

## **EDITORIAL BACKGROUND**

### **GLOBAL EYE HEALTH ISSUES OF WOMEN & CHILDREN**

Historically, women and children around the world have shared a disproportionate burden of disease and economic hardship, due potentially to a combination of biological factors, gender inequalities and a general lack of public awareness of their unique health needs.

Social or economic factors may limit women's access to care for themselves and their families. While women make up only 40 percent of the global workforce<sup>1</sup>, they account for approximately 70 percent of the global population living in poverty.<sup>2</sup> Because their economic contributions are often not acknowledged, women are marginalized in policy decisions that affect access to care and other basic resources.

In industrialized and developing countries alike, women live longer than men, for example, six to eight years longer in industrialized countries.<sup>3</sup> Life expectancy for women is greater than 80 years in at least 35 countries and is approaching this number in several more. Despite this trend, the life expectancy of women in countries at various levels of development ranges from 50 years through the 60s and 70s in rapidly developing countries, according to the World Health Organization.

For many women who live to see their 60s, 70s and 80s, however, longer lives are not necessarily healthier lives, since the likelihood of disease and disability increases with age.

Aside from natural aging, nutrition and basic access to health care within industrialized and developing countries alike can greatly affect a woman's ability to thwart and treat disease, before it becomes a threat to daily function and long-term economic stability.

Children's health, then, is largely dependent on the overall health of their mothers. From infancy to adolescence, basic sanitation, nutrition, health care and education are all key factors in their progression into adolescence and adulthood.

The eye health of women and children is one example of this disparity – both in developing countries and in the industrialized world. Global prevalence of eye diseases and other conditions affecting eye health indicates that the necessary steps to protect the unique eye and overall health needs of these groups are not being properly realized.

### **Prevalence of Eye Conditions and Disease in Women**

According to the World Health Organization, two-thirds of the world's blind and visually impaired are women. A significant portion of this prevalence is due to uncorrected refractive error. There are an estimated 153 million people with visual impairment due to

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<sup>1</sup> International Labour Organization. Global Employment Trends for Women. March 2008.

<sup>2</sup> United Nations Development Programme, 2003.

<sup>3</sup> World Health Organization. Women, ageing and health Fact Sheet. June, 2000.

this condition, of whom 8 million are blind. Women have a higher rate of visual impairment than men in every region of the world, more than twice as high in some regions.<sup>4</sup>

Research also suggests a higher prevalence of several eye diseases among women, as well as systemic diseases that can contribute to eye conditions, vision loss and blindness. Eye-related diseases include:

- **Cataract**

- Cataract can develop with age, and as a result of genetic, pharmacologic, systemic and environmental factors (e.g. prolonged exposure to UV radiation for instance).
- Cataract is the leading cause of visual impairment in all areas of the world, except for industrialized countries.<sup>5</sup>
- Sixteen million people become blind each year due to cataract and up to 3 million of these cases may be caused by ultraviolet radiation exposure.
- *In lower and middle-income countries, cataract occurs more frequently in women.*<sup>3</sup>
- *Women get 60-70 percent of cataract operations in industrialized countries.*<sup>6</sup>

- **Glaucoma**

- The World Health Organization estimates that 4.5 million people are blind due to glaucoma. About 60.5 million people will have glaucoma by the year 2010, a number that may increase to almost 80 million by 2020.
- *Studies suggest that glaucoma affects women more than men.*
  - For instance, a 2006 study published in the British Journal of Ophthalmology projected that women will account for 59 percent of all glaucoma cases in 2010.<sup>7</sup>

- **Age-related macular degeneration**

- In developed countries, AMD is the leading cause of blindness, due to the growing number of people over 70 years of age.<sup>5</sup>
- Because women live, on average, several years longer than men, *women are twice as likely as men to develop age-related macular degeneration*, according to the Women's Eye Health Task Force, a research entity of the Schepens Eye Research Institute.
  - The lifetime risk for getting AMD is 6% for females and 3% for males.

- **Trachoma**

- This infectious eye disease is caused by a bacterium that can be spread through touch or clothing, often from child to child and from child to mother. Aggravating factors include crowded living conditions, water shortage and a high incidence of flies.
- Infection often begins during infancy or childhood. If left untreated, the bacterial infection eventually causes the eyelid to turn inward, which causes the eyelashes

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<sup>4</sup> "Global data on visual impairment in the year 2002." Bulletin of the World Health Organization. November 2004, 82(11).

<sup>5</sup> World Health Organization, 2008.

<sup>6</sup> "Gender and use of cataract surgical services in developing countries." Bulletin of the World Health Organization, 2002.

<sup>7</sup> H A Quigley, A T Broman. "The number of people with glaucoma worldwide in 2010 and 2020." *British Journal of Ophthalmology* 2006;90:262-267.

to rub on the eyeball, resulting in intense pain and scarring of the front of the eye. This ultimately leads to irreversible blindness, typically between 30 and 40 years of age.<sup>5</sup>

- Trachoma affects about 84 million people of whom about 8 million are visually impaired.
- *Women are three times more likely than men to be blinded by the disease.*<sup>8</sup>
- *In hyperendemic areas, the disease is most common in pre-school children with prevalence rates as high as 60-90%.*<sup>5</sup>

- **Dry eye**

- *Research indicates the syndrome is two to three times more prevalent in women than in men.*<sup>9</sup>
- It affects more than 20 million people in the United States.<sup>10</sup>
- Recent studies suggest that intake of fatty acids may decrease symptoms of dry eye in women.
- Data also suggests that women who use Hormone Replacement Therapy (HRT), particularly estrogen alone, are at increased risk of dry eye syndrome.

Systemic diseases and female-specific conditions affecting the overall and eye health of women include:

- **Breast cancer**

- The most common types of cancer that kill women worldwide, followed by lung, stomach, colorectal and cervical cancers.<sup>5</sup>
- As a form of cancer affecting predominantly women, breast cancer is diagnosed in an estimated 1.1 million women around the globe each year.<sup>11</sup>
- The annual worldwide incidence of breast cancer has almost doubled since 1975.<sup>12</sup>
- Ocular side effects of some cancer treatments can include retinal hemorrhaging and sensitivity to light. Other effects include cataract, dry eye syndrome, and itchy eyes.<sup>13</sup>

- **Diabetes**

- Eye diseases often contributed to by diabetes are diabetic retinopathy, cataract, age-related macular degeneration and glaucoma.
- Diabetes and related ocular complications, such as diabetic retinopathy and cataract, have been associated with reductions in contrast sensitivity and increased sensitivity to glare.
- Because of the increasing lifespan of women and the rapid growth of minority populations (who are more at risk for the disease), the number of women in the United States at high risk for diabetes and its complications is increasing.<sup>14</sup>
- Gestational diabetes develops in 2-5 percent all pregnancies but disappears post pregnancy. Women who have experienced this condition are at an increased risk of developing type 2 diabetes.

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<sup>8</sup> International Trachoma Initiative, 2008.

<sup>9</sup> Schepens Eye Research Institute, 2008.

<sup>10</sup> Market Scope. Report on the Global Dry Eye Market. St. Louis, Mo: *Market Scope*, July 2004.

<sup>11</sup> CancerStats: Worldwide cancer. London: Cancer Research UK. April 2005.

<sup>12</sup> World Health Organization. Fact sheet No. 297. Cancer. WHO, Geneva: February 2006.

<sup>13</sup> <http://www.Chemocare.com>. Accessed 10/10/2008.

<sup>14</sup> American Diabetes Association, 2008.

- Women are at a higher risk of **autoimmune diseases** that may affect the eye.
  - Multiple sclerosis (MS), lupus, rheumatoid arthritis, and Sjögren’s can be associated with optic nerve inflammation (optic neuritis), vasculitis in the eye, uveitis, and retinopathy.<sup>15</sup>
  - Sjögren’s syndrome is the autoimmune disease that causes the most eye-related disease. Of the million or so Sjögren’s sufferers in the U.S., 90 percent are women.
  - The first symptom of MS is often temporary blurring or loss of vision, usually in one eye. These symptoms are due to the inflammation caused by these diseases.
- Numerous studies suggest that women take more **prescription drugs** – as well as non-prescription drugs – than men do. Many of these drugs can have significant side effects on the eyes.
  - In the United States, women are nearly 50 percent more likely than men to be prescribed an abusable prescription drug, especially narcotics and anti-anxiety drugs.<sup>16</sup> Anti-anxiety drugs can cause diplopia, abnormal extra-ocular muscle movements, decreases in corneal reflex and conjunctivitis.<sup>17</sup>
  - Women use more oral steroids for asthma than men do.<sup>18</sup> These medications can alter the eye’s refractive state and blur vision. They have also been implicated in the development of cataract and glaucoma.<sup>18</sup>
  - Studies on ocular effects of birth control pills on the eyes have cited tearing, dryness, blurring of vision, eye film, and eye pain as possible effects. Also, some birth control pill manufacturers list ocular lesions as a health risk associated with the drug.
  - Anti-depressants can cause sensitivity to light.
  - HIV/AIDS-related medications can contribute to the development of night blindness, retinal detachment, glaucoma, cataract, maculopathy, retinopathy, optic neuritis, and conjunctivitis.
  - Studies suggest that some prescription medications can cause fetal harm in pregnant women. For instance, smoking, drinking or abusing drugs can increase the possibility of lazy eye, crossed eyes or other vision problems in infants.<sup>19</sup>
- **Smoking** can have a detrimental effect on the eye health of both women and their unborn children.
  - Approximately 8 percent of women in developing countries and 15 percent of women in industrialized countries smoke.
  - It is estimated that by 2025 both figures will be around 20 percent with 187 million women smokers in the world in 2001 rising to 532 million.<sup>20</sup>
  - The percentage in industrialized countries has increased, potentially because many more women have entered the workforce and are subjected to more stress.
  - A recent report released by the WHO shows that, globally, young girls are smoking almost as much as boys.

<sup>15</sup> <http://www.WomensEyeHealth.org>. Accessed 10/10/2008.

<sup>16</sup> National Institute on Drug Abuse Research Report Series. Prescription Drugs: Abuse and Addiction.

<sup>17</sup> Jaanus, Siret D., PhD. *Healthy Sight Counseling: Ocular Effects Associated with Medications*, 2006.

<sup>18</sup> Sexton, Mary et al. "Sex difference in the use of asthma drugs: cross-sectional study." *BMJ* 1009 317:1434-1437.

<sup>19</sup> American Optometric Association, 2008.

<sup>20</sup> "Women and the Tobacco Epidemic: Challenges for the 21<sup>st</sup> Century." World Health Organization, 2001.

- Numerous studies have shown that smoking can cause:
  - Development of cataract, AMD and diabetic retinopathy.
  - Ocular effects on fetuses of pregnant women.
- Studies show a strong association between smoking during pregnancy and the risk of invasive meningitis during early childhood. This can cause inflammation of the cornea and pink eye.
  - Smoking during pregnancy is also associated with low birth weight and eye disease in the infant.
- **Pregnancy** itself can affect the eyes as well.
  - Refractive changes are common.
  - Serious retinal detachment and blindness can occur during preeclampsia and subside postpartum.<sup>21</sup>
  - Pregnant women with existing diabetic retinopathy – the most common ocular effect of diabetes – are at an increased risk for progression of the disease. Diabetic retinopathy can also cause sensitivity to light and can exacerbate the damaging ocular effects of ultraviolet light.<sup>22</sup>
    - More than 90% of severe vision loss and blindness caused by diabetic retinopathy can be prevented with proper eye care.<sup>5</sup>

### **Overall Health and Eye Health Needs of Children**

Aside from counting on the care of their mothers and other adults in their family and community, children are inherently susceptible to numerous diseases and conditions that can negatively affect their eye health. While many of these effects are treatable with primary health care and eye care, lack of access to this treatment can lead to visual impairment or even blindness.

An estimated 500,000 children become blind each year, equating to approximately one child per minute. In developing countries, up to 60 percent of blind children may die within one year of losing their sight.<sup>23</sup> Nearly half of blindness in children can be prevented with proper intervention. Approximately three-quarters of the world's blind children live in the poorest regions of Africa and Asia.

Additionally, uncorrected refractive error is the main cause of vision impairment in children aged 5-15 years<sup>24</sup>, with the highest prevalence reported in urban and highly developed urban areas in south-east Asia and in China.<sup>25</sup> At the same time, prevalence of refractive errors, especially myopia, is higher between the ages of 13 and 18 years.

#### ● **Major causes of blindness**

- The World Health Organization reports that, in high-income countries, lesions of the optic nerve and higher visual pathways are a major cause of blindness in children, while corneal scarring from measles, vitamin A deficiency, use of

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<sup>21</sup> Dinn, Robert B. BS, et al. "Ocular changes in pregnancy." *Obstetrical & Gynecological Survey*. 58(2):137-144, February 2003.

<sup>22</sup> *Healthy Sight Counseling: Diabetes and the Eye*, 2008.

<sup>23</sup> World Health Organization. Preventing blindness in children: report of WHO/IAPB scientific meeting. Geneva: WHO, 2000. (WHO/PBL/00.77.)

<sup>24</sup> Vision 2020, Refractive Errors, 2008.

<sup>25</sup> Vision 2020, Refractive Errors, 2008.

- harmful traditional eye remedies, ophthalmia neonatorum, and rubella cataract are the major causes of blindness among children in low-income countries.
- Retinopathy of prematurity (abnormal blood vessel development in the retina of the eye in a premature infant) is an important cause in middle-income countries.
  - Other significant causes in all countries are congenital abnormalities, such as cataract, glaucoma, and hereditary retinal dystrophies.
- **Impact of nutrition**
    - Children also have nutritional needs that can significantly impact their physical health and development – including eye health. Especially in developing countries, malnutrition is the underlying cause of over one-third of all deaths among children under age five, as well as the underlying cause of one-fifth of all maternal deaths during childbirth.<sup>26</sup>
    - Vitamin A deficiency is a common condition that can develop due to lack of breast milk in infants or due to a generally poor diet. It can also accompany diseases such as measles, respiratory disease and diarrhea. In addition to potentially leading to complete vision loss, vitamin A deficiency can also cause night blindness, infection, corneal ulcerations and scarring, and dry eye.<sup>27</sup>
    - The WHO estimates that vitamin A supplements reduce child mortality by up to 34% in areas where Vitamin A deficiency is a public health problem.
  - **Eye trauma**
    - Children generally spend more time doing physical activities than adults do – whether these activities are play or sports. This leaves children more vulnerable to eye trauma.
    - In the United States, for example, more than 40,000 sports-related eye injuries occur every year. Almost a third happens to children between ages 5 and 14, and an estimated 90 percent are preventable.<sup>28</sup>
  - **Importance of UV protection**
    - Children also spend more time outdoors than adults, where ultraviolet (UV) light is a threat to their healthy sight. Children’s eyes are particularly at risk to damage from UV rays because their eyes are still developing.
    - UV has been linked to several eye diseases such as cataract, macular degeneration and diabetic retinopathy, making UV protection important.
  - **Obesity and diabetes**
    - With obesity on the rise around the world, diabetes in children is a growing concern. For instance, type 2 diabetes usually occurs in people over the age of 40 but is now also affecting children and adolescents to a greater extent.<sup>5</sup>
    - Diabetic retinopathy usually occurs after the onset of puberty and typically 5 to 10 years post-diagnosis; however, it has occasionally been reported in pre-pubertal children after only one to two years of diabetes.<sup>29,30</sup>

<sup>26</sup> Countdown to 2015 Maternal, Newborn and Child Survival: The 2008 Report.

<sup>27</sup> Sommer, Alfred. "Vitamin A deficiency and its consequences: A field guide to detection and control." Third Edition. World Health Organization, Geneva. 2001.

<sup>28</sup> Prevent Blindness America, 2005. *Sports Eye Safety*.

<sup>29</sup> NDEP/NIDDK. Overview of Diabetes in Children and Adolescents: a National Diabetes Program Fact Sheet.

<sup>30</sup> International Diabetes Federation. Diabetes Atlas, 3rd ed. 2006.

- Several studies have suggested that the progression of complications from diabetic retinopathy may be especially rapid and severe in those patients developing diabetes at an early age.<sup>31</sup>
- 80 percent of people with diabetes live in low and middle income countries, according to the World Health Organization.
- **Medication use**
  - Children are taking more medications than ever before. Again, many prescription and non-prescription medications can impact healthy sight.
  - For example, anti-histamines for the treatment of allergies or corticosteroids for asthma management can blur vision and change the eye's refractive state.
  - Steroids, such as those used in asthma medications, can contribute to the development of cataract and glaucoma.
  - Likewise, a central nervous stimulant such as Ritalin, used to treat Attention Deficit Disorder, can produce problems with light sensitivity and glare.

### **Implications for Quality of Life**

Since 70 percent of learning takes place through the eyes<sup>32</sup>, it is no surprise that visual impairment and blindness can take a serious and irrevocable toll on women and their families around the world.

A woman who cannot see, or see well, can expect to see a decrease in quality of life, both subjectively and functionally, in terms of her overall ability to manage daily tasks and activities. She will likely struggle to properly care for her family, and will not be able to contribute as fully to her community. In some societies, the blind are stigmatized – seen as a burden to society. Not only does such stigma affect social status and self-acceptance, but it may also influence whether a woman opts to seek eye care for herself or for her children.

While in industrialized countries the visually impaired may have greater access to basic or comprehensive eye care and may be more encouraged to seek treatment, women with visual impairment or eye disease in some developing countries may try to hide their condition, potentially leading to complete vision loss over time.

Visual impairment and blindness among women can have an equally alarming effect on their children and even grandchildren. Children and grandchildren are sometimes forced to stay home to take care of their blind parents or younger siblings, and to manage basic household duties in order to keep the family afloat. With an education serving as a ticket to a better life for their families, these children may struggle to help their families rise to a better economic status. Plus, the children of women with five years of primary school education have a survival rate 40 percent higher than children of women with no education.<sup>33</sup>

Aside from threatening their overall health, uncorrected visual impairment or blindness in children can, again, seriously hinder their education – considering that approximately 80

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<sup>31</sup> *Healthy Sight Counseling: Diabetes in Children*, 2008.

<sup>32</sup> The Schepens Eye Research Institute, 2008.

<sup>33</sup> Millennium Project, 2008. Fast Facts: The Faces of Poverty.

percent of learning in a child's first 12 years comes through the eyes<sup>34</sup> – which will in turn impede their ability to contribute to the productivity of his or her community. 90 percent of blind children do not attend school.<sup>35</sup>

The detrimental economic effect of such limitations can be felt by an entire community, and, in the long term, on an entire nation.

With the escalating costs of health care, and the prevalence of eye and systemic disease among women, focusing on early detection and treatment of eye and systemic diseases for women can serve as a key method for managing healthcare costs globally. Because of their role as mother, spouse and caretaker, the promotion of education and proper care for women – and among women – can help spread the message of prevention to their children, other family members and peers.

Similarly, children are equally important to focus on, because of their susceptibility to disease, their need for caretaking, and for the important role they will play in the future of community and global economic development.

### **About the Healthy Sight Institute**

The Healthy Sight Institute is an educational and learning resource for health and vision care professionals worldwide. Supported by Transitions Optical, the Healthy Sight Institute is dedicated to the protection and preservation of healthy sight for all people.

As a dynamic knowledge center for professionals, the Healthy Sight Institute makes available a range of information and resources, including clinical papers, professional education courses and public education tools. Drawing on the expertise of its geographically diverse and multidisciplinary steering committee, the Healthy Sight Institute also provides a forum to educate and collaborate with health and vision care professionals, optical industry leaders, policy makers, and the public for a wider understanding of proactive and preventive eye care choices.

The depth of the Healthy Sight Institute's resources can be accessed through its official Web site at [www.healthysightinstitute.org](http://www.healthysightinstitute.org).

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<sup>34</sup> The Vision Council. (2005, May 17). *RIF and VCA Partner to Reach Parents*.

<sup>35</sup> Sightsavers International.