PREVENTING PANDEMICS THROUGH U.S. WILDLIFE-BORNE DISEASE SURVEILLANCE

OVERSIGHT HEARING

BEFORE THE

SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS

OF THE

COMMITTEE ON NATURAL RESOURCES

U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED SEVENTEENTH CONGRESS

SECOND SESSION

Thursday, April 28, 2022

Serial No. 117–20

Printed for the use of the Committee on Natural Resources

or
Committee address: http://naturalresources.house.gov

U.S. GOVERNMENT PUBLISHING OFFICE

WASHINGTON : 2022
COMMITTEE ON NATURAL RESOURCES

RAÚL M. GRIJALVA, AZ, Chair
JESÚS G. “CHUY” GARCÍA, IL, Vice Chair
GREGORIO KILILI CAMACHO SABLAN, CNMI, Vice Chair, Insular Affairs
BRUCE WESTERMAN, AR, Ranking Member

Grace F. Napolitano, CA
Jim Costa, CA
Gregorio Kilili Camacho Sablan, CNMI
Jared Huffman, CA
Alan S. Lowenthal, CA
Ruben Gallego, AZ
Joe Neguse, CO
Mike Levin, CA
Katie Porter, CA
Teresa Leger Fernández, NM
Melanie A. Stansbury, NM
Nydia M. Velázquez, NY
Diana DeGette, CO
Julia Brownley, CA
Debbie Dingell, MI
A. Donald McEachin, VA
Darren Soto, FL
Michael F. Q. San Nicolas, GU
Jesús G. “Chuy” García, IL
Ed Case, HI
Betty McCollum, MN
Steve Cohen, TN
Paul Tonko, NY
Rashida Tlaib, MI
Lori Trahan, MA
Louie Gohmert, TX
Doug Lamborn, CO
Robert J. Wittman, VA
Tom McClintock, CA
Garret Graves, LA
Jody B. Hice, GA
Aumua Amata Coleman Radewagen, AS
Daniel Webster, FL
Jennifer González-Colón, PR
Russ Fulcher, ID
Pete Stauber, MN
Thomas P. Tiffany, WI
Jerry L. Carl, AL
Matthew M. Rosendale, Sr., MT
Blake D. Moore, UT
Yvette Herrell, NM
Lauren Boebert, CO
Jay Obernolte, CA
Cliff Bentz, OR
Vacancy
Vacancy

David Watkins, Staff Director
Luis Urbina, Chief Counsel
Vivian Moeglein, Republican Staff Director
http://naturalresources.house.gov

SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS

KATIE PORTER, CA, Chair
BLAKE D. MOORE, UT, Ranking Member

Nydia M. Velázquez, NY
Jesús G. “Chuy” García, IL
Steve Cohen, TN
Jared Huffman, CA
Raúl M. Grijalva, AZ, ex officio
Louie Gohmert, TX
Jody B. Hice, GA
Vacancy
Bruce Westerman, AR, ex officio

(LI)
CONTENTS

Hearing held on Thursday, April 28, 2022 ............................................................ 1

Statement of Members:
Moore, Hon. Blake D., a Representative in Congress from the State of Utah ................................................................. 4
Porter, Hon. Katie, a Representative in Congress from the State of California ........................................................................................................... 2

Prepared statement of ............................................................................... 3

Statement of Witnesses:
Panel 1
Kinsinger, Anne, Associate Director for Ecosystems, U.S. Geological Survey, Reston, Virginia ................................................................. 6
Prepared statement of ............................................................................... 7
Questions submitted for the record ......................................................... 10

Panel 2
Carlson, Colin, Assistant Research Professor, Center for Global Health Science and Security, Georgetown University Medical Center, Washington, DC ........................................................................................................... 23
Prepared statement of ............................................................................... 24
Questions submitted for the record ......................................................... 28
Semcer, Catherine, Research Fellow, Property and Environment Research Center, Chevy Chase, Maryland ........................................................................................................... 37
Prepared statement of ............................................................................... 39

Stallknecht, David, Director, Southeastern Cooperative Wildlife Disease Study, Professor in Wildlife Health, College of Veterinary Medicine, University of Georgia, Athens, Georgia ........................................................................................................... 31
Prepared statement of ............................................................................... 32
Questions submitted for the record ......................................................... 35
Thorstenson, Julie, Executive Director, Native American Fish and Wildlife Society, Northglenn, Colorado ........................................................................................................... 42
Prepared statement of ............................................................................... 44
Questions submitted for the record ......................................................... 45

Additional Materials Submitted for the Record:
Association of Fish & Wildlife Agencies, Statement for the Record ............ 57
Preventing Pandemics at the Source and the U.S. Wildlife and Health Alliance, Joint Statement for the Record, dated May 11, 2022 ............ 59
List of documents submitted for the record retained in the Committee's official files ................................................................................................. 59
OVERSIGHT HEARING ON PREVENTING PANDEMICS THROUGH U.S. WILDLIFE-BORNE DISEASE SURVEILLANCE

Thursday, April 28, 2022
U.S. House of Representatives
Subcommittee on Oversight and Investigations
Committee on Natural Resources
Washington, DC

The Subcommittee met, pursuant to notice, at 10 a.m. in room 1334, Longworth House Office Building, Hon. Katie Porter [Chair of the Subcommittee] presiding.
Present: Representatives Porter, Cohen, Huffman; Moore, and Hice.
Also present: Representatives Soto, Dingell, Axne, and Quigley.
Ms. PORTER. The Subcommittee on Oversight and Investigations will come to order. The Subcommittee is meeting today to hear testimony on preventing pandemics through U.S. wildlife-borne disease surveillance.
Under Committee Rule 4(f), any oral opening statements at hearings are limited to the Chair and the Ranking Minority Member, or their designees. This will allow us to hear from our witnesses sooner and help Members keep to their schedules.
Therefore, I ask unanimous consent that all other Members’ opening statements be made part of the hearing record if they are submitted to the Clerk by 5 p.m. today, or the close of the hearing, whichever comes first.
Hearing no objection, so ordered.
I ask unanimous consent that the following Members be permitted to ask questions of the witnesses at today’s hearing: the Member from Florida, Representative Soto; the Member from Iowa, Representative Axne; the Member from Illinois, Representative Quigley; and the Member from Michigan, Representative Dingell.
Without objection, the Chair may also declare a recess, subject to the call of the Chair.
As described in the notice, statements, documents, or motions must be submitted to the electronic repository at HNRCDocs@mail.house.gov. Members physically present should provide a hard copy for staff to distribute by e-mail.
Please note that Members are responsible for their own microphones. As with our fully in-person meetings, Members can be muted by staff only to avoid inadvertent background noise.
Finally, Members or witnesses experiencing technical problems should inform Committee staff immediately.
We will begin with my opening statement, and then I will turn to Ranking Member Moore.
Ms. PORTER. We are here today to discuss a topic with consequences we all know too well: the threat of wildlife-borne diseases becoming pandemics. Scientists believe that COVID-19 likely originated from a virus that jumped from wildlife to humans. We have, unfortunately, all learned that late detection can cost lives.

The virus that causes COVID-19 occurs in 29 species that we know of, likely more. And it is not just COVID-19. Sixty percent of emerging infectious diseases in humans come from animals. Although most of those diseases come from animals in the wild, Congress provides far less funding for the Department of the Interior to monitor diseases in wildlife than it does for the Department of Agriculture to monitor diseases in domesticated animals. That is a use of taxpayer dollars that we need to correct.

Recent scientific discoveries have made clear that wildlife continue to play a role in the pandemic. A study last month found that new variants of the coronavirus were created in Canada after being circulated in wild deer. The same study showed that deer have likely spread COVID-19 to humans. With an estimated 30 million deer in the United States, that means there is no shortage of opportunities for the virus to mutate and then be passed back to people.

Researchers conducting a study of deer in Iowa found that they were infected with the coronavirus at a rate as high as 80 percent. The study was only possible because the state of Iowa had been tracking deer for a different wildlife-borne disease: chronic wasting disease. The researchers use the state's archived samples and had to break through many barriers to test them. While this example shows how a little surveillance can go a long way, it also shows that we need to be more intentional about monitoring the health threats in our own backyards.

These outbreaks of wildlife-borne diseases shouldn't come as a surprise. Experts have been warning about them for years. Those same experts are now telling us that two of the biggest drivers of risk from wildlife-borne diseases are climate change and the frequency of interactions between wildlife and people. Both of those drivers are accelerating, which means we should expect more risk in the future, not less.

Even wildlife-borne diseases we know well, such as the bubonic plague, need to be tracked so we can prevent them from causing catastrophic harm. Scientists, including Dr. Carlson, who is testifying here today, have found that the risk of bubonic plague is increasing and spreading to new areas in the West due to climate change. Experts warn that if we don't monitor the risk of bubonic plague closely, response times will be slower and outbreaks will be deadlier.

The good news is that when we commit to systematic surveillance and rapid response, we can contain outbreaks of wildlife-borne diseases. Through regular monitoring of migratory birds, the source of highly pathogenic avian flu in the United States, we have managed the risk of bird flu. If that spread had been unchecked, it would have posed a significant risk to human health, been
economically devastating to commercial poultry operations, and resulted in the deaths of an unimaginable number of animals.

I am proud that this Committee provided $45 million in the American Rescue Plan for states and tribes to improve surveillance of wildlife-borne diseases and rapid response efforts. This funding has already helped states prepare better for potential public health crises.

But this one-time funding doesn’t address the fragmented nature of surveillance in the United States right now, and much more is necessary to meet the need. Wildlife-borne diseases do not know state boundaries, so we need Federal coordination and funding to address this problem. If we want to control outbreaks of wildlife-borne disease, we have to be able to see them.

Tracking wildlife-borne disease helps us identify the source of an outbreak and predict where the next viral spillover into people will be. It could also help us stop the creation of new variants of a disease and prevent a pathogen from establishing itself in a species, as the coronavirus has in deer.

There is already a well-funded, highly organized effort to track wildlife-borne diseases overseas, but we have no such effort here at home. I plan to change that with the help of experts like the ones testifying today.

Thank you for appearing before this Committee, and I look forward to your testimony.

[The prepared statement of Ms. Porter follows:]

PREPARED STATEMENT OF THE HON. KATIE PORTER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

We are here today to discuss a topic with consequences we all know too well: the threat of wildlife-borne diseases becoming pandemics. Scientists believe that COVID-19 likely originated from a virus that jumped from wildlife to humans. We've unfortunately all learned that late detection can cost lives.

The virus that causes COVID-19 occurs in 29 species that we know of—likely more. And it's not just COVID-19. Sixty percent of emerging infectious diseases in humans come from animals. Although most of those diseases come from animals in the wild, Congress provides far less funding for the Department of the Interior to monitor diseases in wildlife than it does for the Department of Agriculture to monitor diseases in domesticated animals. This is a poor use of taxpayer dollars that we need to correct.

Recent scientific discoveries have made clear that wildlife continue to play a role in the pandemic. A study last month found that new variants of the coronavirus were created in Canada after being circulated among wild deer. The same study showed that deer have likely spread COVID-19 to humans. With an estimated 30 million deer in the United States, that means there is no shortage of opportunities for the virus to mutate, and then be passed back to people.

Researchers conducting a study of deer in Iowa found that they were infected with the coronavirus at a rate as high as 80 percent. The study was only possible because the state of Iowa had been tracking deer for a different wildlife-borne disease—Chronic Wasting Disease. The researchers used the state’s archived samples, and had to break through many barriers to test them. While this example shows how a little surveillance can go a long way, it also shows that we need to be more intentional about monitoring the health threats in our own backyards.

These outbreaks of wildlife-borne diseases shouldn’t come as a surprise. Experts have been warning about them for years. Those same experts are now telling us that two of the biggest drivers of risk to people from wildlife-borne diseases are climate change, and the frequency of interactions between wildlife and people. Both of those drivers are accelerating, which means we should expect more risk in the future, not less.

Even wildlife-borne diseases we know well, such as the bubonic plague, need to be tracked so that we can prevent them from causing catastrophic harm. Scientists, including Dr. Carlson, who is testifying here today, have found that the risk of
bubonic plague is increasing and spreading to new areas throughout the West due to climate change. Experts warn that if we don’t monitor the spread of bubonic plague closely, response times will be slower and outbreaks will be deadlier.

The good news is that when we commit to systematic surveillance and rapid response, we can contain outbreaks of wildlife-borne diseases. Through regular monitoring of migratory birds, the source of Highly Pathogenic Avian Flu in the United States, we have managed the risks of bird flu. If the spread had been unchecked, it would have posed a significant risk to human health, been economically devastating to commercial poultry operations, and resulted in the deaths of an unimaginable number of animals.

I am proud that this Committee provided $45 million in the American Rescue Plan for states and tribes to improve surveillance of wildlife-borne diseases and rapid response efforts. This funding has already helped states better prepare for potential public health crises. But this one-time funding doesn’t address the fragmented nature of surveillance in the United States right now, and much more is needed to meet the need. Wildlife-borne diseases do not know state boundaries, so we need Federal coordination and funding to address this problem.

If we want to control outbreaks of wildlife-borne disease, we have to be able to see them. Tracking wildlife borne diseases helps us identify the source of an outbreak and predict where the next viral spillover into people will be. It could also help us stop the creation of new variants of a disease and prevent a pathogen from establishing itself in a species, as the coronavirus has in deer.

There is already a well-funded, highly organized effort to track wildlife-borne diseases overseas. But we have no such effort here at home. I plan to change that, with the help of experts like the ones testifying today. Thank you for appearing before this Committee, I look forward to your testimony.

Ms. Porter. I now recognize Ranking Member Moore for his opening statement.

STATEMENT OF THE HON. BLAKE D. MOORE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF UTAH

Mr. Moore. Thank you, Chair Porter. We are facing several crises in America today. Whether it is a health crisis, a border crisis, or an energy crisis, the work of this Subcommittee should prioritize the most pressing issues at hand. As Americans face skyrocketing inflation and rising gas prices, we seem to spend time on hearings about almost anything other than addressing President Biden’s ongoing energy crisis, most relevant to this Committee’s jurisdiction.

The Biden administration continues to push policies that stifle domestic energy production and leaves us dependent on adversarial nations for energy. From canceling the Keystone pipeline, to refusing to hold statutorily mandated lease sales for over a year, the Biden administration hamstrings American energy production at every possible turn.

The Interior Department should be answering for the delays they have caused in the permitting and leasing process for energy production on Federal lands, which is why I introduced the Protecting Energy Independence and Transparency Act. Despite an even greater need for American energy, thousands of permits to drill and rights-of-ways are languishing before the Interior Department waiting for approval, and we would like to know why. The Administration must be held accountable for its counterproductive announcement on onshore lease sales earlier this month.

The Administration is raising royalty rates and only offering a small fraction of the acreage nominated for leasing. In my home state of Utah, the BLM is offering one parcel for sale—one.
Requiring higher royalty rates on these parcels will only drive up the cost of production at a time when Americans are paying record prices for gas. With rising energy costs and global insecurity threatening supply, now is the time to unleash American production. Yet, the Majority elected to present a narrow topic for today’s hearing: the prevention of pandemics through disease surveillance in the United States. The Majority’s first and only government witness is from the U.S. Geological Survey, the USGS, to testify.

As American families are forced to make their dollars stretch at home, I look forward to seeing if the USGS is appropriately stewarding taxpayer dollars and avoiding duplicative work, just as one of the many Federal agencies that conduct wildlife surveillance.

While we can all agree preventing the next pandemic is important, we cannot simply limit our discussion to wildlife surveillance in this country. We know pandemics have global implications. Therefore, common sense dictates that combating the next pandemic will require international strategies to address these disease outbreaks and coordination among countries’ surveillance efforts. Today, Ms. Catherine Semcer will share her vast expertise, highlighting the importance of responsible management of ecosystems on the international stage.

I look forward to discussing how conservation efforts eliminating illegal wildlife trafficking and accountability for bad actors all play a role in reducing the risk of the next pandemic. Ms. Semcer’s research on wildlife trafficking, environmental security, and the geopolitical implications of conservation will highlight the international ties woven into the pandemic prevention efforts.

Responsible environmental management plays a crucial role in reducing the risk of disease spillover between species. When ecosystems are destroyed, species lose their habitats and are then crowded together. The close proximity of animals increases the chances of disease transformation between different species. For example, China’s Belt and Road Initiative and the resulting practices of Chinese logging companies in Africa highlight this risk. As companies’ activities result in deforestation with the Congo Basin, ecosystems are destroyed and animals lose their home. The continuation of irresponsible logging practices will lead to greater habitat destruction. Ultimately, effective pandemic prevention is tied to responsible management and development of our natural resources.

Equally as important to pandemic prevention is combating illegal wildlife trafficking. This illicit practice heightens the risk of disease spread between species. Traffickers evade health inspections and crowd animals together as they transport them, increasing disease spillover.

China is recognized as a leading consumer of wildlife products, including illegally trafficked products. Rather than relying on the Chinese Government to change their laws, we should assess steps the United States and other international allies can take to curtail illegal wildlife trafficking. These efforts to curb illegal wildlife trafficking, however, should not focus on blanket wildlife trade
bans, but instead on targeted enforcement that is coordinated with local governments.

If we are serious about preventing the next pandemic, bad actors must be held accountable. Until we successfully counter China’s and other bad actors’ dangerous practices, we will continue to face increased risks of wildlife-borne pandemics.

With that I yield back. Thank you.

Ms. PORTER. Thank you very much, Ranking Member Moore. Now I would like to turn to our first panel and introduce our Government witness.

Ms. Anne Kinsinger is the Associate Director for Ecosystems at the U.S. Geological Survey.

Let me remind the witnesses that under Committee Rules, they must limit their oral statements to 5 minutes, but their entire statement will appear in the hearing record.

When you begin, the timer will begin, and it will turn orange when you have 1 minute remaining. I recommend that Members and witnesses joining virtually pin the timer so that it remains visible.

After your testimony is complete, please remember to mute yourself to avoid any inadvertent background noise.

The Chair is now happy to recognize Ms. Kinsinger to testify.

STATEMENT OF ANNE KINSINGER, ASSOCIATE DIRECTOR FOR ECOSYSTEMS, U.S. GEOLOGICAL SURVEY, RESTON, VIRGINIA

Ms. KINSINGER. Good morning, Chair Porter, Ranking Member Moore, and members of the Subcommittee, thank you for the opportunity to appear today to testify on wildlife diseases, especially zoonoses, which are pathogens that spread between humans and animals.

As Chair Porter has already noted, this is a critically important issue, and a review of emerging human infectious diseases going back to the 1940s found, as she said, that approximately 60 percent of human diseases were zoonotic in nature and, of those, more than 70 percent of them originated in wildlife.

USGS conducts disease surveillance and research, supporting the Federal response to zoonotic diseases that circulate in wildlife and in the environment. Our efforts to support a One Health approach that calls for close collaboration between the human health, domesticated animal, and wildlife sectors. In particular, it supports improved biosurveillance of wildlife diseases.

As with many complex challenges, a whole-of-government approach is needed, and USGS scientists are working closely with other Federal and State agencies, including the U.S. Fish and Wildlife Service, National Park Service, USDA, the Centers for Disease Control, and the Association of Fish and Wildlife Agencies.

For example, we and our partners are developing a network that encompasses all aspects of wildlife disease surveillance, including incident reporting, prediction of threats, assessment of impacts, and selection of management options. This will strengthen the capabilities of all network partners: Federal agencies, States, Tribes, academia, and our international partners to predict, assess, and respond to disease threats quickly and effectively.
Enhanced capabilities and additional science could better ensure that our stakeholders, such as resource managers, emergency responders, and the public health community receive early warning and actionable science to inform disease response efforts. We are already moving forward on this endeavor by working with the U.S. Fish and Wildlife Service to begin development of a National Wildlife Disease Database to provide early warning of wildlife diseases. This was funded under the American Rescue Plan.

In addition, DOI funding provided by the CARES Act was used by USGS to initiate biosurveillance of coronaviruses in wildlife, in the environment, and municipal wastewater. This includes integrating SARS-CoV-2 surveillance into wildlife cause-of-death investigations and active field surveillance, such as sampling around mink farms to support a USDA response.

The USGS also incorporated SARS-CoV-2 sample collection into existing bat surveillance studies to ensure rapid detection should infections occur.

Funds were also used to partner with the CDC National Wastewater Surveillance System to provide local public health agencies with tests for community-level infections during a COVID-19 surge.

The USGS can be nimble and responsive to these requests due to the capacity that has been built over decades to support the Federal response to zoonotic diseases and to inform mitigation strategies which help protect both wildlife and the public health. The USGS maintains several important labs across the country, including the National Wildlife Health Center in Madison, Wisconsin, which is the only Federal biosafety-level three lab dedicated to wildlife health.

We also support two aquatic labs that study disease: our Western Fisheries Research Center in Seattle, Washington; and our Eastern Ecological Science Center in Kearneysville, West Virginia.

Our labs, along with USGS wildlife disease experts located across the United States, are supporting our partners with research, technology, and tools to tackle current and ongoing zoonotic diseases found on land and in water environments. These include coronaviruses, avian influenza, chronic wasting disease, rabies, sylvatic plague, brucellosis, rabbit hemorrhagic disease, salmonellosis, Lyme disease, avian malaria, and many others.

In conclusion, the USGS, along with our partners, is leading research on wildlife disease and spearheading monitoring efforts that address diverse stakeholder needs. As the One Health approach implies, understanding wildlife disease is a crucial step in protecting the public from known and emergent diseases. That idea of studying the natural world to benefit all people is very much within the USGS tradition.

Thank you for this opportunity to testify today, and I am happy to answer any questions that you may have.

[The prepared statement of Ms. Kinsinger follows:]

PREPARED STATEMENT OF ANNE KINSINGER, ASSOCIATE DIRECTOR FOR ECOSYSTEMS, U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

Chairman Porter, Ranking Member Moore, and Members of the Subcommittee, thank you for the opportunity to appear today to testify on wildlife diseases, including zoonoses, which are pathogens that spread between humans and animals.
The U.S. Geological Survey (USGS) conducts wildlife disease surveillance and research, supporting the Federal response to zoonotic diseases that circulate in wildlife and the environment. As the science agency of the Department of the Interior (DOI), USGS research supports other bureaus, including the U.S. Fish and Wildlife Service (USFWS) and National Park Service (NPS), to protect the health of wildlife and the health of both employees and visitors to our public lands. Furthermore, the USGS fills a unique role in supporting national zoonotic disease efforts led by the Department of Agriculture (USDA) and the Department of Health and Human Services.

A review of emerging human infectious diseases going back to the 1940s found that approximately sixty percent were zoonotic, and more than seventy percent of those originated in wildlife.1 Because of this, USGS wildlife disease surveillance and research support a One Health approach to national zoonotic disease response. The Centers for Disease Control and Prevention (CDC) defines One Health as “a collaborative, multisectoral, and transdisciplinary approach—working at the local, regional, national, and global levels—with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment.”2

One Health recommends that the Nation improve biosurveillance of wildlife diseases, including zoonoses. The USGS is working with partners to develop a network that encompasses all aspects of wildlife disease biosurveillance including prediction of threats, assessment of their impacts, and selection of management options to apply scientific findings more quickly. This effort is being undertaken in collaboration with the USFWS, the Association of Fish and Wildlife Agencies, and other partners who have also identified expanded biosurveillance needs as a priority. As with many complex challenges, a whole-of-government approach is ideal. Most of the examples we will discuss today illustrate that enhanced capabilities and additional science could better ensure stakeholders receive early warning and sound data to inform disease response efforts.

The national wildlife disease biosurveillance network envisioned by USGS would be adaptively refined as scientific gaps are identified. This will strengthen the capabilities of all network partners, Federal agencies, States, Tribes, academia, and our international partners, to predict, assess, and respond to disease threats quickly and effectively.

The USGS has taken the first steps toward developing this network. Through an interagency agreement with USFWS, the USGS has begun development of a national wildlife disease database as called for under the American Rescue Plan Act. The database will include two components: first, the enhancement of the Wildlife Health Information Sharing Partnership-Event Reporting System (WHISPers) database, and second, development of the new Aquatic Disease and Pathogen database (AquaDePTH). In addition to the situational awareness provided by AquaDePTH and WHISPers, there are also collaborative tools for Federal, State, and Tribal partners to share information, and we are working to increase participation in those databases. Using the national wildlife disease database, the USGS will be able to provide an early warning for wildlife diseases, including those species that serve as sentinels for ecosystem health. The USFWS added a requirement to its upcoming zoonotic disease grant program that agencies receiving funding utilize the WHISPers platform, further enhancing the national wildlife disease database. The USFWS also maintains the National Wild Fish Health Survey, which partners with natural resource managers to assist in inspections, diagnoses, and publishing results of aquatic diseases.

DOI funding provided by the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) was used to initiate biosurveillance of coronavirus in wildlife and the environment. This included integrating SARS-CoV-2 surveillance into USGS cause-of-death investigations as well as active field surveillance, including sampling wildlife around mink farms to support USDA’s response. USGS took advantage of bat ecology research that includes white-nose syndrome surveillance to also collect samples for SARS-CoV-2 surveillance. These are recent examples of the role the USGS plays, providing scientific information to resource managers and planners, emergency response officials, and the public. Over the decades, USGS science has supported federal responses by detecting zoonoses, improving our understanding of their ecological dynamics, and informing mitigation strategies which help protect both wildlife and public health.

---


To do this, the USGS and the USFWS maintain several important labs across the country. The National Wildlife Health Center (NWHC) in Madison, Wisconsin, which was established in 1975, is the only Federal biosafety-level three (BSL-3) lab dedicated to wildlife health, and it is an affiliate lab in several national and international networks. The USGS also has two aquatic high-containment laboratories, the Eastern Ecological Science Center (EESC), in Kearneysville, West Virginia, and the Western Fisheries Research Center, in Seattle, Washington. The USFWS has six fully functional Fish Health Centers conducting regular inspections, diagnostics, and cutting-edge research to actively manage diseases in captivity and the wild.

In addition to these facilities, the USGS and the USFWS develop innovative technologies and methods to support response to zoonoses. A well-known example is our development of capabilities to detect and track wildlife species and pathogens using environmental DNA, or eDNA. This is an example of investments we have made in new methods for monitoring invasive species, which can spread zoonoses. Our research on toxins and contaminants and their spread through the environment informs field experiments, and we maintain a variety of remote sensing capabilities to monitor environmental conditions that inform assessments of zoonotic disease spread. We have even helped design better citizen science campaigns to improve the collection of data. Also, the USFWS hosts a Genetics Community of Practice well known for advancing new technologies and applying them to actively managed fish and wildlife populations. Their expertise in eDNA protocol development, applied to fish and wildlife management and detection of aquatic invasive species, will play a critical role in future disease surveillance.

The NWHC has made significant contributions to national zoonotic disease surveillance efforts in wildlife including SARS-CoV-2, avian influenza, and West Nile virus. For example, the USDA confirmed NWHC preliminary positives for the first U.S. detections of West Nile virus and highly pathogenic avian influenza in wild birds. Following the first detections of those diseases in the U.S., the USGS has collaborated with the USDA and the CDC on surveillance of these zoonoses in wildlife. Notably, experimental research demonstrated that West Nile virus could be transmitted from crow to crow when it was previously thought that it could only be spread by mosquitoes. Additional research and surveillance capacity would be needed to investigate the role of wildlife in other vector-borne diseases. Wildlife vector-borne disease surveillance and research can also enhance management of wildlife diseases like avian malaria, which is the leading driver of population declines and extinctions in Hawaiian forest birds. For example, the USDA confirmed NWHC preliminary positives for the first U.S. detection of highly pathogenic avian influenza, USGS experimental research found that infected native raptors could develop neurological disease and die, providing early warning for the need to monitor raptors in addition to waterfowl. Further research is needed to enhance avian disease risk prediction, mapping, and forecasting tools to inform wild bird management decisions.

USGS disease ecology research provides insight into how zoonoses behave in the environment and affect wildlife. For more than twenty years, we have collaborated with the USDA to support management of bovine brucellosis, a zoonotic disease that circulates in bison and elk as well as domestic cattle, especially in the Greater Yellowstone Ecosystem. The USGS has shown how elk are a key host of this disease and that it affects their reproduction. The spread of the disease can be influenced by the length of the elk supplemental feeding season and elk migratory movements that are linked to greening-up in the spring. USGS science has also shown that maintaining scavenger populations (such as coyotes, foxes, or eagles) can help reduce the spread of brucellosis.

Another example is USGS research into avian influenza ecology. It has provided insights on the genomics of viral lineages that circulate in migratory birds, which informs USDA poultry outbreak traceback investigations and surveillance strategies. USGS waterfowl telemetry and modeling have demonstrated the interface between wild birds and poultry, enhancing situational awareness and risk assessments. USGS research has also confirmed the persistence of infectious avian influenza viruses in surface waters in northern wetlands and determined that diving ducks can play a role in the dynamics of this disease.

USGS science that supports the mitigation of zoonoses can also help protect public health. For example, sylvatic plague is a zoonotic bacterial disease that affects pets, like cats and dogs; wildlife, such as prairie dogs and the endangered black-footed ferret; and also causes several human deaths each year. In addition to improving our understanding of plague ecology, the USGS has developed innovative tools to mitigate this disease in wildlife. The NWHC developed and tested a plague vaccine given to prairie dogs through a peanut-butter flavored oral bait. The license to produce this vaccine was awarded to a U.S. company, Colorado Serum, with a conditional license from the USDA. The USGS also collaborated with the CDC to identify
flea resistance to deltamethrin dust, an insecticide and a long-standing plague management tool. We are investigating other options, such as fipronil pellets, for reducing flea abundance in prairie dog burrows. In another example of vaccine development, the USGS and our partners developed a rabies vaccine that has been shown in the lab to be effective in big brown bats, providing a proof-of-concept for a white-nose syndrome vaccine, which is now in field trials.

These and other examples of USGS research contribute to public health and inform our understanding of impacts humans have on wildlife. For example, the USGS published an online tool3 to provide rapid SARS-CoV-2 risk assessments for human-to-bat transmission (i.e., reverse zoonosis) to guide decision-making for bat biologists, wildlife rehabilitators, and animal control operators who regularly work with bats. In the case of the Zika virus, the USGS provided science to guide management actions that reduce risk to non-target species, like pollinators, but allow for control of insect vectors, such as mosquitoes and ticks. We have also helped integrate mathematical models and statistical tools based in natural resource management for COVID-19 public health mitigation planning.

Chronic wasting disease (CWD) is a good example of a One Health approach. CWD is a fatal neurological disease of deer, elk, and moose caused by infectious prions. While CWD has not been shown to affect humans, variants of other animal prion diseases do, such as Creutzfeldt-Jakob disease. The USGS has worked with the NPS, the USFWS, USDA, States, and Tribes for many years to enhance the understanding of CWD dynamics in deer and elk and develop tools for monitoring the spread of CWD and making management decisions. Our work has focused on mitigating the spread of CWD in wild cervid populations, including reducing environmental prion contamination, and developing customizable surveillance and mitigation planning tools for States and Tribes. Currently, the science community is hopeful that a test will soon be deployed that can be used to detect small numbers of prions, that is achieve early detection, in live cervids rather than the current testing standard that uses post-mortem tissues. All of this requires collaboration across all levels of government and robust public outreach efforts—and it all needs to be done not just for known diseases but also for novel, emerging pathogens yet to be discovered.

The USGS, along with our partners, is leading research on wildlife disease and spearheading monitoring efforts that address diverse stakeholders’ needs. As the One Health approach implies, understanding wildlife disease is a crucial step in protecting the public from known and emergent diseases. That idea, of studying the natural world to benefit all people, is very much within our tradition. Thank you for this opportunity to testify today. I would be happy to answer any questions you may have.

______

QUESTIONS SUBMITTED FOR THE RECORD TO MS. ANNE KINSINGER, ASSOCIATE DIRECTOR FOR ECOSYSTEMS, U.S. GEOLOGICAL SURVEY

Questions Submitted by Representative Moore

Question 1. In the passage of “America’s Conservation Enhancement” Act, the U.S. Geological Survey was instructed to work with the Agriculture Department, the Fish and Wildlife Service, and the National Academies of Science to conduct an interagency study on Chronic Wasting Disease.

(a) Can you provide us an update on the progress of that study?

(b) When do you anticipate that study will be complete?

Answer. The Department of the Interior Chronic Wasting Disease (CWD) Task Force, which was set up prior to enactment of the America’s Conservation Enhancement Act (Act), has been collaborating with the U.S. Department of Agriculture (USDA) to work with the National Academies of Sciences, Engineering, and Medicine to develop a CWD transmission study, as called for in the Act. A statement of task has been completed for the first Phase. The U.S. Geological Survey, U.S. Fish and Wildlife Service, and USDA are each contributing $200,000 for this Phase I study. We anticipate the Phase I study will be completed by FY2024.

3 www.usgs.gov/apps/SARSCOV2BATTRISKCALC/
Ms. PORTER. Thank you very much for your testimony.

Reminding Members that Committee Rule 3(d) imposes a 5-minute limit on questions, the Chair will now recognize Members for any questions they may wish to ask the witness.

Mr. Soto, if you are ready, I will recognize you first and will delay my questioning to make sure we can keep Members on their schedule. I am glad to have you here.

Mr. SOTO. Thank you, Chair Porter.

And I appreciate you being here, Ms. Kinsinger.

Just as a preliminary discussion of how we have gotten this right over the years, in 2016, we had a screw worm outbreak among Key deer in Florida that would have been a huge issue for our cattle ranches throughout Florida. Yet, because of the good work of U.S. Fish and Wildlife, we were able to get that under control. Sadly, 135 deer had to be killed to be able to bring that under control, but it shows that good work can be done to help out.

But we did see a more troubling menace in the Zika outbreak, which we saw starting in places like South America, and eventually getting to my family’s native island of Puerto Rico.

Ms. Kinsinger, in your testimony, you mentioned that the USGS provided guidance to the Puerto Rico Government about how to do mosquito control without killing off pollinators during the Zika outbreak, which is an important balance to strike. Can you tell me more about the specifics of that guidance, and why were pollinators at risk?

Ms. KINSINGER. Yes. We have some limited research in the Zika virus, not only what you were talking about, but also in understanding the disease—the ecology of mosquitoes, which, of course, are what cause Zika.

We have a role in understanding the ecology of species, including pollinators, throughout the United States, in understanding the ecological pathways of disease. So, our work here was to try to understand the unintended consequences of chemical applications to control mosquitoes.

Mr. SOTO. I know this Committee released a report in 2016 showing that forced budget cuts in Puerto Rico compromised the island’s own ability to protect itself from the Zika virus, something that threatened our great state of Florida, as well. That outbreak was devastating for Puerto Rico.

The kind of expertise and experience that you describe strikes me as something the Puerto Rico Government could not be expected to provide under those circumstances. So, having the assistance of USGS in a situation like that is essential.

Does USGS continue to provide assistance to the island on Zika, chikungunya, or other wildlife-borne diseases? And, if so, what kind of assistance?

Ms. KINSINGER. I don’t believe we have any active Zika projects at the moment.

Mr. SOTO. Is there any other wildlife-borne disease that you are assisting with down in Puerto Rico?

Ms. KINSINGER. I will have to get back to you on the record on that. I don’t know.
Mr. SOTO. And what are some other examples of services that USGS provides the states and territories to help them manage wildlife-borne diseases?

Ms. KINSINGER. I did mention biosurveillance, which is key, and we are developing, with our partners, a number of tools, including genetic tools like the measuring genetic components in environmental DNA and RNA. And we continue to do that sort of horizon scanning to see when emergent diseases are detected.

We also do investigations of outbreaks at our National Wildlife Health Center that I mentioned earlier in my oral testimony.

And then, again, ecological research is a key piece of this, as we understand both the vectors and the species that are at risk, understanding their distribution, changes in their migratory patterns perhaps due to climate change, and other factors such as that.

Mr. SOTO. And Ms. Kinsinger, big picture, with a warming climate in states like Florida and territories like Puerto Rico and Virgin Islands getting warmer weather, what does that mean, ultimately, for the threat of vector-borne diseases, and how can we help you all address them?

Ms. KINSINGER. In our Fiscal Year 2023 budget, we do have an increased proposal to look at the effects of climate on wildlife diseases. We have a couple of instances in the United States where we have been working on this, precisely the types of areas I have already outlined.

One is in the Northeast, looking at the distribution and movement of ticks that cause, of course, Lyme disease, deer ticks, and looking at the effects of climate on the tick distribution, and ultimately on wildlife health, such as moose in the Northeast.

Going far across the country to the West, we have worked in Hawaii with our partners in Fish and Wildlife Service, National Park Service, and others, looking at the spread of avian malaria in critically endangered Hawaiian forest birds. And what we are doing there is we are seeing that the mosquitoes are spreading up as climate warms and changes. They are moving up the mountains that are the last refugia for these critically endangered birds. So, we are in a multi-agency effort to look at both the ecological conditions and potential control technologies to stop that further spread.

Mr. SOTO. Thank you, and I yield back.

Ms. PORTER. Thank you very much. We now turn to Ranking Member Moore for his 5 minutes of questioning.

Mr. MOORE. Thank you, Chair.

Thanks for being here, thanks for joining us today, Associate Director Kinsinger.

I would like to start today by getting a better understanding of how the U.S. Geological Survey works with other Federal agencies to meet our wildlife surveillance goals. I am going to ask questions about coordination, how you work where there is duplicative nature. Let me just say on the front end, this frustration of mine predates today. It predates my time in Congress. I have served in Federal agencies before, and this is a problem across our entire government.

But we are going to focus on specifically your area today. This is something we have to get better. We just have to do this better,
because we are wasting taxpayers’ dollars every single day by having way too much duplicative work and making it too difficult for us to get to the root of the problem.

In your testimony, you highlighted the U.S. Geological Survey’s collaboration with several agencies which also conduct wildlife surveillance. For example, the Fish and Wildlife Service just announced $9 million in grants focused on addressing zoonotic outbreaks, and the Agriculture Department received $6 million to study COVID-19, a specific zoonotic disease, in deer.

Please describe the relationship between your agency and others conducting wildlife surveillance, including the Ag. Department and the Fish and Wildlife Service. How often do you communicate with each other? Please provide some context here.

Ms. KINSINGER. OK, thank you. As I noted in my oral testimony, such collaboration is absolutely critical, and we do work very closely with the agencies that I named and many others.

The niche for the U.S. Geological Survey is in the study of wildlife diseases and the ecological condition that leads to spread of diseases, and we do work very closely with USDA. The example I would give you there is an avian influenza. When we do outbreak investigations at our National Wildlife Health Center to detect avian influenza, we then send those samples to the USDA for verification, and we have a closely coordinated communication strategy in which the USDA does make those announcements.

So, again, the focus of USDA is on domesticated animals, and our focus is on wildlife disease in free-ranging animals in the wild.

Another example would be chronic wasting disease. I sit with USDA on the Chronic Wasting Disease Task Force that is managed out of the Department of the Interior. It has USDA APHIS, the Association of Fish and Wildlife Agencies, and many sister DOI bureaus in which we discuss new findings of chronic wasting disease detection, priorities, spread of the disease, mapping, and so on. So, we do share information, I think quite well, when it comes to chronic wasting disease.

Mr. MOORE. And could you share also steps you take to make sure this work is not duplicative in nature?

Ms. KINSINGER. It is through those coordination meetings.

Again, I think we have a special niche that deals with wildlife disease, and both the human health community and the agricultural community do look to us for that specialized expertise.

Mr. MOORE. With respect to a cross-cut budget analysis, to your knowledge has the DOI, the Department of the Interior, conducted a cross-budget analysis of all the Department’s wildlife surveillance programs?

Ms. KINSINGER. I don’t know, so I will get back to you on that.

Mr. MOORE. OK. Yes, without that type of budget—please do get back to us. If there is one, we would love to be able to have a copy of it and dig into it with some of my staff.

But without that, can you be confident the taxpayer dollars are being efficiently used if there is no assessment of how money is being spent through separate agencies working toward the same goal?

Ms. KINSINGER. I think that analysis could be useful, but I am confident, because of the degree of coordination and collaboration
and communication that we have, that we are spending taxpayer dollars wisely.

Mr. MOORE. Professor Carlson, a witness on the next panel noted in his testimony that because wildlife disease surveillance is “fragmented across these institutions,” that it could take a researcher months or years to find the data necessary to answer one question—kind of my prelude here when I started this questioning, the issue that I have. It is unacceptable.

Your testimony noted that your agency had begun developing a National Wildlife Disease Database. How will you prioritize addressing the problem highlighted here by Professor Carlson as you create this database?

Ms. KINSINGER. Thank you for that question. The National Wildlife Disease Database is built on a current system that we have called WHISPers, Wildlife Incident Reporting System, at our National Wildlife Health Center. It already serves as a centralized place where incidents can be reported and additional information be included.

So, we are building from that outward to a system that will be accessible to all, where incidents can be reported, but also where we can combine ecological and environmental information and work with the community to develop risk assessments, look at adaptive management strategies, and generally just help managers bring the science together to address these concerns.

Mr. MOORE. Yes, thank you.

Thank you, Chair.

Ms. PORTER. The Chair now recognizes the gentleman from California, Mr. Huffman.

Mr. HUFFMAN. Thank you, Madam Chair.

Ms. Kinsinger, I appreciate you being here. And I noted you made a passing reference in your testimony to mink farming and to some surveillance work the USGS is doing. I think, if we are going to try to get our heads around this subject of animal wildlife-borne diseases in the context of this current pandemic, we need to talk about mink a little bit more.

I am told that even though there are some anecdotes about cats and big cats getting COVID, mink are really the species where we know it has gone back and forth between humans, and actually mutated within mink populations, and then come back to us. Meanwhile, we produce millions of minks in mink farms in the United States for export, I am told, mainly to China.

So, I wonder if you could tell us a little more about the level of concern we should have about these mink farms as a vector for the spreading of COVID, and potentially creating a mutation laboratory almost here in the United States, simply so that we can sell furs to China.

Ms. KINSINGER. Yes, I do think it is a serious concern, as it is with other animals, both domesticated and wild, that not only are affected by COV-2, but also can serve as reservoirs for potential transmission back to humans and also to other wildlife.

The USGS role in the mink farm surveillance really did focus on wildlife surrounding the mink farms. And we did test a large number of animals—I think the number was 365—and it did show quite a lot of presence of the SARS-CoV-2 virus in those animals.
Mr. HUFFMAN. So, what are you doing about that?
We are continuing to raise and export these minks, as I understand it, back and forth to China of all places, in the middle of this pandemic. Isn't this something that we should be sounding the alarm about, looking into taking action?

Ms. KINSINGER. Well, I think, as I say, the USGS role really is in looking at the wild animals. We work closely with those who do make those sorts of management and policy decisions, but I wouldn't want to speak for them.

Mr. HUFFMAN. So, you are purely looking at the wildlife in the area around the mink farms. Do I understand that correctly?

Ms. KINSINGER. That is correct, yes. And that response is being led by USDA. So, our information has been given to USDA to help in their very difficult management decisions.

Mr. HUFFMAN. And, I think, in your words, you said you were finding quite a bit of COVID just in that surrounding wildlife tracking that you are doing. Is it fair to assume that the level of COVID within the mink farm itself, where these animals are confined and presumably don't even have a lot of interaction with the surrounding environment, wouldn't it be fair to assume that we might have an even bigger problem within the mink farms?

Ms. KINSINGER. Well, it is definitely true that animals that congregate do have higher levels of transmission. Yes.

Mr. HUFFMAN. OK. I am a little surprised, frankly, that we are not hearing more from you about that, but maybe that is just a function of USGS and jurisdictional lines that constrain you. So, maybe there are other witnesses that can speak to this, but are there other authorities or resources that you would want to do more about what seems like a pretty clear and present danger posed by these mink farms?

Ms. KINSINGER. Well, I think, as I mentioned, in the 2023 budget we do have some ample funding to look at wildlife diseases in the wild. We did receive some specific increases in our 2022 omnibus bill, as well. But there is always room to expand our capacity.

And as I said, these are decisions that are informed by the science of USGS, but there are a lot of factors that go into making those decisions.

Mr. HUFFMAN. All right. Well, I appreciate your testimony, and I understand the limitations that you are under there.

But my understanding is that, of all the animals that we might concern ourselves with, mink should be perhaps at the top of the list in terms of the known transmission of this virus back and forth between minks and humans, and the known mutations that have already arisen from that, and the volume of mink farming, and the trade back between the United States and China. I mean, these are all huge red flags.

Madam Chairman, thanks so much. I yield back.

Ms. PORTER. Thank you very much. The Chair now recognizes the gentleman from Georgia, Mr. Hice.

Dr. HICE. Thank you very much, Madam Chair. The USGS collaborates with numerous other partners to conduct wildlife surveillance. I would like to go there, if we can, for a few moments.

What type of metrics do you have in place to assess the value of these partnerships?
Ms. KINSINGER. That is a really good question. I don’t think we have been using specific quantitative metrics. Certainly, I think it can be measured by the rapidity of our response to detected outbreaks, to the ability to communicate quickly and effectively with those who do have to make difficult public health and agricultural sector decisions. But I am not aware of any particular metrics that we have been using to measure our success.

Dr. HICE. So, you just kind of play it by ear and determine the whole?

Ms. KINSINGER. Well, I don’t know if we are playing it by ear, because we do have plans such as the avian influenza response plan, and many other plans in place that are—

Dr. HICE. But there are no metrics to determine the overall value?

Ms. KINSINGER. Not to my knowledge.

Dr. HICE. What about on the funding side of things? What kind of tracking mechanisms are in place to monitor funds that are awarded to partners for wildlife surveillance?

Ms. KINSINGER. I think that is a question better put to the granting agencies.

We were involved, for example, in the criteria that were developed for the Fish and Wildlife Service grants to states and tribes to look at wildlife disease. And we did ask that those measures include information being put into the National Wildlife Disease Database I mentioned.

But I am not familiar with what metrics they are using for success—

Dr. HICE. So, again, there is no real tracking of the funding of it all, either.

Ms. KINSINGER. No, I believe there is tracking. I am just not familiar with it because they aren’t—

Dr. HICE. OK. Well, if we could get that information—

Ms. KINSINGER. I would be happy to do that.

Dr. HICE. It has come up with others about duplicate-type scenarios here. How do you prevent partners from duplicating wildlife surveillance work?

Ms. KINSINGER. Well, as I mentioned in my oral testimony, I think we are doing a better and better job. I wouldn’t say we are where we need to be, but a better and better job of a national coordinated biosurveillance effort.

As one example, the Association of Fish and Wildlife Agencies, which represents state fish and wildlife agencies across the country, passed a resolution in support of biosurveillance of disease. I sit on their National Fish and Wildlife Health Steering Committee. I sit on their Steering Committee for the National Wildlife Health Initiative, and we have been working closely on making sure that we bring our information together and that the Federal agencies, which don’t manage a lot of these species, serve as a support function for the state agencies in doing things like risk assessments, and doing things like—

Dr. HICE. Well, that is good. If I may, because I don’t have much time, that is good that you are doing that. But the question is, how do you prevent duplicating? You are not really answering that question. How is that prevented?
Ms. KINSINGER. I believe it is prevented through the regular meetings and collaborations we have.

Dr. HICE. OK. Are there any metrics to determine the effectiveness of those meetings to make sure duplicative work is not occurring?

Ms. KINSINGER. Again, I am not aware of any quantitative metrics. I think the quality of our response is probably the best way to look at that.

Dr. HICE. Do you think it would be a good idea to have some metrics?

Ms. KINSINGER. I could definitely take that back to our community and get back to you on that.

Dr. HICE. OK. I think that would probably be a good idea.

I would like to transition, if I can, about how your agency provides information to the CDC. Can you kind of walk us through that process from USGS—when you detect a disease to when your agency alerts the CDC of the findings? What is the process there?

Ms. KINSINGER. So, there are different processes, depending on the disease. As I mentioned with avian influenza, our primary partner there is the USDA. But for other diseases, we have a vast network of collaborators that we share our results with all the time.

We also release what we call technical bulletins from our National Wildlife Health Center that goes out to all the key decision makers in multiple Federal and state agencies.

Dr. HICE. What kind of steps are taken to verify your findings before initiating the process?

How do you know that you know what you are doing?

Ms. KINSINGER. We certainly try to design our research so it is replicable, and we do multiple tests when we do them. And in some cases, we do have independent labs like the USDA verify our results.

Dr. HICE. OK, thank you.

Thank you, Madam Chair.

Ms. PORTER. Thank you very much. The Chair now recognizes the gentlelady from Michigan, Mrs. Dingell, for 5 minutes.

Mrs. DINGELL. Thank you, Madam Chair. I really want to thank you and Ranking Member Moore for convening this important and timely hearing on wildlife-borne disease surveillance.

It is important to note that, in addition to COVID-19, we have to be mindful of spillovers of other zoonotic diseases that could pose significant public health risks to Americans. In fact, even prior to the current pandemic, there was a historic outbreak of eastern equine encephalitis in Michigan in 2019 that infected 10 people, killing 6, and leaving at least one survivor with permanent disabilities. For comparison, in an average year there are seven cases of this disease in the entire United States.

So, we have to take seriously this potential threat to America's public health and ensure that there are appropriate systems in place for surveillance and detection of these types of diseases.

Ms. Kinsinger, in your testimony, you speak about how experimental research discovered the potential for previously unknown wildlife-to-wildlife transmission in the West Nile virus, another
mosquito-borne disease. Could more wildlife disease research help warn us about the new risks to human health, and how?

Ms. KINSINGER. Yes, I believe greater surveillance could help in warning about the risk.

And, specifically, I mentioned the use of genetic capabilities. So, not a disease example, but, for example, learning to detect Asian carp in the Great Lakes, we developed these field tests where samples could be analyzed on the spot to detect for the presence of Asian carp. And I think tools and technologies like that would be a significant boost to our national network of biosurveillance.

Mrs. DINGELL. So, building on that, in your testimony you talk about the development of a test for eDNA. Is that the same eDNA that has been essential in tracking invasive carp near the Great Lakes?

Ms. KINSINGER. Yes.

Mrs. DINGELL. How has that technology changed the way we manage invasive carp?

Ms. KINSINGER. Yes, that is the technology I was referring to. Environmental DNA is when you search for DNA in waters, soils, and plants, and the like.

And I think that is essential for early detection because if you wait for—well, in the case of chronic wasting disease, for example, animals don't appear to be sick, don't show symptoms for months at a time. So, it is really important to detect these disease agents early on, either in the live animals or in the environment.

Mrs. DINGELL. But then how does that technology help us manage it better? Yes, detect, but how does it help manage? What do we do?

Ms. KINSINGER. So, a couple of examples: (1) the key is, particularly as I mentioned, combining our ecological research which understands how animals move, where they go—we have done work in avian influenza, for example, to look at the overlap between wild and domesticated birds and certainly human interactions. So, all of those factors where these diseases might occur before they get there, and then we can put in place the biosecurity measures to prevent that spread.

Mrs. DINGELL. Last question: Can you discuss USGS's WHISPers Database? How does this help track the sorts of public health concerns we have discussed today?

Ms. KINSINGER. The WHISPers Database is a wildlife incident reporting system. It is housed at our National Wildlife Health Center. And what it does is serve as a central place for reports of incidents of wildlife disease that occur throughout the nation. So, it is a widely used database right now for people to scan and do this sort of horizon scanning to detect incidences as they occur in real time.

We are also building on that WHISPers Database for our National Wildlife Disease Database to add in additional information, ecological information, environmental information, and the capacity to employ even more predictive tools and technologies.

Mrs. DINGELL. Thanks for the work that you are doing and, Madam Chair, for having this hearing. Michigan has been a place that we saw the transmission of COVID, as well, from mink, and we care a lot about this.
I yield back the balance of my 7 seconds. Thanks, Madam Chair.

Ms. PORTER. The Chair now recognizes the gentleman from Tennessee, Mr. Cohen, for 5 minutes.

Mr. COHEN. Thank you, Madam Chairman, for having this hearing. We had three committees going concurrently, so we thank you for your efforts in this important panel.

Approximately 25 months ago, we learned about coronavirus, and it was a scary, worldwide health issue, and it was estimated that maybe 400,000 or so people might die around the world. Well, now we have seen already a million people die. That virus has told us a lot about pathogens and how they can infect humans, as well as animals. We have had over 80 million confirmed cases in the United States, with almost a million deaths. Worldwide it is more like 6.2 million.

We need to ensure that the United States understands how the interaction with climate change, wildlife, and humans can have an impact on diseases and potential future pandemics.

Ms. Kinsinger, you may be aware—I hope you are—of an unknown pathogen that has killed at least 85 horses at the Bureau of Land Management’s Canyon City Wild Horse and Burro Facility in Colorado since Saturday, April 23. I attended a meeting of individuals, quite a few in Washington, for a national conference on horse management and wild burros, and they brought this up, brought this to my attention.

The infected horses are initially identified with respiratory difficulties, and then they suffer neurological effects. The Bureau of Land Management has reported that Federal and private veterinarians are working to determine the cause, but they haven’t figured it out yet.

The facility currently holds 2,500 horses. Now it is down to approximately 2,400. So, 3.5 percent of the horses in that confinement have died in the last week. Bob Baffert has not been seen around those horses. These horses are kept in close quarters. If they were not penned, it is entirely possible the pathogen would have not spread nearly as quickly.

Are these types of outbreaks that the USGS ecosystem program typically studies?

Ms. KINSINGER. We do study disease outbreaks, and I am aware of this outbreak in wild horses, although that is not something that we have been involved in. I did put out a request to our National Wildlife Health Center to see if they had been involved, and they have not to date. But we have a very close working relationship with the Bureau of Land Management. We have done other non-disease-related work on wild horses, so I would be happy to keep the Committee apprised of any additional information that comes out of that.

Mr. COHEN. If you would, the disease and the death is certainly disturbing, and that is the subject of this hearing. But I am concerned about the horses and the burros in general. So, if you could keep us informed on that, I would appreciate it.

And we know they could affect, other than the horses, we don’t know. And the Bureau of Land Management has certainly not been very effective in this process.
The ranchers like to use that land out there, which they pay ridiculously low fees for, $1 per cow a month, which hasn't been changed, that fee, for a couple of decades. And the cows are about twice as large now, so they eat a lot more. But it should be more like $20, based on 20 years and the size of the cows. But we subsidize it. You've heard the expression, there is no such thing as a free lunch? Well, when the Bureau of Land Management is involved with cattle ranchers, it seems like there is such a thing as a free lunch.

And then they move the horses away because they say the horses are eating the raw materials there, and the horses get penned up and taken, and sometimes they end up being shipped off to Mexico. However, people buy them—at least not supposed to. But the horses, the burros are at risk. The programs they have had—we will be looking into having a hearing on this to see that this is done in a humane fashion, and that the burros and the horses are looked upon with—they should have rights on those lands to graze. They are an American treasure.

Do you have any other information or knowledge of the BLM and their horse-burro policy?

Ms. KINSINGER. I can't speak to their specific policies. But as I said, USGS has worked with BLM on a couple of things. One is in helping to improve their monitoring protocols so that we understand how many horses are out there in the wild, and then looking at reproductive capacities, reproductive techniques for slowing the reproduction of the horses.

Mr. COHEN. Well, thank you very much. On behalf of Trigger and all the other horses of past and present, I appreciate your looking into that.

I yield back the balance of my time.

Ms. PORTER. Thank you very much. The Chair now will recognize herself for her questions.

Ms. Kinsinger, you said earlier that there is always room to expand capacity, and you made a kind of general statement that there is the potential to improve.

I agree with my Republican colleague, Mr. Moore. Taxpayers deserve to know that their money is being spent effectively. And public health is an investment. It can save money. Pandemics are devastatingly expensive, which is something that I think we can find bipartisan agreement about. It is fiscally responsible to give USGS the necessary funding and to hold it to account on how it uses that funding. So, I want to invite Mr. Moore to work with me in a bipartisan way on legislation to try to improve coordination, save resources, and be able to do a better job with the funding that we are giving to prevent future pandemics.

I want to ask you to be as specific as you can be with the Committee. If we were to give you more funding, what would you do differently? How would it protect the American economy and the American public?

Ms. KINSINGER. I will take that last piece first. We often talk about the direct effects of pandemics. For example, the billions of dollars in poultry that have to be destroyed during an avian influenza outbreak. But there is also a huge cost associated with
preparing for pandemics and preparing to respond to pandemics. It is probably an even larger price tag than folks realize.

In terms of what we would do with additional capacity, that would be on several fronts. One would be to expand on our outbreak investigations, to be there at the table immediately, for example, when a wild bird is found dead, to be able to test it immediately for any disease. We would do tests on a suite of diseases. The other, as I have mentioned several times, is in the biosurveillance realm, the ability to develop these rapid markers for detecting disease.

And, by the way, this is also very useful in invasive species, as well, which are a $1 billion cost to the economy.

And then also continue to invest in ecological research, because it is critically important to understand how animals move, how they interact with domesticated animals and humans.

And just to give one example of that, we have been studying migratory birds for decades now, started with the hunting community, and making sure that we could work with state managers on their harvest strategies. But when the avian influenza appeared in 2006, USGS was right there with the worldwide maps of migratory patterns. We were able to quickly see the areas of migratory bird layovers and areas that had avian influenza outbreaks were critical sources for avian influenza entering the United States.

We established a monitoring program in Alaska with the Fish and Wildlife Service so that we could test birds coming in on that flyway, the Pacific Flyway, to try to rapidly detect AI.

So, I think there is a lot that can be done in the ecological research, as well.

Ms. PORTER. I hear you say develop rapid markers, ecological research, which I think you did a terrific job of explaining. Our next panel is going to talk, I think, a lot about data. So, I wanted to ask you specifically about central repositories of data, about WHISPers, the database. If you could explain that to the Committee and talk about how we could improve that.

And then, specifically, I would invite you to respond in more detail to what Mr. Moore raised about the Department of Agriculture and coordination across departments, because I hear a strong willingness to coordinate. I would like to know, if we gave you more resources, could you coordinate better, and what would that look like?

Ms. KINSINGER. I will answer the last first, and I may have to ask you to repeat the first.

We have significantly ramped up our coordination with Agriculture, and I think I have talked about that. I think the most important mechanisms are to have specific pathways for sharing information. We have some really specific protocols in place, as I mentioned, for avian influenza. We can do that with multiple diseases in early detection. We have, as I say, as part of that strategy, a joint communication strategy. We understand who conducts the first test, who validates that, and then, most importantly, who communicates that and how. And that has, particularly with diseases that have significant economic impacts, we have to be very thoughtful about how we communicate those diseases.

And with apologies, could you repeat the first question?
Ms. Porter. Yes, the first question was about WHISPers and centralized data.

Ms. Kinsinger. Yes, yes. So, it is really important to have a central source of data. I think that that is a huge cost alone, just to have researchers out there looking for where they can find collaborators and information. The WHISPers Database has been in place for some time at the National Wildlife Health Center. The WHISPer stands for Wildlife Incident Reporting System. And we already are used by many, many partners who not only input data on the incidence of disease, but also use it to conduct health assessments, risk assessments, and the like.

With the ARPA funding, which $45 million went to the Fish and Wildlife Service. Of that, $6.5 million came from Fish and Wildlife to USGS to expand that system into a National Wildlife Disease Database.

So, we will build on the incident reporting capacity that we already have in place in WHISPers, but become even more of a decision support tool by incorporating environmental data, ecological data, and, most importantly, some web-based tools so that folks can get in there, see the incident, conduct risk assessments, and use that information to make their on-the-ground management decisions.

Ms. Porter. Thank you very much. I think we are now, unless there are any other Members who wish to question on this panel, I think we are ready to transition to our second panel. Thank you very much, Ms. Kinsinger, for your testimony.

We will now pause while we reset for the second panel.

[Pause.]

Ms. Porter. All right, we are now going to go ahead with the second panel.

Before introducing our witnesses, I want to remind non-Administration witnesses that they are encouraged to participate in the Witness Diversity Survey created by the Congressional Office of Diversity and Inclusion. Witnesses may refer to their hearing invitation for further information.

Now, I am going to introduce our witnesses. We have Dr. Colin Carlson. He is an Assistant Research Professor at the Center for Global Health Science and Security at the Georgetown University Medical Center.

We have—I am going to get this one wrong—Dr. David Stallknecht. There you go. Dr. David Stallknecht is the Director of the Southeastern Cooperative Wildlife Disease Study and a Professor in Wildlife Health at the College of Veterinary Medicine at the University of Georgia.

Ms. Catherine Semcer is a Research Fellow at the Property and Environment Research Center.

And Dr. Julie Thorstenson is the Executive Director of the Native American Fish and Wildlife Society.

As with the first panel, oral statements will be limited to 5 minutes, but your entire statement will be made part of the hearing record.

When you begin, the timer will start. It will turn orange when you have 1 minute remaining, and red when your time has expired.
Statements of Colin Carlson, Assistant Research Professor, Center for Global Health Science and Security, Georgetown University Medical Center, Washington, DC

Dr. Carlson. Good morning. Thank you, Chair Porter, Ranking Member Moore, and distinguished members of the Subcommittee, for the opportunity to testify in today's hearing.

My name is Colin Carlson. I am an Assistant Professor at Georgetown University. I am an author on the most recent report of the Intergovernmental Panel on Climate Change. And I am the Director of Verena, a scientific research team working to predict and prevent viral emergence. I want to share three conclusions with you today that I have drawn about how we can better monitor for disease emergence within the borders of our nation.

First, the United States faces a substantial threat, both from zoonotic disease and from complacency about the domestic risk it poses. It is easy to imagine pandemics are someone else's problem. The risk of disease emergence is higher in tropical countries with more biodiversity, weaker health systems, and high-risk interfaces like wildlife markets that allow viruses to jump from animals to humans.

But risk only goes so far when you are planning for a once-in-a-generation event. We live alongside wildlife and alongside zoonosis, even here in the nation's capital. In March, the CDC reported that, in 2018, our local rat problem was responsible for two cases of hemorrhagic fever called Seoul hantavirus. Only a few weeks later, a rabid fox bit Representative Bera just outside this building. Thanks to the miracle of vaccines, the Congressman is safe, healthy, and back at work. But the stakes of these encounters can be much higher and deadlier.

In fact, the deadliest pandemic in recent history started within our borders. Though it is often called Spanish flu, the 1918 pandemic of influenza was first detected on a military base in Kansas and is believed to have originated on a nearby farm. This could happen again today. The pandemic can start anywhere.

Second, the risk posed by zoonotic disease is growing rapidly. One reason in particular stands out. One of the Subcommittee's mandates is to investigate the sources and impacts of climate change, the single biggest issue that affects every aspect of the Committee's work. A growing body of evidence now suggests that climate change could also become the single biggest issue for pandemic prevention and preparedness.

In a study published only a few hours ago today in the journal *Nature*, our team reports that as mammal species are forced to track warming temperatures toward the Arctic and up mountainsides, zoonotic diseases will arrive at new places and encounter new animals, some of which will serve as a stepping stone to reach a human host. Every simulation we conducted was unambiguous: climate change is creating innumerable hotspots of future pandemic risk right in our backyard.
We also believe this process is well underway. In 2004, a virus closely related to measles called phocine distemper virus was first reported in Alaskan sea otters. Working with State and Federal agencies, a team of researchers has spent the last 15 years monitoring wildlife health throughout the northern Pacific. They found that melting Arctic sea ice appears to have removed barriers to animal movement, allowing the virus to spread between otters, seals, and sea lions.

Now, phocine distemper virus is unlikely to ever pose a threat to human health. But as we spotlight in our study, the same process will happen to the hosts of Ebola virus, and coronaviruses, and any other zoonotic disease, even here at home in the United States.

Third, to face that growing risk, the most urgent priority is surveillance. Our country leads the world in zoonotic disease research, but modernizing our surveillance system, sharing data more openly, and increasing connections among State and Federal agencies would do immeasurable good.

For example, in a recent study, we found that since 1950, climate change has increased the risk of bubonic plague in the western United States by up to 40 percent in some areas. We were only able to detect that thanks to decades of both human case surveillance by public health agencies and the wildlife data collected by the USDA’s National Wildlife Disease Program.

However, data also accounts for our study’s biggest limitation. The California Department of Public Health has long curated its own independent surveillance system for plague, and the absence of that data creates a noticeable hole in our risk maps.

Any steps we take toward more comprehensive, connected, and open zoonotic surveillance will massively benefit scientific efforts to predict and prevent the next pandemic. It is easy to miss in all the other pandemic science, but our field is currently headed into something of a scientific revolution. We can do things today we couldn’t do a decade ago, like identify animal viruses with zoonotic potential only hours after we have sequenced their genome. We are headed in leaps and bounds toward true prediction.

All of that exists by the grace of scientific data and the patchwork of programs the Federal Government funds consolidate, collect, and immortalize that data. Building a more centralized infrastructure for zoonotic disease surveillance could easily be the lowest-cost, highest-return way to make our country more prepared, not just for pandemics, but for climate change.

I look forward to discussing this with you further and will gladly answer any questions the Committee may have.

[The prepared statement of Dr. Carlson follows:]
research team working to predict and prevent future viral emergence. Today I want
to share three conclusions about how we can better monitor for disease emergence
within the borders of our nation.

**Zoonotic risk in the United States**

First, the United States faces a substantial threat both from animal infections
that can be transmitted to humans (zoonotic diseases), and from complacency about
the domestic risk that they pose. Historically, the United States has handled
pandemics in a paradigm that treats the risk of emergence within our borders as
comparatively low. The risk of disease emergence is generally believed to be higher
in tropical countries with more animal biodiversity (1), weaker health systems (2),
and high-risk interfaces like wildlife markets (3) that allow viruses to jump from
animals to humans. But risk only goes so far while planning for a once-in-a-
generation event.

We live alongside wildlife, and alongside zoonosis, even here in the nation’s
capital. In March, the CDC reported that in 2018, our local rat problem was responsi-
ble for two cases of a haemorrhagic fever called Seoul hantavirus (4). Only a few
weeks later, a rabid fox bit Representative Ami Bera just outside this building.
Thanks to the miracle of vaccines, the Congressman is safe, healthy, and back at
work. However, the stakes of these encounters can be much higher. In fact, the
deadliest pandemic in recent history started within our borders. Though it’s often
called “Spanish flu,” the 1918 pandemic of influenza was first detected on a military
base in Kansas, and is believed to have originated on a nearby farm. As one 2004
historical account wrote: “If the virus did cross into man in a sparsely populated
region of Kansas, and not in a densely populated region of Asia, then such an
animal-to-man cross-over can happen anywhere.” (5) This remains true today; a
pandemic can start anywhere. It might start here next time.

As the country with by far and away the greatest total number of poultry
chickens, it remains entirely possible another influenza pandemic could start in the
United States. A recent surge of domestic cases of high pathogenicity avian
influenza in poultry, particularly in the Midwest, speaks to this possibility—but also
to the strength of existing outbreak surveillance and transparent reporting in the
agricultural sector.

On the other hand, the domestic emergence risk of wildlife viruses is considered
less often. Coronaviruses are generally thought of as a low risk for emergence in
the United States, because the lineage of viruses related to SARS-CoV and SARS-
CoV-2 are not currently known to circulate in bats in the Americas; however,
another lineage that includes viruses like the Middle Eastern Respiratory Syndrome
coronavirus (MERS-CoV) has been detected in bats in Mexico (6), and other species
of bats throughout the Americas are suspected to possibly host similar viruses (3,
7). It is likely that further zoonotic surveillance throughout North America will
uncover similar viruses in coming years. Similarly, a high number of rodent species
are known to be reservoirs of zoonotic diseases in the United States, including
respiratory and haemorrhagic pathogens like hantaviruses (8, 9); a 2015 study pre-
dicted that the global hotspot of undiscovered reservoirs might be in Kansas and
Nebraska (10). Overall, the Americas are believed to have a large number of
undiscovered mammal viruses (11)—a pattern driven by gaps in zoonotic surveil-
ance that are, in turn, driven by lower perceived urgency of zoonotic risk. (For
example, the USAID PREDICT project’s work sampling for wildlife viruses and
building a surveillance workforce in Latin America was mostly concluded several
years before the main program ended in Africa and Asia.)

Further risks exist in terms of the possibility of importation immediately before
or after spillover takes place at the animal-human interface. Wildlife trade, and the
pet trade in particular, poses a major risk, underscored by the 2003 outbreak of
monkeypox to the United States originating in imported African rodents. These
risks were also recently discussed in a Senate hearing (“Stopping the Spread:
Examining the Increased Risk of Zoonotic Disease from Illegal Wildlife Trafficking”;
July 22, 2020). Pathogens also cross borders with humans: a recent study reported
that several medical professionals had traveled to Haiti in 2017 to assist in Zika
virus outbreak response, and returned with an unknown illness. Both the outbreak
and its cause—canine coronavirus, a well-known virus not generally believed to
infect humans until last year—were essentially unknown to the world until reported
in an October 2021 study. It remains possible that the next coronavirus pandemic
could be the United States’ to prevent.
Climate change and zoonotic risk

Second, the risk posed by zoonotic disease is growing rapidly. One reason in particular stands out: one of the Subcommittee's mandates is to “investigate the sources and impacts of climate change, the single biggest issue that affects every aspect of the Committee’s work.” A growing body of evidence now suggests that climate change could also become a global crisis for pandemic prevention.

In a study published only a few hours ago today in the journal *Nature*, our team reports that, as mammal species are forced to track warming temperatures toward the Arctic and up mountainsides, zoonotic diseases will arrive in new places, and encounter new animals, some of which will likely serve as a stepping stone to reach a human host. Every simulation we conducted was unambiguous: climate change is creating innumerable hotspots of future zoonotic risk right in our backyard.

Figure 1. Climate change makes zoonotic disease emergence a global problem. As a result of climate change, by 2070, predicted hotspots of viral host jumps among mammal species (red) will sometimes coincide with human settlements (blue), including in several parts of the United States (purple). (From Carlson et al., “Climate change increases cross-species viral transmission risk”, *Nature*, 2022)

We also believe this process is already likely underway in some ecosystems. In 2004, a virus closely related to measles called phocine distemper virus was first reported in Alaskan sea otters. Working with several state and federal agencies, a team of researchers spent the next 15 years monitoring wildlife health throughout the northern Pacific (12). They found that melting Arctic sea ice appears to have removed barriers to animal movement, allowing the virus to spread between otters, seals, and sea lions. Phocine distemper virus is unlikely to ever pose a threat to human health, but as we spotlight in our study, the same process will happen to the hosts of Ebola virus, and coronaviruses, and any other zoonotic disease—even here at home, in the United States.

Benefits of strengthening and integrating domestic surveillance systems

Third, to face that growing risk, the most urgent priority is surveillance. Our country leads the world in zoonotic disease research, but modernizing our surveillance system, sharing data more openly, and increasing connections among state and federal agencies would do immeasurable good.

For example, in a recent study, my colleagues and I found that, since 1950, climate change has increased environmental suitability for bubonic plague in the western United States by up to 40% in some areas (13). We were only able to detect that signal thanks to decades of both human case surveillance by public health agencies and the wildlife data collected by the USDA's National Wildlife Disease Program. However, data also accounts for our study's biggest limitation: the California Department of Public Health has long curated its own independent surveillance system for plague, and the absence of that data creates a noticeable hole in our risk maps. Other studies have also used these data to assess potential consequences of climate change for plague transmission in California (14), leading to a fragmented picture of total impacts.
Figure 2. Gaps in zoonotic disease surveillance create gaps in preparedness. A map of plague reservoirs based on wildlife antibody data (green) misses key at-risk areas in California, which are identifiable from county-level human case surveillance (purple). California maintains its own system of wildlife plague surveillance separate from USDA. (From Carlson et al., “Plague risk in the western United States over seven decades of environmental change”, *Global Change Biology*, 2022)

Any steps we take toward more comprehensive, connected, and open zoonotic surveillance will massively benefit scientific efforts to predict and prevent the next pandemic. It’s easy to miss in all the other pandemic science, but our field is currently headed into something of a scientific revolution. We can do things today we couldn’t do a decade ago, like use artificial intelligence to identify animal viruses with zoonotic potential only a few hours after we’ve sequenced their genome (15). Teams like Verena are working toward further advances in what we can do with machine learning, particularly when we harness the genomic revolution, big data, and private sector advances in technology. We’re headed in leaps and bounds toward true prediction: knowing which viruses pose a threat, and which animals we need to test; building early warning systems that predict disease spillover like the weather; and using that information to develop and deploy countermeasures like universal vaccines that can stop an outbreak in its tracks. That vision offers renewed hope the Covid-19 pandemic could, in fact, be the last one.

All of that exists by the grace of scientific data, and the patchwork of programs the federal government funds to collect, consolidate, and immortalize that data. Many of the most important programs the United States funds are the cornerstone of open scientific research not just here but around the world: particularly notable is the National Center for Biotechnology Information, where a small core staff works tirelessly to maintain GenBank, the scientific database of record for all genetic and genomic data around the world. Programs like these foster transparency in scientific research, and the data they store have an incalculably high return on investment, not just to prevent outbreaks but during outbreak response as well.

The same can be said of the immense value of disease surveillance conducted by several federal agencies, including CDC, USDA, USGS, and USFWS; other federal agencies and agencies in every state and territory; and by NIH- and NSF-funded scientists in the academic sector. However, the mandate of domestic surveillance for zoonotic disease is fragmented across these institutions, and as a result, researchers might nevertheless be forced to spend months or years hunting for the data they need to answer one scientific question. Building a more centralized infrastructure for zoonotic disease surveillance could easily be the lowest-cost, highest-return way to make our country more prepared for both the pandemic era and the health hazards of a warming world.

I look forward to discussing this with you further, and will gladly answer any questions that the Committee may have.
Citations

Questions Submitted for the Record to Colin J. Carlson, Ph.D., Center for Global Health Science & Security, Georgetown University Medical Center

Questions Submitted by Representative Porter

Question 1. In your testimony, you said that “Building a more centralized infrastructure for zoonotic disease surveillance could easily be the lowest-cost, highest-return way to make our country more prepared for both the pandemic era and the health hazards of a warming world.” Could you elaborate on the kind of infrastructure and data-sharing needed? Will the expansion of the U.S. Geological Survey’s Wildlife Incident Reporting System fill this gap, or is more needed?

Answer. Through the planned expansion, the Wildlife Health Information Sharing Partnership (WHISPers) system takes an important step toward consolidating wildlife disease surveillance in the United States. The WHISPers database is relatively unique as a public scientific repository, and stores infectious disease data in a format compatible with other important causes of animal mortality (e.g., poisonings, accidents, or unknown causes). For wildlife health professionals, this is critical infrastructure. WHISPers also offers several important features that are critical for
government work—in particular, the ability to share data with partial confidentiality (e.g., precise locations). At present, WHISPers is used unevenly across pathogens, hosts, and regions, but has been particularly useful so far for tracking panzootics that threaten wildlife conservation (i.e., white-nose syndrome in bats; chytrid fungi in amphibians) and avian influenza die-offs in wild birds. To date, it has been used less for zoonotic surveillance, perhaps both because a mortality-focused resource may not be immediately applicable to some zoonotic reservoirs (which often tolerate diseases that are deadly in humans), and because its availability as a resource has been underpublicized in the zoonotic disease research community.

The expansion of WHISPers will be an important step toward integrated disease surveillance in the United States—even just by bridging the gap between the U.S. Geological Survey and the U.S. Fish and Wildlife Service—and offers a key opportunity to connect state agencies not just with federal infrastructure but also with each other. Expanding inputs into WHISPers will empower the partnered federal agencies in their mission, and the availability of more data in a standardized location will empower the broader research community. WHISPers' user base in academic research is currently much smaller than it could be; establishing the database as the definitive data hub for wildlife mortality data in the United States would go a long way to also identifying the USGS-FWS partnership as the coordinating federal authority on these issues. Outreach to academics is important to complement adoption by current and future USGS partners, and—for maximum efficacy—USGS would benefit from additional dedicated support for the community building and outreach dimension of its mission with the database. To bring more scientists' attention to this resource, agencies might also consider digitizing and sharing existing data sources through WHISPers that have historically been restricted in their sharing, such as various long-term surveillance projects by the USDA's National Wildlife Disease Program.

At the same time, these changes are only a first step toward a truly coordinated national infrastructure for disease surveillance. The simple fact is that data sharing infrastructure is only as valuable as the investments made to generate data itself that can then be shared, stored, reanalyzed, and used to spot trends and risks. Perhaps the most important step forward would be to allocate more dedicated funding to scientific research on disease transmission in wild animals within the United States, with a focus on (1) known zoonotic pathogens, and more broadly, key systems that introduce high-risk respiratory pathogens into human populations (e.g., influenza and the interface among wild birds, poultry, and swine; coronaviruses and bats; hantaviruses and rodents; (2) climate change, land degradation, and urbanization as key drivers of zoonotic risk within the United States; (3) collection of new field data that monitors for geographic shifts in pathogen intensity (rather than perpetual re-analysis of existing data, which has finite value for real-time monitoring); and, perhaps most challenging, (4) integration of wildlife disease surveillance with efforts to monitor for outbreaks in human populations. Funding for the wildlife and human aspects of these problems are fragmented by a conventional divide between the mandate of the U.S. National Science Foundation (which funds most wildlife research) and the U.S. National Institutes of Health (which traditionally handles more research that directly relates to human health). Recent efforts like the recent NSF Pandemic Intelligence for Pandemic Prevention program, or the long-standing NSF/NIH/USDA Ecology and Evolution of Infectious Diseases program, have been an important step toward bridging that divide, and are useful models for future funding programs.

In conjunction with an expansion of scientific research, data sharing requirements (as appropriate) would be an important step to ensure federal investments lead to a greater baseline of available disease surveillance data. Encouraging researchers to deposit data in WHISPers could be very valuable if acute outbreaks are detected in the course of routine federally-funded wildlife research. Other databases also address other key dimensions of surveillance: for example, genetic sequence data generated by federally-funded research is already regularly deposited in NCBI's GenBank repository. Enhancement of NCBI's resources might also be considered, given that the core team maintaining these resources has historically been very small, relative to their indisputably global role in keeping scientific research afloat.
Question 2. Is there any additional information about your views on domestic U.S. surveillance of wildlife-borne diseases for future pandemic prevention that you would like to share for the record?

Answer. Thanks kindly for the opportunity to answer this question. One of the biggest threats to domestic health security is the delayed notification, reporting, or publication of key information about zoonotic disease—not just in animals, but also in humans. Several recent instances speak to the need not just to share more information, but to share information faster:

• In 2018, two unconnected patients in Washington, D.C. both tested positive for Seoul hantavirus, an uncommon haemorrhagic fever not previously known to be a risk in the region. The findings remained unpublished until 2022.¹

• Between May 2017 and April 2018, researchers screened samples from patients in North Kivu Province, Democratic Republic of the Congo, for various diseases. They found that several had antibodies to Ebola virus, despite the fact that spillover had not previously been observed in this region. In July 2018, a devastating epidemic of Ebola virus disease started in Kivu, and would continue until July 2020. The scientists’ results were finally published in November 2020.²

• In 2017, multiple medical professionals returning to Florida from Haiti, where they had been engaged in Zika outbreak response, presented with a mild but unusual illness. After ruling out Zika and other likely explanations, scientists identified the presence of an unknown coronavirus, but waited to publish research until confident in its specific identity (a recombinant canine coronavirus); the description of the viral spillover was published in 2021.³

Each instance reflects the painstaking work scientists must undertake to identify and trace zoonotic spillover with confidence, but the broader picture speaks to how academic publishing is insufficient for rapid information sharing with the U.S. government and the global public. These delays increase the risk of another pandemic, and have ripple effects that limit the ability of animal surveillance to keep pace with shifting priorities: scientists have only recently learned they should be monitoring for hantaviruses in D.C.’s rats, or for recombinant canine coronaviruses in domestic and wild animals worldwide.

These delays reflect several intersecting challenges: broad effects of funding scarcity on publishing speed; the limitations of for-profit journals, and the under-incentivization of transparency processes like preprints; and, perhaps most notably, the fact that the vital work of epidemiology and zoonotic spillover detection often falls on academic scientists, instead of the severely under-resourced federal agencies, like the CDC, that should be better empowered to lead this surveillance. A distributed network of well-trained academic epidemiologists and veterinarians across the country has much greater total capacity than, for example, CDC’s Epidemic Intelligence Service or USDA’s National Wildlife Disease Program—but has fewer formal reporting channels available, and less ability to mobilize resources if an event that threatens public health is detected. Greater investment in federal capacity for both wildlife and human disease surveillance, and increased opportunities for government-academic partnerships in One Health outbreak investigations, would be key to solving this problem.

These delays also speak to another challenge: the need to promptly and transparently share information about domestic zoonotic surveillance and outbreaks with the rest of the world. In light of growing evidence that spillover risk is increasing worldwide—and after multiple years of extensive scrutiny on China’s early outbreak response—it seems obvious that the United States must lead the world in transparent reporting of human and wildlife disease surveillance, including notifications to the World Health Organization (WHO) and World Animal Health Organization (OIE) about key events. The current international system for disease outbreak notifications is severely limited, and is designed to only set a response in motion after an emergency starts—rather than earlier, in the key moments when an emergency

might be prevented. A promising opportunity for reform exists in discussions of a Pandemic Treaty or similar multilateral agreement with the goal of preventing and preparing for future pandemics. This instrument will likely address several important issues, among them: curbing human drivers of zoonotic emergence; tracking pre-emergence pandemic pathogens in animals, and detecting spillover into humans earlier; building better emergency response plans and supply stockpiles; and otherwise fixing the unforced errors that made the Covid-19 pandemic a disaster. Negotiations have already begun on this treaty, and are being discussed in the coming weeks at the World Health Assembly.

For transparent and effective surveillance of wildlife-borne disease, a Pandemic Treaty offers a chance to redefine obligations that include data sharing outside of acute emergencies, and connect our disease surveillance infrastructure to other surveillance systems around the world. It is vital that the United States be a full Party to such a Treaty, and that the final agreement includes provisions that address wildlife and human disease surveillance data sharing. The United States owes the world the same that we ask of other nations: rapid and transparent sharing of information about zoonotic disease, a threat that is fundamentally transboundary in nature.

Ms. PORTER. Thank you very much, Dr. Carlson. The Chair will now recognize Dr. David Stallknecht to testify.

STATEMENT OF DAVID STALLKNECHT, DIRECTOR, SOUTHEASTERN COOPERATIVE WILDLIFE DISEASE STUDY, PROFESSOR IN WILDLIFE HEALTH, COLLEGE OF VETERINARY MEDICINE, UNIVERSITY OF GEORGIA, ATHENS, GEORGIA

Dr. STALLKNECHT. Thank you for the opportunity to testify for the Subcommittee. I am currently employed by the University of Georgia as a Professor and Director of the Southeastern Cooperative Wildlife Disease Study.

I am giving this testimony today not as a representative of UGA or SCWDS, but as an individual with over 40 years of experience conducting surveillance and research related to diseases affecting wildlife, domestic animals, and human health. Much of this work has centered on zoonotic pathogens that were not present in North America or known to exist when I began my career.

Discussions related to wildlife and pandemic prevention require perspective. To provide this, I will address three questions.

Can pandemics be prevented? I have lived through at least five pandemics in my lifetime, and all of them have involved viruses that originated from wildlife. These included three influenza pandemics: 1957, H2N2; 1968, H3N2; 2009 pandemic, H1N1, originating from wild birds and domestic animals; and HIV in 1981, from old world primates; and COVID-19 in 2019, presumed to originate from bats. None of these were predicted.

With known pathogens and defined drivers of pathogen emergence, however, prevention may be possible. But with an unknown inventory of perhaps millions of potential and ever-changing pathogens in nature and in human-impacted ecosystems, pandemic prevention might be as futile as attempting to prevent a hurricane. However, like a hurricane, there is much that can be accomplished with preparedness to better protect the public and reduce impacts. Prevention should be the ultimate goal, but preparedness is probably a more realistic and practical approach in the near future.
How can wildlife health professionals and improved infrastructure contribute to pandemic prevention and preparedness? The involvement and inclusion of wildlife health professionals is needed for many reasons. Zoonotic diseases and impacts are shared between wildlife, domestic animals, and humans. Pandemic prevention and preparedness are dependent on a comprehensive understanding of the natural history of these pathogens in wildlife reservoirs and understanding the potential for human and interspecies infection.

Knowledge and expertise in basic wildlife biology, wildlife health, and an understanding of the human wildlife interactions are needed to fully understand these complex interactions. Laboratory and diagnostic capabilities specifically directed at wildlife also offer unique challenges, and these capabilities need to be in place and work-ready.

Finally, wildlife health professionals are on the front line related to disease detection and identification of problems associated with wildlife-human interactions.

What are the current gaps related to building pandemic prevention and preparedness capabilities? A broader wildlife health perspective is needed. It is important not to compartmentalize our efforts and capabilities into diseases only affecting wildlife—diseases affecting wildlife and domestic animals and zoonotic diseases. There is significant overlap in the necessary skills, training, and field and laboratory infrastructure needed to understand diseases in wildlife populations are the same, regardless of the host at risk.

Support for both surveillance and research are needed. Surveillance approaches, capabilities, and effectiveness cannot be improved or even understood or developed without a basic understanding of infection, disease, or transmission processes. Sustainable funding is needed, and recognition that success most often requires a long-haul approach.

Goals related to pandemic prevention and preparedness cannot be achieved through a boom-and-bust funding trajectory based on a short-term response to the current crisis.

And, finally, within-state wildlife health infrastructure and professional resources need to be better supported. This is perhaps the biggest gap. State wildlife health professionals are the frontline troops and are the critical part of our national wildlife disease network. But with few exceptions in-state capabilities are not even close to being adequate.

Thank you for your attention.

[The prepared statement of Dr. Stallknecht follows:]

PREPARED STATEMENT OF DR. DAVID E. STALLKNECHT, SOUTHEASTERN COOPERATIVE WILDLIFE DISEASE STUDY, COLLEGE OF VETERINARY MEDICINE, UNIVERSITY OF GEORGIA

Preventing Pandemics through US Wildlife-borne Disease Surveillance

Thank you, Chair Porter and the subcommittee for calling this hearing and inviting me to testify. I am currently employed by the University of Georgia (UGA) as a professor and Director of the Southeastern Cooperative Wildlife Disease Study (SCWDS). I am giving this testimony not as a representative or UGA or SCWDS but as an individual with over 40 years of experience conducting surveillance and research related to diseases affecting wildlife, domestic animal and human health.
Much of this work has centered on zoonotic pathogens (Lyme Disease, West-Nile virus, SARS-Cov-2, Eurasian highly pathogenic H5 influenza A virus) that were not present in North America or known to exist when I began my career. All of these involve wildlife. Wildlife are important reservoirs for zoonotic diseases. This holds for both endemic and emerging zoonoses as well as zoonotic diseases with pandemic potential. It is also important from a natural-resources perspective to recognize that wildlife populations can also be adversely affected by these same diseases. Discussions related to wildlife and pandemic prevention require perspective. To provide this, I will address three questions: Can pandemics be prevented? How can wildlife health professionals and infrastructure contribute to pandemic prevention and preparedness? What is needed to improve our existing wildlife health infrastructure related to pandemic prevention and preparedness.

Can pandemics be prevented? I have lived through at least five pandemics in my lifetime and all of them have involved viruses that originated from wildlife. These include three influenza pandemics (1957-H2N2; 1968-H3N2, 2009-pH1N1) originating from wild birds and domestic animals, HIV (1981) from old-world primates, and Covid-19 (2019) presumed to originate from bats. There have also been two possible near misses, Ebola (2014–2016) from bats and SARS (2003) from bats. Unfortunately, while we know that such events will continue, our current predictive abilities and capabilities to react are not sufficient to assure prevention. Prevention is dependent on eliminating human exposure to known or potential zoonotic agents, eliminating or reducing risk factors that lead to infection or increased virulence, early detection of human cases, and actions designed to break transmission cycles. With known human pathogens and defined drivers of disease emergence, pandemic prevention can be possible. Influenza and Ebola are examples. However, with an unknown inventory of perhaps millions of potential and ever-changing pathogens that are present in nature and in human-impacted ecosystems, pandemic prevention in many cases might be as futile as attempting to prevent a hurricane. However, like a hurricane, there is much that can be accomplished with preparedness to better protect the public and reduce impacts. Prevention should be the ultimate goal, but preparedness is probably a more realistic and practical approach for the near future.

How can wildlife health professionals and infrastructure contribute to pandemic prevention and preparedness? Currently, a basic infrastructure to conduct surveillance and supporting research related to the role of wildlife species in zoonotic diseases is in place; however, there are significant gaps that need to be filled related to building more effective, inclusive, and comprehensive capacity. The existing and basic infrastructure includes a loose network of Federal, State, and academic professionals and laboratories. On the Federal side, the USDA and USGS carry much of the responsibility with diseases that involve wildlife. However, state involvement in this network includes state veterinary diagnostic labs, state Fish and Wildlife Agencies, and regional wildlife disease labs such as ours (SCWDS) that provides wildlife disease expertise to multiple state and Federal agencies. Collaborative expertise and resource support also are often provided by other agencies and institutions such as USFWS, Centers for Disease Control, National Institutes for Health, state departments of agriculture, public health, and natural resources, and public and private academic institutions. The involvement and inclusion of this vast array of expertise and jurisdictions are justified and needed for many reasons; wildlife and wildlife disease professionals play an important part in this team effort. Zoonotic diseases and impacts are shared between wildlife, domestic animals, and humans and prevention needs to be addressed at all of these levels. Pandemic prevention and preparedness are dependent on a comprehensive understanding of wildlife reservoirs, vectora, and risk factors that provide an avenue for potential human or interspecies infection. Understanding basic wildlife biology and the human/wildlife interactions that may enhance zoonotic pathogen transmission are critical components of zoonotic disease prevention and both fall within the expertise and jurisdiction of wildlife-health professionals. Effective surveillance and research for zoonotic diseases also require a specialized and high level of technical and scientific skills that needs to be in place when needed. These skill sets not only relate to the collection of relevant data but also to providing a comprehensive and realistic interpretation of these data and the development of practical mitigation practices or policies. Finally, laboratory and diagnostic capabilities needed to conduct wildlife-related zoonotic disease surveillance and research also need to be in place when needed not after a problem is encountered. In emergency situations, these diagnostic capabilities can easily be redirected to other new or emerging problems. Wildlife health professionals are on the front line related to discovery of new pathogens and
diseases in wildlife and provide invaluable expertise related to understanding these potential pathogens in these populations and at the human/wildlife interface.

**What is needed to improve our existing wildlife health infrastructure to contribute to zoonotic and pandemic preparedness?**

**A broader wildlife health perspective is needed:** We tend to compartmentalize wildlife disease to those that affect wildlife, diseases that are maintained in wildlife but can spill over from wildlife to domestic animals, and to those affecting humans. These can be further compartmentalized to diseases that are established and well known, diseases that are “new”, and diseases and potential pathogens yet to be discovered. Those of us involved in wildlife health recognize these different perspectives, but also recognize that extensive overlap between these “compartments” occurs. For example, West Nile Virus (WNV) was a well-known zoonotic pathogen originally described in Africa. It gained “new status” when introduced into North America in 1999. It was initially recognized as something new when it affected American crows. Although not range extinct, it rapidly spread and included the entire Western Hemisphere in 4–5 years. This is a zoonotic disease, a domestic animal disease and a disease responsible for significant wildlife mortality. Federal investment for WNV surveillance was primarily justified by this virus’s zoonotic potential but the information gained also was applicable to domestic animal and wildlife health. Effective national WNV surveillance was made possible by including a network of human, domestic animal and wildlife health laboratories. Our lab was involved in these efforts and very quickly mobilized to provide WNV diagnostic support related to detecting infections in wild birds and mosquitoes for Georgia and several southeastern states; we are still doing some of this work today. The information gained not only helped to inform public health, but also informed wildlife health and domestic health professionals as related to wild bird mortality and equine disease. It also resulted in the local detection of other viruses such as equine encephalitis and other vector-borne zoonotic viruses. In addition, isolates of WNV were shared with other labs to provide research material to understand how the virus was evolving and potentially changing. With proper planning and creativity, the value of surveillance can far exceed any immediate objectives. SARS-CoV-2 and Eurasian HP H5N1 both are examples of viruses with known or potential pandemic capabilities where impacts to wildlife, domestic animals, and humans are shared and where an efficient response includes all of these perspectives and expertise. It is important to understand that many of the processes that allow a pathogen or diseases to emerge are similar between diseases affecting wildlife and those that can expand their host range to domestic animals and humans. Knowledge can often be translatable related to disease epidemiology regardless of host populations and such existing knowledge can be invaluable in quickly addressing “new” problems. For example, our abilities to identify new pathogens and to quickly develop and validate diagnostic tools are greatly enhanced by the wealth of genetic sequences and biological collections of both pathogenic and non-pathogenic viruses and microorganisms from wildlife species.

**Support for both surveillance and research is needed; problems cannot be understood or solved without both:** Effective surveillance needs to be science based and should always be improved with time, additional data, and a better understanding of the epidemiology of the target pathogen or disease. It is important that surveillance efforts be supported by state-of-the-art diagnostics. These technologies are rapidly changing and require research to develop and validate. Surveillance technologies also should not stagnate and goals and approaches need to be constantly modified and improved relative to new information and increased understanding provided by supportive research. Wild bird surveillance for WNV provides a relevant example. One year after the detection of WNV, an improved understanding of pathogenesis provided a scientific basis to support a more streamlined and safe wild bird sampling and testing protocol. After four years of wild bird surveillance in Georgia, a very consistent and predictable pattern of when WNV transmission occurred was identified. Based on this, the “early warning” provided by testing birds was no longer needed and preventive measures by public health could be safely and less expensively be scheduled on a calendar year. Though supportive research, we and others identified specific avian and mosquito species that were important amplifying hosts for this virus. This allowed for development of efficient and better targeted surveillance and field research designs to better understand local risk factors, mitigate risk, and determine the effectiveness of preventive measures. With influenza, basic knowledge on the epidemiology of our North American low pathogenic influenza a viruses (IAV) is providing a foundation to better understanding the impacts, risk factors, and prevention and mitigation possibilities associated with the current Eurasian HP H5N1 outbreak in the United States.
Sustainable funding and recognition that success often requires a long-haul approach are needed: Funding for wildlife health often follows a “boom and bust” trajectory, however, pandemics may take years to evolve. Short-term funding to build infrastructure and capacity can certainly be used effectively to reinforce our ability to detect, understand, and respond to zoonotic disease threats. Such funding also is needed in emergency situations such as outbreaks and pandemics. However, we all recognize that these threats and the discovery of future threats are often unpredictable and require continuous vigilance. In addition, an effective response to a disease emergency requires work-ready facilities, equipment, and most importantly skilled people. Our regional lab is very fortunate to have a business model that includes reliable annual support from state fish and wildlife agencies. This is something that we have benefited from for more than 60 years and our member states willingness to support us over these decades speaks loudly relative to the success of this model. It is important to note that this invaluable base support ($750K/year) is modest considering that it provides wildlife disease detection capabilities and support for 17 states. The advantages provided by such base funding are significant not only in relation to completing our day-to-day work but also by providing a foundation for a rapid response to address the next disease issue and to fill gaps and maintain a workforce of skilled biologist and scientists during unpredictable funding cycles. It also promotes discovery-based science as new clinical syndromes can be investigated immediately and not be dependent on obtaining new funding for every new pathogen, disease, or problem encountered.

Within state infrastructure and professional resources are vital to functional network: Surveillance is dependent on professional ground troops, and with wildlife, these are the wildlife biologist and wildlife veterinarians that work in our fifty states, tribal lands, and Federal lands. These professionals are the ones who initially detect wildlife disease problems, who gather the samples and data needed to support surveillance, who provide the biological and local expertise to understand the natural history of these pathogens in wildlife populations, who understand and can identify local risks, who are responsible for developing and implementing response plans, who understand what research is needed to deal with local situations, who provide field and collaborative support for those who communicate face to face to deal with any local issues that occur. Unfortunately, the level of wildlife expertise within individual states is highly variable, but even under the best circumstances is probably grossly inadequate to meet current needs. Dealing with chronic wasting disease which is at present only a potential zoonotic issue is a timely example of the intense personnel and financial demands that a disease may create. Personnel support for wildlife health professionals is needed, and infrastructure support to develop even simple field laboratories are essential to developing an effective network. Almost all of our work at SCWDS is done in collaboration with state wildlife health professionals who are the ones who detect and submit all of our clinical cases from which we diagnose zoonotic pathogens such as rabies, tularemia, Salmonella, zoonotic helminths, assorted encephalitis related viruses, and antimicrobial resistant bacteria. Finally, our surveillance and research with such potential and existing zoonotic and pandemic pathogens such as influenza and SARS-CoV-2 viruses are dependent on support, samples, and data provided by our state partners.

In summary, zoonotic prevention and preparedness require a network of skilled scientists, laboratories, and health practitioners across many disciplines. Wildlife health professionals can and are contributing to these efforts and are a necessary and valuable part of this network. However, improvements need to be made to more sustainably support these efforts, especially at the state level. From a “One Health” perspective, investment will not only improve our capabilities related to zoonotic and pandemic diseases prevention and preparedness but also will serve to improve our overall capabilities related to wildlife and domestic animal health.

QUESTIONS SUBMITTED FOR THE RECORD TO DAVID E. STALLKNECHT

Questions Submitted by Representative Porter

Question 1. During the hearing, you mentioned how the highly pathogenic avian influenza is harming bald eagle populations. In your experience, are there sufficient resources available for research focused on disease in wildlife themselves? Do research organizations like yours or the states you work with have any issues accessing funding for purely wildlife-focused disease surveillance?
Answer. This is the area that I am concerned about because funding for this type of work falls often between the cracks. NIH funding needs a human health connection. USDA funding needs a domestic animal health connection with relatively low competitive funding levels and limited opportunity. NSF does not fund basic disease-related studies that cover many of the types of research that are needed (such as understanding pathogenesis or developing diagnostics). Likewise, funding provided to USDA Wildlife Services for influenza, Covid-19, and feral swine disease surveillance are magnitudes higher than anything available for research and surveillance directed at pathogens known to affect wildlife health, some of which (whitewash syndrome) have threatened entire species. This leaves USGS and the States. Both partner with labs such as ours but funding levels are relatively low and often cannot be sustained. I really worry about the level and reliability of funding when the primary concern is wildlife health. I cannot speak for the states but from a personal standpoint we (SCWDS) do not see a lot of Federal funding opportunities in this area. As I mentioned in my response to Representative Cohen, discussions related to revising the “National Fish and Wildlife Health Initiative” though AFWA may provide some potential and perhaps innovative paths to address this problem.

Question 2. Is there any additional information about your views on domestic U.S. surveillance of wildlife-borne diseases for future pandemic prevention that you would like to share for the record?

Answer. One of the things we struggle with when justifying funding and work related to wildlife diseases in the context of pandemic prevention or preparedness, is that we cannot promise deliverables that provide immediate or even timely solutions. It is possible that surveillance and research “may” provide key information to predict the next pandemic. We “may” be able to prevent the next pandemic, human or domestic animal disease, or the next wildlife disease if we know what potential pathogens are out there and what the drivers for emergence are. We “may” be able to even mitigate disease impacts in the event of a new disease. We can honestly only present these as “potential” deliverables. What we can guarantee, however, is that without additional knowledge provided by research, and additional field intelligence provided by surveillance, we “will not” be able to accomplish any of them.

Questions Submitted by Representative Cohen

Question 1. How does having ecologists and wildlife experts—boots on the ground—in involved in planning and implementing U.S. surveillance of animal diseases improve how we respond to disease outbreaks?

Answer. Surveillance is dependent upon gathering relevant data and the collection and testing of samples. The interpretation of surveillance data also is dependent on local, biological, and technical knowledge. We spend a lot of time thinking about the need for big data and national labs dedicated to animal disease diagnostics and surveillance but an equal consideration needs to be dedicated to the acquisition of the samples and data that effective and comprehensive surveillance programs depend on. The goals of surveillance are to detect and understand the epidemiology of diseases not only to prevent diseases events but also appropriately respond to them. Diseases are the product of interactions between three things: the agent, the host, and the environment. This is a basic epidemiological concept. With diseases involving wildlife, who better than a wildlife biologist or ecologist to provide needed information on host and the environments where these agents and wildlife hosts interact. On a more practical side, wildlife biologists are the ones who know how to effectively collect samples, how to obtain supportive population metadata needed to understand disease interactions in wildlife populations, who manage wildlife populations and habitats, and who work daily at the human/wildlife interface. They also provide a “local” presence that provides needed perspective to understand community risks, guide surveillance objectives and approaches, and provide a community based professional to interact and communicate with the public. It is important to always remember that any success related to surveillance or response is dependent on community understanding and support. In my testimony I centered on States, but this also applies to Tribal jurisdictions.
Question 2. What are the biggest areas of need when it comes to improving surveillance?

Answer. There are several:

- State infrastructure related to meeting wildlife disease surveillance and research needs and capacity need to be improved in all states. These needs vary considerably between states. This is a funding issue at both State and Federal levels.
- Surveillance efforts should be ongoing and provide both general (new diseases or syndromes) and targeted (specific problems such as influenza, rabies) objectives. Both are important. With targeted surveillance, clear objectives need to be in place. More general surveillance is dependent on sustainable funding.
- Discussions are needed related to building a more effective Federal/State/Academic/Tribal network. There is no "one size fits all" model, but perhaps some new approaches should be discussed such as the development of regional labs or improved funding models. Fortunately, this is starting to be addressed through an American Fish and Wildlife Agencies attempt to revise the "National Fish and Wildlife Health Initiative". The steering committee for that initiative include Federal, State, Academic, and Tribal representatives and hopefully will provide some guidance and possibilities.
- As per question 1, there needs to be more State/Tribal involvement in prioritizing, planning, and implementing wildlife disease surveillance and research initiatives.

Ms. PORTER. Thank you very much.

The Chair now recognizes Ms. Catherine Semcer to testify.

STATEMENT OF CATHERINE SEMCER, RESEARCH FELLOW, PROPERTY AND ENVIRONMENT RESEARCH CENTER, CHEVY CHASE, MARYLAND

Ms. SEMCER. Good morning, Chair Porter, Ranking Member Moore, and members of the Committee. Thank you for the opportunity to testify today.

The annual threat assessment by the U.S. Director of National Intelligence has identified pandemic disease as one of the preeminent threats to the security of the United States. The assessment has also identified the degradation of ecosystems as a contributing factor to this threat. This threat is embodied in the ongoing COVID-19 pandemic.

While the exact origins of the pandemic are still unknown, the majority of U.S. intelligence agencies and a large body of peer-reviewed literature has expressed confidence that those origins are likely natural, with a genesis in wildlife.

The global tragedy we are witnessing indicates how permeable the line is between our civilization and those parts of the world we deem wild. Wildlife-borne pathogens, capable of incapacitating millions and shutting down the global economy, have shown themselves to already be inside our door. Scientists warn that diseases capable of far more reaching destruction may await us in the planet’s remaining wild lands, areas our civilization has increasing contact with via the pathways created by unsustainable development.

Disturbances to wild landscapes, such as road building and land clearing like that often pursued by Chinese interests in Africa, increase the chance of viral spillover occurring because they increase opportunities for human contact with wildlife-hosting diseases or disease variants that pose a risk to public health. These
disturbances can also increase the density of wildlife, more likely to be considered a high risk for disease transmission and spillover, such as bats, by altering the habitat to one more favorable to these species.

For example, recent outbreaks of the Ebola virus, which is carried by bats in Central and West Africa, have shown a strong correlation with deforestation events. For this reason, the maintenance of intact, healthy ecosystems is considered a first line of defense against future pandemics. By keeping remote areas remote, the likelihood of people coming into contact with wildlife carrying pathogens that present a risk to public health is reduced, and the stated objective of the current U.S. National Security Strategy to contain bio-threats at their source is advanced.

A proven way to maintain intact, healthy ecosystems is with incentives provided by the legal trade in wildlife and wildlife products. Economic and livelihood benefits provided by wildlife trade can encourage people to avoid the kinds of intrusions and land clearing that can impair the ecosystems the traded species rely on for their survival. A prominent example of this is the international trade in hunting trophies from African countries. This trade involves the sale and transport of tens of thousands of hides and horns around the world annually, with revenues from their sale accruing to landowners, communities, and national conservation authorities. This trade has been credited with providing the economic incentive to conserve more than 344 million acres of remote areas, including those in countries considered to be hotspots of emerging wildlife-borne diseases.

Unlike black markets, regulated legal trade provides the opportunity to have checkpoints to ensure disease is not being spread. To ensure that African hunting trophies are not a pathway by which wildlife-borne diseases spillover into the human population, the United States requires that unfinished hides and feathers be processed by an establishment approved by USDA to ensure that any pathogens which may be present are destroyed.

This requirement is one reason why there is no documented case of African hunting trophies contributing to the spread of wildlife-borne diseases. It also demonstrates that we can put into place policies and programs that limit the likelihood of future pandemics that “save lives, protect livelihoods, and safeguard nature,” as the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services has recommended.

USDA-approved facilities handling hunting trophies are potentially important nodes in the information network contributing to disease surveillance. With the right tools and relationships, these facilities can document the presence and trends of pathogens that may be present in specific species or from specific areas. This information can then be used to alert wildlife and public health officials to potential problem areas and emerging threats.

Working with African nations to fully engage these facilities as partners in disease surveillance programs should be a priority. And these partnerships should then be looked to as a potential model for how to marry legal, sustainable wildlife trade with disease surveillance.
The threat of pandemics stemming from wildlife-borne diseases is ever present. Conserving intact, healthy ecosystems at home and abroad is our first line of defense against this threat. The example of African hunting trophies demonstrates that legal trade in wildlife can enable ecosystem conservation and can be managed to ensure its safety. The regulatory structure of this trade also provides opportunities for expanded disease surveillance partnerships that could serve as a model for other forms of trade in wildlife and wildlife products. These opportunities should be explored further to reduce the likelihood of future pandemics. Thank you.

[The prepared statement of Ms. Semcer follows:]

PREPARED STATEMENT OF CATHERINE E. SEMCER, RESEARCH FELLOW, PROPERTY AND ENVIRONMENT RESEARCH CENTER

Main Points

- The spillover of wildlife-borne diseases and related potential for pandemic is a national security threat to the United States.
- The conservation of intact, healthy ecosystems is the first line of defense against the spillover of zoonotic diseases.
- Regulated and legal trade in wildlife and wildlife products is a proven, incentive-driven, means to encourage the conservation of intact, healthy ecosystems.
- Regulated, legal, wildlife trade allows for the institution of safeguards and monitoring that can reduce the risk of wildlife-borne diseases spilling over.
- Wildlife-borne disease surveillance is important to ensuring confidence in the safety and sustainability of regulated trade in wildlife and wildlife products, and ensuring trade’s continued ability to contribute to ecosystem conservation.
- Surveillance programs should be seen as a compliment to ecosystem conservation efforts, not a substitute, and be carried out in ways that do not unnecessarily discourage or impair the regulated and legal trade in wildlife and wildlife products that encourages ecosystem conservation.

Introduction

Good morning Mr. Chairman, Mr. Ranking Member, and members of the committee. Thank you for the opportunity to testify today. My name is Catherine Semcer and I am a research fellow with the Property and Environment Research Center based in Bozeman, Montana and the African Wildlife Economy Institute at Stellenbosch University in South Africa. I am also a member of the Sustainable Use and Livelihoods Specialist Group of the International Union for Conservation of Nature.

My testimony today will discuss the value of legal, regulated, trade in wildlife and wildlife products and how they enable emerging markets to conserve intact healthy ecosystems, thereby increasing the likelihood that biothreats remain close to their points of origin, and how this trade does and can enable the surveillance of wildlife-borne diseases.

Discussion

In 2022, the Annual Threat Assessment by the U.S. Director of National Intelligence identified pandemic disease as one of the preeminent threats to the security of the United States. The same assessment also identified the degradation of ecosystems as a contributing factor to this threat, as well as threat in-and-of itself.¹

This threat is embodied in the ongoing Covid-19 pandemic, which has claimed 988,000 American lives, made 80 million sick, and which the Congressional Budget Office projects will cost our economy upwards of $7.9 trillion over the next decade.3 While the exact origins of the pandemic are still unknown, a majority of U.S. intelligence agencies have expressed confidence that those origins are likely natural,4 an assessment supported by published, peer-reviewed literature strongly suggesting a genesis in wildlife.5

The global tragedy we are witnessing indicates how permeable the line is between our civilization and those parts of the world we deem wild. It also draws into clear focus the inseparability of ecological sustainability and national security. Wildlife-borne pathogens capable of incapacitating millions and shutting down the global economy have shown themselves to already be inside our door. Scientists warn that diseases capable of more far reaching destruction, a "Disease, X" may await us in the planet’s remaining wildlands, areas our civilization has increasing contact with via the pathways created by unsustainable development.6

Disturbances to wild landscapes such as road building and land clearing can increase the likelihood of viral spillover occurring because they increase opportunities for human contact with wildlife hosting diseases or disease variants that are novel or otherwise pose a risk to public health.7 These disturbances also have the potential to increase the density of wildlife more likely to be considered a high risk for disease transmission and spillover, such as bats, but altering the habitat to one more favorable to these species,8 by reducing the total amount of habitat available and concentrating wildlife population in smaller areas. For example, recent outbreaks of Ebola Virus, which is carried by bats, in Central and West Africa have shown a strong correlation with deforestation events.9

For this reason, the maintenance of intact, healthy, ecosystems is considered a first line of defense against future pandemics.10 By keeping remote areas remote, the likelihood of people coming into contact with wildlife carrying new diseases, new disease variants, or pathogens that present a risk to public health is reduced and the stated objective of the current US National Security Strategy, which precedes the pandemic, to “contain biothreats at their source” is advanced.11 A proven way to maintain intact, healthy ecosystems is with incentives provided by the sustainable use and legal trade in wildlife and wildlife products. Economic and livelihood benefits provided by wildlife trade can encourage individuals, communities, and nations to avoid the kinds of intrusions and land clearing that can impair the ecosystems the traded species rely on for their survival.

A prominent example of this is the international trade in hunting trophies from African countries. This trade involves the sale and transport of tens-of-thousands of hides, horns, tusks, hooves, and bones around the world annually, with revenues from their sale accruing to private landowners, rural communities, and national conservation authorities. This form of wildlife trade has been credited with providing

---

the economic incentive to conserve more than 344 million acres of remote areas, including those in countries considered to be hotspots of emerging wildlife-borne diseases (Fig 1).

Regulated, legal trade also provides the opportunity to have checkpoints to ensure disease is not being spread, [unlike unregulated black markets that emerge in the absence of legal trade opportunities]. To ensure that African hunting trophies are not a pathway by which wildlife-borne diseases spillover into the human population the United States requires that unfinished hides and feathers be processed by an establishment, in the country of origin, that is approved by the USDA Animal Plant Health Inspection Service, to ensure that any pathogens which may be present are destroyed before entering the US. This requirement is one reason why there are no documented cases of African hunting trophies contributing to the spread of wildlife-borne diseases, which might not be the case were the trade to be outlawed and driven underground. It also demonstrates that we can put into place policies and programs to limit the likelihood of future pandemics that "save lives, protect livelihoods, and safeguard nature" as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has recommended.

FIGURE 1

Global Hotspots and Correlates of Emerging Zoonotic Diseases

Overseas USDA-APHIS approved facilities that handle hunting trophies are potentially important nodes in the information network contributing to surveillance of wildlife-borne diseases. With the right tools and relationships, these facilities can document the presence and trends of pathogens that may be present in specific species or from specific areas prior to those pathogens being destroyed. This information can then be used to alert wildlife and public health officials to potential problem areas and emerging threats. Working with African nations to fully engage these facilities as partners in disease surveillance programs should be given increased priority by the United States. These partnerships should then be looked to as a potential model for how to marry legal, sustainable, wildlife trade with disease surveillance.

The threat of pandemics stemming from wildlife-borne diseases is ever present. Conserving intact, healthy ecosystems at home and abroad is our first line of defense against this threat. The example of African hunting trophies demonstrates that legal trade in wildlife can enable ecosystem conservation at large scales and this trade can be managed and regulated to ensure it is not a pathway for wildlife-borne diseases to enter the human population. The regulatory structure of this trade also provides opportunities for expanded disease surveillance partnerships that could serve as a model for other forms of trade in wildlife and wildlife products.

could serve as a model for other forms of trade in wildlife and wildlife products. These opportunities should be explored further to reduce the likelihood of future pandemics.

Thank you.

Ms. PORTER. Thank you very much.
The Chair now recognizes Dr. Julie Thorstenson to testify.

STATEMENT OF JULIE THORSTENSON, EXECUTIVE DIRECTOR, NATIVE AMERICAN FISH AND WILDLIFE SOCIETY, NORTHGLENN, COLORADO

Dr. THORSTENSON. [Speaking Lakota language] Good morning. My name is Julie Thorstenson. My Lakota name is [Speaking Lakota language]. I am Lakota and a citizen of the Cheyenne River Sioux Nation in North Central South Dakota. I am glad to be here as Executive Director of the Native American Fish and Wildlife Society, a 501(c)(3) non-profit with a mission to assist Native American and Alaska Native tribes with the preservation, conservation, and enhancement of their fish and wildlife resources. Thank you for the opportunity to speak today on the importance of including tribes in the prevention of pandemics through U.S. wildlife-borne disease surveillance.

I personally have a unique perspective on this topic, having begun my career as a wildlife biologist for my tribe and also having served as their Health Department CEO. Unfortunately, many times, I found myself in a state of reaction in both jobs due to severe underfunding and lack of capacity for tribes.

Today, I am going to focus on the threats to tribes and the importance of including them in every stage, from prevention and planning, to implementation and monitoring.

The COVID-19 pandemic had devastating impacts to Indian Country, with the CDC and Indian Health Service reporting higher levels of infections, hospitalizations, and deaths as a result of COVID-19 among American Indian and Alaska Native persons compared to non-Hispanic White persons. Nearly 9,000 deaths of American Indian and Alaska Native individuals were attributed to the novel coronavirus in the United States at the end of December 2021. While the number of deaths is overwhelming, what cannot be truly quantified is the amount of knowledge we have lost: the language speakers, the cultural experts, and unknown amounts of traditional ecological knowledge they held.

Tribes are dedicated to the health of their people, lands, fish and wildlife relatives, while preserving their language and culture, but face many challenges. At the Native American Fish and Wildlife Society, several zoonotic diseases are on our radar as we work to provide technical assistance and overall awareness to the 574 federally recognized tribes in the United States.

The recent reports of SARS-CoV-2 in white tailed deer are especially alarming, as many tribal citizens maintain a subsistence lifestyle and are at a higher risk through increased interaction with wildlife.
This amplifies the concerns chronic wasting disease already presents for tribal citizens. For example, there are tribal citizens that use the brain of deer and other big game for hide tanning, presenting a risk of exposure to the prions found primarily in the central nervous system of an infected animal.

Tribal fish and wildlife professionals must balance the need to educate on risk and safety precautions without impeding important cultural practices.

The highly pathogenic avian influenza is currently spreading across the country. Tribes must consider protecting the wildlife, the backyard poultry flocks necessary for food sovereignty and security, while decreasing exposure risk for hunters. Avian influenza also poses an economic hardship to tribes, with lost revenue from hunting licenses due to concerns with exposing hunters to known diseases and other tribal economic losses from lodging and food purchases.

Avian influenza is impacting eagle populations, as well. In some instances, eagle carcasses are not being collected or are being incinerated due to the threat of possible exposure to avian influenza. These eagle carcasses are lost important resources for tribes that need them for ceremonies and other cultural practices, a resource that is already extremely limited with the National Eagle Repository reporting long wait times, up to 10 years for a whole immature golden eagle, for tribal citizens.

One of our most common requests for technical assistance at NAFWS is to help tribes identify funding sources. The inequity in funding for tribal fish and wildlife programs is perhaps one of the most obvious but least known issues in conservation work. We often see one person responsible for multiple complex issues in tribal fish and wildlife programs. We cannot expect one person to be an expert in everything that threatens and impacts our fish and wildlife relatives.

Wildlife do not respect our political boundaries. Tribes most actively engage in every level of surveillance without compromising tribal sovereignty. To actively participate in surveillance, tribes need funding, and not only grant funding. Grants are incapable of providing a rapid response necessary for disease management. You cannot quickly respond with grant-dependent funding nor fund the long-term monitoring necessary. Many tribes also lack the capacity to apply for grant funding and the reporting and compliance that goes with it. Adequate funding for tribes will help build capacity through staffing, training, sampling, and testing, while ensuring tribes maintain data sovereignty.

Without tribes involved, there can be pockets of unknowns or outbreaks in the 56.2 million acres of tribal lands. The very complicated jurisdiction also must be navigated. For example, if zoonotic disease originates within a tribal reservation, what happens? Who becomes the lead? Tribes may be hesitant to report to a state veterinarian because of threats to tribal sovereignty and negative public perception of disease origination.

Adequate funding will allow tribes to develop plans, instead of reacting to situations as they arise. It will allow for these plans to be built in cooperation with Federal, state, and local agencies.
In closing, tribes must be included in preventing pandemics through wildlife-borne disease surveillance. This requires dedicated, long-term programmatic funding for tribes to build capacity and the quick response necessary for disease management. [Speaking Native language.] Thank you.

[The prepared statement of Dr. Thorstenson follows:]

PREPARED STATEMENT OF DR. JULIE THORSTENSON, PHD

Good Morning. My name is Julie Thorstenson. I am Lakota and a citizen of the Cheyenne River Sioux Nation in Northcentral South Dakota. I am glad to be here. I am the Executive Director of the Native American Fish and Wildlife Society, a 501c3 nonprofit with the mission to assist Native American and Alaska Native Tribes with the preservation, conservation and enhancement of their fish and wildlife resources.

Thank you for the opportunity to speak today on the importance of including Tribes in prevention of pandemics through US Wildlife-borne Disease Surveillance. I personally have a unique perspective on this topic having begun my career as Wildlife Biologist for my Tribe and also having served as their Health Department CEO. Unfortunately, many times, I found myself in a state of reaction in both jobs due to severe underfunding and lack of capacity for Tribes.

I’m sure my fellow panelists will speak to the science of wildlife-borne disease and the impacts it has on wildlife. I’m going to focus on the threats to Tribes and the importance of including them in every stage, from prevention and planning to implementation and monitoring.

The Covid-19 Pandemic had devastating impacts to Indian Country. A recent study published by JAMA Network Open (2022) found, "Indigenous populations are believed to be one of the worst affected in the nation. As of November 22, 2021, American Indian and Alaska Native persons were 1.6 times more likely to have SARS-CoV-2 infection, 3.3 times more likely to be hospitalized, and 2.2 times more likely to die as a result of COVID-19 than non-Hispanic White persons. As of December 15, 2021, a reported 296,967 infections and 8,983 deaths of American Indian and Alaska Native individuals were attributed to the novel coronavirus in the US." While the number of deaths is overwhelming, what cannot truly be quantified is the amount of knowledge we have lost, the language speakers and culture experts and unknown amounts of traditional ecological knowledge. On my home on the Cheyenne River Sioux Reservation, we lost 57 people to Covid-19, many were our cultural leaders and fluent Lakota language speakers. Tribes are dedicated to the health of their people, lands, and fish and wildlife relatives, while preserving language and culture but face many unseen challenges.

At the Native American Fish and Wildlife Society several zoonotic diseases are on our radar as we try to provide technical assistance and overall awareness to the 574 federally recognized Tribes in the US. The recent reports of SARS-CoV-2 in white-tailed deer are especially alarming as many Tribal citizens maintain a subsistence lifestyle and are at higher risks through increased interaction with wildlife. This amplifies the concerns Chronic Wasting Disease already presents for tribal citizens. For example, there are Tribal citizens that use the brain of deer and other big game for hide tanning, presenting a risk of exposure to the prions found primarily in the central nervous system of an infected animal. Tribal Fish and Wildlife professionals must balance the need to educate on risks and safety precautions without impeding important cultural practices.

Highly Pathogenic Avian Influenza (HPAI) is currently spreading across the country. Tribes must consider protecting the wildlife, the backyard poultry flocks necessary for food sovereignty/security and decreasing exposure risks for hunters. Not being able to sell hunting licenses due to concerns with exposing hunters to known diseases has an adverse impact on the limited tribal revenue and can cause other tribal economic losses from lodging and food purchases at tribal establishments. We are seeing HPAI deaths in eagle populations as well. In some instances, eagle carcasses are not being collected or are being incinerated due to the threat of possible exposure to HPAI. These eagle carcasses are lost important resources for Tribes that need them for ceremonies and other cultural practices. A resource that

---

Black-footed Ferrets (*Mustela nigripes*) are the most endangered mammal in North America with around 350–400 animals in the wild population. Tribes have been key to Black-footed ferret recovery efforts; serving as some of the most successful reintroduction sites over the years. That is until sylvatic plague decimated thousands of acres of prairie dog towns that serve as the critical habitat for black-footed ferrets. Blackfooted ferret recovery relies on a captive breeding program. As SARS-CoV-2 virus spread there were known cases in mustelids, including farm-raised mink and domestic ferrets (USGS, 2021)\(^2\) adding yet another risk for black-footed ferret recovery. Tribes often take on the role of endangered species recovery without any funding. The increasing number of zoonotic disease threats to black-footed ferret recovery adds additional financial and personnel strains to Tribal programs.

One of our most common requests for technical assistance at NAFWS is to help Tribes identify funding sources. The inequity in funding for Tribal fish and wildlife programs is perhaps one of the most obvious but least known issues in conservation work. We often see one person responsible for multiple complex issues in Tribal fish and wildlife programs. We cannot expect one person to be an expert in everything that threatens and impacts our fish and wildlife relatives.

Wildlife do not respect our political boundaries. Tribes must be actively engaged in every level of surveillance without compromising Tribal sovereignty. To actively participate in surveillance, Tribes need FUNDING and not grant funding. Grants are incapable of providing a rapid response necessary for disease management, you cannot quickly respond with grant dependent funding nor fund the long-term monitoring necessary from sustained funding. Many Tribes also lack the capacity to apply for grant funding and the reporting and compliance that goes with it.

Adequate funding for Tribes will help build capacity through staffing, training, sampling and testing while ensuring Tribes maintain data sovereignty. Without Tribes involved, there can be pockets of unknowns or outbreaks in the 56.2 Million acres of Tribal lands. The very complicated jurisdiction also must be navigated. For example, if a zoonotic disease originates within a Tribal Reservation, what happens? Who becomes the lead? Tribes may be hesitant to report to a state veterinarian because of threats to Tribal Sovereignty and negative public perception of the disease origination. Adequate funding will allow Tribes to develop plans instead of reacting to situations as they arise. It will allow for these plans to be built in cooperation with Federal, State and local agencies.

In closing, Tribes must be included in preventing pandemics through wildlife-borne disease surveillance. This requires dedicated, long-term, programmatic funding for Tribes to build capacity and the quick response necessary for disease management.

QUESTIONS SUBMITTED FOR THE RECORD TO DR. JULIE THORSTENSON, PhD

Questions Submitted by Representative Porter

**Question 1.** What is the Native American Fish and Wildlife Society able to do with the funding it is getting through the American Rescue Plan and how will it help with wildlife-borne disease management?

**Answer.** Tribes have recognized the interconnectedness between people, animals, plants and their shared environments for time immemorial, the very definition of the One Health approach, yet the Tribal voice is often missing. Tribal fish and wildlife professionals’ participation in the One Health effort is critical. However, Tribes often lack the capacity or accessibility to resources to participate or provide input. Tribes have identified the need for training and access to wildlife veterinarians or zoonotic disease specialists as barriers and threats to human health and natural resources.

The NAFWS has entered a PL93-638 self-determination contract with the USFWS, one of the first self-determination contracts with the USFWS. Included in this contract is an objective to provide technical assistance to NAFWS member Tribes and individual members on zoonotic diseases through a dedicated Tribal Wildlife Disease Coordinator. The funds for this objective are from the American Wildlife Health Center. 2021. Development of SARS-CoV-2 vaccine to support black-footed ferret conservation. https://www.usgs.gov/centers/nwhc/science/development-sars-cov-2-vaccine-support-black-footed-ferret-conservation

Rescue Plan section 6003. NAFWS contracted with Native Healing, LLC and Dr. Tolani Francisco, DVM and citizen of Pueblo of Laguna. Dr. Francisco will serve as the lead consultant providing the following:

- A working phone number for Tribes to contact with questions related to zoonotic diseases and overall wildlife disease.
- Four (4) informational articles to be included in the NAFWS newsletter “From the Eagles’ Nest”
- Review, comment and suggest content for the NAFWS 2022 National Initiative “Wildlife Health” webpage
- Present at the National NAFWS Conference and Regional conference/events.

Tribes have expressed a need for a person to contact for wildlife health and disease questions. Dr. Francisco is a respected professional in Indian Country and will help serve a valuable needed service to Tribes. This is also comparative to a service the USFWS has been funding for years through AFWA.

Question 2. Is there any additional information about your views on domestic U.S. surveillance of wildlife-borne diseases for future pandemic prevention that you would like to share for the record?

Answer. Wildlife and wildlife disease do NOT respect political boundaries, therefore all entities must be part of surveillance to protect the health and welfare of all. There are 574 federally recognized Tribes in the U.S. as of 2022 and each are unique sovereign nations. Tribes also hold a unique status as sovereign nations within the United States with a trust responsibility from the Federal Government. Time is needed to develop relationships and understand the unique needs of each Tribe. Tribes will need consistent, sustainable funding to build capacity to be able to participate in the conversations around wildlife-borne diseases.

Questions Submitted by Representative Cohen

Question 1. You testified about impacts that zoonotic diseases are having on tribal cultures, from Covid to chronic wasting disease to highly pathogenic avian influenza. How would having Tribes better represented in the planning and implementation of wildlife disease monitoring and response help address some of these cultural impacts?

Answer. Tribes have a different way of knowing and co-existing with their environment. They bring important perspectives to wildlife and ecosystem management that extend to wildlife disease response planning, including the impacts to culture, medicinal plants, and spiritual wellbeing. In a conversation with a State Agency on chronic wasting disease, our team demonstrated the need for Tribally focused education materials due to increased exposure risk for Tribal citizens who use the brain of big game to tan hides. The State’s response was “tell them to stop.” At NAFWS, we provide resources and technical assistance that supports self-determination and allows for incorporation of Tribal priorities, cultures, and uniqueness. Tribes are best suited to provide the direction to protect and preserve their lands and culture. Asking Tribes to stop practicing their lifeways is neither effective management nor meaningful engagement. Tribes must be involved in the conversations to raise awareness of these risks and help mitigate the ways that supports cultural preservation. In the case of chronic wasting disease, this could mean the utilization of protective equipment rather than the loss of a cultural practice.

The State interests, scientific, academic, economical, and health issues are all represented well within the planning conversations, the Tribal voice is missing. Tribes own or manage nearly 140 million acres of lands in the United States, without Tribes, the plan is not complete.

Question 2. Why do you think Tribes are not better represented in the planning of wildlife borne disease monitoring and response?

Answer. The short answer is a lack of funding and capacity. Tribes do not have consistent, stable base funding for fish and wildlife management. What we see is one person responsible for multitudes of duties. Tribes piecemeal their programs together, often relying on grant funding. This further limits capacity with Tribal fish and wildlife staff spending a large about of their time on planning, writing, implementing and monitoring grants, just to keep staff employed. There is also a lack of understanding of the importance of engaging Tribes and the appropriate avenues to do. Official nation to nation tribal consultation is an important and needed component, however, conversations between managers is also needed to build relationships. Relationship building must be more than a checked box.
Even if Tribes are not living on the lands, they still may have a connection to them as traditional homelands and cultural use areas. Tribes MUST be part of all parts of wildlife borne disease programming. However, they may need assistance to being involved.

Ms. PORTER. I thank the panel for its testimony. Reminding Members that Committee Rule 3(d) imposes a 5-minute limit on questions, the Chair will now recognize Members for any questions that they wish to ask the witnesses.

We are going to begin with recognizing the gentleman from California, Mr. Huffman, for 5 minutes.

Mr. HUFFMAN. Thank you, Madam Chair. I want to continue my line of questioning on mink farming, and I realize that our window of jurisdiction is about wildlife and the habitat that sustains wildlife, and many of the witnesses are appropriately focused on that, but when our oversight authority in that space identifies a problem with much broader implications, I think it is OK to talk about that, too.

So, I guess I would bring my question back to Mr. Stallknecht. Should we be concerned that USGS is finding elevated levels of COVID in wildlife surrounding mink farms?

And while we think about the wildlife and environmental implications of that, should we also be concerned about the broader implications of millions of these animals concentrated into these facilities, where they are known to contract COVID pretty easily, to spread it, and to have mutations that can go back and forth between humans and mink?

Dr. STALLKNECHT. As far as spillover from mink farms to the surrounding wildlife, I think there is an area of concern. I don't think we really know what the implications of that are right now, to be quite honest about it, but it is certainly something that should be monitored. We will leave it at that.

Mr. HUFFMAN. OK.

Dr. STALLKNECHT. As far as mink farms go, any time you concentrate a large number of susceptible animals together under artificial conditions, especially wildlife, you present a potential problem. It is far beyond me.

Mr. HUFFMAN. And I appreciate the fact that we are doing the surveillance work in the surrounding area. But I guess what I am wondering is, if someone can tell me, are we surveilling the mink farms themselves?

Because it seems like that is a far greater concern, in terms of this pandemic. The worst thing that could possibly happen as we try to emerge from this pandemic, of course, is a mutation that throws a monkey wrench at us. So, if we are not doing that same kind of surveillance in the mink farms themselves, surveillance being maybe the first step, maybe more—I mean, Denmark euthanized, I think, 17 million of these animals because of a massive COVID outbreak in one of their mink farming operations. So, do you know of any surveillance within the industry itself in these farms?

Dr. STALLKNECHT. I guess that is directed to me. I do not. This is an area that we do not work in, so—
Mr. Huffman. I am sorry to put you on the spot there, but let me just ask, if any of the other witnesses want to add to what you have said, or speak to the concerns that I am raising, because I find it, frankly, quite alarming.

[Pause.]

Mr. Huffman. All right. Well, crickets, then, in terms of—and I may need to just take up these concerns with some other folks that, hopefully, are on the case and out there in these facilities doing surveillance and considering interventions that may be appropriate. But I appreciate your testimony, Mr. Stallknecht, and the other witnesses.

Madam Chair, I will yield back.

Ms. Porter. Thank you very much. The Chair now recognizes Mr. Hice, the gentleman from Georgia.

Dr. Hice. Thank you so much, Madam Chair. In each of our witnesses, we appreciate you being here a great deal.

Dr. Stallknecht, I would like to begin with you. And I will begin by saying, “Go Dawgs—Welcome, UGA.” Glad you are here with us today.

In your testimony, you stated that there have been five pandemics and two near misses in your lifetime. And I would like, if you could, to expound upon which country each of these viruses originated in. Could you do that?

Dr. Stallknecht. I will give you more of a region than a country.

As far as the two influenza pandemics, 1957—H2N2 and the H3N2, our best guess is these originated from Asia.

Pandemic H1N1 was actually a real surprise, and that actually originated in the Western Hemisphere. The exact location, we don’t know. But it really resulted from some re-combination, re-assortment of events with swine influenza viruses.

HIV, Africa; and SARS coronavirus from Asia. Ebola, the new near misses—Ebola, Africa; and then SARS, the original SARS, virus from Asia.

Dr. Hice. OK, thank you very much. So, we have multiple different places around the world, a couple from Africa, three from China. We have Hong Kong, we have Mexico.

Ms. Semcer, let me come to you with this. Can you describe—and I will just use this one as a specific—can you describe how China’s Belt and Road Initiative has negatively impacted Africa’s defense against these viruses?

Ms. Semcer. Thank you for that question. The Belt and Road Initiative is primarily an infrastructure initiative. But more than that, it is also a cultural exchange initiative.

And one thing that is occurring within the context of Belt and Road is the promotion and expansion of traditional Chinese medicine along the Belt and Road. China is actively promoting traditional Chinese medicine as an alternative to Western medicine. And, as part of this, we are starting to see more promotion of what we deem to be high-risk species as cures, including for things like COVID.

For example, the Chinese Communist Party was promoting pangolin scales for some time as a potential cure for COVID. We know that this is quack medicine, of course. We also know that it
increases the risk of wildlife-borne diseases being transferred into the human population, since pangolins are a species of particular high risk for spillover.

Dr. HICE. So, has it negatively impacted Africa’s defense, would you say yes or no with that.

Ms. SEMCER. I would say that there is an increased demand for high-risk wildlife as a result of this promotion of TCM, yes.

Dr. HICE. OK. So, I guess the big question here that I have in my mind is, if we spend more money in the United States, will that lead to more accountability for countries like China?

Ms. SEMCER. I am not certain it is an either/or situation. I think that we need to shore up our defenses in the homeland for sure, but we also do need to hold bad actors accountable internationally.

Wildlife-borne pandemics are a potential existential threat to humanity. We have already seen what COVID-19 has done. We have nearly a million dead Americans, 80 million sick, and that is just in this country. We have a global economy that has been severely impacted by the pandemic. We can’t do this alone. This has to be an international effort.

Dr. HICE. Yes, and that is the problem. That is the problem. It is an issue that involves the international community. So, just simply the United States spending more money does not mean this fixes the issue in China or in other countries. Is that correct?

Ms. SEMCER. It doesn’t fix the issue in those countries, but it will make it easier for us to defend ourselves should they fall and not do what is expected of them.

Dr. HICE. Yes, and I get that. But we have to do both. We have to defend our country, and our people, and so forth. But at the same time, others have to be held accountable. And simply us spending more money does not produce accountability elsewhere. And that issue, I believe, must be on the table.

Ms. SEMCER. I agree.

Dr. HICE. Thank you very much. I yield back.

Ms. PORTER. Thank you. The Chair will now recognize herself for 5 minutes.

Dr. Thorstenson, what would it mean for the tribes that you work with to have dedicated, consistent funding?

Dr. THORSTENSON. Well, I will tell you that, for the most part, tribes operate in a piecemeal-type project for tribal fish and wildlife programs. There is no base funding for tribal fish and wildlife programs.

So, having dedicated funding that they can rely on, that will help to build sustainable, long-term programing, instead of having someone that is focused mostly on reporting and securing their job through grant funding. I think it would definitely help to bring tribes to a different level and be at the table that they have been left out of for so long.

Ms. PORTER. Do you see it as potentially helping to improve coordination between the work—sustain the work that the tribes are trying to do, but then also bring that information and learning and connect it to the Federal researchers and state researchers working on this?
Dr. THORSTENSON. Yes, absolutely. I think it is not that tribes aren't doing the work. It is not that they don't want to be involved. It is that they simply don't have the capacity to be there.

And they get a lot of asks to be in attendance, or to be a part of something. But like I mentioned, we have several departments that are one person, and they are dealing with everything from food sovereignty to fish and wildlife management to diseases, cultural practices. All of this is on their plate. So, every ask is just an additional task for one person for our understaffed departments.

Ms. PORTER. Thank you for that.

Dr. Carlson, I want to turn to you. I want to understand what we know about the transmission of coronavirus from animals to people.

I am aware of four probable cases of spillover into people from mink in Michigan that were recently disclosed, and all four have the same variant as the minks on the mink farm. Two of the cases were workers on the farm. I think we can understand how they might have gotten it. But the other two cases were a married couple with no connection to the farm at all.

In your opinion, is it possible that the variant spread from the mink on the farm ultimately to the couple through community transmission?

Dr. CARLSON. Thank you for the question. Yes, I think, the strength of genomic epidemiology is that we are able to make these connections, right?

When we see a connection like that, there must be something we haven't caught. So, we can piece together that there may be a connection, most likely, person to person, that has not been observed.

Now, I will say my first training as an epidemiologist is not to weigh in on outbreaks I have not been pulled into. But, yes, I think we know this is a very transmissible virus. We know that it was very transmissible after it went from animals to humans the first time. It is likely that it continues to be transmissible, human to human, after spillback and reintroduction into human populations. I don't think it would be any surprise to see variants that originate in mink, or deer, or any other species have onward transmission.

Ms. PORTER. And I think one of the concerns is, without the kind of work that you are doing, without digging into that research, we can't accurately count how many wildlife-related cases there are, because we sometimes undercount, and those go into the community transmission pile instead of the wildlife pile. And it can really, I think, suggest that this is less of a problem and less of a source of disease than it actually is.

I wanted to ask you—I read with great interest the article about your work in The New York Times, and I believe also maybe in Nature. Can you talk a little bit and share with us? How can artificial intelligence be used to make predictions about wildlife-borne diseases?

How can we leverage that to get the most benefit out of the investments that we do make in monitoring?

Dr. CARLSON. Absolutely. Artificial intelligence is a big, scary phrase, but it is really just statistics running on a nice computer. It is a way for us to make sense of big, complicated data, right?
So, we are able to do things like look at the genomic sequences of viruses that infect humans and learn general rules about what a virus that could affect us looks like. Training the computer to do that lets us work with large sources of data that are hard for us to kind of get in there and handle ourselves, like genomes, where there are maybe hundreds of thousands or millions of data points contained in one record.

So, artificial intelligence has a huge possibility to inform public health, to inform One Health surveillance, but it can only do that if we have sufficient data to power it.

Ms. PORTER. I am so glad you mentioned that, because my last question for you is: Is there any reason, legitimate, that I should accept as to why California, for example, doesn’t share its data?

Dr. CARLSON. There are challenges that arise around, I think, not just data sovereignty, but accountability for how we use data.

I can’t speak for California, but I know that often, when we see data withheld by agencies or made difficult to obtain it, it comes from the fact that because research is so underfunded, because surveillance is so underfunded, there are often concerns that if data are not protected, they might not be acknowledged at all from where they came from. So, this is, I think, largely symptomatic of how under-resourced the institutions that collect the data are.

Now, whether or not that is legitimate is not mine to speak for. I do not work for the government. It is not mine to decide what happens with government data. But I will say that, for researchers, the best thing that we can do is have funded systems that are just flowing with data and there are no concerns about scarcity.

Ms. PORTER. I really appreciate that. I mean, I think, luckily for you, I am a government leader. And I do think that when we, as taxpayers, invest in data, that it ought to be shared as much as possible.

And I was a professor before I came to Congress. I have seen this scarcity mindset that leads to a lack of sharing. But as you point out in your testimony, the lack of data sharing can create noticeable holes in risk mapping and in risk prediction.

So, as we think about how to strengthen our disease surveillance system and how to make these investments, I think one of the commitments has to be that with those stable streams of funding comes expectations of robust data-sharing and robust cooperation across agencies, including the works that tribes are doing.

Mr. MOORE. Thank you, Madam Chair, and I share your frustration or push to be able to share data. We saw, completely out of this context, the 911 Commission. The key finding from the 911 Commission was that intelligence agencies weren’t sharing data for reasons of bravado or just sheer silos. Other than that, it was pointless. And we have seen better collaboration going forward. So, we know that our government can actually improve in this capacity. It has been a common thread through today’s conversation.

Ms. Semcer, I want to just thank you for helping to provide a more international perspective. And as Congress is about to embark on the conferencing of the two different China bills that existed from the House and the Senate—I get to be a part of that
conference process—I can’t underscore the importance of the impact that China will have on the entire world.

We don’t—we want to talk climate change all we want, but if we don’t get China under control, there is nothing that we can do about the effect that they have, the outsized effect that China has in a negative way across so many different factors.

Your focus today, particularly with spread and pandemic, is key to this conversation. So, thank you again for being here. Can you just jump into how illegal activities like wildlife trafficking create environments that increase the risk of disease spillover between species.

Ms. SEMCER. In the context of wildlife trafficking, what we often find is that trafficked wildlife is crammed together. You have suitcases full of birds or turtles. You have shipping containers full of any number of different species. And as the other witnesses have discussed, when wildlife is crammed together in close, close confinement, the risk of spillover from one species to another and mutation is increased.

This is a consequence of illegal trade because the fact that it is a black market means that no one is doing any type of disease monitoring for these species.

Mr. MOORE. Give us a sense for the increased risk with this spillover impact, the likelihood of future pandemics, specifically with this issue and how it will ultimately affect future pandemics.

Ms. SEMCER. Well, I can’t assign a number to it. I don’t have the data to be able to do that.

But unless we get a handle on illegal wildlife trafficking, we are likely going to see the risk of pandemic disease increase. Since the COVID-19 pandemic has broken out, there has been a lot of talk about increasing the global response to illicit wildlife trafficking, but we haven’t seen much deployed on the ground.

I am on the Advisory Board of the Game Rangers Association of Africa, which is the largest professional association of conservation and law enforcement officers on the continent. Frankly, a lot of our members are struggling for resources. These guys are the first line of defense in wildlife trafficking. These are the ones who are going to stop that pangolin, or stop that civet, from getting into that shipping container. They are the ones who are going to potentially keep the bio-threat close to the source of origin. But the resources are just not there. And the pandemic, frankly, has made it worse, because many of them were dependent on revenue from tourism, which, obviously, has declined in the wake of the global tourism shutdown.

Mr. MOORE. And continuing with that in Africa, outside of just the containers and the supply chain issues, how have Chinese investments, whether it be the Belt and Road Initiative, led to unsustainable natural resource extraction projects?

Ms. SEMCER. Well, when we talk about Chinese investments, that is not a monolithic area. McKinsey and Company says there are about 10,000 small- to medium-sized enterprises that are owned by Chinese nationals operating on the African continent. And many of these are perfectly legitimate businesses. However, unfortunately, a significant number of them are engaged in activities that are reliant on criminal activity or government corruption
to produce what it is they are seeking to produce. And this is particularly prevalent in the forestry sector, where we see Chinese companies engaging in illegal logging, exporting raw logs off of the African continent to China to be finished.

Of course, this deforestation, as I mentioned in my opening statement, contributes to the increased risk of viral spillover. Now, what happens to these raw logs once they reach China? Well, very often they are made into furniture that we then purchase.

So, there is a very troubling loop occurring here that unifies our two countries, and also puts us in a position to hold China accountable to make sure that its nationals are not engaging in this illegal activity, not enabling corruption on the African continent, and are enforcing their own laws to make sure that pandemic risk is not increased.

Mr. Moore. And it is easy to complain about this. I find myself doing it quite a bit. It is easy to point the finger at what China is doing, both in their own country and in their investment opportunities across the world.

I welcome your input and expertise in helping us drive toward solutions, and we will always be open to those ideas and collaborations. So, thank you.

I yield back.

Ms. Porter. Thank you very much. The Chair now recognizes the gentlelady from Iowa, Mrs. Axne, for 5 minutes.

Mrs. Axne. Thank you, Chairwoman Porter, for allowing me to waive on to this important Subcommittee hearing. I am glad to be here.

Dr. Stallknecht, my great state of Iowa is the nation’s leading egg producer and a major turkey producer, as well. So, the current outbreak of highly pathogenic avian flu is of great concern to us, of course. Thirteen million chickens and turkeys have had to be depopulated in Iowa as a result of this current avian flu outbreak. So, understanding how we can better predict and protect against these wildlife outbreaks is going to be incredibly important as we continue with the issues we face in Iowa.

I understand that about 50 million birds died as a result of the highly pathogenic avian flu outbreak in 2015, most of which were commercial poultry operations, and that the economic impact of that outbreak was in the neighborhood of about $4 billion. Does that sound correct to you?

Dr. Stallknecht. Yes, it does.

Mrs. Axne. Thank you. And the current avian flu outbreak in the United States has already inflicted some major damage. I hear about it far too often, quite honestly. About 31 million birds in the United States have been confirmed to be near active infection.

Is it true that the vast majority of them, most of which are in commercial poultry farms, will also have to be depopulated?

Dr. Stallknecht. Yes.

Mrs. Axne. OK, and for folks who might not know what that word means, that just means disposed of. That just means killed, correct?

Dr. Stallknecht. Correct.

Mrs. Axne. Thank you. Which way is that outbreak trending, and is it accelerating or is it slowing down?
Dr. STALLKNECHT. At present, it is probably accelerating. Whether it will continue to accelerate is unknown. And that is one of the kind of areas that we are working in.

The one thing we don’t know is if this virus will persist in the wild bird population. And hopefully it won’t, because, hopefully, if it doesn’t persist, we won’t have this threat year after year after year.

And that is sort of our approach to this. We really are not going to get this virus out of wild birds. There is nothing we can do. We can maybe manage a little differently to reduce the risk, but it is basically early warning, and basically informing the poultry industry that, look, in August and July there may be a peak prevalence, be prepared. And I know that is not what poultry producers want to hear, but that is probably the reality of the situation.

Mrs. AXNE. Well, thank you. I appreciate that forewarning here. And listen, it might not be what we want to hear, but we should always know what is coming up. And I appreciate what you are doing to stay on top of this.

But to be clear, I just want to make sure we address this. We found no evidence of spillover into people in the United States from this particular outbreak. Still, the National Academies have said that the outbreak of this type of virus could, in a worst case scenario, cause anywhere from 71 to up to 260 million deaths in people. And while I understand that our monitoring of the outbreak is better coordinated and better funded than many others, and I am so grateful for that, what can we be doing? Is there more that we could be doing to help reduce the damage from this bird flu outbreak?

And the other question I have is: What are we doing well in response to the bird flu?

Dr. STALLKNECHT. I think what we are doing well, what we did well this year, is probably the early detection from wild birds. And it was caught, and that was good. And it actually was quite fortunate, because the surveillance was greatly reduced this year and it was actually going on in only two flyways, and I was not included in any of those flyways. So, I think that is one thing we did well, but we need to beef it all up.

The one thing that we also, I think, really did well is we also did a really quick shift into the Mississippi Flyway when we found it on the Atlantic Flyway. And that was a lot of improvisation, actually, working without funding, and hoping that the funding would come.

This is really a tough one. And basically, as far as reducing—the poultry industry is really going to have to take care of themselves as far as biosecurity, as far as shoring things up to prevent transmission. Early warning helps them do that. And that is about all I can say.

Mrs. AXNE. OK. So, better early warning, a continuance of the early warning, but if I am hearing you correctly, the best we can do at this point is just be prepared as well as possible.

Dr. STALLKNECHT. And know what is going on out there in the wild.
Mrs. AXNE. OK. Well, it is why this hearing is so important, so that, hopefully, in the future we can figure out a way to have less of these risks that we have to mitigate.

Thank you so much for allowing me on the Committee, Chairwoman Porter.

Ms. PORTER. Thank you very much. And I believe that concludes our Member questioning.

With the cooperation of Ranking Member Moore, I would like to offer each witness the chance to make a minute or so of remarks, sharing with us anything else that you believe this panel would benefit from knowing. We will just go in the same order that we went for the questioning, as best as I can remember it. So, we will start with you, Dr. Carlson.

Dr. CARLSON. Sure. I think, just to respond to some of the things that have come up today, I think it is important to note that the landscape of risk is changing very rapidly for disease emergence.

We are used to a world where there are three big drivers upstream, right? There is wildlife trade, there is agriculture, and there is deforestation. Today, we have talked a lot about wildlife trade, particularly illegal wildlife trade. Now, this is a major risk to the United States. We are a major importer in particular of exotic pets. But a 2015 study by researchers at UC Davis showed that, out of more than 100 zoonotic viruses they looked at, I believe at least 90 percent could not be connected at all to wildlife trade or wildlife hunting. If we focus on only one solution, if we focus on only one country, we will not stop outbreaks.

And the future is a different place than the present. There is more climate change. There is more deforestation. We need to be able to move nimbly and pivot to that.

Ms. PORTER. Thank you.

Dr. STALLKNECHT?

Dr. STALLKNECHT. I would like to just make two really quick points.

A lot of the diseases that we are talking about today also have pretty severe wildlife impacts, and this is important for a natural resources committee to understand. This outbreak of highly pathogenic influenza is also really having impacts on bald eagle populations. In Georgia, we have seen close to a 40 percent reduction in productivity on our coastal nesting populations.

And the second thing I would really want to sort of address, there has been a lot of talk on interagency cooperation and how we work together. With influenza we are—SCWDS is also a part of the NIH Centers of Excellence for Influenza Research and Response. And everything that we get from the wild, from a wild bird, we are actually submitting to NIH researchers to do the assessments to really understand the potential for human disease. And this is just another important sort of side product that we get by just actually getting these isolates from the field.

And I also would like to just sort of build on what was said about tribal preparedness and the lack of people. The states are suffering from the same thing. There are many states in our cooperative that have one person dedicated to wildlife disease throughout the entire state. And we are talking about a lot of species here. Thank you.

Ms. PORTER. Thank you very much.
Ms. Semcer?

Ms. SEMCER. Thank you. I would echo some of what Dr. Carlson said. There is no one-size-fits-all approach to this. There is no magic bullet. And we do have to appreciate that this is a threat facing us as severe, if not more severe, than the terrorist attacks of September 11th that Ranking Member Moore mentioned.

To that end, we do need to work internationally. We need to work across borders. At the same time, we need to lead our international partners by example so that we can engage with this threat effectively and reduce its ability to harm us.

Ms. PORTER. Thank you.

Dr. Thorstenson?

Dr. THORSTENSON. Thank you. I think one thing is tribes have recognized the interconnectedness between people, animals, plants, and their shared environments from time immemorial, the very definition of One Health. However, tribal voices have been missing.

And tribes add a different perspective. They bring the cultural impacts that people might not regularly think about with zoonotic diseases.

Also, we were very happy to see the new funding through the American Recovery Plan for zoonotic diseases and see tribes included in that. However, grants—oftentimes we have to write to the grant priorities, and it undermines tribal sovereignty. It limits tribes to be able to write to their own and set their own priorities.

And, also, it pits tribes against each other where there is a small pot of money, where 574 federally recognized tribes have to compete. And it undermines, and it is hard to collaborate when you might have a neighboring tribe and you are after the same pieces of funding.

Also, having tribes at the table, they will bring up the unknown barriers that might be to funding, such as matches, new and complicated grant application platforms.

And I would just really, really urge you to consider self-determination, rather than grant processes, in the future for tribes. There are lots of authorities to the Indian Self-Determination and Education Assistance Act that already exist that can help tribes to receive funding that would be more sustainable, dedicated, and less burdensome to them. Thank you.

Ms. PORTER. Thank you very much for offering those concluding thoughts. That was very helpful.

Before and during this hearing, experts have warned us that surveillance of wildlife-borne diseases is inadequate in the United States, and that we may miss signs of outbreaks that could cause significant harm to human health, to wildlife, and to the economy.

You, as experts, have told us that if we want better tracking, we need to provide consistent funding that doesn’t pit stakeholders against each other. We need to invest in the infrastructure and the people who are already doing this important work. And we need to bring together people from different sectors with diverse expertise to talk to each other and coordinate their efforts.

I will be putting together a bill to make sure that our nation is prepared to address these potentially serious risks, and I invite Ranking Member Moore and his colleagues to cooperate and collaborate on this process.
I thank the witnesses for their valuable testimony and the Members for their questions.

The members of this Committee may have some additional questions for the witnesses, and we will ask you to respond to those in writing. Under Committee Rule 3(o), members of the Committee must submit witness questions within 3 business days following the hearing, and the hearing record will be held open for 10 business days for these responses.

With that, the Committee is now adjourned.

[Whereupon, at 11:55 a.m., the Subcommittee was adjourned.]

[ADDITIONAL MATERIALS SUBMITTED FOR THE RECORD]

Statement for the Record

Tony Wasley, President
Association of Fish & Wildlife Agencies
Washington, DC

The Association of Fish and Wildlife Agencies (“Association”) is the professional organization that represents the collective voice of the fish and wildlife agencies in all 50 states, the U.S. Virgin Islands, and District of Columbia (“state agencies”). These agencies exercise primary statutory authority for management of fish and wildlife as public trust resources within their borders. We thank the Subcommittee on Oversight and Investigations (“Subcommittee”) for its leadership to address the ongoing, ever increasing challenges related to wildlife disease surveillance. As more than 60% of human diseases and 75% of all emerging diseases have origins in wildlife, the capacity of state fish and wildlife agencies to monitor and address these threats in coordination with their federal partners is of foremost concern.

As the Subcommittee is well aware, the economic burden of suppressing wildlife-borne diseases, particularly those with zoonotic potential, can increase exponentially once they become established. With limited resources and capacity, current fish and wildlife disease surveillance and response efforts are typically driven by crises, often lacking consistent funding and logistical support. Therefore, an adequately funded wildlife disease surveillance network is needed to provide coordinated, timely, and effective responses designed to address these critical needs. Further, this network should leverage and enhance existing resources and expertise in an effort to build sustainable resilience and capacity.

The Association has long promoted the National Fish and Wildlife Health Initiative to establish and sustainably fund a coordinated network of federal, state, and university wildlife disease laboratories. We are committed to improving the coordination of measures that ensure fish and wildlife health, while recognizing and respecting the missions, jurisdictions, and abilities of state and federal fish and wildlife managers and their agencies. We support the following programs and initiatives designed to build capacities, detect and manage emerging and increasingly varied fish and wildlife disease challenges, and effectively mitigate and suppress the significant economic, social, and cultural impacts associated with fish and wildlife diseases:

1. Increase and sustain funding for existing federal and state fish and wildlife disease laboratories;
2. Encourage Congress to provide new and sustained federal funding to establish and/or enhance fish and wildlife disease surveillance capacities in those regions of the United States lacking such resources;

3. Encourage Congress to provide increased and sustained federal funding for state, federal and tribal fish and wildlife agencies to train and coordinate their operational workforces to deliver effective fish and wildlife health programs; and

4. Encourage Congress to provide increased and sustained federal funding for aligned university research and training programs to assure that their enormous capacities are harnessed in support of targeted fish and wildlife disease surveillance and management efforts.

Efforts to establish a national framework are increasingly vital in light of the COVID-19 pandemic and the emergence of potentially zoonotic diseases, including the continued spread of Chronic Wasting Disease ("CWD"). While no cases of CWD have been documented in humans, the Centers for Disease Control and Prevention ("CDC") warn of its zoonotic potential and the World Health Organization emphasizes the importance of keeping prion diseases from entering the human food chain. States have borne the brunt of the costs for surveillance and management actions designed to curb the spread of CWD by redirecting funds from other programs and are in dire need of increased resources and federal coordination. Congress already has the ability to take action by fully funding the CWD provisions authorized in the America’s Conservation Enhancement Act (P.L. 16-188, “ACE Act”) and increasing funding for CWD cooperative agreements administered by the U.S. Department of Agriculture’s (“USDA”) Animal Plant and Health Inspection Service (“APHIS”).

While the Fiscal Year 2023 appropriations process is underway, we encourage Federal partners to expeditiously establish the CWD Task Force directed by the ACE Act. Further, in accordance with the Association’s Best Management Practices for Prevention, Surveillance, and Management of Chronic Wasting Disease, we encourage a prohibition on the movement of live farmed cervids.

We applaud the United States Geological Survey (“USGS”) and the National Wildlife Health Center (“NWHC”) for their support of a collaborative One-Health framework with state agencies, including development of the Wildlife Health Information Sharing Partnership (“WHISPers”). While there are some ongoing concerns with data ownership, privacy, and sensitive data release related to Freedom of Information Act requests as well as capacity for data entry, the Association is encouraged by the commitment from USGS to continue collaborating with state, federal, tribal, academic and NGO partners as they continue to develop WHISPers.

To that end, the Association transmitted a letter to USGS with recommended improvements and elements that should be considered for the system to be successful, of which the recognition of state agencies’ statutory authority and unique roles and responsibilities is most critical.

The increasing emergence of zoonotic diseases, exemplified by the COVID-19 pandemic, demands increased attention to wildlife health and wildlife disease prevention, surveillance, and response. With the statutory authority and obligation to manage the public trust species within their borders, state agencies are the front line of defense to prevent, surveille, and combat wildlife-borne diseases. While wildlife can be negatively impacted by diseases, they can also serve as sentinels for environmental contaminants and infectious diseases affecting humans and domestic animals. Human and domestic animal health can impact wildlife and ecosystem health, and vice versa.

We again thank the Subcommittee for its attention to this increasingly vital issue, and we are glad to offer our assistance on these or any other matters relevant to the management of our nation’s fish and wildlife resources.
Statement for the Record
Preventing Pandemics at the Source
U.S. Wildlife and Health Alliance
May 11, 2022

Honorable Members of the House Natural Resources Subcommittee on Oversight and Investigations of the United States Congress:

United States leadership is crucial to ending the current COVID-19 pandemic and preventing future pandemics from occurring. Tragically, we will soon approach the horrific milestone of one million American lives lost to COVID-19.

We do not know where or when the next pandemic will start. We do know it is likely to emerge within a decade and to be the result of zoonotic spillover of a virus from wildlife to humans, like all other pandemics over the last century.

We have a good chance of stopping the next pandemic before it starts. To do so we must learn quickly from the latest science and translate this into policy to ensure various US Government agencies work together, and with other nations, to support key actions around the world.

As organizations with deep expertise on wildlife-human health linkages we also know that much can, fortunately, be done to prevent disease spillover before it occurs. This requires addressing problems with wildlife trade and markets, preventing deforestation and forest degradation, and improving livestock biosecurity and management practices.

It is of the utmost importance that actions to prevent spillover at the source be given far greater attention in US policy. Such actions must be part of any comprehensive plan to prevent and prepare for future pandemics. We cannot stress enough how much more cost effective and efficient it is to prevent spillover in the first place, than to try to control an outbreak, epidemic, or pandemic.

Even a one percent reduction in future pandemic risk is more than justified by the global annual spending of about $20 billion needed to address the root causes of spillover. Governments, including the US, have so far failed to work together to prioritize this spending.

Failing to address the drivers of emerging infectious diseases and pandemics would be a grave mistake and ignores emerging scientific consensus, including a significant report from a global science taskforce convened by Harvard University’s T.H. Chan School of Public Health (see link at the end of the hearing text). A “containment-only” strategy also will be seen as acceptance of sickness and death among front line communities, and the poorest members of society, who will always suffer more with this approach.

Our coalitions, the Coalition to Prevent Pandemics at the Source, and the U.S. Wildlife and Health Alliance bring together a diverse group of organizations and many of the leading public health, wildlife and conservation practitioners and experts. Our coalitions have developed a suite of recommendations and statement of principles, respectively, that we have shared with the Administration and that we urge you to review and address. The Coalition to Prevent Pandemics at the Source has also developed an action agenda describing the interventions needed around the world. We stand ready to assist in any way that we can and to provide more detailed recommendations to your Committee and its members.

An ounce of prevention is truly worth a pound of cure.

[List of documents submitted for the record retained in the Committee’s official files]

1. Submission from Preventing Pandemics at the Source and the U.S. Wildlife and Health Alliance: Appendix to May 11, 2022 statement. [Can be viewed on the Committee Repository at: https://docs.house.gov/meetings/II/II15/20220428/114672/HHRG-117-II15-20220428-SD003.pdf]