In 2002, there were an estimated 161 million visually impaired people globally, 37 million of whom were blind.¹

Predictably, blindness and low-vision disproportionately affect the poorest people and countries.

Perhaps what is more surprising is that two thirds of blind people are women. Most surprising of all is that 80% of these cases are preventable.²


Dr. Gregory offers further explanation, “The Vision 2020 program focuses on eliminating preventable causes of blindness by the year 2020. Cataracts, which can be fixed with a fairly simple surgery, are at the top of the list. Trachoma and onchocerciasis are infectious diseases of the eye that damage the cornea. Vision 2020 also addresses the role of Vitamin A deficiency, and significant refractive errors [poor vision requiring corrective lenses], especially among the children.”

Blindness and low-vision have serious impacts on the productivity and income of families and communities.

The motivation to start Vision 2020 was based on discouraging predictive models, which showed that as many as 76 million people could be blind by the year 2020 if preventable causes were not mitigated.

Further economic modeling has shown that financial loss associated with blindness in 2020 would be $50 billion, and as much as $110 billion when losses from low-vision are included.³

Low vision and blindness are public health issues that will worsen as the world’s population grows and ages if new interventions are not applied.

**Cataracts**

Cataracts are the leading cause of global blindness. This condition causes the natural lens inside the eye to become opaque, leading to cloudy vision.

While some cataracts result from aging, they can also result from other eye diseases, traumatic injury to the eye, and complications from certain medications.

Cataracts cannot be reversed or treated with medication; they require surgery. Cataract surgery coverage has been used as an index to understand socioeconomic and demographic factors of blindness.

Studies have revealed that cataract surgery coverage rates are significantly
The idea of becoming an agent of change made me want to find a way to have a large scale impact on communities in need through prevention and education,” said Roberto Delgado Zapata.

Roberto was born and raised in Lima, Peru. In April of this year, he graduated with a medical degree from the Universidad Peruana Cayetano Heredia in Lima.

Roberto’s exposure to medicine occurred early in life as he was a premature baby and was diagnosed with chronic asthma as a young child. He believes that his frequent hospital visits and recurrent interactions with many doctors and nurses greatly impacted his decision to pursue a medical career.

“My main interest in applying for this fellowship was to gain training in Global Health so I can start developing local research in order to contribute to the poorest communities in my country,” said Roberto.

“I believe that the Center for Global Health’s Celgene Fellowship is a powerful way to gain the ability to work collaboratively and contribute to the sustainable development of the most neglected communities.”

Roberto’s past participation in rural health projects became the foundation for his interests in global health and research.

Throughout the first couple years of medical school, Roberto worked on the IRIS project (Rural Intervention for Research and Sanitation) as a Volunteer, Health Campaign Coordinator, Medical School Coordinator, and General Coordinator.

“The main objective of IRIS was to show first year medical, dentistry, psychology, biology, and medical technology students the reality of working in Peru—it is not always ideal. We want students to see what our country’s people are suffering from and dealing with day-to-day,” said Roberto.

The IRIS project, based throughout the highlands of Peru (specifically in Ancash, Junin, and Arequipa) centered on conducting research, promoting health campaigns, and developing educational programs based on what local leaders identified as the central health and social problems in the community.

IRIS aims to improve healthcare quality in this region by working alongside local organizations. IRIS contacts nearby physicians to help develop free health campaigns. They also work alongside pharmaceutical companies to decrease medical costs and develops research with neighboring groups. Another priority is training multidisciplinary medical students to create educational programs based on specific community’s needs.

Roberto sees himself completing a Masters in Public Health at the Colorado School of Public Health to compliment his past experiences, as well as pursuing a pediatric residency with a global health focus.

When not in the hospital, Roberto loves to cook. He also has an artistic side and loves both photography and painting. Roberto believes that painting is one of his best, and favorite outlets. It was a great stress and pressure reliever when he was attending medical school.

“The Celgene Fellowship is a perfect opportunity as it combines all the aspects I desire: educational projects, community development, healthcare, and intervention. It will help me adapt to novel situations, cultures, and environments, as well as provide me with new ways of thinking,” reflects Roberto.
lower for females than males due to prohibitive cost, and difficulty associated with leaving home and traveling long distances to facilities. Sociocultural reasons, like trust in the outcome of eye surgery, and a differential valuation of women’s eyesight also play a role in the under-utilization of cataract surgery when it is available.

In the year following residency, prior to his fellowship in corneal surgery, Dr. Gregory traveled to Asuncion, Paraguay, and Cape Coast, Ghana, to provide screenings and cataract surgeries. Collaborating with International Aid in Ghana, Dr. Gregory conducted 50-60 exams in the morning, and about 10 cataract surgeries each afternoon.

Reflecting on these early-career missions, Dr. Gregory explains, “The days in clinic were demanding, but also very rewarding. The people who had cataracts removed were essentially blind, and one day later they could see. In the grand scheme of things, it may be a drop in the bucket. But in terms of these people’s lives, the change was huge. It was really very moving to be a part of.”

While in Ghana, Dr. Gregory was having a meal in the restaurant at the hotel where he was staying in Cape Coast. He had become friendly with the staff, but was still caught off guard when his waiter walked over and said, “They’re talking about you on the radio.” Darren looked up, unsure how to reply. “They're talking about me on the radio?”

“Yes, they’re talking about the clinic, saying that an American doctor is here examining people’s eyes,” the server said. Dr. Gregory was both grateful for and concerned by the publicity. He was awash in patients already, but was relieved to know that word had spread about the services he was offering in the nearby clinic.

Sub-Saharan Africa bears a substantial burden of blindness with 1.4% of the regional population afflicted by blindness, almost 19% of the global burden.

While these figures take into account all causes of blindness, Africa is also the region most affected by infectious causes of blindness.
distribution of the drug ivermectin to control infection, and applied larvicide spray in blackfly breeding sites. Onchocerciasis elimination programs are success stories.

The disease has is no longer considered as a public health problem in 11 countries, equating to more than 600,000 cases of blindness prevented.1

Refractive Error, Vitamin A, and Diabetic Retinopathy
Severe uncorrected refractive errors, which are also called near- and far-sightedness, are estimated to account for 5 million blind people. A further 124 million people suffer from low-vision, which detracts from economic productivity and overall quality of life.1

Without corrective lenses, refractive errors in children can become permanent impairments. Dr. Gregory explains, “If a child has significant glasses needs, but does not have the glasses before age 6 or 7, their vision won’t develop fully. The development in the brain is done by age 10.”

Refractive errors can be remediated with corrective lenses, but challenges lie in early and ongoing screening, as well as cost and supplies of glasses frames and lenses.

Another vulnerability for childhood blindness is vitamin A deficiency. Vitamin A deficiency is comorbid with measles, and in both cases the deficiency contributes to scarring and ulcerations of the cornea, a painful and possibly permanent condition.

“Vitamin A deficiency leads to an overall malnourished state in children. In addition to the dryness and scarring on the eye, vitamin A deficiency can damage the nerve cells in the retina,” offers Dr. Gregory.

Fortunately, more sweeping childhood survival programs like the WHO program Integrated Management of Childhood Illness have disseminated vitamin A supplementation programs that have been scaled up in many underdeveloped countries.

While there have been reductions in childhood blindness from vitamin A deficiency, diabetes conditions are poised to contribute to a greater percentage of vision loss.

Gregory comments, “As countries are becoming more affluent, the diets are changing and unfortunately diabetes is on the rise. Diabetic retinopathy is in the top three causes of blindness in the U.S. and Western hemisphere. The abnormal sugar levels cause damage to the smallest capillaries of the body, like the ones in the eye. They can get leaky or blocked, and do not deliver blood to the tissues. In the retina [the part of the eye that communicates with the brain], the nerves are really active all the time, so there is a high oxygen need. They need a rich blood supply, and vision quickly suffers if that blood is not received.”

As the incidence of diabetes increases, it is likely that more individuals will suffer from eye complications that could lead to permanent eye damage. Good diabetes management is key to preventing this condition.

Seeing the Big Picture
Eliminable blindness and vision loss are multifactorial conditions that are mainly found in low income, low resource settings. Robust medical systems that can offer early screening, and public infrastructure that can accommodate basic sanitation and hygiene needs are prerequisites to eye health.

Whether or not these systems are in place will determine in part how impactful nutrition and lifestyle choices will be when it comes to vision impairment.

Vision quality is an interesting indicator of gender parity. In higher-income countries, more females may be blind because women live longer, but in lower-income countries it is because the financial and logistical barriers to care are more difficult for women to overcome.2

Data from research studies must be separated by sex to better understand the circumstances of blindness in women. Similarly, hospital based studies are useful, but more population based studies are needed to drive evidence-based programming.
The ultimate goal of the Vision 2020 initiative is to integrate sustainable, comprehensive, high-quality, equitable eye care systems into strengthened national health-care systems.

Riding the momentum of earlier programs, Vision 2020 has made progress specifically in the area of infectious blindness. The program’s goals for the next five years focus on engagement efforts with national governments, and better integration into established healthcare systems and medical curricula.

Eye health is worth investing in; good vision improves quality of life and lifespan for individuals, and enables maximum economic productivity to benefit families and communities.

As an ophthalmologist, Dr. Gregory has an informed perspective, “You can have a great impact on people’s lives. There are chronic ailments that we can’t resolve, but many diseases of the eye can be cured, and it’s gratifying to help people on that path.”

6. WHO. Gender and Blindness in the Eastern Mediterranean Region.

Learn more about Dr. Gregory’s work, contact him at darren.gregory@childrenscolorado.org.

♦By Molly Terhune
Girls Moving Mountains: Creating Sustainable Community Builders in Nepal

Meagan Cain was born in California but grew up in Sedona, Arizona. Growing up, Meagan’s parents owned a helicopter company that assisted with disaster relief efforts. Meagan believes that witnessing the work of her parent’s company from a young age sparked her interest in working with diverse populations.

She graduated from Colorado State University in 2012 with a degree in psychology. Meagan is currently pursuing her Master’s in Public Health at the Colorado School of Public Health program at the University of Northern Colorado and is expected to graduate this spring.

“Girls Moving Mountains is not a non-profit—but a live project—that aims to create a new generation of sustainable health educators. I am working in Nepal to perform health education, but more importantly, to lay the groundwork for something larger. I want to give the community the tools to help encourage the beginning of a program that they can run by themselves and make their own,” Meagan Cain stated.

Meagan first traveled to Nepal in 2014 to promote health knowledge workshops with nearly 200 sexually exploited women. Meagan was shocked at how little these women, who worked in the sex industry, knew regarding sexual health and female anatomy.

Meagan began to understand that the cultural shame towards sex became a large barrier to sexual health education. This finding fueled Meagan’s desire to educate these women in order to avoid their entering prostitution.

After significant research, Meagan isolated the central trafficking hotspots in Nepal—the largest was a rural community outside Kathmandu called Nuwakot. She created a primary prevention program (which eventually evolved into Girls Moving Mountains) to educate and empower young girls before they entered sex work.

The community of Nuwakot was extremely excited about this program and many of the community leaders and members reached out to Meagan to offer their support to develop this program.

With the support of Health & Ed 4 Nepal — a non-profit organization dedicated to bringing healthcare and education to the villagers of Kumari, Nepal — Girls Moving Mountains trains young girls leadership skills and economic self-sufficiency so they will not have to rely on prostitution in the future.

Focusing primarily on health education, this program proposes alternative sources of income while encouraging values of self-worth and self-reliance.

Meagan hopes these girls will become advocates for others in their communities and will pass on their knowledge to their peers.

Girls Moving Mountains functions as a support system for the Nuwakot girls involved in the program, “First, we wanted to enable the girls to gather together in a safe space to discuss topics related to women. Typically, in rural Nepal, women only engage in domestic work and do not leave the home in any kind of social capacity. Many of the topics we discussed were related to empowerment—decision-making, access to care, and the importance of women in improving community health,” said Meagan.

Part of the program centers on providing and clarifying important health information related to family planning and female anatomy. Meagan believes a woman’s ability to plan when and how many children they have is not only critical to her health, but also gives her control over her life.

Girls Moving Mountains also develops projects outside of the classroom, “A big part of the project was starting a community greenhouse for women. We built it from scratch to give the girls space to plant vegetables through the monsoon season. This was a very special opportunity because it is not typical for women to own land and the village donated the space for these girls specifically for this project,” Meagan explained.

21 days after the 7.8 magnitude earthquake hit Nepal in April 2015, Megan arrived in Kathmandu for the second time to launch Girls Moving Mountains. Due to the earthquake, the largest in 82 years, and its residual damages, Meagan was unsure if the project would launch.

To her surprise, she had numerous girls who wanted to participate even immediately after the earthquake.

“These girls were resilient. Their villages were destroyed and they lost what little they had. It was amazing to watch them come out to help with the project and put in the hard work.

(Continued on page 7)
“They met me at 5 a.m. to avoid interrupting their work schedules farming the rice patties to make this project happen. I do not know many teenagers that would walk many miles that early in the morning to come and help,” reflected Meagan.

Girls Moving Mountains is still active in Nepal. Meagan receives updates on how the program is developing and expanding from Ellen Gurung, who oversees all health activities for Health & Ed 4 Nepal.

These progress reports encourage Meagan to continue to work towards a project that is sustainable by the community, for the community.

Meagan hopes to return to Nepal in the future to train community health leaders and develop more health posts, as many of the hospitals were severely damaged in the earthquake.

She wants to continue international work that endorses community building by looking at gender issues. The capstone project for her Masters degree reflects her work in Nepal as she is writing a “How-To” manual that will give advice to smaller organizations about entering disaster recovery zones and creating lasting change.

“I am most proud of the ability of these kids to come and stay together as a group. I was scared that they would fall apart over time, but they have continued together to talk about health. Most importantly, they have stayed together as community builders,” said Meagan.

Check out Meagan’s blog about her experiences in Nepal.

Notes from the Field — Students making a difference!

Follow these students through their blog posts and monthly notes as they learn about the challenges and rewards of working on the ground in resource constrained settings and WHO, where everything global happens.

East Africa — Sara Adkins
M.P.H. Candidate at Colorado State University

Nepal—Meagan Cain
M.P.H. Candidate at the University of Northern Colorado

World Health Organization (WHO) - Emma St. Aubin
M.P.H. Candidate at Colorado State University

East Africa—Tavia Wolf
M.P.H. Candidate at Colorado State University
Global Health & Disasters Course
November 9 -19, 2015

Registration is open!
Learn more, click here!

This international health course is a two week training offered once a year as part of the University of Colorado School of Medicine Global Health Track and Colorado School of Public Health. The first week of the course is the Global Health section of the course and the second week of the course is the Children in Disasters section.

This course prepares its participants for international experiences and future global health work. The interactive training incorporates readings, lectures, small group problem based learning exercises, technical skill sessions, and a disaster simulation exercise.

2015 Scholarship Recipients

Rotary Scholarship

- Amina Forde (School of Medicine - M.D.) – project in Shenyang, China
- Naveed Heydari (Colorado School of Public Health - M.P.H. Environmental & Occupational Health) - project in Machala, Ecuador
- Ebele Mogo (Colorado School of Public Health - Dr.P.H.) - project in Festac Town, Lagos, Nigeria
- Abigail Nimz (School of Medicine - M.D.) – project in Kisumu, Kenya
- Wesley Porter (School of Pharmacy - Pharm.D.) – project in Quito, Ecuador
- Sophie Pritchard (Colorado School of Public Health - M.P.H. Global Epidemiology) - project in Kisumu, Kenya
- Chrissy Swope (Colorado School of Public Health - M.P.H. Maternal & Child Global Health) – project in Lyantonde, Uganda
- Lexi Tsoi (School of Medicine - M.D.) – project in Shenyang, China
- Ngoc Vu (School of Medicine - M.D.) – project in the Hill Region of Nepal

Robinson Durst Scholarship

- Ebele Mogo (Colorado School of Public Health - Dr.P.H.) - project in Festac Town, Lagos, Nigeria
- Sophie Pritchard (Colorado School of Public Health - M.P.H. Global Epidemiology) - project in Kisumu, Kenya
- Blake Snyder (School of Medicine - M.D.) - project in Vellore, India

Calvin L. Wilson Scholarship for Future Leaders in Global Health

- Andrew Ancharski (Colorado School of Public Health - Dr.P.H.) – project in Khon Kaen, Thailand
- Allison Maytag (Colorado School of Public Health - M.P.H. Community & Behavioral Health) – project in Loreto, Peru

To learn more about this year’s recipient projects and the scholarships the Center for Global Health administers, click here.

2016 scholarship cycle will be announced January 2016.
Fall 2015

October 20, 2015, 12 — 1 p.m.
Education Building 2 North, Room 1103, Anschutz Medical Campus
Gretchen Domek, M.D., M.Phil., Assistant Professor of Pediatrics, University of Colorado Anschutz Medical Campus
Gretchen Heinrichs M.D., D.T.M.H., Assistant Professor of Obstetrics and Gynecology, University of Colorado Anschutz Medical Campus and Denver Health

Topic: Updates from the field: Conducting Maternal and Child Health Programs in Guatemala

November 10, 2015, 12 — 1 p.m.
Education Building 2 North, Room 2302, Anschutz Medical Campus
Jamie Van Leeuwen, Ph.D., M.A., M.P.H., C.A.C. III, Founder and Executive Director, Global Livingston Institute

Topic: Innovative Solutions to Poverty: Thinking Differently and Thinking Big

December 2, 2015, 12 — 1 p.m.
Education Building 2 South, Room 2201, Anschutz Medical Campus
Deborah Thomas, Ph.D., Associate Professor and Chair of Geography and Environmental Sciences at the University of Colorado Denver
Sheana Bull, Ph.D., M.P.H., Professor and Chair of Community and Behavioral Health, Colorado School of Public Health

Topic: Implementation of the THIT mHealth Project in Tanzania using Best Practices

Want to watch a lecture you missed? Click here.

Picture of the Week - Look for it October 2015!

Some pictures do tell a story and the Center for Global Health will be sharing a ‘Picture of the Week’ series this month. Pictures taken by our students and faculty will be posted. So keep an eye out; one of the pictures may be yours!!

Like us on Facebook and follow us on Instagram at CU_globalhealth.