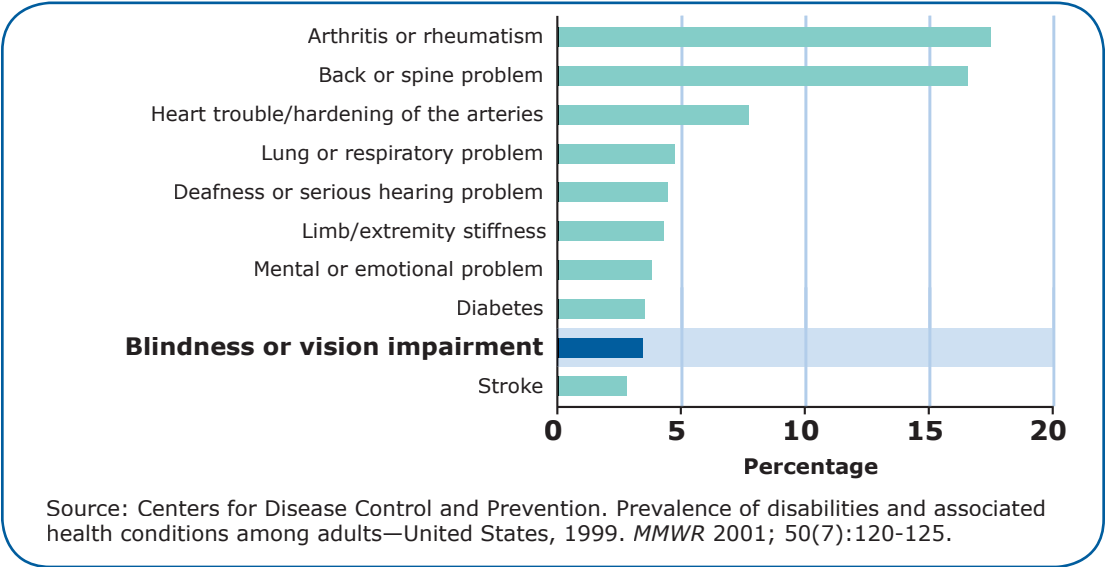


Table 3. Leading causes of disability among persons aged 18 years and older, United States, 1999.

Brief Description of Most Common Eye Disorders

Age-Related Macular Degeneration

Macular degeneration, often called age-related macular degeneration (AMD), is an eye disorder resulting in blurred vision or blindness. AMD affects the macula, the central part of the retina that allows the eye to see fine details. This disorder results in the loss of central vision, which may interfere with the performance of daily activities. It is estimated that 1.8 million Americans 40 years and older are affected by AMD and an additional 7.3 million with large drusen are at substantial risk of developing AMD. The number of people with AMD is estimated to reach 2.95 million in 2020. AMD is the leading cause of permanent impairment of reading and fine or close-up vision among people aged 65 years and older.⁹

Amblyopia

Amblyopia, also referred to as "lazy eye," is the most common cause of vision impairment in children and usually results from either a misalignment of a child's eyes or one eye focusing better than the other. Unless it is successfully treated in early childhood, amblyopia usually persists into adulthood, and is the most common cause of permanent one-eye vision impairment among children and young and middle-aged adults. An estimated 2%–3% of the population suffers from amblyopia.¹⁰

Cataract

Cataract is a clouding of the eye's lens and is the leading cause of blindness worldwide, and the leading cause of vision loss in the United States. An estimated 20.5 million (17.2%) Americans 40 years and older have cataract in one or both eyes, and 6.1 million (5.1%) have had their lens removed operatively. The total number of people who have cataracts is estimated to increase to 30.1 million by 2020. Cataracts can occur at any age due to a variety of causes, and can be present at birth. Although treatment for the removal of cataract is widely available, access barriers such as insurance coverage, treatment costs, patient choice, or lack of awareness prevent many people from receiving the proper treatment.¹¹

Diabetic Retinopathy

Diabetic retinopathy (DR) is a common complication of diabetes. It is characterized by progressive damage to the blood vessels of the retina causing vision impairment. It is the leading cause of blindness among working-aged adults in the United States ages 20–74. An estimated 4.1 million and 899,000 Americans are affected by retinopathy and vision-threatening retinopathy, respectively. The risks of DR are reduced through disease management that includes good control of blood sugar, blood pressure, and lipid abnormalities. Early diagnosis of DR and timely treatment reduce the risk of vision loss; however, as many as 50% of patients are not getting their eyes examined or are diagnosed too late for treatment to be effective.¹²

Glaucoma

Glaucoma is an eye disease that causes damage to the optic nerve resulting in decreased peripheral vision or eventual vision loss. Glaucoma ranks as a leading cause of blindness among African Americans in the United States. It is estimated that 2.22 million Americans 40 years and older are affected by open-angle glaucoma. The major causative factor is elevated intraocular eye pressure. Recent findings now show that glaucoma can occur in some individuals with normal eye pressure and that these individuals may also benefit from early detection and treatment.

Additional risk factors associated with glaucoma include: age, race/ethnicity, family history, eye trauma, and corneal thickness. Although glaucoma cannot be prevented, the condition can be controlled and vision loss can be reduced by early detection and timely treatment.¹³

Refractive Errors

Refractive errors are the most frequent eye problems in the United States. Blurred vision results from an inappropriate length of the eye and/or shape of the eye or cornea, and almost all errors—myopia (near-sighted), hyperopia (far-sighted), astigmatism (distorted vision at all distances), and presbyopia (a form of farsightedness that usually occurs between 40 and 45 years of age)—can be corrected by eyeglasses, contact lenses, or in some cases surgery. Recent studies conducted by the National Eye Institute showed that proper refractive correction could improve vision among 11 million Americans 12 years and older.¹⁴

Strabismus

Strabismus involves deviation of the alignment of one eye in relation to the other. Strabismus is caused by a lack of coordination between the eyes. As a result, the eyes look in different directions and do not focus simultaneously on a single point. In most cases of strabismus in children, the cause is unknown. In more than half of these cases, the problem is present at or shortly after birth (congenital strabismus). When the two eyes fail to focus on the same image, there is reduced or absent depth perception and the brain may learn to ignore the input from one eye, causing permanent vision loss in that eye (one type of amblyopia).¹⁰



Vision Health Across the Lifespan

Infancy and Childhood

In the United States, the most prevalent disabling childhood conditions are vision disorders including amblyopia, strabismus, and significant refractive errors. Early detection increases the likelihood of effective treatment; however, less than 15% of all preschool children receive an eye exam, and less than 22% of preschool children receive some type of vision screening.¹⁴ These facts are especially significant considering that in the prioritization of effective clinical services, vision screening for children scored on par with breast cancer screening for women. Other eye diseases affecting this age group include retinopathy of prematurity (ROP), congenital defects, DR, and cancers such as retinoblastoma.

Adults Younger Than Age 40

Vision impairments in people younger than age 40 are mainly caused by refractive errors, which affect 25% of children and adolescents, and accidental eye injury.¹ Approximately one million eye injuries occur each year and 90% of these injuries are preventable. More than half (52%) of all patients treated for eye injuries are between 18–45 years and almost 30% of those are 30–40 years.¹⁵ Additionally, diabetes affects this age group and is the leading cause of blindness among the working group aged 20–74.¹² Among specific high-risk groups such as African Americans, early signs of glaucoma may begin in this age group, particularly if there is a family history for glaucoma. Lifestyle choices adopted during this period may adversely affect vision and eye health in later years (e.g., smoking, sunlight exposure).

Adults Older Than Age 40

American adults aged 40 years and older are at greatest risk for eye diseases; as a result, extensive population-based study data are available for this age group. The major eye diseases among people aged 40 years and older are age-related macular degeneration, cataract, DR, and glaucoma. These diseases are often asymptomatic in the early treatable stages. The prevalence of blindness and vision impairment increases rapidly with age among all racial and ethnic groups, particularly after age 75.¹ Although aging is unavoidable, evidence is mounting to show the association between some modifiable risk factors (smoking, ultraviolet light exposure, avoidable trauma, etc.) and these leading eye diseases affecting older Americans. Additional modifiable factors that might lend themselves to improved overall ocular health include a diet rich in antioxidants and maintenance of normal levels of blood sugar, lipids, total cholesterol, body weight, and blood pressure combined with regular exercise.

The Current Status of Care

Affordability, continuity, and regular sources of care, along with physician advice, are core factors significantly associated with receiving needed vision care. Additionally, the lack of culturally sensitive and age-appropriate communication that builds patient trust, especially among populations at high risk for eye disease, remains as core obstacles to effective vision health care. Additional factors associated with receiving recommended eye and vision care include higher education, insurance coverage, and prior knowledge of eye diseases.

Healthy People 2010 vision objectives have for the first time placed vision health in the national spotlight, highlighting the need to build capacity for addressing and integrating vision health with other public health programs. Key challenges include limited local, state, and federal resources in public health personnel knowledgeable about vision health and equipment, and facilities available to support vision health initiatives. As a result, existing and effective eye disease and vision impairment prevention initiatives are not being implemented in many communities, thereby creating gaps in vision prevention and care that affect the nation's neediest populations. An enhanced public health infrastructure would facilitate the development of strengthened partnerships with private practitioners, other public health programs, and voluntary groups.

The National Eye Institute's National Eye Health Education Program (NEHEP) has supported this type of development. Over the last 15 years, NEHEP has developed culturally appropriate, health literate and evidence-based public education programs in vision health, developed broad support from the vision community, and developed professional education programs that strengthen and sustain partnerships. Additionally, the National Diabetes Education Program (NDEP) has developed integrative modeling tools and professional education targeting health care providers. The NEHEP and NDEP leadership in these areas has been and continues to be a constant reminder of the full potential that exists within our system.

Recently, the results of a seven-state assessment for vision and eye health capacity were reported in *Vision Problems in the United States: Recommendations for a State Public Health Response*.¹⁶

The report indicated that while many states have vision advisory committees, councils or coalitions, their mandates differ. There was little evidence of systematic, coordinated planning across the range of vision preservation services that include screening, examination, diagnosis, treatment, and rehabilitation.

The 2005 Behavioral Risk Factor Surveillance System (BRFSS) Vision Impairment and Access to Eye Care optional module data from four states revealed that



more than half (60%) of survey respondents said that the main reason for not seeking an eye examination was because they had no reason to go or had not thought about it.¹⁷ These findings were echoed during the Expert Panel Meeting, which collectively concluded that the most substantial barriers to vision preventive care, treatment, and rehabilitation appear to be behavioral issues followed by cost and geographic access. Behavioral and cultural issues of concern included patient belief systems, trust issues, education and language barriers, health literacy issues, immigration status, and concordance between doctor and patient (see Appendix D).

No less important, significant gaps remain in our attempts to measure the burden of eye disease and vision impairment and in our understanding the complexities of implementing effective programs that translate our vast knowledge base in vision and eye health into the community setting. Consequently, concerted efforts are needed to build an applied public health research agenda to address health disparity, delivery, and health promotion systems for vision and eye health that are effective, community-driven, and sustainable.

CDC's Current Activities

As one of the nation's foremost public health agencies, CDC can serve a critical role in promoting vision health. CDC has a history of collaborating with other agencies and organizations to address public health issues of national urgency at multiple levels and in multiple sectors. Integrating vision health with these ongoing efforts is a key, cost-effective approach to enhancing vision health. Further, capitalizing on this strength, CDC's VHI has worked in partnership with other federal programs and nongovernmental agencies to integrate vision health into existing public health initiatives. This strategy has not only been cost-effective but also key to our efforts of enhancing vision health. VHI has begun to develop a coordinated public health approach to improve the nation's vision and eye health by taking a leadership role to convene the people and organizations that can help shape this coordinated framework. This leadership role of bringing people and organizations together is consistent with CDC values and the current scope of the VHI program objectives to do the following:

- Provide technical assistance to national, state, and local organizations oriented to preserving, protecting, and enhancing vision.
- Offer scientific bases for collaboration among provider groups, financing systems, and policy makers such that health care systems can respond effectively to vision and eye health as a major public health concern.
- Aid in translating science into programs, services, and policies and in coordinating service activities with partners in the public, private, and voluntary sectors.
- Address issues related to cost of vision loss, vision disability, eye disease, and quality of life.

Highlights of current VHI activities that will inform future planning and coordination efforts are summarized below.

Assessment

VHI has been active in the pursuit of national data collection including the assembly of key vision and eye health measures. VHI has supported the eye evaluation component of the National Health and Nutrition Examination Survey (NHANES) that will provide current, nationally representative data and help assess progress for vision objectives contained within *Healthy People 2010*. Additionally, VHI developed the first optional BRFSS vision module and introduced it into state use in 2005 to gather information about access to eye care and prevalence of eye disease and eye injury. Five states implemented the module in 2005 and 11 states are currently using the module in 2006. These efforts are critical to identifying data gaps among subgroups requiring special attention and to tracking outcomes.

Applied Public Health Research

VHI utilizes applied public health research to address the economic costs of vision disorders and develop cost-effectiveness models for eye diseases among various populations. Estimating the true economic burden is essential for informing policy makers and for obtaining necessary resources to develop and implement effective interventions. Other VHI work that informs future planning efforts includes data analyses and a systematic review of interventions to promote screening for DR and a review of access and utilization of vision care in the United States.

Programs and Policy

In the area of programs and policy, VHI works collaboratively with the National Eye Institute (NEI) and other government agencies, nonprofit organizations, community-based organizations, and faith-based organizations. As an example, our work with Prevent Blindness America (PBA), the National Association of Chronic Disease Directors (NACDD) and federal, state, and local agencies has sought to improve and expand health systems and provide solutions in the delivery and quality of effective interventions. This work has led to support for surveillance systems, enhanced design of future health information technologies, enhanced screening programs, and new collaborative modalities as exemplified by the formation of a new NACDD Vision Health Interest Group.

Developing the Framework for a Comprehensive, Integrated Initiative

A vision health initiative will effectively enhance our efforts to address the public health challenge of vision loss, by decreasing duplication of efforts and enhancing collaboration, thus increasing our ability to meet measurable objectives. This effort is focused on creating a continuously evolving common platform for dialogue among the diverse stakeholders, organizations, and agencies working in vision health, as well as on increasing people's awareness of the work being done by all organizations with state, federal, and private policy decision makers. In addition, the initiative will function as a catalyst for bringing vision health into the public health arena, and help guide the public health community in its efforts to improve the nation's vision health. Strong science and evidence-based perspectives must underpin the selection of strategies and actions for the initiative. Core elements have been identified through the planning process that will form the foundation of CDC's framework for the VHI and contribute to the development of a collaborative, comprehensive approach to improving the nation's vision health.

Core Elements for an Integrated Initiative

Core elements for a coordinated national vision agenda should include the following:

- Key national partners should be engaged as a significant resource for the development and implementation of a national action plan.
- Collaboration with state and local health departments will maximize the impact of the initiative and assure sustainability.
- Monitoring, surveillance, and evaluation of vision health status are required to enhance effectiveness, accessibility, and quality of individual and population-based health services.
- The elimination of health disparities and a focus on at-risk populations should be prominent in a population-based public health initiative.
- Vision impairment reduction activities and interventions should be integrated into existing primary prevention and chronic disease programs where appropriate.
- Systems and policy changes should facilitate achieving the goals of improving vision health, including steps to address access to care and coordination of scarce resources.
- Interventions to address behavioral changes and inform, educate, and empower people about health issues.
- Collaborating with educational and professional groups to increase the competency of the health care workforce to accomplish these goals.
- An applied public health research agenda should emerge from planning efforts for new insights and innovative solutions to vision health problems.

Engage Key National Partners

CDC is well suited to engage key national partners to serve as a significant resource in the development and implementation of a national vision health action plan from a public health perspective. CDC not only can help articulate the issues but also can invite other federal agencies and national organizations to participate in forming a collaborative, consensus-driven approach. Both CDC and VHI serve as a conduit for combining core information and network brokers that can help engage systems related to eye care. Enhancing cooperation will aid significantly in increasing the impact and efficiency of the plan. Organizations and agencies that identify closely with the project's goals and are willing to take ownership for the success of the initiative are critical for successful implementation. Forming partnerships for research, services, outreach, and community-based studies will be crucial for the initiative's successful implementation. No less important is the involvement of the business community, which has a significant role in promoting vision health by supporting both this initiative and vision health and eye safety in the workplace. The contribution and involvement of professional organizations are also significant for achieving the goals of a coordinated strategy to reducing vision impairment and promoting vision health.

Collaborate with State and Local Health Departments

One way to maximize the impact of a national initiative would be to form collaborations with state and local health departments. Their involvement in the planning process will help us in developing realistic action plans and ensure that the appropriate populations are targeted. State health departments can serve as a vital bridge between federal and community programs. CDC's unique interaction with public health agencies can have high impact by emphasizing vision health with state public health officers.

Community-based organizations, including nontraditional ones, also constitute important partners because they have community access and can increase people's awareness about vision health, thereby helping to effect behavioral change in these communities. Key stakeholders should agree on a common language, share their perspectives, and define what will constitute progress.

The involvement of diverse stakeholders should be extended to all areas with ties to vision and eye health, including groups that are primarily involved in the following areas: cardiovascular disease, healthy aging, disabilities, injury, smoking and health, reproductive health, maternal and child health, nutrition and physical activity, cancer, arthritis, school health, diabetes, birth defects, genomics, and mental health. Efforts will capitalize on this larger, more diverse base of stakeholders to promote a better understanding of the interrelationship between vision and overall health and may ultimately serve to improve the translation of vision research into clinical and public health practice.

Implement Surveillance and Evaluation Systems

Public health surveillance of vision loss and eye diseases in the United States is critical for increasing our knowledge of the burden, identifying high-risk groups, and developing strategies to reduce the human and economic costs associated with these problems. Surveillance data can help formulate recommendations for health care policies and measure the effect of program interventions in the prevention and control of vision loss and eye diseases. Although prevalence data are available from many well-conducted population-based studies, we need to ensure that the existing data will be continuously updated. This will allow groups working in vision related areas to generate programs for understanding national needs, expand system access, and shape consumer behavior. Indeed, as new conditions and treatments develop, together with demographic changes in the United States, we need to be able to update our data quickly and to develop fast and efficient methods for detecting new trends when they occur.

Eliminate Health Disparities and Focus on At-Risk Populations

Healthy People 2010 articulates two overarching goals, one of which is to eliminate health disparities including differences that occur by gender, race, or ethnicity, education or income, disability, geographic location, or sexual orientation. Addressing disparities in a vision health initiative would help improve national eye health and enhance support for continued programs to improve vision health. Critical to this effort is improved access to care, strengthened health delivery systems, enhanced partnerships with existing organizations, and innovative partnership expansion, all of which builds leadership potential to effect change.

In addition, the following populations will figure prominently as the focus of a public health vision initiative:

- Persons with diabetes—need regular, dilated eye exams.
- African Americans and Hispanics—have an increased risk for glaucoma and diabetes complications as well as vision impairment due to unaddressed cataract.
- Children and infants—need to identify amblyopia and complications of type 1 and type 2 diabetes.
- Adults—at risk for age-related eye disease.
- Rural communities—often lack information and may have more limited access to care.
- Socially isolated as well as economically disadvantaged communities—often lack culturally relevant information, access to health care services, and may be more burdened by time constraints.



An important means for assuring that the vision health initiative serves all populations, would be to include representatives from diverse population groups in its development. These groups should also include nontraditional partners outside of public health that might not articulate vision goals as part of their mission statement but who have access to target populations and could be trusted messengers for promoting vision health and the prevention of eye disease and vision loss.

Integrate Vision Health Interventions Into Existing Programs When Appropriate

To reach our goal of integrating health into existing public health programs, we must target public health approaches that use an integrated strategy in their chronic disease prevention efforts. Because vision health is a public health issue, we must compel key stakeholders to interact and collaborate with other health initiatives. We must not disassociate vision health from the prevention and management of diabetes, high blood pressure, and other chronic diseases. By the same token, we must not consider vision rehabilitation separately from initiatives for the older adults, who comprise the largest population of blind and vision-impaired Americans. Vision health must be integrated into public health and become part of the overall public health care system.

Include Systems and Policy Changes

Systems and policy changes should focus on coordinating the delivery of care provided by voluntary organizations, provider organizations, and public health agencies through integrative programming at local, state, and national levels. Policies that support the prevention of eye disease and vision impairment can ultimately help shape an improved and more effective care delivery network through trained health care providers and innovative methods of care, including an energized public health work force. Systems can be redesigned to fortify vision health goals across the life stages and to integrate or “bundle” vision goals with pre-existing health protection measures. Implementing policy and systems changes effectively can ultimately lead to our goal of reduced disparities and improved vision and eye health outcomes for our nation.

Address Behavioral Changes

Strategies and activities within the initiative should address the role of individuals, public health professionals, and health care providers in promoting and maintaining vision health. For individuals, this means increasing awareness of the issues surrounding the maintenance of vision health, exercising appropriate self-care and adopting healthy behaviors for themselves and their families. For public health professionals, this means increasing awareness of the issues surrounding the maintenance of the public’s vision health status through actions aimed at positively influencing the use, acceptance, and accessibility of quality vision care. For providers,

this means increasing awareness of the issues surrounding the maintenance of vision health, its ties to overall health, and modifying practice patterns to build internal capacity for patient management in eye disease and vision impairment prevention.

Assure Professional Workforce Development

The management of vision loss and eye disease, which will ultimately improve the nation's general health, necessitates the application of scientific evidence and best practices among health care providers. Health care providers should understand and incorporate emerging science into the prevention, diagnosis, and treatment of vision-related diseases. Having informed health care providers will assure that the public will have access to needed screening, diagnosis, and treatment. There is also a need to elevate the importance of ophthalmic education in the graduate general medical curriculum. Assisting providers in this arena will involve efforts to increase adoption of best practices among practitioners, and improved coordination among primary care providers, eye care providers, and other people involved in wellness and health care.

Establish an Applied Public Health Research Agenda

Applied public health research shapes and drives the day-to-day life and breadth of public health programs and practice, and generates solutions that are relevant to various populations and to their respective needs. Activities are designed to provide program and policy evaluation on how social factors, financing systems, organizational structures and processes, health technologies, and personal behaviors affect access to health care, the quality and cost of health care, and ultimately the health and well-being of people with and at risk for vision loss and eye diseases. Fundamentally, applied public health research enhances the likelihood that best available health care is provided to every community and patient. Setting vision-related research priorities is an important yet challenging task, given that these priorities need to account for the continual, innovative advancements in eye care and the expected change in the nation's demographics, while still being cost-effective. The establishment of such a research agenda will require determining which priorities can most advance practice and policy to enhance vision health and quality of life for people of all backgrounds.



An Integrated Framework

To address the need for integration, we present a coordinated public health framework that provides a common platform for discussion among different providers, organizations, and agencies that can promote vision health. This framework relies on the knowledge that our health is shaped by many environmental subsystems, including our family, community, social network, workplace, cultural beliefs and traditions, economics, and the external environment. Thus, health promotion efforts must be comprehensive,

Future vision and eye health initiatives in programming and policy at CDC will require innovative approaches that will stretch resources, attack growing health disparities, involve communities, and provide greater measurable impact.

enlightening the systems that positively affect a person's capacity for healthy living and minimizing those systems leading to adverse effects. Multilevel interventions based on targeting individuals, social and physical environments, and policies must be implemented

to achieve change among different populations that improves the nation's vision health and helps people make healthy choices in their daily lives. By integrating CDC's work with natural partners within public health, a potential blueprint for the public health community in its efforts to improve the nation's vision health can be realized.

Developing the Report

In 2005, CDC's VHI initiated the development of a multi-year logic model (Figure 1), to identify strategies, potential actions, and measurable objectives that would help lay a framework for a coordinated national vision public health approach toward shared long term objectives. The essential foundational activities for this process were:

The Literature Review: We provided the expert panel a detailed review focused on the burden and impact of vision loss and eye diseases, quality and limitations of existing data, translation of vision research into public health practices, and existing programs and policies.

The Key Informant Interviews: We conducted a series of open-ended probing questions via telephone interviews to representatives of non-profit and professional vision organizations, as well as to individuals working in governmental agencies and CDC Divisions and Centers.

The Expert Panel Meeting: We convened an expert panel of diverse stakeholders representing provider organizations, the public health sector, the private sector, governmental agencies, educational institutions, and other partners at CDC. The group discussed strategies for a public health approach to address vision loss prevention and eye health promotion.

Based on these three essential foundational activities, a document was generated and revised by the panelists to provide a framework for the coordination of future vision health strategies and activities.

Please see Appendix A for a complete list of panelists and key informants.

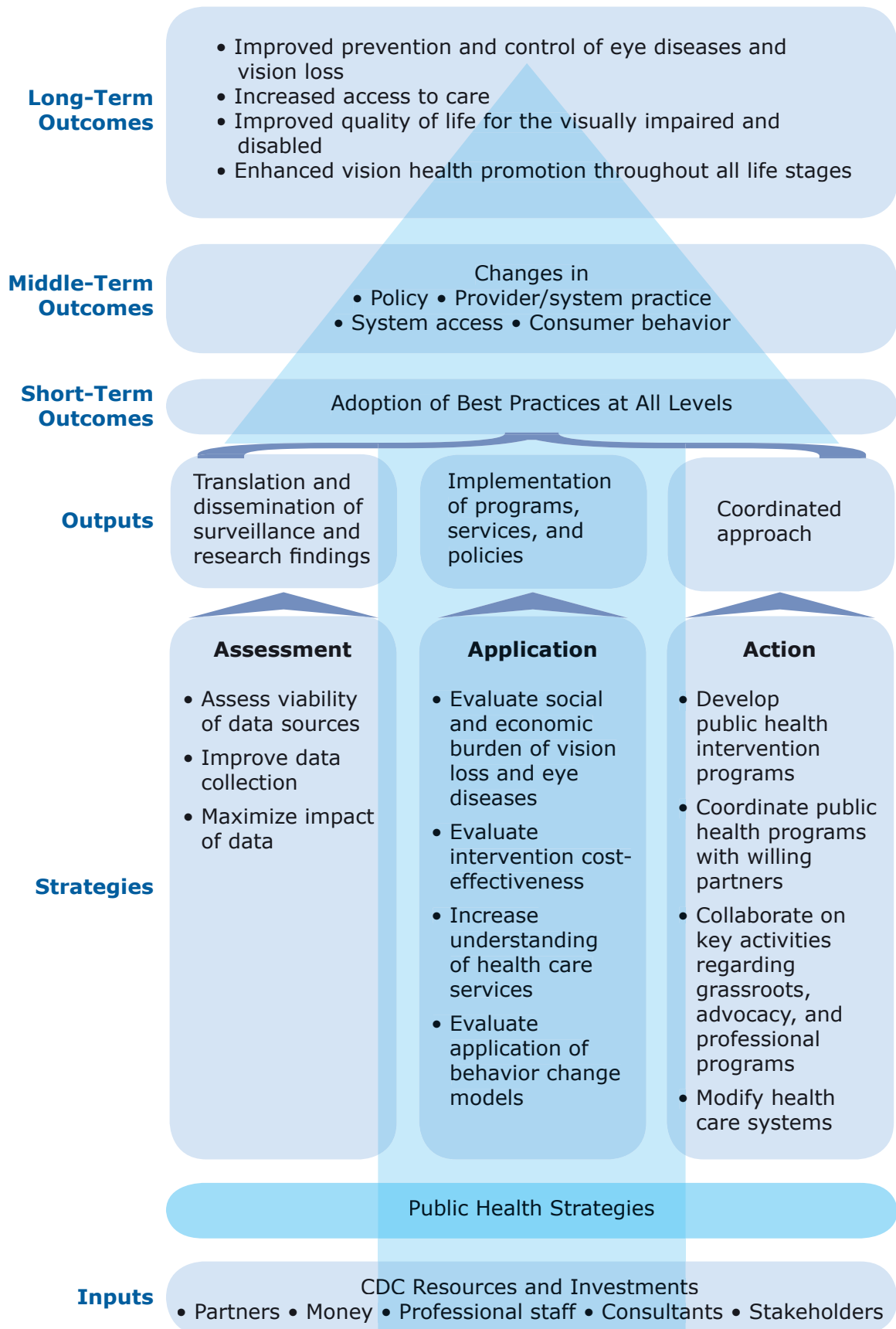


Figure 1. A logical framework for improving the nation's vision health.

Strategies to Improve Vision Health

Although vision and eye health research has identified numerous ways to help curb the rising rates of blindness and vision impairment, an inability to fully translate these scientific findings into widespread and effective community health efforts and enhanced clinical care models has hampered efforts to reduce vision impairment and improve the nation's vision health.

In general, state-specific data are needed to target states with greater need for interventions and for states to accurately identify their most vulnerable at-risk groups. Currently no data sources exist that are large enough to provide stable state-specific estimates of the prevalence of vision impairment as well as access to and barriers to eye care.

Several comprehensive and coordinated vision health strategies and action steps have been identified to help address these shortcomings. These are designed to represent a wide scope of activities, since addressing the nation's vision health will require a commensurate dedication to a multifaceted collaborative strategy. The implementation of specific action steps can reduce or eliminate many of the identified gaps in promoting vision health and in detecting and treating eye disease.

**Assuring
the Nation's
Vision Health**

**Assessment
Application: Applied Public Health Research
Action**

Assessment

Surveillance and Epidemiology

The establishment of a viable surveillance system for vision loss and eye diseases will require the assembly of data sets and the use of existing data systems that include national surveys, population-based studies, and administrative data. Furthermore, these data will need to be combined with measurement of visual acuity and cause-specific diseases. To better understand and plan for the nation's vision care needs, there is a critical need for national vision and eye health data from representative U.S. populations, including data from minority groups and high-risk populations. Data on vision impairment among children as well as on vision impairment relating to occupational and recreational injuries are also extremely scarce. These existing gaps in data serve to illustrate the importance of establishing a comprehensive and effective surveillance system.



Strategy 1

1

Assess the role of available data sources in measuring and monitoring vision loss and eye diseases.

To establish a surveillance system for vision loss and eye diseases, we need to ensure the assembly of data sets and the use of existing data systems that include national surveys, population-based studies, and administrative data.

Potential activities include the following:

- Review what data are currently being collected for prevalence and incidence data, including data collected by CDC (e.g., NHANES, National Health Interview Survey (NHIS), and BRFSS), Centers for Medicare and Medicaid Services (e.g., Medicare claims, Medicaid claims, and Medicare Current Beneficiary Survey), Veterans Administration, Indian Health Services, National Committee for Quality Assurance (e.g., the Health Plan Employer Data and Information Set), and PBA.
- Define the following issues: which comorbidities are attributable to vision impairment, their prevalence, and their cost (e.g., depression, injuries); which comorbidities does vision impairment aggravate and therefore tip the scales toward greater overall disability; and how does vision impairment fit into the cascade of comorbidities.

Strategy 2

2

Improve current vision loss and eye diseases data collection.

Inconsistency in data definition and collection across the nation highlights the need for standardized metrics across different datasets and efforts. The success of the NEI-PBA effort to develop uniform case definitions to derive consensus estimates of population prevalence rates of chronic age-related eye diseases demonstrates the value of such standardization.

Potential activities include the following:

- Convene vision stakeholders to reach consensus on definitions of measures to ensure consistent data use including the following:
 - Setting of standard case definitions and parameters such as life stage criteria.
 - Assist in developing standard quality indicators.
- Validate self-reporting methods and other measurement methods for vision loss and eye diseases.
- Coordinate research activities with other vision stakeholders.

Strategy 3

3

Explore innovative mechanisms to collect data, including new data sources.

New data sources such as school health or managed care data can contribute to better understanding the burden of vision loss and eye diseases and reducing the gap in existing data sources. Novel data collection mechanisms should also be explored to improve efficiency and achieve consistency.

Potential activities include the following:

- Enhance national surveys by including standardized vision tests and vision-related questions.
- Consider new data sources or utilize existing data sources more efficiently (e.g., state data, school data, managed care data, or Medicaid data that are jointly housed with public health data).
- Create a network of sentinel sites in states in order to collect comparable vision data and information at the provider-practice level.
- Encourage states to use the BRFSS modules on “vision loss and access to eye care” and quality of life.
- Enhance data collection on institutionalized people (those in nursing homes).
- Address surveillance gaps, including lack of data on children and minority populations.
- Support the use of standard definitions and data design elements in electronic health information technologies, including convening consensus conferences where helpful.

Strategy 4

4

Maximize the impact of collected and analyzed data.

Data has the ability to energize efforts and direct energies toward high-risk populations, gaps in services, and improved quality care. The current level of treatments and interventions is generally below that which would be called for by the growing social and economic burden of vision loss. The acknowledgement of these signals will result in more widespread dissemination of the scientific research and the ability of those working in vision health to translate the research into meaningful actions.

Potential activities include the following:

- Identify disparities in vision loss, eye diseases, and quality of eye care in different populations.
- Ensure that information receives widespread dissemination.

- Develop state and national fact sheets and surveillance reports.
- Develop a CDC vision Web site that is consumer friendly.
- Monitor changes in the burden of vision loss and its impact on disability and quality of life.
- Enhance the usability of clinical information collected by ophthalmologists and optometrists for public health purposes.

Strategy 5

5

Assess the impact of blindness and vision impairment throughout the lifespan.

The prevention of eye disease and vision impairment whenever possible necessitates a more detailed understanding of the effects of impaired vision on all aspects of life. This knowledge can also assist in targeting interventions at critical points in the lifespan.

Potential activities include the following:

- Identify common risk factors between systemic and ocular disease and cross-link these to an integration matrix that will provide targeted interventions based on an overlay of common high-risk populations, partners, and service delivery mechanisms.
- Identify critical intervention points in the lifespan.
- Help establish surveillance of the blind population for other health risk behaviors and indicators.
- Support efforts by NEI, research organizations, professional societies, and other stakeholders to create additional measures of vision health through a collaborative "grassroots" approach.
- Coordinate the development of a system to track the impact of blindness and vision impairment on quality of life.



Application: Applied Public Health Research

A need exists to develop, test, and implement evidence-based interventions that translate research into enhanced clinical and community practice. Furthermore, it is important to use this information judiciously to improve programs and practices and to disseminate and deliver efficacious interventions appropriately to all people in need.

Strategy 1

1

Evaluate the social and economic burden of vision loss and eye diseases.

Poor vision leads to lower quality of life and increases loss of productivity, disability, and morbidity. Only a few comprehensive studies have evaluated the social and economic impact of eye disease and vision loss.

Potential activities include the following:

- Estimate the cost of vision loss and eye diseases to individuals and their families as well as extended family caregivers and third-party payers (e.g., private insurance, government), the health care system, and society.
- Evaluate the impact of vision loss and eye diseases on individuals' and caregivers' quality of life.
- Assess the effect of vision loss on productivity loss and the labor force.
- Assess what happens to individuals after they lose their vision including tracking over time the overall health status and health behaviors of the visually impaired. (Assessments should include physical, social, nutritional, and emotional health assessments as well as personal and family behavior changes that may adversely affect the individual's chronic disease status.)

Strategy 2

2

Evaluate the cost-effectiveness of interventions to improve vision and eye health.

Description of the economic burden of vision loss and eye diseases provides important evidence for the necessity of additional public health intervention and policymaking. Cost-effectiveness information is also needed to establish that expenditures for prevention and treatment interventions are justified.

Potential activities include the following:

- Evaluate the cost-effectiveness and efficiency of different prevention and treatment interventions.

- Assess costs and values of comprehensive eye exams to people 65 years and younger.
- Coordinate standardization of metrics to be used in programs to measure cost-effectiveness and cost-benefit analyses of community-based interventions (e.g., screening) to reduce the burden of vision loss and eye diseases.
- Design and implement discrete data and evidence-based studies with cost estimates (burden) to influence policy.

Strategy 3

3

Increase the understanding of access and utilization of vision care services.

Affordability, continuity, and regular sources of care, as well as physician advice, remain core factors significantly associated with receiving needed vision care. It is important for health care planners to understand the utilization of services to ensure that resources are allocated to achieve the maximum benefit.

Potential activities include the following:

- Develop an expanded understanding of use of care sources, particularly in different racial and minority groups to identify potential alternatives as well as barriers to vision care.
- Support the development of a surveillance system to track utilization of health care services.
- Test innovative programs to enhance use of services.

Strategy 4

4

Evaluate the application of behavior change models to utilization of care and health care provider practice.

Although effective prevention and treatment interventions exist, many Americans do not seek care in a timely manner or continue with vital follow-up care. To help change the utilization of eye care services, learning from the success of behavior change models implemented with other prevention behaviors such as mammography could be advantageous. Additional studies are also needed to understand and influence the practice of primary care providers who do not fully implement the standards of eye health care and to strengthen the communications among primary care providers, optometrists, and ophthalmologists.

Potential activities include the following:

- Refine community-based approaches to health service research (i.e., community-based participatory research and other established approaches) by tailoring these into defined tools for maximizing eye

health and preventing vision loss within a community.

- Assist state and local public health and professional organizations to more fully implement recommended care patterns for vision care (e.g., best practices among providers).
- Develop mapping systems for vision care providers that account for areas of specialization, insurance coverage, and HMO and PPO provider status and overlay these with anticipated health care needs of communities and current level of disability in order to identify and target highest need areas. Once identified, develop interventions to increase access to and optimize distribution of prevention and treatment services.
- Focus interventions on increasing health literacy, especially among at-risk and vulnerable populations.

Action

Program and Policy Development

Public health programs aim to prevent diseases and conditions by promoting healthy lifestyles, changing the health system to encourage appropriate provider and patient behaviors, and modifying environmental determinants. Programs, policies, and systems changes should focus their priorities among all the life stages to increase awareness of vision health and vision disorders, prevent unnecessary vision loss, and increase access to care.

Strategy 1

1

Develop public health intervention programs.

Although efficacious and cost-effective treatments have been identified, the challenges imposed in transferring these findings to real world settings have not been fully implemented in provider practice or public policy to improve patient outcomes. Further efforts should focus on adapting or replicating effective interventions and successful programs (e.g., the chronic care model).

Potential activities include the following:

- Develop pilot or demonstration vision and eye public health programs.
- Develop and evaluate model health programs that assess vision and eye health at all life stages and that are jointly supported by all provider groups and organizations.
- Develop and evaluate model health programs that reach groups most burdened by eye disease, including high-risk residents in both rural and inner-city areas, and the elderly.

- Develop and evaluate model health programs that incorporate vision health messages into communications addressing other health issues, such as tobacco use and diabetes.

Strategy 2

2

Enhance the role of existing public health programs within federal agencies, state and local health agencies, and community-based organizations.

Through a coordinated and collaborative effort, the public health community can address vision health by working together with other programs in public health to fill gaps in services. Engaging a broad range of partners will increase the likelihood that vision initiatives will become integrated into primary prevention programs or incorporated into chronic disease programs such as diabetes or cardiovascular health.

Potential activities include the following:

- Develop an integration panel within the state health department and CDC consisting of representatives of all divisions with ties to vision health.
- Strengthen efforts of state diabetes programs to promote vision health.
- Partner with primary care organizations, state public health programs, and community-based partners to incorporate vision into the standard health programs.
- Partner with the Administration for Children and Families on screening programs provided through its network of community agencies and Head Start.
- Engage nontraditional partners and community-based partners in demonstration projects at the community level.
- Provide guidance, support, and incentives for local health departments to become more involved in delivery of vision services.
- Encourage federal agencies with vision initiatives to collaborate and integrate when appropriate.

Strategy 3

3

Encourage modifications to existing health care systems to better meet the vision health needs of all Americans.

Changes can be made to current health care systems to better address the nation's vision health needs. Two key areas of focus should be (1) integrating vision health into the overall health of the population, and (2) examining health care delivery frameworks that focus on disease as opposed to prevention. The more efficient use of resources and improved

communication mechanisms among practitioners are also noteworthy issues to address.

Potential activities include the following:

- Address structures and systems that influence consumer behavior and provide increased levels of patient empowerment in disease prevention.
- Develop quantifiable measures to improve the referral and communication flow among primary health care providers, other members of the health care team, and eye care providers.
- Develop methods of enhancing patient access to eye care services in their communities.
- Support efforts to include scientifically based vision care benefits in health care plans.
- Collaborate with partners on policies that maximize the implementation, integration, and use of health information technology to improve and monitor vision health.
- Build alliances with rehabilitation agencies for expanded and more efficient service delivery.

Strategy 4

4

Recommend health care policies to improve vision health.

Regularly articulating vision care needs to policy makers should remain a cornerstone of effecting change at the societal level. Policy and ultimately systems changes can have a positive effect on reducing the overall burden of all eye diseases.

Potential activities include the following:

- Evaluate policies regarding vision screening for children and adults (e.g., link vision screening to immunizations).
- Examine policies that promote the placement of optometrists and ophthalmologists, in the provision of eye care services, within underserved populations (e.g., National Health Service Corps).
- Keep policy makers informed about the cost and burden of eye diseases, and the cost of vision loss related to lost productivity on individuals and society.
- Participate in any expansion of indicators for vision health (e.g., *Healthy People 2020* vision objectives).
- Work with collaborators to develop and implement reimbursement policies that will promote vision health (e.g., bundled claims, monetary incentives).

The strategies and potential actions recommended here should be viewed as comprehensive in their scope. Their implementation can reduce or eliminate many of the identified gaps in promoting vision health and detecting and treating eye disease.



Sector Opportunities and Activities

Influencing vision care at the individual, community, and societal levels requires active and continual participation from all interested parties and organizations, people with eye conditions, and the general public. It is critical for all sectors to work toward educating both policy and decision makers about the necessity of enhancing resources for vision health and the prevention of vision impairment.

To enhance the efficient use of available resources, key stakeholders will have to communicate regularly with each other, share their expertise and lessons learned, and collaborate where appropriate. Furthermore, by understanding what the other stakeholders are doing, each organization will be better able to determine how its own activities can best serve not only its goals but also the goals of the vision preservation community as a whole. As a result, the various stakeholders may organize meetings or conferences, collaborate with others in joint efforts, lead in coordinating targeted programs or interventions, or actually conduct the activities of interest. As long as communication and shared lessons are emphasized, the nation's vision health will continue to be the goal of all stakeholders:

We must think in terms of public health to assess the overall public health burden of vision impairment in terms of disability and lost productivity. We must expand our individual roles, work with each other and people we do not normally work with to make these assessments, and tackle a wide range of critical issues.

- Federal and national agencies
- State and local public health agencies
- Health care delivery systems
- Health care providers and professional societies
- Community and advocacy organizations
- Educational institutions
- Business community
- Consumers
- Patients
- Family members and friends



Next Steps

Eye health promotion and vision loss prevention must assume a more prominent position within all initiatives seeking to improve the health of Americans. Blindness and visual impairment continue as major public health problems causing substantial human and economic toll on individuals and society. Considered one of the top causes of disability, blindness and vision impairment in children and older adults is often underrepresented or not represented at all as an indicator for optimal health and quality of life. There is an urgent need to address the full spectrum of challenges that persist in encumbering efforts to increase the use of and availability of evidence-based, cost-effective interventions to prevent vision loss.

In response, future vision and eye health initiatives must incorporate innovative, comprehensive and multidisciplinary approaches that ensure prominence of eye health within any healthy lifestyle equation. To meet the challenges outlined in this report, health disparities must be addressed, communities must be involved, measurable impacts must be evaluated, and finite resources must be used wisely.

Improving the Nation's Vision Health: A Coordinated Public Health Approach provides comprehensive and coordinated vision health strategies and activities that have been organized around assessment, application, and action principles. These serve as a framework for forward momentum at this critical juncture in time. Furthermore, they follow a logic model that is intended to produce long-term outcomes of improved prevention and control of eye diseases and vision loss, increased access to vision care, improved quality of life for the visually impaired and disabled, and vision health promotion throughout all life stages.

Implementing this ambitious framework will require dedication and active participation from all sectors and stakeholders. The collective efforts and resources of public health professionals, local, state, and federal governments, health care providers, non profit organizations, community-based organizations, academic institutions, businesses, and consumers are paramount to influencing vision care at the individual, community, and societal levels. This proposed framework provides a platform for discussion across different sectors and is intended to foster productive dialogue about specific priorities and activities that should be included in a national vision health action plan.

It is now time to enhance the diversity of stakeholders to include all potential partners, both traditional and nontraditional, who can positively impact vision health and improve coordination between public health programs. Building a larger, more diverse base of stakeholders is essential in promoting a better understanding of the interrelationship between vision and overall health, reducing vision and eye health disparities among population groups and unlocking the full potential that exists within health integration.

A brighter future for vision health in America can be realized through an innovative, comprehensive, multidisciplinary approach that includes:

- Continued engagement of key national, state and local community partners.
- Supporting vision loss and eye disease data collection and exploring innovative mechanisms to collect vision data.
- Assessing the total impact of blindness and vision impairment throughout the life span.
- The application of behavior change models to improve utilization of vision care services and modify provider practice.
- Integrating vision health interventions into existing public health programs.
- Systems and policy changes that support access to care and coordination of resources for vision health.
- Focusing on health disparities and at-risk populations.

CDC stands ready to join together with others committed to vision health, to create a more effective multilevel network for vision loss prevention. CDC will apply its strengths and available resources toward the accomplishments of these vision health strategies and activities through convening, assisting through collaboration, and leading. CDC's next steps will be formulated with the acknowledgment of this report, current surveillance activities, and work with outside organizations, other divisions, and centers within CDC and NEI and other governmental agencies.

Ultimately, a clear vision is needed to promote and sustain the nation's vision health efforts. Together, we can assure the attainment of that vision and thereby greatly influence the vision health and quality of life for all people.

Appendix



Appendix A

Expert Contributors

This collaborative effort consisted of three phases: an independent review of the literature, convening an expert panel, and interviews with key informants both within and outside the government. These three exercises provided comprehensive qualitative and quantitative input for the document.

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Appendix B

Healthy People 2010

Summary of Objectives

Vision and Hearing

Goal: Improve the visual and hearing health of the Nation through prevention, early detection, treatment, and rehabilitation.

Vision

28-1. (Developmental) Increase the proportion of persons who have a dilated eye examination at appropriate intervals.

Potential data source: National Health Interview Survey (NHIS), CDC, NCHS.

Many eye diseases and disorders have no symptoms or early warning signs. Dilated eye examinations should be performed at appropriate intervals to detect changes in the retina or optic nerve or both. Eye care professionals can view the back of the eye for subtle changes and, if necessary, initiate treatment at the right time.

28-2. (Developmental) Increase the proportion of preschool children aged 5 years and under who receive vision screening.

Potential data source: National Health Interview Survey (NHIS), CDC, NCHS.

Many vision problems begin well before children reach school. Every effort must be made to ensure that, before they reach age 5 years, children receive a screening examination from their health care provider. Early recognition of disease results in more effective treatment that can be sight-saving or even life-saving.

28-3. (Developmental) Reduce uncorrected visual impairment due to refractive errors.

Potential data source: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

28-4. Reduce blindness and visual impairment in children and adolescents aged 17 years and under.

Target: 20 per 1,000 children and adolescents aged 17 years and under.

Baseline: 25 per 1,000 children and adolescents aged 17 years and under were blind or visually impaired in 1997.

Target setting method: Better than the best.

Data source: National Health Interview Survey (NHIS), CDC, NCHS.

Children and Adolescents Aged 17 Years and Under, 1997	Blindness and Visual Impairment Rate per 1,000
TOTAL	25
Race and ethnicity	
American Indian or Alaska Native	DSU
Asian or Pacific Islander	DSU
Asian	DSU
Native Hawaiian or other Pacific Islander	DSU
Black or African American	27
White	24
Hispanic or Latino	23
Not Hispanic or Latino	25
Black or African American	27
White	25
Gender	
Female	24
Male	26
Family income level	
Poor	39
Near Poor	30
Middle/high income	20
Disability status	
Persons with disabilities	92
Persons without disabilities	19

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

28-5. (Developmental) Reduce visual impairment due to diabetic retinopathy.

Potential data source: National Health Interview Survey (NHIS), CDC, NCHS.

28-6. (Developmental) Reduce visual impairment due to glaucoma.

Potential data source: National Health Interview Survey (NHIS), CDC, NCHS.

28-7. (Developmental) Reduce visual impairment due to cataract.

Potential data source: National Health Interview Survey (NHIS), CDC, NCHS.

28-8. (Developmental) Reduce occupational eye injury.

Potential data sources: Annual Survey of Occupational Injuries and Illnesses (ASOII), U.S. Department of Labor, Bureau of Labor Statistics; National Electronic Injury Surveillance System (NEISS), CPSC, and NIOSH.

28-9. (Developmental) Increase the use of appropriate personal protective eyewear in recreational activities and hazardous situations around the home.

Potential data source: National Health Interview Survey (NHIS), CDC, NCHS.

Almost all eye injuries can be prevented. Many sports and recreation activities, including baseball, basketball, tennis, racquetball, and hockey, carry some risk of eye injury. Some injuries may go unnoticed because only one eye is involved. Activities at home, such as cooking and yard work, also may present eye injury risk.

28-10. (Developmental) Increase vision rehabilitation.

28-10a. Increase the use of rehabilitation services by persons with visual impairments.

28-10b. Increase the use of visual and adaptive devices by persons with visual impairments.

Potential data source: National Health Interview Survey (NHIS), CDC, NCHS.

Related Objectives from Other Focus Areas

Diabetes

5-13. Increase the proportion of adults with diabetes who have an annual dilated eye examination.

Disability and Secondary Conditions

6-11. Reduce the proportion of people with disabilities who report not having the assistive devices and technology needed.

Injury and Violence Prevention

15-31 Increase the proportion of public and private schools that require the use of appropriate head, face, eye and mouth protection for students participating in school sponsored physical activities.

Available from URL:

<http://www.healthypeople.gov/document/HTML/Volume2/28Vision.htm>



2006

**Behavioral Risk Factor Surveillance System
Questionnaire**

Module 5: Visual Impairment and Access to Eye Care

CATI note: If respondent is less than 40 years of age, go to next module.

I would like to ask you questions about how much difficulty, if any, you have doing certain activities. If you usually wear glasses or contact lenses, please rate your ability to do them while wearing glasses or contact lenses.



This module is for everyone ages 40 and above.

- 1.** How much difficulty, if any, do you have in recognizing a friend across the street? Would you say— (246)

Please read:

- 1 No difficulty
- 2 A little difficulty
- 3 Moderate difficulty
- 4 Extreme difficulty
- 5 Unable to do because of eyesight
- 6 Unable to do for other reasons

Do not read:

- 7 Don't know / Not sure
- 8 Not applicable (Blind) **[Go to next module]**
- 9 Refused

- 2.** How much difficulty, if any, do you have reading print in newspaper, magazine, recipe, menu, or numbers on the telephone? Would you say— (247)

Please read:

- 1 No difficulty
- 2 A little difficulty
- 3 Moderate difficulty
- 4 Extreme difficulty
- 5 Unable to do because of eyesight
- 6 Unable to do for other reasons

Do not read:

- 7 Don't know / Not sure
- 8 Not applicable (Blind) **[Go to next module]**
- 9 Refused

- 3.** When was the last time you had your eyes examined by any doctor or eye care provider? (248)

Read only if necessary:

- 1 Within the past month (anytime less than 1 month ago) **[Go to Q6]**
- 2 Within the past year (1 month but less than 12 months ago) **[Go to Q6]**
- 3 Within the past 2 years (1 year but less than 2 years ago)
- 4 2 or more years ago
- 5 Never

Do not read:

- 7 Don't know / Not sure
- 8 Not applicable (Blind) **[Go to next module]**
- 9 Refused



4. What is the main reason you have not visited an eye care professional in the past 12 months? (249-250)

Read only if necessary:

- 0 1 Cost/insurance
- 0 2 Do not have/know an eye doctor
- 0 3 Cannot get to the office/clinic (too far away, no transportation)
- 0 4 Could not get an appointment
- 0 5 No reason to go (no problem)
- 0 6 Have not thought of it
- 0 7 Other

Do not read:

- 7 7 Don't know / Not sure
- 0 8 Not Applicable (Blind) [Go to next module]
- 9 9 Refused

If the person is diabetic; "yes" to core Q5.1; skip Q6.

5. When was the last time you had an eye exam in which the pupils were dilated? This would have made you temporarily sensitive to bright light. (251)

Read only if necessary:

- 1 Within the past month (anytime less than 1 month ago)
- 2 Within the past year (1 month but less than 12 months ago)
- 3 Within the past 2 years (1 year but less than 2 years ago)
- 4 2 or more years ago
- 5 Never

Do not read:

- 7 Don't know / Not sure
- 8 Not Applicable (Blind) [Go to next module]
- 9 Refused

6. Do you have any kind of health insurance coverage for eye care? (252)

- 1 Yes
- 2 No
- 7 Don't know / Not sure
- 8 Not Applicable (Blind) [Go to next module]
- 9 Refused



7. Have you been told by an eye doctor or other health care professional that you NOW have cataracts? (253)

- 1 Yes
- 2 Yes, and had them removed
- 3 No
- 7 Don't know / Not sure
- 8 Not Applicable (Blind) **[Go to next module]**
- 9 Refused

8. Have you EVER been told by an eye doctor or other health care professional that you had glaucoma? (254)

- 1 Yes
- 2 No
- 7 Don't know / Not sure
- 8 Not Applicable (Blind) **[Go to next module]**
- 9 Refused

Please read:

Age Macular Degeneration (AMD) is a disease that blurs the sharp, central vision you need for "straight-ahead" activities such as reading, sewing, and driving. AMD affects the macula, the part of the eye that allows you to see fine detail.

9. Have you EVER been told by an eye doctor or other health care professional that you had age macular degeneration? (255)

- 1 Yes
- 2 No
- 7 Don't know / Not sure
- 8 Not Applicable (Blind) **[Go to next module]**
- 9 Refused

10. Have you EVER had an eye injury that occurred at your workplace while you were doing your work? (256)

- 1 Yes
- 2 No
- 7 Don't know / Not sure
- 9 Refused

Appendix D

Barriers to Care for Major Eye Diseases*

Disease	Policy	Methods	Cost/ Financial	Geographic Access/ Resources	Behavioral/ Cultural** (See List)
Diabetic Retinopathy		0	2	1	3
Glaucoma		1-2	2	1	3
Cataracts		0	2		2
Macular degeneration		1	2	1	3
Amblyopia	3	0	2	1	3
Low vision		0	2	1	3
Refractive error		0	2	1	3

* Rated on a scale of 0 to 3, with 0 indicating no barriers and 3 indicating the most substantial barriers to preventive care, treatment, and rehabilitation.

** The panel described the following as cultural/behavioral barriers:

- Belief systems
- Trust issues
- Educational level
- Language
- Concordance between physician and patient
- Health literacy
- Immigration status and policy

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