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Wildlife health systems

Commentary on [Wiebers & Feigin](#) on Covid Crisis

Lee F. Skerratt

Melbourne Veterinary School, University of Melbourne

Abstract: Wildlife health systems aim to ensure that all animal life is healthy and resilient. They protect biodiversity and ecosystem services and ensure that the risk of spillover of pathogens is mitigated. These systems are flexible, multidisciplinary and cross-sectorial. They can manage a variety of threats to life that arise in different communities and cultures. Very small investments are required to ensure that wildlife health systems function effectively.

[Lee Skerratt](#) is currently an Australian Research Council Future Fellow and leads the One Health Research Group at the Melbourne Veterinary School. His main research focus is understanding the impact and determinants of diseases affecting wildlife and ultimately methods to control them. [Website](#)



Banning the trade and consumption of wild animals in live-animal markets as suggested by Wiebers & Feigin (2020) (W&F) would certainly help reduce the risk of future pandemics (among other benefits). W&F explain how human actions such as crowding animals and dominating the ecosystem have created more opportunity for pathogens to jump from one species to another and especially into humans. W&F add that this warning should galvanize us into action across a number of areas that pose similar risk, such as factory farms. [This is supported by commentators Schuck-Paim (2020) and Greger (2020) but questioned by Robbins (2020)]. W&F urge us to rethink our relationship with all life on this planet. Commentary from Wyatt (2020) goes on to explore an ethical and legal framework and Morand (2020) suggests that new social-ecological health governance is needed to guide this relationship; a similar argument is made by Fox (2020) for a “United Environmental Nations”.

Wildlife health as a discipline demands these approaches and is captured in this recent directive:

“A modern definition of wildlife health should emphasize that 1) health is the result of interacting biologic, social, and environmental determinants that interact to affect capacity to cope with change; 2) health cannot be measured solely by what is absent but rather by characteristics of the animals and their ecosystem that affect their vulnerability and resilience; and 3) wildlife health is not a biologic state but rather a dynamic social construct based on human expectations and knowledge.” (Stephen 2014).

This statement clearly links the health of wildlife with the environment and humans; it regards wildlife health in terms of resilience to change and situates our views towards wildlife as centrally important.

Commentators Cao (2020), Fawcett (2020) and Whitfort (2020) all argue that major changes in human behavior are needed both to protect animal welfare and to protect humans from disease. Broom (2020) goes on to suggest specific measures that will reduce the risk of

the next pandemic of zoonotic origin. Several of the commentators suggest that a cross-sectorial, One Health, approach is necessary to solve the problem of pandemics. As stated by the Wildlife Disease Association (WDA):

“For over 30 years WDA's One Health mission has been to acquire, disseminate, and apply knowledge of the health and diseases of wild animals in relation to their biology, conservation and ecology including interactions with humans and domestic animals” (WDA 2020).

Because wildlife health has the well-being of wildlife at its core but also recognizes the key interdependencies with the environment and humans, the discipline addresses many of the issues raised by W&F and commentators. Hence, supporting good wildlife health systems is important to mitigating the risk of pandemics but also a major component of the health of life and the One Health approach.

Wildlife Health is a growing discipline, with the formation of the WDA in 1951. Since then the importance of wildlife health to human health, domestic animal health, conservation of biodiversity and the provision of ecosystem services has been rapidly growing. Nations and international bodies are at various stages of developing wildlife health systems. Recently, the Australian Wildlife Health Institute initiative was launched to deal with the need for a national strategic approach to priority issues (Tucak 2020). Wildlife health systems are akin to health and veterinary systems, with trained professionals in wildlife health at their core. Most training is at the postgraduate level but undergraduate courses in animal sciences are increasingly including wildlife health. Programs like the Wildlife Health Bridge and its Interventions in Wild Animal Health course aim to increase capacity through training in low to medium income countries where wildlife health expertise and resources are especially lacking (Meredith et al, submitted). Where wildlife health workers are employed and how they are supported and resourced varies greatly. Canada, for example, has the Canadian Wildlife Health Cooperative (CWHC) with its core workforce based in veterinary schools across the country, funded through federal and provincial governments and many stakeholders (CWHC 2020). At the global level the International Union for Conservation of Nature (IUCN) has the Wildlife Health Specialist Group and The World Animal Health Organisation (OIE) has the Working Group on Wildlife. These bodies recently collaborated to develop guidelines and a manual for disease risk analysis for wildlife (World Organisation for Animal Health (OIE) & International Union for Conservation of Nature (IUCN) 2014, Jakob-Hoff et al 2014).

These wildlife health systems and their practitioners generally aim to mitigate disease risks that affect the health and welfare of all life and have had a One Health approach from their inception. They aim to do this through general health assessments of wildlife to collect baseline information on the resilience of wildlife populations for systematic disease-risk analysis. Much of this information is published in specialist journals such as the *Journal of Wildlife Diseases*. This knowledge then contributes to biosecurity to prevent disease transmission and to other preventative health measures such as genetic and habitat management, pollution control and disease surveillance in case outbreaks occur. For example, Wildlife Health Australia, which coordinates and communicates wildlife health assessments and disease surveillance for Australia, has facilitated the detection of lead

poisoning of wild birds in Esperance. This led to the discovery of widespread lead pollution and poisoning of animals and people, substantial efforts to reduce the health impacts and major changes in the management of the port of Esperance and in the exportation of lead carbonate (Western Australian Government 2007).

Early detection of disease spillover through disease surveillance facilitates emergency and outbreak investigation, providing more effective disease control. A wildlife pathologist at the Bronx Zoo detected the introduction of West Nile Virus into New York through necropsy of dead birds; this facilitated diagnosis in other animals and people and a response to outbreaks over several years as the infection spread across North America (ProMED 1999). Underpinning these wildlife health management systems are research, training and extension of the latest innovations such as through centers for research and training, including the National Wildlife Health Center within the United States Geological Survey and the Southeastern Cooperative Wildlife Disease Study at the University of Georgia.

If we have the skills and knowledge to manage wildlife health, why didn't wildlife health professionals and systems prevent the spillover of SARS Coronavirus 2? Wildlife health is a growing field and it takes decades to build the systems required. The level of investment in wildlife health has been gradual, starting from a very low base. We also tend to give priority to immediate problems rather than to preventing future ones. The benefits of wildlife health systems to mitigate the risk of pandemics are obvious now but were not so obvious over two decades ago when henipaviruses first emerged in south east Asia and Australia (Murray et al 1995, Chua et al 2000). The importance of wildlife health has since been demonstrated by the impact on all animals of many further emerging infectious diseases, the worst being a panzootic fungal disease currently threatening the extinction of over 500 species of amphibians (Tompkins et al 2015; Scheele et al 2019). However, it has apparently taken the lived experience of a pandemic of wildlife origin, creating a massive human health burden and crippling world economies, to demonstrate the serious consequences of inadequate approaches to wildlife health.

The good news is that the level of investment required for good wildlife health systems that would improve wildlife health, welfare and reduce risk of disease spillover is relatively small. Leadership is needed in developing wildlife health systems using existing resources and a cross sectorial approach. This is because of the interdependencies of wildlife health but also because much of the specialist expertise required to support wildlife health, such as diagnostic capability, already exists in veterinary and human health systems. Hence it would be more efficient to use existing capability. This is already being called for by the OIE Working Group on Wildlife, which has recommended that veterinary services support improved wildlife trade and health that prevents future pandemics, protects natural resources, contributes to species conservation and allows economic activities to flourish (World Organisation for Animal Health 2020).

It is also important to note that this international expert group expects the outcomes of this collaborative approach to benefit all life, not just human. Coghlan and Coghlan (2018) urge us to rethink our moral obligations to nonhumans and the ethical premise of One Health. To contend with the threat of pandemics of wildlife origin, wildlife health systems need to be supported by governments, industry, philanthropy and communities to ensure their viability.

Just as we heed public health officials to manage a pandemic we need to heed and support wildlife health experts – not only to prevent pandemics of wildlife origin but if we wish to have healthy and resilient life on Earth.

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