

The illegal introduction of rabbit haemorrhagic disease virus in New Zealand

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Summary

In 1997, a group of pastoral farmers, frustrated by governmental and official responses to their problems of rabbit control, introduced and spread the rabbit haemorrhagic disease virus in a clandestine operation that succeeded in distributing infection over a large area of the South Island before the disease was detected by government officials. The government concluded that eradication was not technically or economically feasible and the disease was accepted as being endemic.

The episode highlighted the inadequate decision-making environment that existed at the time, now improved by the passage of the Hazardous Substances and New Organisms Act.

It also highlights the importance of having a comprehensive biosecurity detection and response capability, including the ability to conduct prompt risk assessments, since preventing entry of biological agents may be difficult to achieve in the face of a determined adversary.

Keywords

Biocontrol – Illegal release – Rabbit haemorrhagic disease.

Introduction

In late August 1997, dead rabbits were found on a farm in the South Island of New Zealand. Post-mortem and laboratory studies confirmed that death was due to infection with the rabbit haemorrhagic disease (RHD) virus. An emergency disease-control response was initiated by the Ministry of Agriculture and Forestry (MAF). The farm was placed under quarantine and an area movement restriction implemented in an effort to contain infection in that area. However, in the course of investigations during the following week, it became apparent that the disease was already widely distributed over a large area of the South Island.

The RHD virus had been deliberately introduced from Australia and multiplied by the inoculation of captured wild rabbits whose tissues (mainly liver and spleen) were harvested at death and homogenised; the homogenate was then applied to grain, carrot and parsnip baits to distribute over farms infested with rabbits. The carcasses of infected rabbits were also distributed to create infection foci. Although the principal objective was to spread infection as widely as possible, it became clear that both biocontrol

(control of the rabbit population through the propagation of an epidemic from infection foci) and biocide (use of infected baits to kill individual rabbits) objectives were being pursued. Infectious material was passed covertly from farmer to farmer to ensure wide distribution.

It became clear that the introduction and spread of the virus had been managed in a highly effective clandestine operation involving a significant number of farmers who farmed land prone to infestation by rabbits. The operation had been in effect for several weeks before the outbreak was first officially recognised. Anecdotal evidence suggests that the virus was in New Zealand before the official decision not to permit the release was announced.

The MAF was forced to announce that no prosecutions for possession of the virus (possession and deliberate spread were illegal at that time) would be taken, in order to encourage farmers to provide the information needed to gauge the extent of the infected area. The extensive distribution led to the conclusion that eradication was probably not technically feasible and could not be justified economically. The political and legal ramifications of this decision are discussed below.

Why did it happen?

The European rabbit (*Oryctolagus cuniculus*) was introduced to New Zealand in the 19th Century and rapidly established itself over most of New Zealand. By the late 19th Century, rabbit numbers had reached pest proportions in many areas of pastoral land, particularly in the drier areas (rainfall 300 mm to 600 mm per year), and were having a severe impact both on pastoral farming and on the environment.

Between 1887 and 1995, the New Zealand government subsidised the costs of control, and control measures were implemented by regional committees. In 1990 the government decided to withdraw its financial support and a five-year phase-out programme was implemented. At the end of this programme, farmers became responsible for meeting the costs of rabbit control undertaken on their own account and/or imposed on them by regional government. For many who farmed pastoral land that favoured the development of high-density rabbit populations, these costs became a severe impost on the farming budget which precluded expenditure on other essential inputs. In some cases, the costs were financially crippling.

An attempt to introduce the myxoma virus as a biocontrol agent in the 1950s was unsuccessful because of the lack of suitable vectors. A new application to introduce the myxoma virus and a rabbit flea vector in 1991 was rejected in 1993, the government opting to invest in Australian research on the RHD virus as potential biocontrol agent because it was seen as a more publicly acceptable option.

The escape of the RHD virus from the field trial site on Wardang Island, South Australia in September 1995 and its rapid dissemination over most of southern Australia caused New Zealand to step up its consideration of the use of the virus as a biocontrol agent. However, the risk of an uncontrolled release of the virus in New Zealand was seen as something to be avoided. The immediate response to this risk was to declare the virus an 'unwanted organism' under the Biosecurity Act 1993 and to increase vigilance at the borders. The declaration made the possession and deliberate spreading of the virus illegal.

A group of interested parties filed an application to import the virus as a biocontrol agent in June 1996 but, after a protracted and often acrimonious period of public consultation and debate, the Deputy Director General of MAF, acting under delegated authority, decided to reject the application (4). A quirk of New Zealand law at the time gave responsibility in this matter to a bureaucrat rather than having the decision taken at a political level. The grounds for declining the application to import the virus were that, although the identified risks were not sufficient

to preclude introduction of the virus at some future time, too little was known of the likely epidemiological performance of the virus in the New Zealand environment to justify those risks at that time. However, the decision-maker drew attention to some consequences of the decision: the inability of farmers to meet the costs of rabbit control with the available technologies would have serious impacts on the environment as well as on productivity. This warning was largely ignored.

A feature of the public consultation process leading up to the decision on the application was the high degree of polarisation of opinion and the widely divergent perceptions of the risks in the community. An analysis of the risk-communication process (6) concluded that although considerable effort was made to ensure that the public were well informed, they did not become engaged with the issues until a very late stage, and that the debate was fuelled by public disagreement among scientists on the interpretation of data and risk assessment. In such circumstances the decision inevitably created winners and losers.

Rejection of the application was angrily received in political and farming circles. The decision was publicly criticised by the Prime Minister, Minister of Agriculture and farming leaders. The anger was sufficient to encourage some farmers to take matters into their own hands. Anecdotal evidence suggests that a negative decision had been anticipated and that plans for the illegal release were already in place if not already implemented.

Political and legal consequences

When it was concluded that eradication was not feasible, the government opted for a pragmatic (some say expedient) approach. Changes to the law were necessary to legitimise the possession and spread of virus-infected material, give legal effect to the MAF's decision not to proceed with prosecutions for the previously illegal possession and spreading, and to alter the status of the virus from the 'unwanted organism' classification.

The way in which the application to import the virus as a biocontrol agent had been considered, through bureaucratic rather than political channels, highlighted a deficiency in the national law at the time. This has been corrected by the passage of the Hazardous Substances and New Organisms (HSNO) Act, which defines the decision-making process, the decision-making body, and the ability for decisions to be made at a political level in appropriate circumstances. It is likely that the decision on the RHD virus application would have been made at the political level had the law been in force at that time.

However, it is by no means clear that, if a future decision made under the HSNO Act was unpopular with a particular group, this would be less likely to lead to an illegal act. In the event that such an illegal act led to the introduction and establishment of an organism, the same considerations would apply as in the case of the RHD virus. The decision would still be based upon the feasibility of and justification for selection of the available options: eradication or control of the organism, or alternatively acceptance or exploitation of its presence. The reasons for a decision to keep an organism out of a country are not the same as the reasons that govern what to do once that organism is established. Establishment of an organism may fundamentally alter the status and decision-making environment of a country in which the establishment occurs.

Biological consequences

Rabbit haemorrhagic disease is now endemic to New Zealand. The initial epidemic significantly reduced the abundance of rabbits in most parts of the country, but the extent of reduction in numbers varied in time and in space (5) for reasons that are not entirely clear. One explanation is the persistence of rabbits immunised by surviving infection or being exposed to non-viable virus by virtue of the methods used to spread the tissue homogenates.

Since the initial epidemic, periodic localised epidemics, occurring usually in the late summer and autumn, reduce local populations. Long-term survival of virus nucleotides in wild rabbits has been demonstrated, with genomic length sequences found in two samples that suggest these rabbits retain the potential to be infectious (2).

In most parts of New Zealand, rabbit numbers fluctuate around a low mean number as the result of the impacts of unfavourable weather and predation on the survival of young rabbits. In this situation, RHD has a minimal impact. In the drier parts of New Zealand, survival of young rabbits is higher in spite of predation, and here RHD continues to have a beneficial effect on numbers. While the use of other forms of control (poisons, shooting) has not been eliminated, the overall costs of rabbit control are much more acceptable to farmers than in pre-RHD days.

Domestic rabbits can be protected by maintaining isolation and vaccination.

Conclusions

There have been a number of reviews of the legal, political and social consequences of the release of RHD virus in

New Zealand (1, 3, 7). The following are the author's conclusions. They draw on the findings of the reviews but should be regarded as personal views rather than a summary of those findings.

The introduction of RHD virus

The illegal introduction and spread of RHD virus was probably an inevitable consequence of the official decision not to permit the legal introduction of the virus as a biocontrol agent. How the introduction was achieved has not been determined, but much is now known about the concerted campaign to spread the virus, once introduced. The farmers responsible considered their livelihoods were threatened, felt betrayed by successive refusals to allow biocontrol agents to be imported, and let down by their government's perceived failure to recognise their plight. Many show no remorse for their actions.

Vulnerability of borders

It is difficult to conceive of border control measures that would have prevented the introduction of the virus in the face of a determined effort by a person or persons with sufficient understanding of how to get viable virus into the country.

Policy-making

The policy consequences of a negative decision on the application to import the virus were not thought through, and the warnings of the decision-maker were ignored.

The Hazardous Substances and New Organisms Act

New Zealand now has a much better legal framework for making such decisions (the HSNO Act) but this provides no guarantee that disaffected persons will not take the law into their own hands in the future. However it is likely that the consequences of a particular decision will be more fully explored as part of the decision-making process in future.

The threat

The actions of the farmers have been likened to bioterrorism. While their motives may not have been the same as those of a terrorist, they demonstrated how efficient organisation can frustrate official efforts to prevent the introduction and establishment of a disease agent.

The need for response capability

New Zealand's biosecurity capability has earned respect over many years, and with the establishment of Biosecurity

New Zealand has had its scope and capability further extended. Bioterrorism is a recognised threat and contingency planning for it is in place. However, recent world events have demonstrated that all too often the official response has to deal with the aftermath of a terrorist act rather than prior prevention. This emphasises the

critical importance of having a carefully planned comprehensive response capability with the capacity to make rapid operational decisions and obtain political endorsement of them. ■

L'introduction illégale du virus de la maladie hémorragique du lapin en Nouvelle-Zélande

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Résumé

En 1997, un groupe d'éleveurs pastoraux, déçus par les réponses gouvernementales et officielles aux problèmes que leur posait le contrôle des populations de lapins, ont introduit et disséminé le virus de la maladie hémorragique du lapin dans le cadre d'une opération clandestine qui a eu pour résultat de répandre l'infection dans une grande partie de l'île du Sud avant que la maladie soit détectée par des responsables gouvernementaux. Le gouvernement a conclu que l'éradication de la maladie n'était pas réalisable d'un point de vue technique ou économique et le caractère endémique de la maladie a été accepté.

L'épisode a mis en lumière l'inadéquation du cadre décisionnel qui existait à l'époque, désormais amélioré par l'adoption de la loi sur les substances dangereuses et les nouveaux organismes.

L'épisode montre également combien il est important de disposer de capacités globales de détection des problèmes de biosécurité et de réaction à ceux-ci, y compris en matière d'évaluation rapide des risques, puisqu'il peut être difficile d'empêcher l'introduction d'agents biologiques face à un adversaire déterminé.

Mots-clés

Contrôle biologique – Dissémination illégale – Maladie hémorragique du lapin. ■

La introducción ilegal del virus de la enfermedad hemorrágica del conejo en Nueva Zelanda

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Resumen

En 1997, un grupo de ganaderos, frustrado por la respuesta de la administración a sus problemas para controlar las poblaciones de conejos, introdujo y propagó el virus de la enfermedad hemorrágica del conejo en una operación clandestina, con la que consiguió extender la infección por una vasta zona de la Isla Sur antes de que las autoridades la detectaran. El Gobierno llegó a la conclusión de que la erradicación no era técnica y económicamente viable y se resignó a considerar endémica la enfermedad.

Aquel hecho puso de manifiesto la inoperancia de los mecanismos decisorios existentes por entonces, mejorados ahora con la aprobación de la "Ley sobre sustancias peligrosas y nuevos organismos".

Esa experiencia también deja patente la importancia de disponer de un sistema global de detección y respuesta de seguridad biológica, lo que incluye la capacidad de determinar riesgos con rapidez, puesto que, ante determinados adversarios, puede ser difícil impedir la penetración de agentes biológicos.

Palabras clave

Control biológico – Diseminación ilegal – Enfermedad hemorrágica del conejo.



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