AN ASSESSMENT OF THE RISKS OF INTRODUCING ALVEOLAR ECHINOCOCCOSIS INTO THE UK AS A CONSEQUENCE OF CHANGES IN QUARANTINE REGULATIONS FOR DOGS AND CATS

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One of the consequences of the UK government review on the quarantine of dogs and cats entering the UK was an identified need to review the potential risks from the importation of pathogenic organisms in the wake of the proposed changes to the current quarantine regulations. As part of the government review, consideration was given to diseases of cats and dogs, other than rabies, that occurred in the European Union, that were zoonotic, and had the potential to become established in the British Isles. From the identified list of zoonotic diseases of cats and dogs produced by the World Health Organisation, five diseases were considered to be a potential threat. One of the main concerns was with alveolar echninococcosis, a potentially zoonotic tapeworm infestation of carnivores, primarily foxes. To support the decision making process a qualitative and stochastic quantitative risk assessment on the risks of specifically introducing *E. multilocularis* into the UK was conducted.

Materials & Methods

Initial information of prevalence and distribution of the disease was based on a worldwide literature search and expert opinion. This was further enhanced and refined by obtaining further expert opinion to increase the confidence in the final parameters used.

For the risk assessment three prevalence areas for levels of infection were used. The Northern Hemisphere was divided into areas of high endemnicity (HL)within wild hosts, and areas where currently the endemic prevalence is limited, (LL) but thought to be increasing. There remain no reports of the parasite in the Southern Hemisphere (SH). Due to the lack of information on the prevalence of the parasite in dogs and cats, an association was assumed between the level of infection in wildlife and that in domestic dogs and cats. Prevalence figures used in the model took into account factors such as period of residency, wildlife reservoirs, dog and cat lifestyles, likelihood of contact and host susceptibilities to infection. Discriminate was made between visiting and long-term resident dogs and cats in each of the three defined areas. Thus, animals within the three prevalence areas have been categorised into Resident (R) and Visiting (V) animals, residency being defined as resident in the exporting country for more than 3 months. Using these catagories the model was constructed in Microsoft Excel and used the programme @RISK (Copyright Palisade) to provide a probability distribution for the numbers of infected cats and dogs per 1000 imports for each category. To allow for

uncertainty, the model was run with and without the proposed additional safeguards of treatment and certification.

Results

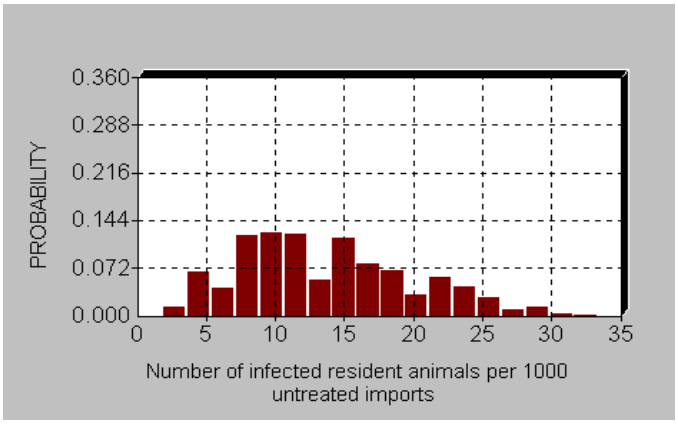
The overall probability distributions for untreated and treated resident and visiting dogs and cats are shown in Figures 1 and 2. The model output predicted that the overall modal numbers of potentially-infected animals as 14 per 1000 imports (95^{th} percentile 25) for resident animals, and 5 (95^{th} percentile 8) if no controls were in place, i.e. untreated with no cetification. The corresponding figures areas for treated animals were 2 per 1000 imports (95^{th} percentile 4) for resident animals, and 1 (95^{th} percentile 1) for visiting animals.

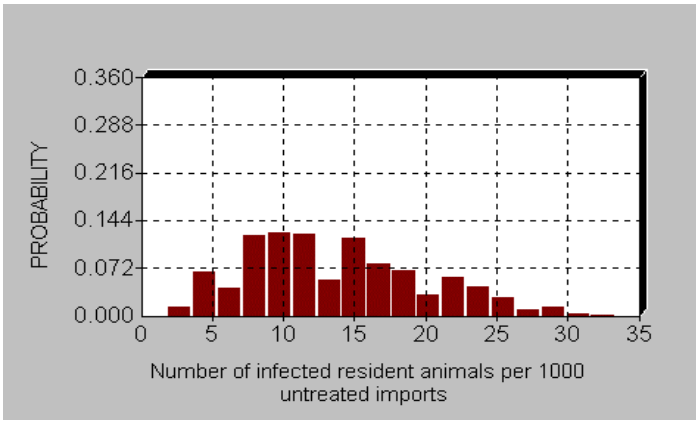
On an area basis, and with treatment compliance, the modal values for dogs is 3 and cats 2 per 1000 imports (95th percentile 6 and 4 respectively) for Resident (R) animals, and dogs and cats both 0, (95th percentile 1 and 0 respectively) for visiting animals to or from northern low prevalence (LL). Modal values for animals from high prevalence northern hemispheres (HL) countries were for dogs 9 and cats 2, (95th percentiles 21 and 3 respectively) for Resident (R) animals, and dogs 1 and cats 0, (95th percentiles 2 and 1 respectively) for visiting animals. For southern hemisphere countries the modal values per 1000 imports for both resident and visiting dogs and cats were 0 (95th percentile 0).

Conclusions

The model demonstrates that overall, treatment compliance and certification greatly reduces the risk of importing dogs and cats with *E. mulilocularis* infections. However, it is considered likely that even if treatment with praziquantel is used correctly, and despite its high efficacy, there remains a very low probability of treatment compliance failure. There therefore remains a low perceived risk of importing infected animals that have been resident in northern low prevalence countries. For animals visiting these countries for less than 3 months, then there is an extremely low risk of importing infected animals. For any randomly selected resident dog from high prevalence regions, the probability of introducing infection is greater than for dogs in low prevalence areas, whilst the risk for cats is present but less than that for dogs. This is a reflection of differences in susceptibility to the parasite, cats being less susceptible than dogs. For animals visiting high prevalence areas, there is a low perceived risk of importation of infection with dogs and cats although it has been assumed that cats are less likely to make short-term vists to these regions, or indeed be exposed to infected intermediate hosts. Because of absence of reports of this parasite in southerm hemisphere countries, the risk of importing *E. multilocularis* from the southern hemishpere is negligible

Overall Probability distrbutions for total numbers of (a) resident and (b) visitor animals per 1000 untreated imports





Overall Probability distrbutions for total numbers of (a) resident and (b) visitor animals per 1000 treated imports