WillsEye Hospital
America's First World's Best

Wills Eye Hospital

Community Health Needs Assessment

From

Julia A. Haller, MD
Ophthalmologist-in-Chief

Joseph P. Bilson
Chief Executive Officer

Leslie Hyman, PhD
Vice Chair for Research

Lisa A. Hark, PhD, RD
Director of Research

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Wills Eye Hospital: 840 Walnut Street, Philadelphia, PA 19107

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1.0 Executive Summary

Wills Eye Hospital is a comprehensive ophthalmology center located in Philadelphia, Pennsylvania. Wills Eye provides a full range of ophthalmic sub-specialty services and houses one of the only Eye Emergency Departments in the country. The hospital treats over 300,000 patients with eye conditions annually. As the oldest eye hospital in the nation, Wills Eye has a history of breakthrough advances that have defined best practices in vision care and advanced the science of ophthalmology. Our ophthalmology residency program is one of the top in the nation, with 8 doctors obtaining this coveted training program annually and 24 residents total in the program. Ophthalmology fellowships at Wills Eye span more than 8 ophthalmic sub-specialties and train over 15 doctors per year. The residency and fellowship programs at Wills Eye train skilled ophthalmologists who are dedicated to improving and preserving sight. Our clinical expertise makes us a referral center for patients both locally and globally. We are committed to providing accessible eye care and developing community-based outreach programs to meet the vision needs of the Philadelphia community.

The 2016 Wills Eye Hospital Community Health Needs Assessment (CHNA) was conducted to identify eye health issues for communities within the Philadelphia metropolitan area. The results have enabled Wills Eye to identify community eye care needs, develop community-based programs, and apply for federal, state, and foundation funding in order to improve the eye health of children, adults, and older adults living in Philadelphia.

The Wills Eye CHNA was developed from a systematic review of eye health in Philadelphia, focusing on major ophthalmic public health challenges including diabetic retinopathy, glaucoma, and pediatric vision conditions. Data presented in this CHNA is sourced from the Philadelphia Department of Public Health, School District of Philadelphia, 2010 U.S. Census, and results from our Centers for Disease Control and Prevention-funded cooperative agreements. Extracting from these sources, the CHNA describes the demographics of the populations in Philadelphia that are the focus of our community-based outreach programs to detect, treat, and manage various eye conditions.

The process of developing and completing the CHNA consisted of meeting with the Philadelphia Department of Public Health and furthering collaboration with our many community partners. According to the National Eye Institute, eye disease is a growing public health problem and can cause significant suffering, disability, loss of productivity, and diminished quality of life for millions of people. As an outcome of establishing community partners, the major focus areas that continued to emerge are:

- Improving access to eye care for people with diabetes
- Early detection and improved management of glaucoma
- Maintaining healthy vision by taking prescribed medications and attending eye care appointments
- Vision screening programs for elementary school-age children

2.0 Introduction

2.1 Wills Eye Hospital at a Glance

Wills Eye Hospital is a non-profit specialty hospital that was established in 1832. James Wills, Jr., a Quaker merchant, was instrumental in the founding of Wills Eye Hospital through his bequest of $116,000 to the City of Philadelphia. Mr. Wills stipulated that the funds be used specifically for the indigent, blind, and lame. Wills Eye has remained true to its founder's vision and always has been very committed to improving the health of all residents in Philadelphia and has grown into one of the world's premier eye care facilities.

Wills Eye is governed by the Board of Directors of City Trusts, hence its legal title, "City of Philadelphia Trustee, acting by the City of Philadelphia, doing business as Wills Eye Hospital." Wills Eye is recognized as one of the best eye hospitals in the U.S. according to the *U.S. News & World Report's Best Hospitals* in 2015 when it was ranked #2, and provides a full range of primary and subspecialty eye care services. Our clinical expertise, state-of-the-art diagnostic testing and advanced surgical capabilities make Wills Eye a worldwide referral center where more than 300,000 patients are treated annually.

Today, Wills Eye continues to shape the science and medicine of ophthalmology thanks to our talented, skilled physicians and staff who are dedicated to improving and preserving sight. Wills Eye Hospital is composed of a 140,000 square foot facility, which houses inpatient beds, eight operating rooms, examination rooms, multiple diagnostic testing areas, an ophthalmic library, teaching facilities, and research spaces.

2.2 Wills Eye Hospital Mission

Wills Eye Hospital's mission is to serve as a comprehensive center of ophthalmology. It is also to remain the preeminent center of excellence for vision care by creating a continuum of care accessible and responsive to the needs of the community. Wills' ophthalmologists are dedicated to the preservation and restoration of vision at every stage of care.

Wills Eye Hospital has engaged the local community to identify eye health issues and implement strategies to address the needs of the community for decades. We are committed to providing eye care to vulnerable and underserved children, adults, and older adults. The mission of Wills Eye Hospital includes:

- Provide excellent patient care to all of those in need
- Support of our medical staff
- Education of healthcare professionals and the community
- Participation in medical research

3.0 Purpose and Background

3.1 Process and Methods

The Wills Eye Hospital Community Health Needs Assessment (CHNA) has been developed and is based on principles of community engagement.[1] We began the CHNA process in 2012 by setting goals and studying the community. Race concordant staff and an awareness of cultural diversity helped us establish partnerships and build trust with distinct communities. We have conducted formal interviews and informal meetings with community leaders, government officials, and community members, to understand barriers to eye care in Philadelphia.

Our CHNA also drew from the National Eye Institute's (NEI) *National Eye Health Education Program Five-Year Agenda* (2012-2017) to determine priority areas for community-based eye health education.[2] The NEI's agenda provides strategic goals and objectives for raising eye health awareness among people at higher risk for eye disease and people living with low vision.

We began the CHNA by educating various community groups, such as the *Philadelphia Corporation for Aging, the Health Promotion Council, the Council of Spanish Speaking Organizations, the Philadelphia Senior Center, and the Philadelphia Housing Authority* about the major eye conditions in Philadelphia, including diabetic retinopathy and glaucoma. We focused on improving access to eye care, helping people maintain healthy vision as they age, and improving adherence to recommended eye examination guidelines. We also met with the Director of the Division of Chronic Disease at the Philadelphia Department of Public Health who confirmed these priority issues in Philadelphia and suggested collaborations with the *Get Healthy Philly Program* and the *Philadelphia Community Health Improvement Plan* workgroup on *Improving Access to Care*.

We also began discussions with the School District of Philadelphia in 2013 to identify the gaps in vision screening due to the increased shortage of school nursing staff. As an outcome of these meetings with the School District's Office of Specialized Services and the Director of Related Services, we initiated the *Wills Eye Vision Screening Program for Children*, to address disparities in the ocular health care of school-age children. We are conducting vision screenings for children in grades K-5, and through these screenings we are able to provide glasses to children with refractive error and refer children with suspected non-refractive eye disease to the Wills Eye Hospital Pediatric Ophthalmology and Ocular Genetics Service.

Therefore, we established the following priority areas to focus on in the CHNA:

- **Diabetic Eye Disease**
- **Glaucoma**
- **Vision and Aging**
- **Pediatric Vision Screening**

3.2 Description of Data Sources (See Section 10)

Development of this CHNA helped Wills Eye to identify community eye care needs, develop community-based programs, and apply for federal, state and foundation funding in order to improve the eye health of underserved children, adults, and older adults living in Philadelphia. In collaboration with community partners and government officials, we have developed, implemented, and evaluated numerous community-based eye detection, education, and treatment programs over a 4-year period from January 2012 to June 2016. Data presented in the Wills Eye CHNA has come from the Philadelphia Department of Public Health, Pennsylvania Department of Health; School District of Philadelphia, U.S. Census, Public Health Management Household Health Survey; Bureau of Health Statistics, Wills Eye Hospital electronic medical records, and results from our Centers for Disease Control and Prevention (CDC)-funded Cooperative Agreements. We have also incorporated goals and objectives from the National Eye Institute's *National Eye Health Education Program Five-Year Agenda* (2012-2017).[2]

3.3 Analytical Methods Applied to Identify Community Health Needs

In order to complete the CHNA, the Philadelphia Board of City Trusts directed the Wills Eye Department of Research to develop a formal process for assessing and prioritizing the ocular health needs of the local community and to implement impactful community-based programs to address those needs. We began with an extensive literature review and consulted the National Eye Institute's *National Eye Health Education Program Five-Year Agenda* (2012-2017).[2] This document presents important strategic goals and objectives for raising eye health awareness among people at higher risk for eye disease. Similar to *Healthy People 2020*[3], the agenda includes extensive focus on Priority Areas.

With the establishment of the Wills Eye Department of Research in 2012, Julia A. Haller, MD; Ann P. Murchison, MD, MPH; Lisa Hark, PhD, RD; and Deiana Johnson, MPH formed and led a Community Advisory Board. Our Community Advisory Board includes representation from health care professionals, community leaders, directors of community organizations, senior center coordinators, local religious leaders, school nurses, school principals, school district officials, and community members. Extracting from these sources, the CHNA describes the demographics of various populations living in Philadelphia, focusing on those impacted by our community-based outreach programs. Based on input from community members, our program's major foci have become: early detection, treatment, and management of diabetic retinopathy, glaucoma, vision conditions of aging, and pediatric vision conditions.

4.0 Community Health Profile

4.1 Geographic Area

Wills Eye Hospital's primary service area, for the purpose of this report, is defined as Philadelphia. This includes Center City Philadelphia, as well as North, West, and South Philadelphia (Figure 1). Ophthalmologists at Wills Eye Hospital see patients from Pennsylvania, New Jersey, and Delaware, across the United States, and other countries. Philadelphia is currently the fifth largest city in the U.S., behind New York City, Los Angeles, Chicago, and Houston. The population of Philadelphia in 2010 was 1,526,006, a 0.6% increase from the 2000 population. This is the first population increase in Philadelphia since 1950. Between 1950 and 2000, Philadelphia's population decreased by 26% from a peak of 2,071,512. This was likely due to de-industrialization, job loss, and population shifts to the suburbs.[4]

Despite being one of the oldest and most historic cities in the country, Philadelphia is a demographically young city. The 15- to 34-year-old group constitutes the largest portion of the population, and birth rates have increased over the past decade. Philadelphia is also racially and ethnically diverse, with about one-third of the population identified as non-Hispanic/Latino Whites. Non-Hispanic/Latino Blacks make up 42% of the population, Asians make up 6%; and Hispanic/Latinos of all races constitute 12%. Nearly 1 in 5 births in Philadelphia in 2010 are to women born outside of the U.S.[4]

Within the city, there is significant geographic clustering of populations by race/ethnicity. Non-Hispanic/Latino Whites comprise large portions of the population in Northeast and South Philadelphia, with non-Hispanic/Latino Blacks being concentrated in the West and North, and Hispanic/Latinos in the North and Lower Northeast parts of the city. Asians are most prevalent in South and Lower/Central Northeast Philadelphia.

4.2 Philadelphia's Population and Demographics

Center City Philadelphia has a higher percentage of adults aged 18-44 than Philadelphia as a whole (38% vs. 28%) and has more adults over the age of 44 (55% vs. 48%). More than 197,000 residents in Philadelphia identify themselves as Hispanic/Latino. The majority of Hispanic/Latinos in the Philadelphia area is of Puerto Rican descent (72%) and lives predominantly in Eastern North Philadelphia; 17% are of Mexican descent with the remaining Hispanic/Latino population from Latin America, the Caribbean, and Central America. Although they share a common language, each Hispanic/Latino community is culturally unique, and internally diverse by gender, generation, class and race. [4]

The Asian community in Philadelphia represents 6.6% of the total population (100,950 residents). Southeast Philadelphia has the largest Asian community with 13,633 (15.6%) of residents, followed by 8,647 (10.4%) in South Philadelphia west of Broad street (8,647) and 14.9% in Center City (7,964). The Asian community in Center City is predominantly of Chinese descent, while in South Philadelphia residents include immigrants from Vietnam and refugees from Cambodia (the largest population of Asian residents) as well as newly resettled refugees from Burma, Nepal and Bhutan.

Philadelphia also has the second-largest Irish-, Italian-, and Jamaican-American populations in the entire U.S. Philadelphia consists of 47 zip codes and 18 planning districts. It is known as a city of neighborhoods.[4] (Figure 1)

Figure 1. Philadelphia zip code map
Source: Philadelphia Department of Public Health. Used with permission.

4.3 Types of Patients Community Programs Serve

In order to reach vulnerable populations at greatest risk for glaucoma and diabetic retinopathy, our programs target distinct neighborhoods in Philadelphia where the poverty rate is above the national average of 10%.[4] In 2010, nearly 25% of Philadelphia families were living in poverty, representing the highest poverty rate among the top 10 largest cities in the U.S.[5,6] In addition, 19% of older adults were living in poverty. The communities in which our participants lived are in the North, Northwest, West, and South Philadelphia areas. African-Americans living in these neighborhoods are exposed to poverty at a rate of 24.8%, nearly 3 times higher than whites (8.4%). Hispanic/Latinos are more than 3 times more likely to live in impoverished communities in Philadelphia, with an average poverty rate of 25.4% (Figure 2).[5]

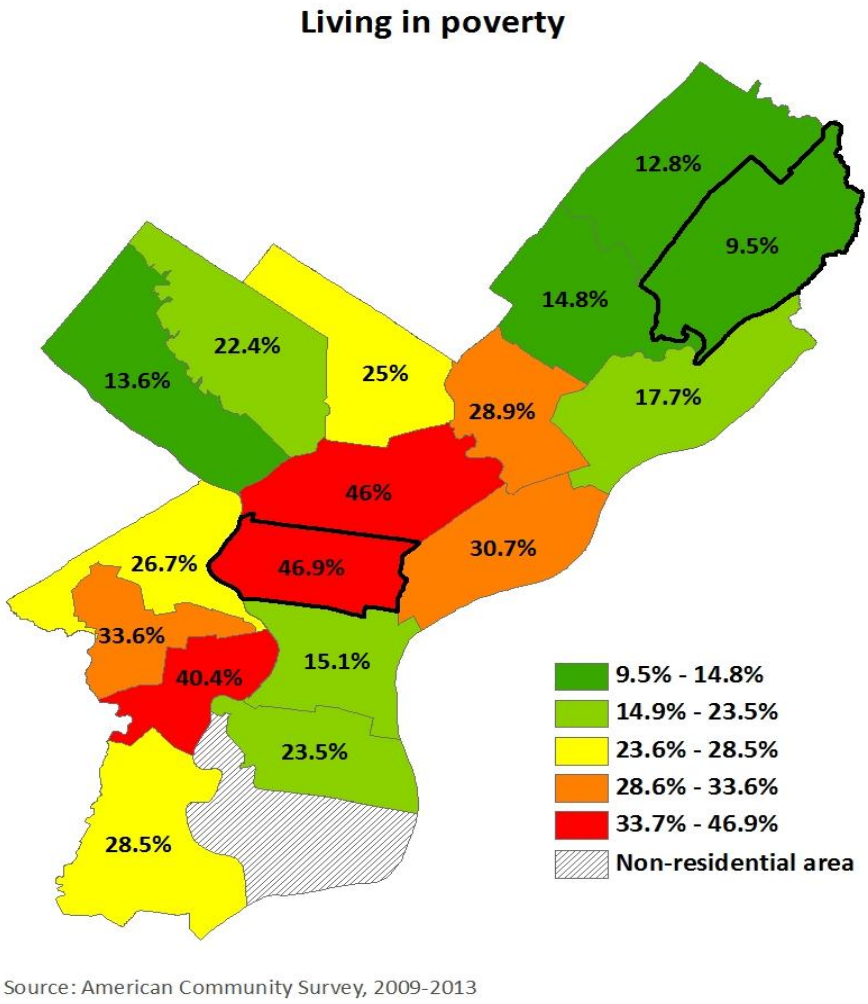


Figure 2. Philadelphia neighborhood poverty areas
Source: Philadelphia Department of Public Health. Used with permission.

4.4 Vision and Aging Related to Appointment Adherence

People diagnosed with glaucoma and diabetic retinopathy who have low attendance rates at follow-up eye exam appointments are significantly more likely to be African American or Hispanic/Latino than Caucasian.[7] Our programs serve primarily African Americans (68%) and older adults. The National Eye Institute has reported that African Americans are skeptical of and lack knowledge of eye care and are significantly less likely than other ethnic groups to attend ocular examinations by an ophthalmologist.[7-9]

Additionally, denial regarding personal risk of blindness, inaccurate health beliefs, poor patient-provider communication, and low literacy levels result in health disparities related to glaucoma and diabetes screening, treatment, management, and follow-up.[10,11] Therefore, the target population of Wills Eye Hospital's *Philadelphia Glaucoma Detection and Treatment* program consisted of a subgroup of communities who have a greater risk of developing glaucoma. This subgroup included more than 300,000 residents of Philadelphia: individuals with advancing age (60+ years), a family history of glaucoma, diabetes, and self-identification as African American, Hispanic/Latino, or Asian.

4.5 Socioeconomic Characteristics

In order to reach underserved populations at greatest risk for diabetic retinopathy and glaucoma, we have targeted neighborhoods in Philadelphia where the poverty rates are above the national average of 10%.[4] In addition, older adults were included, as 19% live below the poverty level in Philadelphia. Nearly 3 times more African Americans live in poverty than their white counterparts, (24.8% compared to 8.4%) and Hispanic/Latinos in Philadelphia are 3 times more likely to live below the poverty level than whites (25.4% vs. 8.45%).[4]

4.6 Child Poverty

In Philadelphia, 35.8% of children under 18 live below 100% of the poverty level. Similar to overall poverty, child poverty is higher in Philadelphia than in all but one of the other 11 largest U.S. counties, and it increased 24% between 2000 and 2011 (Figure 3). Despite steady improvements, only 6 in 10 Philadelphia 3rd graders read proficiently, and only 6 in 10 Philadelphia teens graduate high school on-time.[4]

4.7 Children in Single-Parent Households

In Philadelphia, 59% of children live in a household headed by a single parent. According to national data on the 11 largest U.S. counties, Philadelphia has the second highest percentage of children living in single-parent households.[4]

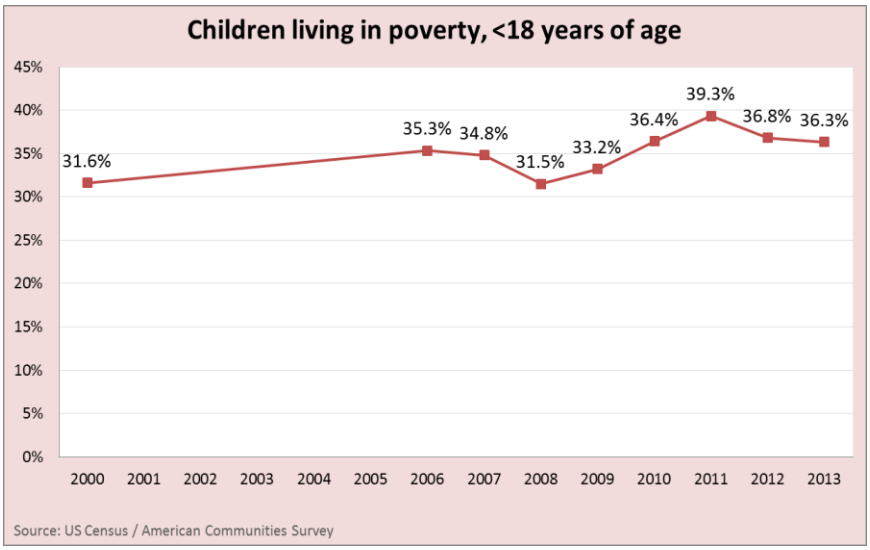


Figure 3. Children living in poverty in Philadelphia
Source: Philadelphia Department of Health. Used with permission.

4.8 Health Behaviors

Behavioral patterns are influenced by one's social circumstances and are the most important factor in premature death. While health is determined, in large part, by genetics and behavioral patterns, it is also shaped by access to healthcare and opportunities for healthy choices. Socioeconomic factors, including income, education, employment, and social support have a large impact on healthy choices. In general, people with more education have higher incomes and better chances of employment in safe workplaces with benefits, including health insurance, and sick leave.

4.9 Models to Guide Community-Based Research

According to the *National Eye Health Education Program Five-Year Agenda*, theoretical models help to inform the development, management, and evaluation of public health education initiatives because they answer the *why*, *what*, and *how* in program planning.[2] Theories guide the search for *why* people do not care for themselves in healthy ways or follow public health or medical advice. Theories help identify *what* needs to be done before developing and implementing interventions and what needs to be measured during and after implementation, and *how* to design program strategies to effectively reach individuals or populations. Public health education interventions, materials, education programs, and resources are most likely to be successful when there is a clear understanding of targeted health behaviors and their environmental contexts, and what factors need to be changed to bring about the desired change in behavior.

We recognize that health is affected by societal organization, socioeconomic factors, race and ethnicity, gender, and stages of life. We have found that there are multivariate factors affecting health issues, and several theoretical models have been and will be used to frame the development of our Community Health Needs Assessment and community programs. These include the *Behavior Change Model,* the *Disablement Process Model and the Health Belief Model.*

The ***Transtheoretical Model and Stages of Change Model:*** Prochaska and DiClemente's Stages of Change Model has been vigorously applied to smoking cessation programs, as well as other addictive behaviors and psychological distress programs. This model states that there are multiple stages in the process of change: precontemplation, contemplation, preparation, action, maintenance, and relapse. People can progress from one stage to the next or they can regress to a previous stage, either to work themselves ultimately to maintenance or regress again.

The amount of progress made is a result of the stage the person was in when beginning the program; thus, someone in the action or maintenance stage would likely be highly successful, while someone in the contemplation stage would be much less likely to be successful.[12,13] This model should, however, take into account people's misperceptions regarding their own behavior. Many think of themselves as complying with health behavior recommendations, but their actual adherence is less.

The ***Disablement Process Model*** describes how disease affects functioning in specific body systems and leads to disability. The model posits that disability is part of a complex relationship between health conditions and contextual factors. The latter refers to environmental factors (such as access to vision care) and personal factors (such as motivation, values, beliefs, and level of knowledge of eye disease). Eye disease is a physiologic dysfunction that impairs vision and results in disability (i.e., blindness), where personal (such as low literacy, inaccurate knowledge) and environmental factors (such as limited access to care) may "speed" this core pathway. We propose to improve access to care and thereby "slow" the progression to disability.

The ***Health Belief Model*** guides our understanding of how health beliefs predict one's actions to prevent, screen for, or treat disease.[14] It invokes the concepts of perceived susceptibility (one's chances of experiencing a disease), perceived severity (the severity of a disease's consequences), perceived benefits (efficacy of the advised action to reduce risk), perceived barriers (practical and psychological costs of the advised action), cues to action (strategies to activate "readiness"), and self-efficacy (confidence in one's ability to take action). The model provides the rationale for our interventions and guides the study design.

5.0. Administrative Infrastructure and Community Partners

5.1 Establish an Executive Committee

The Wills Eye Hospital Executive Committee consists of Julia A. Haller, MD; Lisa A. Hark, PhD, RD; Ann P. Murchison, MD, MPH; Jeri Mogle, Brian Burke, MPH, Kristin Jasinski, BS, Michael Allen, Esq and Neva White, DNP, CRNP, CDE. This committee has been working together to develop the Wills Eye CHNA.

5.2 Establish a Community Advisory Board

The Community Advisory Board represents an even balance of physicians, stakeholders (such as leaders of community centers), and patients (such as participants in past Wills Eye clinical trials and community programs). The Advisory Board's roles are to 1) monitor and give advice regarding the design and quality of the programs; 2) monitor and give advice on progress, including recruitment; 3) ensure the scientific integrity of the programs; and 4) ascertain whether patient-centered outcomes addressed are relevant to the targeted population. As grant applications are submitted, we have initiated several additional Advisory Boards and Data Safety and Monitoring Committees which include some of these members and well as community members who have eye diseases such as diabetic retinopathy, glaucoma, and/or low vision conditions.

5.3 Partner with Philadelphia Department of Public Health (March 2016)

On March 23, 2016, the Wills Eye Executive Committee members met with Cheryl Bettigole, MD, MPH, the Director of the Division of Chronic Disease at the Philadelphia Department of Public Health (PDPH) and Naomi Mirowitz, MPH, Director of Accreditation, Performance Management, and Quality Improvement at PDPH, to discuss current and future collaborations. These meetings resulted in an invitation for Wills Eye team members to be part of the *Get Healthy Philly* program as well as participate in the *Philadelphia Community Health Improvement Plan (CHIP)* workgroup on Improving Access to Care.

5.4 Establish Community Partners (January 2012 – December 2012)

Wills Eye research team met individually with 30 community site directors from over 10 community-based organizations in Philadelphia to determine the highest priority eye care issues facing Philadelphians and the gaps in Wills Eye's community outreach programs. Our CHNA describes the process that was used to collect and analyze data from the community. We have identified barriers to eye care and have successfully applied for funding to support programs that improve access to eye care for children, adults, and seniors in the Philadelphia community.

Beginning in January 2012, Lisa Hark, PhD, RD, Director of the Department of Research, and Deiana Johnson, MPH, Community Health Manager at Wills Eye Hospital, met with Robert Simmons, DrPH, MPH, James Plumb, MD, Rickie Brawer, PhD, and Neva White, CRNP, DNP, CDE, at the Thomas Jefferson University School of Population Health and the Jefferson Center for Urban Health. These highly experienced faculty members have a long history of working with the

Philadelphia community. Our meetings were initiated to learn about and develop our community partner relationships and have been essential to the success of our community outreach programs. We also met with Jeffrey Henderer, MD, Chair of Temple University Hospital's Department of Ophthalmology, and Mr. Darnell Wilkerson, Director of the Philadelphia Health Department's Health District Center 5, in order to conduct community eye screenings for vulnerable populations in Philadelphia.

During numerous meetings and workshops, the collaborating organizations listed below, expressed interest in working with Wills Eye Hospital. To raise awareness of eye health issues in the community, many partners requested that we conduct educational workshops about the effect of diabetes on the eyes and why community members may be at risk for glaucoma. In all of our meetings with these partners, we introduced the high rates of diabetic retinopathy in people with diabetes, the undiagnosed rates of glaucoma in high-risk populations, how vision and aging ties into keeping eye appointments, and provided education about how Wills Eye Hospital could help improve access to eye care in the Philadelphia community. Specific roles of community sites were discussed as opportunities for screening people with diabetes and those at risk for glaucoma. All of these partners have been extremely supportive of fostering new relationships with Wills Eye Hospital and we continue to work with these groups on current projects and new programs.

5.5 Collaborating Organizations

Philadelphia Corporation for Aging (PCA): PCA is a private, non-profit organization founded in 1973. PCA contracts with approximately 180 community-based organizations to deliver social and healthcare services to more than 100,000 Philadelphians annually. The PCA has established relationships with over 40 senior centers, including those owned and operated by the Philadelphia Housing Authority. We have interviewed senior center leadership and are now collaborating with many of these senior centers. We have invited PCA leadership to serve on our Advisory Board.

Health Promotion Council (HPC): HPC is a non-profit corporation founded in 1981 to implement community-based hypertension education and control programs. Now HPC has programs in four major areas, including chronic disease risk reduction and chronic disease prevention and management. The HPC collaborates with other community-based organizations, local governments, health care providers, and public health professionals. We have interviewed HPC leadership and are now collaborating with HPC. We have invited HPC leadership to serve on our Advisory Board.

Philadelphia Senior Center (PSC): For 60 years, PSC has kept thousands of seniors active and independent in their homes and communities. Three locations in Center City assist more than 5,000 underserved older adults each year, serving as a resource for recreation, group meals, financial management assistance, health and wellness education, transportation, and other supportive services. In addition, Dr. Plumb directs a full-time primary care medical practice staffed by Jefferson's Department of Family and Community Medicine physicians at PSC's main branch. We have interviewed PSC leadership and are now collaborating with many of these senior centers. We have invited PSC leadership to serve on our Advisory Board.

Center in the Park: Founded in 1968, Center in the Park is a non-profit community center in Northwest Philadelphia, primarily focused on the needs of older people. The center currently has

over 5,000 participating members. Center in the Park provides supportive services and activities such as daily meals, a fitness center, art and computer classes, transportation to medical appointments, assistance with accessing care, and numerous other services. We have interviewed Center in the Park leadership and have collaborated with this senior center. We have invited Center in the Park leadership to serve on our Advisory Board.

Council of Spanish Speaking Organizations (Concilio): Founded in 1962, the Council of Spanish Speaking Organizations, Inc. is the oldest Hispanic/Latino organization in Philadelphia and has a well-established reputation as a leader for Hispanic/Latino family services. This organization provides services to over 10,000 people annually in eastern and northern Philadelphia. We have interviewed Concilio leadership and are now collaborating by participating in health fairs and other programs. We have invited Concilio leadership to serve on our Advisory Board.

Southeast Asian Mutual Assistant Associations Coalition (SEAMAAC): Founded in 1984, SEAMAAC has over two decades of experience serving and advocating for refugees, immigrants, and those seeking asylum in the Philadelphia area. Located in central Philadelphia, it serves approximately 1,500 people and reaches another 6,000 individuals through outreach activities. We have interviewed SEAMAAC leadership and are now collaborating with these programs. We have invited SEAMAAC leadership to serve on our Advisory Board.

5.6 Government Agency Partnerships

School District of Philadelphia (SDP): The SDP is the eighth largest school district in the nation. The district is organized into 9 geographic regions encompassing 162 public elementary schools. The SDP is governed by a five-member School Reform Commission (SRC), and was established in December 2001, when oversight of the School District shifted to the Commonwealth of Pennsylvania. The Governor of Pennsylvania appoints three of the SRC members, while the Mayor of Philadelphia appoints two members of the commission. The Pennsylvania Public School Code of 1949, Section 1402(a), Act 404, requires that, "Each child of school age shall be given a vision test. The vision test shall be administered by a certified school nurse, medical technician (health room aide) or teacher." [15] Due to recent funding constraints across several Philadelphia school districts, the number of school nurses has been dramatically reduced, leading to requests from the school district for additional support from community partners and eye care services to meet these mandated eye screening requirements.

Philadelphia Department of Public Health: The mission of the Philadelphia Department of Public Health is to protect the health of all Philadelphians and to promote an environment that allows people to lead healthy lives. The department provides services, sets policies, and enforces laws that support the dignity of every person in Philadelphia. Physicians, nurses, dentists, and other healthcare providers staff the department's 8 health centers. The department supports a broad network of community, hospital, academic, and business partners throughout Philadelphia and beyond. We have interviewed Philadelphia Department of Public Health leadership and are discussing future collaborations. We are currently collaborating with the *Get Healthy Philly* program and the Philadelphia *Community Health Improvement Plan (CHIP)* workgroup on Improving Access to Care. Darnell Wilkerson, Director of the Philadelphia Health Department's Health District Center 5, is a member of our Advisory Board.

Philadelphia Housing Authority (PHA): Established in 1937, the PHA is the nation's fourth largest housing authority, housing nearly 80,000 people in the City of Philadelphia, and with a total budget approximately $400 million. The PHA develops, acquires, leases and operates affordable housing for city residents with limited incomes. The PHA's funding comes primarily from the federal government and they work in partnership with the city and state governments, as well as with private investors. We have interviewed PHA leadership and collaborated with several buildings to conduct glaucoma screenings and examinations. We have invited PHA leadership to serve on our Advisory Board.

5.7 University-Based Partnerships

Thomas Jefferson University (TJU): Founded in 1824, TJU is the largest university-based health system in eastern Pennsylvania. The university is also one of the oldest and largest private medical schools in the country. It consists of the Sidney Kimmel Medical College, Graduate School of Biomedical Sciences, College of Health Professions, School of Population Health, School of Pharmacy, School of Nursing, and Thomas Jefferson University Hospital. The mission of the university is to educate qualified students as physicians, nurses, pharmacists, biomedical scientists, and allied health personnel, to elucidate the relationship between health and disease through basic, translational, and clinical research, and to provide and promote health services as a basis for clinical education.

Jefferson Center for Urban Health: Directed by James Plumb, MD, MPH and Rickie Brawer, PhD, MPH, MCHES, the mission of the Jefferson Center for Urban Health is to improve the health and wellbeing of Philadelphia citizens of all ages by marshaling the resources of Thomas Jefferson University, Thomas Jefferson University Hospitals, and the Department of Family and Community Medicine, and by partnering with community organizations and neighborhoods. The Center's partners include schools, homeless shelters, senior centers, and faith-based communities. The Center participates in efforts that recognize neighborhood economic, social, and physical environments as underlying determinants of health. The Center also undertakes more extensive assessments, in partnership with community-based organizations, to create programs that reflect community needs, voices, and culture. Dr. Neva White, Senior Health Educator for the Center, works closely with our team on numerous community-based projects.

Jefferson School of Population Health: Robert Simmons, DrPH, MPH, MCHES, CPH, Director of the Master of Public Health degree program, is a member of our Advisory Board. This is the first designated school of population health in the U.S. dedicated to the exploration of the policies and forces that determine the health and quality of life of populations locally, nationally, and globally. Its mission is to prepare leaders with global vision to develop, implement, and evaluate health policies and systems that improve the health of populations and thereby enhance the quality of life. The school presents exemplary graduate academic programming in public health, population health sciences, health policy, healthcare quality and safety, and applied health economics and outcomes research.

Temple University Department of Ophthalmology: Dr. Henderer, Chair of the Department of Ophthalmology, continues to participate in our community-based programs. The mission of the Temple University Department of Ophthalmology is to provide high-quality eye care to the regional

community, train and educate highly competent ophthalmologists, teach basic ophthalmology to medical students, and to expand and contribute to the field of ophthalmology. Under the leadership of current department chair, Jeffrey Henderer, MD, who is also a glaucoma specialist trained by Drs. George Spaeth and Jay L. Katz at the Wills Eye Glaucoma Service, the department is currently conducting eye examinations to detect diabetic eye disease and glaucoma in the Philadelphia Health Department Health District #5. Dr. Henderer and several Temple medical students from the Temple Ophthalmology Special Interest Group provide these free eye examinations one half-day a month. The students refer individuals to Health District #5 physicians.

5.8 Prioritize Community Health Needs

According to the Philadelphia Department of Public Health's Community Health Assessment, racial/ethnic and geographic disparities are common in Philadelphia.[16] In addition, rates of diabetes, hypertension, and adults who are uninsured have increased consistently since 2000 which has implications for eye care. Neighborhoods with large racial/ethnic minority populations—particularly North and Lower North Philadelphia—have the greatest risk factors, including poverty, educational attainment, premature death, high teen births, low breast cancer screening, and increased homicide.[16] For this reason, we have focused our programs to help preserve and improve vision for people residing in these zip codes. With the assistance of our community partners, we are reaching out to people most at risk for glaucoma and diabetic retinopathy.

During conversations with the Philadelphia Corporation for Aging we became aware that 20% of Philadelphia's seniors are currently below the poverty level and many more are near poverty. (Figure 4).

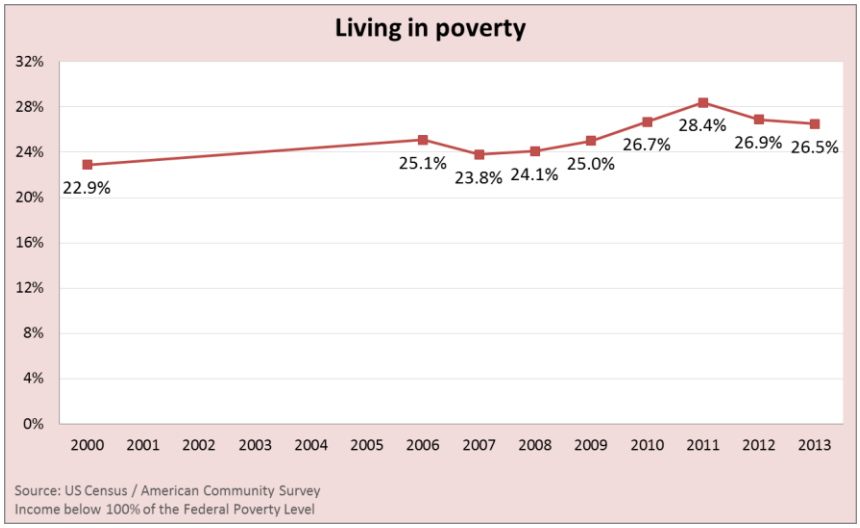


Figure 4. Adults living in poverty in Philadelphia
Source: Philadelphia Department of Public Health. Used with permission.

The need for assistance to access essential eye care is critical, but traditional outreach and education efforts often fail to reach those in need. For example, currently an estimated 18,000 low-income Medicare beneficiaries in Philadelphia have not yet applied for the additional assistance available to help them pay for Medicare Part D expenditures, despite repeated written notices from Medicare/CMS (Figure 5).

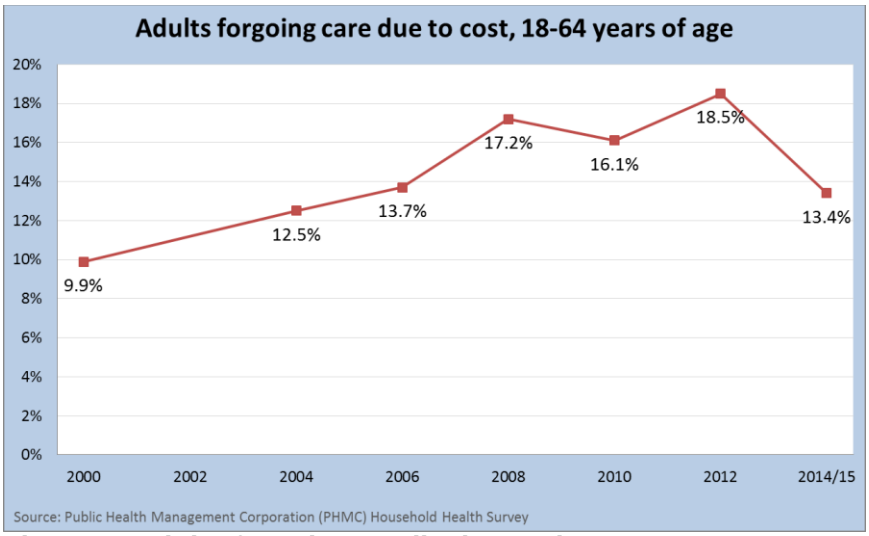


Figure 5. Adults forgoing medical care due to cost
Source: Philadelphia Department of Public Health. Used with permission.

In response to these challenges, Wills Eye partnered with organizations, universities, and government agencies that reach large numbers of at-risk African Americans over age 40 and seniors over age 60 in Philadelphia. Many community leaders suggested educational workshops as a way to increase awareness of diabetic retinopathy and glaucoma. This patient engagement process led to excellent participation rates in a glaucoma screening and examination, sponsored by the Centers for Disease Control and Prevention.

These focus areas are well-aligned with the mission of Wills Eye Hospital and have set new standards in outreach efforts for community-based eye care. We have determined that community eye care services can improve glaucoma detection by identifying and targeting those at risk and offering practical treatment and management options.[17] However, previous efforts to improve access to eye care by performing community- or hospital-based glaucoma screenings in high-risk populations have not led to improved health outcomes because of poor follow-up care.[18-22]

Patients screened for glaucoma do not consistently adhere to follow-up recommendations in office-based settings. Many patients reported difficulty scheduling and traveling to appointments.[4,20,23-25] Employing public health strategies, the project aimed to mobilize local agencies to plan, develop, implement, and evaluate an integrated, community-based, targeted intervention with the goal of improving detection, management, treatment, and follow-up eye care among people at high-risk for glaucoma and diabetic retinopathy in Philadelphia.

We also based our eye health priorities for the Philadelphia community on the National Eye Institute's (NEI) National Eye Health Education Program Five-Year Agenda (2012-2017).[2] Our strategic goals and objectives are aligned with the three priority areas listed below (Table 1).

Table 1: Wills Eye Hospital Community Outreach Goals

NEI Priority Area Three: Diabetic Eye Disease
Goal 1: Increase awareness about diabetic eye disease among people with diabetes.
Goal 2: Conduct targeted outreach to health professionals, community health workers, and others working with people with diabetes.
NEI Priority Area Four: Glaucoma Education Program
Goal 1: Increase awareness about glaucoma among people at higher risk for the disease.
Goal 2: Conduct targeted outreach to health professionals, community health workers, and others working with people at higher risk for glaucoma.
NEI Priority Area Seven: Vision and Aging Education Program
Goal 1: Increase awareness among adults ages 50 and older about eye health, eye diseases and conditions, and the importance of comprehensive dilated eye examinations.
Goal 2: Conduct targeted outreach to health professionals, community health workers, and others working with older adults.

Source: National Eye Institute Health Education Program.[2] Used with permission.

The expected outcomes are to enhance access to and utilization of eye care, and to reduce disease progression and glaucoma-related vision loss. This situation illustrates the importance of providing a unique community-based glaucoma and diabetic retinopathy screening programs that includes community-based rather than office-based education, examination, treatment, and follow-up, all free of charge to participants (Table 2).

Table 2: Approaches to Overcome Barriers to Eye Care

Barrier to Eye Care	Approach to Overcome Barrier
Reaching high-risk populations	Community-based, targeted intervention performed near or at the residency of individuals at risk or glaucoma.
Lack of trust	Collaborating with trusted local community partners; Establishing relationship with community partners and patients.
Lack of access to eye care provider	Facilitating access by providing the eye examination at the community sites and providing names of local ophthalmologists for follow-up eye care.
Need for multiple visits once glaucoma treatment initiated	Reducing number of visits by offering laser treatment at the community site and treating both eyes on the same day.
Low rate of follow-up appointment adherence	Reminding patients of follow-up eye appointments by letters and phone-calls; Providing follow-up eye appointments in the community setting.
Lack of single test to diagnose glaucoma	Establishing detection system that includes intraocular eye pressure, corneal pachymetry, visual field, gonioscopy, and slit-lamp examination in one visit.
Poor adherence with using glaucoma medication	Offering selective laser trabeculoplasty as a first line treatment as an alternative for eye drops for primary open angle glaucoma.
Language	Translated educational material; Medical interpreters on site.
Transportation	Transporting the intervention team and equipment to the community. Community and senior center managed transportation.
Lack of medical insurance	Assistance with application to charity care and referral to city health centers that provide eye care for uninsured residents of Philadelphia.
Cost of eye care for office visits and treatments	Provided comprehensive eye examination and laser treatment at no cost to the patient as part of the demonstrational project.

Source: Wills Eye Hospital Department of Research. Copyright 2016.

6.0 Identifying Philadelphia's Eye Health Priorities

6.1 Priority 1: Diabetes and Diabetic Retinopathy Data

Approximately 26 million Americans over the age of 20 have diabetes. The CDC estimates that this number will dramatically increase to 1 in every 3 Americans by 2050.[26] Nationally, the prevalence of diabetes in African-Americans and Hispanic/Latinos is high (13.7% and 11.8%, respectively) compared to the rate of diabetes in the Caucasian population (8.7%). Uncontrolled or undiagnosed diabetes causes co-morbidities including hypertension, hyperlipidemia, neuropathy, amputation, and diabetic retinopathy. According to the American Diabetes Association (ADA), the total annual cost for diagnosed diabetes in the U.S. is estimated at $245 billion. Diabetes is the underlying cause of death listed on 71,382 death certificates in 2012.[27] From 2004 to 2012, diabetes prevalence in Philadelphia increased by nearly 50% with current prevalence of diabetes in Philadelphia up to 20% (Figure 6).

CDC states that 16% of adults who reside in Philadelphia have diabetes. Adults with diabetes are more prevalent in Philadelphia than any other of the 11 largest US cities. Diabetes prevalence rose by nearly 50% between 2004 and 2012.

The quality of life (QoL) for African Americans and Hispanic/Latinos with diabetes is correlated with their level of socioeconomic status (SES), which is primarily measured by income and level of education.[28,29] African-American and Hispanic/Latino individuals with diabetes who are younger than 65 are often uninsured and have lower income and education levels compared to other racial groups.[29,30] Ali et. al. (2012) reported that poor glycemic control is most common among younger African-Americans and the uninsured.[31] Similar studies show that working-age Hispanic/Latinos often suffer from poor glycemic control, high cholesterol, and hypertension.[32]

Rates of diabetes-related complications such as diabetic retinopathy, end state renal disease, and depression are high among Hispanic/Latinos compared to other racial groups.[32-34] Racial disparities are often influenced by SES and may impact the ability to access healthcare.[35] Poor access to health care and low health literacy contribute to diabetes-related complications among African Americans and Hispanic/Latinos.[30]

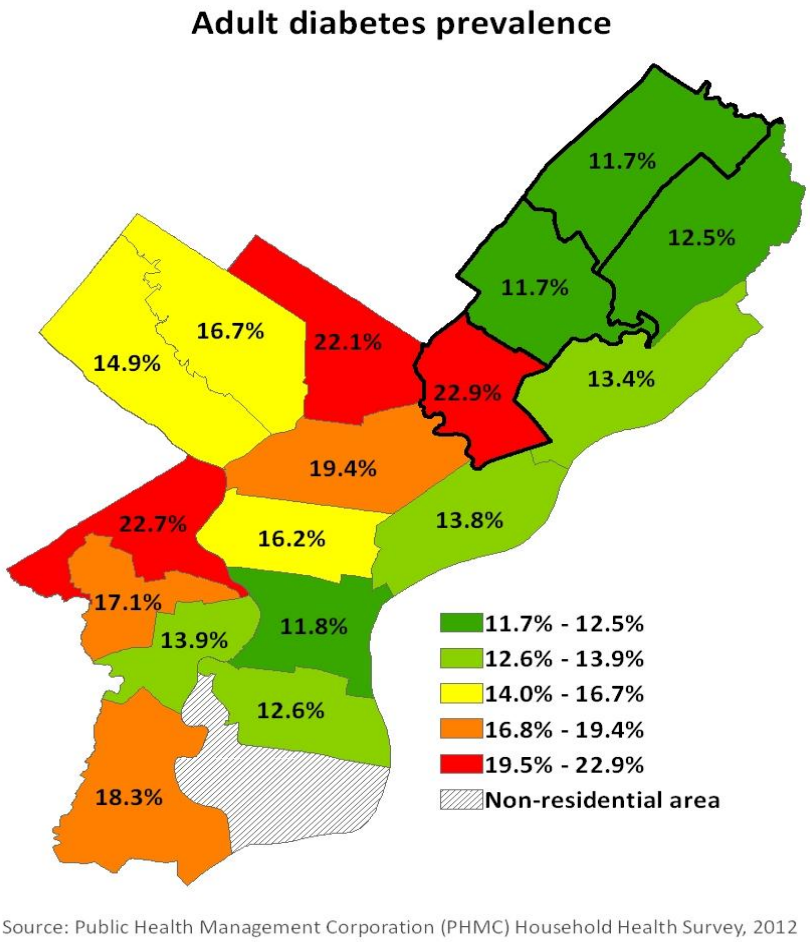


Figure 6. Diabetes prevalence in adults in Philadelphia
Source: Philadelphia Department of Health. Used with permission.

6.2 Introduction to Diabetic Retinopathy

Diabetic retinopathy (DR), a major complication of diabetes, is one of the leading causes of blindness in the U.S.[36] This vascular disorder causes microvascular damage, which leads to retinal ischemia and increased vascular permeability. Diabetic retinopathy can be non-proliferative or proliferative (which indicates that new, weaker blood vessels prone to leaking blood begin to grow in the retina) depending on severity, with a subset of patients also having macular edema.[37] If glucose is poorly controlled, the risk of DR increases. Management of DR includes early detection, glycemic and blood pressure control, and treatment with laser photocoagulation, injection and/or vitrectomy.[12,38,39] The National Eye Institute estimates that 7.7 million people age 40 and older have DR and this number will increase to approximately 11 million people by 2030.[2]

Clinical trials demonstrating the efficacy of DR treatments have led the American Academy of Ophthalmology (AAO) and the American Diabetes Association (ADA) to recommend that people with

diabetes obtain regular dilated fundus examinations (DFE) at least annually in order to reduce their risk of vision loss and blindness due to DR.[40,41] (Figure 7) Previous research has shown that DR predominantly affects African Americans with diabetes at 38.9% and Hispanic/Latinos at 34.0%, versus 26.4% of Caucasians with diabetes. Furthermore, vision-threatening diabetic retinopathy affects 9.3% of African Americans and 7.3% of Hispanic/Latinos with diabetes versus 3.2% of Caucasians.[42] Although African Americans and Hispanic/Latinos are at higher risk of having diabetes and developing DR,[42] only 46.4% of African Americans with diabetes and 53.7% of Hispanic/Latinos with diabetes receive regular DFEs.[43]

a) Normal vision b) Advanced diabetic retinopathy c) Blurred vision

Figure 7. Vision seen with normal (a) and advanced stages of diabetic retinopathy (b,c)
Source: National Eye Institute Eye Education Program

Non-adherence to primary care physician (PCP) appointments and poor adherence to DFE guidelines are a major factor contributing to the rise of DR in African Americans and Hispanic/Latinos. If patients are not seeing PCPs, they are unlikely to be screened for DR. Parker (2012) examined PCP appointment rates among various ethnic groups with diabetes and found that Hispanic/ Latinos and African Americans had the highest rates of non-attendance at PCP office appointments compared to other ethnic groups.[13]

Results also indicated that missed appointments contributed to higher hemoglobin A1C levels (>7%), higher cholesterol levels (LDL>100 mg/dL), and higher systolic blood pressure (SBP>130 mm/HG). Therefore, non-adherence to PCP appointments may result in increased incidence of disability for people with diabetes.[13] Reasons for non-adherence included education level, socioeconomic status, transportation, and degree of trust in the PCP.[13]

6.3 Importance of Dilated Fundus Examinations

The importance of obtaining DFEs for people with diabetes is paramount (Figure 8). Almost all patients with Type 1 diabetes and more than 60% of patients with Type 2 diabetes will develop DR within the first 20 years of acquiring the disease.[44] Therefore, the ADA recommends regular DFEs at least annually for patients with diabetes because the initial progress of DR is asymptomatic and early detection can help prevent vision loss.[27] Diabetic retinopathy is the most frequent cause of blindness among working-age adults, [45,46] yet nearly 50% of patients with diabetes in the U.S. do not receive any regular documented DFE.[45] This finding is in spite of the overwhelming evidence that annual DFEs combined with appropriate management can prevent up to 95% of cases of vision loss and blindness in people with diabetes.[10,44,47,48]

Failure to screen for DR represents a missed opportunity to prevent blindness. Sloan et al (2005) found that older persons who had consistent DFEs had better vision and functional outcomes than those who did not.[49] Each additional year of obtaining a DFE decreased the probability of losing reading vision or developing impaired vision or blindness.[49] The aforementioned studies document the current health disparities and illustrate the necessity for improved interventions and services that increase vision care utilization among working-age African Americans and Hispanic/Latinos with diabetes.

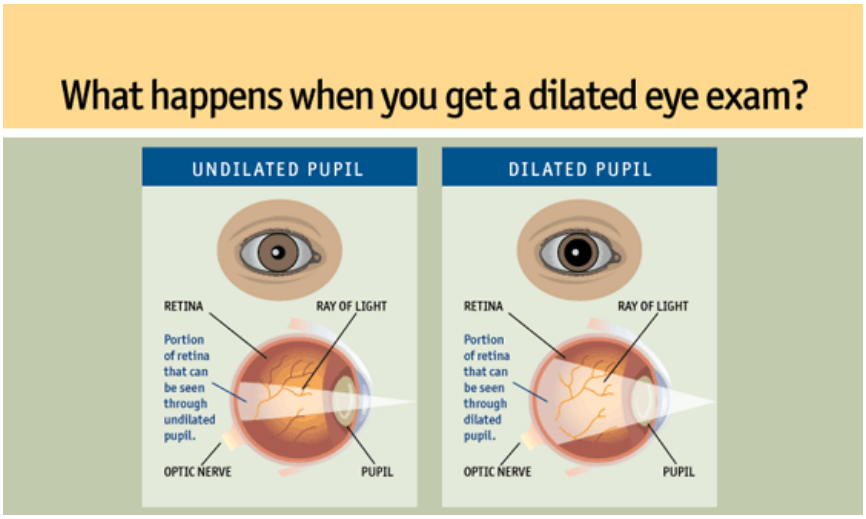


Figure 8. Dilated eye exam explanation
Source: National Eye Institute Eye Education Program. Used with permission.

6.4 Barriers to Eye Care in Philadelphia Communities (Table 2)

At least 40 million Americans do not have access to initial and follow-up health services.[50] Numerous factors, including income and insurance, may impede a person's access to overall healthcare and recommended eye care (Figure 9).[51,52] Multiple barriers make it difficult for African Americans and Hispanic/Latinos with diabetes to obtain DFEs, which significantly increase their risk for visual impairment and blindness.[53] Ellish et al (2007) conducted a study about African Americans' knowledge, attitudes, and beliefs about eye care.[54] In this study, 66% of participants reported an annual income less than $20,000 and approximately 60% believed that changes in vision loss are normal, indicating lack of knowledge and a lower probability of seeking medical attention if fluctuations in vision occur.[54]

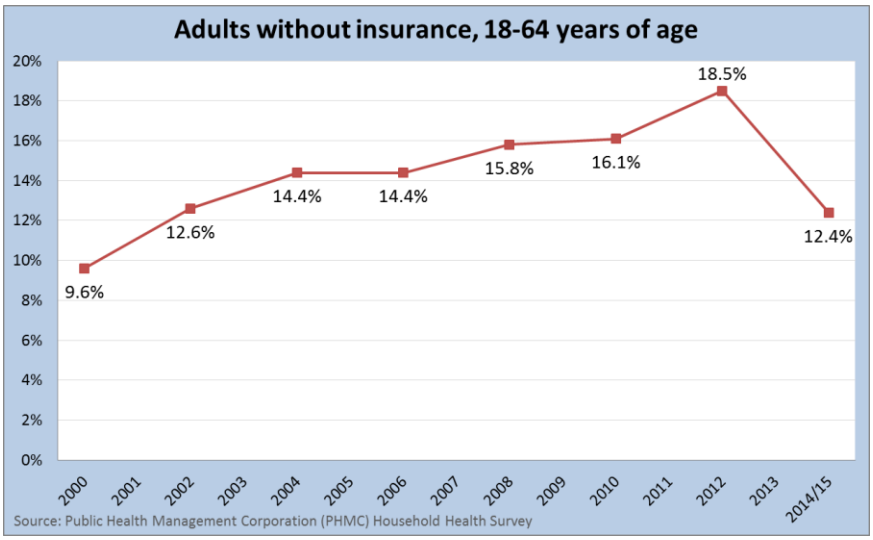


Figure 9. Adults without health insurance in Philadelphia
Source: Philadelphia Department of Health. Used with permission

Furthermore, 38% of African Americans believe they should undergo eye examinations every two years, which contradicts recommendations from the ADA and AAO, for examinations at least once every year for anyone with diabetes. Lack of knowledge and access to healthcare contribute to African Americans having the highest rates of DFE non-adherence.[54-56]

Difficulty trusting their PCP and eye care provider, lack of communication, poor service at the doctor's office, requirement for co-pays, lack of insurance, lack of social support, low health literacy, poverty, and spiritual beliefs may also decrease the rates of DFEs among the African American community.[11]

Like African Americans with diabetes, Hispanic/Latinos with diabetes also have low rates of DFE adherence. Several studies on working-age Hispanic/Latinos revealed that language, cost, lack of symptoms, lack of information from PCP, accessibility, work, and childcare are significant barriers to obtaining eye care services.[7,8,57] Another study involving Hispanic/Latinos aged 21 and older found that the participants had little knowledge of diabetic eye diseases and vision care guidelines.[8] In addition, many people within the Hispanic/Latino community, including immigrants, are not familiar with or cannot navigate the U.S. healthcare system, which may make it extremely difficult to adhere to eye care recommendations. As a result, some Hispanic/Latinos lack a PCP or seek intermittent care in emergency rooms, increasing the likelihood of diabetes complications.

While African Americans and Hispanic/Latinos share several barriers, each group has reported different risk factors. With disparities in many aspects of healthcare, diabetes will continue to affect the clinical and patient-centered health outcomes of the African American and Hispanic/Latino communities. Knowledge and access to care are key factors associated with good management of diabetes and appropriate vision care utilization. Addressing these barriers in African American and Hispanic/Latino populations with proven interventions is necessary to reduce the disparities in DFE adherence and improve health outcomes.

6.5 Pennsylvania Department of Health- Commonwealth Universal Research Enhancement (CURE) Funding

During the CHNA process, Julia A. Haller, MD and Lisa A. Hark, PhD, RD applied for and were awarded a $3.5 million grant from the Pennsylvania Department of Health to conduct a randomized, controlled clinical trial to test the efficacy of a culturally-relevant, behavioral intervention to increase rates of annual dilated fundus exams (DFE) in older (≥ 65 years) African Americans with diabetes. In this study, race-concordant community health educators administered behavioral activation or supportive therapy over four, one-hour long, home-based sessions, using an investigator-developed manual.

This clinical trial has been completed in 152 subjects and we have shown that behavioral activation is successful in getting older African Americans with diabetes to obtain DFEs. Confirmed documentation of DFEs has been obtained for 81% of the behavioral activation subjects versus 28% of control subjects. At least 4 subjects who were enrolled in this study are serving on one of our Advisory Boards and have written letters of support for grant submissions.[58]

6.6 Overcoming Barriers in Vision Care Utilization of African Americans with Diabetes

In 2012, the Wills Eye Hospital Department of Research received a 5-year $1.25 million cooperative agreement from the CDC to assess and evaluate system-level and individual-level factors that impact access to and the quality of eye care in people with diabetes. The project identified barriers and enablers to the delivery of efficacious eye care. In a retrospective chart review of over 1,900 patients with diabetes seen at the Wills Eye Cataract and Primary Eye Care Clinic within a 3-year period, the research team identified factors associated with increased eye examination adherence. In the predominantly (67%) African American sample, severity of DR, being over age 65, non-smoking status, and insulin use are associated with increased adherence to follow-up examination recommendations.

Regarding severity of diabetes and diabetic retinopathy, younger patients with mild or no DR are the least likely to adhere to follow-up recommendations.

In the second aim of the CDC project, the research team implemented a telephone-based, educational intervention to improve DFE follow-up adherence in people with diabetes (n=521). Participants randomized to the Intervention group received a brochure about diabetes and its effect on their eyes as well as a personalized letter regarding their recommended follow-up. Subsequently, community health educators attempted to contact participants by the phone up to 3 times in order to schedule a DFE. In the predominantly (72%) African American sample, participants in the telephone-based Intervention were twice as likely to schedule a DFE appointment compared to those in the Usual Care group. Participants in the telephone Intervention were also more likely to obtain a DFE than the Usual Care group (48% vs. 30%, $p<.01$). Therefore, our research projects are incorporating many of these study design elements into intervention protocols, specifically using community health educators as patient navigators to assist patients with diabetes to schedule DFE appointments.

7.0 Priority 2: Early Detection and Improved Management of Glaucoma

Glaucoma is a chronic eye condition that affects the optic nerve, which is the connection between the visual system and the brain. Fluid buildup and high pressure in the eye can damage the optic nerve, causing progressive vision loss (Figures 10a and 10b). Glaucoma is the second leading cause of blindness worldwide.[59-61]

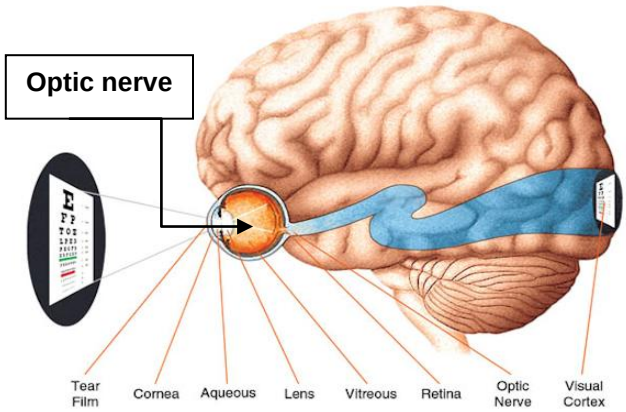


Figure 10a: Eye anatomy of the optic nerve
Source: Google Images

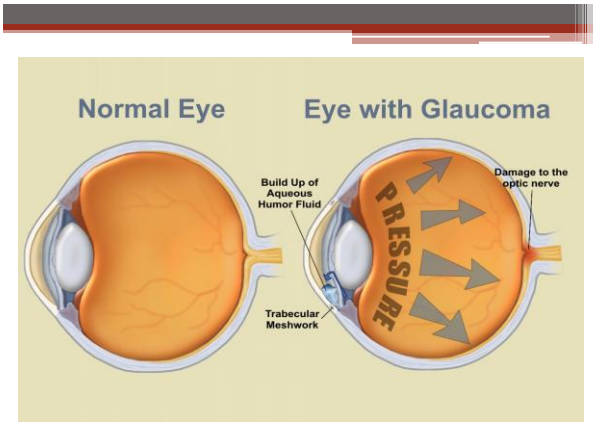


Figure 10b: Intraocular pressure in glaucoma
Source: Google Images

Vision loss due to glaucoma is irreversible.[62] Open-angle glaucoma, the most common form of the disease, affects approximately 2.2 million Americans, and increases with age. Given the rapidly aging population, the number of people with glaucoma is expected to increase by 50% to 3.36 million people by 2020.[63] Researchers expect that the increasing prevalence of glaucoma will adversely affect the quality of life in people diagnosed with this condition, as well as cause a significant economic burden to society.[62,64]

Individuals across the country may lose their ability to drive, work, enjoy leisure activities with friends and family, and ultimately lose their independence. Consequently, both *Healthy People 2010* and *Healthy People 2020* have included objectives specifically aimed at reducing vision loss related to glaucoma by 10%, from 13.9 per 1,000 people aged 45 years and older in 2008 to 12.5 per 1,000 people in 2020.[3,65]

7.1 Risk Factors for Developing Glaucoma

Risk factors for developing glaucoma include advanced age (60+ years), family history of glaucoma, and certain ethnicities.[66-68] African Americans over age 50 and Hispanic/Latinos over age 60 have an increased risk for developing glaucoma.[59,69-75] Glaucoma is 3 times more prevalent in African Americans than in non-Hispanic/Latino Caucasians. African-Americans also develop glaucoma at a younger age, which can progress more rapidly, and are almost 7 times more likely to go blind than Caucasians.[76] Asians and African Americans are also at higher risk for a condition referred to as anatomically narrow-angle,[62] where differences in eye anatomy can lead to glaucomatous changes if left untreated. The National Eye Institute has reported that African Americans are skeptical of and

lack knowledge of eye care. These populations are prone to denial of personal risk of blindness, inaccurate health beliefs, poor communication with providers, and low literacy levels. These factors can cause health disparities related to glaucoma screening, treatment, management, and follow-up.[17-19]

In all races/ethnicities, individuals diagnosed with open-angle glaucoma are significantly more likely to have co-morbidities, many of which can affect quality of life and even threaten life.[77] Older adults with impaired vision are more likely than those with normal vision to report difficulty walking, getting into or out of bed, preparing meals, grocery shopping, and managing medications.[78] They also have a higher risk of falls and fractures.[78] In addition, glaucoma severity correlates with incidence of depression.[79,80] Even for participants who are physically and mentally able to care for themselves, these challenges undoubtedly reduce their quality of life and functional status.

7.2 Importance of Glaucoma Eye Examination Appointment Adherence

When glaucoma is diagnosed in its early stages, appropriate treatment and management can almost always prevent blindness.[81-83] Unfortunately, glaucoma typically goes unnoticed until advanced stages, at which time treatment options may be limited.[62,63] Despite advancing technology and available diagnostic testing, 50% of people with glaucoma remain undiagnosed because they are asymptomatic in the early stages, may have only one eye affected, or their vision loss goes unnoticed.[62,84] As shown in Figure 11, glaucoma progresses slowly and results in changes in peripheral vision which can be detected by testing visual field. Our program aimed to identify individuals previously undiagnosed with glaucoma and provide appropriate community-based treatment and follow-up, to minimize vision loss and preserves quality of life.

Figure 11. Vision field changes associated with advancing glaucoma
Source: National Eye Institute National Eye Education Program

7.3 Philadelphia Glaucoma Detection and Treatment Project

In recognition of the known risks factors for glaucoma, the asymptomatic character of the disease, the lack of a simple screening test for the disease, and the known limitations of access to eye care among high risk populations, the Wills Eye Glaucoma Research Center initiated a distinct public health approach to reach those at high-risk for glaucoma in community-based settings.

Under the leadership of L. Jay Katz, MD, Chief of the Wills Eye Glaucoma Service and Lisa Hark, PhD, RD, Director of the Glaucoma Research Center, we applied for and were awarded a $1.8 million 2-year Cooperative Agreement from the Centers for Disease Control and Prevention (CDC) to conduct a 2-year project: *Improving Access to Eye Care Among High-Risk Persons with Glaucoma in Philadelphia*. Based on the meetings and input from our community partners, we developed the program to "improve access to eye care" by:

1) Identifying and engaging, via educational workshops, community members at high risk for glaucoma (African-Americans ages 50+ and other older adults age 60+) in underserved areas in Philadelphia who are most vulnerable to glaucoma;
2) Performing 1600 community-based eye examinations free of charge to detect glaucoma and other eye disease in these high-risk individuals; and
3) Providing community-based management, treatment, follow-up eye exams, and referrals to individuals diagnosed with glaucoma, glaucoma-suspect, or diabetic retinopathy.

Wills Eye Hospital accomplished this 2-year project, now referred to as the *Philadelphia Glaucoma Detection and Treatment Project*. By partnering with Philadelphia's community-based organizations, universities, and the Philadelphia Department of Health, we have scheduled eye examinations in 43 community-based sites. These sites are located in underserved areas such as North, Northwest, West, and South Philadelphia where most African-Americans over age 50 and other adults over age 60 living at or below the poverty level reside.[85]

The *Philadelphia Glaucoma Detection and Treatment Project* works with partner organizations to provide a broad, community health model for the recognition and treatment of glaucoma in high-risk Philadelphia populations. Partner sites helped recruit participants to this program due to their directors' and coordinator's' motivation and enthusiasm. Through the support of these partnerships, we have gained an understanding of our community members' needs and the trust of both individuals and new community partner organizations. We have improved accessibility to eye care by having screenings and follow-up visits performed at these community centers instead of in an office-based setting, at no cost to the participants.

7.4 Philadelphia Glaucoma Detection and Treatment Project Results

The Wills Eye Hospital Glaucoma Service and Glaucoma Research Center is committed to helping solve one of the major public health issues today: glaucoma. Without appropriate treatment and frequent long-term follow-up with an eye care provider, this disease can progress and cause irreversible vision loss and blindness. Our program is unique because it actively identifies community members who are at the greatest risk for glaucoma in Philadelphia. It brings eye care services directly to those who are least likely to access eye care by: 1) educating individuals about glaucoma,

its risks, and effects, using interactive, culturally appropriate teaching materials, 2) using patient navigators to help make and confirm appointments, schedule transportation, and arrange interpreter services, and 3) providing quality, personalized attention to the target populations we serve.

The project aimed to improve access to and utilization of eye care and to provide a model for a targeted community-based glaucoma program. Methods and year 1 results have been published by *Ophthalmic Epidemiology in 2016.*[86]

We successfully enrolled 1649 participants (African Americans age 50+, adults 60+ and individuals with a family history of glaucoma). A total of 1074 individuals attended a glaucoma educational workshop and 1,508 scheduled glaucoma detection examination appointments in the community setting. Community health educators from Wills Eye traveled to the sites to present glaucoma-awareness workshops. Sites included senior centers, community centers, and senior housing buildings. These 60-minute workshops were given over 2 to 6 days at each site in order to explain glaucoma, including its diagnosis, symptoms and warning signs, demographic factors that may clarify whether participants are at risk, the program's methods of examinations, and the reasons why participation could be valuable.

At the conclusion of the workshop, participants completed workshop evaluation forms and scheduled examination appointments. Pre- and post- surveys to assess knowledge about glaucoma were administered to 707 participants. There was a significant increase in the level of knowledge about glaucoma as reflected in the pre- and post- survey composite scores (M=3.86, SD=1.95 vs. M=4.97, SD=1.82, P<0.001). In the 5 largest community sites, 44% (n=221/480) of the participants who attended an educational workshop scheduled a glaucoma detection examination appointment and 76% (n=160/211) of these participants completed this eye examination in the community setting. Results confirmed these educational workshops are effective in increasing knowledge about glaucoma. Educational workshops increased knowledge and awareness about glaucoma and helped in recruiting patients for community-based glaucoma detection examinations. Results have been published *in 2016*.[87]

From January 1, 2013 to May 31, 2014, 1,649 people received a comprehensive eye examination in these community settings. A team of ocular technicians, health educators, and glaucoma specialists conducted the eye examinations which included 1) ocular, medical and family history of glaucoma 2) visual acuity 3) pupil examination 4) biomicroscopy of the anterior segment, 5) intraocular pressure 6) gonioscopy 7) undilated optic nerve evaluation by indirect biomicroscopy, 8) visual field testing, and 9) fundus imaging (Figure 12). The treatment included laser surgery and/or intraocular pressure (IOP)-lowering medications. A cost analysis was conducted to understand resource requirements.

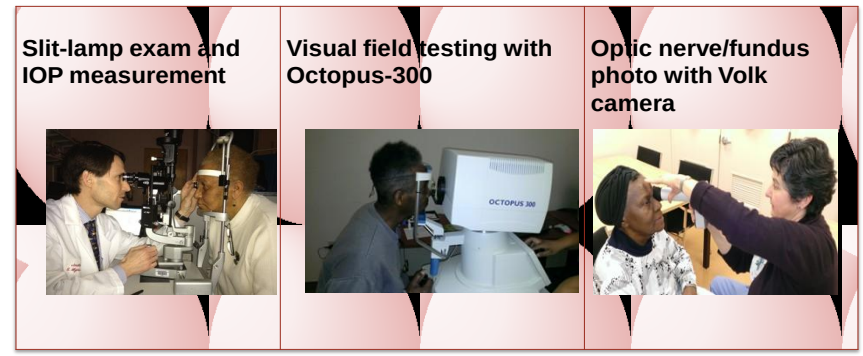


Figure 12. Glaucoma examination
Source: Will's Eye Hospital. Used with permission.

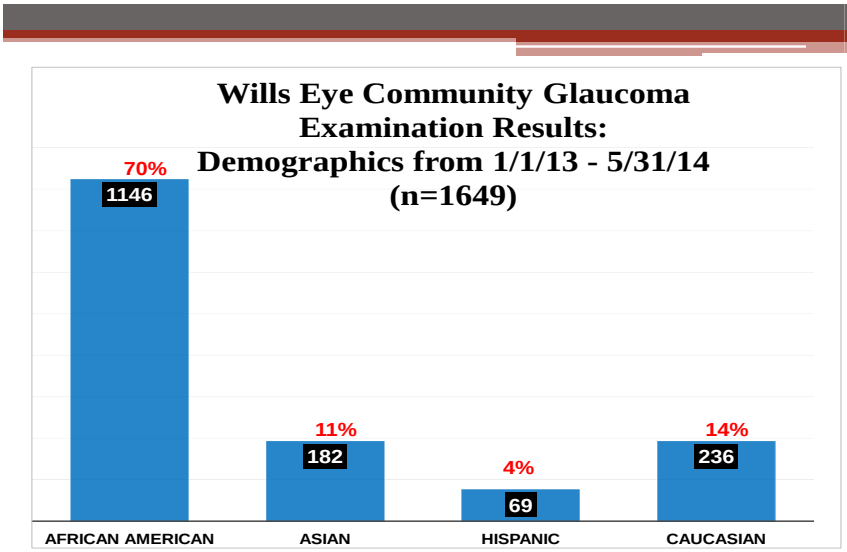


Figure 13. Demographics of Wills Eye Hospital glaucoma examinations
Source: Wills Eye Hospital. Used with permission.

Outcome measures (Figure 13) included the prevalence of glaucoma-related pathology and other eye diseases among high-risk population; the impact of educational workshops on level of knowledge about glaucoma (assessed by pre- and post-test evaluation); and patient satisfaction of the glaucoma detection examinations in the community (assessed by satisfaction survey). Treatment outcome measures are change in IOP at 4-6 weeks and 4-6 months following SLT treatment, deepening of the anterior chamber angle following LPI treatment, and the rate of adherence to recommended follow-up examinations. Cost outcomes included total program costs, cost per case of glaucoma detected, and cost per case of ocular disease detected.

7.5 Quantifiable Improvements in Patients' Access to Eye Care

Of these 1649 people examined, 39.1% were identified as having glaucoma, glaucoma-suspect, or anatomically narrow-angle, and required follow-up (Figure 14). Targeting individuals at risk for glaucoma in underserved communities in Philadelphia yielded a high detection rate (39.1%) of previously undiagnosed glaucoma-related diagnoses. Providing examinations and offering treatment, including first-line laser procedures, at community-based sites providing services to older adults is an effective strategy to improve access to eye care in underserved populations.

Our rate of previously undiagnosed glaucoma is significantly higher than nationally reported statistics, especially among African-Americans diagnosed with anatomically narrow-angle who are recommended for laser therapy. High rates of detection in this self-selected group may occur because the group was comprised mostly of older African Americans, as well as focused on targeting underserved neighborhoods in Philadelphia, where the poverty rates are very high. As stated in Section 5.0, Philadelphia is the poorest big city in America and has the highest rate of deep poverty: people with incomes below half of the poverty line.

Overall, 39.1% (n=645) of participants were diagnosed with glaucoma-related conditions; 20.0% (n=330) were identified as Open angle glaucoma (OAG) suspects, 9.2% (n=151) as having PACS/PAC, and 10.0% (n=164) were diagnosed with glaucoma, including 9.0% (n=148) with OAG and 1.0% (n=16) with PACG. A total of 39.0% (n=64 of 164) of those diagnosed with glaucoma were newly diagnosed. While the remaining 61.0% of those with glaucoma had been previously diagnosed, it was noted that many of them had not been under the care of an ophthalmologist. Of the 645 patients diagnosed with glaucoma-related conditions, African Americans made up the majority (n=433), followed by Caucasians (n=105) (Figure 13).

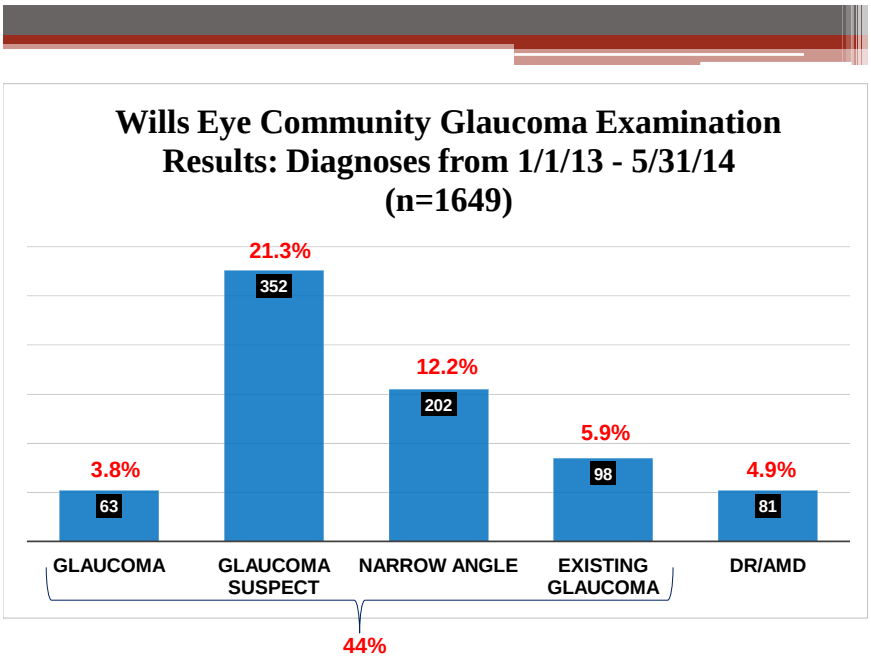


Figure 14. Wills Eye Hospital glaucoma examination diagnosis results
Source: Wills Eye Hospital. Used with permission

7.6 Follow-up Rates and Improvement

Cancellations and no-show rates for initial and follow-up visits were minimal. Approximately 80% of those scheduled for eye examinations and follow-up visits have attended, allowing the team to accommodate people who "walk-in" and signed up the same day. The convenience of community-based follow-up appointments yielded extremely promising attendance at both initial and follow-up appointments (Figure 15).

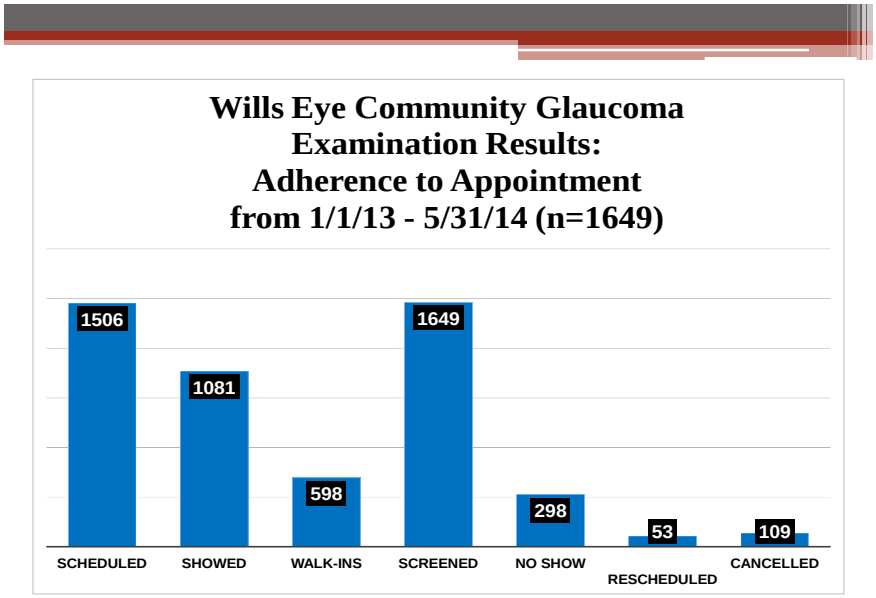


Figure 15. Wills Eye Hospital glaucoma examination adherence to appointments
Source: Wills Eye Hospital. Used with permission.

7.7 Adherence to Glaucoma Eye Exam Appointments

This program successfully screened and detected glaucoma in high-risk populations and illustrates the need for ongoing follow-up. Considering the lack of success with glaucoma patient follow-up adherence in office-based settings, this charitable program not only provides a much needed community service but also contributes new valuable scientific information regarding glaucoma and its treatment. This study serves as a model to set new standards in outreach efforts, identified by the hospital as a true need in the community.

After the 6-month follow-up visit is completed, all patients are offered future follow-up eye care with the Wills Eye Glaucoma Service, the Temple University School of Medicine Department of Ophthalmology, or with local ophthalmologists. Patients also received individual counseling about the importance of follow-up eye care by the physician, ocular technician, and community health educators.

7.8 Community-based Glaucoma Screening Satisfaction Survey Data

We surveyed community members examined in the CDC program regarding their satisfaction with their eye examinations and treatment after each visit. The vast majority (99.3%) of the responders were either very satisfied or satisfied with their glaucoma eye examination, and 99.1% reported that they were either very likely or somewhat likely to recommend the glaucoma detection examination to a friend or family member. These participants preferred to be seen at community-based rather than office-based settings, and 97% are very satisfied or satisfied with the convenience of the examinations. We continued to assess patient satisfaction at each follow-up visit. In addition, 97% of patients are very likely or likely to recommend the examination to a friend or family member (Table 3).

Table 3. Satisfaction Survey Results

Question	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
Satisfaction with the examination	82%	16%	0%	0.4%
Satisfaction with the examination duration	57%	36%	5%	0.6%
Satisfaction with the staff	86%	12%	0.4%	0.6%
Convenience of location of examination	84%	13%	0%	1%

Source: Wills Eye Hospital Department of Research. Used with permission.

This CDC funding has successfully demonstrated that the Wills Eye Hospital Glaucoma Research Center can identify, detect, treat, and manage high-risk individuals diagnosed with glaucoma and other eye diseases in the community. Additional funding has been secured from the CDC to support community-based interventions in these high-risk populations to identify, detect, treat, and manage people diagnosed with glaucoma and other eye diseases. The lasting impact of this project aims to reduce: disability, ocular health disparities, and the economic burden from vision loss due to glaucoma.

7.9 Develop Glaucoma Community-Based Research Program (2014 – 2019)

With the help of the Philadelphia Department of Public Health, Health Federation of Philadelphia, Temple University, and Public Health Management Corporation, Wills Eye has designed a 5-year community-based research project. The study is addressing how to maximize opportunities and address access to vision care gaps in 10 federally qualified health centers (FQHC) and 7 Temple University primary care Temple University practices, all located in underserved areas of Philadelphia. The targeted, diverse, populations are the focus of this research due to being at risk for previously undiagnosed glaucoma or glaucoma suspect, other eye diseases, and vision loss.

The specific aims of our project are to:

1. Determine the effectiveness of an innovative, community-based telemedicine intervention using fundus photography of the optic nerve and macula to increase the detection of previously undiagnosed glaucoma, glaucoma suspect, other eye diseases, and vision loss in high-risk populations.
2. Evaluate the effectiveness of an evidence-based, enhanced intervention using patient navigators and a social worker to improve eye care access, utilization, and follow-up care in community settings among those with newly diagnosed glaucoma, glaucoma suspect, other eye diseases, and vision impairment.
3. Conduct a comprehensive cost study to estimate the intervention costs and cost-effectiveness of detecting eye diseases and vision impairment in a high-risk population.
4. Replicate and disseminate protocols, materials, tools, and results with other communities in order to develop a public health repository of interventions to detect, manage, and follow-up with patients with glaucoma, other eye diseases, and vision impairment.

The following individuals will be included in the study:

- African American, Hispanic/Latino, or Asian individuals over age 40
- Caucasian individuals over age 65
- Individuals of any ethnicity over age 40 with a family history of glaucoma
- Individuals of any ethnicity over age 40 with diabetes

Any patient with previously diagnosed glaucoma, glaucoma suspect, or eye diseases who is currently being followed by an ophthalmologist with the last appointment being equal to or less than one year prior is not included in the study.

Phase 1 consists of detecting eye disease in 2500 eligible patients in 7 primary care offices and 10 FQHC using telemedicine (Visit 1) with a camera to photograph the back of the eye (optic nerve and macula). If eye disease is detected, patients are invited back to the primary care office for a comprehensive eye exam, which is conducted by a Wills glaucoma specialist to confirm the diagnosis (Visit 2). Based on preliminary data, 30% of patients (approximately 600) will have abnormal optic nerve and/or macula images detected using telemedicine. The predictive accuracy of the optic nerve images to detect glaucoma and glaucoma suspect as confirmed by the comprehensive eye exam will be evaluated.

Through the implementation of this initiative, we propose that tele-ophthalmology will allow earlier diagnosis of glaucoma, improve access to care for potential glaucoma suspects, and provide better disease surveillance for glaucoma patients. Our study builds upon our current infrastructure, set up in 2012, where these federally qualified health centers and primary care offices contain our telemedicine cameras. Utilizing this telemedicine technology, we are able to offer detection, referral, and ultimately, continuous follow-up care for high-risk patients diagnosed with glaucoma and other eye diseases. These technologies for glaucoma detection are still in pilot stages, and Wills Eye is an ideal institution to develop and standardize the application of tele-ophthalmology practices.

8.0 Priority 3: School District of Philadelphia and Pediatric Vision Care

8.1 Identify School District of Philadelphia Vision Screening Needs (2013 – 2014)

In addition to establishing community partners to improve access to eye care to identify diabetic retinopathy and glaucoma, beginning in April 2013 we met with members of the School District of Philadelphia to improve access to eye care for vulnerable children in the community. As, previously stated, the School District of Philadelphia is the eighth largest school district in the nation. The district is organized into 9 geographic regions encompassing 162 public elementary schools. The Pennsylvania Public School Code of 1949, Section 1402(a), Act 404, requires that, "Each child of school age shall be given a vision test. The vision test shall be administered by a certified school nurse, medical technician (health room aide), or teacher."

The Pennsylvania Department of Health regulations further specify that vision screenings, including near and distance visual acuity testing, must be conducted annually using the Snellen chart or other approved screening devices. These regulations also indicate that first grade students, second grade students, and previously unscreened students should receive color vision and stereopsis testing.

> **Due to recent funding constraints across several Philadelphia districts, the number of school nurses has been dramatically reduced, leading to requests from the school district for additional support from community partners and eye care institutions to meet these mandated eye screening requirements.**

Under the leadership of Alex Levin, MD, MHSc, Chair of the Wills Eye Department of Pediatric Ophthalmology and Ocular Genetics Service, Julia A. Haller, MD, and Lisa A. Hark, PhD, RD we were awarded a $2.2 million grant from a private foundation to develop, implement, evaluate and disseminate a 3-year community-based program to address the ocular health care disparities of school-age children. The *Wills Eye Vision Screening Program for Children*, in partnership with the School District of Philadelphia, was established to conduct in school vision screenings for children in grades K-5, provide free glasses to children with refractive error, and help children with suspected non-refractive eye disease to be evaluated by a pediatric ophthalmologist.

8.2 Develop and Implement School Vision Screening Program (2014 – 2016)

The *Wills Eye Vision Screening Program for Children* team consists of a pediatric ophthalmologist, project director, project manager, optometrist, vision screeners, optician, social worker, data manager/biostatistician, and van driver. A liaison is appointed by the School District of Philadelphia to select the schools each semester, attend all screenings, and manage parental/guardian consent form return.

Each semester, approximately 15 elementary schools are chosen by the School District of Philadelphia liaison, in collaboration with the school nurses. The majority of chosen schools are in underserved areas of Philadelphia where the principals and nurses requested assistance to comply with the Pennsylvania Department of Health required vision screening mandate. Final selection of

schools also considered other Philadelphia community-based eye screening programs to avoid duplicate efforts at any one school.

School nurses at participating schools are sent information about the vision testing procedures and the roles of the Wills Eye optometrist or ophthalmologist and optician. Team members are trained by the program director and the pediatric ophthalmologist. Ongoing training of vision screeners continues to be conducted on the job by the project managers using a manual of procedures. Students in grades K-5 are selected by the school nurse to have an eye screening if they had not previously been screened. Approximately 100-150 children are screened each day.

8.3 Pediatric Vision Screening Logistics

Figure 16. Will's Eye Hospital screening van
Source: Wills Eye Hospital. Used with permission.

Vision screenings occurred on school premises in classrooms, auditoriums, and libraries during school hours. The locations are selected based on availability, suitability, and the preference of the school's administration. The team and equipment are transported from Wills Eye Hospital to the School District of Philadelphia elementary school in a van (Figure 16). Students rotated through the stations in a set order with each child traveling with one screener through the testing stations (Figure 17).

The vision screening equipment consists of visual acuity charts [Snellen Charts, Kindergarten Eye Charts, Lea Symbols Charts, or ClearCharts (ClearChart 2 Digital Acuity System, Reichert Technologies, Depew, NY)], Ishihara pseudo-isochromatic test books (Ishihara Test Chart Book 1254, Graham Field, Atlanta, GA), stereo test books (Original Stereo Fly Stereotest, Stereo Optical Company, Chicago, IL), and auto-refractors (Spot Vision Screener VS100, Welch Allyn, Skaneateles Falls, NY). The optometrist also transports and assembles a phoropter (Phoropter 11625, Reichert Scientific Instruments, Buffalo, NY). Multiple stations are used: 1) check-in, 2) distance visual acuity, 3) near visual acuity, stereopsis, and color vision, 4) optometrist, 5) glasses fitting, and 6) check-out.

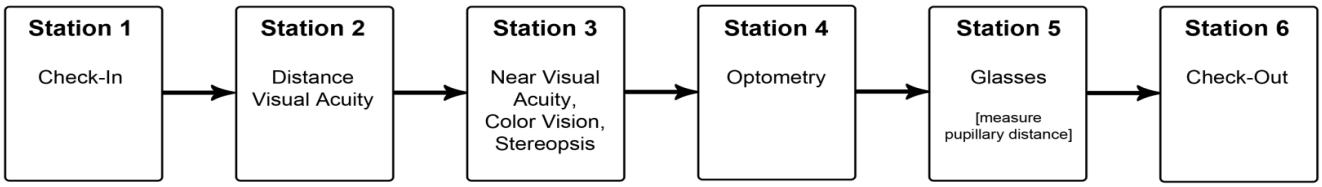


Figure 17. Vision screening stations and flow
Source: Wills Eye Hospital Department of Research. Used with permission.

Station 1) Check-In: Children are given a vision screening form on a clipboard that they carried with them as they proceed through screening stations. All information regarding screening outcomes is recorded on the form. Children are checked in by the team to confirm their name, date of birth, classroom, grade, and language(s) spoken at home. A Spanish-speaking translator is available, if needed. All children who already have glasses are encouraged in advance by their teachers to bring them to the eye screening. Students and their teachers are asked if they had ever worn glasses and whether they had lost or broken glasses. Each student is assigned a vision screener and a sticker is placed on their shirt with their name.

Station 2) Distance Visual Acuity: Methodology for assessing visual acuity is selected depending on the age and reading level of the child. Distance visual acuity testing is performed at 3 meters. For children in kindergarten or first grade, criteria for vision screening failure is visual acuity worse than 20/40, or a > 2-line reading difference between eyes.[88,89] For children in grades 2-5, the criteria for vision screening failure is visual acuity worse than 20/30, or a ≥ 2-line reading difference between eyes (Figure 18).[88,89]

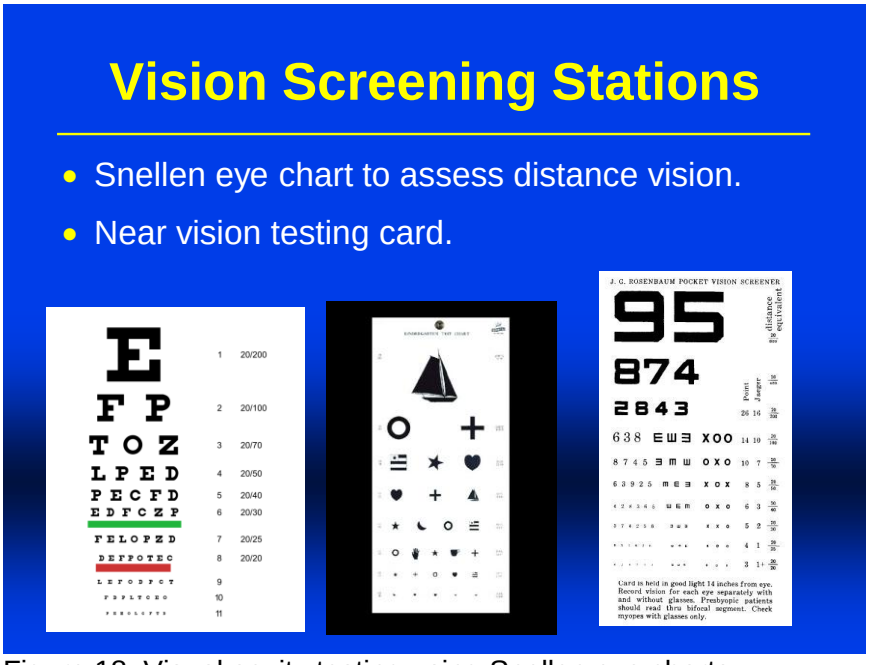


Figure 18. Visual acuity testing using Snellen eye charts
Source: Wills Eye Hospital. Used with permission.

Station 3) Near Visual Acuity, Color Vision, and Stereopsis:

- ***Near Visual Acuity:*** Methodology for assessing visual acuity is selected depending on the age and reading level of the child (Figure 19). Near visual acuity testing is performed at 76 cm. For children in kindergarten or first grade, criteria for vision screening failure is visual acuity worse than 20/40, or a ≥ 2-line interocular difference.[14,15] For children in grades 2-5, the criteria for vision screening failure is visual acuity worse than 20/30, or a > 2-line intraocular difference.[88,89]
- ***Color Testing:*** Examiners are instructed to hold the test book approximately 76 cm away from the child being screened. The child is asked to identify the number or symbol seen on each page of the book and is allotted 3 seconds per page. Children who failed this station are not referred to the optometrist for further evaluation unless there are other coexisting vision or eye abnormalities.
- ***Stereopsis Testing:*** Children are asked to identify the fly's raised wings and raised animals. A child is considered to have passed this test if they accurately identified 2 of the 3 animals. Children who failed this station are referred to the optometrist for further evaluation.

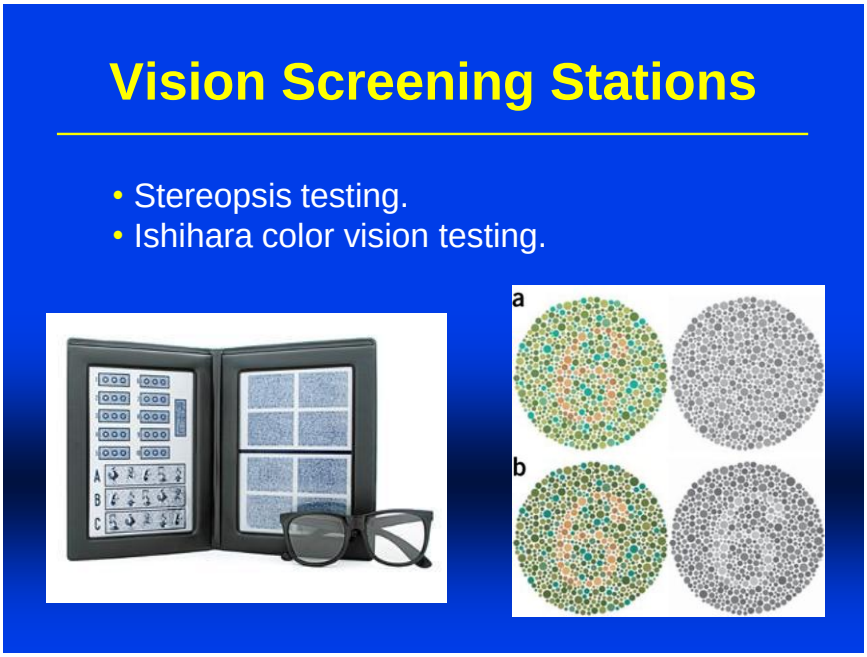


Figure 19. Stereopsis testing and Ishihara color vision testing
Source: Wills Eye Hospital. Used with permission.

Station 4) Optometrist or Ophthalmologist: The optometrist used manifest refraction (no cycloplegic agents) to determine if a child's visual acuity could be corrected using the phoropter. She/he also assesses ocular alignment. If the best corrected visual acuity is still below the pass criteria or any ocular pathology is seen or suspected, a referral is made to a WEH pediatric ophthalmologist. Glasses are prescribed by the optometrist for children in grades 2-5 with visual acuity worse than 20/30 and children in grades K-1 with a visual acuity worse than 20/40 or a ≥ 2-line interocular difference whose refractive error is able to be improved or corrected using manifest refraction.[89]

Station 5) Glasses: Children who need glasses visit the optician's station, where pupillary distance is measured using a pupillary distance ruler (Graham-Field Health Productions, Atlanta, GA). Children also select from 20 glasses frames that are available on site and include a combination of sizes, colors, and styles. Each pair of glasses costs the program $14.50.

Station 6) Check-Out: Parental Communication and Consent: The protocol has been approved by the school district as an extended screening in compliance with state requirements. Parental consent is therefore not required for screening. Parental consent is required for children to be given glasses or to be contacted by the social worker upon being referred to a pediatric ophthalmologist.

Consent Form Return: For children who pass their examination and do not require glasses, a letter to the parents is sent home with the child. For children who failed the screen and either required glasses or a referral to a pediatric ophthalmologist a letter to the parents and a consent form are sent home with the child. A self-addressed, stamped envelope is provided for the parents to return the consent form. Children who speak a language other than English at home are sent consent forms both in English and in one of several other available languages.

The *glasses consent* form informs parents of the child's screening failure and requests consent for two pairs of glasses to be made and fitted for the child at no charge to the family. The *referral consent* form allows the Wills Eye Pediatric Ophthalmology Services' social worker to contact parents and assist with scheduling children for a follow-up eye appointment. All parents who are sent the *referral consent* are also requested to return a brief questionnaire in a self-addressed envelope indicating whether their child is currently seeing an eye care provider. Families who did not have eye care in place are offered an incentive to attend the referral examination by an offer of two complimentary movie tickets if they attended.

The School District of Philadelphia liaison keeps track of consent returns and conducts up to three phone call reminders to parents if consent forms are not returned within four weeks. This task is conducted by the liaison at the district headquarters to maintain confidentiality. All consent forms received by the liaison are shared with the Wills' team. We retain no record of the names or personal health information of any child until such consent is received. A coding system is used to match fitted glasses with students until receipt of the consent at which time the code is broken. A summary of the vision screening flow chart is presented in Figure 20.

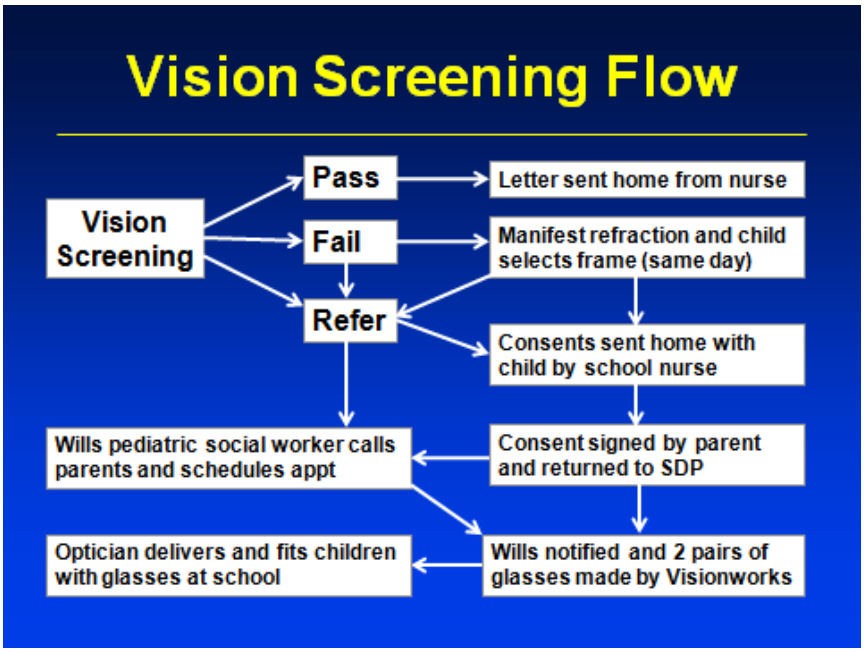


Figure 20. Vision screening flow chart
Source: Wills Eye Hospital. Used with permission.

8.4 Pediatric Vision Screening Data

Caucasian children and children living in higher income families are more likely to have a diagnosed ocular condition compared to children who are uninsured or non-Caucasian.[90-92] Underserved, non-Caucasian children are under-diagnosed for ocular conditions because they are less likely to access to eye care services.[93,94] African American and Hispanic/Latino children, and children from poor, urban neighborhoods, have higher rates of failed vision screenings and are more likely to have visual impairment due to uncorrected refractive error (Figure 21).[95]

According to the National Center for Educational Statistics, African American and Hispanic/Latino children have lower reading and mathematics scores than Caucasian children in the United States.[96,97] Because childhood eye disease can lead to poor academic performance, lack of eye care for underserved children may further widen this achievement gap.[90,98] Over 20% of school-aged children experience a refractive or non-refractive ocular condition.[90] The World Health Organization (WHO) estimates that 37% of cases of child visual impairment are due to non-refractive eye disease, with a total of 7 million children between 5–15 years old worldwide affected.[99] Uncorrected eye disease during childhood has the potential to lead to irreversible vision loss due to amblyopia. [91,100]

School vision screening exams are the first indication of ocular disease in approximately 76% of children under 13 years of age.[101] While these screenings serve as a vital function in detecting ocular disease, most children's vision screening programs do not treat the ocular abnormalities that are identified. In the School District of Philadelphia, approximately 20,000 children failed a school vision screening in 2007.[101] However, 13,834 of these children did not receive follow-up care or treatment following this failed screening.[101] These numbers have remained approximately stable in subsequent years.[102]

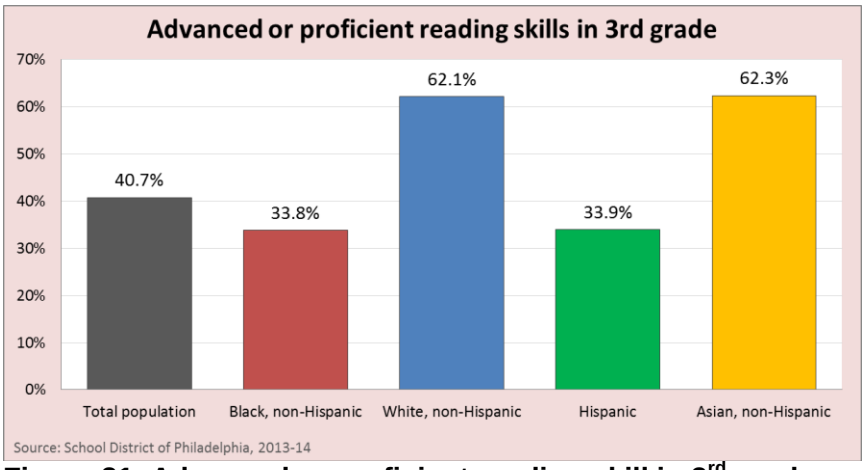


Figure 21. Advanced or proficient reading skill in 3rd grade
Source: Philadelphia Department of Public Health. Used with permission.

8.5 Wills Eye Vision Screening Program for Children Results

Between January 2014 and June 2016, a total of 18,916 children were screened at 78 School District of Philadelphia schools. A total of 15,729 children (83%) passed the screening. A total of 3181 children (17%) failed the screening and required glasses, and 782 children (4%) were referred for a pediatric ophthalmology assessment due to suspected non-refractive eye disease (Table 4). Of the 2399 children who exhibited refractive error, 1584 (66%) returned their consent form, allowing two pairs of glasses to be made and fitted (Table 4). Of the 509 children referred for follow-up eye exams, 317 (41%) returned their consent form allowing the social worker to call and schedule an appointment (Table 3). Of the 317 children referred to WEH, 271 (85%) did not have a current eye care provider. Of these 271 children, 175 (65%) completed their exam at Wills Eye Hospital. Results have been submitted to the *Journal of Pediatric Ophthalmology and Strabismus in 2016.*

Outcome Data Summary

Academic Year	Children Screened N (%)	Children Passed N (%)	Children Failed N (%)	Children Referred N (%)	Glasses Made (2 per child) N
Spring 2014	2775	2223 (80%)	549 (20%)	136 (5%)	582
Fall 2014	4523	3855 (85%)	668 (15%)	183 (4%)	800
Spring 2015	3428	2815 (82%)	613 (18%)	190 (6%)	654
Fall 2015	4151	3514 (85%)	639 (15%)	156 (4%)	838
Spring 2016	4039	3322 (82%)	712 (18%)	117 (3%)	720
Total	18,916	15,729	3,181	782	3,594

Table 4. Wills Eye Hospital School Vision Screening Program for Children Results
Source: Wills Eye Hospital. Used with permission.

We detected and treated refractive error on site and provided the opportunity for follow-up and non-refractive ocular care by providing glasses and facilitating attendance at a pediatric ophthalmology visit through social work support and the incentive of two complimentary movie tickets. A referral visit adherence rate of 72% was observed. Vision screening studies that have not utilized medical social workers report follow-up adherence rates between 30%-45%, while vision screening studies utilizing medical social workers without incentives have exhibited adherence rates between 53%-59%.[103-106] Our higher adherence rates may be due to our social worker's assistance in overcoming barriers and navigating health insurance plans, as well as a movie ticket incentive for returning consent forms.[102,107,108]

We have a high consent return rate of 67%, compared to a similar school vision screening program performed at two schools, which yielded consent return rates of 48% and 57%.[109] Our glasses consent form return rate of 77% is high, and there is a low referral consent return rate of 42%. Of the 1,321 children who are prescribed glasses, 1,015 (77%) returned the glasses consent form. Of the 509 children who are referred for pediatric ophthalmology consultation, 215 (42%) returned the referral consent form. The difference is likely due to the free glasses as an incentive. As also indicated by the response to the movie tickets, incentive-based systems should be considered in future school vision screening studies to maximize referral visit adherence.

We also believe that the direct working relationship with the School District of Philadelphia facilitated glasses consent adherence. By further taking advantage of the relationship between the School District of Philadelphia and WEH, the WEVSPC might be strengthened. Barriers to consent form return may include inadequate or misperceived communication between parents and schools following school-vision screening. A brief mentioning of the vision screening program at parent-teacher conferences might result in more parent-school communication, which may lead to a higher consent form return rate.[110]

Following the receipt of eyeglasses by the school, a two-item recall questionnaire was distributed to teachers. The survey contained two Likert scale questions inquiring the frequency of eyeglass usage and, if applicable, the reasoning as to why the child was not wearing the eyeglasses. Teachers reported eyeglass usage on a 5-point scale, with 1 representing glasses wear "all of the time (>90% of the time)" and 5 representing "never" over the previous two weeks. If the child was not wearing the eyeglasses, the staff member had the options "lost," "broken/damaged," "does not like them," or "no perceived benefit" as the rationale.

Teachers who completed the adherence questionnaire were informed that they would receive two complimentary movie tickets to a common public commercial movie venue. Adherence data was received for 46.5% of the students who received eyeglasses. According to this data, 67.4% of the students wore their eyeglasses more than 75% of the time. Of the 55 children who never wore their eyeglasses, 20 lost their eyeglasses, 20 had no perceived benefit from their eyeglasses, eight did not like their eyeglasses, and seven had broken or damaged eyeglasses (Table 5).

Table 5. Eyeglasses Adherence Data Collected from Teachers

Covariant	Children, N (%) N=178
Adherence	
All of the time (>90%)	68 (38.2)
Most of the time (75%)	52 (29.2)
Some of time (50%)	25 (14.0)
Rarely (>25%)	16 (9.0)
Never	17 (9.6)
Reasons for Not Wearing Eyeglasses	**Children, N (%) N=55**
No perceived benefit	20
Lost	20
Does not like them	8
Broken/Damaged	7

Source: Wills Eye Hospital Department of Research. Used with permission.

In addition, the lack of data obtained on adherence of eyeglasses usage is a limitation when trying to determine the academic impact of wearing eyeglasses. Reasons reported for not wearing eyeglasses included no received benefit, lost, broken or damaged eyeglasses, and the child forgetting to wear the eyeglasses. These reasons provide insight on issues that need to be addressed in future vision screening programs providing eyeglasses. Further studies should examine methods to overcome this barrier, such as educating parents on the importance of reminding their child to bring their eyeglasses to school, wearing their eyeglasses, and utilizing their second pair of eyeglasses if the first pair is no longer available.

8.6 School Vision Screening Satisfaction Survey Data

Satisfaction Survey: Following the screening, a survey has been sent to 75 school staff members, including 37 principals, 37 nurses, and 1 administrator at the 45 participating schools over three semesters. The survey contains 7 Likert scale questions with 5 representing "strongly disagree", and 1 representing "strongly agree" and 2 free-response questions. The Likert scale questions assess how much of an impact the nurses and principals felt the program had on their students' vision, the professionalism and skills of the vision screening staff, the quality of the vision screening staff's interactions with the children, the responsiveness of the program to the school's needs, whether the nurses and principals would want us to return the following year, and if they would recommend the program to other schools. One free-response question asks for opinions regarding the barriers to parents returning consent forms and potential solutions. The final free-response question asks for general feedback and comments for improving the program.

The satisfaction survey results reflect responses from 29 school staff members, including 15 school nurses, 13 principals, and 1 administrator (39% response rate). More than 85% of respondents strongly agreed that the vision screening program positively impacted the school and the children and that the vision screening staff is professional, skilled, and worked well with the children. Over 85% of respondents agreed that they would want the WEVSPC to return to their school and that they would recommend the program to other schools and school nurses. More than 71% of respondents strongly agreed that the program is responsive to their needs. The full results of the survey are shown in Figure 23.

One potential reason for the positive response is how the program helped school nurses to meet the mandated Pennsylvania eye screening requirements. Additionally, the structure of the school vision screening, with each child travelling with one screener through the testing stations, allowed for a more organized screening environment, making the program less disruptive to the school day. One limitation of the satisfaction survey is the low response rate exhibited. The satisfaction survey results are also subject to non-response bias.

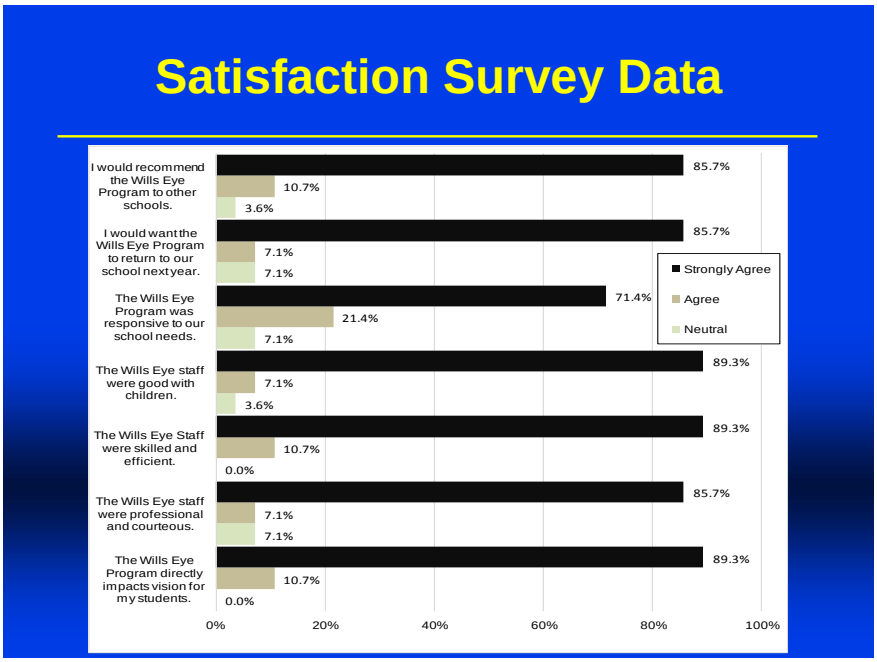
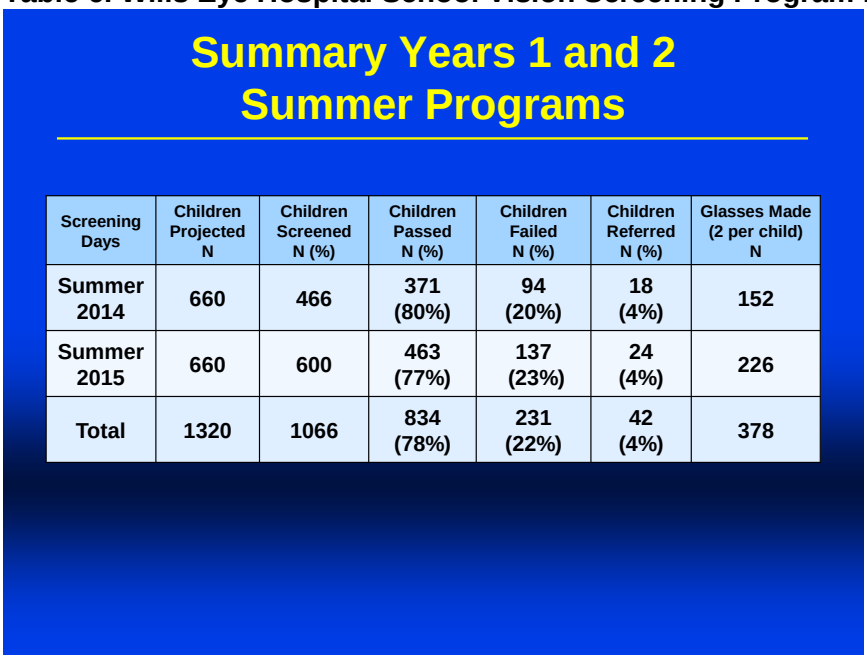


Figure 23. Wills Eye Hospital school vision screening program for children results
Source: Wills Eye Hospital. Used with permission.

8.7 Summer Program Pediatric Vision Screening Results (2014 and 2015)

During the summers of 2014 and 2015, a total of 1066 children (mean age, 8.6 years; age range; 54% boys) were screened at 6 Boys and Girls Clubs of America (BGCA), 5 Summer Skills Reading Programs, and Girard College. Most children (60%) are between second and fifth grade. A total of 834 children (78%) passed, 231 children (22%) failed the screening, and 42 children (4%) were referred to the Wills Eye Pediatric Ophthalmology and Ocular Genetics Service. Vision screening results for Summer 2014 and 2015 are shown in Table 6.

Table 6. Wills Eye Hospital School Vision Screening Program for Children Results



Summary Years 1 and 2
Summer Programs

Screening Days	Children Projected N	Children Screened N (%)	Children Passed N (%)	Children Failed N (%)	Children Referred N (%)	Glasses Made (2 per child) N
Summer 2014	660	466	371 (80%)	94 (20%)	18 (4%)	152
Summer 2015	660	600	463 (77%)	137 (23%)	24 (4%)	226
Total	1320	1066	834 (78%)	231 (22%)	42 (4%)	378

Source: Wills Eye Hospital. Used with permission.

8.8 Girard College Vision Screening

Girard College was formed by an unprecedented act of American philanthropy and constructed and endowed from the fortune of Stephen Girard (1750 - 1831). Girard College is a boarding school for academically capable students, grades 1 through 12, from families with limited financial resources, each headed by a single parent or guardian. Girard College is now owned and managed by the Philadelphia Board of City Trusts, which also governs Wills Eye Hospital. Because of the success of our vision screening program in the Philadelphia schools, the leadership at Girard College invited our team to conduct vision screenings for grades K through 6. A total of 90 children were screened at Girard College and the results are shown in Table 7.

8.9 Intensive Reading Program Vision Screening

During the month of July 2015, in collaboration with Pennsylvania State Senator Vincent Hughes and the Free Library of Philadelphia, we were invited to conduct vision screenings as a part of the intensive summer reading program "Read to Succeed", held in 5 schools during July. All children enrolled in the program from grades 1 through 5 are invited to participate. A total of 202 children received vision screening at the Intensive Summer Reading Programs in 2015.

Table 7. Wills Eye Hospital School Vision Screening Program for Children Results

Vision Screening Results (Summer 2015)

Summer Program Name	# of Screening Days	Children Screened	Children Passed	Children Failed	Children Referred	Glasses Made (2 per child)
Girard College	1	90	67	23	2	42
BGCA Chester	1	49	40	9	0	18
BGCA West Kensington	1	76	56	20	1	38
BGCA Germantown	1	46	35	11	1	20
BGCA Bridesburg	1	26	20	6	1	10
BGCA Vaird	1	84	62	22	4	36
BGCA NE Frankford	1	27	23	4	0	8
Summer Skills Gompers	1	44	36	8	3	10
Summer Skills Cassidy	1	43	36	7	3	8
Summer Skills Ethel Allen	1	43	34	9	3	6
Summer Skills Locke	1	41	34	10	5	5
Summer Skills Mifflin	1	31	23	8	1	7
Totals	12	600	463 (77%)	137 (23%)	24 (4%)	226

BGCA=Boys and Girls Clubs of America
Source: Wills Eye Hospital. Used with permission.

9.0 Community Input

9.1 Interviews with Community Members

Individual interviews are conducted with all of the partners described in Section 3.0. These individuals work with health care and community-based organizations that understand the health and underlying social conditions of the people in their neighborhood and broader community. These interviews are conducted to identify community eye care needs, develop community-based programs, and apply for federal, state, and foundation funding in order improve the eye health of children, adults, and older adults living in Philadelphia. The process of developing and completing the CHNA consisted of meeting with the Philadelphia Department of Public Health and establishing many community partners over a 4-year period from January 2012 to January 2016. We are able to gain insight about health needs and priorities, barriers to improving community health, and the community assets and efforts already in place or being planned to address these issues and concerns.

> ***Member of the West Philadelphia Senior Community Center*** –
> *"I teach classes here at the community center to fellow seniors. Education is important for seniors because they have the tendency to not take health matters seriously until it is too late. Education also has to be done on a consistent basis because seniors often forget. The Wills Eye glaucoma screening program not only provides free eye care but also educational workshops that reinforce the importance of vision."*
>
> *"During health classes here at the Center, other seniors tell me about different health concerns they have, or they talk about not knowing who to trust or knowing where to go to obtain needed help. Many seniors cannot afford to go to the eye doctor regularly, especially those who rely totally on Social Security as their primary means of income. My father had glaucoma, and two siblings had corneal transplants. This has really reinforced, for me, the importance of caring for the eyes. The Wills Eye Program has been extremely important to the Center. The program has built trust with senior members, so that they understand the importance of eye care as well as the need to obtain regular eye exams."*

9.2 Community Partners and Locations

Community Partner	Address
African American United Fund	2227 N. Broad Street Philadelphia, PA 19132
Angela Court Apartments	4400 Fairmount Avenue, Philadelphia, PA 19104
ASPIRA, Inc. of Pennsylvania	4322 N 5th Street, 3rd Floor Philadelphia, PA 19140
Bentley Hall	1710 N. Croskey St., Phila., PA 19121
Brith Shalom	3939 Conshohocken Avenue Philadelphia, PA 19131
Casa Del Carmen Family Service Center	4400 N. Reese Street, Philadelphia, PA 19140
Cassie L. Holly Court	2100 Dickinson St. Philadelphia PA 19146
Center at Journey's Way	403 Rector St., Philadelphia, PA 19128
Center at Journeys Way: Pensdale Village	4200 Mitchell Street, Philadelphia, PA 19128
Center in the Park Senior Center	5818 Germantown Ave. Philadelphia, PA 19144
Chinese American Women's Sisterhood Soc.	301 N 9th Street, Philadelphia, PA 19107
Christian Street YMCA	1724 Christian St., Philadelphia, PA 19146
Collegeview Apartments	3218 W. Susquehanna Ave. Philadelphia 19121
Columbia North YMCA	1400 N. Broad St Philadelphia PA, 19121
Comhar Inc.	2055 E Allegheny Ave, Phialdelphia PA
Council of Spanish Speaking Organizations	705 N Franklin Street, Philadelphia, PA 19123
Deliverance Evangelistic Church	2001 West Lehigh Avenue Philadelphia, PA 19132
Divabetic Club of Philadelphia	1001 Locust Street, Philadelphia, PA 19107
Emlen Arms	6733 Emlen St. Philadelphia PA 19119
First Baptist Church of Crestmont	1678 Fairview Ave., Willow Grove, PA, 19090
Germantown House	5457 Wayne Avenue, Philadelphia, PA, 19144
Gladys B. Jacobs Manor	1100 Fairmount Ave., Philadelphia PA 19123
Grands As Parents	2227 N. Broad Street Philadelphia, PA 19132
Greater Philadelphia Asian Am Lions Club	928 Race Street 2B, Philadelphia PA 19107
Greater Philadelphia Overseas Chinese Assoc	1108 South 5th Street, Philadelphia, PA 19147
Guild House West	1221 Fairmount Avenue, Philadelphia, PA 19123
Haddington Multi-Services for Older Adults	5331-41 Haverford Avenue Philadelphia, PA 19139
Haven Peniel Senior Residence	1615 N 23rd St, Philadelphia, PA 19121
Health Promotion Council (HPC)	260 South Broad Street, Philadelphia, PA 19102
Holmecrest Homes	8133 Erdrick Pl. Philadelphia PA 19136
Holy Redeemer Chinese Catholic Church	915 Vine Street, Philadelphia, PA 19130
Jefferson Center for Urban Health	111 S 11th St, Philadelphia, PA 19107
Jefferson School of Population Health	111 S 11th St, Philadelphia, PA 19107
JFK Behavioral Health Center	112 N Broad Street, Philadelphia, PA 19132
Juniata Park Older Adult Center	1251 E. Sedgley Ave., Philadelphia, PA, 19134
Katie B. Jackson Plaza	400 N. 50th St. Philadelphia PA 19139
KleinLife/Klein Jewish Community Center	10100 Jamison Ave. Philadelphia, PA 19116
Lehigh Senior Center	1701 Lehigh Ave Philadelphia, PA 19132
Lenfest Center (HUGS)	3890 N 10th Street, Philadelphia, PA 19140
Lutheran Settlement House	1340 Frankford Avenue, Philadelphia, PA 19125
Mann Older Adult Center	3201 North 5th Street Philadelphia, PA 19140
Martin Luther King Older Adult Center	2101 W. Cecil B. Moore Ave. Philadelphia, PA 19121
Mexican Consulate	111 S. Independence Mall East, Phila PA 19106
Mount Olivet Village	642 N. 41st St. Philadelphia PA 19104
Nellie Reynolds Gardens	2653 Glenwood Ave, Philadelphia, PA 19121
North City Congress Senior Center	1438 North Broad Street Phila, PA 19121
Northeast YMCA	1108 Knights Road, Philadelphia, PA 19154

Northeast Older Adult Center	8100 Bustleton Ave. Philadelphia, PA 19152
Neumann North Senior Housing	1741 Frankford Ave. Philadelphia PA 19125
Olney Senior Center	5900 N. 5th St. Philadelphia, PA 19120
On-Lok House	219 N 10th St Philadelphia, PA 19107
Opportunities Tower 1-2	1717 W. Hunting Park Ave., Philadelphia, PA 19140
Opportunities Tower 3	5524 Haverford ave Philadelphia, PA 19139
Park Tower Apartments	4001 Conshohocken Ave Philadelphia, PA 19131
Parkview Apartments	3218 W Susquehanna Ave, Philadelphia, PA, 19132
Philadelphia Corporation for Aging (PCA)	642 North Broad Street, Philadelphia PA
Philadelphia Department of Public Health	1101 Market St #8, Philadelphia, PA 19107
Philadelphia Housing Authority (PHA)	12 South 23rd Street, Philadelphia, PA
Philadelphia Senior Centers (PSC)	509 S. Broad Street, Philadelphia, PA 19147
Philadelphia Senior Center Coffee Cup Branch	247 South Tenth Street Philadelphia, PA 19107
Philadelphia Senior Citizens Resource Center	801 N 65th Street, Philadelphia PA 19151
Plymouth Hall Apartments	2201-7 W. Venango Street, Philadelphia, PA 19140
Project AYUDA	3150 N. Mascher Street, #100, Phila, PA 19133
St. Anthony's Senior Residence	2309-33 Carpenter St. Philadelphia PA 19146
Salvation Army Booth Manor	5522 Arch Street, Philadelphia, PA 19139
Salvation Army Ivy Residence	4051 Ford Avenue, Philadelphia, PA 19131
Senior Expo @ Phila Convention Center	1101 Arch Street, Philadelphia, PA 19107
Simpson Mid-Town - Simpson Senior Services	1001 Green St, Philadelphia, PA 19123
South Philadelphia Older Adult Center	1430 East Passyunk Ave. Philadelphia, PA 19147
Southeast Asian Mutual Assist. Association Coalition (SEAMAAC)	1711 South Broad Street, Philadelphia, PA, 19148
St. Charles Senior Center	1940 Christian Street, Philadelphia, PA 19146
Star Harbor Senior Center	4700 Springfield Avenue, Philadelphia, PA 19143
Temple Health Center #5	1900 N. 20th St. Philadelphia, PA 19121-2217
Temple University Department of Ophthal.	3401 N Broad St, Philadelphia, PA 19140
Thomas Jefferson University (TJU)	111 S 11th St, Philadelphia, PA 19107
West Oak Lane Senior Center	7210-18 Ogontz Ave. Philadelphia, PA 19138
West Philadelphia Senior Community Center	1016 N. 41st St. Philadelphia, PA 19104
West Philadelphia YMCA	5120 Chestnut St, Philadelphia, PA

9.3 Focus Group Methods

Dr. Lisa Hark, Director of Research, conducted a total of 6 focus groups on March 3, 7, and 8, 2016 at Wills Eye Hospital. The purpose of the focus groups is to gather information on how Wills Eye Hospital can improve access to eye care by reducing barriers and implementing methods to improve medication adherence and eye appointment attendance rates. Each day we held two sessions, each 1.5 hours in length with approximately 5 to 7 participants per group. Participants are also provided with lunch. A total of 34 individuals (ages 46-75) residing in the Philadelphia metropolitan area living with various eye conditions participated in the focus groups. The most prevalent eye conditions affecting these individuals are glaucoma, diabetic retinopathy, cataracts, uveitis, and varying degrees of blindness.

Participants were asked to answer general questions about their eye conditions and eye care, as well as varying questions about cell phone use before beginning the discussion. During the discussion, each participant was asked to share any information or questions they had about their eye care, including the barriers they experience trying to obtain or get to an eye exam. Participants were also invited to share how they remember to schedule eye exam appointments and how often they may miss their eye medications along with reasons for their missed doses.

The relationship between patient and physician was also explored as participants were asked whether they trust their ophthalmologist and if they understand the diagnosis and treatment their physician suggests. Participants were also asked whether they would advise family members to visit an ophthalmologist. All of the questions discussed in the focus group served to gather information on health concerns of a particular interest group served by Wills Eye Hospital, particularly investigating the participants' experience at Wills Eye and how barriers to eye care can be reduced.

9.4 Focus Group Meetings Summary Results

Of the 34 adults who participated in the focus group, 12 participants (37.5%) had glaucoma, 8 participants had diabetes (~24%), and 6 participants had diabetic retinopathy (~19%, or nearly 86% of the participants with diabetes). Ten participants (~31%) are blind in one eye. Focus group conversations centered on how participants' manage their eye health and their views on overall health and wellness.

A main topic of discussion was acquiring and taking medications for various eye conditions. Many participants take at least three different prescriptions for their eye conditions, and one participant reported that she needs to take 16 different prescriptions each day. Although most participants' insurance covers their prescriptions, some reported that their insurance does not cover eye care at all. All participants agreed that medication can be expensive, and for some, the price of medication dictated whether or not they would choose to fill or refill a prescription (Figure 24). As one participant added, *"When you have to pay $40 for a prescription and you don't have the $40, you don't get the prescription. That's the bottom line."*

Participants also reported issues with the amount of medicine they are prescribed. Many of the participants who are prescribed eye drops noted that they often run out of their drops days before

they are supposed to. *"The drops don't last the 30 days. I got it down to a science and I can't get the 30 days out of it."* A woman mentioned the same issue, adding that her insurance will not pay for her prescription before the next refill date if she finishes a bottle of drops prematurely.

One of the more significant issues participants mentioned concerning their medication, however, is remembering to take their prescriptions. Although some reported that they have no trouble taking their medication, most said that they occasionally forget and that they have difficulty taking their medicine at the same time each day. Reasons participants mentioned for forgetting to take medication include: participation in various activities, busyness at work, and caring for others, including grandchildren. She forgets to take her medication because "*I'm so busy doing for everybody else."*

Similarly, participants noted that they sometimes have difficulty remembering their eye appointments. Participants discussed ways to remember to take their medicines and attend appointments, and some shared that using a date book or a calendar has been helpful. A woman said that she sets an alarm on her cell phone to remind her to take her medication every day. *"It really helps. I saw a big difference,"* she said. Most participants, however, relayed that they would not have considered setting a phone reminder. *"I never thought about putting a reminder on my phone/"* All participants agreed that getting a letter and/or a phone call from Wills Eye Hospital to remind them to attend and schedule appointments is necessary. *"I'll miss an appointment if I don't get the reminder call."*

When participants remember to attend their appointments, transportation is a major barrier to keeping appointments. Most participants rely on public transportation, and although a pick-up transportation service is available, many find it unreliable. Moreover, many participants expressed that they do not feel comfortable taking public transportation after receiving ophthalmic care, especially if they are dilated during an exam. Participants stressed the importance of safe, reliable transportation, and noted that if they cannot get a ride to and from an appointment, they will not attend the appointment.

Participants also discussed their relationship with their eye care providers and their experiences as patients at Wills Eye Hospital. Although most acknowledged that Wills Eye has a reputation as a world class eye care facility, they all expressed dissatisfaction with long wait times. As Wills Eye is a teaching hospital, participants also commented on the impact of residents and fellows in clinical rotation. Many could not distinguish between a resident, fellow, and an attending physician. Most, however, relayed that seeing different doctors made them worried about the quality of their care:

"Every time I come I have somebody different. I hate that."

"When there's a different doctor, you get a different opinion. Inconsistency is a problem."

"I don't like to try new doctors."

"Having two doctors makes you worried that they're not doing the same thing, or what's right."

Even though participants reported that seeing different doctors can sometimes leave them confused about their care, many said that they had no problem asking clarifying questions. *"I'll question the doctor if I think they don't know something or if they're not doing something right."* Similarly, one participant said that she will ask her doctor to *"put it in layman's terms."*

Generally, participants recognized the importance of seeing an eye doctor and that eye health is related to one's overall wellbeing. Many participants have adopted healthier lifestyle choices and recognize the ways that past behavior has negatively impacted their vision. They spoke about the ways they stay healthy and their motivation for continuing healthy behaviors:

"When I was younger, I was drinking all the time and I wasn't worried about anything happening. Now that I've lost sight in one of my eyes, I remember to take my medicine so I don't lose sight in the other eye. Don't play with your eyesight."

"I take my medicine faithfully now because I'm healthy and doing so well that I don't want to lose that momentum. I believe it is important to go to the doctor. I believe a person should continue their medication until they're told to stop."

"My daughter is a 'health person' and she helped me realize that when you eat better, you feel better."

"I do what I have to for my sight and my eyes. I'm worried that if I don't come to the eye doctor like I should, I could lose my eyesight. So I do what I'm told."

"I love to read. That's my motivation."

"At one time, I didn't believe in going to doctors for anything. But at this time in my life, I keep all my appointments. I don't take any chances no more. You only have one life to live and I'm not ready to check out."

"I changed my eating to more organic, started exercising, and now I'm off insulin and I don't have high blood pressure anymore."

"I don't like feeling bad. I have too much to do. I like it when I feel good. I need to feel good to do things."

"It's important for people to use everything at their disposal to stay healthy. You can get a prosthesis for an amputated limb, but once your eyes are gone, they're gone."

Participants also commented on the ways their spirituality and religious beliefs affect their relationship to health and wellbeing. Many African-Americans in the focus groups explained that they are raised to believe in God as a healer and that God can make you healthier if you pray to Him. But they stressed that along with a Christian belief system and prayer, people must make healthy choices themselves to stay healthy. They believed that God, their doctors, and their personal choices are all working together to influence their overall health:

"We are raised to think of God as a healer. And one way he can heal us is by us going to the doctor."

"I forget to take my medications, and when I don't take it I pray to God to forgive me and to remind me to take them. I work with God. I'm always praying."

"I know God's taking care of me, but I'm going to take care of me. He's helping me think positive."

"I learn to trust my doctor. I'm a believer in God. I do pray, but you need something else besides that. Prayer relieves me. We've been taught that prayer changes things, and I believe it, but there's also a place for doctors."

"You can't depend on Jesus Christ, you have to do it yourself, too. I depend on the Lord first, then I have a part to play. When Jesus told the man to get up out of his bed, he said 'you must take your own bed up.'"

At the conclusion of each focus group meeting, participants were invited to participate in several Advisory Boards that we have established for current and future grant submissions to the Patient-Centered Outcomes Research Institute (PCORI) and the National Institutes of Health. To date, 50% of the attendees, or 17 individuals, have agreed to participate as Advisory Board members.

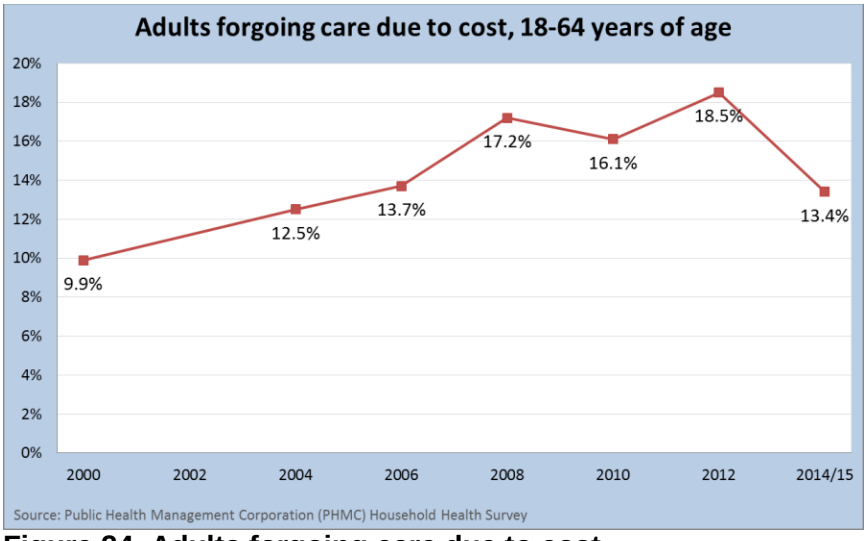


Figure 24. Adults forgoing care due to cost
Source: Philadelphia Department of Public Health. Used with permission.

10.0 Data Sources

American Community Survey (ACS): The ACS is an ongoing survey that samples a small percentage of the population every year. It provides data on demographics, family and relationships, income and benefits, and health insurance. 5-year estimates pool 60 months of data.

Bureau of Labor Statistics (BLS): BLS is a unit of the US Department of Labor. It collects, processes, analyzes, and disseminates essential statistical data in the broad field of labor economics and statistics. The Local Area Unemployment Statistics (LAUS) program of the Bureau of Labor Statistics produces monthly and annual employment, unemployment, and labor force data for Census regions and divisions, states, counties, metropolitan areas, and many cities by place of residence. The LAUS estimates are consistent with the national labor force and unemployment measures from the Current Population Survey.

Behavioral Risk Factor Surveillance System (BRFSS): BRFSS is a national system of health-related telephone surveys that collect data about health-related risk behaviors, chronic health conditions and use of preventive services. BRFSS collects data in all 50 states as well as the District of Columbia and three US territories. Data are collected via a national surveys conducted by CDC and state, territorial, tribal, and local surveys conducted by state, territorial, and local education and health agencies and tribal governments.

National Diabetes Surveillance System (NDSS): NDSS provides national statistics on the prevalence, incidence, and duration of diabetes, as well as complications, health status and disability, and healthcare for people with diabetes.

National Eye Health Education Program Five-Year Agenda 2012-2017: Established by the National Eye Institute, the National Eye Health Education Program provides public and professional education programs on glaucoma, diabetic eye disease, low vision, vision and aging, and special population outreach, emphasizing the importance of early detection and timely treatment of eye disease and the benefits of vision rehabilitation. The Five-Year Agenda provides strategic goals and objectives for raising eye health awareness among people at higher risk for eye diseases and conditions and people living with low vision.

National Vital Statistics System (NVSS): NVSS provides vital data based on the collection and registration of birth and death events at the state and local levels. It provides critical information on teenage births and birth rates, prenatal care and birth weight, risk factors, and conducts telephone surveys that collect state data about adult health risk behaviors and chronic health.

Pennsylvania Department of Health: The Department of Health was created by the Act of April 27, 1905, P.L. 312, and modified subsequently through the Administrative Code of 1929. Through the use of community-based strategies, the Department of Health has successfully reduced the number of serious illnesses, injuries and deaths due to major health threats; tobacco-related diseases; infectious disease; and accidental injuries. The Department supports outreach, education, and prevention and treatment services across a variety of program areas. Grants and subsidies to community-based groups are used to provide essential services to the Commonwealth's citizens including programs for women and children, nutrition, immunization, diagnosis and treatment of certain blood and communicable diseases, cancer control and prevention, and the prevention and

treatment of substance abuse. In 2001, Act 77 directed the Pennsylvania Department of Health to establish a health research program. Under this program, research grants are awarded for clinical, health services, and biomedical research. Wills Eye Hospital received a grant to conduct the study, *Confronting Unequal Eye Care in Pennsylvania.*

Pennsylvania Health Care Cost Containment Council (PHC4): PHC4 is an independent state agency responsible for addressing the problem of escalating health costs, ensuring the quality of healthcare, and increasing access for all citizens regardless of ability to pay. It collects over 4.5 million inpatient hospital discharge and ambulatory/outpatient procedure records each year from hospitals and freestanding ambulatory surgery centers in Pennsylvania. It also collects data from managed care plans on a voluntary basis.

Philadelphia Department of Public Health: Community Health Assessment Report (May 2014): This Community Health Assessment presents a systematic review of population health in Philadelphia, highlighting key public health challenges, assets, and improvements in our city. This Assessment enables governmental and non-governmental health organizations to identify community needs and assets, develop policies and programs, allocate resources, and monitor changes to the public's health. The key public health issues include: 1) Social determinants of health, 2) Summary health measures, 3) Tobacco and alcohol, 4) Obesity, 5) Cardiovascular disease, 6) HIV, 7) Teen reproductive health, 8) Maternal and infant health, 9) Child health, 10) Access to care, 11) Cancer screening and prevention, 12) Environmental health, 13) Violence, 14) Mental health, 15) Built environment, and 16) Public health assets.

Philadelphia Vital Statistics: The Vital Statistics Report contains comprehensive data about the vital events of births, deaths, and fetal deaths in Philadelphia from the Department of Health.

Public Health Management Corporation (PHMC) Household Health Survey: Conducted biannually since 1994, the Household Health Survey is a comprehensive local health survey providing information on a broad range of topics, including health status and chronic health conditions, access to care, health screenings, and risk behaviors.

School District of Philadelphia (SDP): With an enrollment of approximately 2000,000 students, SDP is the eighth largest school district in the nation. It tracks a variety of student indicators, including dropout and graduation rates, reading and math proficiency, and height and weight.

Small Area Health Insurance Estimates (SAHIE): The SAHIE program produces single-year estimates of health insurance coverage for counties and states by detailed demographic and income groups. Estimates are model-based and consistent with the ACS.

Small Area Income and Poverty Estimates (SAIPE): The SAIPE program produces single-year estimates of income and poverty for school districts, counties, and states. These model-based estimates combine data from administrative records, post-census population estimates, and the decennial census with direct estimates from the ACS.

U.S. Census Bureau: The decennial U.S. Census provides age and race/ethnicity data of the US population, based on actual counts of persons dwelling in US residential structures, including citizens, non-citizen legal residents, and long-term visitors, and undocumented immigrants.

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