



CAMPAIGN
AGAINST CANNED HUNTING

Dying for a Myth

May 2017

A CACH report on the danger of
transference of TB from lions to humans

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Dying for a Myth



In September 2016, Linda Park, Director of the Campaign Against Canned Hunting (CACH) highlighted the health issue of TB in lion bones in her blog "SA Exporting TB in lion bones?" <http://www.cannedlion.org/blog/archives/09-2016>. The blog includes further opinion from Professor Paul van Helden, Stellenbosch University stating that "It should be noted that the organism that most commonly causes lion TB is Mycobacterium bovis (which causes

bovine TB). This differs very slightly from that species most often causing human TB. Unfortunately, this organism has the propensity to cause TB in humans often in organs other than the lung, making it very difficult to diagnose. Furthermore, it is inherently resistant to one of the four most important drugs (antibiotics) used to treat primary human TB. Treatment of humans with this form of TB is therefore compromised. This therefore poses a potential risk to humans which is arguably greater than the most common form of TB in humans.

I am therefore of the opinion that uncontrolled exposure of humans to bones from animals, in particular lion bones, poses a risk for development of the form of TB known as bovine TB in particular, although not necessarily being limited to this form of TB only." (In July 2009, Professor Paul van Helden was featured in an article on Thompson Reuters' Sciencewatch - <http://archive.sciencewatch.com/ana/st/tub/09julSTTubvanHel/> - citing him as the 4th highest ranked scientist in the World in the field of tuberculosis)

At the beginning of this year the South African Government announced plans to permit the annual export of 800 lion skeletons from captive bred lions. <http://www.traveller24.com/Explore/Green/sas-export-of-800-lion-skeletons-misguided-and-shameful-20170123>. The majority of these would most likely be sent to manufacturers of fake tiger wine. Lion bones have been used as a substitute for tiger bones since around 2008.

<https://www.theguardian.com/environment/2013/apr/16/south-africa-lion-bones-trade>. Further highlighted in the paper Williams VL, Loveridge AJ, Newton DJ, Macdonald DW (2015) 'Skullduggery': Lions Align and Their Mandibles Rock! PLoS ONE 10(11): e0135144.

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0135144> and the report Bones of Contention report by Oxford University's Wildlife Conservation Research Unit (WildCru), TRAFFIC and the University of Witwatersrand <https://www.wildcru.org/news/bones-of-contention-lion-bone-trade-report-released/>

We are deeply concerned that there could be substantial health risks to people when handling/consuming lion parts from a lion infected with TB. <http://www.health24.com/Medical/Tuberculosis/TB-in-south-africa/Can-you-get-TB-from-animals-20150324>. <http://edition.cnn.com/2016/10/31/health/veterinarian-contracts-tuberculosis-from-wildebeest/> The OIE – World Organisation for Animal Health list diseases transmissible to humans in their October 2016 press release <http://www.oie.int/for-the-media/press-releases/detail/article/update-on-wildlife-diseases/>. Zoonotic infection including *M. tuberculosis* is highlighted by Bruno B. Chomel et al in "Wildlife, Exotic Pets, and Emerging Zoonoses" https://wwwnc.cdc.gov/eid/article/13/1/06-0480_article

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We believe there is an urgent need for further research from all parties to prevent a major health issue. The most significant health risk applies to those that handle lion carcasses and bones in the first instance i.e. farm labourers who prepare a carcass immediately after it has been hunted, euthanised or died and prepared for the lion bone trade. It may also affect other participants in the industry (i.e. taxidermists <http://www.dailymail.co.uk/news/article-3178868/Inside-Namibian-taxidermy-factory-stuffs-6-000-animals-year-trophy-hunters.html>, customs officers, multi users <http://www.penton.co.za/strong-multi-harm-ye-none-two-worlds-apart/> and the TCM end-users <http://www.bloodlions.org/tiger-bone-wine/> , to a degree, depending upon how long the infection remains viable within the bones/organs. It should also be noted that South Africa has a burgeoning TCM industry of its own <http://globalriskinsights.com/2017/04/radar-traditional-chinese-medicine-became-one-africas-fastest-growing-industries/>

Possibility of infection becomes a major risk factor for anyone who is on medication that is immunosuppressant or has an inherited or acquired immunodeficiency disorder e.g. HIV infection or other factors (but not limited to) those with low socioeconomic status, crowded living conditions etc. There is also the issue that once a person catches TB it can lie latent for a number of years whilst it multiplies in the body. Once the disease is activated during this time they are likely to infect other members of their whole family as well as friends or anyone they may be in contact with since the disease is normally passed from human to human via the respiratory systems.

Immunodeficiency disorders

<https://medlineplus.gov/ency/article/000818.htm>

Tuberculosis overview

http://www.emedicinehealth.com/tuberculosis/article_em.htm

HIV Infection Disrupts the Sympatric Host-Pathogen Relationship in Human Tuberculosis

<http://journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1003318>

Humans can get deadly TB from animals

<http://bhekisisa.org/article/2016-03-11-00-humans-can-get-deadly-tb-from-animals>

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Workers prepare animal skins in front of animal trophies at the taxidermy studio in Pretoria, February 12, 2015. Photo by Siphwe Sibeko/Reuters. Taken from <http://www.pbs.org/newshour/rundown/trophy-hunting-explained/>

TB in lions

TB affects humans and many animal species including wild and captive-bred lions. Both the human and animal form of TB may be the causative agent. The Wildlife Disease Association Africa & Middle East April 2017 Quarterly Newsletter (page 5) contains an article entitled Tuberculosis as an Emerging (Re-Emerging) Disease in South African Wildlife by Professor Michelle A Miller, DVM, MS, MPH, PhD NRF South African Research Chair in Animal TB, Stellenbosch University and highlights the fact that *“although a Bovine TB Eradication Scheme was introduced in 1969 to address the issue in cattle, changes in national and provincial veterinary structures, lack of funding and trained personnel, and disease prioritization have resulted in failure to control the disease in South Africa.”*

<http://wildlifedisease.org/wda/Portals/0/Sections/AME/WDA%20AME%20April%202017%20Newsletter.pdf>

In 2009, South African National Parks, Endangered Wildlife Trust and the Conservation Breeding Specialist Group Southern Africa convened a workshop entitled “Lion (Panthera Leo) Bovine Tuberculosis Disease Risk Assessment”. A large group of specialists met to evaluate the then status of lions in the Kruger National Park and the issue of TB. The final report can be found here https://www.wcs-ahead.org/gltfca_grants/pdfs/lion_tb_risk_report_final.pdf

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At this workshop, Dewald Keet the Chief State Veterinarian KNP stated the clinical signs and pathology of TB. *"Clinical signs are typically non-specific and consist of varying degrees of emaciation with deterioration of skin quality. Focal areas of partial alopecia of varying size are seen in most cases. Visible, palpable and marked enlargement of superficial lymph nodes as seen in various other species does not occur. Hygromas of the elbow are found to be a reliable indicator of M. bovis infection. They are more frequently seen in females than in males. Undetermined or non-specific lameness due to swollen, inflexible stifle and hock joints associated with muscular atrophy of affected appendices occur in older lions. Dermal wounding with an apparent inability to heal is seen in a number of cases. Older males often develop large swellings above or below the hip joint. Large ulcers subsequently develop on the surface of these swellings. This is often bilateral but varying in size. Varying degrees of mane loss and deterioration are seen in most males necropsied. Testis atrophy is consistently present in these cases. None of 86 females were pregnant at the time of necropsy. Tachypnoea and dyspnoea was seen in cases with advanced pulmonary lesions. Ocular lesions are seen in a small number of cases and central nervous system impairment in only one. Hair covering the ventral aspects of the neck, thorax and abdomen appears to be longer and white in inactive females.*

Gross lesions in the carcass of a lion are not typically caseous-necrotic. They are rather fibrous and proliferative and seldom associated with abscess formation. The sarcomatous appearance of mycobacterial lesions in domestic cats frequently leads to misdiagnosis in cats and lesions in lions have a similar sarcomatous appearance. Lymph nodes are only slightly enlarged but mostly rather severely atrophied. These lymph nodes reveal sinus ectasia associated with cortical and paracortical lymphoid hyperplasia. Pulmonary lesions are the only category identifiable with a certain degree of accuracy. However, they also appear distinctly different from lung lesions seen in ruminant, primate, rodent, swine and lagomorph species.

Microscopic lesion patterns observed in various organs were of a granulomatous nature consisting of macrophages, epithelioid cells, lymphoplasma cells and numerous neutrophils, suggestive of mycobacterial infection. Severe generalized lymphoid atrophy was sometimes seen in association with granulomatous lesions. Pulmonary lesions comprised of granulomatous interstitial pneumonitis or granulomatous bronchopneumonia often associated with bronchiectasis. Intestinal lesions showed mononuclear macrophage predominance suggestive of mycobacterial mural enteritis. Granulomatous osteitis, periosteitis and osteosis were found in most of the well-developed cases frequently associated with myositis."



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Lioness at Hluhluwe-iMfolozi Park
with TB and sarcoptic mange



Hygroma in Kruger lion with TB



Kruger lion with TB

<https://www.journeyman.tv/film/1271> In 2002 reporter Sally Sara and Journeyman.tv made a report on TB in lions in the Kruger Park highlighting the issues, clinical signs and prognosis going forward with the spread of TB and the knee jerk reaction of bringing in

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hunters to kill neighbouring reserve lions that had been infected. If all lions that become infected with TB are culled like this there will certainly be one place that their bones could potentially end up and that will be in the lion bone trade!

TB & Captive-bred lions



With the numbers of lions held together in a breeding farm, the likelihood of disease spread is raised to a high level. Plus the issues of inbreeding that occur in captive lion breeding cause major immune issues and therefore another high-level risk for disease spread. A recent study by the Animal TB Research Group of Stellenbosch University also suggests that lions may be able to transmit bacteria between themselves through respiratory secretions (droplets transmitted through sneezing or coughing).

<http://www.bioone.org/doi/full/10.7589/2014-07-170>

As noted above by Dr Dewald Keet and Professor Nick Kriek of Onderstepoort Veterinary Academic Faculty (in our first blog on this issue) - hygromas of the elbow have been found to be a reliable indicator for TB in lions. Kirberger RM, Keet DF and Wagner WM (2006) highlight "Radiologic abnormalities of the appendicular skeleton of the lion (*Panthera leo*): incidental finds and *Mycobacterium bovis*-induced changes".

<https://www.ncbi.nlm.nih.gov/pubmed/16553146>



Hygroma in captive-bred lion (circled) - classic clinical sign of TB

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In Viljoen et al (2015) *Mycobacterium bovis* infection in the lion (*Panthera leo*): Current knowledge, conundrums and research challenges it was also shown that the first cases of lions contracting TB came from two zoos. The onset of the disease was relatively sudden after the felids experienced high stress situations such as after repeated periods of pregnancy and lactation.

This situation is replicated within lion breeding farms and it is well known that lion breeding farms keep their lionesses in a tight circle of pregnancy (by removing cubs as early as possible to bring them back into estrus) to maximise the number of cubs that are born each year.

Keel et al (2010) also highlight the fact that progress of TB in lions is apparently slow, with the majority of infected lions appearing healthy while being sub-clinically infected.

Conclusion

We believe that there is a substantial risk to humans from TB carried in lion bones/organs and that this requires immediate attention and further research. An industry that puts the health of its workers/end-users at risk is an industry that is likely to find lawsuits against them in the future. They have now been warned about this issue and need to act on it immediately.

Acknowledgements

We wish to acknowledge the following people for their assistance in the preparation of this document.

Professor Paul van Helden, Stellenbosch University
Professor Nick Kriek, Onderstepoort Veterinary Academic Faculty
Dr Kobus du Toit, Rhino expert, wildlife veterinarian and biologist

This document has been sent to the following organisations for their concern with a request to immediately look at the serious health implications:-

Hospitality, Catering and Farm Workers Union (HOCAFAWU)
National Domestic Security Agriculture and Allied Workers Union (NDOSAWU)
South African Forestry, Farming, Catering and Allied Workers Union (SAFFCAWU)
<http://www.saffcawu.com/427086635>
Human Rights Institute of South Africa (HURISA) <http://www.hurisa.org.za/>
Centre for Human Rights/University of Pretoria www.up.ac.za/centre-for-human-rights
The South African Human Rights Commission <http://www.sahrc.org.za/>
The Black Sash <http://www.blacksash.org.za/>
The Food and Allied Workers Union <http://www.fawu.org.za/>
Lawyers for Human Rights <http://www.lhr.org.za/programme>
Foundation for Human Rights <http://www.fhr.org.za/>
African National Healers Association <https://www.africannationalhealersassociation.org/>
World Health Organisation, Africa Region <http://www.afro.who.int/>
Wildlife Disease Association <http://www.wildlifedisease.org/wda/>
Human Sciences Research Council <http://www.hsrc.ac.za/en/>
OIE World Organisation for Animal Health <http://www.oie.int/>

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