Publications Links

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Newsletter

Wildlife Disease Association

April 2017

First Cases of PPR in Free-ranging Saiga Antelope

By Richard A. Kock, Royal College of Veterinary Medicine

Photo credit, Dr. Munkhduuren, SCVL: Sick saiga antelope on the Khuisin Gobi Western Mongolia with PPR. This animal was approached on foot and a fecal sample was positive by penside test to PPR, their normal flight distance is 500 meters

Peste des petits ruminants (PPR) has been spreading, effectively uncontrolled, across Africa and Asia for over a decade with relatively little engagement from the international donor community to stop it. Despite warnings of the risk of PPR to saiga, a critically endangered species to central Asia, (Kock et al 2014), no appropriate action was taken to protect them in the face of an outbreak in Mongolia. The disease first reported officially to the OIE in September 2016, affecting sheep, goat and yak. FAO technical advisers rightly recommended an emergency vaccination program which included 10.4 million sheep and goats and this was completed but without, seemingly, any thought given to wildlife. The campaign suppressed the disease but apparently failed to stop the spread of virus. It spilled into the small surviving population of saiga antelope (*Saiga tatarica mongolica*) in the Khuisin Gobi desert by 22nd December, 2016. Saiga were at their annual low, virtually starving with temperatures below -30 degrees Celsius and snow falling. Gritty Mongolian herders, braving these extreme conditions, tending their horse and camel herds, were the first to report.

Photocredit, R Kock: Mongolian herders in Khuisin Gobi Western Mongolia and scavenged saiga antelope carcass, January 2017.

A small number of samples taken from saiga reached the State Central Veterinary Laboratories, thousands of kilometres away by the 6th of January and PCR tests confirmed the presence of PPR virus. FAO commendably took immediate action and commissioned an FAO-OIE crisis management committee mission which I led, including Dr. Purevsuren Bolortuya (FAO), Dr. Munkhduuren (SCVL); Dr. Batkhuag (VABA); Dr. Enkhtuvshin (WCS); Dr. Buuveibaatar (WCS); Mr. Aruinbaatar (WCS), Mr.

Oktyabri (FAO) and Mr. Tsend-Auysh (WCS). We were in the field by 18th January, two days drive out from Ulan Bataar. We witnessed a full-blown epidemic and by the end of January, clinical cases and deaths were reported across most of the saiga range, with half the population of an estimated 10,000 animals dead. We found many carcasses and confirmed 19 cases using penside diagnostics (PPR Rapid - BD SL Pirbright UK), including saiga, and confirmed for the first time PPR in wild Siberian ibex (*Capra sibirica*) and goitered gazelle (*Gazella subgutttorosa*). Two other dead saiga we examined were negative for PPR but with signs of starvation and contagious ecythma respectively, and an ibex was shot with severe mange. Further samples are being analyzed to try to explain this mass mortality event and extreme susceptibility of saiga. This makes a double tragedy for the species with over 200,000 decimated in Kazakhstan by hemorrhagic septicemia in 2015.

Spill-over to wildlife confirms the failure of the current global strategies for PPR control. Regrettably, despite lip service to One Health, there is still precious little consideration being given to the serious threat epidemic livestock disease poses to wild ungulates, already under huge pressure from grazing competition and poaching. This event will surely drive this subspecies close to the brink of extinction and, who or what will we blame? The virus? With a few surviving unaffected saiga, dying argali, ibex and goitered gazelle and around two million naïve Mongolian gazelle to the East of the saiga range, I respectively ask the donors and veterinary authorities to treat this as an ongoing international disease emergency and counter this stoppable virus with a well-coordinated response.

My sincere thanks to the members of the emergency mission, the FAO CMC AH, Wildlife Conservation Society, the Mongolian Veterinary Authorities and staff, and members of the National Emergency Committee and task force for saiga, and local authorities and the community for their openness and hospitality during this work.

Kock R.A., M.B. Orynbayev, K.T. Sultankulova, V.M. Strochkov, Z.D. Omarova, E.K. Shalgynbayev, N.M. Rametov, A.R. Sansyzbay, S. Parida (2015) Detection and genetic characterization of lineage IV peste des petits ruminants virus in Kazakhstan, Transboundary and Emerging Diseases, 62(5), 470–479. doi:10.1111/ tbed.12398

WDA 66th International Conference

WDA: Building bridges not walls

Deadline for abstract submission for 2017 WDA Conference in San Cristobal de las Casas, Chiapas, Mexico extended until April 14th. See at: **http://www.kalaankab.org/**

For program, registration, travel, lodging and other information see **Conference website:** www.kalaankab.org

An interactive map of lodging options in San Cristobal is at: http://www.kalaankab.org/travel.html

The conference will be bilingual. Simultaneous translations will be provided for most major sessions and when meeting in split sessions there will be Spanish and English options.

66th WDA Annual International Conference

3rd Conference of the WDA Latin American Section

5th Kalaan Kab International Congress on Disease Ecology

San Cristobal de Las Casas, Chiapas, Mexico 2017, July 23rd-28th

Event venue will be "Casa Mazariegos"

"Building networks for sustainable health"

MAIN TOPICS INCLUDE:

- WILDLIFE DISEASES AND SPECIES CONSERVATION
- DISEASE ECOLOGY AND ECOHEALTH
- SPECIES DIVERSITY AND PATHOGEN DISTRIBUTION
- ECOTOXICOLOGY AND ENVIRONMENTAL HEALTH
- MATHEMATICAL MODELS AND SIMULATIONS
- MICROBIOMES IN WILDLIFE
- HEALTH AND WILDLIFE MANAGEMENT
- ONE HEALTH AND PUBLIC HEALTH POLICY

KEYNOTE SPEAKERS

Carol Meteyer
National Wildlife Health Center, USGS, USA
Jonna Mazet
One Health Institute, UC Davis, USA
Jean-Francois Guegan
MIVEGEC, IRD, France

*Pre-congress workshops will be announced soon.

Registration fees	On time (US$)*	Late
STUDENTS		
Students (LAWDA)**	175	275
Latin Students (not WDA/LAWDA)	225	325
WDA Students from all other countries	250	350
PROFESSIONALS FROM LATIN AMERICA		
LAWDA/WDA Regular Members **	350	450
LAWDA/WDA Associate/Aquatic Members	380	480
Non-members of LAWDA/WDA	450	550
PROFESSIONALS FROM ALL OTHER COUNTRIES		
Regular WDA Members (not Latin American)	430	530
Associate/Aquatic WDA Members	480	580
Not WDA Member	530	630

* Until June 1st 2017
** Applies to current (2017) WDA regular and student members only, who reside in Latin American countries and have paid LA-WDA Section dues for 2017.
*** The evening events and four lunches are included

For more information:
www.kalaankab.org | www.eefmvz.net | sancristobalwda2017@gmail.com | www.wildlifedisease.org/wda

Wildlife Veterinary Section News

The WDA Wildlife Veterinary Section (WVS) is pleased to announce it is offering a travel award this year for the WDA Conferenence in San Cristobal de las Casas, Chiapas, Mexico. The award will be $500 to a speaker who presents on a problem or issue of significant veterinary interest. This award will be for an individual coming from one of the contries that qualifies for free access to the JWD (other than Mexico...to optimize global participation). More information soon. Please visit the link below to determine if you qualify: http://www.jwildlifedis.org/page/countryaccess

Latin American Section News

WDA 2017 CONFERENCE - LATIN AMERICA AND CARIBBEAN STUDENT REGISTRATION GRANTS

In an effort to encourage Latin American and Caribbean students to attend the 66th WDA Annual International Conference to be held in San Cristobal de las Casas, Chiapas, Mexico, July 24-27, 2017, the Latin America Section (WDA-LA) will provide up to 10 free student registrations.

Applications period April 5-30, 2017. See at: http://www.kalaankab.org/la-grant.html

To qualifythe following requirements must be met:

Be an undergraduate or postgraduate student at a Latin American and / or Caribbean university institution in biological sciences, conservation, wildlife management, biomedical or health sciences,

veterinary medicine, public health or tropical diseases.

Be a current (2017) student member of Wildlife Disease Association (WDA) and have paid 2017 dues to its Latin American Section

Provide a CV

Provide a short (1 page) letter of Intention

Provide 2 reference letters

Candidates who have submitted an abstract to the conference will be given preference

These above information must be sent to the email wdalatinoamericana@gmail.com before April 30 23:59:59 pm hours GMT-4

* These grants cover only the conference registration tax, any other expenses associated with transportation, lodging and food must be paid by the candidate

We look forward to seeing you in Mexico in July

Saludos

Dr. Gerardo Suzán

Jefe del Departamento de Vinculación

Facultad de Medicina Veterinaria y Zootecnia

Yellow Fever in Brazil: A Classic Example of One Health

By Marina Galvão Bueno, Oswaldo Cruz Foundation (Fiocruz) and Ana Carolina Ewbank, Laboratory of Wildlife Comparative Pathology (LAPCOM). University of Sao Paulo, Brazil

The current Yellow fever outbreak in Brazil is a great example of how disturbances in one or more of the pillars of the "One World, One Health Concept" – environmental, animal and human health – can have detrimental conservation- and public health-related consequences. Yellow fever is an acute febrile and non-contagious infectious disease caused by a RNA virus of the Flavivirus genus that affects humans and primates (Figure 1), considered endemic in parts of Africa and South America. It is often found in several forest-dwelling mammal species, from marsupials to primates. The virus remains in the environment through transmission between non-human primates to human and blood-feeding mosquitoes, and transovarial transmission in mosquitoes. Thus, mosquitoes are both vectors and reservoirs, whereas monkeys are hosts, and just like humans, are affected by the disease (because of their susceptibility to the pathogenic effects of the virus). Yellow fever presents two cycles in America: the urban cycle, last reported in Brazil in 1942, transmitted by the *Aedes* (mainly the *Aedes aegypti*) and the sylvatic or jungle cycle transmitted by *Haemagogus* and *Sabethes* mosquitoes. Humans are accidental hosts and get infected by the bite of infected *A. aegypti* mosquitoes breeding in water-containing vessels inside or close to dwellings or by *Haemagogus* and *Sabethes* mosquitoes that previously fed on a viremic animal.

Figure 1. The Northern muriqui (*Brachyteles hypoxanthus*), a threatened species host.

http://www.telegraph.co.uk/news/earth/earthpicturegalleries/6194490/Saatchi-Gallery-wildlife-exhibition-The-Art-of-Thriving.html?image=18

Since December 2016, Brazil has been experiencing one of the largest yellow fever outbreaks (sylvatic cycle) in many years, mainly affecting Southeastern states, particularly Minas Gerais and Espírito Santo (Figure 2), with notified suspected cases in another 17 states throughout the country. According to the last bulletin of the Brazilian Ministry of Health, there are currently 492 confirmed human cases and 1101 still under investigation. Yellow Fever deaths account for 162 human cases with another 95 deaths still under investigation - a mortality rate of 32.9%. All confirmed cases are distributed among four states: Minas Gerais (375), Espírito Santo (109), São Paulo (5) and Rio de Janeiro (3) (Figure 2).

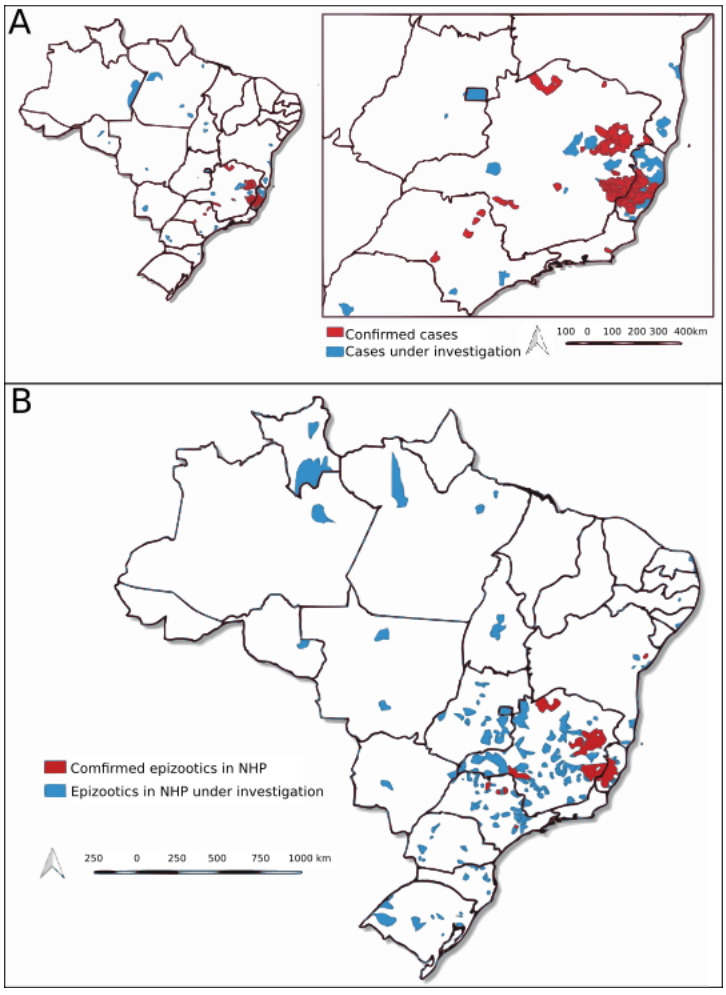


Figure 2. Geographic distribution of the confirmed (red) and under investigation (blue) yellow fever cases registered in Brazil between December 2016 and March 2017: A - Human cases, B - Epizootics in Non-Human Primates (NHP). Source: Data from the Brazilian Ministry of Health at: http://portalarquivos.saude.gov.br/images/pdf/2017/marco/24/COES-FEBRE-AMARELA-INFORME-33.pdf

One of the major concerns regarding the current outbreak is the arrival of the virus to heavily populated cities through the *Aedes aegypti*, triggering the urban cycle of the disease. This has not

happened yet and the government has been working to control the epidemics by investing in yellow fever vaccine production and promoting large-scale campaigns of human vaccination in confirmed epizootics and adjacent areas. There are currently no available records on the exact number of yellow fever primate deaths, but until March 23rd 2017, there were officially 1324 primate epizootics notified; 387 confirmed and 432 still under investigation. The numbers, however, continue to increase: the latest confirmed report identified 3 new primate deaths in Campinas, 99 km from São Paulo, the third most populated city in the world, with approximately 12 million people.

Primates are of special concern, once they are severely affected, dying in outbreaks of severe and rapid mortality, and vaccines are not available for them. Great primate mortality has been recorded in the current epizootic, mainly in Espírito Santo and Minas Gerais. Other primate species supposedly affected by the outbreak include the buffy-headed marmoset (*Callithrix flaviceps*), crested capuchin (*Sapajus robustus*), titi monkey (*Callicebus personatus*) and tufed capuchin *(Sapajus nigritus*). All Neotropical primates are susceptible to the virus; some genera are more sensitive and present higher mortality rates (e.g. *Alouatta* (howler monkeys) and *Callithrix* (marmosets and tamarins)), whereas others seem more resistant and are reportedly able to acquire immunity (e.g., *Sapajus* (capuchin monkeys)). If the host, either humans or monkey, do not die within a few days following infection, they develop permanent immunity, thus acting as virus amplifiers during this short time. Furthermore, yellow fever outbreaks along with habitat destruction and other known factors affecting the conservation of primates are likely to have a synergistic effect that may severely affect these species and lead to extinction, especially of populations isolated in fragments and/or already threatened. According to researchers, 80% of the brown howler monkeys (*Alouatta guariba*) living in forest fragments of Minas Gerais have already died. This situation has caused great concern among primate conservation groups, once some epizootics have occurred in areas close to the natural habitat of threatened primate species, such as the critically endangered Northern muriqui (*Brachyteles hypoxanthus*) (Figure 1) in the state of Minas Gerais and the endangered golden lion tamarin (*Leontopithecus rosalia*) (IUCN 2008) (Figure 3) in Rio de Janeiro state.

Primates are sentinels of yellow fever. In the Americas, deaths of susceptible non-human primates may indicate the presence of the virus in a specific geographic location or environment, and surveillance provides an early warning of human transmission risk, promoting the rapid implementation of vaccination and prevention strategies. However, there is a great deal of concern on the part of conservationists and primatologists over the spread of misinformation about the actual role of primates in the yellow fever cycle. Inaccurate information or misrepresentation of news provided by the media have initially led to monkey aggressions and deaths caused by misinformed people trying to protect human populations living in the affected areas, mistakenly blaming primates for the presence of the virus and its transmission. As an attempt to stop such behavior, many primatologists have carried out educational campaigns and reached out to major media broadcasters in an attempt to avoid more primate deaths.

It is estimated that Yellow Fever has occurred cyclically every 6 or 7 years, but the current situation is worse than our last outbreak, in 2008-2009, when the great majority of primate deaths was concentrated in the southern Brazilian states. Now the disease shows as higher dispersion and primate and human mortality rates, and is expanding to new areas. No one knows for sure why, but it is believed that environmental factors such as climate changes, forest fragmentation, biodiversity loss, human vaccine failure and human movement between endemic and non-endemic regions could favor the epizootics. Thus, some institutions are proposing projects to further understand some of these factors. The Center for Information on Wildlife Health (CISS) of the Oswaldo Cruz Foundation (Fiocruz), has been working with the Ministry of Health to try to understand, with the aid of computational data modeling, the factors involved in this outbreak, based in several climatic, environmental and socioeconomical data.

Further studies are still needed in order to address all these unanswered questions, especially those regarding primate susceptibility, resistant species, immune response, potential vectors, etc. Until then, the Ministry of Health, along with researchers and local and federal governments need to implement a broader yellow fever vaccination and vector control campaigns, monitor the primate population (sentinels) living adjacent to known endemic areas and/or currently or previously affected, and educate the public regarding the importance of primate species as yellow fever sentinels and counter the misconception that killing primates will prevent the spread of the disease. Primates are sentinels of yellow fever and protecting them is a matter of conservation as much as it is of public health.

Source of information: LAWDA Section Newsletter Volume II, number I – March, 2017

http://sbprimatologia.org.br/o-surto-de-febre-amarela-no-brasil-e-seus-impactos-sobre-populacao-de-macacos/

http://www.biodiversidade.ciss.fiocruz.br/sites/www.biodiversidade.ciss.fiocruz.br/files/sitecissenglish.pdf

Bicca-Marques, J. C., & de Freitas, D. S. (2010). The role of monkeys, mosquitoes, and humans in the occurrence of a yellow fever outbreak in a fragmented landscape in south Brazil: protecting howler monkeys is a matter of public health. *Tropical Conservation Science*, *3*(1), 78-89.

Monath, T. P., & Vasconcelos, P. F. (2015). Yellow fever. *Journal of Clinical Virology*, *64*, 160-173.

Figure 3. Golden lion tamarin (*Leontopithecus rosalia*).

https://www.robertharding.com/index.php?lang=en&page=search&s=golden%2Blion%2Btamarin%2B%2528leontopithecus%2Brosalia%2529&smode=0&z

Africa Middle East Section News

WDA-AME Wildlife Disease Symposium, 6-8 December, 2017

Wildlife Disease Association (WDA)-Africa Middle East (AME) Section has organized a WDA-AME Wildlife Disease Symposium as part of the 11th Tanzania Wildlife Research Institute (TAWIRI) Scientific Conference that will be held at the Arusha International Conference Centre (AICC) in Arusha, Tanzania from 6-8 December 2017.

TAWIRI conference will be held under the theme: *"People, Livestock and Climate change: Challenges for sustainable biodiversity conservation*". The special WDA-AME Wildlife Symposium will be under the sub-theme: "*Wildlife Diseases and Ecosystem Health"*.

WDA-AME Wildlife Disease Symposium is entitled: "*The role of Wildlife Health Professionals and the increasing trend of emerging and re-emerging diseases at wildlife-livestock-human interface".*

The objectives of the symposium include:

1. To mobilize wildlife health professionals to proactively engage in investigation and outbreak responses of infectious diseases of wildlife origin
2. To equip wildlife health professionals with current knowledge and status of infectious diseases
3. To update wildlife health professionals with advances in one health approaches to disease investigation and outbreak responses

The call for abstracts following the TAWIRI conference published guidelines can be found at: **http://www.tawiri.or.tz/index.php?option=com_content&view=article&id=26&Itemid=25**

Abstracts for the WDA-AME Wildlife Disease Symposium should be submitted to **mugishalaw@gmail.com** for special handling and submission by the section. The abstract should be submitted together with the filled registration form.

Thank you sincerely,

Dr. Lawrence Mugisha

WDA-AME Wildlife Symposium

Nordic Section News

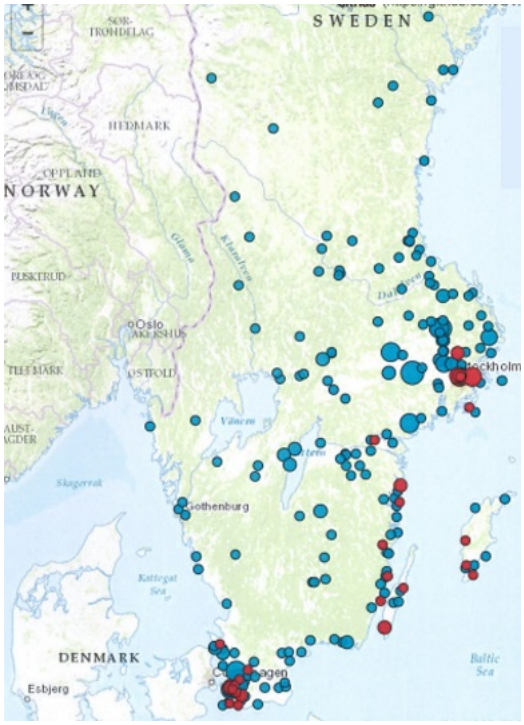
Influenza A (H5N8) in the Nordic Countries (Caroline Bröjer, National Veterinary Institute (SVA), Sweden; Minna Nylund and Marja Isomursu (EVIRA), Finland; Charlotte Kristiane Hjulsager and Mette Sif Hansen (National Veterinary Institute at DTU), Denmark)

Highly pathogenic avian influenza virus (HPAIV) A(H5N8) was detected in South Korea in January 2014 and was followed by outbreaks in Japan and China. The virus subsequently spread and was detected in Europe at the end of 2014 and continued to circulate in a few countries during the beginning of 2015. The virus was again detected in Europe in wild birds (in Hungary) in October 2016 and has since November spread to a large number of countries throughout Europe infecting both poultry and wild bird species.

Starting November 2016 HPAIV-H5N8 was detected in the Nordic countries. In Sweden, the National Veterinary Institute (SVA) has diagnosed the virus in 50 wild birds between November 2016 and March 2017. Species affected were Tufted duck (*Aythya fuligula*), Mallard (*Anas platyrhynchos*), Common goldeneye (*Bucephala clangula*), Mute swan (*Cygnus olor*), Herring gull (*Larus argentatus*), Black-headed gull (*Chroicocephalus ridibundus*), White-tailed eagle (*Haliaeetus albicilla),* Peregrine falcon (*Falco peregrinus*), Common buzzard (*Buteo buteo*), Eurasian sparrow hawk (*Accipiter nisus*), Carrion crow (*Corvus corone*), Eurasian magpie (*Pica pica*), and Rook (*Corvus frugilegus*). All positive cases originated from the South-East of Sweden.

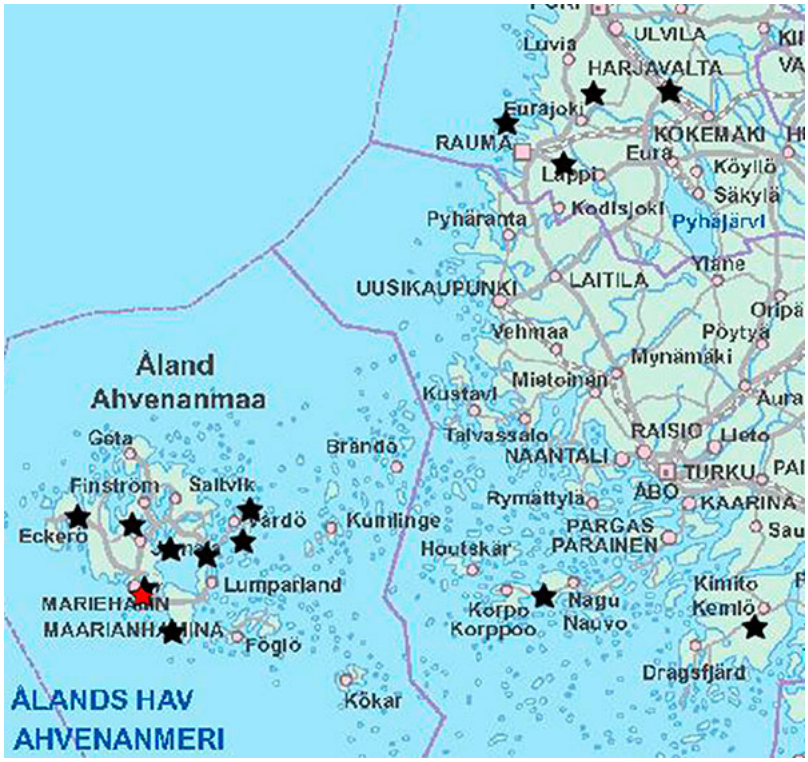
No cases of HPAIV-H5N8 have been reported from Norway.

In Denmark, the National Veterinary Institute at DTU diagnosed 65 dead wild birds with HPAIV-H5N8 during 2016. The birds originated from all over Denmark. Species affected were mainly tufted duck, mute swan, gulls and different birds of prey. The outbreak is ongoing (March 2017).



Wild birds tested for influenza virus (blue dots) and wild birds positive for HPAIV-H5N8 (red dots) in Sweden Sept 1, 2016 to March 20, 2017

In Finland, the Finnish Food Safety Authority (Evira) has diagnosed 13 wild birds (9 White tailed eagles, 3 Tufted ducks, and one eagle owl- *Bubo bubo*) with HPAIV-H5N8 between November 2016 and February 2017. All cases have been found in the South-West of Finland.



Wild birds positive for HPAIV-H5N8 (black stars) in Finland between November 2016 and February 2017.

Compared to reports in 2014/2015, an increased mortality and an increased number of affected species have been reported in the current outbreak, suggesting a higher pathogenicity of the virus. It is interesting to note the large number of affected raptors as well as the fact that several small scavenger species, that could potentially be involved in the spread of the virus to captive birds, have been positive for the virus. Continued surveillance among wild birds and genetic analysis of the virus is warranted in order to detect infected birds and reduce the risk of spread to poultry, as well as to better understand the properties of the currently circulating virus.

WDA Student Corner

What's on?

Mentorship program coming up soon: We (the Student Activity Committee) are currently working on reviving the mentorship program in collaboration with the Joint ad hoc WDA- AAZV (American Association of Zoo Veterinarians) Committee. Student members will be able to apply for being matched with a suitable mentor. Check the WDA website and Facebook group for updates!

Don't miss out on the Student Chapter Grants: Application deadline is May 1st. For details check the WDA website: **http://www.wildlifedisease.org/wda/STUDENTS/StudentChapters.aspx**

Young wildlife professionals in focus

Where does the journey lead you? National Park vet, field biologist, academic? The options are plentiful. However, getting the job of your dreams often appears like a long and rocky road. In this section we introduce extraordinary newly graduated vets and biologists who followed that rocky road all the way through.

Of Speedy Kiwis and Bored Penguins

India is huge. Her possibilities for vets are not. In contrast to Western countries where applicants pile up for vet school, this profession is still rather unregarded in India. Hence getting into vet school is fairly easy.

But things are on the move. For the past 10 years more and more women choose to become vets and slowly start changing the face of the profession. Madhumita Kale is one of them.

From the cradle, Madhumita wanted to work with animals and she kept following this path: At the Bombay Veterinary College she received her Bachelors degree in Veterinary Science and Animal Husbandry. Following this, she moved to New Zealand to do her Masters in Wildlife Health at Massey University. For her thesis she spent countless hours roaming the deep New Zealand woods chasing after blood samples of kiwis.

After her graduation, she was certain in her determination to return to her home country - to an amazing diversity and abundance of wildlife and a need for vets to work towards reducing the very common human-wildlife conflict due to habitat destruction and encroachment.

During her studies Madhumita gained vast experience in wildlife medicine at rehabilitation facilities and zoos in India and New Zealand. Upon her return, Mumbai zoo approached her to take care of a bunch of very special newcomers to the zoo and Madhumita accepted straight away: She became the first penguin vet in India taking care of 7 Humboldt penguins.

The first few months in her new job turned out rather tricky: One of the birds died of an infection upon arrival. As construction work of their exhibit was still ongoing, the penguins were forced to stay at the quarantine facility for 8 months. As there were no labs in the country that would process penguin samples, Madhumita set up her own 'penguin lab'. Besides monitoring water and air quality and temperature at their enclosure, the birds' boredom was one of her biggest enemies. Bored penguins are unhappy penguins and hence this issue had to be fixed: Madhumita came up with ever changing ways of keeping the curious birds active.

And her efforts paid off: In March 2017 the penguins got to move into their new enclosure and Mumbai came to watch: 15.000 people crowded around the exhibit to see the first penguins displayed at an Indian zoo for nearly two decades.

If you have any suggestions for a young wildlife professional in focus or if you have any other ideas for the Student Corner, please send an email to Catharina Vendl, Student Representative on Council, (catharinavendl@gmail.com)

USGS-NWHC Quarterly Wildlife Mortality Report, April 2017

Written and compiled by members of the U.S. Geological Survey National Wildlife Health Center - Wildlife Epidemiology & Emerging Diseases Branch.

Avian Cholera Winter 2016-2017 National Summary

The USGS National Wildlife Health Center (NWHC) investigated eight wildlife mortality events between November 1, 2016 and March 1, 2017 in which avian cholera (caused by the bacterium *Pasteurella multocida*) was either suspected or confirmed as the causative etiologic agent. Five additional event reports were provided by State wildlife management agencies. The 13 events were spread over ten states (California with four events, and one each in Idaho, Illinois, Missouri, Montana, Nebraska, New Mexico, Oregon, Texas, and Washington) and three flyways (Mississippi, Central, and Pacific). The estimated mortality reported to date in these events ranges from less than ten to over 6,500. The three largest events include Canyon County, Idaho (beginning February 2017) with an estimated mortality of 6,500 dabbling ducks as of March 6, 2017; Yolo County, California (January 2017) with an estimated mortality of 3,750 (primarily American coot [*Fulica americana*] and a small number of dabbling ducks); and McNary National Wildlife Refuge (NWR) and surrounding areas in Washington (February 2017), with an estimated mortality exceeding 2,000. The McNary NWR event primarily involved mallard ducks (*Anas platyrhynchos*), but also included other dabbling ducks, herons, owls (barn [*Tyto alba*] and great horned [*Bubo virginianus*]), and raptors (northern harrier [*Circus cyaneus*], red-tailed hawk [*Buteo jamaicensis*], and bald eagle [*Haliaeetus leucocephalus*]). More information about avian cholera can be found on the NWHC website.

Bsal Update

In 2016, the USGS National Wildlife Health Center (NWHC) collaborated with the USGS Amphibian Research and Monitoring Initiative (ARMI) to conduct a spatial risk analysis of the introduction of the invasive salamander fungus *Batrachochytrium salamandrivorans* (Bsal). Bsal is currently not known to exist in the U.S. and the NWHC-ARMI collaborating scientists were guided by the risk analysis to collect samples from live amphibians with the goal of detecting Bsal if it were present in the highest risk areas. This effort resulted in 7,735 samples collected from over 30 species in 20 states and all samples were negative for Bsal using real-time PCR diagnostics. Additional information about the Bsal surveillance effort is available on the NWHC website.

Avian Influenza 2016-2017 Update

The U.S. interagency (U.S. Department of Agriculture, Department of the Interior, Centers for Disease Control and Prevention, States, and the National Flyway Council) surveillance program for the detection of highly pathogenic avian influenza (HPAI) virus continued in the 2016-2017 surveillance year. Between July 1, 2016 and February 1, 2017 a total of 33,695 birds was sampled, with 96% of those samples coming from dabbling ducks. Pursuant to this surveillance effort HPAI H5N2 was detected in two mallards (*Anas platyrhynchos*) including one from Fairbanks-Northstar Borough, AK, in August 2016, and one from Fergus County, MT, in December 2016. In each case, the HPAI virus was the Eurasian-American lineage H5N2 (clade 2.3.4.4) that was first detected in North America in December 2014.

Globally, HPAI H5 subtype detections have continued in wild and domestic birds in Europe, Asia, and Africa during the fall and winter of 2016-2017 with more than 40 countries reporting outbreaks to the World Organisation for Animal Health (OIE). As of March 13, 2017, there have been 576 reported outbreaks in poultry, with nearly seven million poultry destroyed worldwide. Additionally, during the same timeframe there were 638 reported outbreaks involving more than 75 species of free-ranging or captive wild birds (618 of these were H5N8). In January 2017, a mortality event involving more than 1,200 white-winged terns (*Chlidonias leucopterus*) and other wild bird species was reported in Uganda; HPAI H5N8 was isolated from numerous birds from this outbreak. At least five different HPAI H5 subtypes have been detected during these outbreaks worldwide. For additional information on the current global HPAI situation, please reference the following OIE Situation Report.

National Surveillance Continues to Detect Spread of White-Nose Syndrome in Bats

The USGS National Wildlife Health Center (NWHC) continues to assist State and Federal wildlife agencies nationwide with early detection of *Pseudogymnoascus destructans* (*Pd*), and to address specific research priorities identified by partners in conjunction with the White-Nose Syndrome National Plan. During annual bat population surveys, participating State agencies collect bat skin swabs, pooled guano, hibernaculum sediment, and environmental substrate swabs. If white-nose syndrome (WNS) clinical signs are observed in the population, carcasses or wing biopsies are collected for diagnostic testing.

Since 2014, 226 unique hibernacula have been surveyed nationwide. These samples have resulted in the detection of *Pd* at 81 hibernacula of previously unknown *Pd* status from 13 states, including 28 sites where there was no physical or behavioral evidence of WNS observed in the bat population. Nearly 95 percent of all detections of *Pd* originated from samples collected from bats rather than from environmental substrates collected inside of hibernacula. Data analysis and modeling of risk factors associated with *Pd* movement from data collected during the past three years of the project are currently underway.

In winter 2016-2017, WNS was confirmed for the first time in Nebraska (Cass County) where *Pd* was first detected in 2015. Additionally, Texas announced detection of *Pd* in six counties (Childress, Collingsworth, Cottle, Hardeman, King, and Scurry) and on two new bat species, cave myotis (*M. velifer*) and the western sub-species of Townsend's big-eared bat (*Corynhinus townsendii townsendii*). No clinical signs or mortality were reported in Texas. These findings increase the number of states with confirmed cases of WNS to 30, while the number of affected Canadian provinces remains at five. Three additional states (Texas, Mississippi and Oklahoma) have reported detection of Pd in hibernacula in the absence of confirmed WNS. Northern long-eared bats (*M. septentrionalis),* little brown bats (*M. lucifugus),* and tricolored bats (*Perimyotis subflavus)* remain the species most often positive for *Pd.*

Despite national surveillance to detect the spread of WNS, the 2016 detection of WNS in Washington State illustrates the ongoing importance of investigating wildlife mortality events as part of a comprehensive wildlife disease surveillance strategy, and we encourage wildlife managers to report unusual bat mortality or bats displaying clinical signs suggestive of WNS to the NWHC for further investigation. We can also answer questions about designing WNS surveillance and response plans relevant to your state and help with testing samples collected as part of opportunistic or targeted surveillance efforts in accordance with the national *Pd* surveillance strategy. Tribal, State, and Federal agencies with questions about ongoing surveillance efforts, or who may wish to participate, should contact Dr. Anne Ballmann (608-270-2445, aballmann@usgs.gov).

Please visit www.whitenosesyndrome.org for more information about the national multi-agency WNS response effort. A recently completed fact sheet titled "White-Nose Syndrome in North American Bats – USGS updates" is available online. For paper copies, please contact Gail Moede Rogall, gmrogall@usgs.gov. Also, a WNS poster and handout are available at https://www.whitenosesyndrome.org/resource/white-nose-syndrome-poster-available-your-use.

To view, search, and download historic and ongoing wildlife morbidity and mortality event records nationwide visit the Wildlife Health Information Sharing Partnership event reporting system

(WHISPers) online database: http://www.nwhc.usgs.gov/whispers/

To request diagnostic services or report wildlife mortality: http://www.nwhc.usgs.gov/services/