

Conservation medicine: One World, One Health in action

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There is no doubt that the pressures being exerted by the burgeoning human population are having increasingly catastrophic effects on our environment. Be it from agricultural practices that increase desertification of arable lands or eutrophication of waterways, the over-harvesting of fish and game that deplete natural stocks beyond the point of recovery, the chemical pollution of air and waterways, deforestation or the drainage of wetlands, the basic life-support systems of the planet are being eroded.

Pathogen pollution

A new term, "pathogen pollution" has been coined to describe the increasing distribution of pathogens across geographic and ecological divides, aided by human activities. At the same time, increasing specialisation within the health sciences has resulted in silos of expertise working in isolation from each other, ill equipped to bring the level of understanding needed to address diseases emerging in response to complex sets of interacting variables.

Origins of conservation medicine

The so-called Manhattan Principles, arising from the first "One World, One Health" meeting held in New York in 2004, are a coherent summary of the thinking that underpins the new discipline of conservation medicine.

Key concepts are the recognition that human, animal and environmental health are inter-linked and that understanding and addressing these complex interactions requires a collaborative approach by trans-disciplinary teams.

Veterinary scientists in North America have been at the forefront of developing this paradigm – stimulated by the growing number of emerging



The Archey's frog, *Leiopelma archeyi*, an ancient and uniquely native frog is, like all amphibians, exceptionally vulnerable to environmental change.
PHOTO: LANA JUDD

and re-emerging zoonotic diseases such as severe acute respiratory syndrome (SARS) and pandemic forms of avian influenza as well as the impact on biodiversity conservation of pathogens able to cross species boundaries. In New Zealand, examples include *Salmonella typhimurium* DT160, a new strain to this country. It caused mass mortality in sparrows in 2000/01 and spread from them to cause morbidity and some mortalities in a range of species including humans, domestic and wild mammals and birds. Elsewhere, examples include measles

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vets are naturally more interested in endemic disease while government is more concerned with zoonoses and exotic diseases. The report concludes it is imperative that government and the veterinary profession reach a common position on surveillance.

I believe that many aspects of the Lowe Report are relevant to the New Zealand situation and that NZVA has a role to play in coordinating efforts by the veterinary profession and government authorities to optimise the contribution that the veterinary profession can make to New Zealand's agricultural sector and economic wellbeing. NZVA is currently developing a paper on this matter for discussion with government authorities.

The World Organisation for Animal Health (OIE) has also expressed concern that the supply of food production veterinarians around the world is not keeping up with the growing demand and has initiated a global conference in Paris in October 2009: "Evolving veterinary education for a safer world". The focus of the conference will be to consider whether veterinary schools in the developed and developing world are providing appropriate teaching in food safety, animal welfare and biosecurity and producing veterinary graduates with expertise and enthusiasm for a career in production animal practice.

The role of the veterinarian in society has evolved tremendously over the past 30 years, particularly in



Hananui 2, one of this year's crop of kakapō, recovers from a foot injury at the NZCCM's wildlife hospital. The NZCCM is contracted to provide veterinary support for the kakapō recovery programme. PHOTO: BETHANY JACKSON

and polio in mountain gorillas in close contact with eco-tourists and distemper from domestic dogs causing die-offs in lions, African wild dogs and the critically endangered black-footed ferret. It is estimated that 60–75 percent of these emerging infectious diseases have a wildlife reservoir.

Conservation medicine in New Zealand

The New Zealand Centre for Conservation Medicine (NZCCM) at Auckland Zoo was opened in August 2007. The centre aims to establish itself as an international centre of excellence in its field. Recognising that human and animal health sciences currently work in relative isolation from each other, the centre provides a hub to actively promote and facilitate national and international

collaboration and research focused on enhancing the health of people, animals and the environment.

Research

Disease surveillance and baseline wildlife health data

In New Zealand, we have a dearth of knowledge of the disease status of feral and native wildlife and this has significant implications for national biosecurity preparedness, biodiversity conservation as well as human and domestic animal health. Consequently, the NZCCM's main research efforts have been directed at wildlife disease surveillance and the establishment of baseline data to enable health evaluation of free-living wildlife. This work underpins Auckland Zoo's involvement in many native species recovery programmes, particularly those involving the translocation of species including kiwi, tuatara, kokako, pateke (brown teal), Campbell Island teal and kakapō.

Disease investigation

The NZCCM has established a post-graduate Residency in Conservation Medicine in collaboration with James Cook University (Queensland), the University of Otago and Massey University, Albany. The incumbent, Dr Stephanie Shaw is pursuing a PhD research project to investigate the incidence, geographic distribution and epidemiology of selected native frog diseases. Disease is considered to be a major driver of global amphibian extinctions and some of our native Archey's frogs – the rarest evolutionarily distinct frogs in the world – have suffered major declines in recent years. Through MAF Biosecurity New Zealand (MAFBNZ) we are also periodically involved in mass-mortality investigations such as the recent penguin die-off in the Hauraki gulf.

National wildlife health database and disease risk assessment

The NZCCM has been contracted by the Department of Conservation (DoC) to manage its national wildlife

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western countries. The range of career opportunities for veterinarians has expanded exponentially as society has become more sophisticated and affluent. However, one of the core roles of the veterinary profession since its inception has been the health and welfare of food-producing animals. This role is as important today as it was when the first veterinary school opened in France in 1761.

While the veterinary profession has a vitally important role in helping to feed a hungry world, we also have a responsibility to consider the sustainability of the production animal systems that we support and advise.

The world is facing great challenges with an exploding human population and ever-increasing demands on the environment and ecosystems. The sustainability of this growth is questionable and it remains to be seen whether we can maintain and expand living standards for all humans without doing permanent damage to fragile ecosystems upon which all life on earth depends. But that is a whole other subject which will be explored in the November edition of *Vetscript*.

To view the Lowe Report, visit:
www.defra.gov.uk/animalh/ahws/vservices

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health database funded through the terrestrial and freshwater biodiversity information system (TFBIS). This will, for the first time in New Zealand, provide a single portal for pooling and accessing wildlife disease surveillance and normal health parameter data. To date this data, where collected, has been scattered and its value to biosecurity risk assessment and conservation management decision making negated. In addition, DoC and the Auckland Zoo have been collaborating with the Conservation Breeding Specialist Group (CBSG) over a number of years in developing a series of tools for assessment of disease risks involved in wildlife translocations. These tools are becoming increasingly sophisticated but all depend on the availability of baseline disease prevalence data. Consequently, the national wildlife health database will provide an essential resource for risk assessment and risk management planning.



Participants in the kakapō disease risk assessment workshop assemble outside the NZCCM public gallery. The author is third from right in the back row. PHOTO: AUCKLAND ZOO

Collaborative partnerships

It is only through partnerships with organisations and individuals that have complementary expertise and resources that the NZCCM is able to achieve its goals. Some of these partnerships have been formalised with memoranda of understanding (e.g., with Landcare Research, Victoria University’s Centre for Biodiversity and Restoration Ecology, and DoC’s national kakapō team) while others are evolving on a project-by-project basis (e.g., with MAFBNZ, DoC and a growing number of community-based species restoration groups and corporate service providers).

The NZCCM also works in close partnership with international organisations that provide access to a diverse range of expertise. The CBSG, a division of the World Conservation Union, has recently established an Australasian branch whose office is has been based at the NZCCM. Specialising in the development of tools, and processes to facilitate conservation partnerships, it is through the NZCCM’s close relationship with this body

that the centre has recently hosted a disease risk assessment workshop for kakapō and a regional marine debris forum, bringing together 19 groups to coordinate their efforts in cleaning up our beaches and coastal waters.

The way forward

“Business as usual” is failing to turn the tide of planetary degradation. As Einstein said, problems are not solved with the same thinking that created them. With that in mind, it is encouraging to see some active steps towards closer collaboration between government agencies, Crown research institutes and others with a common interest in zoonotic and wildlife diseases. A current example is a recently completed two-year project to research the ecology of vector-borne diseases. Funded through a cross-departmental research pool, the project included collaboration between MAFBNZ, DoC, Ministry of Health, Landcare Research, Environmental Science and Research, Massey University, NZ BioSecure, AgResearch and the NZCCM. Each participant brought unique knowledge, expertise and resources that enhanced the outcomes and, through their different professional perspectives, contributed to expanding the knowledge and understanding of every team member. This was a truly trans-disciplinary approach and, surely, a great example for the way forward!

For further information: www.oneworldonehealth.org

Morepork foundling



Unfortunately not all injured wildlife can be saved. This injured morepork (ruru) was left outside Inglewood Vet Services earlier this year. Although it was alert and happily eating trapped mice and Harrison’s Recovery Formula, the multiple open fractures on its left wing were too severe for recovery and rehabilitation, and it had to be euthanased. Our thanks to Alison Harland of Inglewood Vet Services for this great photo.