Building a Comprehensive Child Vision Care System

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Acknowledgments

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Abt Associates, Inc.  Building a Comprehensive Child Vision Care System
Executive Summary

Preventing vision problems and maintaining healthy eyes for all children from birth through adulthood must become a public health priority in the United States. Even though there should be, at a minimum, universal vision screening programs with immediate follow-up examinations for all preschool children in every community throughout the nation, only 36% of all preschool children received a vision screening in 2002 (Centers for Disease Control and Prevention’s Morbidity and Mortality Weekly Report [CDC MMWR], 2005). Undetected and untreated eye disorders, such as amblyopia, strabismus and uncorrected refractive errors, are major child health problems in the U.S. that are associated with poor reading and other poor school outcomes (Vaughn et al., 2006).

Other significant vision conditions among children include retinopathy of prematurity, congenital defects, diabetic retinopathy and cancers such as retinoblastoma. Child visual impairments are important causes of developmental disabilities in childhood (CDC MMWR, 1996) which lead to long term economic and other social concerns (CDC MMWR, 2004). Although there is an urgent need to correct refractive error and diagnose and treat eye disease in preschool children to prevent the development of amblyopia, strabismus and permanent vision loss, this major public health intervention is not a current public health or health care priority.

Child Vision Loss and Problems

The Vision Council of America (2004) estimates that a quarter of school-age children suffer from vision problems that could have been addressed or eliminated if appropriate screening and follow-up had been in place upon entry to school. The need for action to address child vision problems is reflected in the prevalence estimates for child visual impairments and blindness from the 2002 and 2007 National Health Interview Surveys. These prevalence estimates are used as the baseline and follow-up review of progress for the 2010 National Health Objective 28-4 – Reduce blindness and visual impairment in children and adolescents aged 17 years and under from 24 per 1,000 in 1997 to 18 per 1,000 in 2010 (CDC MMWR, 2005; Healthy People 2010 Midcourse Review). The 2002 prevalence rate for children aged 17 years and under was 25 per 1000. Unfortunately, the 2007 prevalence rate remained at 25 per 1000, showing that no progress has been made toward meeting the 2010 objective (Healthy People 2010 Progress Review, 2008). This lack of progress over the past decade indicates there is a need for action to significantly improve child vision care services.

Child Vision Screening and Examinations

Early detection and treatment is essential in treating eye disorders in children. The American Public Health Association (2002) issued a policy statement in 2001 that supported “a regular comprehensive eye examination schedule as opposed to just screening…so that all children have exams performed at approximately age 6 months, 2 years, and 4 years.” The American Optometric Association states that “all children should receive a comprehensive eye and vision examination assessing and treating any deficiencies in ocular health, visual acuity, refractive status, oculomotility and binocular vision prior to entering school.” In addition, the American Optometric Association adopted a policy about informing parents that a vision screening does not replace a comprehensive vision examination of vision and ocular health (2001). The evidence from past studies shows that comprehensive eye exams for children by an optometrist or ophthalmologist are highly effective in detecting vision conditions.
Research suggests that children are being screened at low rates and those screened often do not receive the necessary follow-up assessments and treatment services (Vision Council of America, 2004). Furthermore, there is currently a wide variation in the requirements for child vision screening and examinations before entry to school and during the school years. At the end of 2007, sixteen states did not require any vision assessment for children prior to entering school or during the subsequent school years. Although the majority of states require some type of vision screening for children in public school settings, they often fail to identify or require methodologies that meet or exceed the sensitivities and specificities of the National Eye Institute’s Vision in Preschoolers Study or programmatic elements that assure necessary follow-up examination. Only five states (Arkansas, Massachusetts, North Carolina, Oklahoma and Rhode Island) require a follow-up eye examination to the screening.

Even though universal comprehensive eye exams for children before entry to school would result in many more children being diagnosed and successfully treated for various eye diseases, only three states (Kentucky, Missouri and Illinois) have legislatively mandated eye examinations for preschool children. Massachusetts and Ohio have mandated eye examinations for children newly referred to special education. Children from racial and ethnic minority groups and children who are uninsured or from lower income households receive less vision care services. Children without insurance and living in poverty have the greatest unmet need for services.

**Access and Utilization of Child Vision Services**

Despite the current efforts to provide vision care for children, there is considerable evidence of disparities in both the access to and utilization of vision care from national and state population-based surveys as well as from studies in clinical and community settings. Analyses of the 2005 National Health Interview Survey found that nearly 54% of all children without health insurance did not have a “well child” visit, which typically includes vision screening (Campaign for Children’s Health, 2006). Children who were uninsured for longer than one year had significantly more instances of delayed care than children uninsured for less than a year. Finally, 23% of children without health insurance for more than a year had unmet vision care needs as compared with 5% of children who were insured for a year or more (Campaign for Children’s Health Care, 2006).

Financing and coverage of eye care services are an essential part of building a comprehensive child vision care system. Currently there is great variation by state in what is covered in school health programs, in community health centers, in public insurance programs (Medicaid and SCHIP) and in private insurance plans. Access to early and timely vision care services by a professional eye care provider is essential in addressing this public health emergency in child vision care.
Recommendations

Given the data indicating there is a public health emergency in addressing children’s vision health, the following is a set of comprehensive recommendations that are necessary for building and sustaining comprehensive child vision care systems in every community and state. Public health agencies at the federal, state and local level should facilitate the implementation of these systems in collaboration with partners from all other sectors (academia, business, media, health care providers, community organizations, etc.) (Institute of Medicine, 2003).

- Ensure that children get the vision care that they need by including child vision health in key legislation at the federal and state levels.

- Assure adequate comprehensive coverage of child vision care services by all public and private insurers and payers.

- Assure a “point of accountability” in the U.S. public health system for child health vision care through the establishment of a child vision health categorical program linked to the Title V MCH Block Grant within the Maternal and Child Health Bureau in the Health Resources Service Administration (HRSA), Health and Human Services (HHS).

- Develop a national set of children’s vision guidelines for screening and examinations and assure these guidelines are adopted by all states in school health codes and mandates.

- Implement and fund a national clearinghouse for child vision health within the Department of Health and Human Services.

- Enhance and fully fund national campaigns to encourage early identification of child vision problems and to prevent injuries from sports and toys.

- Design and implement an ongoing data system that monitors prevalence of child vision problems together with access and utilization of child vision care services at the local state and national levels.

- Develop and facilitate a broad coalition of child-oriented stakeholder groups to work towards the establishment and maintenance of a comprehensive child vision system across the country.

In conclusion, studies from the past two decades reveal that there exists a public health emergency with respect to child vision health in the United States. Millions of children are not receiving essential eye care services which can prevent eye disease, developmental delays, school achievement and other social problems. Given the asymptomatic nature of most eye and vision disorders and that most childhood vision problems can be prevented thorough early detection, follow-up and treatment, it is essential that building a comprehensive child vision care system as part of the public health system at the local, state and federal levels become a top priority. Public health agencies at the federal, state and local level should facilitate the implementation of these child vision health systems in collaboration with partners from all other sectors (academia, business, media, health care providers, community organizations, etc.).
A comprehensive child vision health system must be available in every community in every state to assure that all children are assessed for potential eye problems before entering school and throughout the school years. Essential components of a comprehensive child vision system include universal access to comprehensive child vision care services, a “point of accountability” program within each state public health system, a national clearinghouse and education campaign, and ongoing data systems for monitoring prevalence and utilization of child vision health at the local, state and national levels. In summary, early identification of vision health problems by a vision care professional (optometrist or pediatric ophthalmologist) can result in better school achievement and health outcomes which lead to more productive and healthier lives across the lifespan.

Correctable visual impairment is the most common treatable chronic condition of childhood. (Kemper, 2004)
Introduction

Preventing vision problems and maintaining healthy eyes for all children from birth through adulthood must become a public health priority in the United States. Even though there should be universal vision screening with immediate follow-up examinations for all preschool children in every community throughout the nation, only 36% of all preschool children received a vision screening in 2002 (Centers for Disease Control and Prevention’s Morbidity and Mortality Weekly Report [CDC MMWR], 2005).

Undetected and untreated eye disorders, such as amblyopia, strabismus and uncorrected refractive errors, are major child health problems in the U.S. that are associated with poor reading and other poor school outcomes (Vaughn et al., 2006).

Other significant vision conditions among children include retinopathy of prematurity, congenital defects, diabetic retinopathy and cancers such as retinoblastoma. Child visual impairments are important causes of developmental disabilities in childhood (CDC MMWR, 1996) which lead to long term economic and other social concerns (CDC MMWR, 2004). The Vision Council of America (2004) estimates that a quarter of school-age children suffer from preventable vision problems that could have been addressed if appropriate screening and follow-up examination had been in place upon entry to school. Although there is an urgent need to correct refractive error in preschool children to prevent the development of amblyopia, strabismus and permanent vision loss (Giordano et al., 2009), this major public health intervention is not a current public health or health care priority.

This recognition of the burden of child vision loss led to the inclusion of three national health objectives for 2010 that are focused on children’s vision (CDC MMWR, 2005; Healthy People 2010 Midcourse Review, 2009). These three objectives (out of a total ten on vision health) are as follows:

- **Objective 28-2** – Increase the proportion of preschool children aged 5 years and under who receive vision screening from 36% in 2002 to 52% in 2010.

- **Objective 28-4** – Reduce blindness and visual impairment in children and adolescents aged 17 years and under from 24 per 1,000 in 1997 to 18 per 1,000 in 2010.

- **Objective 28-9a** – Increase the use of personal protective eyewear in recreational activities and hazardous situations around the home among children 6-17 years from 15% in 2002 to 20% in 2010.

Tracking progress towards reaching these child vision health objectives is important for the nation and provides a report card on our progress in meeting the vision needs of children and youth. Unfortunately, no progress has been made in reducing blindness and visual impairment in children and adolescents aged 17 years and under since 1997 when the prevalence rate was 24 per 1,000. Data indicates that the nation has failed to improve child vision health since the prevalence rate of blindness and visual impairment for children aged 17 years and under was 25 per 1000 in both 2002 and 2007, (CDC MMWR, 2005; Healthy People 2010 Midcourse Review/ Healthy People 2010 Progress Review, 2008).

The mission of the National Commission on Vision and Health (NCVH) formed in 2008 is “to improve the nation's visual health by collaborating with experts in science and health policy to ensure informed analysis and policy recommendations in order to prevent blindness improve vision function and eliminate
vision health disparities.” One of the goals of the Commission is to assure that vision care is integrated fully into public health programs at the national, state and local levels.

This White Paper has been prepared for the Commission on issues and challenges related to achieving optimal vision care for children and youth in all states across the country. The paper includes an overview of the following areas:

- burden of child vision loss and eye disease
- recommended evidence-based guidelines for screening and examinations
- requirements for screening and examinations in school settings and public insurance programs
- access and utilization of vision screenings and examinations

This review provides an overview of the prevalence of childhood vision problems, unmet treatment needs and barriers to child vision care that result in health disparities in outcomes and services received. The paper concludes with a set of recommendations for adoption in order to meet its goal of assuring that child health vision problems are detected early and treated in order that all children are healthy and productive in school and later as adults.

### Social and Economic Burden of Child Vision Loss and Eye Disease

#### Prevalence of Childhood Vision Impairments

Estimates of the prevalence of child visual impairments and blindness from the 2002 National Health Interview Survey are used as the baseline for one of the Healthy People 2010 Objectives – Reduce blindness and visual impairment in children and adolescents aged 17 years and under from 24 per 1,000 in 1997 to 18 per 1,000 in 2010 (CDC MMWR, 2005; Healthy People 2010 Midcourse Review). The 2002 prevalence rate for children aged 17 years and under in 2002 was 25 per 1000. The 2007 prevalence rate of 25 per 1000 was the same as that in 2002 (Healthy People 2010 Progress Review, 2008).

Prevalence rates in 2002 varied by age, race/ethnicity and family income. Older children had higher prevalence rates (33 per 1000 for children 6 to 17 years as compared with 10 per 1000 for children under six years of age). Rates for Hispanic children (36 per 1000) were higher than those for Black non-Hispanic (26 per 1000) and White non-Hispanic (23 per 1000). Finally, children from families with incomes below the federal poverty level (FPL) had a higher prevalence rate (35 per 1000) than those from families with higher incomes (32 per 1000 for incomes of 100% to 199% of FPL and 20 per 1000 for incomes greater than or equal to 200% of FPL (CDC MMWR, 2005). These patterns in prevalence of childhood vision impairments and blindness were also found in population estimates from national surveys conducted in 1971-72 (Ganley & Roberts, 1983) and in 1996 (National Center for Health Statistics, 1996).

Amblyopia is the most common cause of monocular visual impairment in children and young adults and is estimated to be the leading cause of vision loss in children, affecting 500,000 preschoolers (Marshall et al., 2007; Rutstein, 2005). A 1998 literature review identified the most prevalent vision disorders in preschool children as ocular disease (less than 1%), amblyopia (2-3%), strabismus (3-4%), color vision...
defects (8-10% of males), and refractive errors (15-30%) (Ciner et al., 1998). Over 29% of preschool children from families with lower incomes in Head Start programs had one or more vision disorders including: amblyopia, 6%; strabismus, 4%; significant refractive error, 21%, and reduced visual acuity, 10%. (Vision in Preschoolers Study Group, 2004).

It is important to note that most of the prevalence estimates for childhood vision impairments are available for the national level only. There are currently limited state specific data sources on children’s vision health.

**Impact of Vision Impairment in Childhood**

Many studies have documented that early identification of child vision problems decreases the risk of amblyopia, minimizes developmental delay and maximizes school performance (Gerali et al., 1990; Marshall et al., 2007; Simons, 1996). Untreated eye disorders in children, such as amblyopia and strabismus, can result in delayed reading and poor overall school performance. For example, a recent study showed that preschool children with uncorrected refractive error had significant reduction in visual-motor functioning (Roch-Levecq et al., 2008). Since visual clues are key to how children learn and function, impaired vision can affect all aspects of a child’s development (e.g., emotional, neurologic, cognitive and physical) by potentially limiting the range and types of information and experiences the child processes. Consequently, children with vision impairments might have an increased risk for other impairments and disabilities as well. For example, results of the Metropolitan Atlanta Developmental Disabilities Surveillance Study found that three quarters of visually impaired children (ages 3-10 years) had one or more other developmental disabilities, such as cerebral palsy, epilepsy, hearing loss and/or mental retardation (CDC MMWR, 1996).

Poor vision and eye health in children severely affects their ability to learn. One study found that visual factors are better predictors of academic success than race or socioeconomic status (Vaughn et al., 2006). Several studies highlight the importance of vision and the elimination of vision problems as essential to children’s performance in school. The New Jersey Commission on Business Efficiency of the Public Schools (2006) found that children with reading difficulty fall into two categories of visual problems -- undiagnosed or untreated. The Commission Report concludes that “undiagnosed and untreated vision related learning problems are significant contributors to early reading difficulties and ultimately to special education classification” (New Jersey Commission, 2006). The Commission Report documents the savings in special education and other costs that would accrue if early intervention for children with undiagnosed or untreated vision problems and early reading assistance and follow-up were implemented.

A major cause of vision impairments is eye injuries from sports or toys. An estimated 18,060 sports and recreation-related eye injuries were reported in hospitals for children under 14 years of age in 2000 (American Academy of Pediatrics, 2004). The sports most associated with reported eye injuries include baseball, basketball, swimming, bicycling and football. The most common toys causing eye injuries reported for children 14 years of age and under were toy weapons, bicycles and balloons (National Injury Information Clearinghouse, 2004).

Overall, the United States Preventive Services Task Force (1996) estimated the prevalence of undetected vision problems in preschool children to be 5% to 10%. Most childhood vision problems could have been prevented thorough early detection, follow-up and timely treatment. Effective interventions must include access to treatment as studies show that many children who fail initial vision screening did not receive the
appropriate follow-up care (Center for Health and Health Care in Schools, 2004; Marshall et al., 2007; Vision Council of America, 2004). This essential relationship between early case finding and prompt treatment is often broken, resulting in increased cost to families and communities. In effect, increased cost-effectiveness of an intervention can be achieved through greater specificity of the target population, eye disease, and programmatic elements that assure timely access to needed treatment.

Impact of Vision Loss and Blindness over the Lifespan

Studies have documented the social and economic burden of vision loss and blindness over the lifespan on individuals, caregivers, the workforce and the national economy (CDC MMWR, 2004; National Eye Institute (NEI), 2008). Vision impairments and problems, often begun during childhood, result in negative impacts on the economy and workforce, health care resources, quality of life, and community health. According to the CDC, if visual impairment conditions are left untreated, they “can have substantial long-term implications for the quality of life of the child and family and can place a burden on public health resources (CDC MMWR, 2005).”

Although understanding costs of vision care is important for policymakers and the public, few studies provide credible estimates that have been a catalyst for action. The NEI estimated the economic costs of visual disorders and disabilities at $68 billion using both medical expenditures and indirect costs of lost productivity and institutionalization (NEI, 2008). The Healthy People 2010 Progress Review (2008) stated that the lifetime costs associated with visual impairment are estimated as $601,000 per person in 2003 dollars.

A comprehensive analysis conducted by Prevent Blindness America (PBA) found that total economic impact of adult vision problems, including cataract, diabetic retinopathy, glaucoma, refractive error, visual impairment and blindness, totaled over $51 billion (PBA, 2007). The estimate was based on $16.2 billion in direct medical costs, $11.2 billion in other direct costs, $8 billion in productivity losses, $5.5 billion in total excess monetary impact, and $10.5 billion in health-related quality of life costs. While direct medical expenditures of $16 billion may be considered high, the overall economic estimate is nearly tripled when including the other costs related to vision problems, such as loss of productivity and personal utility (e.g., physical, mental, and social impairment) (Ko et al., 2005).

The impact of vision problems on quality of life is difficult to quantify. This is because both the methods used for measuring quality of life and translating the cost of care provided by family or unpaid persons as well as personal distress and pain days vary considerably. For example, the Prevent Blindness of America (2007) study measures the impact of vision loss on quality of life using a health utility approach. Other studies measure a loss of quality by nursing home placement, well-being, community service use, and daily living activities (Frost et al., 1998; Vu et al., 2005). Although consensus methods and measures of vision-related quality of life are needed, these studies consistently indicate that vision problems result in significant loss in quality of life and, for some populations, substantially greater health care costs.

Finally, the Bureau of Labor Statistics (2006) indicates three percent of nonfatal injuries to the eye require significant days away from work. The 2005 data from five states using the Behavioral Risk Factor Surveillance System (BRFSS) vision module revealed self-reported prevalence of workplace eye injury ranging from 5.8% in Tennessee to 9.0% in Iowa (CDC MMWR, 2006). The NEI (2008) estimates productivity losses from visits to eye care professionals and services can range from $333 million in lost
working days to $14 billion for inability to work. Prevent Blindness America (2007) estimates $8 billion in productivity losses due to vision impairments.

**Child Vision Screening and Examinations**

**Recommended Guidelines**

In order to implement a comprehensive child vision system at the local, state and federal public health levels, it is desirable to have an evidence-based set of clinical guidelines endorsed by the major provider professional associations. Although there is consensus that vision screening programs are essential for children before entering school and during the school years, there is disagreement about the value of child vision examinations for all children before entry to school. There is still debate in the professional provider communities about the content of vision screening and examinations, who should administer them, how frequently they should be administered and the varying modes of treatment depending on the population (Agency Healthcare Research and Quality, 2008; Marshall et al., 2007; Smithen et al., 2004; Vision Council of America, 2004; Wang et al., 1994).

Vision screenings have been used as a diagnostic tool for identifying child vision problems for over a century, as the first school vision screening program was implemented in Connecticut in 1899 (Appelboom, 1985). Many studies, however, have shown that vision screenings have high error rates and/or documented that many children identified in the screening process do not receive follow-up care (Donohue et al. 2000; Preslan and Novak, 1998; Vision Council of America, 2004). Although child vision screening is incorporated in many states in school health programs, Medicaid and SCHIP, there is much controversy about the validity and effectiveness (e.g., sensitivity and specificity) of vision screening by various providers, especially compared with comprehensive eye and vision examinations for preschool and school-age children (Ciner et al., 1999). (See next sections of report for more detail on required screenings and examinations for each state.)

The United States Preventive Services Task Force (USPSTF) is the major authority on recommended clinical services that are used by policy-makers and payers in implementing screenings and other clinical services. The USPSTF conducts a review (by leading experts on primary care and prevention) to “grade” and make recommendations based on the strength of clinical evidence and net benefits. In some cases, the USPSTF may highly recommend screening services but indicate few or no benefits. Based on the available literature in 1996, the USPSTF (1996) did not recommended child vision screenings and/or examinations. However, the USPSTF recommendation changed in 2004 with more accumulated evidence. The USPSTF (2004, 2008, 2009) currently “recommends screening to detect amblyopia, strabismus, and defects in visual acuity in children younger than age 5 years” with a B level recommendation.

Early screening and treatment is essential in treating eye disorders in children (Vision Council of America, 2004; Williams et al., 2002). The Vision in Preschoolers (VIP) Study, funded by the National Eye Institute (NEI), was conducted in three phases to evaluate the effectiveness of vision screening tests and help determine what screening tests best detect most child vision problems. Phase I examined the performance of several screening tests currently used to identify preschoolers for vision problems. The study found that screening tests administered by licensed eye care professionals (optometrists or pediatric...
ophthalmologists) varied widely in performance. At 90% specificity, sensitivities of noncycloplegic retinoscopy (NCR) (64%), the Retinomax Autorefractor (63%), SureSight Vision Screener (63%), and Lea Symbols test (61%) were similar. The best tests detected only two thirds of children having one or more eye conditions and 90% of children with the most important eye conditions. The two tests that used static photorefractive technology were not as accurate as the three tests that measured refractive error in the other ways (VIP, 2004). A summary of the characteristics of a variety of screening tests compiled by Marshall and his colleagues (2007) is included in the Appendix.

Currently, there are a variety of health care providers who perform vision screenings before entry to school and during the school-aged period. In addition to licensed eye professionals (optometrist or ophthalmologist), many eye screenings are conducted by pediatricians, technicians, school nurses and trained lay persons.

Phase II of the VIP study funded by the NEI was designed to assess the relative effectiveness of pediatric nurse screeners and lay screeners in administering the three best performing preschool vision screening tests found in Phase I (e.g., Retinomax Autorefractor, SureSight Vision Screener, Lea symbols distant visual acuity test and Stereo Smile II stereoaucuity test). Phase II showed that nurse screeners and trained lay screeners achieved similar results for accuracy in detecting preschool children in need of a comprehensive eye exam. With 90% specificity, the best tests missed one third of children with one or more targeted vision conditions. The gold standard to determine if the children had any vision condition was a comprehensive eye exam by an optometrist or an ophthalmologist (VIP, 2005). Although the two best performing screening tests (the Retinomax Autorefractor and SureSight Vision Screener) were as effective when used by trained lay screeners or nurse screeners as when used by optometrists and ophthalmologists, the screening tests only detected 68 percent of serious vision problems in children. (VIP, 2005).

Given these findings from the VIP study (2004, 2005) that even trained eye care professionals, using only screening procedures, can fail to identify specific targeted vision problems, there has been more attention placed on the value of comprehensive eye exams as the most effective way of detecting child health vision problems and eye disease. Several professional associations have issued policies in support of comprehensive eye examinations before entry into school. A joint policy statement of the American Academy of Pediatrics, the American Association of Certified Orthoptists, the American Association of Pediatric Ophthalmology and Strabismus, and the American Academy of Ophthalmology (2003) stated “eye examination and vision assessment are vital for the detection of conditions that result in blindness, signify serious systemic disease, lead to problems with school performance, or worse, threaten the child’s life.”

The American Public Health Association issued a policy statement in 2001 that supported “a regular comprehensive eye examination schedule as opposed to just screening…so that all children have exams performed at approximately age 6 months, 2 years, and 4 years.” The American Optometric Association states that “all children should receive a comprehensive eye and vision examination assessing and treating any deficiencies in ocular health, visual acuity, refractive status, oculomotility and binocular vision prior to entering school.” In addition, the American Optometric Association adopted a policy about informing parents that a vision screening does not replace a comprehension vision examination of vision and ocular health (2001).
In 2000, Kentucky became the first state in the country to require a comprehensive vision examination for all children before entering school. A study of the first year of implementation of the law (Zaba et al., 2003a,b) found that a large majority of children diagnosed with vision problems (86% of the amblyopes, 80% of the stabismics, and 84% of those needing a lens prescription) had visited their primary care clinician (a pediatrician or a family practitioner) within the prior year of the vision examination.

Given the concern about the costs of a comprehensive eye examination versus vision screening, Abt Associates conducted a study to determine the relative costs of universal screening versus universal eye examinations before entering school (White, 2004). The study found that a universal preschool eye examination would be more cost effective in diagnosing and treating amblyopia, the most prevalent childhood eye condition, than a universal screening program before entering school. Abt Associates estimated that 41 percent of children would be successfully treated for amblyopia if all children received comprehensive eye exams. The study determined that the higher cost of comprehensive eye exams by a licensed eye care professional were offset by gains in quality-adjusted life years (QALYs). Using standards from the literature, Abt Associates determined that an intervention for children to be effective must cost less than $50,000 per QALY and to be “highly effective” must cost less than $20,000 per QALY. Comprehensive preschool eye examinations were determined to be highly effective, with a cost of $18,390 per QALY (White, 2004).

School Screening and Examination Guidelines

There is currently a wide variation in the requirements for child vision screening and examinations before entry to school and during the school years. Figure 1 presents a snapshot of the vision care requirements for children. The figure was produced by Marshall and his colleagues (2007) with updates through 2007 by the American Optometric Association.¹

At the end of 2007, sixteen states did not require children to receive any vision screening or examination before or during school. Although the majority of states require some vision screening for children, only five states (Arkansas, Massachusetts, North Carolina, Oklahoma and Rhode Island) require a follow-up to the screening. In addition, most of the requirements are for children in public school settings only.

Even though universal comprehensive eye exams for children before entry to school would likely result in many more children being diagnosed and successfully treated for various eye diseases (White, 2004), only three states (Kentucky, Missouri and Illinois) have legislatively mandated eye examinations for preschool children. Massachusetts and Ohio have mandated eye examinations for children newly referred to special education.

¹ Updates provided by Sherry L. Cooper, Associate Director, State Government Relations, American Optometric Association, February 19, 2009.
The Vision Council of America maintains a database of vision regulations by state on its website (www.2020advocacy.com). The regulations of each state through the 2007 legislative session are reported for child screening, SCHIP, Medicaid, driving, workplaces, adult sports and child sports activities. States were rated on multiple criteria as “below average”, “average”, or “progressive”. The ratings were more favorable if there were requirements for driving and child screening in schools, Medicaid and/or SCHIP. At the end of 2007, fourteen states (Arizona, Idaho, Iowa, Georgia, Louisiana, Montana, Nevada, New Hampshire, North Dakota, Oklahoma, South Carolina, South Dakota, Wisconsin and Wyoming) were rated “below average” and five (Massachusetts, Missouri, North Carolina, Rhode Island and Vermont) were rated “progressive.”

**State Public Insurance (Medicaid and SCHIP) Provisions**

Medicaid and the State Children’s Health Insurance Program (SCHIP) are basically partnerships between federal and state governments to provide health services for eligible children. These partnerships allow states significant flexibility in determining beneficiary eligibility requirements and benefits offered. Medicaid, begun in 1965 as Title XIX of the Social Security Act, includes coverage of health care services for poor children in every state. The benefits offered, particularly in Medicaid programs, fall into two categories: mandatory and optional benefits. Mandatory benefits are required by the federal government for all participating states. States can designate benefits as “optional” regardless of whether or not the services may be needed. Vision services are generally classified as optional benefits. Unlike the Medicare program that provides health care coverage for elders (65 years and older) and classifies optometrists as physicians, Medicaid programs do not currently classify optometrists as physicians, which reduces access to vision and eye health care for vulnerable populations under 65 years of age.
The Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) service is a preventive and comprehensive child health program for individuals under the age of 21 eligible for Medicaid services in their state. The Omnibus Budget Reconciliation Act (OBRA) of 1989 defined EPSDT by law to include periodic screening, vision, dental, and hearing services. Although the scope of coverage and eligibility criteria for Medicaid vary from state to state, Section 1905 (r)(5) of the Social Security Act requires “that any medically necessary health care service listed at Section 1905 (a) be provided to an EPSDT recipient, even if the service is not available under the State’s Medicaid plan to the rest of the Medicaid population.” (CMS, 2008). Medicaid state agencies are responsible for assuring that required health care services are available and accessible and that Medicaid recipients and their parents or guardians effectively use the resources. Vision screening under EPSDT must include diagnosis and treatment for defects in vision and must cover eyeglasses. States set the specific standards and protocols for each component of EPSDT; most states’ vision care standards are in accordance with the American Academy of Pediatrics (AAP) recommendations (Baumrucker, 2004).

The State Children’s Health Insurance Program (SCHIP) was funded in the Balanced Budget Act of 1997 as Title XXI of the Social Security Act to provide health insurance to children and youth not eligible for Medicaid or private insurance in their state. States can provide coverage through SCHIP via the state Medicaid program or a new stand-alone insurance program or some combination of both. The stand-alone programs do not have to provide the EPSDT and other benefits of Medicaid coverage, leaving many important services for the children and youth with special health care needs (CYSHCN) population uncovered. SCHIP was intended to cover children not eligible for Medicaid with incomes up to 200 percent of the federal poverty level, with the option to cover children of even higher income levels. When passed in 1997, Congress allocated $40 billion in federal funds for a ten year period. Unlike Medicaid, SCHIP was funded as a capped block grant to states rather than as an individual entitlement. In January 2009, Congress reauthorized SCHIP for the future with the President’s support.

In addition to Medicaid’s mandatory EPSDT benefit that ensures access to vision screening with follow-up eye examinations and treatment services for children, there are several other Medicaid benefit categories where vision screening services may be delivered. Often such services are billed as a part of a well-child visit. Under SCHIP, state-specific benefit packages must provide well-baby and well-child care, which may include a vision screening component. As with Medicaid, the well-child coverage requirement is not the only service category where children could receive vision screening under SCHIP.

The most recent comprehensive survey of what child vision services were included in each state’s Medicaid and/or SCHIP program was performed in 2000. The assessment was completed in two surveys on children’s vision care, one for state Medicaid programs and the other for separate state SCHIP programs, by the national Academy of State Health Policy for a Congressional Research Service Report (CRS) (Baumrucker, 2004). The results of these surveys are summarized in the next four tables from the CRS report (Baumrucker, 2004).

As of October 2000, 36 states had medically needy programs that covered at least some groups under Medicaid. These 36 states may be shown as “categorically needy only” or as “categorically and medically needy”, depending on benefit coverage policies for categorically needy versus medically needy beneficiaries. Those without medically needy programs were Alaska, Alabama, Arizona, Colorado, Delaware, Idaho, Indiana, Missouri, Mississippi, New Mexico, Nevada, Ohio, South Carolina, South Dakota, and Wyoming. These 15 states are always listed in the “categorically needy only” sub column under Medicaid.
In the SCHIP column in Tables 1 to 4, 28 states had a single, separate SCHIP program represented by the state abbreviation. The remaining five states with separate SCHIP programs each had multiple programs, each with different benefit plans. Two states (California and New Jersey) offered two separate SCHIP programs. In this case, an A or B extension was added to the state abbreviation to distinguish these programs (e.g., CA-A, CA-B). Three states (Connecticut, Florida, and Massachusetts) offered three separate SCHIP programs. In this case, an A, B, or C extension was added to the state abbreviation to distinguish these multiple programs (e.g., CT-A, CT-B, CT-C).

Though Medicaid covers vision care for children through EPSDT for Medicaid eligible children, SCHIP program coverage varies between states; Table 1 outlines the coverage of well-child services under Medicaid and SCHIP in 2000.

<table>
<thead>
<tr>
<th>Program Classifications</th>
<th>Medicaid (51 programs in 50 states and DC)</th>
<th>SCHIP (41 Programs in 33 States)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Categorically needy</td>
<td>Categorically and medically needy</td>
<td>2- CT-B, CT-C</td>
</tr>
<tr>
<td>Programs that do not cover well-child (non-EPSDT) services</td>
<td>NOTE: Under Medicaid, all states cover well-child care and screening services under mandatory EPSDT benefit. The States listed below chose not to cover well-child care and screening services outside of EPSDT as well.</td>
<td>3- AL, MS, WY 27- CO, DE, FL-A, FL-B, FL-C, IA, IL, KS, KY, MA-A, MA-B, MA-C, ME, MI, MT, NH, NJ-A, NJ-B, NV, OR, PA, TX, UT, VA, VT, WA, WV</td>
</tr>
<tr>
<td>Programs with specified limits and/or monitoring of well-child (non-EPSDT) services</td>
<td>3- AZ, ID, OH 3- IL, TN, UT</td>
<td>8- AL, AZ, CA-A, CA-B, GA, NC, ND, NV</td>
</tr>
<tr>
<td>Programs for which limits were not specified</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Baumrucker EP, 2004, Coverage of Vision Services under the State Children’s Health Insurance Program (SCHIP), CRS Report for Congress, RL32628

Other SCHIP-covered services, such as physician services, may cover child vision care. Table 2 highlights the coverage of physician services by Medicaid and SCHIP programs in states as of June 2000.
<table>
<thead>
<tr>
<th>Program Classifications</th>
<th>Medicaid (51 programs in 50 states and DC)</th>
<th>SCHIP (41 Programs in 33 States)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Categorically needy</td>
<td></td>
</tr>
<tr>
<td>Programs that do not cover physician services</td>
<td>The amount, duration and scope of physician services was not captured on the Medicaid benefits survey because coverage of physician services is mandatory under Medicaid</td>
<td>1- CT-C</td>
</tr>
<tr>
<td>Programs with unlimited physician services</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Programs with specified limits and/or monitoring of physician services</td>
<td>0</td>
<td>States were not required to report quantity limits for physician services 40- AL, AZ, CA-A, CA-B, CO, CT-A, CT-B, DE, FL-A, FL-B, FL-C, GA, IA, IL, IN, KS, KY, MA-A, MA-B, MA-C, ME, MI, MS, MT, NC, ND, NJ-A, NJ-B, NH, NV, NY, OR, PA, TX, UT, VA, VT, WA, WV, WY</td>
</tr>
</tbody>
</table>


Vision services for children vary significantly by state and type of insurance program. As seen in Table 3, nearly all states in 2000 covered vision services for children in their SCHIP programs. Programs which excluded vision benefits were California-B, Connecticut-B, Connecticut-C, and Michigan. CRS found that 26 of the 51 Medicaid programs had specific quantity limits for at least one type of vision related service including: eyeglasses, frames, and contact lenses; vision screenings; eye exams; and orthoptic training, such as “one exam every two years.”
Table 3: Coverage of, and Limits for Monitoring of, Vision Services for Children under Medicaid and SCHIP (as of June 2000)

<table>
<thead>
<tr>
<th>Program Classifications</th>
<th>Medicaid</th>
<th>SCHIP</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>(51 programs in 50 states and DC)</td>
<td>(41 Programs in 33 States)</td>
</tr>
<tr>
<td></td>
<td>Categorically needy</td>
<td>Categorically and medically needy</td>
</tr>
<tr>
<td>Programs that do not cover vision services</td>
<td>0</td>
<td>13- CA, CT, DC, FL, IL, KS, LA, MI, TX, UT, VT, WA, WV</td>
</tr>
<tr>
<td>Programs with unlimited vision services</td>
<td>7- AK, CO, NV, OR, RI, SD, WY</td>
<td>17- AR, GA, HI, IA, KY, MD, ME, MT, NC, ND, NE, NH, NY, OK, PA, VA, WI</td>
</tr>
<tr>
<td>Programs with specified limits and/or monitoring of vision services</td>
<td>9- AL, DE, ID, IN, MO, MS, NM, OH, SC</td>
<td>17- AR, GA, HI, IA, KY, MD, ME, MT, NC, ND, NE, NH, NY, OK, PA, VA, WI</td>
</tr>
<tr>
<td>Programs for which limits were not specified</td>
<td>1- AZ</td>
<td>4- MA, MN, NJ, TN</td>
</tr>
</tbody>
</table>


Like Medicaid programs, SCHIP programs also limit the quantity of services. Nearly half of the states reported specific quantity limitations of “one exam per year” or “refractions limited to one per year.”

Table 4 displays the coverage of eyeglasses benefits for children in Medicaid and SCHIP programs. EPSDT must cover eye glasses for children unless there is a special exemption (states must apply for exemption). In 2000, only one Medicaid program (Delaware) did not cover eyeglasses. In contrast, there were six SCHIP programs (California-B, Connecticut-B, Connecticut-C, Florida-B, New York and Utah) which did not cover eyeglasses in 2000. In the most recent comprehensive study, ten states limit SCHIP coverage for vision care, most of which limiting the number of exams and corrective lenses covered during a year.

In summary, the June 2000 CRS benefits assessment found that nearly all Medicaid and SCHIP programs covered vision services for children, with most programs covering eyeglasses. The type and breadth of the vision-related service, however, varies within and across the states for the two public insurance programs.
Table 4: Coverage of, and Limits for Monitoring of, Eyeglasses for Children under Medicaid and SCHIP (as of June 2000)

<table>
<thead>
<tr>
<th>Program Classifications</th>
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<tbody>
<tr>
<td></td>
<td>Categorically needy</td>
<td>Categorically and medically needy</td>
</tr>
<tr>
<td>Programs that do not cover vision services</td>
<td>1- DE</td>
<td>0</td>
</tr>
<tr>
<td>Programs with unlimited vision services</td>
<td>6- AK, CO, NV, OR, RI, SD</td>
<td>9- DE, FL-C, IL, MA-A, MA-C, NJ-A, NV, OR, WY</td>
</tr>
<tr>
<td>Programs with specified limits and/or monitoring of vision services</td>
<td>8- AL, ID, IN, MO, MS, OH, SC, WV</td>
<td>27- AR, CA, DC, FL, GA, HI, IA, KY, LA, MD, ME, MI, MT, NC, ND, NE, NH, NJ, NM, NY, OK, TN, UT, VA, VT, WA, WI</td>
</tr>
<tr>
<td>Programs for which limits were not specified</td>
<td>1- AZ</td>
<td>3- IN, KS, MA-B</td>
</tr>
</tbody>
</table>


Although there has been no updated survey of child vision benefits in Medicaid and SCHIP since 2000, Kaiser Family Foundation maintains an online database of Medicaid benefits on their website. A summary table of the optometrist services and eyeglasses/contact lenses provided by states in October 2006 was compiled from the state benefit profiles (see Appendix, Table 2). Every state provides optometrist services; over half (29) of the states and the District of Columbia require a co-payment for those services. The large majority of states provide coverage for eyeglasses and contact lenses. The six states not covering eyeglasses in October 2006 were Kentucky, Louisiana, Maryland, Oklahoma, Vermont and Virginia. One-third of the states providing coverage for eyeglasses required a co-payment for the service.

Access and Utilization of Child Vision Services

Findings from National and State Population-based Surveys

Data collected in national and state population-based surveys, as well as in smaller purposive samples, reveal that many children have not received the child vision services necessary to identify and treat eye

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2 www.kff.org/medicaid/benefits/index.jsp
problems and diseases. Children without insurance and living in poverty have the greatest unmet need for services.

This section reports on the findings related to access and utilization from the 1993-94 National Health Interview Survey, the 2002 National Health Interview Survey, the 2005 National Health Interview Survey and the 2001 and 2005-6 National and State Surveys of Children with Special Health Care Needs. The National Health Interview Surveys give estimates for the entire child population while the Surveys of Children with Special Health Care Needs give estimates only for CSHCN.

Using the data from 50,000 children surveyed nationally in the 1993-94 National Health Interview Survey, Newacheck and his colleagues (1998) found discrepancies in services between those insured and uninsured. Twenty-two percent of uninsured children went without “needed medications, eyeglasses or mental health care” compared to six percent of insured children.

According to the 1998 Medical Expenditure Panel Survey of 5,141 children aged 6 – 18 years, Kemper and his colleagues (2004) found that uninsured black or Hispanic children had lower odds of having corrective lenses than other children, regardless of health insurance status. However, black or Hispanic children with health insurance had similar odds of having corrective lenses as insured non-black/non-Hispanic children. This suggests there are differences in access and utilization of eye care services that are not related to potential differences in prevalence.

An analysis of the 2002 National Health Interview Survey revealed similar discrepancies in access and utilization of vision care services (CDC MMWR, 2005). These data also serve as the baseline for two of the national health objectives related to vision health:

- Objective 28-2 – Increase the proportion of preschool children aged 5 years and under who receive vision screening from 36% in 2002 to 52% in 2010
- Objective 28-9a – Increase the use of personal protective eyewear in recreational activities and hazardous situations around the home among children 6-17 years from 15% in 2002 to 20% in 2010.

The estimate used for the baseline for Objective 28-2 was derived from the 2002 survey response for those under 6 years of age who “ever had a vision test.” The estimates by race were 43% for Black, non-Hispanic, 36% for White, non-Hispanic, 33% for Hispanic and 31% for Asians. There was no difference in the percent tested by income (35% for below federal poverty level versus 36% for greater than or equal to 200% of poverty) (CDC MMWR, 2005).

Only 21% of children age 18 and under had visited an eye care provider during the previous year. Significant disparities by age, race/ethnicity and income were found for visits to an eye care provider within the preceding 12 months. Children from families with incomes greater than or equal to 200% of the federal poverty level were more likely to see an eye care provider during the prior year as compared with families below the poverty level (23% vs. 17%). Asian (15%), non-Hispanic black (19%) and Hispanic children (16%) were significantly less likely to have visited an eye care provider during the preceding 12 months than non-Hispanic white children (23%). Children ages 6 to 17 were significantly more likely (27%) to visit an eye care provider during the preceding year than children under 6 years (7%); adolescents (12 to 14 years) and (15 to 17 years) were also significantly more likely (30% and 31% respectively) to have visited an eye care provider than younger children (CDC MMWR, 2005).
Estimates for the baseline of Objective 28-9a regarding use of personal protective eyewear in recreational activities and hazardous situations around the home among children aged 6-17 are also derived from the 2002 National Health Interview Survey (CDC MMWR, 2005). Of the 51% of those children who participated in activities that can cause an eye injury in 2002, 15% stated they used protective eyewear “always or most of the time”. This percentage ranged from 12% for children 6-11 years to 17% for children in the 12-14 years and 15-17 years age groups (CDC MMWR, 2005).

Analyses of the 2005 National Health Interview Survey found that nearly 54% of all children without health insurance did not have a “well child” visit, which typically includes some type of vision screening (Campaign for Children’s Health, 2006). Children who were uninsured for longer than one year had significantly more instances of delayed care than children uninsured for less than a year. Finally, 23% of children without health insurance for more than a year had unmet vision care needs as compared with 5% of children who were insured for a year or more (Campaign for Children’s Health Care, 2006).

The Maternal and Child Health Bureau has supported the collection of child health data in every state every two years since 2001. The surveys in 2001 and 2005 focused on children with special health care needs (CSHCN) defined as “those who have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally” (MCHB, 2007, p. 5). It is important to note that children with vision problems in the CSHCN group in each state can not be identified specifically in the 2001 or 2005 state samples. Diagnostic categories were not included in the 2001 survey and the list of diagnostic categories used in the 2005 survey did not include amblyopia or any other child vision impairment.
The surveys in 2003 and 2007 are of the total population on children in all the states. All of the data from every survey are available in a user-friendly, searchable database by state maintained by the Data Resource Center for Child and Adolescent Health (www.childhealthdata.org). Although these are the only state-based surveys with key access and utilization questions, questions about vision care were only included in the 2005-6 survey of CSHCN.

Overall, 13% of U.S. children under 18 years of age had a special health care need in 2001. Twelve percent of the CSHCN were uninsured at some point in the past 12 months and 36% needed eyeglasses or vision care in the past 12 months. Six percent in the 2001 survey had an unmet need for vision care due to limitations on eyeglasses or vision services (Heslin et al., 2006). Rates of unmet need ranged from 3% to 14% across seven racial/ethnic groups. Children of African American, Hispanic and multiracial backgrounds had approximately twice the adjusted risk of unmet need relative to white children. Children without health insurance were also nearly twice as likely to have an unmet need for vision care (Heslin et al., 2006). While uninsured children are least likely to receive vision care, one study found that children covered by public insurance (e.g., Medicaid and SCHIP) were more likely to have their vision care needs met than those with private insurance (Heslin et al., 2006).

Overall, 14% of U.S. children under 18 years of age (or approximately 10.2 million children) had a special health care need in 2005-6. Twenty-two percent of households with children had at least one child with a special health care need. In the previous 12 months, 9% of the CSHCN were uninsured at some point and 33% reported needing eyeglasses or vision care (www.cshcndata.org). Overall, 1% of CSHCN had unmet needs for eyeglasses or vision care, 32% received all the vision care they needed, and 67% did not need vision care. Figure 4 shows the percent who received all needed vision care and those with unmet vision care needs by whether or not they had insurance. Children without health insurance were approximately five times more likely to have an unmet vision care need.

![Figure 3: Unmet Needs for Vision Care or Eyeglasses for CSHCN by Currently Insured](source)
Figure 4 presents the percent of children with unmet vision care needs by age group. The prevalence of unmet vision needs approximately doubled from less than one percent for children from birth to 5 years to two percent for older children from 12-17 years.

Estimates for each state and the District of Columbia are available for each state from the National Survey of CSHCN (www.cshcndata.org). State estimates for children who received all needed eyeglasses or vision care ranged from a low of 21% in Hawaii to a high of 46% in Wyoming in 2005-6. Finally, state estimates for unmet needs for eyeglasses or vision care ranged from a low of 0.3% in both Hawaii and Vermont to a high of 3.1% in Utah and 3.2% in Colorado. Although those with unmet vision care needs is a very small portion of the CSHCN population in each state, there is a five fold difference in those with unmet needs between the state with lowest and highest levels of unmet vision care needs.

![Figure 4: Unmet Needs for Vision Care or Eyeglasses for CSHCN by Three Age Groups](image)


**Findings from Community and Clinical Studies**

Despite the current efforts to provide vision care for children, there is considerable evidence of disparities in both the access and utilization of vision care in studies with clinical or community settings. Even though many states have regularly covered vision care services for poor and near poor children, there are many children who either do not have or do not utilize vision care services. Research suggests that children are being screened at low rates and those that are screened are often not receive the necessary follow-up assessments and treatment services (Vision Council of America, 2004). Just as was true for
populations-based samples, racial and ethnic minorities and children who are uninsured or are from lower income households receive fewer vision care services.

Although most vision impairments are treatable if detected early, the research indicates vision care is not readily accessible. Only one in five preschool children in the United States were screened for vision problems and one in seven preschool children received a comprehensive eye examination (Ciner et al., 1998). Several studies have shown that primary care pediatricians do not always perform vision screening, even though it is recommended policy (Hered & Rothstein, 2003; Marcinak & Yount, 1995; Wasserman et al., 1992). A cross sectional study in 23 states and Puerto Rico found that 62% of three-year-olds and 34% of three to five-year-olds were not screened (Wasserman et al., 1992). Results from a national survey of parents conducted by the Vision Care Institute (2006) indicated that 35% stated that their child had never seen an eye care professional (Vision Care Institute, 2006).

A Johns Hopkins Children's Center Study (Giordano et al., 2009), funded by the National Eye Institute, found that many children with easily treatable problems are not being diagnosed and treated. This Urban Baltimore population-based study of nearly 2,300 children, aged 6-71 months, found 5.1% of the children had refractive error which required correction, but only 1.3% had prescribed glasses. This study suggests a lack of system follow up and structured programs to adequately test for refractive errors. Without structured programs available in the community to adequately test for refractive errors and assure care, children in need of services do not get follow-up assessments and treatment. Correction of refractive error is an essential public health intervention that can prevent amblyopia and permanent visual loss.

Mark and Mark (1999) found the two main reasons for not following up for a vision exam were lack of time (25%) and lack of financial resources (24%). In another study, nearly 40% of children who failed initial vision screening did not receive the appropriate follow-up care (Donohue et al., 2000). A North Carolina study of kindergarten health assessments found that 38% of those who failed a screening test were not referred for follow-up care (Clemens et al., 2002). Less than 15% of all preschool children received an eye exam and less than 22% received some type of screening in Rochester, Minnesota (Yawn et al., 1998). Finally, nearly two-thirds of the children who failed a vision screening in Baltimore did not comply with recommended treatment follow-up services despite care being provided (Preslan and Novak, 1998).

Similar to other health services, lack of insurance is one of the principal reasons individuals do not obtain vision examinations and treatment (Bailey, 2006; Baker et al., 2005; Zhang et al. 2007). In addition, a 2001 analysis of the administrative claims of the Medicaid-enrolled population of children from 1 to 18 years in Michigan, found that racial and ethnic minority children were less likely to receive eye examinations and treatment for vision problems (Kemper et al., 2004). A recent study assessing the availability of on-site vision care in community health centers, where many low income families receive health care services, found that 70 percent of the health centers do not have vision care professionals on-site to provide comprehensive eye exams (Shin and Finnegan, 2009).

In general, there is little or no coordination of vision care services in state health department programs. As indicated earlier, state and local agencies vary in the value of mandating vision screening and comprehensive examinations of preschool children (Ciner et al., 1999; National Association of Chronic Disease Directors, 2004; Prevent Blindness America, 2008).
In an effort to improve care of very young children, the American Optometric Association, in partnership with the Vision Care Institute™ of Johnson and Johnson Vision Care, Inc., began InfantSEE™ in 2005 to provide vision assessments during the first year of life “to ensure that eye and vision care becomes an integral part of infant wellness care to improve a child’s quality of life” (Press, 2008). This major public health program, which is offered at no cost to families by over 6500 optometrists nationwide in all fifty states, has received a lot of attention for its efforts to improve child vision health. (InfantSEE™, 2009).

Although correcting refractive error in preschool children is a recognized public health intervention to prevent the development of amblyopia and strabismus (Giordano 2009), this need is not being met.
Recommendations for Building a Comprehensive Child Vision Care System

The following is a set of recommendations that are necessary for building and sustaining comprehensive child vision care systems in every community and state. These recommendations are based on the three core functions (assessment, policy development and assurance) of public health that are needed to develop and sustain a comprehensive child vision care system in every community in the country (Institute of Medicine, 1988). Public health agencies at the federal, state and local levels should facilitate the implementation of these systems in collaboration with partners from all other sectors (academia, business, media, health care providers, community organizations, etc.) (Institute of Medicine, 2003).

- Ensure that children get the vision care that they need by including child vision health in key legislation at the federal and state levels.

The recognition of the importance of a comprehensive child vision health system is vital in major legislation that focuses on children. When possible, services specified in major child legislation should be linked to the child vision care system in each state. Therefore, information about the importance of child vision health and the links to the child vision health care system should be mentioned explicitly in the following national legislation:

Social Security Act, Title V - MCH Block Grant
Social Security Act, Title IV - Welfare, Child Support, Foster Care
Social Security Act, Title XVI - Supplemental Security Income (SSI)
Social Security Act, Title XIX - Medicaid
Social Security Act, Title XXI - SCHIP
Child Care Block Grant
Individuals with Disabilities Education Act (IDEA)
Head Start
Supplemental Nutrition Program for Women, Infants and Children (WIC)
Public Health Service Act
Community and Migrant Health Centers (Sections 329 & 330)

- Assure adequate comprehensive coverage of child vision care services by all public and private insurers and payers.

Financing and coverage of eye care services are an essential part of building a comprehensive child vision system. Currently there is great variation by state in vision and eye health care coverage in school health programs, in community health centers, and in public insurance programs (Medicaid and SCHIP). In addition, there is variation in what is included in private health care plans. Access to early and timely vision health care services by a professional eye care provider (optometrist or ophthalmologist) is essential in addressing the public health emergency in child vision care. Vision health care should be considered as part of routine primary care for all children. All insurers should provide a standard vision care benefit for all children from birth to eighteen years of age.
• Assure a “point of accountability” in the U.S. public health system for child health vision care through the establishment of a child vision health categorical program linked to the Title V MCH Block Grant within the Maternal and Child Health Bureau in the Health Resources Service Administration (HRSA), Health and Human Services (HHS),

Access to a universal standard for vision care services is necessary, but not sufficient, in assuring all children will receive the services needed in a timely manner. In order to address all of the potential barriers that prevent all children from getting the essential vision care services they need, a child vision care system should be developed and sustained within a public health system using the core functions (assessment, policy development and assurance) and the ten essential services. The Maternal and Child Health (MCH) Services Block Grant (Title V of the Social Security Act) has provided support to assure the health and well-being of all mothers and children in all states since it was passed as part of the Social Security Act in 1935. Funding for this new categorical program should be linked to Title V Block Grants and the Special Projects of Regional and National Significance (SPRANS) set aside.

State Title V programs, administered in the state health agency, receive 85% of the Title V funds on a formula basis. States must provide a three dollar match for every four federal dollars allocated and at least 30% of the block grant funds must be used for children with special health care needs (CSHCN). States use the dollars for CSHCN for a variety of activities, including direct health care services; enabling services such as transportation, case management, respite care and coordination with other health and social services; population-based services such as newborn screening including hearing screening and follow-up; and infrastructure building services such as needs assessment, finance planning, quality improvement, information systems and parent leadership activities (MCHB, 2009).

Funding for building and sustaining a comprehensive child vision care system in each state could be appended to Title V to support the public health infrastructure needed in order to:

• provide needs assessments and monitoring of child vision care services
• develop and maintain key partnerships and collaborations necessary to build the child vision system
• assure the development and sustainability of a child vision care system through the establishment and enforcement of standards and regulations, the provision of technical assistance and education, and the provision of services not provided through insurance or other payers

Title V funds could be used to give a state capacity grant to every state to ensure that comprehensive child vision health systems are created and sustained. The grants to state could be modeled after the current ECCS (Early Childhood Comprehensive System) state grants. The grants should support a full-time Child Vision Care Coordinator who is responsible for developing a strategic plan for the provision of child vision services from birth to age 18. The coordinator should be responsible for the execution of the plan that has been endorsed by a statewide child vision care advisory committee. The Coordinator should facilitate the development and engagement of a child vision health network within the state. Individuals to be included in the network are child eye professionals (optometrists and pediatric ophthalmologists), parents, child health providers, preschool and school personnel, public and private purchasers and insurers, local health officials, and others.
Responsibilities of the Child Vision Care Coordinator and the grants to states should include the following:

- conduct needs assessment
- develop indicators for tracking the child vision care system
- provide technical assistance to early childhood programs, schools and other community programs
- provide culturally relevant materials to parents and professionals
- convene the statewide child vision care advisory committee and network
- coordinate and expand efforts with vision care initiatives, such as InfantSEE™ and Prevent Blindness America
- develop and implement a strategic plan
- advocate for appropriate financing for child vision care services
- coordinate with others, including the directors of chronic disease, in the health department concerning child vision care
- facilitate training opportunities for health providers concerning child vision services
- assist in the development and promulgation of comprehensive program requirements for child health vision screening and examinations

Each state capacity grant should incorporate a standard set of performance measures. These measures should be reported annually and be available on the national MCHB website. The MCHB who would administer the Comprehensive Child Vision Health (CCVH) grants should also fund a national evaluation to track the implementation of the grants and their impact on child vision health. In addition, the federal appropriation for this child vision health program should include resources for a data monitoring system and evaluation, a national coordination center, and a national public health marketing campaign.

- Develop a national set of children’s vision guidelines for screening and examinations and assure that these guidelines are adopted by all states in school health codes and mandates.

The NEI’s Vision in Preschool Study has been important in contributing to the evidence-base about which screening tools to use under which circumstances. This research needs to be immediately translated into child health vision guidelines and programs. The federal government should continue to support research that can be used to facilitate the adoption of quality guidelines for screening and examinations. States should move toward the adoption of comprehensive guidelines and requirements for vision care in schools and public insurance plans. The evidence from past studies shows that comprehensive eye exams by an optometrist or pediatric ophthalmologist are highly effective in detecting vision conditions. In addition, universal preschool eye examinations have been found to be more cost-effective in diagnosing and treating amblyopia, the most prevalent childhood eye condition, than a universal screening program before entering school (White, 2004). Unless comprehensive and coordinated screening programs are in place that combine high-sensitivity, specificity and positive predictive value with assurance of necessary follow-up treatment, a comprehensive examination before entering school should be a considered as a practical option.

The NCVH should play a major role in educating policy-makers and the public about the need for vision screening and examination standards before entering school and throughout the school years. These standards of care should be incorporated by all payers for vision care services. The NCVH should work to gain consensus of all child health professional groups regarding vision screenings and assessments from birth through adolescence.
• **Implement and fund a national clearinghouse or center for child vision health within the Department of Health and Human Services.**

A National Center on Child Vision Health should be funded at the federal level to assist states and others to build comprehensive child vision care systems. The National Center could be modeled after others funded by the Maternal and Child Health Bureau for newborn hearing screening, cultural competence, adolescent health, and/or children with special health care needs. The National Center on Child Vision Health should provide the following:
- educational materials for parents, providers, payers and others,
- technical assistance on child health vision screening and examinations,
- technical assistance suggested requirements for schools and insurers,
- maintenance of a database on states’ requirements for schools, Medicaid and SCHIP,
- maintenance of a database on state legislation
- maintain a data base on key research related to screening and assessment of eye problems and diseases,
- coordination with state and local social marketing campaigns,
- technical assistance on best practices

The National Center could be funded as part of the Title V infrastructure and coordinated with the state capacity grants.

• **Enhance and fully fund national campaigns to encourage early identification of child vision problems and to prevent injuries from sports and toys.**

Education for parents and families, as well as key child health providers, about the importance of child vision care is critical in an effort to assure that all child health problems are identified and treated as early as possible. In addition, education about how to prevent injuries from sports and toys is critical to meeting one of the key national objectives for improving child vision health. Social marketing campaigns are invaluable in these efforts to get out important public health messages. A social marketing campaign for these two purposes should be designed and coordinated with state and local efforts and funded by federal dollars. This campaign should include the Association of Maternal and Child Health Programs as well as the State and Territorial Association of Injury Prevention Directors. A logical locus for the national campaigns could be the Maternal and Child Health Bureau who would administer the Comprehensive Child Vision Health (CCVH) grants to states. Materials for the national campaign, which could be available through the National Center, should be linked and supportive of local and state efforts as well.

• **Design and implement an ongoing data system that monitors prevalence of child vision problems, together with access and utilization of child vision care services, at the local, state and national levels.**

Monitoring the prevalence and access and utilization of child vision health services is a critical function of public health. Child health vision indicators are needed at the local, state and federal levels to monitor vision status and services. Although child vision has been included in some national and state surveillance systems in the past, it has not consistently been included in all major child health data systems. Consistent use of child health vision indicators is critical for assessing progress and making improvements in the provision of vision services. New data sources and improved utilization of existing
data from a variety of providers (e.g. state public health, school health and education, managed care entities, community health centers, Medicaid/SCHIP, etc.) should be considered (CDC, 2006). The following are specific recommendations related to the use of child vision indicators:

- Include child vision health in the Healthy People 2020 national health objectives.
- Include child vision questions in the ongoing MCHB-funded state surveys of child health and children with special health care needs. When appropriate, add diagnostic categories related to child vision.
- Include child vision questions in national surveys, such as the National Health Interview surveys.
- Develop performance measures for child vision health for inclusion in the Title V Maternal and Child Health Block Grant System.
- Create a network of sentinel provider-level practices to collect data on vision care services and child vision health.
- Include child vision health questions addressed to caregivers in the Behavioral Risk Factor Surveillance System in every state.
- Include child vision health in the Youth Risk Behavior System in every state.

- Develop and facilitate a broad coalition of child-oriented stakeholder groups to work towards the establishment and maintenance of a comprehensive child vision system across the country.

The achievement of a comprehensive child vision health care system will take the sustained work of a broad coalition of child and family organizations working together in an orchestrated way over time. The coalition should include the relevant public health and child health professional organizations as well as organizations that focus on other areas of importance in the lives of children and families. A list of key stakeholder groups that should be included in the coalition for child vision health includes but is not limited to the following:

- American Public Health Association (APHA)
- Association of Maternal and Child Health Programs (AMCHP)
- Association of State and Territorial Health Officials (ASTHO)
- National Association of County and City Health Officials (NACCHO)
- CityMatCH
- American Academy of Pediatrics (AAP)
- American Optometric Association (AOA)
- American Academy of Ophthalmology (AAO)
- Prevent Blindness America (PBA)
- Family Voices
- American Association of School Health (AASH)
- National Association of School Nurses
- National Association for the Education of Young Children (NAEYC)
- Head Start Association
- Voices for Children
- Child Welfare League of America
Conclusion

Studies from the past two decades reveal that there exists a public health emergency with respect to child vision health in the United States, and that we are making no progress toward its solution. Millions of children are not receiving essential eye care services which can prevent eye disease, developmental delays, school and social achievement problems and death. Given the asymptomatic nature of most eye and vision disorders and that most childhood vision problems can be prevented through early detection, follow-up and treatment, it is essential that the building of a comprehensive child vision care system as part of the public health system at the local, state and federal levels become a top priority. Public health agencies at the federal, state and local levels should facilitate the implementation of these child vision health systems in collaboration with partners from all other sectors (academia, business, media, health care providers, community organizations, etc.).

A comprehensive child vision health system must be available in every community in every state to assure that all children are assessed for potential eye problems before entering school and throughout the school years. Essential components of a comprehensive child vision system include universal access to comprehensive child vision care services, a “point of accountability” program within each state public health system for child vision health, a national clearinghouse and education campaign, and ongoing data systems for monitoring prevalence and utilization of child vision health at the local, state and national levels. In summary, early identification of vision health problems by a vision care professional (optometrist or pediatric ophthalmologist) can result in better school achievement and health outcomes which lead to more productive and healthier lives across the lifespan.
References


Appendix

Table 1 – Effectiveness of Vision Screening Methods in Identifying Vision Conditions of Preschool and School Children

Table 2 – Medicaid Benefits for Optometrist Services and Eyeglasses and Contact Lenses by State, as of October 2006
<table>
<thead>
<tr>
<th>SCREENING METHOD</th>
<th>EFFECTIVENESS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sensitivity</td>
</tr>
<tr>
<td>Modified Clinical Technique*,+‚‡‡</td>
<td>0.96</td>
</tr>
<tr>
<td>Telebinocular*,+‡‡</td>
<td>0.76</td>
</tr>
<tr>
<td>NYSOA Vision Screening Battery*</td>
<td>0.72</td>
</tr>
<tr>
<td>Retinomax Autorefractor†,+不禁.‡‡</td>
<td>0.63^a</td>
</tr>
<tr>
<td></td>
<td>0.52^a</td>
</tr>
<tr>
<td>SureSight Vision Screener†,+不禁.‡‡</td>
<td>0.63^a</td>
</tr>
<tr>
<td></td>
<td>0.51^a</td>
</tr>
<tr>
<td>Massachusetts Vision Kit*,+†‡‡</td>
<td>0.62</td>
</tr>
<tr>
<td>Lea Symbols Visual Acuity†,+‡,‡‡</td>
<td>0.61^a</td>
</tr>
<tr>
<td></td>
<td>0.49^a</td>
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<tr>
<td>Power Refractor ††,‡‡</td>
<td>0.54^a</td>
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<tr>
<td></td>
<td>0.36^a</td>
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<tr>
<td>HOTV Visual Acuity†,+‡‡</td>
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<tr>
<td></td>
<td>0.36^a</td>
</tr>
<tr>
<td>Stereo Smile ††,‡,+‡‡</td>
<td>0.44^a</td>
</tr>
<tr>
<td></td>
<td>0.33^a</td>
</tr>
<tr>
<td>Random Dot E Stereoacuity†,+‡‡</td>
<td>0.42^a</td>
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<td></td>
<td>0.22^a</td>
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<tr>
<td>Teacher Observation†,+‡‡</td>
<td>0.39</td>
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<tr>
<td>Parent Questionnaire†,+‡‡</td>
<td>0.38</td>
</tr>
<tr>
<td>SCREENING METHOD</td>
<td>EFFECTIVENESS</td>
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<tr>
<td>--------------------------------</td>
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</tr>
<tr>
<td></td>
<td>Sensitivity</td>
</tr>
<tr>
<td>Screen Photoscreener†,±±</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>0.37</td>
</tr>
<tr>
<td>MTI Photoscreener†,±±</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>0.37</td>
</tr>
<tr>
<td>Snellen E Chart*,+,‡‡</td>
<td>0.27</td>
</tr>
<tr>
<td>Nurse Observation*,-,††</td>
<td>0.18</td>
</tr>
</tbody>
</table>


‡‡Values calculated from available data.
††Values can not be calculated from available data.
a Conducted by licensed eye care professional.
b Conducted by nurse screener.
c Conducted by lay screener.
### Table 2. Medicaid Benefits for Optometrist Services and Eyeglasses and Contact Lenses by State, as of October 2006

<table>
<thead>
<tr>
<th>State</th>
<th>Medicaid Populations³</th>
<th>Optometrist Services</th>
<th>Eyeglasses and Contact Lenses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Benefit Limitations</td>
<td>Co-Pay</td>
</tr>
<tr>
<td>Alabama</td>
<td>CN</td>
<td>1 refractive exam/2 years</td>
<td>$1/visit</td>
</tr>
<tr>
<td>Alaska</td>
<td>CN</td>
<td>1 refractive exam/year</td>
<td>-</td>
</tr>
</tbody>
</table>
| Arizona        | CN & MN               | • Emergency eye care and treatment of medical conditions only  
                     |                       | • Vision exam limited to post-cataract surgery services. | -                           | Limited to post-cataract surgery items | -            |
| Arkansas       | CN & MN               | • 1 refractive exam/2 years  
                     |                       | • 12 visits/year irrespective of setting included in limits for other specified practitioners | -                           | 1 pair eyeglasses/2 years  
                     |                       | • Contact lenses limited to post-cataract surgery | $2/dispensing service       | $2/dispensing service       | -            |
| California     | CN & MN               | • 1 refractive exam/2 years  
                     |                       | • Orthoptics not covered | $1/visit                  | 1 pair eyeglasses/2 years  
                     |                       | • Special lenses not covered  
                     |                       | • Interim replacement for lost or broken eyeglasses allowed once in 2 years | -                           | Special lenses covered when specified criteria met | -            |
| Colorado       | CN                    | None specified        | $2/visit                    | Limited to post-surgery lenses and eyeglasses |              |
| Connecticut    | CN & MN               | 1 refractive exam/year | -                           | Special lenses covered when specified criteria met | -            |
| Delaware       | CN                    | Limited to diagnosis and treatment of medical eye problems as permitted by law | -                           | Limited to aphakic or bandage lenses following cataract surgery | -            |
| District of Columbia | CN & MN     | None specified        | -                           | 1 pair eyeglasses/2 years  
                     |                       | • Minimum diopter correction needed | $2/service     |

³ CN= Categorically Needy; MN= Medically Needy

Except where noted, populations covered for optometrist services are identical to those covered for eyeglasses and contact lenses.
<table>
<thead>
<tr>
<th>State</th>
<th>Medicaid Populations</th>
<th>Optometrist Services</th>
<th>Co-Pay</th>
<th>Eyeglasses and Contact Lenses</th>
<th>Co-Pay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida</td>
<td>CN &amp; MN</td>
<td>Eye exams limited to determining presence of disease or reported vision problem</td>
<td>$2/day</td>
<td>• Eyeglasses, contact lenses and prosthetic eyes for specified medical conditions,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• 2 pairs of eyeglasses/year</td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>CN &amp; MN</td>
<td>• Limited to diagnosis and treatment of medical eye problems as permitted by law and post-cataract surgery follow-up care</td>
<td>$1/office visit</td>
<td>• Adult coverage limited to nursing facility residents with specific physician order</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Refractive exams covered for nursing facility residents with specific physician order</td>
<td></td>
<td>• Minimum diopter correction required for initial and replacement eyeglasses</td>
<td></td>
</tr>
<tr>
<td>Hawaii</td>
<td>CN &amp; MN</td>
<td>Orthoptics and orthoptic training not covered</td>
<td>-</td>
<td>• 1 pair eyeglasses 2/years</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Special lenses limited by age and medical condition</td>
<td></td>
</tr>
<tr>
<td>Idaho</td>
<td>CN</td>
<td>• 1 refractive exam/year</td>
<td>-</td>
<td>• 1 pair eyeglasses/4 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Certified optometrists may diagnose and treat medical eye problems</td>
<td></td>
<td>• Minimum diopter correction required for initial and replacement eyeglasses</td>
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</tr>
<tr>
<td>Illinois</td>
<td>CN &amp; MN</td>
<td>1 refractive exam/year</td>
<td>$2/visit</td>
<td>1 pair eyeglasses/year with specified exceptions</td>
<td></td>
</tr>
<tr>
<td>Indiana</td>
<td>CN</td>
<td>1 refractive exam/2 years</td>
<td>-</td>
<td>• 1 pair eyeglasses/2 years</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Age-specific minimum diopter correction required for initial and replacement eyeglasses</td>
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</tr>
<tr>
<td>State</td>
<td>Medicaid Populations (^3)</td>
<td>Benefit Limitations</td>
<td>Co-Pay</td>
<td>Benefit Limitations</td>
<td>Co-Pay</td>
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</tr>
<tr>
<td>Iowa</td>
<td>CN &amp; MN</td>
<td>• 1 refractive exam/year,</td>
<td>$2/day</td>
<td>• 1 pair eyeglasses/2 years unless specific criteria met</td>
<td>$2/day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Visual aids covered when visual acuity criteria met and visual therapy limited to 90 days</td>
<td></td>
<td>• Contact lenses for specified post-surgery conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Special lenses covered if specified criteria met</td>
<td></td>
</tr>
<tr>
<td>Iowa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kansas</td>
<td>CN &amp; MN</td>
<td>• 1 refractive exam/4 years,</td>
<td>$2/date of service</td>
<td>• 1 pair eyeglasses/4 years,</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2 exams/month for medical conditions, orthoptic and pleoptic training not covered</td>
<td></td>
<td>• Post-cataract surgery lenses and eyeglasses covered for 1 year</td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td>A, B, C, &amp; D (see note on population categories below this table)</td>
<td>Limited to diagnosis and treatment of medical eye problems as permitted by law</td>
<td>A, C &amp; D - $2/visit</td>
<td>No eyeglasses/lens benefit provided</td>
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</tr>
<tr>
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<td>A, B, C, &amp; D (see note on population categories below this table)</td>
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<td>Louisiana</td>
<td>CN &amp; MN</td>
<td>Limited to diagnosis and treatment of medical eye problems as permitted by law</td>
<td>-</td>
<td>No eyeglasses/lens benefit provided</td>
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</tr>
<tr>
<td>Maine</td>
<td>CN &amp; MN</td>
<td>• Limited to dispensing and fitting eyeglasses and 1 routine eye exam/2 years</td>
<td>$.50-$2/day, depending on payment, up to $20/month</td>
<td>• 1 pair glasses/lifetime,</td>
<td>$.5-$3/day depending on payment up to $30/month</td>
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<tr>
<td></td>
<td></td>
<td>• 1 routine eye exam/year for ICF/MR residents</td>
<td></td>
<td>• Minimum diopter correction required</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Contact lenses not covered</td>
<td></td>
</tr>
<tr>
<td>Maryland</td>
<td>CN &amp; MN</td>
<td>1 refractive exam/2 years</td>
<td>-</td>
<td>No eyeglasses/lens benefit provided</td>
<td></td>
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<tr>
<td>State</td>
<td>Medicaid Populations</td>
<td>Optometrist Services</td>
<td>Eyeglasses and Contact Lenses</td>
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</tr>
<tr>
<td>Massachusetts</td>
<td>CN &amp; MN</td>
<td>1 refractive exam/2 years unless specific diagnostic criteria met</td>
<td>1 pair eyeglasses/2 years, minimum diopter correction required of initial and replacement eyeglasses, replacements within 2 years only if eyeglasses lost or unusable, contact lenses and special lenses for specified medical conditions</td>
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<tr>
<td>Michigan</td>
<td>CN &amp; MN</td>
<td>1 refractive exam/2 years</td>
<td>$2/visit</td>
<td>$2/dispensing service</td>
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<tr>
<td>Minnesota</td>
<td>A &amp; B (see note on population categories below this table)</td>
<td>None specified</td>
<td>$3/visit for non-preventive service</td>
<td>A-$3/pair B-$25/pair</td>
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<tr>
<td>Mississippi</td>
<td>CN</td>
<td>1 refractive exam/5 years included in physician visit limitations</td>
<td>$3/visit</td>
<td>1 pair eyeglasses/5 years</td>
<td>$2/pair</td>
</tr>
<tr>
<td>Missouri</td>
<td>CN &amp; MN</td>
<td>1 vision exam/year with or without refraction Adults who are not pregnant, blind, or residing in nursing facilities are limited to 1 exam/2 years</td>
<td>$.50-$3/service, depending on payment</td>
<td>1 pair eyeglasses/2 years</td>
<td>$.50-$3/item or service, depending on payment</td>
</tr>
</tbody>
</table>
### Table 2. Medicaid Benefits for Optometrist Services and Eyeglasses and Contact Lenses by State, as of October 2006

<table>
<thead>
<tr>
<th>State</th>
<th>Medicaid Populations</th>
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<th>Co-Pay</th>
<th>Eyeglasses and Contact Lenses</th>
<th>Co-Pay</th>
</tr>
</thead>
</table>
| Montana      | A & B (see note on population categories below this table) | A-1 refractive exam/2 years, additional exams allowed for cataract care  
B-limited to exams essential for employment | $2/visit | A-1 pair eyeglasses/2 years unless post-cataract surgery or minimum diopter correction criteria met.  
B-Limited to post-cataract surgery lenses or eyeglasses and to eyeglasses essential for employment or related to specified medical conditions including diabetes | $2/pair |
| Nebraska     | CN & MN              | 1 refractive exam/2 years | $2/visit | Minimum diopter correction required for initial and replacement eyeglasses  
Replacements 1/year and only if eyeglasses lost or unusable  
Contact lenses for specified medical conditions | $2/pair |
| Nevada       | CN                   | 1 refractive exam/2 years | - | 1 pair eyeglasses/2 years if minimum diopter correction criteria met | - |
| New Hampshire| CN & MN              | 1 refractive exam/year | - | 1 pair eyeglasses/year if minimum diopter correction criteria met, limit also applies to replacements and repairs | - |
| New Jersey   | CN & MN              | Visual aids covered when visual criteria met | - | 1 pair eyeglasses/year for over age 59  
1 pair/2 years for age 19-59 | - |
Table 2. Medicaid Benefits for Optometrist Services and Eyeglasses and Contact Lenses by State, as of October 2006

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<td>Co-Pay</td>
<td>Benefit Limitations</td>
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<td></td>
<td>Co-Pay</td>
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<tr>
<td>New Mexico</td>
<td>CN (see note on population categories below this table)</td>
<td>1 refractive exam/2 years</td>
<td>A-$5/visit or B-$7/visit</td>
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<td></td>
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<tr>
<td>New York</td>
<td>CN &amp; MN</td>
<td>• 1 refractive exam/2 years</td>
<td>-</td>
</tr>
<tr>
<td>North Carolina</td>
<td>CN &amp; MN</td>
<td>• 1 refractive exam/2 years</td>
<td>$3/visit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Dakota</td>
<td>CN &amp; MN</td>
<td>1 refractive exam/3 years</td>
<td>$2/visit</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Ohio</td>
<td>CN</td>
<td>• 1 refractive exam/2 years for over age 20 and under 60</td>
<td>$2/refractive exam visit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 exam/year for age 60 and older</td>
<td>$1/dispensing visit</td>
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<tr>
<td>Oklahoma</td>
<td>CN</td>
<td>Visits included in physician 4 visit/month limit</td>
<td>$1/visit</td>
</tr>
</tbody>
</table>
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<th>Co-Pay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon</td>
<td>A</td>
<td>1 refractive exam/2 years</td>
<td>$3/visit</td>
<td>1 pair eyeglasses/2 years</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Contact lenses if specified criteria met</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Multiple pairs, special lenses and low vision aids not covered</td>
<td></td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>CN &amp; MN</td>
<td>1 vision exam/year</td>
<td>$.50-$3/service, depending on payment</td>
<td>Limited to post cataract lenses</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 refractive exam/year,</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>1 low vision aid/2 years,</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>1 eye prosthesis/2 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhode Island</td>
<td>CN &amp; MN (Eyeglasses benefit for CN only) (see note on population categories below this table)</td>
<td>1 refractive exam/2 years</td>
<td>-</td>
<td>1 pair eyeglasses/2 years</td>
<td>-</td>
</tr>
<tr>
<td>South Carolina</td>
<td>CN</td>
<td>1 refractive exam/year</td>
<td>$2/visit</td>
<td>Limited to cataract surgery lenses and eyeglasses</td>
<td>-</td>
</tr>
<tr>
<td>South Dakota</td>
<td>CN</td>
<td>1 refractive exam/year</td>
<td>$2/procedure</td>
<td>1 pair eyeglasses/15 months if minimum diopter correction criteria met,</td>
<td>$2/lenses, frame, or repair</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 replacement contact lenses/year</td>
<td></td>
</tr>
<tr>
<td>Tennessee</td>
<td>A &amp; B (see note on population categories below this table)</td>
<td>Medical eye care only</td>
<td>-</td>
<td>Limited to 1 pair of post-cataract surgery lenses or eyeglasses</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Refractive exams are not covered</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>Medicaid Populations</td>
<td>Optometrist Services</td>
<td>Eyeglasses and Contact Lenses</td>
<td>Co-Pay</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
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<td></td>
</tr>
<tr>
<td>Texas</td>
<td>CN &amp; MN</td>
<td>1 refractive exam/2 years</td>
<td>1 pair eyeglasses/2 years if minimum diopter correction criteria met</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
| Utah          | A, B & C (Eyeglass benefit for A & C only (see note on population categories below this table)) | A-Adult coverage limited to pregnant women  
B&C-1 refractive exam/year  
• low vision therapy not covered | A- Adult coverage limited to pregnant women,  
B-Balance of exam cost over $30.  
C-$5/visit | -                             |
| Vermont       | A & B (see note on population categories below this table) | A-1 refractive exam/2 years  
B-1 refractive exam/2 years and only covered under PC Plus | No eyeglasses/lens benefit provided | -                             |
| Virginia      | CN & MN              | Refractive exams only               | No eyeglasses/lens benefit provided                | -                             |
| Washington    | CN & MN              | • 1 refractive exam/2 years  
• Orthoptic therapy not covered | • 1 pair eyeglasses/2 years  
• 1 pair eyeglasses/year for developmentally disabled | -                             |
| West Virginia | CN & MN              | 1 refractive exam/3 years           | 1 pair eyeglasses following cataract surgery       | -                             |
| Wisconsin     | CN & MN              | None specified                      | • 1 pair eyeglasses/year  
• 1 replacement/year if eyeglasses lost or broken or if minimum diopter correction criteria met | -                             |
Table 2. Medicaid Benefits for Optometrist Services and Eyeglasses and Contact Lenses by State, as of October 2006

<table>
<thead>
<tr>
<th>State</th>
<th>Medicaid Populations</th>
<th>Optometrist Services</th>
<th>Co-Pay</th>
<th>Eyeglasses and Contact Lenses</th>
<th>Co-Pay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wyoming</td>
<td>CN</td>
<td>• Limited to diagnosis and treatment of medical eye problems as permitted by law and post-cataract surgery follow-up care</td>
<td>-</td>
<td>Limited to post-cataract surgery lenses</td>
<td>-</td>
</tr>
</tbody>
</table>

Population Notes:

Kentucky
Kentucky has implemented portions of its KyHealth Choices initiative that customizes beneficiaries’ benefits to meet their specific needs. There are four plans included in the initiative.

- Global Choices (“A” on the tables) includes the standard benefit package with more extensive cost sharing and benefit caps and does not include long-term care; it targets pregnant women and parents, caretaker relatives, recipients of cash assistance through SSI or the state’s TANF (KTAP) program, women with breast or cervical cancer, medically fragile children and children in foster care.

- Family Choices (“B” on the tables) is targeted to children, including those eligible for traditional Medicaid and those covered by both the Medicaid expansion and separate SCHIP (called KCHIP in Kentucky); it includes the standard benefit package with no cost sharing for the Medicaid-covered children.

- Optimum Choices (“C” on the tables) includes the standard benefit package as well as institutional (ICF/MR) and community-based long-term care; it targets persons with developmental disabilities, and its parameters, through a Section 1115 waiver, are still being negotiated with CMS.

- Comprehensive Choices (“D” on the tables), targets the elderly and disabled in need of institutional or community-based long-term care; it includes the standard benefit package as well as long-term care services, and also relies on authority in a Section 1915 (c) waiver. Some cost sharing is required of beneficiaries in both the Optimum Choices and Comprehensive Choices plans. The plan’s designated letter on the tables notes distinctions in coverage; nuances applicable only to the separate KCHIP are not included. Any identified copayment requirements are applicable to beneficiaries age 18 and older and do not apply to preventive services; beneficiaries eligible for both Medicare and Medicaid are exempt from cost sharing.

Minnesota

- This State’s traditional Medicaid population of categorically and medically needy beneficiaries receives full benefits and is identified on the tables as “A.” Also included is the optional Medicaid buy-in group of disabled adults permissible through the Ticket to Work and Work Incentives Improvement Act (TWWIIA). These working disabled beneficiaries are allowed to continue Medicaid coverage, and receive full benefits, irrespective of annual income, however they are responsible for applicable copayments and an income-based monthly premium is required for any beneficiary with income above the federal poverty level (FPL). Minnesota has an approved Section 1115 Waiver from CMS under which it extended Medicaid eligibility to a number of previously uninsured individuals with income at or below 275 percent of the FPL, including children, pregnant women and the parents and caretakers of Medicaid and SCHIP-eligible children. The program, called MinnesotaCare, requires monthly premiums based on gross family income. Children and pregnant women receive the same benefits as the traditional Medicaid population, with no copayments, so are included within the meaning of group “A” on the tables.

- Parents and caretakers on MinnesotaCare receive a lesser benefit package and copayments apply to this group in two tiers, depending on income. The group with income at or below 175 percent of the FPL, identified as “B” on the tables, has a higher copayment requirement than the group with higher income but that variance is expected to end in mid 2007. MinnesotaCare also provides a limited benefit package to childless adults with income at or below 175 percent of the FPL but pays for the services with state funds. All MinnesotaCare
beneficiaries receive services through managed care organizations. The reference to specialty
drug products under prescription drug reimbursement relates to those drugs used by a small
number of beneficiaries with specific complex and chronic diseases, such as HIV/AIDS.
Reduced reimbursement rates are negotiated with a limited number of providers.

Montana
This State has an approved Section 1115 Waiver from CMS under which it extended Medicaid eligibility
to parents and caretaker relatives of dependent children as described in Sections 1925 and 1931 of the
Social Security Act and who are age 21 through 64 and neither pregnant nor disabled. The Basic
Medicaid Waiver for Able-Bodied Adults was modeled after the State’s welfare reform demonstration
from the mid-1990s, and provides mandatory Medicaid benefits as well as a limited package of optional
services. Specified services are not covered, including audiology, dental, durable medical equipment,
eyeglasses, optometry and ophthalmology for routine eye exams, personal care services and hearing aids,
but are available through the Essentials for Employment program if services are essential to obtaining or
maintaining employment, consistent with a typical work-related insurance program. The State provides
coverage for emergency dental situations, medical conditions of the eye and certain medical supplies such
as diabetic supplies and oxygen, as well as services that may be essential for employment. The State’s
traditional Medicaid population is identified on the tables as “A” and the expansion population covered
under the waiver is identified on the tables as “B.” Cost sharing requirements are the same for both
groups.

New Mexico
This State has added the optional Medicaid buy-in group of disabled adults permissible through the
Balanced Budget Act of 1997 in its Working Disabled Individuals program. These beneficiaries are
allowed to continue Medicaid coverage, and receive full benefits, if their income is at or below 250
percent of the federal poverty level (FPL). Beneficiaries in this group, as well as women with income
between 133 percent and 250 percent of the FPL who qualify for Medicaid through the State’s Breast and
Cervical Cancer Program (BCCP) are required to make copayments for some services. Traditional
Medicaid beneficiaries have no copayment requirements. Copayment amounts for the BCCP beneficiaries
are identified on the tables as “A” and copayment amounts for the buy-in beneficiaries are identified as
“B.” There are annual income-based costs sharing limits for each group.

Oregon
This State has an approved Section 1115 Waiver from CMS under which it implemented a prioritized list
of covered health services for its Medicaid program, called the Oregon Health Plan (OHP), based on their
comparative benefit to the population served. Through an amendment to the waiver implemented in 2003
the State extended Medicaid eligibility to a number of previously uninsured individuals. The traditional
Medicaid population, covered under OHP Plus and identified as “A” on the tables for 2004 and 2006,
includes families with income below the federal poverty level (FPL), the elderly, blind and disabled, and
pregnant women and children living in families with income at or below 185 percent of the FPL.

Rhode Island
This State has an approved Section 1115 Waiver from CMS under which it extended Medicaid eligibility
to a number of previously uninsured individuals. This program, called Rhode Island Rite Care, has
several components, for different groups at different income levels. The State has also added the optional
Medicaid buy-in group of disabled adults permissible through the Balanced Budget Act of 1997 in a
program called Working Adults with Disabilities and provides them the full scope of CN benefits
including home health agency-based personal care services. Beneficiaries are required to pay income-based monthly premiums. Services are provided by managed care organizations. Only policies related to those services available to all populations or reimbursed directly by the State are reflected on the tables.

Tennessee
This State has an approved Section 1115 waiver from CMS under which it serves two distinct populations. Tennessee Medicaid, identified on the tables as “A,” provides a comprehensive package of covered services with some limitations for adults and nominal copayment requirements for prescription drugs. TennCare Standard, identified on the tables as “B,” provides a similar package of services for adults not meeting criteria for Medicaid eligibility except this group is not eligible for long-term care services. Cost sharing requirements in TennCare Standard vary according to income level. TennCare Standard enrollees with income at or above the federal poverty level (FPL) have cost sharing obligations; those with income above 100 percent but below 200 percent of the FPL (identified as B1) have lower copayment obligations than enrollees with income at or above 200 percent of the FPL (identified as B2). All TennCare services with the exception of long-term care are provided through managed care contractors (MCCs): managed care organizations, behavioral health organizations, a dental benefits manager (for children) and a pharmacy benefits manager. MCCs have broad discretion relative to the types of providers they use as long as the providers deliver services within their scope of their licensure and have been appropriately credentialled by the MCC. Within contractual parameters, the MCCs establish their own prior authorization policies, reimbursement methodologies and payment rates. Accordingly, only limitations mandated by the State appear on the tables.

Utah
This State has an approved Section 1115 waiver from CMS under which it provides three different packages of services for its Medicaid beneficiaries. Traditional Medicaid, identified on the tables as “A,” provides a comprehensive package of covered services for primarily children, pregnant women, and the aged, blind and disabled, with some limitations and nominal copayments. Included in this category is the optional Medicaid buy-in group of disabled adults permissible through the Ticket to Work and Work Incentives Improvement Act (TWWIIA). These beneficiaries are allowed to continue Medicaid coverage if their income is at or below 250 percent of the federal poverty level (FPL); they are required to pay any applicable copayments and a monthly premium equal to 20 percent of their net income. Non-traditional Medicaid, identified on the tables as “B,” provides a smaller package of covered services for certain adults receiving or previously receiving cash assistance through the State’s Temporary Assistance for Needy Families (TANF) program, with some limitations and nominal copayments up to an annual maximum of $500. The Primary Care Network, identified on the tables as “C,” provides a very limited package of covered services for parents of Medicaid-eligible children and other adults with incomes below 150 percent of the FPL, requires a $50 enrollment fee, and has higher copayment obligations with an annual maximum of $1,000. The state does not require copayments for any preventive services.

Vermont
This State has an approved Section 1115 waiver from CMS under which it created the Global Commitment to Health. The unique provisions of this waiver cap federal Medicaid contributions at a predetermined level in exchange for State flexibility to redesign its public healthcare program. The waiver approves designation of the Office of Vermont Health Access, the Medicaid agency, as a statewide public managed care organization. Services are delivered on a fee for service basis or through the State’s primary care case management model of managed care called Primary Care Plus (PC Plus). Beneficiaries receiving healthcare coverage through the Vermont Health Access Plan (VHAP), created under previous
waiver authority, are included under the new waiver with the exception of those receiving long-term care services, who are covered under a second 1115 waiver called Choices for Care. The State’s traditional Medicaid population, including low-income families and caretaker relatives and the aged, blind and disabled, as well as optional and expansion populations of pregnant women with income at or below 200 percent of the federal poverty level (FPL), children under age 18 living in families with income at or below 300 percent of the FPL and the working disabled with net income at or below 250 percent of the FPL receive a more generous benefit package (identified on the tables as “A”) than does the VHAP population (identified on the tables as “B”). The working disabled beneficiaries in the State’s Work Incentives Initiative Program are covered as permitted through the Balanced Budget Act of 1997. The benefit package for the VHAP population is also more generous under PC Plus than under fee for service. Copayments are required for certain services. Income-based premiums are required from some of the expansion populations. In some cases, premiums are reduced if the beneficiaries secure employer-sponsored insurance.
About the National Commission on Vision and Health

The National Commission on Vision and Health strives to improve the nation’s visual health by collaborating with science and health policy experts to ensure informed analysis and policy recommendations in order to prevent blindness, improve vision, and eliminate vision health disparities. The Commission aims to provide unbiased and authoritative information and advice concerning health policy to decision-makers, health professionals, and the public at large and to integrate vision care into public health programs at the national, state and local levels. For more information go to www.visionandhealth.org.