



'Disease detective' uses vet education to sniff out public health threats

By Susan Lassetter

AS A DOCTOR OF VETERINARY medicine, Victoria Hall wouldn't seem a natural fit for investigating human epidemics. However, it's her background in agriculture and animal sciences that make her a valuable part of the Centers for Disease Control and Prevention.

The Mississippi State alumna is what's known as a "disease detective" in the CDC's Epidemic Intelligence Service. Chosen from a highly competitive pool of applicants that include physicians, scientists, and skilled nurses from across the country, these young professionals chase down outbreaks and disease to sleuth out what is happening and how to keep the public safe.

"We rely on veterinarians in applied epidemiology because they are trained to assess the health of an individual as well as the health of the population," explained Eric Pevzner, chief of the Epidemic Intelligence Service program. "These skills contribute to our multidisciplinary approach of addressing public health."

The CDC uses a concept called "one health" to serve the public good. It is the idea that human, animal, and environmental health are all closely related and that addressing emerging health problems requires collaborative efforts across these disciplines. Hall said she began to really embrace this idea during a semester studying wildlife management in Kenya. "During that semester, it became very apparent that you couldn't ask people to care about elephants when the elephants were stomping on crops and causing families to go hungry," Hall recalled. "I really became aware that if you helped people grow healthier animals and have safer food supplies you could really help grow a community and its capacity to do a lot of things. That was my first introduction to improving community health."

A native of Cincinnati, Ohio, Hall came to Mississippi State as part of the College of Veterinary Medicine's early entry program, which pre-admits students to its ranks in an effort to smooth their

transition from undergraduate to medical degree. She completed a bachelor's in animal and dairy science in 2011 and finished the vet program in 2014.

During that time, she also completed a number of international placements, including time with the Food and Agriculture Organization of the United Nations in Italy and Vietnam, a One Health summer school program in Uganda, a World Vets project in Nicaragua, and a summer aboard a Navy ship in the south Pacific—all of which inspired her to continue her studies at Mississippi State and complete a master's in preventative medicine in 2015.

"It was such a blessing to be in an environment like Mississippi State University that was so supportive to me pushing the limits of what a vet can do in the public-health world," Hall explained.

"My time at Mississippi State sparked this desire to serve," she continued. "It became about how to find the best information and the best science to put into the community and drive good policy, decisions, and programs to help it succeed."

Now in her final year of the two-year CDC training program, she is stationed with the Minnesota Department of Health. There she works with the state's Unexplained Deaths and Critical Illness Program to investigate fatalities that have no clear cause.

"With emerging health threats, people are getting affected by disease before we even know it exists," Hall explained. "Since death represents the most severe manifestation of disease, this system allows us to look into unexplained deaths to find rare illnesses or common illnesses that present uncommonly and identify growing threats."

Basically, it's Hall's job to expect the unexpected. And it's this way of thinking that helps her find the reason behind many of Minnesota's unexplained deaths and how they might be interconnected—like those related to the habitual use of opioid-based painkillers such as morphine, hydrocodone, or oxycodone.

Take the case of a middle-aged Minnesota man who died suddenly and at home. He regularly took prescription medication for back pain, and in the

two days prior to his death had shown mild indications of feeling ill and began slurring his words. Testing from the medical examiner diagnosed influenza pneumonia and revealed a high level of opioids in his system.

In this instance, it was a common illness presenting uncommonly that raised the red flag for Hall and her colleagues. Pneumonia wouldn't ordinarily be fatal to an otherwise healthy man in his 40s, but Hall said it's likely his use of opioid painkillers made him more susceptible to the infection or allowed it to become more severe.

"By using this unexplained-deaths program we've been able to look at the opioid epidemic from the infectious disease standpoint," Hall said. "We know opioids can impact the immune system and have side effects that make it easier for something like pneumonia to set in. What we've seen is that even prescribed levels of these drugs can be deadly if combined with infectious disease.

"We've seen a good number of cases with such profound infectious disease it was the only thing written on the death certificate," Hall continued. "With no mention of the very high levels of morphine, these deaths don't get counted in opioid-related death surveillance, which means the problem could be underestimated."

Hall reports that more than half of the opioid-related fatalities identified through her work were not captured in the statewide opioid surveillance data. Because Minnesota is low on the list of severity when it comes to states facing an opioid crisis, it's possible the problem is much greater nationwide.

"Ninety-one Americans die each day from an opioid overdose and in 2015, there were over 33,000 deaths related to opioids, more than any year on record," Hall explained. "Opioids don't discriminate against the young or the old, men or women, rural or urban. We find it in all areas. With the number of opioids being prescribed quadrupling in the last decade, it makes for a very complex public health threat that we need to address from a lot of different angles."

CALS Alumna Tackles Childhood Hunger in Mississippi

By Sarah Buckleitner

WHETHER IT'S FEEDING HER parents shepherd's pie at 11 years old or feeding thousands of children across Mississippi each month, CALS alumna Catherine Montgomery has found the recipe to success.

Mississippi has the highest food insecurity rate in the United States: 28.3 percent of the state's children do not have reliable access to affordable, nutritious food. But Montgomery is working to change that. In her position as programs manager at the Mississippi Food Network, an organization dedicated to fighting food insecurity in Mississippi, she runs several programs that put food in the bellies of both hungry children and adults.

"I oversee our summer feeding, backpack, and school pantry programs. For each of these, I'm involved from the beginning to the end—I plan menus, order food, plan logistics, and manage sites. This last year we were able to begin packing our own backpack meals for children in house," Montgomery explained.

These programs each help ensure that children have access to food even when school isn't in session. Each program addresses a different need and the summer program has provided an average of 48,000 meals over three years to kids over the summer months. The backpack program, which provides kids with a backpack stuffed with three pounds of shelf stable foods each weekend, has also been especially successful.

"The physical act of giving children a meal is really fulfilling, so we have some great supporters. Every Friday, we feed 1500 kids through that program," Montgomery said.

But Montgomery's favorite project is one that she has been involved with

since the beginning: the school pantry program.

"I got funding and implemented this program with the help of the team at Mississippi Food Network. For this program, we physically go in with a group of volunteers—the Junior League of Jackson—and set up a mobile food pantry once a month so that families in the community can pick up fresh produce and shelf stable foods. We supply an average of 60-65 families each with 18-20 pounds of food every month," Montgomery said.

Montgomery especially loves this program because she gets to know the families who regularly come.

"We have this one little girl who comes with her mom every single month. I've gotten to know them over the course of the year. And one time she spotted me from down the hallway, and just dove into my arms," Montgomery said.

Montgomery herself has always had a keen interest in food.

"I was always intrigued by what my mom was making in the kitchen, and when I turned eleven, I asked for a cookbook of my own. I made a shepherd's pie recipe from it, and that's what my family ate for dinner that night," Montgomery reminisced.

When it came time to pursue her college education and eventual career, Montgomery knew right where she belonged.

"We are multi-generational Bulldogs. We grew up coming to games, and we have Thanksgiving and Christmas in Starkville. I didn't really have an option as far as my family was concerned, but I didn't want an option," Montgomery said.

While it took her awhile to determine her eventual major, she finally settled on