Bovine Tuberculosis in Wildlife - Overview and Update from South Africa: Publication of Disease Information from BTB Outreach Day

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Bovine tuberculosis in wildlife is a global concern for wildlife veterinarians, managers, agencies involved with animal disease control, researchers, and public stakeholders. Advances in knowledge and understanding of disease pathogenesis, epidemiology, diagnostic techniques, and strategies for management and control are constantly evolving. However, for many individuals and groups, accessing current information may be challenging. In order to provide local and regional stakeholders with contemporary material on BTB in wildlife in South Africa, a sponsored information session was held on March 2, 2015. Since attendance was limited, it is crucial that the knowledge conveyed to participants be available to a wider audience. The WDA Small Grant award will support publication of an information booklet (electronically and limited print version) to disseminate the most up-to-date data and discussions that resulted from this event. This will be conveyed through various regional wildlife association websites and other listserves that reach wildlife veterinarians, regulatory personnel, game ranchers and conservation agencies. In addition to distribution in southern Africa, this material will be made available on the WDA website, thus furthering the mission of WDA to disseminate knowledge of wildlife diseases that impact management of wildlife, conservation, and their interaction with humans and domestic animals.

Figure 1: TB testing a lion
The monotonous “thump, thump, thump” of the Hammer Head bat (Hypsignathus monstrosus) reverberated through the forest, the sound occasionally moving up and down the river system that coursed past our remote camp. Thoughts of the Ebola virus living within this ecosystem passed my fuzzy mind (where are you lurking?) as I listened to the night sounds in Odzala-Kokoua National Park (O-KNP) and to the occasional human snore from our sleeping team. We were camped alongside a river that appeared to be rising, the sound of thunder and flash of lightning up stream reminded me that an evacuation route might be needed.

It was November 2014 and I was contracted by African Parks to be part of a team tracking and immobilizing Forest elephant in the heart of O-KNP. We had trekked across open savanna, savanna mosaics with islands of tall trees in which anything might be lurking including elephant, chugged up river systems in a pirogue with the river banks cloaked in tall closed canopy forest. Mixed monkey troupes were often startled by our sudden presence, scuttling across the canopy and Giant Blue Turaco (Corythaëola cristata) belted out their calls from high in the forest. Odzala is a unique 13600 km² wilderness situated in the northern part of the Republic of Congo, just across the equator.

Tracking Forest elephant in this environment is the ultimate challenge in my opinion! Just yourself as a veterinarian, a dart gun and other kit, Ba’aka pygmy trackers, an ecologist and other members of the team, no fixed wing aircraft, no helicopter and an environment that tests everyone and everything!

A tropical, humid environment with the only means of travel by pirogue or walking through closed canopy forest, Marantaceae thickets (the worst) favoured by gorillas, swamp forest, open bais (clearings) and mud and more mud, another swamp. The Forest elephant are engineers of the forest and make it possible to move through with relative ease, along their often-ancient trails but leave these trails and the ordeal begins! No less so for the footwear you have chosen, no easy answer here whether wearing gumboots or self-draining trail running shoes that will be trashed after 1 month!

Odzala-Kokoua National Park is managed by the Odzala Foundation - a partnership between African Parks and the Congolese Government. African Parks (AP) supported the Forest elephant-monitoring project. AP have been very successful in turning around a number of National Parks in Africa but some present such major challenges that they have had to withdraw. The model they adopt has great potential (www.african-parks.org) and no less so for O-KNP but it is early days for AP in their attempt to make Odzala-Kokoua a jewel in
the tourist crown of Congo. Sadly, this challenge has been made even more difficult by the presence of a particular virus in these forests, Ebola. Tourism throughout Africa has been negatively effected by the West African outbreak despite some parts of Africa being several thousand miles away! O-KNP and surrounds had not been spared in the past with mortalities from Ebola in people and wildlife - devastatingly so for gorilla and chimp. I found myself thinking about the shadowy, stealthy “Shepherds Crook” virus that exists in this forest and wondered what set of circumstances suddenly creates the enabling environment for an outbreak, be it in forest dwellers, wildlife and, indeed, city dwellers. Hammer Head bats maybe…?  

But my mind always returned to the task in hand, finding a needle in a haystack in the forest! Because of the huge pressure on Forest elephant in the Central African rain forest through illegal hunting, especially in the areas surrounding Odzala-Kokoua, it was decided to use satellite tracking collars to monitor elephant movements in O-KNP and to see whether the park was like a safe “sink” for elephants as illegal hunting pressures mounted outside of the park. The initial program was a pilot project to place 10 collars on Forest elephant in certain areas of the park. My experiences in the past in Congo had seen a team take a full month to place 2 collars on Forest elephant! There was no way of knowing in such a challenging environment but the Odzala-Kokoua team successfully placed 8/10 collars on Forest elephant, 2 more collars would have been placed if technical issues with the dart gun had not developed in the second half of this month long operation.

Savanna elephant immobilization, which is often carried out from a helicopter, is relatively easy and safe for the elephant. They tolerate the drugs very well with the single most important issue being positional especially the trunk once they go down. With Forest elephant, as the Americans say “this is a different ball game”! The environment is so challenging with visibility often reduced to a few meters, difficulties include being able to see the elephant to sex, age and size an individual and one is either too close or too far! Problems are compounded by the fact that once darted the elephants will do one of two things: either charge you or take off like an express train! Now the challenge is keeping up with them by tracking their “flight” path and this is where the Ba’aka trackers come in and their skills are absolutely essential. One has to get to the elephant within 4-5 minutes to deal with positional issues, the potential for heading into a swamp, river or a flooded bai is a constant worry. So this type of op-
few minutes to secure kit! A remarkable ecosystem but even more so when one thinks of emerging and re-emerging infectious diseases especially of the haemorrhagic virus type and many significant parasitic diseases including malaria, filarial worms (we came to recognize the fly that transmits the filarial parasite), Trypansomiasis (tsetse fly attack country!) and, of course, the unknown!

The health of these vast rainforests (the central African rainforest stretches from Gabon (Atlantic coast) eastwards to the Albertine Rift (Uganda), north to CAR and southwards through DRC and is estimated to be 14 million square km in extent!) and their importance on a global basis cannot be underestimated, an ecosystem that delivers such essential goods and services, effects the worlds climate and harbours unique wildlife. Elephants, primates and birds spread seeds from fruiting trees, duiker wander the forest floor and provide an important food source for forest dwellers (unfortunately being unsustainably exploited through the bush meat trade), gorilla and chimp continue to battle the bush meat trade, Ebola and loss of habitat and both traditional and many modern medicines originate from the forest. All of us who have the health of our planet in the forefront of our minds, need to engage in whatever way we can to preserve the rain forest, protect it, keep it intact. Otherwise, a degraded and stripped forest will continue to release silent, stealthy and deadly assassins. Ebola still haunts West Africa and lurks elsewhere! We ignore our actions at our peril!
A Symposium on the health, welfare and pathology of reptiles and amphibians was held at Birkbeck College, University of London, on Saturday 24th January 2015 and attracted nearly 100 registrants.

The meeting was organised under the auspices of the Edward Elkan Memorial Fund, established in 1983. It was sponsored by the British Herpetological Society (BHS) and supported by donations from the British Chelonian Group (BCG) and the British Veterinary Zoological Society (BVZS). Admission and refreshments were free.

The Symposium commemorated the 120th anniversary of the birth in Germany of Dr Edward Elkan, pioneer of lower vertebrate pathology. Edward Elkan was trained originally in human medicine but throughout his life he had an absorbing interest in natural history and comparative pathology, especially in respect of reptiles, amphibians and fish. His research, lectures, publications, photographs and drawings contributed much to our knowledge and understanding of diseases of reptiles and amphibians and helped promote the health and welfare of these animals. Dr Elkan influenced a generation of veterinarians, zoologists and herpetologists.

The Symposium was opened by the President of the British Herpetological Society, Professor Richard Griffiths, who welcomed the audience and expressed his pleasure that the attendees include both professional and amateur herpetologists, veterinarians, students and members of the public with an interest in natural history or Dr Elkan and his life.

The first session was chaired by Mrs Margaret Cooper who called on the first speaker to explain the background to the Symposium: John E Cooper’s presentation was entitled “The Elkan Legacy” and mapped Edward Elkan’s career, with particular reference to his research on the so-called lower vertebrates.

Dr Jesse Olszynko-Gryn then gave a lecture entitled "Edward Elkan and the Xenopus pregnancy test", outlining Dr Elkan’s contributions to gynaecological research.

Professor Peer Zwart, a contemporary of Dr Elkan’s, who co-authored a seminal paper with him, in the 1970s and was also the Third Edward Elkan Memorial Lecturer then presented his paper “Edward Elkan and amphibian-reptilian trematodes” which was followed by Dr - David L Williams’ talk entitled “The chameleon and the microscope - a lesson in comparative pathology”.

The refreshment break followed, during which an extensive array of literature from different herpetological organisations, as well as specimens from Edward Elkan’s Collection, were on display.

The second session was chaired by Mr Martin PC Lawton FRCVS who, in his Opening Remarks provided a succinct, amusing, overview of the evolution of herpetological medicine, with particular reference to the United Kingdom. He then introduced the first of three Short Presentations about the health and diseases of reptiles and amphibians. “Living with amphibians: A hobbyist and veterinary surgeon’s perspective" was the title of the first talk, by Mark Naguib MRCVS. This was followed by “Diagnosis and treat-
On 24 January 2015, a lion, which was shot as a result of its poor condition and unusual behaviour was confirmed positive for the rabies virus. This young male lion was from Bubye Valley Conservancy, a 3740 km$^2$ conservancy in the lowveld region of southern Zimbabwe.

Rabies is a communicable disease capable of infecting all mammals. The viral pathogen concentrates in cerebral and nervous tissues, often causing severe behavioural changes in the host. In humans, the clinical symptoms, and virtual certainty of death following the development of these symptoms have made this disease one of the most feared in the world. Indeed, rabies is one of the most deadly zoonoses, each year killing as many as 70 000 people worldwide, mostly children in developing countries (OIE). However, unlike many other diseases, the tools exist to significantly reduce, if not eradicate rabies infections in humans.

Rabies first became a real problem in Zimbabwe in 1950 where it emerged in the Beit Bridge area and rapidly spread into the Masvingo and Bulawayo areas. Vaccination of dogs was initiated in 1950, but by 1952 the disease was also diagnosed in wild carnivores. Despite an active vaccination programme, rabies could not be eradicated. The combination of the periodic fall in the number of dogs presenting for vaccination, and the resultant spillover of infection into the jackal population resulted in approximately 120 confirmed cases per year until 1976. In 1978 there was a sudden drop in the number of dog vaccinations, which was followed by a sudden increase in confirmed rabies cases. Not surprisingly, this rabies epidemic coincided with a period of civil unrest that culminated in independence in 1980.

Although the complex epidemiology of rabies in Africa is not completely understood, it is evident that in Zimbabwe, the large population of domestic dogs appears to act as the primary self-sustaining reservoir of the rabies virus (Rhodes et al. 1998). The importance of dogs in the transmission and maintenance of rabies virus infection in southern Africa is not completely understood, but it is evident that in Zimbabwe, the large population of domestic dogs appears to act as the primary self-sustaining reservoir of the rabies virus (Rhodes et al. 1998). The importance of dogs in the transmission and maintenance of rabies virus infection in southern Africa is not completely understood, but it is evident that in Zimbabwe, the large population of domestic dogs appears to act as the primary self-sustaining reservoir of the rabies virus (Rhodes et al. 1998).
Africa cannot be over-emphasized. Programmes aimed at increasing control and vaccination of dogs would therefore have the most significant impact on reducing rabies in Zimbabwe (Rhodes et al. 1998). Indeed, it has been demonstrated that good vaccination coverage in dogs, is followed by a decrease in the number of human rabies cases. Communal farming areas are over-populated and they generally have a high population of roaming, unconfined dogs. Thus dog rabies in Zimbabwe is primarily a problem of communal farming areas.

In southern Zimbabwe recent rabies cases in spillover wildlife species have highlighted the current lack of control of this deadly disease. Moreover, obvious lack of reporting, in both humans and animals, means the enormity of the problem may be far greater that what is currently acknowledged. With dwindling government resources and an ever-growing dog population in the communal lands, rabies has been allowed to have the upper hand. While the Zimbabwean State Veterinary Services recognize the problem and are willing to implement more comprehensive vaccination programmes, the resources do not always exist to carry out such initiatives. Thus, reliance on volunteers and non-governmental organisations is becoming increasingly important in the fight against rabies.

It was through the enthusiastic support and generous donations from Dr Renee van Oudtshoorn of Vets For Change that a vaccine campaign in the communal lands near Bubye Valley Conservancy, could be carried out. Vets For Change donated 1000 vaccines with vaccination certificates, provided an invaluable volunteer in the form of Claire Blackmore, as well as other ancillary equipment needed to carry out a successful vaccination campaign.

In 5 days, a total of 977 dogs were vaccinated in the following areas: Umzingwane, Nottingham Estates, River Ranch, Malala, Mtetengwe, Dihana, Mopane, Penemene, Tongwe and Jopembe Village 4.

We believe this was a positive start to an ongoing relationship between Vets For Change, the State Veterinary Services and private veterinarians, whom all have a common goal of putting an end to deaths caused by rabies.

Some of the above information was sourced from “Rabies control in dogs in Zimbabwe”. W.N. Madzimo, Department of Veterinary Services, Harare, Zimbabwe.
The University of Eduardo Mondlane (EM) especially the Biotechnology Center, Mozambique and the University of Pretoria, South Africa (both Faculties of Veterinary Science) have teamed up to develop a research platform under a One Health umbrella in Limpopo National Park (LNP). LNP is part of the Greater Limpopo Transfrontier Conservation Area (GLTFCA), which borders the Kruger National Park to the west and the Gona-Re-Zhou NP (Zimbabwe) to the north. The LNP is a challenge in its development as there are several villages situated within the Park, along with inhabitants and approximately 30,000 head of cattle. All these communities are part of a resettlement program, scheduled to be completed by 2018, whole villages, people and livestock will be moved outside the Park to be settled next to host villages. In the meantime, there is a tremendous interface that exists between people, their livelihoods and wildlife, particularly elephant and buffalo.

There are several pressing disease and socio-economic issues that need to be addressed within the LNP and surrounds, which includes the Limpopo River to the west (remember The Elephant’s Child by Rudyard Kipling: “Then the Kolokolo Bird said, with a mournful cry, ‘Go to the banks of the great grey-green, greasy Limpopo River, all set about with fever-trees, and find out (how the crocodile feeds”). The research platform will focus on several diseases including Rabies, Rift Valley Fever, Bovine TB, Brucellosis and Theileriosis. In addition, documenting the distribution and type of rodents in the Park will be undertaken. An assessment of Health issues and attitudes to conservation within village communities and a health follow up of livestock and people resettled will be another focus - appropriate research under a One Health Umbrella and primarily driven by a Mozambique team.

Several Mozambique Masters and PhD students will operate in the LNP carrying out their research during 2015-2016, assisted by supervisors from both Universities. The work will be carried out with additional support from ANAC (Wildlife and Conservation Areas, Ministry of Environment and Tourism, Maputo), Biotechnology Centre (EM University, Faculty of Veterinary Science) and National Institute of Health. The platform will be referred to as “Communities on the Move: animal and human health challenges” and it is hoped that a model platform can be developed that can be established elsewhere in Mozambique – a country with a beautiful and unspoilt 3000km coastline, a big country stretching from Tanzania in the North to South Africa in the South; Malawi, Zambia, Zimbabwe, Swaziland and South Africa to the west.
Dr. Anne-Lise Chaber, DVM, MSc (Wild Animal Health), MRCVS, Vice-chair of the WDA AME

Anne-Lise is a wildlife veterinarian who worked on wildlife projects in Botswana, France, UK and the UAE.

She established a company offering consultancy services in wild animals' health as well as environmental studies (www.wildlifeconsultant.org).

Most of her work focuses on wildlife trade, on disease detection and management at the wildlife-livestock interface in the UAE and on biodiversity surveys.

Anne-Lise is an editor of the Wildlife Middle-East Magazine (www.wmenews.com), a member of the Wildlife Health Specialist Group and a Research Associate of the Zoological Society of London.

James’ Poetry Corner

Underneath the cork tree

Itchy skin, runny nose, contorted body, crusty toes.
I try to hunt but my mind is weak, gone is that stripy air of mystique.

Spasmoid ripples, pirouetting dholes, I long for a dose of phenobarbitol.
To elegantly slip into the relief of sleep, or throw myself under a tourist jeep.

Cryptic Contagion Crossword

ACROSS
2 Aquatic lion may be at risk from your pet cat
4 Middle East and Flora and Fauna International share the present
6 Constrains Australia’s sexually voracious marsupials
7 Badger bury kestrel in ruins
8 People and pigs can’t resist sweet sticky fruit in southern Asia
9 Africa’s first national park
10 A new Gnu is fatal to cattle

DOWN
1 Only one in a thousand will make it back to the shore
3 With dwindling populations, you’ll have difficulty pouring Chai and Hamsters into a glass
5 Kisha cha mbwa (Swahili)