When discussing malnutrition, it is important to distinguish between chronic and acute conditions.

Acute malnutrition is considered low weight for a given height, and is often depicted as wasting (i.e. very thin limbs and distended belly). On the other hand, stunting is considered short height for a given age. Stunted children are shorter than their healthy peers.

To quantify and standardize malnutrition indicators, the World Health Organization has defined thresholds (z-scores) for weight-for-height and height-for-age.

Severe food deficits lead to acute malnutrition, but chronic malnutrition is more insidious and long-term. It is caused by an imbalanced diet that does not provide adequate micronutrient intake, and does not meet energy requirements from carbohydrate, protein, and fat sources.

Chronic malnutrition is much more prevalent than acute malnutrition in the Trifinio region and the country in general. Although it draws more public attention, acute malnutrition affects just 1.1% Guatemala’s children under the age of 5.

Chronically malnourished children are at risk for higher incidence of infectious disease and cognitive delays, which can lead to delayed development, lower IQ, fewer years in school, lower academic achievement, lower economic productivity, and earlier childbearing. This future begins to take shape before birth, and even before conception. Dr. Bekelman points out, “Mothers who are...” (Continued on page 3)
Camp GLOW: Making the Future of Women’s Empowerment Bright

“Camp GLOW arose from the need to educate and empower females with skills, knowledge, and behaviors that would allow them to reach their full potential. It is a model that involves host country nationals in order to focus on sustainability,” explained Hannah Pensack-Rinehart, MPH.

After graduating from Colorado State University in 2013 with a Bachelor of Science in Health and Exercise Science, Health Promotion and a Bachelor of the Arts in harp, Hannah decided to enter the Peace Corps in 2015.

Volunteering as a community health teacher in Mezezo, Ethiopia, Hannah was involved in many educational programs in the region.

Some of the projects she assisted with included: instructing HIV/AIDS education to secondary school students through a grassroots soccer program, leading a menstrual health training for students in rural Ethiopia, co-leading a gender equality club for secondary school students, acting as a community mobilizer to increase sanitation infrastructure at a rural health center, and co-facilitating a nutrition class for pregnant women and women with young children, to name a few.

After returning to the United States from her time volunteering abroad, Hannah decided to pursue a Masters in Public Health at the ColoradoSPH at Colorado State University and graduated from this program in May 2017.

Gender Inequality in Ethiopia

While pursuing her Masters in Public Health from the ColoradoSPH, Hannah also served as a volunteer in the Peace Corps and lived for two years in a rural Ethiopian village of Mezezo.

While conducting a community needs assessment, she noticed a need for female education and empowerment due to certain cultural practices and gender norms that seemed to prevent females from finishing their education. “I spoke to several girls in my village who faced challenges and barriers in their education, due to gender norms. For example, many of the girls expressed to me the cultural practice of early marriage, which forces girls to leave their education early,” reflected Hannah.

This gender inequality that Hannah observed during her community needs assessment has also been acknowledged by the international community.

A 2015 United Nations Human Development Report ranked Ethiopia 116th out of 159 countries in the Gender Inequality Index that was developed to rank countries based on three dimensions: reproductive health, empowerment, and labor market participation. In 2015, the highest ranked countries in terms of gender equality were Switzerland, Denmark, Netherlands, and Sweden, while the lowest were Yemen, Niger, Chad, and Mali.

Inevitably, female empowerment can only be fully obtained with the support of the entire community. Hannah wanted to explore these cultural differences further and co-facilitated a gender equality club in Mezezo, which included both males and females, in order to include all genders in the empowerment process.

“Camp GLOW arose from the need to educate and empower females with skills, knowledge, and behaviors that would allow them to reach their full potential. It is a model that involves host country nationals in order to focus on sustainability.”

Hannah Pensack-Rinehart, MPH, ColoradoSPH

“Promoting Women’s Education and Empowerment

Camp GLOW, standing for Girls Leading Our World, is an empowerment camp that focuses on “helping participants understand the role of health in their future success, increasing self-esteem, and understanding how gender
food insecurity is prevalent in this lowland region in the southwest part of the country. Results from a 2011 community health assessment showed that seventy percent of participants agreed with the statement, "In the past three months the food we had was not sufficient and we had no money to buy more food." The same proportion reported skipping meals because of insufficient money to buy food. Economic constraints are just one component of food insecurity. During his visits to markets near the Trifinio, Dr. Delgado-Zapata observed a lack of diversity in fruits, vegetables, and protein sources. He also noticed that most of the available foodstuffs at local markets were grown in neighboring regions, not in the communities themselves. This is likely due in part to the frequent flooding and landslides that this region experiences. These external pressures force certain decisions within the home. A family of eight may have to make different decisions about food distribution than a family of four. Local customs that influence how parents feed their children are additional factors to examine. Dr. Bekelman summarizes, "To alleviate the burden of stunting, we need to figure out how biology, culture, and the social and physical environments all interact to influence child growth. Untangling those interactions makes chronic malnutrition an interesting area of research. We started to scratch the surface with our study." To alleviate the burden of stunting, we need to figure out how biology, culture, and the social and physical environments all interact to influence child growth. Untangling those interactions makes chronic malnutrition an interesting area of research. We started to scratch the surface with our study.

Traci Bekelman, PhD, MPH, Postdoctoral Fellow in Pediatrics, CU Anschutz

In February 2017, Drs. Bekelman and Delgado-Zapata traveled to El Trifinio. They recruited a small sample of 12-24 month old children, half of whom were stunted and half of whom were normal height. The children and their mothers were recruited through Niños Sanos, the child-health community outreach program created by the Center for Global Health. The study was not designed to detect differences between stunted and normal-height children, but rather to understand what foods are locally available and family attitudes about what children between ages 12 to 24 months should eat. "An unexpectedly high number of moms were still breastfeeding after 12 months. Breastfeeding is essentially free, and when you have restricted financial circumstances it makes sense that you would take advantage of this resource," says Dr. Bekelman. "Breast milk offers good nutrition, but in this age group, breastmilk alone is not sufficient for healthy child growth. So, we are trying to assess complementary feeding practices -- are kids between 12 and 24 months getting the right foods outside of breastfeeding?"

To answer this question, the investigators relied on four data collection methods. They took anthropometric measurements (length, weight, and head circumference), administered 24-hour dietary recall surveys, conducted qualitative, open-ended interviews, and used a photo-rank method to determine desirability and perceived cost of different protein sources. A secondary aim of the pilot study was to assess the feasibility of using the 24-hour dietary recall method to measure dietary intake. 24-hour dietary recall is what it sounds like -- a very detailed report of all foods and beverages consumed in the past 24 hours. The investigators suspected that this would be the most appropriate tool for this population since other similar methods require lengthy questionnaires that recount long periods of time like months or even a year. The
investigators noted that even with the 24-hour recall, moms struggled to recall portion sizes and breastfeeding practices from the preceding day. To be sure that average consumption habits are adequately captured, the investigators would like to collect additional 24-hour dietary recalls in the future.

In order to understand nuances of household attitudes, decision-making processes, and why children eat what they eat, Bekelman and Delgado-Zapata gathered qualitative data using an open-ended survey.

"In our qualitative interviews we explored parents’ ideas about what children between 12 and 24 months should eat. We found that they have concerns about serving meat to children in this age group because they’re worried children are not old enough to eat meat, or that it may cause choking or abdominal pain," says Dr. Bekelman.

During interviews, Dr. Delgado-Zapata often heard about caldos, which are commonly served soups. “Caldos are culturally accepted food for children, but they are not very nutritional. They usually consist of hot water and a packet of broth, which is very high in sodium, and two or three pieces of vegetables,” he says.

Incaparina is another food that has become culturally accepted. It is a corn flour/soy flour formula fortified with micronutrients and mixed with water or milk to provide a nutritionally complete food source.

A big advantage is that the formula is non-perishable. This became especially relevant after interviews revealed that lack of refrigeration was a barrier to maintaining animal protein sources in the home.

The investigators used the photo-rank method to evaluate the perceived cost and desirability of different sources of dietary protein. They took photos of 15 dietary proteins commonly consumed in a Guatemalan diet (beans, eggs, cheese, tripe, etc.)

First, mother’s had the opportunity to rank photos highest to lowest according to what they would most like to feed their children, regardless of cost. Then they were asked to arrange the photos highest to lowest according to costliness and accessibility.

They were then asked why they chose to rank the foods the way they did. Dr. Bekelman points out, “Many of the foods that were most desirable and most expensive were not consumed by the children, which raises questions about whether moms can afford to feed kids the food they want.”

Even though they are facing difficult decisions about desirability and affordability in the marketplace, many mothers are unaware of the overall nutritional status of the community.

Dr. Delgado-Zapata explains, “Moms are not seeing that there is a problem. Not recognizing the problem is one of the barriers to seeking treatment. It is important that they understand their children are at risk for other diseases and long-term consequences from these early life circumstances.”

Dr. Bekelman adds that, “With chronic malnutrition, it’s unclear whether children will be able to get back on the growth curve after suffering from stunting.” Treatment for chronic malnutrition is difficult.

According to the study PI, Dr. Cunningham, the real treatment is prevention, which can only be accomplished via public health efforts. “This includes improving the diet of young children before they become parents themselves, and this can only happen through macro-level efforts to reduce food insecurity and improve nutritional knowledge among caregivers,” she says.

"Even though the Ministry of Health in Guatemala has developed nutrition guidelines and policies, government health workers do not go out in the communities to find malnourished children because they don’t have the resources to care for them.”

Roberto Delgado-Zapata, MD, MPH, Celgene Global Health Fellow, Center for Global Health

Meanwhile, the Niños Sanos program has been distributing Vitamin A supplements to children enrolled in the program every six months. Vitamin A is a crucial micronutrient that supports immune system function, eye health, and proper growth. These supplements are donated by Vitamin Angels, a California based non-profit organization.
Data from this pilot study will be used to make locally relevant adaptations to the recommendations being given by the nurses in the Niños Sanos program.

According to Dr. Bekelman, “This is just the first step toward informing the design of a nutritional education program that is feasible and culturally appropriate to the Trifinio population in an effort to prevent malnutrition among young children.”

With this research ongoing, the Niños Sanos program will begin distributing Chispitas, a micronutrient powder, to address micronutrient deficiencies that accompany chronic malnutrition.

Dr. Cunningham is also looking to the future, and investing in relationships that will support lasting change in the fight against malnutrition. She says, “We have also started meeting with health officials from the departments of San Marcos, Quetzaltenango, and Retalhuleu to collaborate on the treatment of acute malnutrition in the region. Hopefully, this will pave the way for future collaborative efforts to address chronic malnutrition. Collaboration with local health officials and community leaders will be critical for the development of a sustainable effort.”


♦ By Molly T Moss

CU Anschutz and Baylor researchers to study Zika virus impacts on children

"We now know the severe effects of Zika in the fetus and the unborn child if the mother gets the infection during pregnancy," said Edwin Asturias, MD, co-principal investigator of the study and director of Latin American Projects at the Center for Global Health at the Colorado School of Public Health.

Press Release
“impacts resources and opportunities,” said Hannah.

Camp GLOW was started in Romania in 1995 and has expanded to most of the Peace Corps countries. Each time Camp GLOW is run, there are up to ten Peace Corps volunteers involved as well as up to ten host country national counterparts who assist in the program planning and implementation.

The main goals of the camp are to increase knowledge, behaviors, and attitudes related to goal setting, personal health, self-confidence and leadership. Formatted as a five-day overnight camp for female students, pre-tests and post-tests were used to evaluate change in knowledge, attitudes, and behavior.

Ten Different Villages Come Together

Girls who participated in Hannah’s sect of the worldwide Camp GLOW program included teens from 10 different rural villages, ages 14-18.

In order to select participants, Hannah met with the local school director and described what she was striving to achieve with Camp GLOW. Working alongside the school director, they brainstormed about student selection and decided on four girls who were among the top students at Mezezo Secondary School.

Even though the school director was supportive, Hannah also needed the support of the various communities involved.

In order to build trust between the camp and the community, Hannah wrote permission slips and had them translated into the local language, Amharic, and had pre-camp meetings with the students and their family members to answer questions such as where the girls were staying, how secure the housing was, and who would be watching over the girls during the week.

Hannah found that the families of the girls were very enthusiastic about Camp GLOW and viewed it as a valuable experience for girls to not only visit a bigger town, but to also learn visit a nearby university.

“One of the students who came from my village had never been outside of Mezezo before, so it was a very exciting opportunity for her to be able to attend the camp, which included visiting the University in Debre Birhan,” said Hannah.

As expected, Hannah did experience some setbacks due to cultural differences. “During the planning of the camp, we worked with host country nationals from Ethiopia, and we encountered some cultural challenges during this process. For example, permission slips are not a usual part of Ethiopian culture, and therefore this was new for the parents. Other cultural issues we encountered included the language barrier and the fact that time is very relative in Ethiopia,” she said.

To overcome these challenges, Hannah and her team had to be very proactive in the planning process well ahead of the start date.

“The biggest challenge involved working with the rural transportation system to ensure that all participants arrived for our sessions and our field trip to the university. Communication was sometimes a challenge due to the inconsistent phone network and electricity,” she said.

Even though they faced some challenges in planning and executing the camp, Hannah also experienced wonderful surprises as well—one of which was how the girls changed and bonded over the five days.

“On the first day, the girls were very shy and kept to themselves, and on the fifth day, they stayed up all night talking with each other. During the final ceremony for the camp, the girls were in tears as they expressed how Camp GLOW inspired them and changed their lives.”

Hannah Pensack-Rinehart, MPH, ColoradoSPH

The Future of GLOW is Even Brighter

Although Hannah was not present at the camp this summer, the camp occurred again in July.

Hannah is in contact with the Peace Corps volunteers who planned this round and gave them advice based on what she learned during her time in Ethiopia.

(Continued on page 8)
Join us the morning of October 20th - all Students, Faculty, Staff, Community Members and Leaders with an interest in global health work are welcome to attend.

**Call for Abstracts**

To apply to be a presenter, please submit a 250 word abstract highlighting your current international work. This Symposium not only shares your work with the community, but also proposes the opportunity to promote potential networking and collaboration with other global health advocates. [Click here](#) to see the required guidelines.

**Call for Nominations - 2017 Excellence in Global Health Award**

The purpose of this award is to recognize and publicly honor those individuals, institutions or organizations based in the state of Colorado that have made a significant and exemplary contribution to the sustained improvement of the health of multiple populations over an extended period of time in a global health setting.

This award will be given at the Global Health Symposium. If you are interested in nominating a deserving candidate, please [click here](#) to see selection criteria and how to nominate.

Deadline for both abstracts and nominations: Monday, August 21, 2017

Questions? Contact N Michelle Shiver, Administrator, Center for Global Health at: michelle.shiver@ucdenver.edu.

Are you a student looking for a global health project and mentor?

Mark your calendar to join us from 2 to 4 p.m. on October 20th for the Global Health Project Fair and learn about the exciting global health opportunities currently available to you as a CU student enrolled in a graduate program.

Global Health faculty from different CU schools will give overviews of projects and opportunities for student involvement for academic year 2017-2018. Faculty will be available to network and answer your questions.

Are you a faculty member with an international project and would like to present at the Fair?

Please contact Molly T Moss, Program Assistant, Center for Global Health at: molly.moss@ucdenver.edu to see how you can participate.

All events will take place in the Gossard Auditorium, Fulginiti Pavilion for Bioethics & Humanities Building on the University of Colorado Anschutz Medical Campus.
“By sharing my experience, they made some changes based on what was challenging or what could have gone better. Additionally, they are going to find ways to better save and distribute the leftover materials after the camp. By sharing experiences, each Camp GLOW will hopefully be more effective and sustainable,” reflected Hannah.

Hannah plans on returning to Ethiopia in the near future as her husband is Ethiopian. Additionally, Hannah is excited to “return to my village of Mezezo to see the family and friends who cared for me for two years,” she said. “I continue to be in contact with my host family in Mezezo as well as other community members I worked with, so I can’t wait until I can go back and see them and to see how much Mezezo has grown, changed and developed!”

As for her career path with the Peace Corps, Hannah credits the Peace Corps for helping grow her passion for working with underserved populations, specifically within international communities. Because of this, Hannah sees herself working with the Peace Corps or similar organizations in the future.

“The girls said they made close friends who they will never forget. It was extremely moving and one of the most memorable experiences from my Peace Corps service in Ethiopia,” reflected Hannah.

Hannah would like to acknowledge and thank Kabir Gemachu Hageyo who translated during the camp and assisted with many logistics, as well as all of the host country nationals who were invaluable in making the camp happen.

Globally, 5 billion people do not have access to surgical care. In resource-limited settings, this is further magnified, with almost 90% of the population unable to receive surgical care.

Multiple factors contribute to this inequity, but chief among them is a lack of surgical providers. This realization has led to an unprecedented interest among surgeons and surgical trainees to change those numbers.

In order to work in these resource constrained environments, surgeons need to be competent in a variety of skills in specialties such as neurosurgery, orthopedic surgery, general surgery, plastic surgery, and obstetrics.

Dr. David Kuwayama, a vascular surgeon in the Department of Surgery, School of Medicine, University of Colorado Anschutz Medical Campus (CU Anschutz), understands this discrepancy well. Although he performs the most technologically advanced endovascular procedures in the United States, he has worked in multiple settings with Medecins Sans Frontieres including Sudan and the Democratic Republic of Congo.

In order to bring low-tech surgical skills to a high-tech training environment, the Colorado Humanitarian Surgical Skills workshop was developed by Drs. Kuwayama and Yihan Lin, a general surgery resident at CU Anschutz.

The goal of this annual workshop is to train general surgery residents in essential skills to function safely in these unfamiliar settings. The course is structured around manual skills acquisition, and using cadaver based skills practice.

This year the course included 12 residents from 12 different surgical programs from around the country. Over two days, a total of 20 faculty members from 9 specialties in the Department of Surgery volunteered their time to teach this course.

Residents learned a variety of procedures, such as emergency craniotomy with Gigli saws, manual external fixation (without power), cesarean section, and a variety of flaps including cross finger flaps and pedicle abdominal flaps.

These residents walked away from the course with new skills in multiple lifesaving procedures that are necessary for practice in resource-limited settings.

What makes this course a success from year to year is what past course participants are sharing. One of last year’s course participants is currently a surgeon in Sierra Leone, and has commented multiple times how important these skills have served him throughout the past year.

2017 was the third year for the course and it will continue as long as there is a need. For more information, please visit www.coloradoglobalsurgery.org

**Why Global Surgery?**

“Surgery is an indivisible, indispensable part of health care.”

- Dr. Jim Kim, President of the World Bank
**2017 Global Health & Disasters Course**

October 9 - 20, 2017

- October 9 - 13        Global Health Course
- October 16 - 19       Pediatrics in Disasters
- October 20            Global Health Symposium & Project Fair

Registration is open!

Register early to lock in your participation!

**Students, Residents or Fellows:**

Students, Residents or Fellows currently in a training program.

*Please note: If you are a student with the University of Colorado School of Medicine or Colorado School of Public Health and you are taking the course for credit, you must register for the course via your school. You do not complete this registration form and payment.*

- Week 1 - $50
- Week 2 - $50
- Both weeks - $100

**External Participants:**

An external participant is anyone who is not currently in a training program as a student, resident or fellow or taking the course for credit with the School of Medicine or the Colorado School of Public Health.

- Week 1 - $600
- Week 2 - $600
- Both weeks - $1,000

Deadline for registration is September 4th.

Questions? Contact Michelle Shiver at michelle.shiver@ucdenver.edu

Click here to register!!
Fall 2017 | Global Health Lecture Series Schedule

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Want to watch a lecture you missed? Click here.