

Envisioning the Vision Health of US Children

All Children's Health Initiative for Eye and Vision Excellence



(A.C.H.I.E.V.E.)



Edwin C. Marshall, OD, MS, MPH, FAAO, FNAP Professor Emeritus of Optometry and Public Health Indiana University marshall@indiana.edu "When people make decisions about their health – or the health of their children – the choices they make depend on the options they [knowingly] have available."

Ben Schmauss, Health Equity is Why! American Heart Association, 2019

"The health of a nation is largely a reflection of the past and present health of its children."

Forrest CB, Riley AW. *Health Affairs* 2004; 23(5):155-164

"In the United States, the most prevalent disabling childhood conditions are vision disorders including amblyopia, strabismus, and significant refractive errors."

"Low-income minority youth appear to suffer from a disproportionately high prevalence of educationally relevant vision problems, and are clearly at high risk for inadequate treatment of vision problems."

Basch CE. J Sch Health 2011; 81:599-605

Undetected vision problems can produce long-term adverse effects in the lives of children and interfere with their ability to realize full potential, satisfy needs and interact successfully with the environment

Impaired cognitive, social and physical development

Poor academic performance and interference with learning

Difficulty participating in sports and recreational activities Increased risk for depression, anxiety, social isolation and permanent vision loss

"Childhood is an incubation period for many disorders"

Forrest CB, Riley AW. Health Affairs 2004; 23(5):155-164

Institute of Medicine. *Children's Health, the Nation's Wealth: Assessing and Improving Child Health,* 2004; National Academies of Sciences, Engineering, and Medicine. *Making Eye Health a Population Health Imperative: Vision for Tomorrow,* 2016

Health Disparity/ Inequality Avoidable, systematic health differences adversely affecting the attainment of full health potential

Awareness → structural barrier



Structural inequities → screening, diagnostic, treatment, vision health disparities

Health Equity

Everyone has the fair and just opportunity to attain full health potential

Braveman P, et al. *What is Health Equity? And What Difference Does a Definition Make?* RWJF, 2017; Braveman P, et al. *Am J Public Health* 2011; 101(S1):S149-S155; Interaction Institute for Social Change | Artist: Angus Maguire

Preschool Children 3 to 6 Years with Visual Impairment

Varma R, et al. JAMA Ophthalmol 2017; 135(6):610-616



Blindness and Vision Impairment in Children and Adolescents 17 Years and Over, 2008-2018

Healthy People 2020. HealthyPeople.gov



Between 2015 and 2018, the greatest disparity in the rate of blindness and vision impairment in children and adolescents was between Black and White children and adolescents

Healthy People 2020. HealthyPeople.gov

The rate of blindness and vision impairment increased 30% for White children and adolescents and 93% for Black children and adolescents

The disparity gap grew wider from a difference of 1.5 times to 1.9 times

"Children from poor urban areas, many of whom are ethnic minorities, experience more than twice the normal rate of vision problems."

Zaba JN. J Behav Optom 2011; 22(2):39-41

"Black children and children living below 400% of the FPL had lower levels of use and expenditure, indicating that they received fewer and less intensive services."

The disparity in vision impairment and blindness for children and adolescents 17 years and younger from low income families grew to almost three times that of those from high income families Healthy People 2020. HealthyPeople.gov

Per Capita Prevalence of Children with Visual Impairment

Varma R, et al. JAMA Ophthalmol 2017; 135(6):610-616

2015





Vision Screening Legislation by State



40 states + DC mandate some type of vision screening

Children ≤17 Years with Vision Test in Last 12 Months

2018 National Survey of Children's Health (NSCH) data query Data Resource Center for Child and Adolescent Health



"Failure to detect amblyopia while it is amenable to treatment is a serious public health problem." Hunter DG. J AAPOS 2013; 17(1):2-3

Many at-risk children who are screened do not receive necessary follow-up for needed care



Approximately one-third had vision tested in eye doctor's office and slightly less than one-third in pediatrician or other general doctor's office

Children between the ages of 3 and 6 years should be screened annually

Cotter SA et al. Optom Vis Sci 2015; 92(1):6-16



Prevalence of vision disorders in Head Start children: 21% All 22% African American 18% American Indian 19% Asian 23% Hispanic 19% White Ying G, et al. *Ophthalmology* 2014; 121(3):630-636

Percent

"Visual factors are significantly better predictors of academic success . . . than is race or socio-economics."

Maples WC. Optometry 2003; 74(1):35-49

Visual symptoms inversely correlated to academic performance

Vaughn W et al. Optometry 2006; 77(3):116-123

"Preschool vision screening is critical to improving long-term vision outcomes."

Kemper AR et al. MMWR 2014; 63(2):43-46

Percent 1st Grade Children Referred for Eye Exam

Marshall EC, et al. Optometry 2010; 81(2):71-82



Black and Hispanic children 17 Years and younger experienced higher percentages of blindness or problems seeing even when wearing glasses

2018 National Survey of Children's Health (NSCH) data query Data Resource Center for Child and Adolescent Health

"Uncorrected refractive error (either because it was never diagnosed, but more commonly because an individual's spectacles are no longer appropriate to their need) is far and away the major cause of visual impairment (though not blindness)." Sommer A. Am J Prev Med 2012; 43(1):119-120

Black and Hispanic adolescents are twice as likely as white adolescents to have uncorrected distance vision impairment

Kemper AR, et al. J Adolesc Health 2012; 50:645-647

12-13 year-olds were over two times as likely to have uncorrected distance vision as 18-19 year-olds

86% were correctable to 20/30 or better in both eyes



Black and Mexican American adolescents are three times as likely as white adolescents to have inadequately corrected (uncorrected and undercorrected) distance vision impairment

Qiu M, et al. Invest Ophthalmol Vis Sci 2014; 55(10):6996-7005

Prevalence of inadequate correction: 9% All 12-19 year-olds 37% Black 37% Mexican American

Function of awareness?

Vision Impairment in Children Under the Age of 18 Years, 2007-2008 NHANES

Chan T, et al. *JAMA Ophthalmol* 2018; 136(1):12-19

Visual acuity less than 20/40 Black 89% Hispanic 89% White 85%

Visual acuity equal to or better than 20/40



Vision Through the Lens of Children: Summing Up

 Uncorrected vision problems can interfere with a child's ability to realize his or her full potential, satisfy needs and interact successfully with the environment

 Children 5 years and younger are most at risk of not having had their vision tested

• Disparities in vision impairment are increasing and greatest for African American, Hispanic children and low income children



Vision Through the Lens of Children: Summing Up

- Racial and ethnic minority children are twice as likely as white children to have uncorrected distance vision impairment and three times as likely to have inadequately corrected refractive error
- Culturally accessible vision screening, follow-up and examination for underserved and at risk populations – particularly African American and Hispanic children – is absolutely necessary to ensure eye and vision health and health equity across the lifespan

