

One Health Newsletter

A quarterly newsletter highlighting the interconnectedness of animal and human health



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The One Health Newsletter is a collaborative effort by scientists and health professionals from the following organizations:

- Palm Beach County Health Department
- Florida Department of Health
- University of Florida
- Kahn/Kaplan/Monath One Health Team



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Palm Beach County Health Depart-



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

One Health - At the Crossroads

Ted Cohn, DVM

I first became aware of the concept of One Health during my freshman year as a veterinary student at the (then) Tuskegee Institute. I was attending a class on the history of veterinary medicine and our instructor asked the class what the term "One Medicine" meant. He went on to describe, what is today the accepted definition of the principles of One Health, "*One Health is the collaborative effort of multiple disciplines working locally, nationally, and globally, to address critical challenges and attain optimal health for people, domestic animals, wildlife, and our environment*".

Since that first introduction, I have believed that every practicing veterinarian could and should play an important role in supporting this concept. Practitioners must be cognizant that they are responsible to help protect the health of not only our patients, but their owners as well. As a small animal and exotics practitioner, I feel my exam room sits at the cross roads between animal and human health. I constantly remind myself that the cute new puppy in my exam room, may be a vector for *Toxocara*; the urban chicken flock I visit could harbor avian influenza; the pampered cat that "never goes outside, except when he escapes", toxoplasmosis; and the pot-bellied pig, H1N1 influenza. It is my duty to not only diagnose and treat my animal patients, but also to inform their owners of any zoonotic disease potential their pets may present. Further, if I diagnose a reportable disease, then I have the responsibility to inform my state veterinarian and/or public health authorities, so that appropriate follow-up actions can be carried out.

Our patients and their owners often share similar health concerns. Daily, we see pets and pet owners that are a part of the obesity epidemic affecting such a large proportion of our population. We directly address the pet's weight problem but through our communication efforts, we can also influence the pet owner to take action regarding their own disease. A public health physician owns one of my favorite patients, we have often lamented that the veterinary profession has not been more active in the fight to get people to stop smoking. If veterinarians would emphasize the negative effect that second hand smoke can have on their pets, we may help persuade people to stop smoking, an obvious health benefit for themselves as well as their animal.

Why have I shared these experiences? Well, not only do I see my exam room as a One Health cross roads, but also I believe the concept of One Health itself is at a critical junction. For this most worthy of efforts to succeed, it will take broad-based, long-term support. It will require high levels of coordination, cooperation, and commit-



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ment, by both the veterinary and the human medical professions. It is imperative that we as a profession (especially at the organizational level of veterinary medicine) communicate zealously with our human health care counterparts (i.e. physicians) to let them know the cooperative roles we can each play. A successful amalgamation of efforts as envisioned by One Health will enhance the quality of care for all of our patients. For the sake of our animal patients, as well as the global human population it is essential that this initiative succeed.

The views expressed in this article are solely those of the author and do not necessarily reflect the views of the AVMA and/or the AVMA Executive Board.

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The following One Health “In Action” presentation [abstract] was presented at an historic joint American Society of Tropical Medicine and Hygiene/ Society of Veterinary Tropical Medicine One Health Symposium that was held November 21, 2009 at the American Society of Tropical Medicine and Hygiene (ASTMH) 58th Annual Meeting in Washington, D.C. (USA).

Concurrent Development Of Novel West Nile Vaccines For Humans And Equids: Application Of One Health Principles

Thomas P. Monath, MD

West Nile (WN) virus, introduced into North America in 1999, spread rapidly and had an alarming impact on wild, exotic captive, and domesticated animals (especially horses), as well as causing a human epidemic that swept the U.S. over several years. In 1999, work began in several laboratories on WN vaccines.

One such effort, at Acambis, utilized a platform technology for the concurrent development of a similar vaccine for humans and equids. This technology was based on a chimeric yellow fever (YF) 17D live vector, in which the prM-E genes of 17D virus were replaced with the corresponding genes of another flavivirus, in this case WN. Early experiments showed that YF 17D was an acceptable vector for both horses and primates, but that the chimeric vaccine elicited higher viremias in the latter. Thus the WN prM-E gene insert for the equid vaccine was not modified, whereas the sequence for the human vaccine was mutated at multiple virulence determinants to further attenuate the virus.

In 2001, Acambis entered into a collaborative research and license agreement with Intervet, a leading veterinary vaccines company, for development of the vaccine for equids. Trials sponsored by Intervet of the vaccine in horses led to USDA approval of the product (Prevenile®) in 2006. The vaccine was safe and >95% effective in preventing WN in equids after a single dose and provided long-lasting immunity.

Using a common platform for concurrent development of veterinary and human vaccines against the same pathogen appears to be unprecedented and exemplifies the power of One Health.

The human vaccine (ChimeriVax™-WN) was tested in humans in Phase 1 and 2 clinical trials. The vaccine was well tolerated and 100% of subjects developed neutralizing antibodies to WN. The use of a common platform for concurrent development of innovative veterinary and human vaccines against the same pathogen, meeting the needs for control of the same emerging threat to humans, appears to be unprecedented and exemplifies the power of One Health.

Dr. Thomas P. Monath is a Partner at Kleiner Perkins Caufield & Byers, Menlo Park CA. He was formerly the Director of the Division of Vector-Borne Infectious Diseases, Centers for Disease Control, Ft. Collins, CO; Chief of the Virology Division, US Army Medical Research Institute of Infectious Diseases, Frederick, MD; and Chief Scientific Officer at Acambis Inc., Cambridge, MA.

Dr. Monath manages the One Health Initiative Website with the One Health team of Laura H. Kahn, MD, MPH, MPP, Bruce Kaplan, DVM, Thomas P. Monath, MD and Jack Woodall, PhD. Dr. Monath has co-authored One Health publications in scientific journals, a book chapter [a pending book chapter] and a national newspaper Op-ed. He formerly served on the AVMA One Health Task Force, the One Health Joint Steering Committee, and the newly formed One Health Commission (USA).



ONE WORLD, ONE HEALTH – AN UTOPIAN DREAM OR A REALITY?

S.K. Lam, PhD

The One Health Initiative is aimed at enhancing the integration of animal, human, and environmental health for the benefit of all. This utopian concept may be realistic in developed countries but may not become a reality in developing countries unless we address a much wider issue of health in these countries.

The world population stands at 6.8 billion in 2009 and will reach 7 billion by 2011. Virtually all the growth is in developing countries. It must be realized that more than half the world's population live in countries which are in a constant struggle just to fight endemic infectious diseases. Third world countries will always be at a disadvantage, being burdened with 90% of the global health problems with only 10% or less of health resources. With the increasing world population, it will be even more difficult and challenging to find the ways and means to tackle the issue of health when faced with food and water shortage. Migration as a result of social unrest will undoubtedly add to these problems.

In order to meet the demands of the growing population, land has to be carved out to cultivate food and cash crops. Building of dams and uncontrolled logging activities go side by side with opening of agriculture lands. But at what price and what problems will this pose that will affect the One Health Initiative? Indiscriminate land clearing and deforestation is often criticized by the rest of the world, but what is the alternative for the growing population of the impoverished poor? "Who will feed my children?" is the anguished cry of many. Opening up of land can expose them to exotic diseases which are normally contained in ecological niches with little or no contact with humanity. Is it any surprise that we see reports of diseases like simian malaria, melioidosis, Lyme disease, leptospirosis, and other hitherto uncommon or unknown diseases? Climatic change and

A much wider range of issues must be addressed in order for One Health to become a reality in developing countries.

Deforestation is often criticized by the rest of the world, but what is the alternative for the growing population of the impoverished poor?

The Nipah outbreak is a classic example of a One Health type event involving agricultural practice, migratory bats, domestic pigs, and human disease.

global warming as a result of these activities may even result in bigger outbreaks of vector-borne diseases such as dengue, Japanese encephalitis, and chikungunya.

In order to promote greater yields of food crops, these countries are prepared to consider the planting of high yielding and pest-resistant Genetically Modified (GM) which may not have been perceived to be adequately studied in the country of origin. Food security is seen to be more important and of greater concern to them than food safety. The same goes for anything GM, domestic animal produce, pesticides, etc. On the issue of food security, there is a strong perception among Association of Southeast Asian Nations (ASEAN) countries that they are the testing grounds for any GM crops, animal produce, etc.

There was a massive hue and cry last year when there was a press release in Malaysia pertaining to the release of GM mosquitoes to fight against dengue. The media can play an important role in the dissemination of scientifically correct information which may actually be beneficial to mankind. As for the issue of trade, it is most damaging when trade barriers are immediately set up following a disease outbreak in domestic animals, whether justified or not, adversely affecting the economy of developing countries. This is the same when travel advisories are issued in haste and can be very detrimental to tourism. The economic impact of Emerging Infectious Diseases (EID) is far-reaching indeed.

EID have become a rallying call for scientists the world over to work together to contain their spread. About 70% of EIDs involve either wild or domestic animals, or both. Examples include SARS, avian influenza, Nipah and Hendra viruses. Developing countries are often the epicenters for such outbreaks and lacking resources, they have to look to the United States Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) for help. Regrettably, regional experts are not utilized due to the lack of funds and infrastructure.

The Nipah outbreak is a classic example of a One Health type of outbreak involving agricultural practice, migratory bats, domestic pigs, and human disease. The spread of the disease in the country and to Singapore is due to a lack of enforceable quarantine measures, poor agriculture and farming practices, and inadequate compensation for culling of domestic animals.

More than the sharing of expertise to fight EIDs, there is a need to do more for developing countries. Much criticism has been levied on countries such as China, Indonesia, and Thailand for not sharing influenza virus strains in the face of pandemics. While we see other countries stocking up on tamiflu and H1N1 vaccines, the developing countries can only wish and hope that developed countries will be generous enough to make a donation to the least developed countries.

Is there a mechanism whereby there is a fairer distribution of health resources and better vaccine access which are not measured in terms of dollars? Do we still wonder why developing countries are reluctant to share their virus strains when there is obviously little benefit to them?

Conclusion

While the One Health Initiative is to be lauded, the solutions may not lie in the implementation of methods found suitable for the developed world. One size does not fit all here. What is to replace deforestation, open burning, or free range poultry farming?

One size does not fit all here.....

.....the solutions may not lie in the implementation of methods found suitable for the developed world.

It is as important to engage economists, health policy makers, politicians, social workers, and NGOs such as the Bill and Melinda Gates Foundation as it is to engage the global scientific community in the implementation of the One Health Initiative for the developing world.

— ProMED —
The Program for Monitoring Emerging Diseases.

Perhaps encouraging eco-tourism will prevent deforestation. A more pragmatic and innovative approach as well as a paradigm shift needs to be implemented to enable any hope that this noble initiative will turn from a dream to a reality. Engaging economists, health policy makers, politicians, social workers, and NGOs such as the Bill and Melinda Gates Foundation, may be just as important as engaging the global scientific communities in implementing the One Health Initiative for the developing world.

Professor Dr. S. K. Lam is a Senior Research Fellow at the University of Malaya, Kuala Lumpur, Malasia and is a member of the Strategic Advisory Group of the 1st International One Health Congress scheduled to be held in Melbourne, Australia February 14-16, 2011.

Dr. Lam has been one of the most influential figures in medical virology in Southeast Asia. His research in dengue is recognized worldwide as well as by the World Health Organization (WHO). In recent years, his involvement in emerging diseases has led to the discovery of new viruses in the region, and the isolation of Nipah virus and Tioman virus has made his team internationally recognized.



ProMED-mail and ONE HEALTH

Jack Woodall, PhD, Lawrence C. Madoff, MD, Alison Bodenheimer, MPH*, Peter Cowen, DVM, MPVM, PhD, Dipl. AVES (Hon), Thanis Damrongwatanapokin, DVM, PhD, Fabian Ekue, DVM, MSc, PhD, Tam Garland, DVM, PhD, D.ABVT, Martin Hugh-Jones, VetMB, MPH, PhD, FACE, MRCVS, Arnon Shimshony, DVM, Tom Yuill, PhD

ProMED-mail since its inception, has espoused the “One Health” concept.

ProMED’s beginnings date back to 1993, when, due to the spread of HIV and a renewed threat of biological warfare, many were beginning to recognize the growing role emerging infectious diseases play in global health. At the same time, the internet was enjoying increased interest and attention, finally being shared by the general public rather than used exclusively as a research tool among scientists. From these fortuitous trends was born ProMED, the Program for Monitoring Emerging Diseases. ProMED was founded by Dr. Stephen Morse, then of Rockefeller University, Dr. Barbara Rosenberg of the State University of New York at Purchase, and Dr. Jack Woodall, then of the New York State Department of Health. Since its inception, ProMED has covered the emergence of infectious diseases and acute exposure to toxins in humans, domestic, wild and captive animals, and crop plants. Thus, ProMED-mail adopted a “One Health” focus well before the recent widespread acceptance of the concept by the wider biomedical community. ProMED’s founding focus on the emergence of new diseases anywhere in the world and in any species made the choice of an integrated “One Health” approach covering humans, animals, and plants an obvious one. After all, a “One Health” methodology is the only way to accurately report what is happening in the world of emerging disease and to alert people to the spread of new diseases that may affect them directly or put human or animal food crop supplies at risk.

ProMED covers the emergence of infectious diseases and acute exposure to toxins in humans, domestic, wild and captive animals, and crop plants.

It is open to all sources and free of political constraints.

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ProMED has several regional networks in multiple languages.

Electronic communications enable ProMED-mail to provide up-to-date and reliable news about threats to human, animal, and food plant health around the world, seven days a week.

ProMED-mail is a web- and email-based reporting system dedicated to rapid global dissemination of information on outbreaks of infectious diseases and acute exposures to toxins that affect human health, including those in animals and in plants grown for food or animal feed. Electronic communications enable ProMED-mail to provide up-to-date and reliable news about threats to human, animal, and food plant health around the world, seven days a week. By providing early warning of outbreaks of emerging and re-emerging diseases, public health precautions at all levels can be taken in a timely manner to mitigate epidemic transmission and to save lives.

ProMED is open to all sources and free of political constraints. Sources of information include media reports, official reports, online summaries, local observers, and others. Reports are often contributed by ProMED subscribers. A team of expert human, plant, and animal disease moderators screen, review, investigate the reports and add explanatory notes, evaluations, and background information before posting them to the network. Reports are distributed by email to direct subscribers and posted immediately on the ProMED website. ProMED-mail currently reaches over 55,000 subscribers in at least 185 countries.

A central purpose of ProMED is to promote communication amongst the international infectious disease community, including scientists, physicians, veterinarians, epidemiologists, public health professionals, and others interested in infectious diseases on a global scale. ProMED encourages subscribers to participate in discussions on infectious disease concerns, to respond to requests for information, and to collaborate together in outbreak investigations and prevention efforts. ProMED also welcomes the participation of interested persons outside of the health and biomedical professions.

ProMED has several regional networks in multiple languages, including Portuguese (ProMED-PORT) and Spanish (ProMED-ESP). Both of these lists cover disease news and topics relevant to Portuguese and Spanish-speaking countries in Latin America and elsewhere. ProMED-RUS offers Russian-language reports relevant to Russia and the independent states of the former Soviet Union. PRO/MBDS posts reports in English on six countries in Southeast Asia bordering the Mekong River. Under a recent grant from Google.org, ProMED is working to enlarge our networks in Francophone Africa (ProMED-FRA) posted in French, and East Africa (ProMED-EAFR) posted in English, as well as to improve the multilingual capacity of PRO/MBDS. ProMED is partnering with HealthMap on this project. This collaboration has already resulted in some exciting new visuals for ProMED, including our shared interactive map which plots ProMED disease reports on HealthMap, and a more user-friendly design for the youngest ProMED regional network, ProMED-EAFR based in East Africa.

Figure 1: Screenshot of interactive ProMED HealthMap <http://www.healthmap.org/promed/en>

Since October 1999, ProMED has operated as an official program of the International Society for Infectious Diseases (ISID), a nonprofit professional organization with 20,000 members worldwide. ISID fully espouses the One Health concept and promotes a synergistic approach to health in its conference programs and its International Journal of Infectious Diseases. ISID's next International Congress on Infectious Diseases (ICID, March 9-12, 2010 in Miami) and International Meeting on Emerging Diseases (IMED, February 4-7, 2011 in Vienna) will continue to provide fora for discussing new research findings and global trends in animal, human, and food plant health.

Following the launch of ProMED-EAFR in June of 2009, ProMED and HealthMap held a workshop highlighting the importance of informal sources in disease surveillance in conjunction with the Training Programs in Epidemiology and Public Health Interventions NETwork (TEPHINET) and The African Field Epidemiology Network (AFENET) conference held in Mombasa, Kenya in August of 2009.

ProMED's focus on human, animal, and food plant health fit well with the One Health theme of the conference, and attendees were very interested in the use of informal information sources such as ProMED and HealthMap as adjuncts to disease surveillance in Africa. Existing partnerships with public health, infectious disease, and veterinary organizations in the region were strengthened, new connections were forged, and over 150 health professionals subscribed to the ProMED-FRA and ProMED-EAFR email lists.

ProMED's commitment to One Health principles is manifest in a number of ways. ProMED's current staff of around 30 individuals in 16 countries includes 7 veterinarians and veterinary medical health specialists (one in Thailand, one in Cameroon, one in Israel, 4 in the USA). We know that ProMED is widely read in the veterinary medical and veterinary public health world; nearly 20% of our 57,000 subscribers belong to the AHEAD (Animal Health and Emerging Animal Diseases) mailing list. We recently reviewed ProMED postings from 1996 to 2004 (Cowen P, et al. Evaluation of ProMED-mail as an electronic early warning system for emerging animal diseases: 1996 to 2004. *J Am Vet Med Assoc* 2006; 229 (7): 1090-9) and found that over 10,000 reports on animal disease were posted during that interval. Approximately 30% covered zoonotic diseases; the remainder related to animal diseases in both domestic animals and wildlife, both free and captive.

ProMED-mail is a part of the team that has recently been awarded the PREDICT grant from the USAID Avian and Pandemic Influenza and Zoonotic Disease Program. The team is headed by the UC Davis School of Veterinary Medicine and includes such influential members as the Wildlife Conservation Society, Wildlife Trust, Global Viral Forecasting Inc., Smithsonian Institute, HealthMap, Google and Veratect. Together, these highly experienced and active groups will develop global capacity to anticipate and prevent emerging infections of the future. In addition, ProMED will participate in the USAID RESPOND initiative along with Tufts University's Cummings' Veterinary School, the University of Minnesota, and DAI to help veterinary field epidemiologists learn to better use informal sources of emerging disease information.

ProMED-mail website: <http://www.promedmail.org>

Publications and Presentations by ProMED Authors
http://www.isid.org/publications/promed_mail_publications.shtml

ProMED in the News
http://www.isid.org/publications/promed_mail_inthenews.shtml

Jack Woodall is a co-founder and Associate Editor of ProMED-mail, a viral epidemiologist and retired Director of the Nucleus for the Investigation of Emerging Infectious diseases, Institute of Medical Biochemistry, Center for Health Sciences at the Federal University of Rio de Janeiro, Brazil.

Lawrence C. Madoff is the Editor of ProMED-mail. He is an infectious disease physician and is Professor of Medicine, Division of Infectious Diseases and Immunology at the University of Massachusetts Medical School and director of the Division of Epidemiology and Immunization for the Massachusetts Department of Public Health.

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Alison Bodenheimer is Project Manager of ProMED-mail, and prior to joining the ProMED team, worked as a Consultant for UNICEF's Operational Research Unit.

Peter Cowen is Associate Professor of Epidemiology and Public Health, College of Veterinary Medicine, North Carolina State University and ProMED-mail Assistant Animal Disease Moderator.

Thanis Damrongwatanapokin is based in Bangkok, Thailand and joined the ProMED-mail team in February 2009 as Veterinary Moderator for the PRO/MBDS network.

Fabian Ekue is the Veterinary Moderator for ProMED-FRA, the francophone Africa network. He is Research Professor in Veterinary Medicine in the specialty of veterinary virology and has worked for the past 30 years in the Institute of Agricultural Research for Development (IRAD), Cameroon.

Tam Garland, a veterinary toxicologist, is an Animal Disease and Zoonoses Moderator for ProMED-mail.

Martin Hugh-Jones is Emeritus Professor, Pathobiological Sciences, School of Veterinary Medicine; Emeritus Professor, Environmental Sciences, School of the Coast & Environment, Louisiana State University, Baton Rouge, LA, USA; Coordinator, WHO Anthrax Working Group; ProMED Anthrax Moderator.

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Thomas Yuill is an Emeritus Professor of Pathobiological Sciences in the School of Veterinary Medicine and is Emeritus Director and Professor of the Nelson Institute for Environmental Studies at the University of Wisconsin-Madison.

A grant opportunity for charitable organizations.....

IDSD/ProMED-mail was awarded a \$25,000 grant from the 'Chase Community Giving program – Round 1' <http://apps.facebook.com/chasecommunitygiving/>. This resulted from a vote of Facebook users who recognized the significant contribution and service that IDSD/ProMED-mail has performed by distributing important worldwide infectious disease information in their free e-mail posts online.

January 15, 2010, Facebook users will have another opportunity to cast up to 5 votes for their favorite charities, but only one vote per charity. The eligible organization receiving the most votes and meeting program requirements will earn a \$1 million grant from Chase. Five additional charities will each receive a \$100,000 grant towards their cause.

Consider supporting ProMED or the charities of your choice by voting on the Chase Community website <http://apps.facebook.com/chasecommunitygiving/> on January 15, 2010.



Tuberculosis: a re-emerging disease in animals and humans

Charles O. Thoen, DVM, PhD, Philip A. LoBue, MD, Donald A. Enarson, MD, John B. Kaneene, DVM, MPH, PhD & Isabel N. de Kantor, PhD

Summary

Tuberculosis continues to be an important disease both in humans and animals. It causes morbidity, mortality, and economic loss worldwide. The occurrence of *Mycobacterium bovis* disease in humans, domesticated, and wild animals confirms the relevance of

Since October 1999, ProMED has operated as an official program of the International Society for Infectious Diseases (ISID), a nonprofit professional organization with 20,000 members worldwide.

International Society for Infectious Diseases (ISID)'s next International Congress on Infectious Diseases is on March 9-12, 2010 in Miami, USA.

Tuberculosis continues to be an important disease both in humans and animals. It causes morbidity, mortality, and economic loss worldwide.

this zoonosis. *M. bovis* in humans continues to be reported in industrialized countries and in immigrants from regions of the world where tuberculosis in cattle is endemic. The real incidence of *M. bovis* in humans in developing countries continues to be roughly underestimated due to the scarcity of appropriate laboratory facilities to isolate and to differentiate *M. bovis* strains. In Latin America, less than 1% of tuberculosis cases are reported as being due to *M. bovis*. However, the economic relevance that meat and dairy industries play in these countries stimulates the promotion of bovine tuberculosis eradication programmes. Human-to-human airborne transmission of *M. bovis* does occur and it may be important where human immunodeficiency virus (HIV) infection in humans is prevalent. *M. bovis* infection in cattle is enzootic and pasteurisation of dairy products is not routinely practised. Eradication of *M. bovis* in cattle and pasteurisation of dairy products are the cornerstones of prevention of human disease. Measures should be developed to identify and control *M. bovis* infection in wild animals as these may be important reservoirs of infection for domesticated food-producing animals. There is a need for medical and veterinary professionals to cooperate on disease outbreaks. The information presented herein strongly supports the 'One World/One Health/One Medicine' concept.

Full text of article:

http://www.doh.state.fl.us/Environment/medicine/One_Health/TB_Thoen_fulltext.pdf

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Dr. John B. Kaneene is Professor and Director of the Center for Comparative Epidemiology, College of Veterinary Medicine, Michigan State University, East Lansing, MI.

Dr. Isabel N. de Kantor is a member of the Tuberculosis Consultants Panel, World Health Organization, Buenos Aires, Argentina.



The Big Fix: Engineering's role in Repairing America's Broken Health Care System

Donya Currie

Health care might be the most difficult system in the universe, considering all the things that can go wrong. It's unpredictable. No two patients are guaranteed the same quality of care on any given day. A clinic waiting room can become packed at any moment, overwhelming an already stressed-out health care staff. A seemingly minor error can be deadly. As U.S. lawmakers grapple with how to overhaul the nation's unwieldy and costly health care system, they would do well to consider systems engineering's long track record of streamlining industries to eliminate fraud, waste, and errors. Medical mistakes are linked to 98,000 yearly deaths and 1 million injuries.

"If you look at the health care system, it's just, to put it bluntly, a big ugly system," said Joseph Hartman, professor and chair of the UF College of Engineering's Department of Industrial & Systems Engineering. "You've got people and services needing to be moved around quickly and efficiently." And then there's that "uncertainty" factor. As in,

how do you know exactly how long a doctor will need to spend with a particular patient? In an emergency department, how can you predict the number of people who'll be packed into the waiting room on any given hour of the day or night?

Kids these days, or anyone younger than 35, might not remember a time when doctors couldn't simply order an MRI and moments later hold a picture of a patient's brain in their hands, said Bruce Wheeler, interim chair of UF's Pruitt Family Department of Biomedical Engineering. Thanks to that "spectacular bioengineering triumph," as

Wheeler called it, there's no need to saw through a patient's skull for a look at the brain. Wheeler's father-in-law checks his blood pressure at home daily and phones the results into a computer that automatically uploads the information for his doctor, saving him a trip to a clinic. Pacemakers, cochlear implants, artificial skin — the contributions engineering has made and continues to make to the field of medicine save and improve countless lives.

That engineering/medicine relationship needs to go a step further, though, especially in light of a health care system where 30 cents to 40 cents of every dollar is spent on costs linked to "overuse, underuse, misuse, duplication, system failures, unnecessary repetition, poor communication, and inefficiency," according to a landmark 2005 report, *Building a Better Delivery System: A New Engineering/Health Care Partnership*.

The following article was originally published by Veterinaria Italiana

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It was one of 13 essays in the monograph 'One Health – One Medicine':

linking human, animal and environmental health,

http://www.izs.it/vet_italiana/2009/45_1/45_1.htm

Enter engineering, the epitome of efficiency. The report, the result of an alliance of the National Academy of Engineering and the Institute of Medicine, grew out of the idea that systems engineering tools — the same practices that keep Wal-Mart, Boeing, and the rest of corporate America going — could transform the way health care is delivered. Those tools include simulation, supply-chain management, game theory, value-at-risk, optimization, and data mining. For the patient, this translates into a better experience and a smaller bill.

Systems engineering can help in the design of operating rooms, management of human resources (how many nurses should be on the night shift, anyway?), scheduling of patients and staff, and more. The marriage of health care and engineering can, and should, result in not only more efficient health care, but also better quality and fewer deadly mistakes.

"If you look at what has to happen in a hospital, you've got really difficult problems because of the uncertainty," Hartman said, pointing again to the need for a systems engineering approach to grease the gears of the health care industry. And that's exactly where engineering can help health care.

"There really is great opportunity for improving the quality, safety, and productivity of health care delivery by bringing these fields and disciplines together," said Proctor Reid, director of programs for the National Academy of Engineering and study director for the committee that authored the *Building a Better Delivery System* report. Reid can list countless areas where engineering approaches could improve health care. For example,

22 trillion dollars spent on health care in 2008

39% increase in spending on health care from 2000 to 2005

90% hospitals without computer programs for physician order-entry

1/3 patients reporting a medical, medication or laboratory error in the past two years

7,000 average number of deaths from medication errors each year

(above facts are based on U.S. healthcare)

Measures are needed to identify and control M. bovis infection in wild animals as these may be important reservoirs of infection for domesticated food-producing animals.

This article originally appeared in the Summer 2009 issue of The Florida Engineer, and is reprinted with permission.

www.thefloridaengineer.eng.ufl.edu

Health care might be the most difficult system in the universe, considering all the things that can go wrong.

hospitals might be making strides in adopting information technology for things like electronic patient records, but how about using IT and systems techniques to improve clinical operations?

“Progress has been very slow, and, I think it’s fair to say, disappointing,” Reid said. Yet he pointed to “islands of progress” like Vanderbilt University’s health system. During a 2008 workshop on using systems engineering to improve traumatic brain injury care in the military health system, Vanderbilt professor Dr. William W. Stead, who also is the Vanderbilt University Medical Center associate vice chancellor for strategy and transformation, presented a case study that should have hospital administrators taking notice. Stead proposed hospitals shift from “expert-based practice” to “system-supported practice,” which, of course, uses engineering to improve patient care. In this case, patients on ventilators need complex, specialized care and are prone to many life-threatening complications.

A systems approach, Stead theorized, could tackle the problem. “The idea behind system-supported practice focuses on the system’s performance; teams of people, a well-defined process, and information technology tools work in concert to produce desired results consistently,” Stead wrote in his case study. The experiment focused on intensive care units and was based on a design that could be implemented in 45 days or less.

Stead said a major breakthrough in the development of the system-supported practice was the “process-control dashboard.” This shows a patient’s status as a set of red, yellow, or green lights, using a line for each patient and a column for each element of the standardized practice. A green light means everything is as expected, a yellow light means action must be taken but there is still time to do so, and a red light means take immediate action.

One reason the Vanderbilt system ended up working well, Stead said, was that it operated as a “closed-loop control,” meaning the output of the system feeds back directly to change the inputs. He likened the system to the interaction between a thermostat and a furnace. When the thermostat senses room temperature is falling below the set limit, it calls for heat, the temperature rises, and the thermostat approaches the upper control limit and turns off the heat. If someone opens a window and changes the inputs to the system, the thermostat adapts to that change without reprogramming. “The desired performance is achieved without programming complex interactions among inputs or modifying the program as inputs change,” Stead wrote. “This what is needed in health care.”

For that to happen, though, hospitals and clinics need to agree on an end-to-end plan of action and have real-time measurement to show what is happening and display a patient’s status and how that fits into the plan. Because, as the report cautions, a run-of-the-mill application of engineering just won’t do. Hospitals are more complicated than giant retail super-centers, and the human body is more complex than an airplane.

UF engineers and medical researchers are constantly looking at creative ways to improve health care. The contributions they are making are patient game-changers that will build on the work programs like Vanderbilt has created to make the internal workings flow more efficiently.

Dr. Paul Carney, director of the UF Epilepsy Research Laboratory, is himself both a neurologist and biomedical engineer and teaches in the medical school and College of Engineering. He sees endless opportunities to meld engineering with medicine to im-

Cochlear implants, pacemakers, artificial skin — the contributions engineering has made and continues to make to the field of medicine save and improve countless lives.

Systems engineering can help in the design of operating rooms, management of human resources, scheduling of patients and staff, and more.

“Systems thinking allows us to at least ponder how we can do things better.”

prove health care. Epilepsy is a seizure disorder that affects 50 million people worldwide. An estimated 25 percent of people with the disease aren't helped by drug therapy. In five to 10 years, Carney hopes to be able to offer them a tiny device that will be implanted in their brain and deliver signals to prevent seizures. In working on that neural prosthetic idea, Carney recognized it needed a specialized, engineering/medical approach. “I realized we were really doing systems biology,” Carney said. “We do strive to combine experimentation with computation around the system, in this case the epilepsy system. We constantly bump into having to understand the brain as a system.”

“Systems thinking allows us to at least ponder how we can do things better,” said Hartman of the Industrial & Systems Engineering Department. “I think the more people you bring into this arena to ask these questions is a healthy thing.” Or consider associate professor Benjamin Lok's Virtual Patients Project. In a twist on video game technology, it allows medical students to examine and relate to life-size patients and learn everything from bedside manner to better diagnostic techniques. Aside from appearing a little wild-eyed, the virtual patients are surprisingly realistic, and they can actually be more effective than human actors when it comes to simulating patient/doctor interaction. A virtual patient, for example, could show symptoms an actor couldn't fake, such as different pupil sizes.

Carney said UF is particularly well-positioned to foster the engineering/health care partnership because the College of Engineering and medical school are physically close, and faculty are willing to work across disciplines. One course, BME 6010, links engineering students with a preceptor in the medical school, and the student comes up with a solution to a problem. That course has spawned real-life medical innovations such as a device that could detect air in a premature baby's abdomen before deadly infection set in. Another student came up with a hand-held brain monitoring system for intensive care patients that could tell a nurse whether a patient was asleep, awake, or having a seizure.

“There are a lot of problems out there, and I think the solutions are within reach,” Carney said. “A systems approach is great because it forces people to interact. We have to meet in the middle and try to leverage each other's expertise.” National Academy of Engineering member William Pierskalla said a systems approach is most useful on the operations side, helping countries like the United Kingdom deliver effective and efficient dialysis treatment. “Basically, what systems engineering is pretty good at is handling waste or inefficiency,” said Pierskalla, a retired engineering professor from the University of California Los Angeles and Wharton School at the University of Pennsylvania who is still active in engineering research. “But health care has been slow to adopt it, as well as a lot of IT in general.”

With a 2009 economic stimulus package that earmarked \$19 billion for health information technology and a spirited national health reform debate brewing, timing could be perfect for more systems engineering to be woven into the health care fabric. “We just have been disappointed that we haven't been able to move this further along,” Reid of the National Academy of Engineering said about incorporating more of a systems approach to health care. “But I'm optimistic.”

Donya Currie is an award-winning freelance journalist and UF grad living in Virginia. She specializes in health topics and is working on a book about the intersection of human, animal, and environmental health. <http://donyacurrie.com/>

One Health in Action!

**Tufts University
tackles the
cross-species
problem of obesity**

*The One Health
Obesity Awareness
Fair featured educa-
tional tables, speak-
ers, tours of the hos-
pital and farm and a
healthy local foods
BBQ.*

Tufts University hosted a One Health Obesity Awareness Fair

Annie Shea [DVM, MPH Candidate 2011]

On October 3, 2009, the Cummings School of Veterinary Medicine at Tufts University hosted a One Health Obesity Awareness Fair in honor of the national One Health Obesity Challenge 2009. Lauren Baker, Tufts University SCAVMA president, and Annie Shea, One Health Committee Chair, invited students from all over the university and local community members to participate and attend. We planned a day of interactive and educational tables, speakers, tours of the hospital and farm, and a healthy local foods BBQ.

Despite a very rainy Saturday morning, we had close to 100 attendees at the event. Buses from the Medford and Boston Tufts campuses allowed students and faculty to attend the event on the Grafton veterinary campus. Students representing many of the schools at Tufts University participated with educational and interactive tables.

The Cummings School of Veterinary Medicine hosted a table called 'Guess the Calories' with a self-quiz of the number of calories found in various dog and cat treats. In addition, we had information about the number of calories required by dogs and cats of different body weights. Purina student representatives hosted a table on body condition scoring and gave away measuring cups and educational information. Pfizer student representatives presented information about Slentrol, a weight loss drug indicated for use in dogs.

The Friedman School of Nutrition and Policy hosted a table with fresh fruit smoothies and information about the Slow Foods Movement, a group dedicated to enjoying fresh, healthy food, a counter to fast life and fast food.

The Fletcher School of Law and Diplomacy's GREENFletcher student group presented information on food security and how unstable environments contribute both to hunger and also to unhealthy food choices.

The Graduate Program of Biomedical Sciences presented easy healthy treats for 3-5 year olds that children could prepare for themselves.

The School of Public Health presented a new scoring system for foods to help people make good food choices while in the supermarket or eating out. Students were able to apply the point system to dog and cat foods as well.

A MPH/MD student presented her summer project on obesity in inner city youth. In addition, Commonwealth Corps, a group that provides food stamp outreach to elderly people, and Community Harvest, a farm that grows food for a local food bank, participated in the event.

John Rush, DVM and board certified veterinary cardiologist gave a great talk about heart disease in dogs and cats and compared veterinary heart disease to heart disease in people. Lisa Freeman, DVM, PhD in nutrition, spoke about reading pet food labels and gave people some excellent information about what to look for in the pet food aisle. Julie MacCartee, MS/MPH student gave an excellent overview about the environmental impacts of our food choices. Following the speakers, we showed the movie 'King Corn', a documentary about the corn industry and its impact on nutrition in the United States.

Local farms, including the Tufts veterinary farm, generously donated fresh produce, meat, and pies, from which students made a delicious lunch provided to all participants and attendees at the event.

Annie Shea is a 2011 DVM/MPH Candidate at Tufts University Cummings School of Veterinary Medicine.

An Essay: Yale Medical School One Health Elective for a Veterinary Medical Student



Jennifer McRobbie [DVM, MPH Candidate 2010]

As a fourth-year veterinary student at Tufts Cummings School of Veterinary Medicine, I have been enjoying my clinical year gaining experience in the animal hospitals where I've finally been able to connect the endless hours of didactic learning with the patients on the table (or in the stall) in front of me. My interests in zoonotic disease epidemiology and public health make me somewhat of an outlier in my veterinary class, but I have found clinical work to be fascinating as well and the education provided at the hospital in Grafton, Massachusetts, is truly exemplary. One of the greatest advantages of our curriculum at Tufts, though, is the emphasis on elective weeks off-campus to explore other specialties and individual areas of interest.

When I told my peers that I was heading to Yale for two weeks this autumn to spend time with Peter M. Rabinowitz, MD, MPH with the Department of Environmental and Occupational Health, I received many puzzled expressions. Many asked if he was a large or small animal veterinarian, a common question in our field. With so many of my classmates using their elective time to visit private veterinary practices, I found that I had difficulty explaining my plans for two weeks with a human physician. I could justify the importance of One Health to my classmates but I was still unsure exactly how my elective would help me to gain a better understanding of veterinary public health. Despite my uncertainty, I thought that spending some time with a human doctor interested in One Health seemed like a promising opportunity.

I first met Dr. Peter Rabinowitz this past spring at the annual wildlife and zoo medicine student organization (WAZE) symposium. The topic of the symposium was "Bridging the Gaps to One Health: Veterinary, Human, and Conservation Medicine" and Dr. Rabinowitz presented clinical cases which highlighted the shared risks of humans and companion animals. We spoke over lunch after his presentation and his enthusiasm for making new connections between human, veterinary, and environmental medicine was infectious. Months later, I contacted him about visiting Yale and he was very receptive to the idea. He had been developing a One Health elective for the medical students and we agreed that a veterinary student perspective might be useful. I was especially interested in the Canary Database and was eager to learn how the curators collected and sorted through the scientific literature to catalog evidence of animals as sentinels of human health hazards.

One goal of my elective would be to recognize clinical linkages between human and veterinary medicine such as zoonoses (diseases transmitted from animals to

The goal of the One Health elective was to recognize clinical linkages between human and veterinary medicine such as zoonoses, the human-animal bond, and animals as sentinels.

I planned to focus on identifying clinical situations where professional communication between human and animal health professionals would be indicated and how to approach these scenarios.

“It struck me that medical students and veterinary medical students receive very similar educations, yet we know so little about how to communicate and combine our fields...”

... This elective showed me that my role in making connections between human and animal health is entirely dependent on my own level of participation.”

humans), the human-animal bond, and animals as sentinels. Next, I planned to focus on identifying clinical situations where professional communication between human health and animal health professionals would be indicated and how to approach these scenarios.

Though each day it seemed that he had a schedule busy enough for a team of medical professionals, Dr. Rabinowitz constantly made me feel like his top priority. In my short two weeks, I participated in a multitude of human health activities and lectures. I attended classes and discussions on campus and learned about various topics such as human and animal exposure to chemical hazards, the progression of H1N1 virus, babesiosis in the human population, and the ecology and epidemiology of vector-borne and zoonotic diseases. I learned how to navigate the Canary Database and enter primary literature. In the hospital, I shadowed second-year medical students as they interacted with patients and learned how to perform physical exams. We talked between appointments and compared classes, textbooks, and curricula. It struck me that medical students and veterinary medical students receive very similar educations, yet we know so little about how to communicate and combine our fields.

While at Yale, I was also able to meet with several veterinarians who had distinctive roles in public health. Lynda U. Odofin, DVM, MSPH spent a morning with me explaining her research on methicillin resistant *Staphylococcus aureus* (MRSA) in swine industry workers. Dr. Odofin showed me her laboratory where she cultures samples taken from pigs and humans. I met with Zimra J. Gordon, DVM, MPH, a veterinarian who works in a small animal private practice while maintaining her interests in zoonoses and public health outside of her clinical work. It was very valuable to me to hear about the experiences and lives of veterinary medical professionals like Drs. Odofin and Gordon, who are working to simultaneously improve human and animal health.

After each of my activities, Dr. Rabinowitz and I would discuss the issues and try to make connections to veterinary medicine. In one particularly valuable exercise, he presented two case studies to me and asked how I would handle each situation as a veterinary medical professional. The first case involved an immunocompromised child whose dog was positive for MRSA, and the second case focused on the health risks of a swine industry worker with Human Immunodeficiency Virus (HIV). Initially, these real-life scenarios were quite intimidating, and I felt overwhelmed trying to find an easy answer. As I began to review the literature and piece together realistic solutions, I recognized that complex issues are not necessarily impossible. With the right training, veterinarians and physicians faced with these problems have the ability to develop solutions that can benefit both human and animal health.

Even though it was only a short time, I believe the ideas and concepts presented to me throughout my elective were invaluable to my development as a future health professional. Previously, my understanding of the role of veterinarians in public health was strictly limited to zoonotic diseases. It was obvious to me that a veterinarian would be important in the control and prevention of zoonoses and it was easy to explain to others. At Yale, I gained an appreciation of issues that are less intuitive and have no clear solutions. Though I had always recognized that the future of One Health depends on health professionals taking collaborative, interdisciplinary leadership roles, this elective showed me that my role in making connections between human and animal health is entirely dependent on my own level of participation. I am now confident that I can call a physician and discuss our shared patients, and I plan to ask owners about their health if there is a relevant problem with their pet. My One Health elective with Dr. Rabinowitz has

As animals and humans collide and attempt to integrate here in the sunshine state, nowhere is it more appropriate to embrace a One Health concept.

The Florida Dept. of Health continues to lead the way on One Health with the formation of an H1N1 Veterinary and Agricultural Liaison.

shaped the role that I expect to take in my future career as a veterinarian in the field of public health.

Jennifer McRobbie is a 2010 DVM/MPH Candidate at the Cummings School of Veterinary Medicine at Tufts University.

H1N1 Veterinary and Agricultural Liaison

Jenifer Chatfield, DVM



Agriculture. To Floridians, agriculture is more than an abstract concept or a pastoral setting romanced in fiction novels; it is an everyday way of life. As Florida's population continues to grow, it expands increasingly into more rural areas of the state. Thus, more people are coming into contact with wildlife, more families are raising livestock, and the companion animal industry is flourishing.

The Florida Department of Health (FDOH) must continue to safeguard the health and well-being of its 2 legged herd: the general public. As animals and humans collide and attempt to integrate here in the sunshine state, nowhere is it more appropriate to embrace a One Health concept than Florida. A subtropical climate with large numbers of travelers is fertile ground for the emergence of vector-borne diseases, such as dengue fever and Rift Valley fever. Of the 1,461 diseases now recognized in humans, approximately 60% are due to zoonotic and vector-borne pathogens. And, over the last three decades, approximately 75% of new emerging human infectious diseases have been zoonotic.

One of the One Health Initiative's four strategic goals is to "create national and international awareness within the health science professions, the broad scientific community, government institutions, the political leadership, and the general public, of the power of One Health to improve the health of people, animals and our environment." Florida Department of Health has been at the forefront of the One Health movement since its inception, and this fall, FDOH continued to lead the way through the formation of an H1N1 Veterinary and Agricultural Liaison in the Environmental Health Division. By doing so, FDOH has officially recognized the role that agriculture plays in the development of a complete public health program.

In her role as liaison, Dr. Jenifer Chatfield will cultivate relationships and enhance communication with private practitioners in both the human and veterinary fields, commercial agricultural producers, Florida Department of Agriculture (FDACS), Florida Fish and Wildlife Conservation Commission (FWC), USDA APHIS (United States Department of Agriculture, Animal and Plant Health Inspection Service) county health departments, and veterinary medical associations, including the Florida Veterinary Medical Association (FVMA) and its regional affiliates. The emergence of the novel 2009 H1N1 is just a hint to the global community of the growing importance of a One Health approach to continued co-habitation.

Dr. Jenifer Chatfield is the new H1N1 Veterinary Agriculture Liaison at the Florida Department of Environmental Health.

USDA and the One Health Initiative

Leslie Tengelsen, PhD, DVM

USDA-APHIS-VS (Veterinary Services) is committed to the practice of One Health and has incorporated One Health concepts into their 2015 agency vision

In 2007, the American Veterinary Medical Association (AVMA), with support from the American Medical Association (AMA), adopted the One Medicine concept and formed the One Health Initiative task force. The task force developed recommendations for public health and animal health professionals, encouraging collaboration between disciplines in order to more effectively recognize and respond to animal and human health threats requiring a multidisciplinary approach. Threats may include, but are not limited to zoonotic and newly emerging pathogens and environmental toxins (<http://www.avma.org/onehealth/>). Animal health, public health, and the environment should all benefit from such collaborative recognition and control efforts.

In 2008, USDA-APHIS (United States Department of Agriculture-Animal and Plant Health Inspection Service) initiated an agency-wide analysis of One Health principles. USDA-APHIS-VS (Veterinary Services) is committed to the practice of One Health and has incorporated One Health concepts into their 2015 agency vision. Goals include establishing collaborative efforts with multidisciplinary One Health partners and defining overarching agency objectives. To that end, USDA-APHIS-VS has created a One Health Working Group (OHWG) to bring One Health concepts to fruition.

Immediate goals of the OHWG include 1) increasing outreach to understand and integrate appropriate aspects of animal health and related One Health partner activities, and 2) undertaking incremental One Health-type projects with public health entities.

In late 2009, USDA-APHIS-VS invited a representative of the National Association of State Public Health Veterinarians (NASPHV), Dr. Leslie Tengelsen, to join the OHWG. She was chosen to provide a public health voice and to contribute to the development of a successful USDA One Health Investigation Team program. In October, the OHWG convened in Ft. Collins, CO for a very productive two-day meeting to identify specific OHWG goals. The group is currently working toward developing formal guidance for the One Health investigation teams, including methods to quickly identify when and how to deploy subject matter experts and share data and laboratory expertise across agencies involved in One Health investigation efforts.

The USDA OHWG is well on its way to developing innovative ways of looking at disease transmission and control that impacts the human-animal interface.

Dr. Leslie Tengelsen is the Deputy State Epidemiologist with the Idaho Department of Health and Welfare and NASPHV Secretary.

Influenza Viruses Continue to Surprise Scientists: Major Meeting Planned this February at Amelia Island, Florida

Gregory C. Gray, MD, MPH, FIDSA



In recent years, much of the scientific dogma regarding influenza viruses has been disrupted by a number of startling observations. Scientists have learned that pigs, turkeys, and dogs may be infected with human influenza viruses. Similarly, scientists have been surprised to learn how readily some animal influenza viruses can infect man and other animal species. These observations have largely been made possible by the modern availability of molecular detection and gene sequencing techniques that readily

The novel H1N1 pandemic influenza virus has shown us, despite our best biosecurity efforts, viruses can rapidly move across wide geographic areas and infect susceptible populations of a number of species.

Scientists who study swine, equine, canine, and marine mammal viruses are planning to share their research findings so the next generation of novel influenza viruses might be anticipated.

permit the identification of strains of influenza crossing from one species to another. These discoveries have threatened the scientific paradigm that major barriers exist to prevent influenza viruses from moving across species.

The discoveries have challenged viral nomenclature, specifically the tradition of partially naming a virus after the first species from which it was detected. “Why do we call this a pig virus when it harms only man?” They have also called for complete transparency and cooperation between public health officials and veterinarians. After all, our experience with novel H1N1 pandemic influenza virus has shown us, despite our best biosecurity efforts, how these viruses can rapidly move across wide geographic areas and infect susceptible populations of a number of species.

With these observations in mind, scientists who study swine, equine, canine, and marine mammal viruses are planning for the first time to share their research findings such that the next generation of novel influenza viruses might be anticipated. The *isirv* (International Society for Influenza and Other Respiratory Virus Diseases) International Symposium on Neglected Influenza Viruses will be held February 3-5, 2010 at Amelia Island, Florida.

The program will include veterinarians, public health professionals, virologists, epidemiologists, historians, agriculture experts, biologists, economists, and physicians all concerned with the diverse and profound impact these lesser known influenza viruses can have upon our world. Influenza experts from the World Health Organization, US Centers for Disease Control and Prevention, the National Institutes of Health, and OIE and OFFLU (international influenza organizations) will speak. Truly a *One Health* event, it is hoped that readers of this newsletter, especially those living in Florida, will take advantage of this rich educational experience. CME will be offered to veterinarians. Meeting details can be found on the Symposium's web site: <http://www.isirv.org.nucleusclient.com/>

Dr. Gregory C. Gray, is Professor and Chair of Department of Environmental and Global Health, College of Public Health and Health Professions at the University of Florida.

2009 H1N1 in Companion Animals

Courtesy Centers for Disease Control and Prevention.

<http://www.cdc.gov/h1n1flu/qa.htm>



Updated on Dec 22

What animals can be infected with the 2009 H1N1 virus?

In addition to humans, live swine and turkeys, a small number of ferrets (which are highly susceptible to influenza A viruses), domestic cats and dogs have been infected with 2009 H1N1 virus. In addition, 2009 H1N1 virus infection was reported in a cheetah in the United States. CDC is working closely with domestic and international public and animal health partners to continually monitor reports of 2009 H1N1 in animals and will provide additional information to the public as it becomes available.

How do pets become infected with 2009 H1N1?

All available information suggests that the ferrets and domestic cats infected with 2009

The CDC is working closely with domestic and international public and animal health partners to continually monitor reports of 2009 H1N1 in animals.

Available evidence suggests that transmission has been from ill humans to their companion animals.

No evidence is available to suggest that animals are infecting humans with 2009 H1N1 virus.

If you are sick with influenza-like-illness, take the same precautions with your pets that you would to keep your family and friends healthy.

H1N1 infections acquired the virus through close contact with ill humans.

Can I get 2009 H1N1 influenza from my pet?

Available evidence suggests that transmission has been from ill humans to their companion animals. No evidence is available to suggest that animals are infecting humans with 2009 H1N1 virus.

What do I do if I am sick with flu-like symptoms and I have pets?

If you are sick with influenza-like-illness, take the same precautions with your pets that you would to keep your family and friends healthy:

- Cover your coughs and sneezes
- Wash your hands frequently
- Minimize contact with your pets until 24 hours after your fever is gone

What should I do if I suspect my pet has 2009 H1N1 influenza virus?

If members of your household have flu-like symptoms, and your pet exhibits respiratory illness, contact your veterinarian.

Is there a vaccine available for my pet?

Currently, there is not a licensed and approved 2009 H1N1 vaccine for pets. (There is a canine influenza vaccine, which protects dogs from the H3N8 canine flu virus, but it will not protect pets against the 2009 H1N1 virus, and the H3N8 vaccine should not be used in any species other than dogs.)

How serious is this disease in pets?

Pet ferrets with naturally occurring 2009 H1N1 infection have exhibited illness similar in severity to that seen in ferrets exposed to seasonal influenza viruses and to 2009 H1N1 virus in laboratory settings. Clinical signs exhibited have included sneezing, inactivity, and weight loss. Of the reported cases, most of the pets have recovered fully with supportive care, although some have died.

Additional Information:

American Veterinary Medical Association http://www.avma.org/public_health/influenza/new_virus/default.asp

United States Department of Agriculture http://www.usda.gov/wps/portal/?navid=USDA_H1N1

On November 17, 2009 the One Health Commission in partnership with the National Academies held a ground-breaking summit in Washington, D.C.



The Executive Summary of the summit can be found at : <http://www.onehealthcommission.org/news/ohc-summit-executive-summary-2009-12-01-b.pdf>.

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Continued.....

Recent One Health Publications:

- Confronting Infectious Diseases in an Interconnected World: People, Animals, and the Environment** - The National Center for Zoonotic, Vector-Borne, and Enteric Diseases (ZVED), Centers for Disease Control and Prevention

http://www.cdc.gov/nczved/docs/strategic_framework-tagged.pdf
- Rabies in the 21st Century - A Global Challenge**. Vaccine, 2009 Nov; Volume 27, Issue 51, Pages 7139-7218. William H. Wunner, editor.

<http://www.sciencedirect.com/science/issue/5188-2009-999729948-1562167>
- Animal-human connections, "one health," and the syndemic approach to prevention**. Rock M, Buntain BJ, Hatfield JM, Hallgrímsson B. - Soc Sci Med. 2009 Mar;68(6):991-5. Epub 2009 Jan 20.

<http://www.ncbi.nlm.nih.gov/pubmed/19157669>
- Institute of Medicine - One Health Study Potential Highly Significant: For National and Global One Health Implementation and Institutionalization**. Prepared by Laura H. Kahn, MD, MPH, MPP, Bruce Kaplan, DVM, Thomas Monath, MD and Jack Woodall, PhD , November 30, 2009 One Health Initiative.

<http://www.onehealthinitiative.com>
- Human-Animal Medicine - Clinical Approaches to Zoonoses, Toxicants and Other Shared Health Risks**. Peter M. Rabinowitz, MD, MPH and Lisa A. Conti, DVM, MPH, DACVPM, CEHP. W.B. Saunders Co. 2010

<http://www.us.elsevierhealth.com/product.jsp?isbn=9781416068372>

For other One Health publications visit the One Health Initiative website.



<http://www.onehealthinitiative.com/publications.php>

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The International Symposium on Neglected Influenza Viruses

Amelia Island, Florida, USA

February 3-5, 2010

<http://www.isirv.org.nucleusclient.com/>

14th International Congress on Infectious Diseases (ICID)

Organized by the International Society for Infectious Diseases

MIAMI, FLORIDA • USA

MARCH 9-12, 2010

http://www.isid.org/14th_icid/

2010 American Physiological Society Intersociety Meeting

Global Change and Global Science:
Comparative Physiology in a Changing World

Westminster, Colorado, USA

August 4-7, 2010

<http://www.the-aps.org/meetings/aps/comparative/index.htm>.

The One Health Newsletter is interested in publishing articles from a variety of view points and perspectives and any opinions and statements made in the Newsletter articles belong to the author (s), not the Editor, Editorial Board, or Newsletter Contributors.