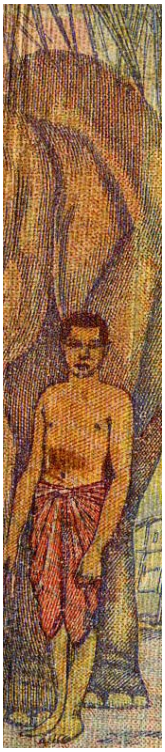
ECI Elephant TB Initiative

ELEPHANT CARE INTERNATIONAL

ECI is a nonprofit organization dedicated to elephant healthcare and conservation. We provide direct care, information resources, and support community-based initiatives to reduce deaths and injuries caused by human-elephant conflict.

Dr. Sarad Paudel recording medical history in Nepal.



The emergence of drug-resistant TB (MDR TB and XDR TB) makes it imperative that all sources of TB are controlled.

The ECI Elephant TB Initiative has been our focus since 2005.

We have a Plan

Look at one small herd of captive elephants where one elephant has died from TB, three of four remaining cows are infected, and a 26-month old calf was sired by a wild bull and you have a microcosm of the threat that TB poses for captive and wild Asian elephants.

Did you know…

- TB was implicated as a factor in the extinction of the mastodon (Rothschild 2006 based on examinations of 56 of 113 skeletons by a forensic anthropologist)
- Initial studies indicate infection rates exceeding 13 percent in captive Asian elephants
- India has the highest number of human TB cases in the world. (India is also home to more than half of all Asian elephants) ECI and partners are examining 800 elephants in India.
- Elephants are susceptible to human and bovine forms of TB
- TB has not been reported in wild elephants, yet…
- ECI is an acknowledged leader in elephant TB field studies

Early diagnosis and treatment is essential

The World Health Organization says early diagnosis and treatment is the best way to control TB, thus reducing the impact on infected individuals and their ability to transmit the disease.

"If we wait, it is too late." *Dr. Julie Gerberding*, Director CDC (Center for Disease Control)

A key problem in the diagnosis of TB in elephants has been reliance on the trunk wash method for obtaining culture samples. In a recent Swedish study (Møller 2005), TB was isolated from only 7 of 189 trunk wash samples from five elephants (TB confirmed post-mortem). The trunk wash has delayed diagnosis and treatment. Recently (Aug. 2007) the USDA approved a serological test that allows us to 1) Quickly screen for TB 2) Segregate high risk elephants, 3) Minimize risk to humans, and 4) Treat elephants:

a) before they become contagious (serology may be positive months to years in advance of a positive culture)
b) before the disease becomes advanced
c) when treatment is more likely to succeed

Elephant TB Fact Sheet, FAQ, & references:
www.elephantcare.org/TBinfo.htm

Human impact unpredictable...

What if TB mutates in elephants…and moves back to humans in a novel, more virulent form, that none of our drugs can control?

"…the possibility of a TB epidemic exists and reciprocal transmission between humans and elephants could have devastating consequences."

William Modi, PhD. Genetics Division, Zoological Society of San Diego

Threat to wild elephants (and rhinos)

The first step is to demonstrate the scope of the problem to raise awareness and concern.

TB has not been reported in wild elephants. If it is not present, we must institute strategies to prevent its introduction. If TB is in wild populations, we must limit further transmission.

TB is a threat whenever wild elephant bulls breed captive cows, grazing land is shared with domestic livestock, or captive elephants are exposed to infected humans. We must control TB in captive elephants to protect wild populations—and humans...

ECI Elephant TB Initiative: a multi–year, multi-partner, international program to control TB

Problems

- TB in elephants is under-reported, under-investigated, and under-funded
- Diagnosis is difficult
- Treatment is complicated
- Wildlife is threatened
- TB in elephants may pose a threat to humans

Solutions

- Education
- Direct care (segregation, treatment)
- Research (field and lab)
- Collaboration
- Global surveillance
- *In situ* capacity building

Select Projects:

Nepal Elephant Healthcare & TB Surveillance Program

India: Health Assessment of Captive Elephants with Special Reference to TB (800 elephants)

Sri Lanka: Partnering for elephant TB control (2008)

Range country TB planning meeting: 2008

Research Projects and Collaborators

1. Serological Diagnosis of TB (Dr. Konstantin Lyashchenko, Chembio Diagnostic Systems, Inc.)
Research from this collaboration contributed to the development of the 1st licensed test for TB in elephants.

2. TB Biosensor (Dr. Elaine McCash, Dr. Nic Murray, and Dennis Camilleri, Rapid Biosensor Systems Ltd.) This U.K. based company has developed a breathalyzer that detects TB in humans. We are testing the application of this device to identify infected elephants.

3. TB Immunology (Dr. Karen Terio and Dr. Jennifer Landolfi, University of Illinois) Cytokine profiles are altered in humans with active TB. Changes in elephant cytokine profiles may be an adjunct diagnostic test and a means to monitor treatment efficacy.

4. Endocrine Responses to TB (Dr. Janine Brown, National Zoo Conservation and Research Center.) Endocrine changes during TB infection may help determine response to treatment.

5. Genetic Epidemiology of TB (Dr. William Modi, Genetics Division, Zoological Society of San Diego) Identifying genes that confer susceptibility or resistance to TB would aid diagnosis and provide a management tool to prevent transmission.

Dr. Susan Mikota,
Director of Veterinary Programs and Research
requests your support for the ECI Elephant TB Initiative

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Participating and Supporting Organizations:

WWF-AREAS Program

Disney Conservation Fund

Alexander Abraham Foundation

ANCF (India: Asian Nature Conservation Fund)

DNPWC (Nepal: Department of National Parks & Wildlife Conservation)

IAAS (Nepal: Institute of Agriculture & Animal Science)

Tufts Center for Conservation Medicine
Busch Gardens, Tampa

AVMF (American Veterinary Medical Foundation)

Mazuri Fund

Walter J. Ernst Memorial Fund

We are seeking additional partners for the ECI Elephant TB Initiative:

Contact
Hank Hammatt, Executive Director
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Email: hh@elephantcare.org

Funding opportunities:

- Portable scales to weigh elephants ($3,000 ea)
- TB Treatment Nepal ($5,000 per elephant)
- Fund full-time *in situ* veterinarians ($8,000 per year)
- Final phase of India TB project ($10,000)
- Test all captive elephants in Sri Lanka ($16,000)
- Construct and equip a sophisticated mobile TB lab for humans and elephants: powered by alternative energies, climate controlled, satellite connected, containerized (call for details)
- ECI Elephant TB Initiative Fund: any donation appreciated, funds applied where needed most

Photos by Genevieve Dumonceaux DVM (Busch Gardens, Tampa), Karin Hamilton (Tufts School of Veterinary Medicine), Piers Locke PhD, University of Kent, Susan Mikota DVM & Hank Hammatt (ECI)