[applause]

Greg Sousa: "Hey there, can you guys hear me okay? Okay. Awesome. So what do you all think about when you imagine the work that veterinarians do on a daily basis? Tonight, I'd like to share some thoughts with you that will allow you to view the work that veterinarians perform in a whole new light. I'd also like to share a story that I learned about, well, when I was in veterinary school, that really inspired me to explore career options in public health.

"It's the story of an outbreak that occurred in the late 90's, and it threw New York City into a panic and began to really change the way that public health professionals view our relationship with both animals and our environment. So this is what I imagine most of you envision when you think about veterinary medicine. Bringing your best boy or girl in for their annual exams, routine blood work, maybe some flea ticket, and heartworm prevention. Well, you might not realize that small animal veterinarians play a key role in helping to keep our community safe from diseases, like rabies, through the vaccination of our companion animals. They also play a key role in helping prevent the spread of antibiotic resistance through the judicious use of antimicrobials.

"We also have our large animal veterinarians. These folks are working tirelessly to ensure the health and security of our nation's food supply. Not only are these clinicians trained to diagnose and treat infectious disease, but also to optimize the amount of meat or milk each animal is producing so we can feed the greatest number of people with the smallest environmental impact. And because of this diverse training, veterinarians have a unique understanding for how diseases move through populations, or herds, of animals. And as you might imagine, this is a skill set that is directly translatable to public health. Do you remember all the talk about reaching herd immunity after the COVID vaccines came out? That if enough individuals in your community, your family or your herd got the vaccine, became immune, then we could disrupt disease transmission. This is the origin of that terminology. We really do have a lot in common with our animal friends. Including a number of shared infectious diseases.

"Now, the diseases that we share with animals are called zoonotic diseases, or zoonoses. Zoonotic diseases have an outsized impact on public health. 60% of all of the known infectious diseases that humans can catch, they can get them from animals. Now we're in Minnesota, which means you all love attending the State Fair every year, the Great Minnesota Get Together. And this is why whenever you go into an exhibit that features livestock or animals, you're given many reminders to please wash your hands. Washing your hands is one of the most effective tools that we have to prevent the spread of disease, and this is to keep you, to help keep your family, and all your friends and everyone around you safe from zoonotic diseases. And the last few decades have witnessed a steady wave of zoonotic diseases that have made their way around the world, caught national headlines, and put us all on edge. Going back to 2003, we had SARS. In 2009 we had H1N1, swine flu. Ebola virus has reared its ugly head on a few separate occasions. In 2016, we had Zika virus. And in 2019 we had the emergence of COVID, SARS-Cov-2. Which impacted all of our lives in profound and sometimes devastating ways. And we don't know what's gonna come next.

"But all of these outbreaks have really highlighted the importance of One Health. One Health is this understanding that human health, animal health and the environment are all intimately connected, and they influence each other and the forces that bring humans and animals closer together, like habitat loss and climate change, can increase the chance of zoonotic disease transmission. So now I want to shift gears and really tell you a story which set the stage for the One Health movement in the United States.

“This is New York City. It's in August. It's 1999. For reference, because I couldn't remember, Bill Clinton was president and Y2K was on everybody's mind. So our story begins on the left. This is an aerial photograph of the Bronx Zoo with the New York City skyline on the horizon. Doctor Tracey McNamara is a comparative veterinary pathologist working at the zoo. She's helping to oversee the care of countless rare and endangered species. But she's really concerned. She's concerned by an unusual number of dead crows in New York City and around the zoo's complex. That these birds are literally dying and falling from the sky into the zoo's exhibits. And this concern began to turn into a nightmare when whatever was killing these crows appeared to jump over into the captive bird populations. So the zoo lost a pheasant, lost a cormorant, some bald eagles, and three Chilean flamingos. And closely examining those birds revealed that they died from a significant encephalitis, which is an inflammation of the brain.

“And curiously, ten miles down the road, around the same time, an infectious disease human clinician got on the phone to the New York City Department of Health to report an abnormal spike in the number of human cases of encephalitis. Several folks even died. And so preliminary studies by the CDC suggested that these humans were likely infected by a rare endemic, meaning present at a low-level mosquito borne viral disease known as Saint Louis Encephalitis. Now, this presumptive diagnosis of Saint Louis Encephalitis put New York City officials on a war footing with drives to reduce mosquito populations. Through interventions like pesticide spraying. And while this is a gold standard approach that'll work against any mosquito borne disease, something just wasn't sitting right with Doctor McNamara back at the Bronx Zoo.

“She remembers from her veterinary training that Saint Louis Encephalitis, while it'll infect birds, it rarely kills them. The clinical picture just wasn't adding up. She was convinced that there was a connection between her birds and the humans with encephalitis. But her attempts to reach out to the CDC to have them look at her bird samples were rebuffed. They were too focused on just the human cases. But undeterred, Doctor McNamara, with the help of the National Veterinary Services Laboratory and some military scientists, determined that the agent that was causing encephalitis in her birds was a viral agent that had never before been seen in this part of the world. That's the kind of stuff that will get CDC’s attention. Soon, their follow up, confirmatory studies, determined that the virus that was causing encephalitis in her birds, and the virus that was causing encephalitis in the humans, was indeed one in the same. And it was not the one that caused Saint Louis Encephalitis, it was one from Africa, called West Nile virus.

“This story beautifully illustrates the power of One Health and highlights the importance of collaboration between human clinicians, veterinarians and with scientists. In the case of West Nile, it was a veterinarian who cracked the case. But when the next outbreak happens, it can be any one of our health care providers who makes that connection. We're definitely stronger when we collaborate and when we work together.

“But circling back to West Nile. So the picture on the right, which you can barely see because it's so washed out there, um, is the first case in New York City, in 1999. Within a few short years, it spread coast to coast, becoming endemic in the United States. And this rapid spread was inevitable because West Nile virus became established in wild bird populations, moving between mosquitoes and birds, with occasional spillover events infecting humans and other creatures like horses, with potentially devastating consequences.

And with this lovely creature being the unofficial state bird here in Minnesota, it's no surprise that the folks at the Department of Health in Saint Paul are routinely testing specimens for mosquito borne diseases like West Nile. And, you know, they're quite busy, you know, in 2023, there were 43 positive cases of West Nile virus here in Minnesota, which is the 14th highest in the U.S. And with climate change expecting to boost mosquito numbers, the diseases they transmit are only expected to rise.

“So this is a photograph of the Public Health Laboratory building in downtown Saint Paul. And it's here you have human clinicians, you have veterinarians, you have scientists, and you have epidemiologists all working shoulder to shoulder, hand in hand, putting One Health principles to work to keep the folks in Minnesota safe from infectious diseases, like zoonoses. And it's been a great privilege of mine to learn about public health alongside with these heroes. And I really hope I've left you with a lot to think about today, and a new perspective on the work that veterinarians can do in the public health space. And I want to leave you with a challenge, and the challenge is to begin to view the world through a One Health lense, to gain an appreciation for the interconnected nature of human health, animal health and our shared environment.

“Thank you very much.”

[applause]

Sara Vetter: “Thanks Greg. As a side note to Greg’s story, I was a student at the Department of Health in the year 2000, still when West Nile was still sweeping across the United State, and people were, at that point, still continuing to send dead birds to the Health Department. For years, people sent in dead birds, especially in the summertime…anyway!”

[laughter]