



Exotic Diseases in Dogs and Cats – The DACTARI Scheme

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DACTARI (Dog and Cat Travel and Risk Information) is a voluntary scheme, launched by Defra in March 2003, for the reporting of cases of exotic disease in dogs and cats in Great Britain. While it is intended for the reporting of any exotic disease in these species, DACTARI focuses on four main ones: babesiosis, ehrlichiosis, dirofilariasis and leishmaniasis (which is a known zoonosis).

This article presents the background to the scheme, the results from its first year of operation, and an assessment of the risk of introduction of exotic disease into Great Britain via companion animals.

Background

Before February 1998, in order to prevent the introduction of rabies, cats and dogs could only enter the UK after a six-month period of quarantine. Following acceptance of the recommendations of the Kennedy report in 1998, which reviewed the need for quarantine conditions for all imported pets, the UK government introduced the Pet Travel Scheme (PETS). This scheme, which served as a model for the creation of

the European Pet Passport scheme introduced in July 2004, permits the movement of pet animals into the UK subject to certain conditions.

As well as preventing the introduction of rabies via a requirement for imported pet animals to be effectively identified and vaccinated, PETS requires additional pre-import treatments to minimise the risk of exotic ticks and tapeworm species (*Echinococcus multilocularis*) being introduced into the UK.

Despite these controls, there was concern that a greater number of companion animals being imported into the UK would increase the potential for the introduction of other exotic diseases. For example, although treatment for ticks prior to entry may reduce the risk of diseases such as babesiosis or ehrlichiosis being established in GB, it does not stop cats and dogs which are already infected from entering the country. From its introduction on 28 February 2000 until 1 July 2004, PETS permitted the movement of 165,000 dogs and cats into the UK, of which 60% were of UK origin.

A national surveillance scheme

DACTARI, which is part of Defra's ten-year veterinary surveillance strategy, aims to quantify the occurrence of exotic diseases in imported or native pet animals in GB, and thereby to monitor the risk of spread of these diseases in GB and the potential consequences for animal health should this occur. The information gained from DACTARI can also be used to provide more effective preventive measures.

Defra is also working closely with the Department of Health to ensure that any risk factors associated with the importation of these zoonotic diseases in dogs and cats are effectively managed.

Because many of these diseases are carried and transmitted by arthropod vectors, the potential consequences of the introduction of such diseases into the GB arthropod population needs to be monitored, and the effects of global warming taken into account.



Figure 1 Vectors of the four main diseases targeted by DACTARI: A tick, a sandfly and a mosquito



Figure 2 Facial ulceration in a child due to *leishmaniasis*

How DACTARI works

For DACTARI to be effective, it is important that cases of suspected or confirmed exotic diseases in cats and dogs are reported. The PETS documentation reminds cat and dog owners to consider the potential risks of travelling in areas where exotic diseases occur, and advises them to seek veterinary advice before travelling. PETS also encourages them to report any suspicion of exotic disease in their animal to their veterinary surgeon.

Under the DACTARI scheme, private veterinary surgeons can voluntarily report suspect or confirmed cases of exotic diseases in cats and dogs using a form available from Defraweb or from the British Veterinary Association (BVA) and British Small Animal Veterinary Association (BSAVA) websites.

Animal Health Divisional Offices of the State Veterinary Service are strongly encouraged to promote the scheme via Local Veterinary Inspector (LVI) training and newsletters.

The four main diseases targeted by DACTARI

Although any exotic disease can be reported under DACTARI, it specifically targets babesiosis, ehrlichiosis, dirofilariasis and leishmaniasis. These diseases are carried and transmitted by ticks, sandflies or mosquitoes and which therefore occur more commonly in warmer climates that favour vector survival. The diagnosis of these diseases can be difficult for various reasons such as dual infection, subclinical infection and non-specific clinical signs.

Babesiosis (also known as piroplasmosis) is caused by the tick-borne protozoan parasites *Babesia canis* and *Babesia gibsoni* as well as other species which have recently been characterised. Babesiosis commonly affects dogs and occasionally cats in Africa, Asia, and Europe (including France, southern Germany and Switzerland). Young or immunon-



Figure 3 Marginal alopecia and scaling of the ears and periorbital alopecia in case of *leishmaniasis*

naïve dogs are highly susceptible to babesiosis. The average incubation period is ten to 21 days; the parasite causes haemolytic anaemia with clinical signs, in acute cases, of high fever, collapse and coffee coloured urine. Death may occur as soon as 24 hours from the onset of clinical disease. Mild or even sub-clinical forms of the disease are also recognised. Jaundice and multiple organ failure may occur. Infected dogs may remain carriers, in which stress and other diseases may predispose the sudden onset of clinical signs. Babesiosis is rare in cats and appears to affect mostly wild feline species. The common *Babesia* species affecting dogs do not cause disease in humans.

Ehrlichiosis in dogs is caused by *Ehrlichia canis*, a bacterium which invades monocytes and macrophages. It is transmitted by *Rhipicephalus sanguineus*, one of two ticks known also to transmit babesiosis. Ehrlichiosis affects both cats and dogs and has been reported in the USA, Europe and Africa. Clinical signs appear after an incubation period of eight to 20 days, and may include intermittent fever, anorexia, enlarged lymph nodes, bleeding and weight loss. In cats, fever, joint pain, anaemia, enlarged lymph nodes and shortness of breath may occur. The *Ehrlichia* species which affects cats has not been characterised. *E. canis* is not zoonotic.

Leishmaniasis is caused by the protozoan parasite *Leishmania infantum*. Dogs act as the major

reservoir for this infection (others are foxes and rodents), which is transmitted by sandflies. It is endemic in the Mediterranean area and in South America. Leishmaniasis has recently been reported in the USA and Canada, despite the fact that there are no known competent vectors in these countries. The disease is chronic and may have an incubation period of months to years. Skin lesions (alopecia, especially around the eyes, scaling and ulceration) are common, although they do not necessarily appear in the initial stages. Enlarged lymph nodes, emaciation, nephritis, polyarthritis, pronounced claw growth and nasal bleeding, are other signs which may appear. Treatment alleviates disease, but dogs remain infected for life. Drug resistance may occur. Leishmaniasis is a zoonosis, and a particular risk for children

or immunosuppressed people. Mechanical transmission may occur from dog to human (e.g. from a dog with advanced exudative skin lesions). *Leishmania* infection is known to occur in cats, but is more difficult to diagnose.

Dirofilariasis (heartworm) is caused by the nematode *Dirofilaria immitis*, and is common in Southern Europe, USA, Canada, Eastern Australia and South East Asia. The microscopic larval parasites are transmitted by mosquitoes. Following an infectious bite the larval worms migrate to the pulmonary artery where they become adults after six to seven months, reaching up to 30cm in length. A low level of infestation may be sub-clinical while a higher level of infestation may cause clinical signs such as exercise intolerance, respiratory

embarrassment and weight loss. Death may be caused by the side effects of treatment, through immune reaction, or by blood clots or dead parasites passing into the arteries of the lungs. Cats can become infected; clinical signs include vomiting or sudden death. Human cases have also been described but are extremely rare.

Brief case definitions for these four diseases are also included on the report form.

Results for the first reporting year (March 2003- February 2004)

Since the commencement of the scheme in March 2003, veterinary practitioners have reported cases of suspected or confirmed exotic disease in 29 dogs, one of which had concurrent infection with both babesiosis and ehrlichiosis. No reports were received for cats.

Method of entry into the UK

The table overleaf shows the number of reported cases of exotic disease in dogs (and cats) compared against the number of dogs and cats entering or re-entering GB between March 2003 and February 2004.

When the number of disease cases is compared to the total number of dogs and cats entering GB over this period, a relatively higher proportion of infected dogs entered via quarantine (0.12%) than via PETS (0.03%). For comparison, a survey of quaran-



Figure 4 Epistaxis is a common clinical presentation in cases of ehrlichiosis and also sometimes occurs in cases of leishmaniasis

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	Total number of animals	% of animals entering GB	Number of reported cases of exotic disease	Reported cases per 100,000 animals entering GB
PETS	57,392	90.65	16	27
PETS and quarantine	1,913	3.02	1	52
Quarantine	4,010	6.33	5	124
TOTAL	63,315	100.00	22*	34

*One extra case was identified in a dog which never travelled outside the UK but had received a blood transfusion from a housemate which had travelled to Europe. Of the 22 dogs (indicated in the table 1) reported between March 2003 and February 2004, most entered via PETS.

Table 1 Number of reported cases of exotic disease in dogs (and cats) compared against the number of dogs and cats entering and re-entering GB between March 2003 and February 2004

tinued pets conducted in 1998 reported 15 cases of exotic disease in the 6500 pets entering GB that year, a level of 0.2%.

Despite these figures, however, the sheer number of pet animals now travelling abroad and returning to GB is considered to present an increased risk of introduction of exotic disease than was the case prior to the introduction of PETS.

The majority of reports were made by practitioners in the South and East of Great Britain and are indicated in Figure 5. The DACTARI website shows a breakdown, by area, of the origin of the reports. While significant differences might be expected in the reporting rate between different geographic areas (due, for example, to differences in population, higher frequency of travel with companion animals, or

better local promotion of the scheme), these are not evident from the data so far.

Travel history of reported cases

Under PETS (over 90% of entries over this period), cats and dogs have entered the UK from 145 countries and 98% of all entries arrived from just 20 countries.

Exotic disease was reported in dogs which had visited Spain (11), France (9), Greece (2), Portugal (2) and South Africa (2), and once from each of Cyprus, Switzerland, Tobago and the Caribbean. The difference between these figures and the total number of cases is explained by the fact that some animals travelled to several countries during the reporting period. The number of cases of exotic disease in dogs reported to DACTARI by European country of origin of pet is indicated in Figure 7.

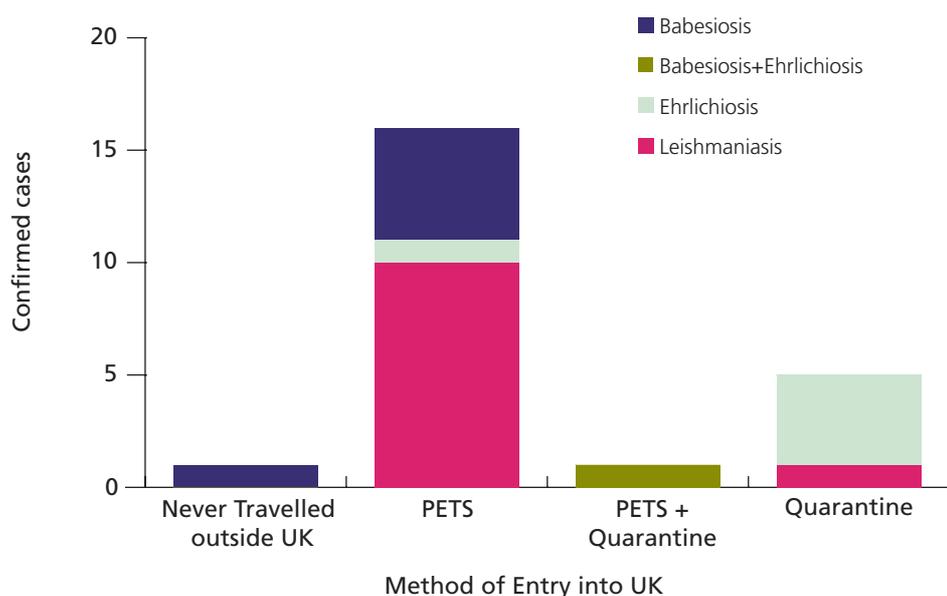


Figure 5 Number of cases reported to DACTARI by method of entry into UK

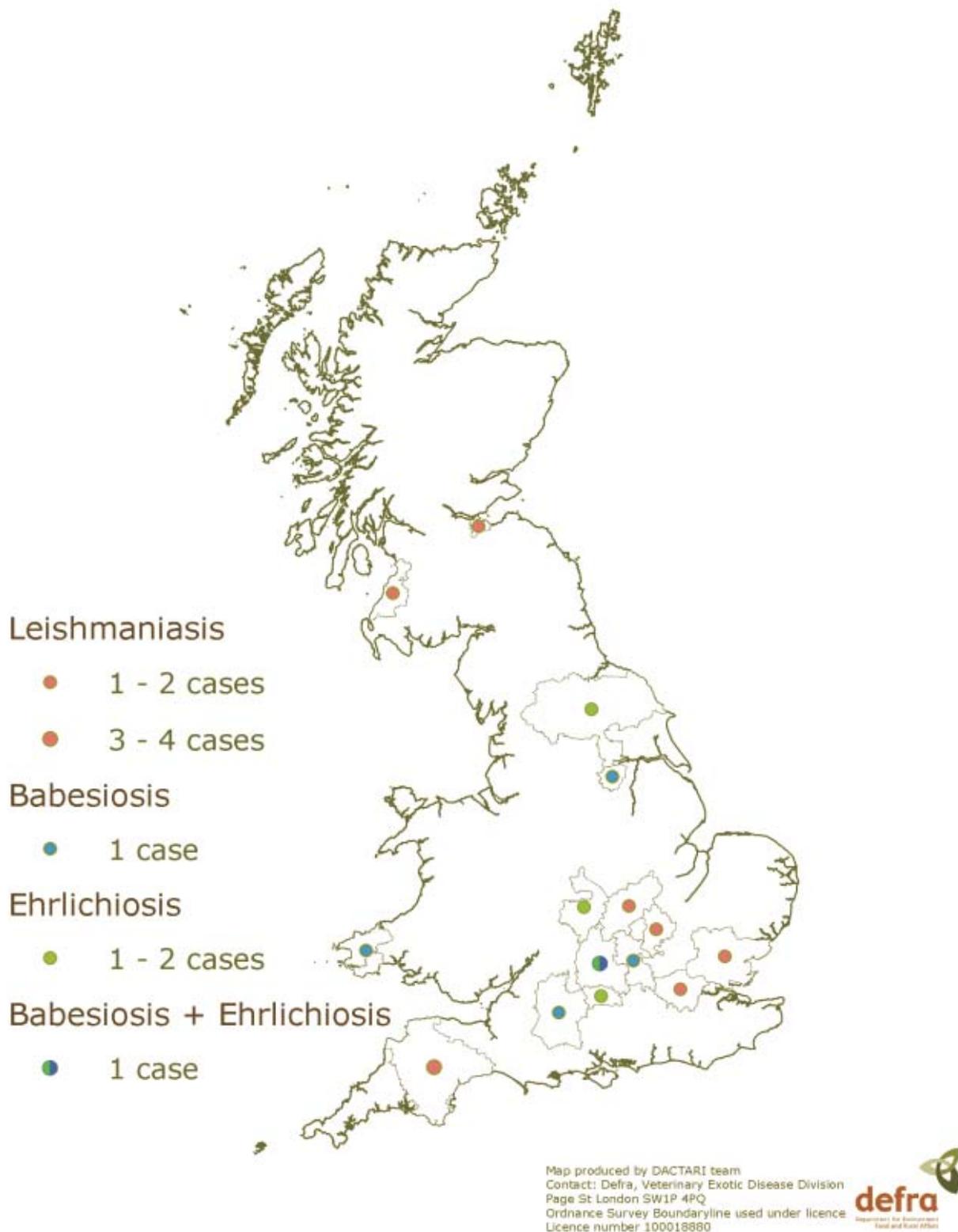


Figure 6 Distribution of reported cases by county where the pet was resident when presented for veterinary attention

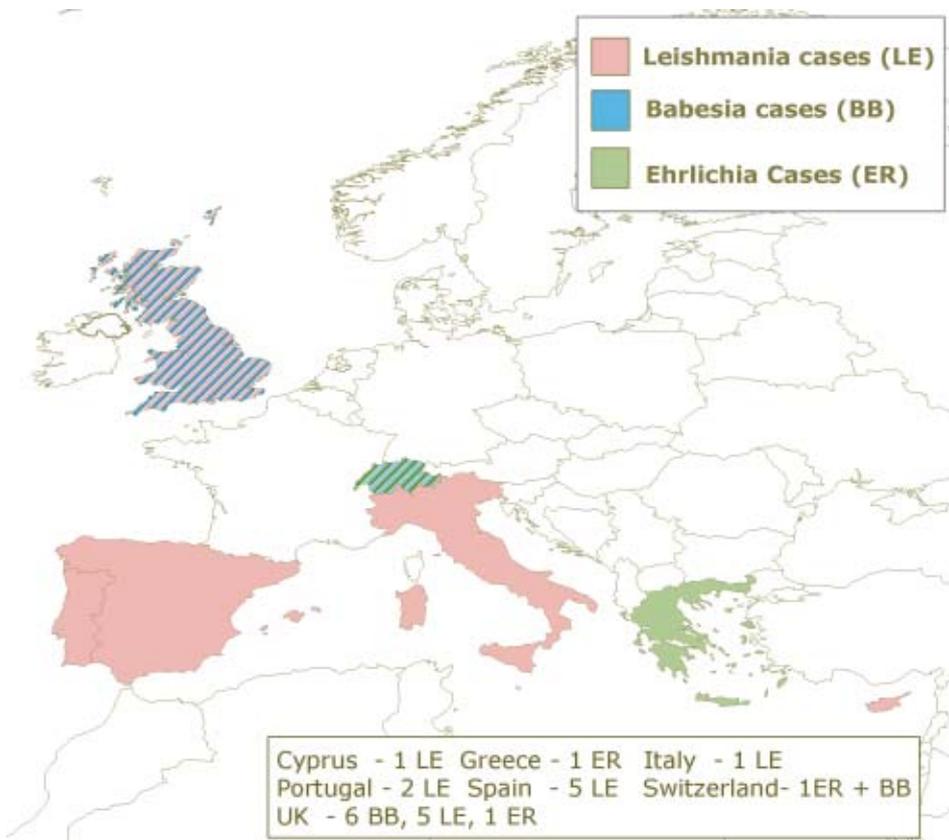


Figure 7 Number of cases of exotic disease reported to DACTARI by country of origin of pet (Europe only)

Discussion

Diagnostic difficulties with identifying these exotic diseases

The diagnosis of exotic diseases on clinical grounds alone is often difficult, for several reasons:

- Practising veterinary surgeons in this country are often unfamiliar with the clinical signs of these diseases.
- Many of the clinical signs of these diseases (such as lethargy, weight loss, and anaemia) are non-specific, and can also be highly variable. This can be a particular problem in cats, in which infection is often sub-clinical, and may

partly explain the absence of reports so far in cats (although it is also possible that fewer cats are travelling and/or that infection with these agents is less common in cats).

- Because incubation periods for these diseases can be extremely variable (from a few days to several years), the fact that an animal has been abroad may not be made known or considered relevant when a pet is presented to a veterinary surgeon.
- More than one diagnostic test may be required; this can take time and may not provide a clear diagnosis. A combination of

specific and non-specific tests may be necessary and may need to be repeated at intervals of several weeks.

An increased awareness of these diseases, combined with new diagnostic methods (such as polymerase chain reaction, which identifies the presence of the DNA of the infectious agent), are improving the likelihood of making a timely diagnosis in individual cases.

Information about exotic diseases is key to successful prevention

Practitioners should consider and discuss with their clients the risks to their pets associated with travel. These include:

- The presence of disease in the country to be visited. Even if a disease is known to be present in a particular country, it may, because of limited vector activity, be seasonal and/or restricted to specific areas. For example, in France the sandfly which transmits leishmaniasis is found only in the south-eastern area of this country.
- The degree of exposure (such as duration of stay, the animal's activities during the visit), and/or protection against disease, (such as use of preventive measures and the immunity of the individual animal to specific diseases). For instance practitioners should also discuss simple preventative measures (such as routine checking for and removing ticks and appropriate controls of

insects) with clients planning to travel with their pets.

Also, although not available in GB, it is possible to vaccinate dogs against infection with *Babesia canis*, something which may be worth considering for animals which have long or repeated stays in South-Western France or similar regions.

Conclusion

DACTARI provides useful information on exotic diseases of pets for veterinary practitioners and encourages them to improve the diagnosis, treatment and control of these diseases and to reduce the risk of zoonotic transfer.

While Defra supplies epidemiological data and encourages training and education on these diseases for members of the veterinary profession in GB, DACTARI must be used as widely as possible if it is to be effective; Defra therefore encourages veterinary surgeons in private practice to send reports in by e-mail, fax or mail (using the free-post address on the form) whenever appropriate.

The information on DACTARI is regularly updated on Defraweb. As a result of reports already received, the reporting form has been adapted so that more specific risk details can be identified.

For further information on DACTARI contact:

- Anna Guitton – Veterinary Exotic Diseases Division, Defra, 1a Page Street, London, SW1P 4PQ.
- Megan Power – SVS, FREEPOST, Reading RG1 6BR.
- Further reading: Trees A.J. and Shaw S (1999) Imported diseases in small animals. *In Practice*, **21**, 482-491.
- Trotz-Williams and Trees A.J. (2003) Systematic review of the distribution of the major vector-borne parasitic infections in dogs and cats in Europe – *The Veterinary Record*, **157**, 97-105.

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