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FROM THE AMERICAN PEOPLE

The USAID Child Blindness Program

FOSTERING DEVELOPMENT THROUGH THE
PREVENTION AND TREATMENT OF BLINDING EYE DISEASE

PREVENTABLE AND TREATABLE CAUSES OF BLINDNESS AND VISUAL IMPAIRMENT

Cataract – clouding of the lens of the eye, most frequently related to the aging process but also found in children.

Vitamin A deficiency (Xerophthalmia) – can cause extreme dryness of the cornea and irreversible blindness. Measles can increase the risk of vitamin A deficiency.

Neonatal conjunctivitis – an eye infection in newborns caused by a bacteria or virus.

Trachoma – an infection caused by a bacterium, trachoma occurs when the inside of the eyelid becomes so scarred that the eyelid turns inward, damaging the cornea.

Onchocerciasis (river blindness) – a parasitic infection that can disfigure or blind. Caused by a worm that is transmitted to humans through the bite of a black fly.

Refractive Error – blurred vision due to imperfections in the eye's lens. Can be corrected with eyeglasses.

Approximately 1.4 million children in the world are blind, and 75 percent of them live in developing countries. For every blind child, three children have serious vision impairment and 13 need eyeglasses. Through innovative programs, USAID is preventing blindness and restoring vision to thousands of people, especially vulnerable children in the poorest communities of the world.

Causes of Blindness and Visual Impairment

Blindness and visual impairment persist despite significant reductions in blindness through public health measures. Poverty, lack of primary health care and eye services, and unavoidable causes are major factors contributing to blindness. Injuries, genetic conditions, degenerative disorders, harmful eye treatments, and preventable infectious and non-communicable diseases rarely found in industrialized countries can cause blindness and visual impairment.

In the general population, approximately 75 percent of blindness could be prevented or treated. The primary causes of blindness in children under 16 years of age vary by the country's level of socio-economic development, as shown in figure 1.

- **Preventable causes** include corneal scarring from vitamin A deficiency, measles, neonatal conjunctivitis, and harmful traditional eye treatments. About 8 million people are visually impaired as a result of trachoma, making it the leading infectious cause of preventable blindness.
- **Treatable causes** such as cataracts require surgery. Growing evidence suggests that cataracts cause half of all blindness in developing countries, and are replacing vitamin A deficiency as the leading cause of child blindness. This change is due in large part to global efforts to sustain national vitamin A supplementation programs, many of which are supported by USAID.
- **Unavoidable causes** are a result of congenital conditions, genetic disease, and central nervous system lesions.

Magnitude of the Problem

Blindness and visual impairment is a significant public health problem.

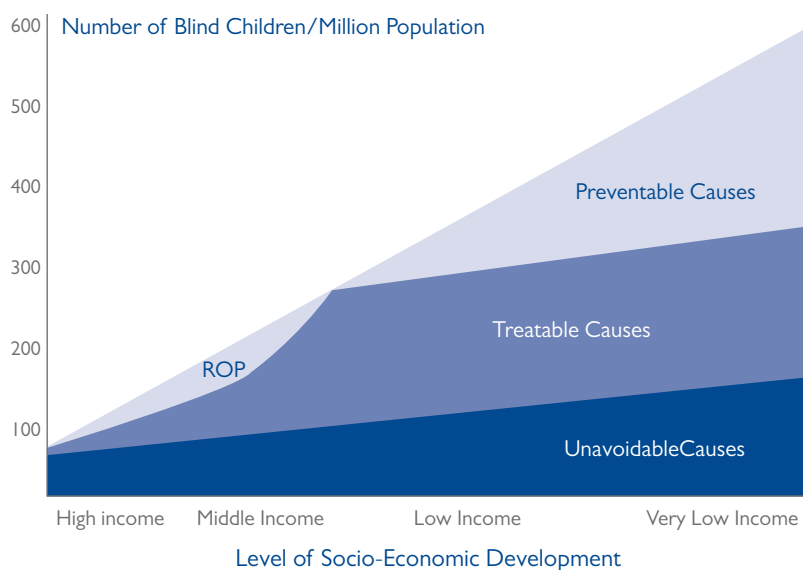
Of the world's 37 million blind people, 1.4 million are children. Until the recent success of large-scale vitamin A supplementation programs, up to 60 percent of children died within a year of becoming blind. Today, as cataracts replace severe vitamin

A deficiency as the primary cause of child blindness, the subsequent mortality rate has declined. But those children who survive live an average of 40 years bearing the burdens associated with blindness, such as poorer education, social isolation, and increased poverty. The control of child blindness not only results in a decrease in mortality through preventive measures such as vitamin A supplementation, but also improved quality of life for decades to come.

Nearly 17 million children with low vision or blurred eye sight lack visual aids, services, or eyeglasses to help them function. These children often are unable to read a chalkboard or textbook. They restrict their movements, fearful of injury or embarrassment. Less than 15 percent of children with disabilities in developing countries have access to education.

- Approximately 3.5 million children have low vision due to congenital and degenerative conditions. Low vision cannot be corrected with surgery, medication, or eyeglasses, but visual aids such as magnifiers and mobility training can increase the ability to function and participate in family, school, and community life.
- Another 13 million children experience refractive errors commonly known as near-sightedness, far-sightedness, and astigmatism.

Gender-based blindness begins in childhood. Girls have less access to medical and surgical services than boys. These services include diagnosis of correctable cataract, treatment of eye infections, and provision of corrective glasses. In a study in Tanzania, parents were less likely to take their young daughters with congenital cataracts to the hospital for surgery than their sons. This gender inequity continues into adulthood: women account for two-thirds of blindness and three-fourths of trachoma-related blindness.



School-based vision screening and eyeglass distribution improve vision and academic potential for children such as this young Guatemalan girl.

FIGURE I. PATTERN OF BLINDNESS IN CHILDREN BY LEVEL OF SOCIO-ECONOMIC DEVELOPMENT

Preventable: corneal scarring from vitamin A deficiency, measles, ophthalmia neonatorum, harmful traditional eye treatments, retinopathy of prematurity (ROP)

Treatable: cataract, glaucoma

Unavoidable: anomalies, genetic disease, central nervous system lesions

Source: Gilbert C. New issues in childhood blindness. *Community Eye Health* 2001;14(40):55.

An eye specialist in Peru examines a baby after surgery. Preserving the sight of a young child improves the quality of life for decades to come.

Restoring the sight of a child is an investment that benefits the individual as well as the family and community. Globally, the eradication of avoidable child and adult blindness would result in an estimated savings of \$102 billion.¹

The Impact of Blindness

The impact of child blindness extends from the individual to the family, the community, and the nation. The physical, social, educational, and economic consequences can be devastating if not addressed.

Lost opportunities associated with blindness and visual impairment lead to emotional stress and economic hardship. Blind children and those with limited sight experience social isolation, low self-esteem, lack of independence, and lost educational and economic opportunities. Lack of eye care can have a severe economic impact by perpetuating poverty or pushing a family into poverty.

Adult blindness also results in lost opportunities for children. Instead of receiving care, children become caregivers. Girls frequently cannot go to school because they have to care for an adult parent or relative who is blind.

Blindness and low vision may lead to a reduction of 0.5 percent of GDP in parts of Africa and Asia by 2020.¹ Nearly a third of the global economic cost of blindness is due to child blindness. Time spent caring for the blind, money spent on treatment, and lost earnings reduce family income and productivity and their potential contribution to the nation's economic development.

Prevention and Treatment

Effective and low cost solutions exist to eradicate avoidable blindness. Preventive interventions and early detection and treatment of problems can dramatically reduce the incidence of child blindness.

The solutions to prevent blindness, restore sight, correct vision, and give hope are available. Table 1 links the solutions to the various eye problems.

Interventions that prevent child blindness can also prevent death and illness. Improving vitamin A status reduces the risk of blindness, reduces child deaths by an average of 23 percent, and increases resistance to infections. Treating trachoma in children can improve their quality of life and decrease the risk of blinding complications in adulthood. Controlling river blindness can prevent a disease that disrupts children's education and turns children into caregivers of parents and elderly relatives blinded by the disease.

¹ Frick KD, Foster A. The magnitude and cost of global blindness: an increasing problem that can be alleviated. *American Journal of Ophthalmology* 2003 (April): 471–476.

TABLE 1. PREVENTION AND TREATMENT OF EYE CONDITIONS AND THEIR ASSOCIATED FACTORS

Condition	Associated Factors	Prevention	Treatment
Cataract	<ul style="list-style-type: none"> • Genetic disease • Maternal rubella • Injuries and inflammation • Aging process 	<ul style="list-style-type: none"> • Counseling • Measles vaccine 	<ul style="list-style-type: none"> • Surgery
Corneal scarring	<ul style="list-style-type: none"> • Vitamin A deficiency • Measles • Neonatal conjunctivitis • Harmful traditional eye remedies • Trachoma 	<ul style="list-style-type: none"> • Vitamin A supplementation twice a year • Measles vaccine • Antibiotics and control of sexually-transmitted infections • Health education • Facial cleanliness and environmental improvement 	<ul style="list-style-type: none"> • Antibiotics • Surgery for advanced stages
Microfilaria	<ul style="list-style-type: none"> • Onchocerciasis (river blindness) 	<ul style="list-style-type: none"> • Insecticide spraying of affected area 	<ul style="list-style-type: none"> • Single annual dose of ivermectin
Refractive error (blurred vision)	<ul style="list-style-type: none"> • Genetics • Environmental factors 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Optical correction with eyeglasses

Eye care interventions are cost effective. The World Bank classifies those interventions costing \$100 or less per disability-adjusted life year (DALY) as “highly cost effective.”² Highly cost-effective interventions that prevent and treat blindness are shown in figure 2 and include:

- Vitamin A supplementation (two doses per year at two cents per dose)
- Ivermectin/Mectizan®, a deworming medication for onchocerciasis (river blindness)
- Providone iodine, an inexpensive (less than one penny per treatment) disinfectant used to clean the eyes of newborns to prevent neonatal conjunctivitis
- Zithromax®, a single oral dose antibiotic for trachoma treatment that is available free of charge to International Trachoma Initiative programs through Pfizer Inc.

The director of a nursery school in Guinea helps distribute vitamin A. Two doses per year at a cost of two cents per dose reduce the risk of blindness and death and increase resistance to infections.

² The World Bank. *Health, Nutrition, and Population Sector Strategy Paper*. Washington: The World Bank, 1997.

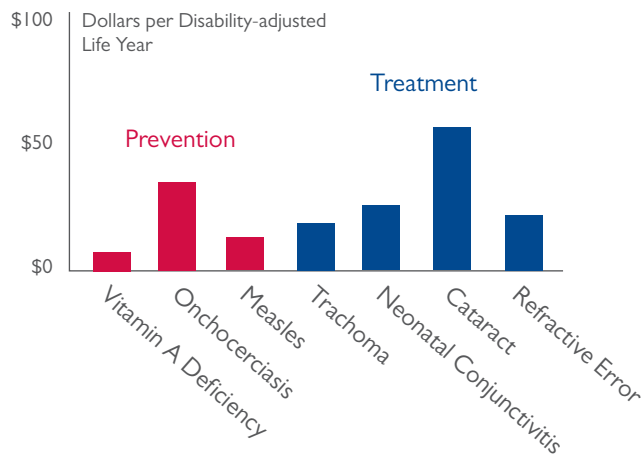


Eye care reaches large numbers of people in remote and isolated areas through eye campaigns such as this one in Nepal.

FIGURE 2. COST EFFECTIVENESS OF MAJOR EYE CARE INTERVENTIONS BY CAUSE IN DOLLARS PER DALY*

(\$100 or less per DALY is considered highly cost effective by the World Bank)

*A disability-adjusted life year (DALY) is an indicator of the time lived with a disability and the time lost due to premature mortality, providing a standardized means to compare and prioritize health interventions.



USAID's Global Leadership in the Prevention and Treatment of Blindness

USAID's global leadership in programs to prevent and treat blinding eye disease began in the 1960s, as shown in the historical summary on page 11. USAID continues to invest in these programs to foster human and economic development and improve the quality of life of vulnerable children and their families. Preventing and treating child and adult blindness has the potential to increase global economic productivity. If eye care interventions eradicate avoidable blindness and low vision, an estimated 429 million blind person-years will be saved, with a minimum savings of \$102 billion for blindness alone or approximately \$204 billion if savings are included for low vision.³ The economic savings from eyeglasses have not yet been calculated but will likely add significantly to these totals.

³ Frick KD, Foster A. The magnitude and cost of global blindness: an increasing problem that can be alleviated. *American Journal of Ophthalmology* 2003 (April): 471–476.

USAID's multi-faceted approach tackles the various causes of blindness and eye disease. This approach includes the following elements:

- Vitamin A supplementation
- Grants to nongovernmental organizations (NGOs) to deliver eye care services
- Immunization against measles
- Treatment of infectious diseases that cause blindness such as trachoma and onchocerciasis
- Prevention of neonatal conjunctivitis and programs to reduce sexually-transmitted infections
- Programmatic research on blindness

USAID works through partnerships to save sight. USAID collaborates with national governments, international agencies, NGOs, foundations, and pharmaceutical companies to combat blindness. USAID works closely with UNICEF in vitamin A supplementation programs and partners with the International Trachoma Initiative through the Neglected Tropical Diseases Control Project. Many of the NGO grantees of USAID's Child Blindness Program are partners in Vision 2020, a global initiative of the World Health Organization and the International Agency for the Prevention of Blindness. The goal of Vision 2020 is to eliminate avoidable blindness by the year 2020.

The Child Blindness Program

The Child Blindness Program features prominently in USAID's approach to the eradication of preventable blindness. The program originated through a Congressional directive in 1991 to prevent and treat child blindness. Since then, 25 eye care and health NGOs have received grants totaling approximately \$20 million to implement eye care interventions in 58 countries, as shown in figure 3. The primary interventions include surgery, eye health education, vision screening and provision of eyeglasses, education and rehabilitation services, provision of antibiotics, and training. The sustainability of these interventions depends on high quality care, sufficient human resources, increased demand for services, affordable costs, adequate and functional equipment, and efficient clinic management and systems. The Child Blindness and Eye Health Grants Fund is currently managed by A2Z: The USAID Micronutrient and Child Blindness Project.



A child in Guatemala whose vision cannot be restored receives the training and education he needs to participate in school and receive an education.

USAID is tackling the various causes of blindness and eye disease through vitamin A supplementation, measles immunization, prevention and treatment of tropical diseases, and grants to NGOs to deliver eye care services. These grants help restore sight to blind children, provide access to education and support services to children with visual impairment or untreatable blindness, and establish sustainable vision screening programs.

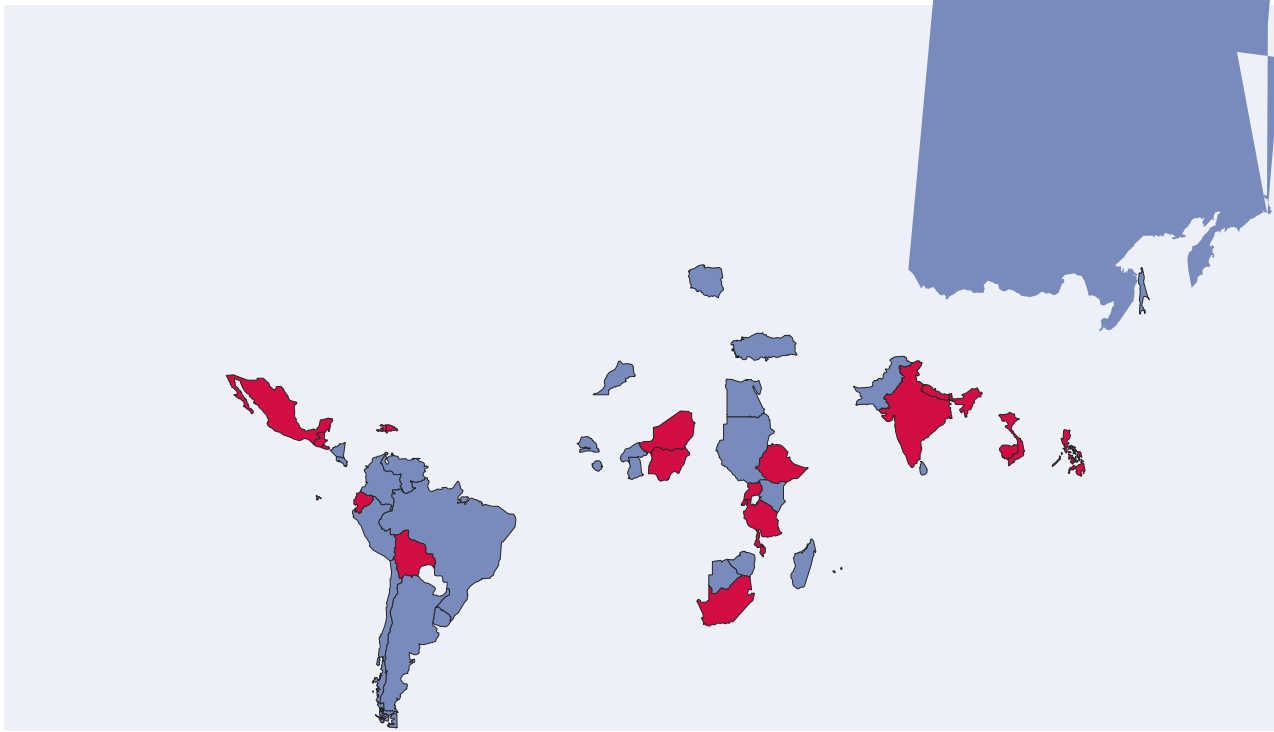


FIGURE 3. GLOBAL REACH OF THE USAID CHILD BLINDNESS PROGRAM

- Current Grantees
- Past Grantees

Current Grantees

- Bangladesh
- Bolivia
- Cambodia
- Dominican Republic
- Ecuador
- El Salvador
- Ethiopia
- Guatemala
- Haiti
- India
- Malawi
- Mexico
- Nepal
- Niger
- Nigeria
- Philippines
- Rwanda
- South Africa
- Tanzania
- Uganda
- Vietnam

Past Grantees

- Albania
- Argentina
- Armenia
- Botswana
- Brazil
- Bulgaria
- Burkina Faso
- Chile
- Colombia
- Costa Rica
- Croatia
- Egypt
- Estonia
- Ghana
- Indonesia
- Kenya
- Madagascar
- Mauritius
- Morocco
- Nicaragua
- Pakistan

- Papua New Guinea
- Peru
- Poland
- Romania
- Russia
- Senegal
- Sierra Leone
- Slovakia
- Sri Lanka
- Sudan
- Thailand
- Tibet
- Turkey
- Uruguay
- Venezuela
- Zimbabwe

KEY INTERVENTIONS SUPPORTED THROUGH THE CHILD BLINDNESS PROGRAM

Vision screening finds problems and identifies appropriate treatment.

In developing countries, the average distance to the nearest eye clinic is 50 kilometers from home. Vision screening in the community by entrepreneurs and in schools by teachers and other lay people greatly increases access to eye care. These screening programs enhance the treatment of eye conditions by strengthening the referral system and improving a child's potential for success in school through the distribution of eyeglasses.

Helen Keller International (HKI) provided 34,500 free pairs of eyeglasses in 2003 to students in Oaxaca, Mexico, working in close collaboration with schools and the Ministry of Health to ensure that the program was integrated in the country's health and education systems. In partnership with the Ministry of Health in Nigeria, HKI screened, referred, and treated approximately 10,000 children in 2006.

The International Center for Eyecare Education, in collaboration with AfricaTrust, is working with schools, government, and private sector optometrists to screen 500,000 people in two provinces of South Africa and to deliver eyeglasses to 50,000 children.

Scojo Foundation established micro-franchises in Andhra Pradesh, India, and trained 200 community members known as Vision Entrepreneurs. These entrepreneurs conduct vision screenings in their communities, sell affordable reading glasses, and refer those who require advanced eye care to reputable clinics.

Education and rehabilitation creates opportunities and dreams for the future.

A walking cane and mobility training can mean the difference between dependence and self-reliance. Reading Braille gives children access to knowledge, information, and opportunities.

Perkins School for the Blind has provided quality education with USAID support in 24 countries. Perkins also serves children who are blind and have additional disabilities. In the Philippines, Perkins is training school administrators, teachers, and parents; mentoring teachers in their classroom; supporting a parent organization to help parents advocate for their children's educational needs; and forming a national advisory committee. Courses have also been conducted in Latin American and Africa on maintenance and repair of Braille writing machines.

Child Sight Foundation (CSF) works in two districts in northeastern Bangladesh, a country where only five percent of blind children have access to proper eye treatment. CSF identifies blind children using a community-based approach that works through education of community members. The project is providing sight-restoring surgeries and low vision services to more than 100 children as well as education and rehabilitation services to more than 300 children whose blindness cannot be treated.

Surgery restores sight and transforms lives.

Cataract surgery is a passport to unseen places and new discoveries. Post-operative surgery following cataract surgery is critical to quality outcomes, especially in children.

Helen Keller International, a long-time partner in USAID's blindness prevention and treatment efforts, has performed hundreds of cataract surgeries for children in the world's poorest countries. HKI works with local hospitals and governments to train pediatric ophthalmologists in areas where cataract rates are high and quality care is lacking.

Himalayan Cataract Project (HCP) is expanding direct eye care services for children in Nepal and increasing training and education for eye care providers. With USAID support, HCP will conduct 2,000 surgeries on children over the next two years.

Christian Blind Mission International (CBMI) is increasing the availability of cataract care and blindness prevention through a newly constructed eye clinic and eyeglass workshop in Haiti. The USAID Child Blindness grant will enable CBMI to triple the number of cataract surgeries performed, restoring or saving the sight of more than 2,000 children and providing quality post-operative care.

Training increases access to quality eye care services.

Increasing the number of people trained in vision screening, surgery, rehabilitation, and eye health education will increase the number of children receiving eye care. Management training strengthens the capacity to sustain these services by increasing demand and cost recovery.

Seva Foundation is training 450 female community health volunteers in Nepal to identify girls with blinding conditions and provide gender-sensitive eye health education within the communities they serve.

The International Eye Foundation (IEF) improves the capacity of local government and public and private sector eye care organizations to increase the quality, efficiency, customer satisfaction, and financial health of eye clinics by providing training on managerial and clinical topics. Among seven hospitals located in four regions of the world, 182,763 people received eye exams in 2004. Cataract surgeries for adults tripled, and 586 children had sight-restoring or sight-saving surgery. IEF worked with the hospitals to increase revenue from paying clients to subsidize free care for the poor. IEF is currently providing medical and refractive eye care in rural Malawi and training new eye health personnel to serve Malawi and neighboring Southern Africa Development Community countries.

Inexpensive antibiotics prevent and treat debilitating eye diseases.

One of the groundbreaking contributions to public health was the discovery in the 1880s of a simple technique to prevent neonatal conjunctivitis. More than a century later, this simple and inexpensive technique is not available in many communities in developing countries.

Helen Keller International and Christian Blind Mission-US are two of the NGOs working with traditional birth attendants and midwives to ensure that they clean the eyes of newborns and apply antibiotic eye drops or ointment immediately after birth. In Africa and Asia, only 47 percent and 61 percent, respectively, of women give birth with the help of a skilled attendant. Providing antibiotics and educating traditional, non-formally trained attendants and community-based providers on essential newborn care, including eye care, will save sight and lives.

History of USAID's Commitment to Blindness Prevention and Treatment

1960s USAID began fortifying dry milk, flour, and cornmeal with vitamin A in U.S. food donation programs to prevent blindness from vitamin A deficiency.

1970s USAID, other donors, and national governments established the Onchocerciasis Control Program, which protected more than 40 million people from river blindness and prevented 600,000 cases by 2002.

1980s USAID-supported field research in Indonesia established the strong link between vitamin A and under-five mortality. USAID and partner Helen Keller International continued global efforts to establish vitamin A as an essential component of child and maternal health.

USAID launched the Vitamin A Field Support Project (VITAL), an enhanced effort to combat childhood blindness and improve child survival through the expanded delivery of vitamin A to vulnerable populations worldwide.

1990s Congress recognized the importance of treating blindness in developing countries and requested a directive for these efforts.

USAID supported the newly-founded International Trachoma Initiative, which expanded trachoma control efforts to over 14 countries in Africa and Asia by 2005.

USAID supported Project ChildVision (HKI) and Seeing 2000 (IEF) through grants that increased community awareness of preventable eye disease, trained health workers, integrated primary eye care into existing structures, and established centers of excellence for childhood cataract surgery and post-operative care.

A child from Malawi sleeps comfortably after having a cataract removed.

USAID's long-standing commitment to address the root causes of child blindness represents a critical component of our overall development goals.

– Frances Davidson, USAID

USAID's Commitment Today

- The USAID Child Blindness Program provides blindness and eye health grants to NGOs to deliver eye care services including sight-restoring surgery and the provision of eyeglasses.
- The Neglected Tropical Diseases Control Project focuses efforts on the treatment of several neglected diseases, including trachoma and onchocerciasis.
- A2Z: The USAID Micronutrient and Child Blindness Project strengthens vitamin A supplementation programs as a sustainable intervention to reduce child mortality.

For further information, please visit www.usaid.gov

USAID programs in global health represent the commitment and determination of the U.S. government to prevent suffering, save lives, and create a brighter future for families in the developing world. USAID's commitment to improving global health includes confronting global health challenges, such as child blindness, through improving the quality, availability, and use of essential health services.

Copies of this publication are available for downloading at www.usaid.gov and www.a2zproject.org.

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Photos: Raphael Talisman: right photo, Cover;
International Eye Foundation: left & center photos, Cover; Pages 4, 6, & 11;
Off Ramp: Page 3; USAID Guinea: Page 5;
Perkins School for the Blind: Page 7.