

Executive Summary

State of the Apes

Disease, Health and Ape Conservation



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What is health? Based on the World Health Organization definition, it can be considered as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”. While such definitions of health have been developed for humans, as our closest living relatives sharing many of the same genetic, anatomical and physiological features, we can consider that a similar concept of health should apply to non-human apes. Where health is concerned, similarities between apes and humans include two-way disease transmission, social and mental health, the interplay between the health of the individual, the group and their environment, as well as the ethics of treatment to improve health. The concept of ape health is thus broad and multifaceted, and comprises conservation, public health, welfare and wellbeing. Furthermore, it varies at different scales and in different settings – from individuals to populations, and between wild and captive apes.

Apes are endangered species and infectious diseases represent a major threat to their survival. Disease is often listed alongside habitat loss and hunting as one of the three principal threats to apes, and clear interlinkages exist between these three threats. For example, industrial development projects fragment and reduce ape habitat, and often increase incidence of hunting, both of which bring humans into closer contact with apes and thus increase the risk of infectious disease transmission. Habitat loss and fragmentation can also lead to non-infectious health impacts via microclimate change, pollution, stress, decreased food availability and reduced connectivity (which impacts gene flow and access to mates).

The similarities shared by humans and non-human apes make both groups susceptible to similar diseases, meaning that the risk of zoonoses/two-way disease transmission – and the potential for “spillover” events – is high. Respiratory pathogens in particular are recognized as a major cause of often fatal disease in wild great apes, with veterinary monitoring and diagnostic tools providing solid evidence as to the role of humans in transmission of such illnesses. At the same time, ape to human disease transmission is also a cause for serious concern and apes are considered as sources for human disease – with both Ebola and HIV among the infectious diseases confirmed to have spilled over to humans from apes. Widespread hunting and consumption of apes significantly elevates this risk.

Because of such interconnections, we cannot separate ape health from human (and indeed planetary) health, and there is an increasing recognition of the central role of a broader concept of health in ape conservation. While historically the creation of protected areas designed to keep people separated from apes and other species was

the de facto approach to protecting apes, more recently other more integrated approaches have emerged. In particular, the One Health concept is becoming a key tool in addressing ape conservation ambitions linked to health. The origins of One Health lie in preventing cross-species infectious disease transmission between humans, domestic animals and wildlife, but the concept has developed rapidly and today One Health is globally recognized as a trans-disciplinary theory of change that recognizes the interconnections between people, animals, plants and their shared environment, and focuses on creating and implementing solutions in the face of complexity. One Health ensures inclusion of all relevant stakeholders in solution-based processes, based on the theory that inclusion leads to more robust, implementable and sustainable solutions, both in-situ and ex-situ.

Apes live in a variety of settings, from wild-living populations residing in natural habitat either far from human settlement or under anthropogenic encroachment, to sanctuaries and rehabilitation centers in ape range countries, and zoos and sanctuaries all over the globe. Each of these settings comes with its own unique risks and challenges to ape health, and appropriate management of such risks is central to ape welfare, wellbeing and long-term survival. Ape behaviors and social



Previous Titles

2020. *State of the Apes: Killing, Capture, Trade and Conservation.*

2018. *State of the Apes: Infrastructure Development and Ape Conservation.*

2015. *State of the Apes: Industrial Agriculture and Ape Conservation.*

2014. *State of the Apes: Extractive Industries and Ape Conservation.*

All volumes are available as open access eBooks via www.cambridge.org/core/ and at www.stateoftheapes.com

Other Language Editions

Bahasa Indonesia

2020. *Negara Kera: Pembunuhan, Penangkapan, Perdagangan, dan Konservasi.*

2018. *Negara Kera: Pembangunan Infrastruktur dan Konservasi Kera.*

2015. *Negara Kera: Pertanian Industri dan Konservasi Kera.*

2014. *Negara Kera: Industri Ekstraktif dan Konservasi Kera.*

Chinese

类人猿现状：
捕杀、捕捉、贸易和类人猿保护

类人猿现状：
基础设施开发与类人猿保护

类人猿现状：
采掘业与类人猿保护

French

2020. *La Planète des grands singes : La destruction, la capture, le trafic et la conservation.*

2018. *La planète des grands singes : Le développement des infrastructures et la conservation des grands singes.*

2015. *La planète des grands singes : L'agriculture industrielle et la conservation des grands singes.*

2014. *La planète des grands singes : Les industries extractives et la conservation des grands singes.*



systems also influence the risk for and the impact of diseases. For example, while living in social groups can provide a number of health benefits such as increased protection from predators and access to grooming partners for social health and the removal of ectoparasites, sociality can also bring risks, in particular through increased risk of exposure to communicable disease. Similarly, dietary preferences can also influence health risk, for example meat-eating chimpanzees and bonobos can be exposed to the pathogens of their mammal prey.

Ape welfare is also of relevance to health, and how we understand and measure the welfare of apes is pertinent in both wild and captive settings. Animal welfare refers to how an animal is experiencing its own life, and good welfare is defined as “a state of overall well-being which requires a balance of emotional, mental and physical components”. In captive settings, apes are often challenged by disease and poor health due to exposure to pathogens, pollutants, stress and/or poor diet and care. In wild settings, the presence of research and tourism programmes that bring humans into proximity with wild apes also present a risk to ape welfare in terms of behavioral disturbance, disease transmission, over-habituation and risk of aggression, conflict and stress.

The question of whether, when and how to intervene to ensure the welfare of apes in both their natural habitat and in captivity is complex, particularly in situations where health issues are human-induced (e.g. snare removal). Intervention may be aimed at improving the health of either an individual, group, population or ecosystem, and thus extends beyond welfare to include conservation concerns. The decision-making process to intervene in a given injury or health issue is context specific and usually based on the environmental situation, accessibility of the individual animals, and the potential for improvement in either welfare or conservation of the individual, species or ecosystem that is the subject of the intervention. Decision-making also involves questions of ethics, and a decision not to intervene must be justified as much as a decision to intervene.

The *State of the Apes* series has previously covered extractive industries, industrial agriculture, infrastructure development, and ape killing, capture and trade. This, the fifth volume, expands on a theme that is linked to all of these activities: the impact of disease and other health considerations on apes and ape habitats. It focuses on the interface between health considerations and ape conservation and presents an in-depth analysis of the major and plausible impacts of both infectious and non-infectious diseases on the health of both wild and captive ape populations. It also explores the impact of tourism and research activity on ape health and the role of One Health in ape conservation, and provides guidance on both disaster mitigation measures and the ethics and practicalities of decision-making processes for human intervention in ape health issues. The second section of this volume, which focuses on the status of apes in their natural habitat and in captivity more broadly, reassesses the potential impacts of industrial development projects (agriculture, mining and infrastructure) on ape health, with updates on case studies included in earlier volumes of *State of the Apes*. The section also provides updated abundance estimates for apes living in their natural habitats, as well as updated population statistics for apes in captive facilities (zoos, rescue and rehabilitation centers and sanctuaries) across the globe.

While questions of ape health, disease and welfare are complex, it is clear that health has a significant impact on ape populations’ ability to survive and reproduce, ultimately influencing their conservation status and how they evolve. By exploring the relationships between apes, humans, the environment, disease and health, this volume provides an unprecedented overview of one of the most significant threats to apes and their wellbeing, as well as one of the greatest threats to humans.



As the Anthropocene unfolds, the impact of humanity on all ecosystems on the planet is becoming more visible and better understood. Deforestation, encroachment into natural habitat and other human activities are driving an increase in the frequency of interactions between people and wildlife, including viruses, parasites and bacteria. One consequence is a heightened risk of disease transmission, with serious implications for biodiversity protection and human health. Indeed, infectious disease is often listed among the principal threats to ape conservation, along with habitat loss and hunting, which can also expose apes to health risks. In captive settings such as sanctuaries and zoos, apes face similar health risks from increased human contact, as well as geriatric and psychological disorders. Spillover of wildlife pathogens into sanctuaries can also occur.

This volume of *State of the Apes* brings together original research and analysis with topical case studies and emerging best practice to further the ape conservation agenda around disease and health. It provides an overview of relevant disease and health issues and explores factors such as the ethics of intervening in and managing ape health; the impact of research and tourism on apes; the One Health approach; and disaster management and the protection of apes. It shows how the welfare of apes is interrelated with that of the people who share their habitats, while also demonstrating the benefits of integrating ape conservation in health, socioeconomic activities (such as in the extractive industries, industrial agriculture and infrastructure development) and regulatory policy and practice at all levels, from the local to the international.

This volume is available as an open access eBook via Cambridge Core and at www.stateoftheapes.com.

“Continuing their quest to address the severe threats and endangerment to the world’s great apes and gibbons, the Arcus Foundation has published the powerfully impactful and critically awakening series on great ape and gibbon conservation, *State of the Apes*.

Every generation is not without its challenges; however, very few times in history are we presented with the ability to forever influence every subsequent generation. Great apes and gibbons are critical links to our evolutionary past and to our future, and conserving these species is, in fact, the act of saving a part of ourselves.”

Inger Andersen

Under-Secretary-General of the United Nations and
Executive Director of the UN Environment Programme



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