

ARTICLE

One Health and the wildlife rehabilitator

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Abstract

The One Health approach is gaining momentum as a transdisciplinary movement for finding solutions to the greatest challenges threatening the health of all life on Earth today. These threats range from climate change and emerging infectious diseases to pollution and the ever-expanding agricultural footprint. As awareness of the interconnection of the health of animals, humans, plants, and our shared environments has grown in recent years, so too has an appreciation for finding solutions to mitigate those challenges threatening our shared One Health. Within the One Health approach is the important role of the wildlife rehabilitator. As wildlife rehabilitators, we provide temporary care for diseased wildlife so that we may introduce them back into their appropriate habitats. The importance of healthy wildlife populations to ensure the health of domestic animals, humans, and the environments that support all life is central to our jobs as wildlife caregivers, and it is core to the One Health mission. Approaching our work through a One Health lens, we may create a healthier world for wildlife patients, the populations they represent, the habitats where they belong, and the domestic animals and humans that share their environments.

BIO

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Introduction

In recent years you have probably heard the term One Health. You may even be familiar with similar terms such as One Medicine, Conservation Medicine, and Planetary Health. But what is One Health and does it, or any of the other closely related terms, matter for what you do every day in wildlife rehabilitation? This article explores One Health both as an approach that helps to safeguard the health of animals, plants, humans, and our shared environments; and the reasons why wildlife rehabilitation work is imperative to the One Health approach.

One Health: Past, present, future

One Health is based on the recognition of the interconnections, and interdependence, of the health of humans, animals, plants, and the ecosystems on which all life depends. The term One Health first came into use in 2007 when it was introduced as an approach to optimize

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Abbreviations

WHO, World Health Organization
FAO, Food and Agriculture Organization
UNEP, United Nations Environmental Program
WOAH, World Organization of Animal Health
EID, emerging infectious disease

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human and animal health (Enserik 2007). An early definition by the One Health Commission is that One Health is a collaborative effort of multiple disciplines—working locally, nationally, and globally—to attain optimal health for people, animals, and the environment. The foundation of One Health was set by prior movements such as One Medicine from the 1960s and Conservation Medicine from the 1990s and has since been closely followed by Planetary Health, coined in the 2010s (Deem et al. 2019). Although each of these terms has slightly different definitions, they all seek to address the interconnected challenges that threaten the health of *all* life on Earth today.

The driving principle behind One Health (and these similar movements) is the understanding that the health of plants, animals, humans, and our shared environments is connected. Each is dependent on these categories for their health and, just as importantly, each impacts the health of the four categories. However, the One Health approach is much more than simply realizing the challenges threatening an organism's health; whether a tree, dog, turtle, or

human, is tied to the health of other organisms (although this simple realization is an important first step if we are to find solutions to health challenges of the 21st century.) In addition to this understanding, One Health asks that we take a transdisciplinary approach—with diverse disciplines from the health fields, humanities, business, law, politics, and so much more—so we may more effectively find the solutions to the wildlife conservation, environmental sustainability, and public health issues of today.

In recent years, the One Health approach has gained traction internationally as a guiding force for the health of all species. As recently as December 2021, the major international organizations of the WHO, FAO, UNEP, and the WOAHA, came up with an agreed upon definition of One Health that highlights the interconnectivity central to the concept. They state, “One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals, and ecosystems. It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent. The approach mobilizes multiple sectors, disciplines, and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems while addressing the collective need for clean water, energy, and air; safe and nutritious food; taking action on climate change, and contributing to sustainable development” (OHHLEP et al. 2022; Fig. 1). This definition, as a blueprint for One Health goals, is laudable. But we might ask why a One Health approach now, and how do we sustainably balance and optimize the health of all these sectors?

Why we need a One Health approach

In the first decades of the 21st century, we have been witness to a growing list of conservation and public health challenges. For many of us, daily news of worrisome health events—from climate change, pollution, and infectious diseases in frogs, bats, and people—has led to the conclusion that the health of our planet is not good. Most significant may be the changes experienced while working, and living, within a global pandemic over the past 4 yr. The COVID-19 pandemic, caused by SARS-CoV-2, a novel zoonotic infectious agent of humans, has created challenge and change on a global scale with impacts on environmental, animal, and human health (Deem & Brenn-White 2020). Although the origin of the exact spillover event remains in debate, there is ample epidemiological evidence that supports a variety of wildlife species with varying susceptibilities that may serve as spillover and spillback hosts as the SARS-CoV-2 pandemic may move into an endemic phase (Hale et al., 2022; Sparrer et al., 2023). Although

COVID-19 is a newly EID for humans; zoonotic pathogens (those shared between human and non-human animals) is not a new concept to wildlife rehabilitators. A great deal of our day (and night!) jobs of providing health care for wildlife patients may have direct preventive health benefits that protect people from zoonotic pathogens.

These 21st century health threats are symptoms of the geologic epoch in which we now find ourselves living. In fact, the current Holocene geologic epoch has been renamed by many as the Anthropocene (Crutzen 2002). The Anthropocene is based on how we humans, *anthro*, are the driving force behind the planetary changes on Earth today. The human footprint is responsible for creating some of our greatest shared health threats. These threats range from EIDs of plants, animals, and humans; the loss of biodiversity, pollution, habitat degradation, to impacts from food production for just one species—*Homo sapiens* (Deem et al. 2019; Table 1). All of these threats may place health burdens on our animal patients, human communities, and ecosystems and often impact our ability to assist wildlife patients at an individual, population, and even species level.

Almost a quarter into this century, in 2024, the global community is more appreciative of (1) how an EID may cause economic and livelihood chaos and lead to periods of global shutdowns, such as the “anthropause” of 2020, (2) how biodiversity loss may impact forest health and food security as seen with the loss of pollinators, and (3) that pollution and contaminants impact not just human health, but other species as well. Humans are better prepared to consider that we may need to modify our business as usual thinking into a more health promoting—preventive—One Health approach.

As these challenges unfold, we as a global community are also more aware that the One Health approach requires transdisciplinary teams of veterinarians, animal care specialists, human doctors, conservationists, sociologists, economists, politicians, anthropologists, science communicators, and many more. All these disciplines are needed to confront the planetary health threats of today. If we view our challenges through a One Health lens and take a collaborative One Health approach, we have the

Table 1 Some of the greatest threats to our shared One Health (Deem et al., 2019).

Climate change
Biodiversity loss
Emerging and re-emerging infectious diseases
Land degradation and human expansion
Food insecurity
Pollutants
Wealth inequality
Science denialism
Human unrest and war

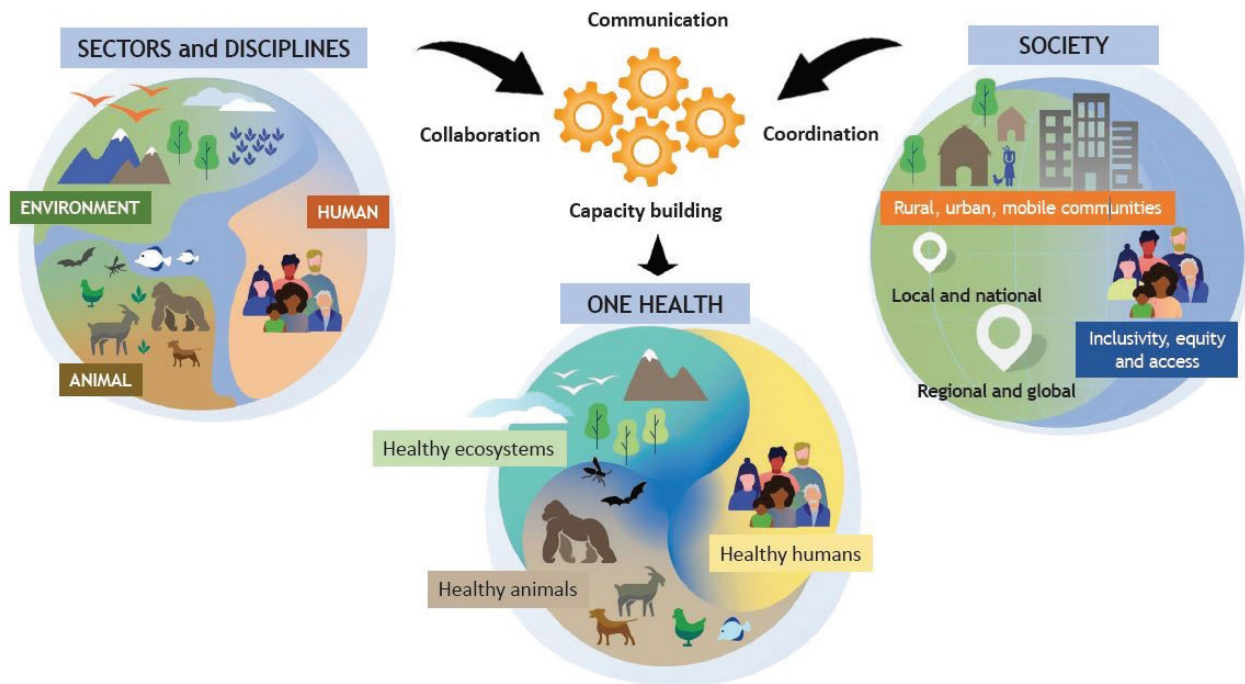


Fig. 1 The One Health High Level Expert Panel One Health Definition (OHHLEP et al., 2022).

opportunity to best ensure human public health, wildlife conservation, domestic animal health and welfare, and environmental resilience.

Wildlife rehabilitation and One Health

Health challenges that threaten wildlife

When we consider the greatest challenges to our shared One Health, from climate change, EIDs and noninfectious pollutants, to the loss of biodiversity, we can also appreciate how these threats have direct and indirect impacts on the animals we work to rehabilitate and release back into their native habitats. Considering each of these threats individually is beyond the scope of this article. However, we know that pollution from macro- and micro-plastics, including their endocrine disruptor chemicals, to contaminants from oil spills impact wildlife health (Bhandari et al., 2015; Henkel & Ziccardi 2018). Wildfires globally have increased morbidity and mortality of wildlife species and have led to the need for increased health care and rehabilitation of species across taxa (Butkus 2021; Haque 2021). Although less appreciated we also know the health impacts that climate change places on animals in our care due to phenological mismatch between animals and the plants on which they depend. For migrating or post-brumating/post-hibernating animals this environmental mismatch may lead to nutritional and immunological weaknesses, in addition to the

negative environmental impacts (Visser et al. 2012; Kudo & Ida 2013).

In addition to these direct, and indirect, health threats to wildlife under our care and the populations they represent are the many add-on costs global threats place on our donors. These supporters of our work may be contending with impacts on their family health and livelihoods, just as we ourselves may be doing. This lack of financial support and people power may minimize our ability to care for the wildlife patients in our facilities. With extreme weather events from fires to floods in which human communities are dealing with the health, monetary and societal costs of these events, it is hard to generate interest in supporting wildlife rehabilitation and conservation. This is unfortunate for a variety of reasons, as well as counter-intuitive. At a time when One Health demonstrates how human health is dependent on animal and environmental health, events such as weather extremes associated with climate change should be a reminder of why our work is important. Healthy wildlife and habitats provide preventive health services for humans.

Wildlife rehabilitators role in One Health

Wildlife rehabilitation is defined as the temporary care of injured, diseased, and displaced indigenous animals and the subsequent release of healthy animals to appropriate habitats in the wild (Miller 2012). As wildlife

rehabilitators, we know how important it is to have healthy environments where our patients live. We also know how important wildlife species are for environmental health through the ecosystem services they provide (e.g., pollination, seed dispersal, water purification, pest control, etc.) and that environmental health is critical for human health. Wildlife rehabilitation is a core component of One Health in its mission to strive for optimal health of animals (domestic and wild), humans, and environments.

Being part of the solution for healthy wildlife populations and One Health

The One Health approach provides a platform for advancing wildlife health, wildlife rehabilitation, and the role of wildlife in our urban, suburban, and rural habitats. By sharing with our supporters, the role of wildlife in ecosystem health to the value of wildlife and nature as tangible human health benefits with both psychological and physical benefits (Louv 2008; Coolman et al. 2020), we can bring our communities into more fully engaging in our work. Human's innate love of life—biophilia—that E.O. Wilson so aptly coined in the 1980s, should be the guiding force of why wildlife rehabilitation sits at the core of One Health. Healthy wildlife is important for public health as it protects domestic animals—think of the wild-life–livestock/companion animal interface, ensures environmental health, and allows wildlife to continue with their ecosystem services. In addition to the ecosystem services provided by wildlife species are the benefits that wildlife surveillance through rehabilitation facilities offer as biosentinels of the environment. Wildlife rehabilitation centers are increasingly appreciated as they provide bio-surveillance of the flora and fauna of the areas they serve (Deem et al. 1998; Sleeman 2008; King et al. 2023).

Conclusions

Wildlife rehabilitators are One Health practitioners. In fact, rehabilitators are on the frontline of preventive health care for animals, humans, and environments. The key goal of wildlife rehabilitation is to provide temporary care for injured, diseased, and displaced indigenous animals that results in the release of *healthy* animals back to appropriate habitats. By doing this we may help to ensure the health of wildlife populations, especially as it is clear that every individual becomes more important for populations facing decline in the face of increasing anthropogenic threats. We may also help to ensure the healthy habitats where these wildlife patients live, and the domestic animals and humans that share their habitats.

We effectively provide preventive health measures for the four components of the One Health approach. Although beyond the scope of this article, we must remember that it is imperative that wildlife rehabilitators always practice under the old adage “first, do no harm.” With EIDs threatening wildlife species across taxa, we must ensure that we only release healthy animals. This may require clinical diagnostics to rule out contagious pathogens prior to reintroductions. This too strengthens the need for a One Health team that includes animal care staff and veterinarians.

As we move further into the 21st century, the greatest challenges to our shared One Health continue to mount, especially climate change which is now viewed as an existential threat to human civilization. Along with climate change are the other significant threats of biodiversity loss and pollution during a time of increased political division, science denialism, and societal unrest and war. The wildlife rehabilitation community has so much to offer for advancing the preventive One Health approach globally. We must communicate our work and the importance of healthy wildlife populations so we may continue to fulfill this critical part within One Health.

Disclosure statement

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