

The One Health Newsletter is a collaborative effort by a diverse group of scientists and health professionals committed to promoting One Health.

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One Health Newsletter

Volume 7, Issue 4

This quarterly newsletter is dedicated to enhancing the integration of animal, human, and environmental health for the benefit of all by demonstrating One Health in practice.



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One Health Applied to Animal Responders during Incidents

Kendra E. Stauffer, DVM, DACVPM, John S. Haven, and John E. Crews, DVM, MS

See the [corresponding article](#) published in *Veterinary Record* on November 1, 2014.

Only recently with the introduction of PETS Act (Pets Evacuation and Transportation Standards Act) of 2006 (1) and the subsequent DAP9523.19 FEMA (Federal Emergency Management Agency) agreement (2) have efforts been devoted to One Health issues in emergency management, specifically those related to responders dealing with animal issues. The PETS Act of 2006 was born out of the lessons learned by DHS (Department of Homeland Security). It states that in order for state and local governments to receive DHS-funded grants, the governments are required to integrate procedures that include pets into their emergency plans.

Also, during the past decade an effort has been made by governmental and non-governmental agencies to develop a credentialing process for animal emergency response through the formation of working groups (3). This credentialing process was mirrored after the National Wildfire Coordinating Group Incident Qualification Card, commonly called a Red Card. (The Red Card is an accepted interagency certification that a person meets minimum training, experience and physical fitness standards for wildland fire positions set by the National Wildfire Coordinating Group (4).) This credential concept creates a high level of interoperability between agencies and facilitates working together on large scale or duration incidents. Animal response working groups were formed and draft documents created; however, in the past year, the working groups were disbanded. FEMA is currently reviewing the future reformation and goals of the working groups as related to animal emergency response.

Recently, there were several governmental and non-governmental animal response teams tasked with response to and recovery after Superstorm Sandy. Lack of an existing nationally accepted credentialing process for animal emergency responders meant that such teams cooperated on FEMA missions but may have had different training, experience, and medical clearances.

Animal Response Programs in Florida

Between August 2004 and October 2005, four Category 3 and one Category 4 hurricanes hit Florida. Spurred by these crises and the need for pertinent response to animal issues, the state of Florida formed



During the Florida SART animal emergency response workshop, 103 animal emergency responders reviewed incident response and animal decontamination procedures.
Photo courtesy of Kendra Stauffer



Emergency responders practice animal decontamination procedures during an emergency response training exercise hosted by Florida SART. *Photo courtesy of Kendra Stauffer*

and trained animal response teams and coalitions through leadership of the Department of Agriculture and Consumer Services and the University of Florida College of Veterinary Medicine. Florida SART (State Agricultural Response Team) was established under the Department of Agriculture and Consumer Services and is a multi-agency coordination group with 30 partner groups. Florida SART supports an effective and coordinated incident response for the animal and agricultural sectors in the State of Florida (5). The group has thus far responded to many types of agriculture events including hurricanes and other natural disasters, animal disease events, and animal welfare and hoarding cases.

One Health Aspects during a Recent Workshop

Florida is very active in emergency preparedness and conducts workshops and exercises several times a year that are collaborations between many governmental and non-governmental agencies.

One recent workshop utilized ICS (Incident Command System) to set up a temporary emergency pet shelter and decontamination of animals exposed to flood waters in a hurricane scenario. This was the third such event that Florida SART has hosted in the past few years. The animals were triaged, processed through intake, decontaminated, examined, and then sheltered.

Fourteen federal, state, and local agencies as well as non-governmental agencies participated for a total of 103 individual participants. The animals used in the workshop were adoption ready dogs from a local animal control facility. During the planning of the workshop and without any national credentialing system in place for animal emergency responders, the planning team determined the following prerequisites for all participants: ICS 100, 200, and 700, medical clearance from a doctor or occupational health office for the task(s) to be performed, and current tetanus vaccination as well as a valid pre-exposure rabies immunization or acceptable titer if tasked to a position which required handling of animals.

The determination on required vaccinations was made in consultation with the Florida Department of Health and the CDC (Centers for Disease Control and Prevention) immunization recommendations for disaster responders. The Rabies Prevention and Control in Florida 2014 Guide recommends rabies pre-exposure vaccine for high-risk groups including veterinarians, veterinary students, and animal control officers. In addition people involved in disaster animal response should also consider being pre-immunized based on expected frequency of animal contact. People who are at frequent risk should have their rabies antibody titers determined every two years. The CDC recommends tetanus (vaccinated every 10 years) and hepatitis B immunizations for disaster responders. In our workshop, responders were not going to have access to human bodily fluids but would have significant exposure to animals; therefore, the recommendation of valid tetanus and rabies immunization status was made for this workshop. Although rabies cases continue to decline in Florida, it is estimated that at least 60,000 Florida residents and visitors (especially children) are bitten each year by some type of domestic or wild animal. Dogs are the major source of animal bites in Florida, followed by cats, rodents, raccoons, bats, and other species (6, 7).

Regarding tetanus vaccination status, 28 of 103 responders had a status of unknown, two had tetanus-vaccinations but greater than 10 years ago, and 73 had a current tetanus vaccination within the past 10 years.

For rabies vaccination status, 53 of 103 responders had an unknown status or were never vaccinated, 36 were vaccinated at some point but had not had their antibody titers checked in the past two years, and 14 had an immunization in the past two years or a current antibody titer. Prior to the workshop, our assumption was that those who had routine exposure to animals in their daily jobs would be the most likely to be current on their rabies immunization. We did not find this to be true in our workshop. Animal control officers and shelter staff were the least likely to be current on immunizations, and federally employed responders were the most likely to be current on immunizations. Cost of the 3-series pre-exposure vaccination for rabies is around \$3000 and decreasing state and local budgets have been speculated to be the main reason contributing to low immunization rates.



Kendra E. Stauffer, DVM, DACVPM has joined the Global Disease Detection (GDD) Branch at the CDC serving as a Veterinary Medical Officer in the Republic of Georgia. Previously she worked for Veterinary Services (VS) for almost 10 years, as well as was an Epidemic Intelligence Service Officer in the Bacterial Special Pathogens Branch of the CDC.



John E. Crews, DVM, MS has practiced both in central Florida and East Africa. In 2000, Dr. Crews joined the Florida Department of Agriculture and Consumer Services' Division of Animal Industry. He has served as Director of the Diagnostic Laboratories in Florida and now serves as a District Veterinarian. Currently, as a Diagnostic Veterinarian, he works cases involving Aardvarks to Zebras and everything in between. Dr. Crews has served in many positions on Florida's SART.



Initial briefing at the SART emergency response training. Photo courtesy of Kendra Stauffer

Moving Forward

The first and most important objective in an incident is to provide for safety of the responder. This should include that the responder not only has the training to do the position but is physically and medically cleared for the position. We encourage FEMA and other agencies with statutory authority to continue their quest for credentialing for animal emergency responders and to coordinate with CDC and State Departments of Health on recommendations. Collaboration with non-governmental animal response coalitions such as NARSC (National Animal Rescue and Sheltering Coalition) and Florida SARC (State Animal Response Coalition) is necessary since those groups provide the bulk of the responders during an animal incident. In addition, strategies on how to increase the compliance on immunizations required for animal emergency responders are desperately needed.



John S. Haven is the Director of Medical/Health Administration at the University of Florida's College of Veterinary Medicine. He also leads the college's disaster response team, "VETS", one of the largest non-federal veterinary disaster response teams in the country, and represents the college on the State Agricultural Response Team. He is recognized as a national expert in animal technical rescue, and teaches the only DHS approved operations level animal technical rescue course.

An Analysis of the Linkages Between Public Health and Ecosystem Integrity: Part 5 of 6

Steven A. Osofsky, DVM, Anila Jacob, MD, MPH, and Christopher D. Golden, PhD, MPH

Health & Ecosystems: Analysis of Linkages

(HEAL) is a consortium of more than 25 institutions collaborating to analyze and quantify relationships between the state of ecosystems and public health. The consortium comprises many of the world's premier public health and environmental science institutions working in both developing and developed countries. HEAL's mission is to increase support for integrated public health and environmental conservation initiatives as intimately related, interdependent challenges. A cross-sectoral attitudinal change will ultimately help to improve public health outcomes, equity, and resilience for some of the world's poorest people, often living in the world's most remote areas, while simultaneously conserving some of the most important natural landscapes and seascapes left on earth. It is a mission directly aligned with that of One Health ([Barrett and Osofsky, 2013](#)).

The HEAL consortium believes that there are important public health impacts associated with changes in the state of different ecosystems and that, frequently, degradation of these ecosystems leads to negative public health impacts. However, relatively little peer-reviewed literature delves into the mechanisms underlying potential causal relationships between ecosystem degradation and public health outcomes.



Photo by Mike Kock, [Wildlife Conservation Society](#)

Policy-makers interested in understanding these relationships are left with largely anecdotal information that is clearly insufficient for informing decision-making in terms of conservation, public health, or both.

A key component of HEAL's approach is to explore what is currently known regarding linkages between human health and natural ecosystems, as a foundation for prospective applied research. In this 6-part series, we are exploring what is currently understood in terms of linkages between the state of various ecosystems and major public health challenges. We focused on communicable diseases in [Volume 6 Issue 4](#) of the One Health Newsletter, non-communicable diseases in [Volume 7 Issue 1](#), nutrition in [Volume 7 Issue 2](#), and mental health in [Volume 7 Issue 3](#). In this issue, we focus on ecosystem integrity and resilience to extreme events. In our last installment, we'll tackle the connections between ecosystems and biopharmaceuticals.

Currently Understood Linkage #5: Ecosystem degradation and vulnerability to extreme events

In the last 60 years, there have been significant changes in the climate and in the frequency of weather events; in general, certain regions have experienced warming trends, increases in heat waves, more frequent heavy precipitation events, and longer, more intense droughts. In the coming decades, the IPCC (Intergovernmental Panel on Climate Change) projects that climate change will result in increased intensity of tropical cyclones and extreme temperature events, and increased frequency of heavy precipitation events ([Sauerborn and Ebi 2012](#)). Specific health consequences from the impacts of extreme events will vary by region, but may include direct physical injury, increased transmission of certain vector-borne

diseases such as malaria, increased water-borne diseases due to the flooding of insufficient sanitation infrastructure, food shortages due to decreased agricultural productivity, heat stress, and decreased access to clean water ([Ramin and McMichael 2009](#), [Barrett and Osofsky 2013](#)).

Vulnerability to extreme events is determined by various socioeconomic, cultural, institutional, environmental, and health factors. Intact ecosystems are important in providing resilience to the impacts of extreme events. Climate mitigation procedures and human behavioral adaptations will be important in protecting people from some effects of climate change. However, many effects of climate change, particularly the less visible ones, will heavily impact the health of human populations. It is estimated that about half of the global population lives within 60 km of coastal areas, which are particularly vulnerable to the direct impacts of extreme weather events such as hurricanes and cyclones ([Chivian and Bernstein 2008](#)). Healthy marine ecosystems such as mangrove forests and coral reefs can serve as effective barriers against storm surge caused by these events; degraded ecosystems have less capacity to provide protection from these impacts ([MA 2005a](#)). For example, communities near intact mangrove forests suffered less damage than those near degraded mangroves during the 2004 Asian tsunami ([Danielsen et al. 2005](#)).

Intact terrestrial ecosystems, particularly forests, also provide significant protection from extreme events. Forests help to prevent landslides and soil erosion caused by heavy precipitation; deforestation has been associated with increased risk of landslides. For example, researchers in India found that deforestation for the development of tea estates in the southern state of Tamil Nadu resulted in more frequent and severe landslides ([Kumar and Bhagavanulu 2008](#)).

Valuation of intact natural systems in the context of societal resilience is of increasing interest to the insur-



Photo by Christopher Golden, 2014

ance industry, for obvious reasons. Perhaps as climate change continues to make extreme events more frequent, more of the many values of intact nature can finally be better quantified and moved into mainstream economic thinking.

In the next issue of the One Health Newsletter, our sixth installment explores the linkages between ecosystem change and biopharmaceuticals.



Steven A. Osofsky, DVM is the Executive Director of the Wildlife Conservation Society's Wildlife Health & Health Policy Program, overseeing all of the Wildlife Conservation Society (WCS) Global Conservation Program's work in the health realm. He is also an adjunct assistant professor at the University of Maryland, College Park. Steve launched the Health & Ecosystems: Analysis of Linkages (HEAL) program.

Anila Jacob, MD is an internal medicine physician with an MPH in Global Environmental Health. Currently she is a senior technical expert at ICF International, where she works on the Measuring Impact project with USAID's Forestry and Biodiversity Office.

Christopher D. Golden, PhD, MPH is the Director of the Wildlife Conservation Society's Health & Ecosystems: Analysis of Linkages (HEAL) program. He is also a Research Associate at the Harvard School of Public Health's Department of Environmental Health and Department of Nutrition, and the Director of MAHERY (Madagascar Health and Environmental Research).

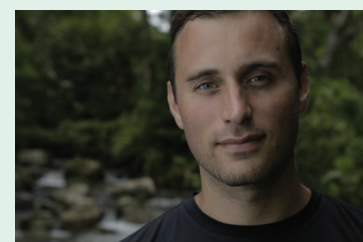


Photo Credit: Jon Betz/National Geographic

Halting a Global Pandemic Before it Starts

Jonna Mazet, DVM, MPVM, PhD

Article previously published May 2014 in [EVOTIS](#), University of California - Davis Veterinary Medicine's quarterly online publication which focuses on work being conducted at the UC Davis [One Health Institute](#).

During the past decade, attempts to control deadly viruses like SARS and H5N1 have been, out of necessity, almost entirely reactionary. It is time to move beyond that costly approach, which measures impact in death tolls and money spent on diagnosis, treatment, and containment. We need a more proactive paradigm that allows for use of knowledge on what diseases might be coming and the development of interventions to prevent or at least control the pathogens at their source.

The World Bank estimates that from 1997 to 2009, at least \$80 billion was spent responding to just six outbreaks of deadly zoonotic diseases, caused by viruses shared between people and animals. We believe that total could be drastically reduced if the health community can get upstream and predict the risk from these diseases before they emerge rather than waiting to respond after they've already begun spreading.

That means going to the most likely source: high-risk transmission interfaces where animals and people come together.

Getting Upstream

We can choose to focus on all of the doomsday scenarios, but I prefer to think of our time as one in which we have the opportunity to really benefit from the advances of technology.

At the UC Davis One Health Institute, we're especially trying to detect and limit the spillover of

pathogens of pandemic potential that can move between wildlife and people. Funded by the U.S. Agency for International Development (USAID), our PREDICT global surveillance strengthening program is collaborating with governments and a wide network of partners in over 20 countries around the world to identify new and known viruses related to those that have caused epidemics and pandemics in the past. We focus our work in places where environments and market systems are changing in ways that are conducive to the spillover of viruses from animals to people. We work on the ground with our local teams, which include health professionals, scientists, educators, and ministry officials. Our local teams are key to understanding the biology and the potential transmission interfaces of each distinct area, as well as how best to get surveillance done in their countries.

The collaborative PREDICT consortium we have built is also strengthening 35 laboratories to allow for advanced diagnostics on four continents in those areas that have been determined to be hotspots for the emergence of new diseases. Much of our work is based in lower income countries, because our science has shown us that those areas are the most at-risk for the next disease emergence.



Photo by UC Davis One Health Institute

It's important to focus on animals because they harbor many viruses that humans may not have seen in the evolutionary history of our health systems, so when one of those viruses spills over to us, we may be very susceptible to severe disease and not have any tests to diagnose it. If that virus is also transmissible from human-to-human, it could travel around the world very quickly if left unchecked.

Instead of spending billions of dollars reacting to outbreaks, we're hoping to contribute to a system to identify disease potential and prevent pandemics before they start.

An Interconnected World

Web-based communications have also helped stop the spread of disease by making it much easier to distribute real-time information throughout the world, among government agencies as well as on social media.

When the SARS outbreak happened in China just over 10 years ago, the disease had already crossed international borders when a global alert was issued in March 2003. More than 750 people died in the outbreak.

In April 2013, China was hit by an outbreak of H7N9

flu, but this time they were quick to report it.

The Chinese government controlled live poultry markets and brought scientists in to do intensive lab testing, hindering the spread very quickly.

All the while, the public was sharing information on a Chinese social media site called Weibo. This gave the public a real-time voice that they didn't have 10 years earlier, which supplemented China's quick response to the outbreak.

But the information hasn't circulated so easily everywhere.

Last spring, Middle East Respiratory Syndrome (MERS), which first appeared in Saudi Arabia, claimed the lives of almost 70 people in 12 countries, including western European countries like France and the United Kingdom. Air travel enabled those victims to carry the disease to other countries, and lack of diagnostics for mystery diseases slowed the recognition and response.

Through PREDICT, we're working to bridge these gaps – improving surveillance, diagnostics, and global health communications.

Jonna Mazet, DVM, MPVM, PhD, is the Executive Director of the One Health Institute in the UC Davis School of Veterinary Medicine.

Utilizing the Protocol for Assessing Community Excellence in Environmental Health (PACE EH) in the East Gifford Community

Julianne Price, RS and Barbara Progulske, DVM, MPH

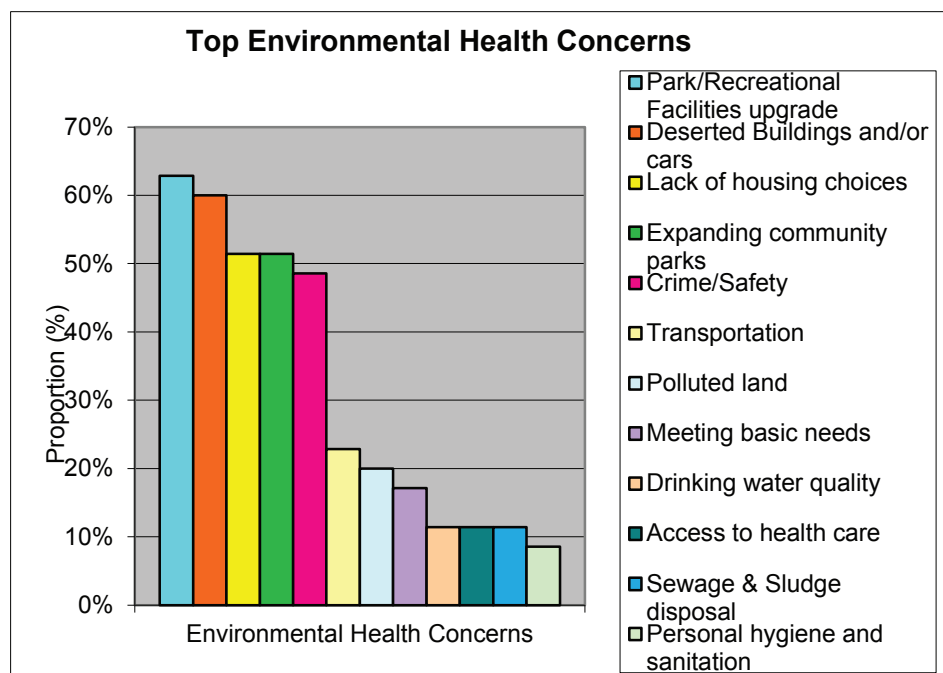
Protocol for Assessing Community Excellence in Environmental Health (PACE EH) is a tool, developed through collaboration between the Centers for Disease Control and Prevention and the National Association of County and City Health Officials, for determining environmental public health concerns in communities facing disproportionate health risks. PACE EH involves the community, local health officials, the public, and

other stakeholders to identify local environmental health issues, make a plan for action, and address identified issues. PACE EH can improve environmental health awareness, strengthen trust of governmental officials, strengthen collaborations, and implement several of the 10 Essential Public Health Services. For more information on PACE EH, please visit the following link: [PACE EH Factsheet \(CDC\)](#).

The community of East Gifford, also known as Geoffrey’s Subdivision, is located in Indian River County, Florida, and is home to approximately 113 residents. In contrast to its wealthy neighboring city of Vero Beach, a quarter of East Gifford’s population lives below the poverty line, and the community has a 35% unemployment rate. The community is overwhelmed with abandoned and dilapidated buildings and structures, and these abandoned areas have been exploited by individuals for illegal drug-use and prostitution. The built environment

as a factor in public health is relatively new, but research has shown that perceptions of safety and walkability of neighborhoods can affect physical activity, obesity rates, social capital, and social cohesion in the community (Renalds, Smith, & Hale, 2010). Additionally, lower socioeconomic status communities such as East Gifford often have reduced access to physical activity facilities, which can also contribute to lower levels of physical activity (Gordon-Larsen, Nelson, Page, & Popkin, 2006). In order to address these underlying health factors, the Florida Department of Health in Indian River County (DOH-IR) Environmental Health Sector joined with the East Gifford community to promote a safer, more community-friendly environment.

The first objective was to gather feedback from community members on what they thought were the most pressing environmental health issues in East Gifford. In 2013, DOH-IR utilized the Protocol for Assessing Community Excellence in Environmental Health (PACE EH) in the Geoffrey’s Subdivision to determine environmental public health concerns. Residents were surveyed, and 65% of respondents cited the



Environmental Health Concerns as reported by Geoffrey’s Subdivision Residents, 2013.

Hosie-Schuman Park as their top issue of concern. The park was in disrepair and lacking infrastructure and equipment. The park contained only a paved area and basketball hoop, both in poor condition. There were no bathrooms or water fountains, no children’s play area or equipment, and no lights. Survey respondents also cited concerns about crime and safety, as well as lack of neighborhood recreational opportunities for their children, and called for infrastructure improvements, installation of equipment, lighting and security. Based on this feedback, the DOH-IR’s second objective was to work with community leaders to improve the designated priority issues and create a better environment for residents.

East Gifford Park Clean Up and Improvements

There is a clear association between physical activity and a number of health benefits including better mental health and maintaining a healthy weight, which reduces the risk of developing Type 2 diabetes and heart disease. Access to green spaces and parks encourages physical activity; however, there are often disparities in park locations, facilities and conditions

that limit access based on demographics and socioeconomic status.

Because of these disparities, detrimental activities such as crime, especially drug and prostitution activities, abound. Since this PACE EH project brought these community concerns to light, DOH-Indian River and County officials have worked with community leaders to begin making improvements to Hosie-Schumann Park. To date, improvements include installation of new benches, a swing set, truck tire play structure, trash cans, and temporary toilets. A new guardrail was installed at the north end of the park to address safety issues, and the existing picnic table has been rehabilitated.

This project also elevated the importance of availability of safe recreational areas in the recently updated Gifford Neighborhood Plan (GNP), which now includes specific objectives and actions to improve parks in the Gifford Community. Additional improvements to Hosie-Schumann Park will be made through the year 2016 and include repair and replacement of playground equipment and basketball courts as well as the installation of a park pavilion.



Lack of park amenities prior to PACE EH project.
Photo courtesy DOH - IR

East Gifford Community Housing Improvements

It has long been recognized that poor housing conditions contribute to a wide range of health conditions, including asthma, respiratory infections, lead



Abandoned housing in East Gifford. *Photo courtesy DOH - IR*

poisoning and injury. Crime and illegal activities also increase in areas with dilapidated and abandoned structures, posing a safety issue to community residents. Substandard housing also negatively affects property values throughout the community. Gifford contains a range of housing conditions including absentee landlords, low rates of home ownership, and houses in disrepair or abandoned.

These dilapidated homes and unsafe buildings are frequently used as shelter by the homeless population or as venues for drug deals and prostitution. During the PACE EH initiative, a successful drug bust by the Indian River County Sheriff's Office uncovered a vast amount of drugs, guns, cash, and pit bulls used for fights in one of the abandoned residences. Residents have called for these abandoned and deserted buildings to be torn down, and new homes and apartments built. One resident noted clearly that the deserted homes bring the entire East Gifford community down. Residents also had concerns with deserted and abandoned cars, and requested they be removed. These cars were shelters for wild animals and produced flies and mosquitoes when rainwater became stagnant. In response, the PACE EH initiative removed 90% of abandoned cars, thus addressing some of the above issues, but further initiatives will be needed to support long-lasting improvements to abandoned buildings in the area.

In conclusion, the built environment can play a critical role in community members' feelings of safety, physical activity levels, and social cohesion. Through the use of the CDC's PACE EH protocol, the DOH-IR was able to make substantial improvements to the East Gifford community, with the underlying goal of increasing safety, physical activity, and overall well-being in this low socioeconomic status subdivision. By

Barbara Progulske, DVM is an environmental consultant and epidemiologist with the Florida Department of Health in Indian River County. Prior to joining the Florida Department of Health, Dr. Progulske was an epidemiologist with the Oregon Public Health Division for nine years, and with USDA Veterinary Services for 12 years.



working with the community, DOH-IR was able to address the community's primary environmental concerns as well as establish a healthy rapport which can lead to successful public health campaigns in the future.



Julianne Price, RS is the Coordinator for the Florida Department of Health (FDOH)'s Statewide Protocol for Assessing Community Excellence in Environmental Health and a Government Analyst at the FDOH in Indian River County. Mrs. Price is also the Chairperson of the National Association of County and City Health Officials

Environmental Health Advisory Board. Her work has been featured in two textbooks, numerous journal articles, and in the Public Health Grand Rounds documentary. Mrs. Price is also the founder and President of the housing nonprofit, Every Dream has a Price, Inc.

One Health Perspectives from International Health Professionals

Maged Al-Garadi, PhD, Najmul Haider, DVM, MPH, Giorgi Maghlakelidze, DVM, and Sophia Papageorgiou, DVM, MPVM, PhD

As a follow-up to our Volume 7 Issue 2 article, "Graduate-level Certificate in One Health Training at the University of Florida," we asked seven of the One Health Certificate trainees, all health professionals in their respective countries, to elaborate on the importance of One Health in their countries and in their work. We interviewed them and asked a variety of questions focusing on One Health and the roles it plays in public policy, disease outbreaks and its perception in their respective countries. In this article, we feature **Dr. Maged Al-Garadi from Yemen, Dr. Najmul Haider from Bangladesh, Dr. Giorgi Maghlakelidze from Georgia, and Dr. Sophia Papageorgiou from the United States of America**, who is currently working in Mongolia.

How do you define One Health?

Dr. Maged Al-Garadi:

One health is a collaboration between different

disciplines including medicine, veterinary and environmental health, and involves individuals in the political and economic realms. Individuals in these areas are involved in decision-making to reduce the risk of exposing all populations to hazards. These hazards may include zoonotic or infectious diseases or environmental health contaminants such as pollutants. This collaboration should revolve around local, regional, and global community efforts to achieve world health goals.

Have there been any recent disease outbreaks or health issues in your country where a One Health approach was taken? How so?

Dr. Maged Al-Garadi:

In Yemen, the collaboration between the Ministry of Agriculture and the Ministry of Public Health and Population was started early in the efforts to fight a Rift Valley fever outbreak in 2000. In a continuation of

this collaboration, in January 2014, partners have established one committee for surveillance and investigation of zoonotic disease outbreaks. Additionally, medical and veterinary universities in Yemen have introduced a uniform zoonotic disease curriculum. However, more collaboration between disciplines is needed to shape One Health decision-making in government and in academic-research settings.

Yemen has a unique geographical location; its inter-continental port connects Africa to Asia. Thus, an increased emphasis should exist on international collaboration with global universities, institutions, and laboratories. Establishing a local One Health institution, with regional reference laboratories for the CDC and OIE coupled with cooperation between global One health institutions remains imperative in the fight of emerging infectious diseases.

Dr. Najmul Haider:

From 2009-2010, there were several anthrax outbreaks in Bangladesh that tremendously affected the country's cattle industry. As a result of these outbreaks, there was a sharp fall in beef prices, fewer cattle went to slaughter, a decline in cattle industry employment, and a loss of approximately 100 million US dollars in the tannery industry. The government of Bangladesh took a One Health approach to stop the anthrax outbreaks. The International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) and the Institute of Epidemiology, Disease Control and Research (IEDCR) conducted a joint outbreak investigation and informed health authorities of effective community prevention messages to reduce risky practices, such as advising against slaughtering sick ruminants because it can lead to human infection. In addition, the Department of Livestock Services vaccinated all cattle and goats in the anthrax prone areas, and local government authorities warned the public to not slaughter sick cattle and goats. These steps have also served to

mitigate future outbreaks.

Similarly, icddr,b and the government of Bangladesh have been working together to combat Nipah virus outbreaks since 2006. IEDCR and icddr,b have scaled up an innovative intervention to impede date palm sap contamination from bats to prevent Nipah virus transmission. Likewise, the Ministry of Health and other local government organizations such as city corporations and municipalities have been delivering important messages instructing people to avoid drinking raw date palm sap. Although Nipah virus outbreaks have been reported sporadically each year, employing a One Health approach has helped to reduce the size and effect of Nipah virus outbreaks in Bangladesh.

Dr. Giorgi Maghlakelidze:

I've had a few examples of One Health collaboration in recent years when researching Crimean-Congo hemorrhagic fever (CCHF), anthrax and orthopoxviruses. In these cases, human and animal health authorities communicated well, and their joint efforts led to successful outcomes.



Giorgi Maghlakelidze participates in class discussion during the One Health Certificate course.

Photo by Greg Gray

Also, Georgia's Centers for Disease Control's One Health mission supports the country's efforts in establishing a One Health approach and promotes tight communication between agencies. I personally work on an orthopoxvirus sero-survey project involving specialists from many different fields: epidemiologists, veterinarians, lab personnel, and university students.

Dr. Sophia Papageorgiou:

A One Health approach for surveillance of emerging infectious diseases is even more essential in countries

such as Mongolia, where half of the population lives in pastoral or nomadic subsistence communities, alongside their animals, and where livestock production (meat, milk, fiber) accounts for approximately 22% of the nation's GDP. Living in proximity to their animals, herders are exposed, or potentially exposed to zoonotic diseases that can cause devastating animal and human health problems and even affect food and economic security locally and nationally. Pathogens such as peste-des-petits ruminants (PPR), a virus known as goat plague, and glanders, a bacterial disease in horses, caused by *Burkholderia mallei* that can be transmitted to humans, are emerging pathogens of concern to veterinary and human health researchers in Mongolia. Goats are used for cashmere production and for food, while horses are important animals used for transportation, milk protein, and serve an integral role in Mongolian culture and heritage. Both of these pathogens are 'knocking' at the borders of Mongolia with the potential of causing health and economic devastation to this nation. Implementing a One Health approach for surveillance, identification, control, and drafting health policy regarding these pathogens would provide a comprehensive solution to address disease outbreaks.

What are examples of existing health issues that you think could benefit from a One Health approach in the future?

Dr. Sophia Papageorgiou:

In Mongolia, two health concerns would benefit from One Health research and development of a comprehensive health policy. The first is respiratory diseases, linked to environmental health caused by poor air quality. The second disease, brucellosis, caused by zoonotic bacterial pathogens from the genus *Brucella*, impacts livelihoods in Mongolia and in pastoral and nomadic communities across the globe.



Sophia Papageorgiou (center) and Lkhagvatseren Sukhbaatar (right) learn about dairy production at North Florida Holsteins.

Photo by Greg Gray

In Mongolia, there are over 45 million livestock and a number of endemic *Brucella* species which cause some of the highest rates of human and animal brucellosis reported globally. Recall that livestock production constitutes approximately 22% of the GDP in Mongolia, so the consequences from brucellosis not only impacts animal and human health, but also food security and the nation's economy. Animal vaccines are available for some of the *Brucella* species, but vaccination requires a comprehensive countrywide surveillance, testing, and control program. Mongolia is a large country, with dispersed pastoral and nomadic populations, political differences regarding brucellosis control, rough terrain, and extreme weather conditions in which to work; these factors create challenges for ongoing surveillance and control programs. These complex health threats would benefit from a One Health approach to identify feasible solutions to these health problems.

What are your perceptions about the level of cooperation between medical, public health, veterinary, and environmental health professionals in your country?

Dr. Najmul Haider:

The One Health concept has been gaining recognition and acceptance in Bangladesh since 2007, when several outbreaks of highly pathogenic avian influenza

A virus (H5N1) impacted the country. icddr,b, an internationally renowned health research organization based in Dhaka, Bangladesh has been the leading advocate for a One Health approach in the country. icddr,b, in collaboration with IEDCR and the Ministry of Health and Family Welfare research wing, have been using multi-disciplinary outbreak investigation teams consisting of epidemiologists, physicians, veterinarians, anthropologists, microbiologists and public health specialists to identify causes of outbreaks and mitigate further transmission. There has been increasing cooperation among government ministries such as the Ministry of Health, Ministry of Livestock and Ministry of Environment and Forest as well as non-governmental organizations, which has led to improved responses to zoonotic disease outbreaks in Bangladesh. In the last five years, multidisciplinary teams have successfully investigated approximately 50 outbreaks including anthrax, Nipah virus, avian influenza A virus (H5N1), hepatitis E virus, chikungunya and cholera outbreaks.

How do you think health policy in your country may be positively impacted to better encourage One Health collaborations among government agencies?

Dr. Sophia Papageorgiou:

Many countries face problems of political instability with subsequent shifts in ministry officials that impede developing inter-ministry/inter-agency collaboration among health professionals and progressive health policies.

One proven method to positively impact health policy in any country is to identify the stakeholders affected by a particular problem and have them meet to collectively identify health problems that are important in their community. The need to then establish a framework to solve these problems, outline how these



Najmul Haider participates in class discussion during the One Health Certificate course.

Photo by Greg Gray

solutions can be translated into health policy, and clarify implementation of the health policy. The stakeholders include herders, doctors, veterinarians, governmental administrators, non-governmental organizations, and others, which must work together to develop unified health policies. In Mongolia, a bottom-up approach seems to be moving forward based on how readily the human and veterinary professionals embraced our One Health approach to research tick-borne pathogens. A similar integration of human and veterinary health ministries' goals, implementing a 'top-down' approach would be an enormously positive step for the One Health initiative.

How do you plan on using/instituting/adapting what you have learned from this workshop to your programs at home?

Dr. Giorgi Maghlakelidze:

The knowledge I received participating in the Certificate in One Health training program allowed me to understand the importance of all components in the One Health paradigm. To me, One Health represents a mosaic, where even if we remove one piece, we will lose the whole picture. Without incorporating a One Health response into our public health system, our current structure with its disconnected institutions will not be able to respond to current and future infectious

disease threats.

After returning to Georgia, sharing my experiences of the US meat and milk production plants with my Georgian colleagues was my first priority. Georgia is a developing country with a growing economy. Georgia is constantly establishing new technologies in different areas of production, and a knowledge gap exists, especially when it comes to the fine details. Witnessing the US meat and milk production plants filled in some of these details, which can improve quality and safety of animal products in my country.



Maged Al-Garadi, PhD is an Assistant Professor of Microbiology, Molecular Biology, and Infectious Diseases in the Department of Veterinary Medicine at Tamar University in Yemen.

Sophia Papageorgiou, DVM, MPVM, PhD is a Duke University Postdoctoral Fellow working on an NIH funded One Health research project investigating zoonotic tick-borne pathogens of primary concern across a variety of landscapes



in Mongolia. For background information on Dr. Papageorgiou's NIH One Health Innovation Fellowship in Mongolia, see Volume 7 Issue 2 of the One Health Newsletter.



Maged Al-Garadi operates a pesticide application device during the entomology section of the certificate course.

Photo by Greg Gray

Najmul Haider, DVM, MPH is a public health veterinarian working as a Research Investigator at icddr,b, an internationally renowned health research organization (www.icddr.org). He has been involved with One Health



Initiatives in Bangladesh and has conducted research on several zoonotic diseases including anthrax, avian influenza A virus (H5N1), Q Fever, and zoonotic tuberculosis, while also participating in over 30 zoonotic disease outbreak investigations.



Giorgi Maghlakelidze, DVM is a Vet specialist at the National Center for Disease Control and Public Health of Georgia and a US CDC South Caucasus Field Epidemiology and Laboratory Training Program resident, working on novel orthopoxvirus detection issues in Georgia within the One Health framework.

ProMED Quarterly Outbreak Roundup, September-December 2014

Jack Woodall, PhD

This review covers selected reports posted on the ProMED-mail outbreak early warning website <www.promedmail.org> and e-mailed to more than 60,000 free subscribers during the quarter September through early December 2014.

Ebola

By now, everybody in range of TV or radio has

heard of the Ebola virus disease (EVD) outbreak in West Africa which probably started in December 2013, but was first reported from Guinea in March of this year. In the previous quarterly update we reported that cases had passed the 4000 mark in early September, with over 2000 deaths. By the end of November the total according to the WHO was 17,145 suspected,

probable and confirmed cases including 6,070 deaths.

These are the official figures; estimates are that there are 2-4 times as many cases being cared for and dying at home, either for fear of going to hospital to die in isolation, or for lack of floor space in the isolation hospitals -- all the beds already taken. The bed situation has recently eased because hundreds more beds have been provided in new Ebola Treatment Units (ETUs). WHO acknowledges that many deaths not confirmed as due to Ebola but buried in Ebola cemeteries were probably from malaria and other causes. Additionally, many actual, but untested, Ebola deaths may have been classified as due to "other" causes, so they could be buried with full funeral rites. We will never know the true figures.

The case fatality rate (CFR) is over 50 percent, ranging from about 40 percent in Sierra Leone to over 60 percent in Guinea depending

on how early the patients seek medical care – earlier care increases the chance of survival. It has been widely reported that there is no cure or vaccine, but there is supportive care with fluid replacement and a high-protein peanut-based nutrition supplement called Plumpy'Nut – and trials of candidate vaccines and potentially effective drugs have started.

As of early December, 23 international volunteer doctors, nurses and other health workers have been infected in spite of using personal protective equipment (PPE), and have been evacuated to their home countries. As of 29 December 2014, 24 have been

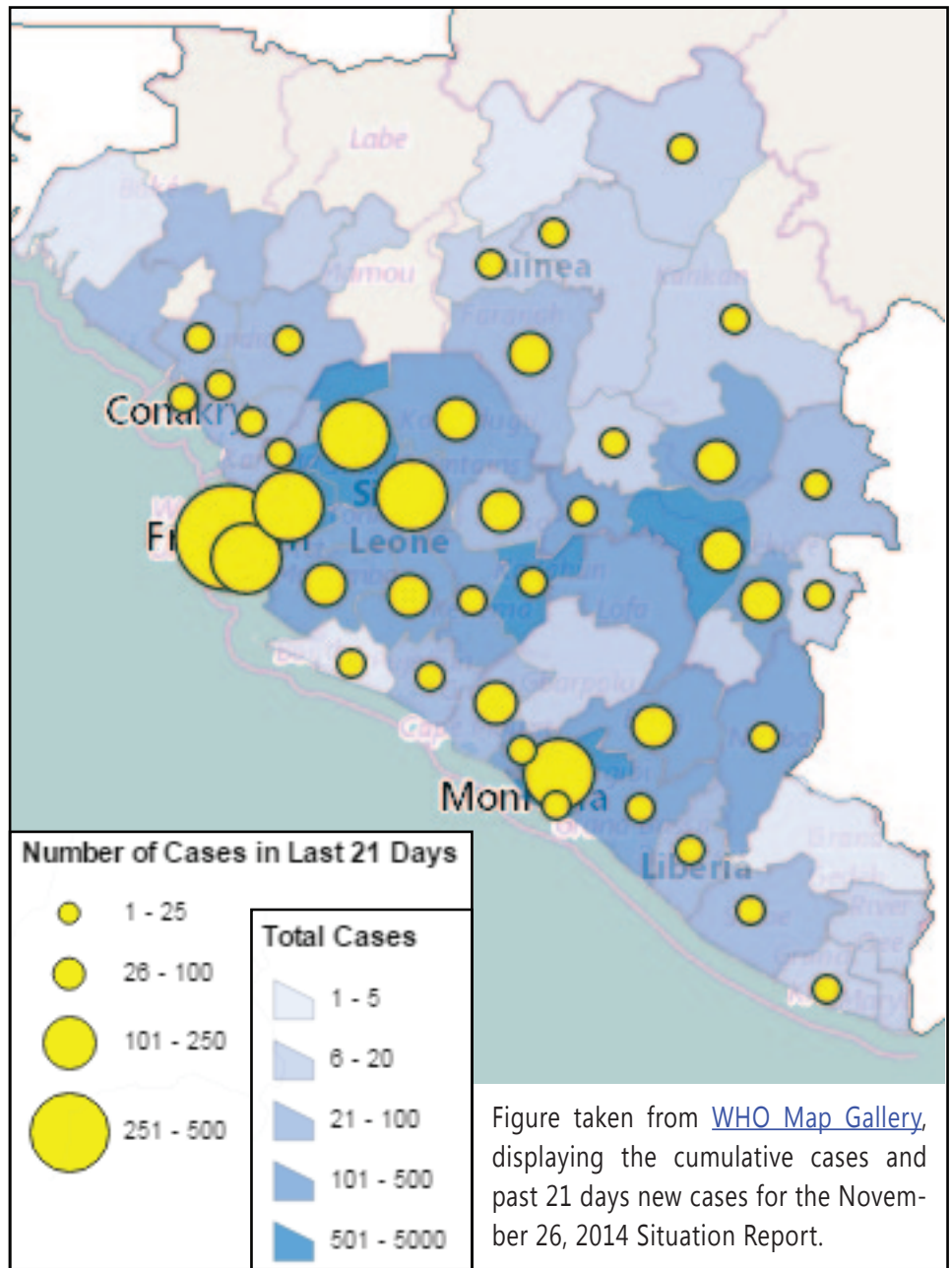


Figure taken from [WHO Map Gallery](#), displaying the cumulative cases and past 21 days new cases for the November 26, 2014 Situation Report.

treated in Europe; all have recovered except for three still undergoing treatment and four who have died. There have been critical shortages of PPE and basic infection control supplies in the EVD-stricken countries, as well as shortages of health professionals to staff the many additional hospital beds that have been provided.

There is also a serious lack of precautions in putting on and taking off PPE, as a consequence of which 300 doctors and health workers have been infected, and more than 170 have died.

Middle Eastern Respiratory Syndrome coronavirus (MERS-CoV)

Transmission of this highly fatal pneumonia seems to have dropped off since mid-June 2014. Since 27 July five new laboratory-confirmed cases, five recovered cases, and five deaths have been reported from Saudi Arabia. The total number of laboratory-confirmed MERS-CoV cases reported by Saudi Arabia since September 2012 is 726, including 302 deaths. According to the most recent European Centre for Disease Control (ECDC) Communicable Disease Threats Report, as of 2 September 2014, there has been a global total of 854 laboratory-confirmed cases of MERS-CoV infection, including 334 deaths (CFR just under 40%, compared to just over 50% for EVD). The reason for the drop may be connected with the dromedary camel breeding season, since young camels are suspected of being carriers of the virus. Fruit bats are suspected to be the reservoir (just as they are for Ebola virus, although the viruses belong to completely different families), but nobody has so far worked out how the virus gets from bats to camels.

Bird flu in poultry



Photo from BBC.co.uk

Avian flu viruses continue to affect poultry and a few people around the world. Low pathogenic (LPAI) strains that kill only a small proportion of an infected flock have to be monitored in case they become high pathogenic (HPAI) strains that kill most of a flock. LPAI **H7N1** affected an ostrich farm in South Africa this quarter.

HPAI **H5N1** has killed poultry and a few people this quarter in Egypt and Indonesia, ducks in India, and poultry in China and Russia. Poultry have been infected by:

- H5N2** in Canada and Germany;
- H5N3** in China;
- H5N6**, a new variant, in China, Laos, and Viet Nam;
- H5N8** in China, Germany, Japan, Netherlands, South Korea, and UK, and was found in migratory birds in Germany and a wild bird in Japan;
- H7N9** in China, where it also caused severe illness in people.

In July 2013, WHO announced a total of 630 confirmed human cases of H5N1 which resulted in the deaths of 375 people since 2003, but apart from H5N1, none of the above variants have started epidemics – yet.

Livestock diseases

Classical swine fever continued to spread in Mongolia and Russia, and African swine fever (ASF) has spread unchecked from Russia, via Latvia, to Ukraine and Estonia, carried across the frontiers by wild boar. ASF outbreaks were also reported from Chad and Zambia.

First reports (never seen in the country before) came in of:

- Caprine arthritis/encephalitis, goats, Poland;
- Mycoplasma agalactiae*, goats, UK (Wales);
- Newcastle disease, poultry and wild chicken, St. Helena (a tiny island far out in the South Atlantic), likely source considered to be imported poultry meat;
- Oyster herpesvirus, Norway and Sweden;
- Small hive beetle infestation (*Aethina tumida*), honeybees, Italy;
- Transmissible gastroenteritis, swine, Argentina;
- Varroosis, honeybees, Mauritius.

Wildlife diseases

As mentioned above, African swine fever has been carried across the frontiers into Estonia by wild boar, which can crash through or burrow under most types of fence. Additionally, first reports were confirmed of bluetongue virus in deer in the USA (New Jersey).

Crop plant diseases

There were first reports of:

- Cucumber green mottle mosaic, **watermelon**, Australia.
- Downy mildew, **poppy**, Australia: (Tasmania) *P. somniferi*. Different varieties of poppy (*Papaver somniferum*) are grown to produce poppy seed (as edible seeds or for oil extraction) or as a source of alkaloids. Downy mildew is one of the most economically serious diseases of the crop worldwide.
- Liberibacter, **carrot**, Morocco -- first report from the African continent. This bacterium has caused economic damage to carrot and celery crops in the Canary Islands, which belong to Spain but lie off the coast of Morocco.



Watermelon with cucumber green mottle disease
Photo from abc.net.au

- Moko disease, **plantain**, Ecuador
- Pale cyst nematode, **potato**, Bosnia & Herzegovina
- Stemphylium leaf spot, **sugar beet**, UK: (England).

From where these diseases were accidentally imported is usually unknown. They pose a challenge to plant breeders and pesticide companies.



Jack Woodall, PhD, is Co-founder and Associate Editor of ProMED-mail. He is also a member of the One Health Initiative team.

Advancements in One Health

University of Florida seeking Director for One Health Center of Excellence

As part of a recruiting initiative in One Health, the University of Florida is seeking candidates at the Associate/Full Professor level to assume directorship of an interdisciplinary Center of Excellence in One Health Research. This recruitment is part of a growing commitment by UF to investigate and provide real-world solutions to health challenges that involve humans, animals, and their environments in dynamic local, national, and international settings. The application deadline is January 20, 2014. Potential applicants may learn more by visiting <https://jobs.ufl.edu/postings/59509>

One Health Commission Hosts First International Who's Who in One Health Webinar

The One Health Commission was pleased to host the 1st International Who's Who in One Health Webinar on November 10, 2014. This Webinar brought together noted One Health leaders, advocates, professionals and students in real-time to discuss global One Health efforts while providing a forum for dialogue within and

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Advancements (continued)

across disciplines. There was no cost to attend the Webinar but participants had to register in advance.



The main objectives of the Webinar were to:

- Connect One Health stakeholders around the world to better understand, share and highlight individual- and agency-level efforts;
- Educate Webinar participants about the One Health paradigm and way of thinking towards improved health outcomes; and
- Create new strategic partnerships and networks for collective, purposeful and coordinated action.



The above map denotes in yellow the countries from which attendees joined in the Who's Who in One Health Webinar.

Over 1,000 attendees from 41 countries across 6 continents participated during the 8-hour webinar (see map above). Recordings of speaker sessions are being posted (when available) on the OHC [website](http://www.onehealthcommission.org). Future webinars are being planned and suggestions are welcome. Please visit the OHC website <https://www.onehealthcommission.org> or contact Cheryl Stroud (cstroud@onehealthcommission.org) or Deeanna Burleson (dburleson@onehealthcommission.org) to be sure you are included on the listserv for future events.

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International Symposium for One Health Research



Photo courtesy Sun Yat-sen University

The first International Symposium for One Health Research was held on November 22-23 in Guangzhou, China, hosted by Sun Yat-sen University (China) in partnership with South China Agricultural University (China), State Key Laboratory of Pathogen and Biosecurity (China), and Duke University (USA). This successful 2-day meeting engaged various health professionals from throughout China, as well as neighboring countries and autonomous regions including Bhutan, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Romania, Sri Lanka, and Vietnam.

The overall objectives of the symposium were to promote One Health research in China and the surrounding regions, create new research collaborations in Asia, and encourage young researchers to engage in One Health projects. The conference featured a range of prominent Chinese and international One Health experts, and had 300 attendees. It was also announced that a new One Health Center for Research and Training has officially been established at Sun Yat-sen University. This is the first such center of its kind to be opened in China and aims to serve as a flagship for One Health research in the country and surrounding regions.

New Mexico Pediatric Society hosts One Health mixer

A veterinarian, a breast surgeon, and a state land commissioner walk into a bar... And so began the inaugural New Mexico One Health Mixer, held at the Tamaya Hyatt resort near Albuquerque, NM, on July 28, 2014. The event was co-hosted by the New Mexico Pediatric Society (NMPS) and the National Park Service and was held in conjunction with the 63rd Annual International Conference of the Wildlife Disease Association, with over 100 diverse professionals in attendance.

NMPS is planning to submit a One Health resolution for consideration at next year's American Academy of Pediatrics (AAP) National Conference & Exhibition. Said NMPS President Alex Cvijanovich, MD, FAAP, "We want to highlight that to truly address the health of our patients and families, we need to think outside of the human health silos we've been trained in". Also in the works is an NMPS-sponsored One Health workgroup that will lead and coordinate local inter-disciplinary initiatives. Potential topics include dog bite prevention education and data sharing between veterinarians and physicians on snakebites, among others.

If you are interested in joining the New Mexico One Health workgroup or have project ideas, please contact David Wong, MD, FAAP, at david_wong@nps.gov.

Upcoming Events

33rd Annual UC Davis Infectious Diseases Conference

Sacramento, CA

February 6-7, 2015

http://www.ucdmc.ucdavis.edu/cme/course_pages/INFE/infec_pagelink.html

Infectious Diseases in Clinical Practice: Update on Inpatient and Outpatient Infectious Diseases

Koloa, Hawaii

February 15-20, 2015

<http://www.ucsfcmecme.com/2015/MDM15K01/info.html>

Conference on Retroviruses and Opportunistic Infections

Seattle, WA

February 23-26, 2015

<http://www.croiconference.org>

3rd International One Health Congress

Amsterdam, the Netherlands

March 15-18, 2015

<http://www.iohc2015.com/>

Impact of Environmental Changes on Infectious Diseases

Melia, Sitges, Spain

March 23-25, 2015

<http://www.iecid2015.com>

Superbugs & Superdrugs

London, UK

March 25-26, 2015

<http://www.iohc2015.com/>

32nd World Veterinary Congress

Istanbul, Turkey

September 13-17, 2015

<http://www.wvcistanbul2015.com>

Recent Publications in One Health

Journal Articles

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Recent Publications (continued)

Journal Articles

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New One Health Book Publication

Confronting Emerging Zoonoses: The One Health Paradigm (2014)
by Akio Yamada (Senior Editor), Laura H. Kahn (Editor), Bruce Kaplan (Editor), Thomas P. Monath (Editor), Jack Woodall (Editor), Lisa Conti (Editor)

Hardcover now available from [Springer](#) or [Amazon!](#)

Also, be sure to visit the One Health Initiative [website](#) for an in depth summary of "Four Landmark One Health Textbooks of the early 21st Century"

Recent Publications (continued)

Journal Articles

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Call for "One Health" Manuscripts

Veterinary Record Journal

During 2014, featured articles will present the concept of One Health, including current issues, history or future challenges. <http://veterinaryrecord.bmj.com/>

Infection Ecology & Epidemiology: The One Health Journal

This One Health journal features original research articles, review articles, or other scientific contributions in One Health, that motivate interdisciplinary collaborations between researchers in various clinical and environmental health disciplines.

<http://www.infectionecologyandepidemiology.net/index.php/iee>

Recent Publications (continued)

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Miscellaneous Publications

Guidance for applying the One Health Approach to enhance prevention and curative care for humans and animals. Horizon International, Yale University Department of Biology. December 2014. <http://www.solutions-site.org/node/923>

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How to stop the next Ebola: Call in the veterinarians. *National Journal*. 24 November 2014. <http://www.nationaljournal.com/health-care/veterinarians-just-might-save-the-world-20141124>

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