



The Royal College of Pathologists
Pathology: the science behind the cure

Letter to the Editor – Global climate change alters patterns of disease: a veterinary medical perspective

Following April's Bulletin exploring the topic of climate change and sustainability, we hear a veterinary medical perspective on the effects of the climate emergency.

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Author: Brian A Summers

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The subject of climate change and its consequences for our health (*Bulletin, April 2024*) has long been a concern in veterinary medicine. There is evidence of changing patterns of known diseases and emerging new syndromes in human and also animal populations, such as avian and wildlife species, zoo animals and agricultural species.

Confusion and misdiagnosis may occur; when West Nile virus arrived in North America, health authorities initially incriminated the mosquito-borne St Louis virus and spraying New York city began in earnest. Bronx zoo veterinary pathologist Dr Tracy McNamara recognised that illness and death was targeting local species (many crows died), unusual for a 'home-grown' agent and she suggested that this flavivirus was exotic, as proved to be the case.¹

Wildlife, commonly various bats, feature in many new infections including Nipah virus in pigs and humans, Hendra virus, which caused equine and human mortalities, and more recently human coronavirus respiratory infections (which infect some animals), with bats, palm civets and camels as possible sources. Destruction of natural wildlife habitats by deforestation or natural disasters (ferocious storms, droughts, floods, fires) increase the potential for human exposure to animals carrying unsuspected pathogens.

As climates have warmed, vector-spread disorders have appeared in virgin territory, with agents carried biologically or simply mechanically. The orbivirus infection Bluetongue of sheep, goats and cattle (so called because the tongue swells and may become cyanotic) is transmitted by biting *Culicoides* midges. The infection has long been known in sub-Saharan Africa and Mediterranean lands, and cases have been recorded in the UK since 2007. Possibly infected midges were blown across the channel from Western Europe. Wildlife is not spared: warming

seasons in Quebec have resulted in heavy tick infestations in moose, with blood loss, wasting and deaths. Many tick-borne infections such as Lyme disease and tick-borne encephalitis (TBE) are spreading, affecting human and animal populations. Antibodies to TBE virus in sheep's milk identified new virus foci in Sweden. With climate change, Heffernan discusses the remarkable complexity of modelling global health outcomes.²

Many years of monitoring a single agent revealed how the interactions between weather patterns and disease can be remarkably complex. Canine distemper infection, a systemic morbillivirus disorder (and related to measles), was common and lethal in dogs before vaccines were developed in the 1960s. Distemper virus is an unusually promiscuous agent in its range of natural hosts, which include foxes, coyotes and dingoes, plus animals of unrelated families including badgers, ferrets, raccoons and mink, and even seals, dolphins and porpoises.

In 1994, canine distemper caused encephalitis with seizures, which depleted the lion population of the Serengeti National Park, Tanzania. Distemper, also in other large cats (tigers and leopards), is now recognised globally. In Africa, while subsequent seroepidemiology showed cycles of infections in lions, the development of clinical disease was influenced by the weather which facilitated a comorbidity – a tick infestation in distemper-infected cats – yes, it's complicated. The tick-borne haemoparasite *Babesia* was incriminated in delivering the coup de grace.³

Finally, *Ixodes holocyclus* ticks cause paralysis in dogs and cats, and sometimes young children in eastern Australia. Both the onset of the tick paralysis season and the number of cases are determined by the weather.⁴

[References available on our website.](#)

Meet the author

BRIAN A SUMMERS

RETIRED VETERINARY ANATOMIC PATHOLOGIST

WRITING TO THE EDITOR

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The Royal College of Pathologists

6 Alie Street

London E1 8QT

[Map and directions](#)

Tel: +44 (0) 20 7451 6700

Email: info@rcpath.org

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