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Rabies Disease Control Strategy

June 2011



Llywodraeth Cynulliad Cymru
Welsh Assembly Government



defra

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Part One - Introduction

1.1 Purpose of document

Protecting the environment, society and the economy from the risks of animal disease is a priority for Government. This document sets out a framework for how an outbreak of rabies in England and Wales would be managed.

It covers general control principles for the most likely scenarios for cases of Classical rabies virus and the rationale for such controls. It is not intended to provide detailed operational instructions for how to deal with an outbreak. Defra's and the Welsh Government's [Contingency Plan for Exotic Animal Diseases](#) covers these arrangements and should be referred to for detailed explanation of the systems, structures, roles and responsibilities implemented during an outbreak which are referenced in this control strategy.

By describing this framework all parties affected during an outbreak of rabies will be better placed to respond quickly and effectively to control the outbreak in order to protect public health, regain our disease-free status as quickly as possible and to minimise the wider impact on the public and the natural environment. If an outbreak occurs evidence and analysis from a number of sources (including veterinary, scientific and economic) will be used to assess the effectiveness of different control options. This strategy should enable affected parties to prepare to mitigate the likely impact of these control measures during a rabies outbreak.

The plan covers control of rabies in animals - for information and advice on potential cases of rabies in humans the Department of Health have issued guidance which is contained within the [Memorandum on Rabies - Prevention and Control](#).

Arrangements for managing an outbreak in Scotland are covered by the [Scottish Government's Rabies Contingency Plan](#).

1.2 The Disease

Rabies is an invariably fatal disease to which all mammals are potentially susceptible, including humans, if no treatment is received. The characteristics of the disease vary greatly and a definitive diagnosis can only be made by laboratory testing of brain tissue after the animal's death. Incubation of the infection after exposure is often prolonged and variable, causing problems both in predicting disease spread and in proving disease freedom.

In humans, there is no treatment for rabies once clinical signs appear and so prevention of infection is vital. The British Isles (UK and the Republic of Ireland) have been rabies free since rabies was eradicated in 1922. Thus the risk of a human case of rabies in the UK is currently very low. If an incident or outbreak of rabies were to occur, rapid public health measures would be required to mitigate the health risks. Vaccination prior to exposure to infection provides safe and effective protection. Vaccination and post exposure prophylaxis (PEP) is effective in

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preventing the disease developing providing it is administered promptly after a person has been exposed to infection and before clinical symptoms develop. Information on the disease is readily available from many sources:

- [Defra: animal diseases](#)
- [World Organisation for Animal Health](#)
- [World Health Organisation](#)
- [Health Protection Agency](#)
- [National Health Service](#)

Part Two – Background To The Disease

2.1 The Virus

The rabies virus is a lyssavirus, one of a group of viruses responsible for causing encephalitis, which causes acute inflammation of the brain. Other lyssaviruses are considered along with classical rabies as their clinical presentation is indistinguishable.

There are currently eleven classified species of lyssavirus. Full details of each can be found on the [International Convention on taxonomy of viruses](#) and [Rabies Bulletin Europe](#) websites.

This strategy focuses on Classical rabies virus, as the most prevalent serotype. EBLV is subject to separate control measures.

2.2 Transmission

The virus is usually transmitted through the saliva of an infected animal, normally via a bite. Less often, it can be transmitted through an open wound or a mucous membrane such as those in the mouth, nasal cavity or eyes. Person to person transmission does not occur though there are rare reports of transmission by other routes, such as after transplantation of organs from infected individuals. Aerosol transmission has been documented in special circumstances, such as in laboratories and caves with an extremely high bat density (although such circumstances do not exist in the UK).

Though most animals are susceptible to rabies infection, many are 'dead end' hosts who will be unlikely to transmit the infection. Such 'dead end' hosts include humans most herbivores: cattle, sheep, goats and horses.

2.3 Incubation

Incubation of the Disease in Animals: The incubation period can vary considerably but for dogs and cats it is generally considered to be between two and twelve weeks post-infection though longer incubation periods have been reported.

Incubation of the Disease in Humans: In human cases, the incubation period is typically two to eight weeks, but may vary from less than a week to more than a year.

2.4 Clinical Signs

Clinical Signs in Animals: Rabies cannot be definitively diagnosed on clinical signs alone and must be confirmed in the laboratory. In animals, clinical signs vary considerably, though typically include sudden behavioural changes and progressive paralysis leading to death. In some cases, however, an animal may die rapidly without demonstrating significant clinical signs. Animals often exhibit one of the two following forms of rabies:

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- **Furious rabies:** animals may be anxious and/or aggressive, losing their natural fear of other animals and humans. They may demonstrate sudden behaviour changes and attack without provocation. Muscular weakness and seizures are common. Death results from progressive paralysis.
- **Dumb/Paralytic rabies:** animals may be depressed or unusually docile, sometimes paralysed in the face, throat and neck, causing abnormal facial expressions, drooling and inability to swallow. The paralysis progresses rapidly to the whole body with subsequent coma and death.

Vaccination of animals: Vaccinations for domestic animals are safe and effective and are normally administered by injection. Oral vaccines are widely used to eradicate the disease in wildlife.

Clinical Signs in Humans: The first symptoms are likely to be non-specific; headaches, muscular pain, nausea or coughing. The most suggestive early sign of impending rabies is numbness and/or tingling and twitching at the site of the original bite. This is likely to be followed by a phase of agitation and confusion, followed by coma, respiratory failure and death.

2.5 Treatment/Disease Risk Mitigation in Humans

Once symptoms have begun the disease is invariably fatal so rapid intervention after a biting incident or other exposure to rabies is vital. Prompt post-exposure vaccination and administration of rabies immunoglobulin together with immediate and appropriate wound cleansing can prevent the risk of rabies developing. Post exposure vaccine needs to be very specifically administered in order to be effective and the [WHO](#) has published recommendations for the use of rabies vaccine.

Initial Response to a bite: The rabies virus is rapidly inactivated by heat, liquid solvents and disinfectants, including warm soapy water and basic detergents. Swift and thorough cleansing of the entry site with these is an effective first measure to reduce the risk of infection.

Vaccination: Modern rabies vaccinations offer a safe and very high level of protection against classical rabies virus and other serotypes including DUVV, EBLV and ABLV when give pre-exposure. Vaccination immediately following exposure will also help to reduce the risk of rabies developing. Rabies immunoglobulin is also given as a post exposure treatment to prevent development of the disease. There are vaccines available for [human use](#) as well as for use in animal populations. The vaccines are considered both safe and effective.

2.6 Confirming Disease

Rabies can only be confirmed by laboratory testing on the brain after death. Results can usually be delivered within a few hours. Slower laboratory tests taking around 2-3 days will also be used to confirm earlier results and identify different serotypes.

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2.7 Current Disease Distribution

The UK is currently free of terrestrial animal rabies as are a number of other countries including many in the EU. European bat lyssavirus (EBLV) 2 has been detected at a low prevalence in Daubenton's bats in the UK. The occurrence of EBLV in the UK does not affect our disease-free status, as this is based upon freedom from terrestrial rabies.

Rabies is [widely distributed](#) across the globe, present on all continents and endemic in most African and Asian countries. An estimated 55,000 people die of rabies each year with about 95% of human deaths occurring in Asia and Africa.

The Health Protection Agency (HPA) has published on its website an [assessment](#) on the level of rabies risk, by country.

2.8 Risk of Introduction

Our island status makes it unlikely that rabies will be introduced through natural wildlife spread. There are strict legal controls on the entry of animals into the UK aimed at preventing the introduction of rabies. Pet cats dogs and ferrets entering the UK are subject to rules relating to the movement of pets. Consequently, the largest risk for rabies entering the UK would be through an infected animal imported into the country illegally. Further information on pet travel rules is on Defra's [website](#).

Experts have assessed that by far the most likely scenario UK might face is that a single pet with rabies (re)entering the country from abroad without meeting all legal border controls, and subsequently is diagnosed as having rabies, and as being the initial source of the infection. In virtually all cases of rabies brought into Europe in the last decade by illegal pet movements the initial pet that had brought in the rabies was identified. This makes control of the disease spread easier and quicker than a scenario where a series of infected animals are found, and none has recently being abroad.

2.9 Risk of Disease Spread

The Urban Cycle: In countries where rabies is enzootic, the urban cycle, in which dogs are the main reservoir for rabies infection, is a particular danger to human health because of the close contact between dogs and humans. 99% of human deaths from rabies are associated with dog bites. This cycle is maintained when the proportion of unvaccinated and stray dogs is high. Urban rabies has been virtually eliminated in North America and Europe.

The UK does not have the high levels of stray animals required to perpetuate this cycle but the low levels of dogs vaccinated against the disease would have to be quickly addressed in the event of an outbreak that could not be contained.

The Sylvatic Cycle: The sylvatic (or wildlife) cycle is still present in various areas of Europe and North America where rabies is endemic in one or more wildlife species, normally foxes. The UK's large fox population and large number of urban foxes would therefore be significant in an outbreak. Badgers have not been a significant

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host in epidemics in Europe, however, the density of the UK badger population is much greater than in other countries.

Wildlife rabies has the potential to remain undetected, allowing it to establish itself more widely before it is noticed. Human contact with wild animals, though rarer, still occurs and there is also the possibility of 'spill over' infections into the domestic dog or cat populations, once again putting human health at risk.

Bat Lyssaviruses: European Bat Lyssaviruses have, very occasionally, been confirmed in bats in the UK. However the small likelihood of contact between people and bats (apart from bat handlers) make the human risk from this disease negligible. There are no known incidences of bat lyssaviruses becoming established in other, more risk-associated animal populations.

Part Three - Management of an Outbreak

3.1 Legislative Powers for Controlling Outbreaks

Powers for controlling a rabies outbreak are primarily set out in the Rabies (Control) Order 1974, which can be used for declaring infected places and areas. This allows for a number of measures to be applied within the declared place or area including movement and behaviour restrictions (such as requiring muzzles on dogs in public places) and compulsory vaccination of domestic animals. It also allows for an Infected Area to be divided into zones permitting different measures in different places. There are also powers available for the culling of foxes should that be necessary in an Infected Area.

Other powers available in support of the 1974 Order include The Animal Health Act 1981 which contains provision for introducing government funded vaccination programmes and for the destruction of animals other than foxes.

The Movement of Animals (Restriction) (England) Order 2002 and The Movement of Animals (Restriction) (Wales) Order 2003 allows a veterinary inspector who suspects disease to impose restrictions or requirements to prevent the spread of the disease including serving a notice prohibiting the movement of any animal at the premises in question. There is also the power to declare a temporary control area, with particular bio security measures or other measures as are considered necessary to prevent the spread of the disease.

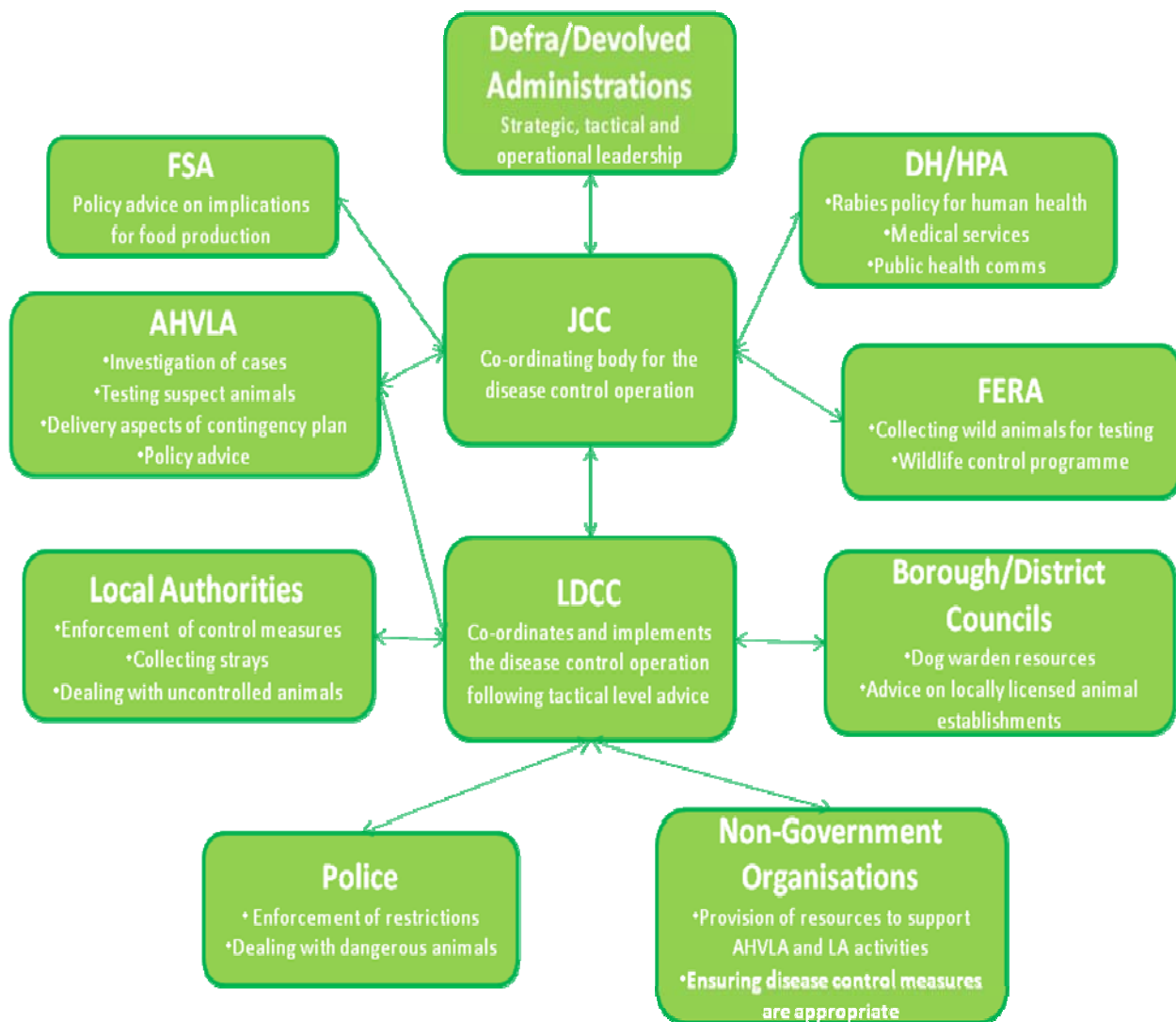
The Rabies (Compensation) Order 1976 fixes the amount payable in respect of animals destroyed under the Rabies (Control) Order 1974.

3.2 Roles and Responsibilities

Defra and Devolved Administrations will provide strategic, tactical and operational leadership during an outbreak through the establishment of a number of structures to coordinate and support the disease control response. Detailed information about these structures can be found in Defra's and the Welsh Government's Contingency Plan for Exotic Animal Diseases. [Strategic decisions](#) will be taken by the relevant Minister or Chief Veterinary Officer (CVO), delegated as appropriate. Their decisions will be based on advice from experts, vets, policy, economists and delivery agents. As necessary, key UK wide policies will be submitted for approval by the Animal Disease Policy Group (ADPG).

The tactical level response is coordinated by the Joint Coordination Centre (JCC), which is part of the National Disease Control Centre (NDCC). It ensures that strategic advice is translated into practical instructions for those carrying out the operational response. The JCC provides both an advisory and coordination function for those controlling the disease at local level. The Local Disease Control Centre (LDCC) coordinates and implements the disease control operation following tactical level advice and guidance as set out in contingency plans and operational instructions. The LDCC also reports to the JCC about the progress of the disease control operation.

3.3 Key roles and responsibilities in the event of an outbreak



See [glossary](#) for explanation of abbreviations.

Part Four – Suspicion, Notification and Disease Confirmation

4.1 Suspicion and Notification

Rabies is a notifiable disease and anyone who suspects rabies in an animal on whatever premises must report it to their local [Animal Health and Veterinary Laboratories Agency \(AHVLA\) office](#).

Although a definitive diagnosis of rabies cannot be made on clinical grounds alone, the investigating Veterinary Inspector may rule out suspicion of disease when they visit the premises and end the investigation at this point. Should the Veterinary Inspector not be able to rule out rabies on clinical grounds, the animal will become a suspect animal as outlined below.

Should AHVLA wish to impose restrictions on movement of suspect animals at this stage they would need to have the premises declared an infected place, using the same powers (the Rabies (Control) Order 1974) as are invoked when a confirmed case has been identified. This should only be used, therefore, if the suspect animal is very likely to be positive because of the potential for causing alarm.

4.2 Suspect Animals

A suspect animal (or 'case') is one showing clinical signs of the disease. The Veterinary Inspector will wish to ensure that any suspect animals are contained if it is possible without risk to humans. In a situation where the country of origin has disease free status, the destruction of the suspected animal will not normally be compulsory – this would change in the case of an established outbreak because infection with the disease would be more likely.

Recovery is considered a *de facto* sign that the animal is negative for rabies, given that rabies is invariably fatal.

Any decision to destroy the animal prior to disease confirmation will be discussed between the owners and the Veterinary Inspector. The Veterinary Inspector or the owner may decide that the animal should be destroyed on welfare grounds if the animal is distressed. Alternatively, it could be removed to approved premises, for example a quarantine facility, for observation. Should there have been a human bitten or scratched by the potentially infected animal, the Veterinary Inspector would require the destruction of the animal in order to confirm or rule out a diagnosis of rabies.

If rabies seems likely on clinical grounds and exposure history and the animal is confined for observation or humanely destroyed the relevant CVO will raise an Amber alert which will remain until the animal recovers or laboratory results prove positive or negative.

Should a veterinary risk assessment suggest that the risk of rabies is high, the relevant CVO may decide to raise the level of alert to Red before waiting for disease confirmation through laboratory results.

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4.3 Contact Animals

A contact animal is one which has been in contact with a suspect or confirmed case but is not exhibiting clinical signs of rabies. A contact animal could remain healthy for a period of weeks or less commonly, months while potentially incubating the disease. This creates significant problems for an owner who could be required to keep the animal isolated for this length of time. For this reason, or because they are uncomfortable with the risk to their own or their family's health, an owner may decide to have a contact animal humanely destroyed.

If any contact animals are to be left on the owner's premises, the Veterinary Inspector must be assured that the owner can guarantee that the animals will not come into contact with any other non-exposed animals. If the initial suspect animal is confirmed positive for rabies then the animal's quarantine may need to continue for a lengthy period of time. Alternatively the Veterinary Inspector may decide that the premises are not suitable for this purpose and detain the animals, either placing them in isolation or requiring them to be humanely destroyed. Any high risk of infection, for example where the contact animal has been bitten by a suspect animal, will make humane destruction more likely.

Where a contact animal has bitten a human, it will be required to be humanely destroyed in order to allow confirmatory testing for rabies to be done.

4.4 Human Risk

If a person has been bitten or has had broken skin licked by a suspect animal the Veterinary Inspector will recommend immediate washing of any open wound with soap or detergent and water and advise the individual to seek immediate medical attention. It is essential that the bite victim seeks medical intervention as soon as possible as post exposure treatment should be begun as soon as possible and not be delayed until the outcome of clinical observation or laboratory testing of the suspect animal. The Veterinary Officer will immediately notify the Proper Officer of the local Health Protection Unit of the biting incident by an animal in which rabies is suspected.

4.5 Disease tracing

The Veterinary Inspector will also try to establish provisionally the extent to which the animal may have infected or been infected by unknown animals. If the animal has been at large since the onset of clinical signs or in the 15 days before their onset, this may indicate the necessity of preparing wider control measures as it will be impossible to establish all the animal's contacts in that period.

Similarly, if the animal has or could have been in contact with wildlife during this period it may be necessary to activate the rabies wildlife control strategy in order to begin managing the potential risk of establishing a sylvatic cycle in wildlife.

4.6 Infected Premises

The rabies virus cannot live for long outside the body of its host and is destroyed by contact with common household detergents. Premises need only be considered infected until the infected animal has been removed or destroyed and the property has been disinfected and any other animals on the premises have been quarantined

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and/or destroyed. Animals must not be moved onto the infected premises unless the move is specifically licensed. No animal will be removed from an infected premises unless exception licence is issued or to a designated facility for observation or for humane destruction.

Once the presenting case and all contact animals have been removed from the premises, the infected premises declaration may be lifted, or the controls applied to the premises varied as appropriate to the continuing conditions. Animals remaining on the property would remain under quarantine until further direction from the CVO.

4.7 Laboratory Diagnosis

If the suspect case is already dead, or the veterinarian and/or owner decide on the humane destruction of the animal or if the animal dies while under observation, the carcass will be transported immediately to the relevant laboratory for appropriate diagnostic testing.

Results from initial testing should be available within in a few hours. When results are negative for a suspect case, all contact animals will continue to remain in isolation until further results of more sensitive tests are available, usually within 2-3 days. If an initial laboratory result is positive the alert state would move immediately to Red. On confirmation of disease, the CVO UK would formally establish the NDCC.

On the confirmation of Red alert status, the Animal Health and Veterinary Laboratories Agency (AHVLA) will establish a Local Disease Control Centre, inviting key partners to assist in managing the outbreak. For a rabies outbreak these partners would include local authorities, the police, the Food and Environment Research Agency (FERA) and the Health Protection Agency (HPA) (or Public Health Wales). For incidents affecting Wales the Welsh Government would consider establishing the Emergency Coordination Centre.

Part Five – Control – Domestic Animal Rabies

5.1 Introduction

The use of wider measures to control the spread of rabies, even in cases where it seems unlikely that an animal has been in a position to infect others, is very likely to be instigated given the serious nature of even a small risk of rabies. Measures will be focused on containing and eradicating the disease as quickly to protect public and human health and to prevent the disease from becoming established in any animal population. Without rapid and proportionate controls being applied, it is highly likely that a rabies outbreak would lead to the disease becoming endemic in wildlife and potentially the domestic pet population in the UK, based on the experience of other countries.

Control measures will begin immediately upon suspicion, though the results of laboratory testing and a detailed history may be needed to identify whether wildlife measures are necessary in addition to those for domestic animals. Control measures for wildlife are considered separately in this document.

Some control measures, in particular vaccination and leashing/muzzling should be considered by pet owners as part of a range of sensible precautions to keep pets safe from injury more generally. Microchipping is also considered to be good practice and can play an important role in an outbreak in helping to quickly identify stray animals. Having more animals microchipped could significantly reduce the burden on local authorities and reduce the number of animals that might be considered at risk of exposure and requiring destruction though unknown history.

This document does not explicitly consider the use of control measures on animals (including livestock and other herbivores) classified as dead end hosts as they are unlikely to transmit rabies. Such animals may still be caught up in control measures should an outbreak occur as, for example, farmers and vets can be at risk from infected cattle if they undertake a detailed clinical examination. The application of proportionate controls will need to be determined depending on the specific circumstances of the incident or outbreak.

5.2 Control Measures

There are various standard control measures that could be used in an outbreak, depending on the severity of the incident and the likely spread of the disease. Whilst each outbreak will have its own specific circumstances we can assess the potential application of these measures based on the experiences of other countries and our own scientific, veterinary and practical expertise.

There is a large range of possible scenarios for a rabies outbreak or incident, from a contained case of an individual pet animal, to the highly unlikely worst case of a nationwide outbreak involving both wildlife and domestic animals. To determine the type of controls that might be appropriate under different circumstances, possible scenarios along this spectrum have been considered, whilst recognising that each case will have to be dealt with individually. Under all scenarios effective

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communications will remain vital to ensure the public are appropriately informed about the risks and mitigating actions.

We anticipate that the most likely scenario for a rabies incident will be an individual infected pet. This is likely to be identified quickly with its source of infection/exposure history capable of being rapidly ascertained (i.e. through recent travel history). In this scenario, the control and containment measures required would be very restricted and localised, likely to be limited to the infected animal and any other pets that had direct contact (for example those in the same house) It is envisaged that containment and control should be quickly achieved and that there would be no subsequent infections.

If disease were to spread to other domestic animals, either within the same locality or more widely across the country, then a wider range of controls would be required. For example leashing/muzzling or vaccination of pets at risk. In the unlikely circumstance that the disease spreads into wildlife, a broader range of wildlife controls would be instigated alongside tighter restrictions on movements of domestic pets, and requirements for vaccination, muzzling and leashes.

A range of the potential activities to be undertaken are outlined briefly here, but the specific measures taken will be dictated by the circumstances of an individual incident or outbreak, following advice from rabies experts. Decisions on the use of control measures in an outbreak will need to take into account the public health risks and the relative costs and benefits and effectiveness of the options; The possibility of a rabies outbreak in the UK is very low, and if an outbreak did occur it would in all likelihood be very limited in terms of scale and impact, there is a strong case to be made on the use of control options.

5.3 Tracing

If a rabies case in the UK is confirmed, tracing all animals that have been in contact with the case will be essential. Animal contact tracing investigations are the responsibility of the National Emergency Epidemiology Group (NEEG).

Rapid and effective control will depend on establishing whether the first case found is the first in the country and to what extent there has been opportunity for further spread.

The most likely point of entry of the rabies virus into the UK is a dog or other animal imported illegally into the country. Rabies is unlikely to enter the UK via legal route due to the EU rules on pet movements. This could pose additional challenges for the NEEG, as involvement in illegal activity may make an owner or importer less cooperative. This may require the NEEG to work closely with law enforcement and/or customs officials to establish the source of the outbreak.

Alternatively, if a stray or wild animal presents with rabies, tracing where it has come from may be very difficult. Both of these scenarios would therefore make wider control measures more likely.

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5.4 Surveillance

In a case where rabies first presents in a domestic animal, the NEEG will be working to identify all contact animals. Contact animals can be considered as being either high risk (which might include definite contact with the suspect animal, evidence of biting or wounds, changed behaviour combined with no previous vaccination against rabies) or low risk (an animal that has had possible but unconfirmed contact with the suspect case, or shows no evidence of behavioural changes or biting or wounds which may be combined with a previous vaccination against rabies).

If the animal has been unsupervised at any point during the possibly infectious period, or in the scenarios mentioned above, surveillance of the wider animal population may be instigated. Notification provisions in Provision VIII of Schedule 3 to the Rabies (Control) Order 1974 could be of assistance here – in order to require the notification of the death of animals. Raising awareness of the possibility of infected animals would also be necessary in order that people could report uncharacteristic behaviour to the helpline (see below).

5.5 Laboratory Testing

Initial suspect cases will undergo the full [range of tests](#) in order to establish disease presence and the strain. This level of testing is not necessary during an outbreak when PCR tests are best deployed when large numbers of tests are required.

5.6 Declaring an Infected Area

The Rabies (Control) Order 1974 allows Defra/Welsh Government (WG) to impose a number of restrictions on movement, premises, gatherings and actions through declaring infected areas. How far these powers are utilised would depend on the nature of the outbreak. Circumstances which might make utilising these stronger powers more likely include:

- Outbreaks where more than one case of rabies is identified with no clear link between them;
- Outbreaks that are located in the wildlife population or may have spread into wildlife;
- Cases where there is the potential that the infected animal may have infected further unknown animals;
- When there is evidence to suggest potentially infected animals may have been imported but are not identified as yet.

Whether to declare an Infected Area will be a decision taken by the relevant CVO after consultation with NEEG and the Defra Emergency Management Committee. Which measures to impose then will also need to be decided. The potential length of time that controls will need to be in place in order to be effective will also have to be considered, given the long incubation period for rabies and the difficulties for pet owners in adhering to some of the possible restrictions, with implications for effectiveness and for welfare (for example not allowing pets off the lead, not moving them in or out of the Infected Area).

In an outbreak where it was considered that animals in the vicinity surrounding the Infected Area were at low risk, Defra would instigate a communications campaign

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which would focus on responsible pet ownership and publicising measures that should be taken by the general public and pet owners for their own and their pets' safety.

5.7 Vaccination

Rabies vaccine for domestic animals is one of a range of treatments available via veterinary surgeons and there are no restrictions on pet owners who want to vaccinate their pets against rabies pre-emptively. Pets that have travelled to the UK under the Pet Travel Scheme will have been vaccinated against rabies.

Decisions about whether to advise or require vaccination, the area a vaccination programme should cover and determining and monitoring the level of vaccine uptake required are for NEEG to make during the early stages of each rabies incident or outbreak. The use of vaccination as a control measure is likely to increase in major outbreaks in which disease many not have been contained or where the disease is suspected to be in the wildlife population. Conversely, vaccination is less likely to be deployed in minor or localised incidents. When a decision is taken to use vaccination, government can act to ensure that the supplies of vaccine and the resource needed to carry out a vaccination campaign will be focused on where they are needed most.

Practical issues associated with the use of vaccination that would also need to be considered are:

Supply: Control via vaccine would be slow due to the lag time in (a) vaccine production and (b) immunity development following vaccination. Replenishment of the UK supply of rabies vaccine is likely to be quite slow and therefore there is a delay in achieving control through vaccination of dogs and cats. This is however mitigated by the comparatively slow dissemination of rabies due to its long incubation period and the limited ways in which it can transmit.

Enforcement: The relevant CVO may decide that the particular circumstances of an outbreak may necessitate the need to target vaccination in a specific area and to make uptake compulsory. Any compulsory measures would require declaring the area where measures are to be imposed in an Infected Area.

It should not be necessary to make vaccination compulsory if local communications are utilised to explain the risks associated with rabies and the benefits of vaccination to pet owners. This will also avoid the enforcement issues likely to be experienced by local authorities and local law enforcement officers should vaccination be compulsory. AHVLA would liaise with private vets within the designated area to ensure and monitor local take-up.

Domestic animals that have been vaccinated should be visibly identified by a tag or similar, possibly in addition to micro chipping.

Costs: The costs associated with a vaccination campaign (including procurement and distribution) would need to be met. Decision makers would need to make an

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early decision about whether these costs should be met by Government or pet owners and the incentives and impacts of the alternatives.

5.8 Destruction and detention

Any domestic animal that is suspected as having been infected by rabies will be humanely destroyed. Under exceptional circumstances animals suspected of being infected may be detained in quarantine rather than destroyed depending on their condition, welfare needs and a veterinary assessment.

The approach to be adopted for dealing with animals in the same house as confirmed cases is dealt with at paragraph 4.3 above.

5.9 Movement restrictions

Restrictions on the movement of pet animals could be introduced once an Infected Area has been established. Movement restrictions could mean either confining animals to their owners' premises or controlling the movement of pets in and out of an Infected Area.

Restricting pets to the owner's home and garden should be considered as a possible control measure under any rabies outbreak scenario. For minor or localised incidents such controls may not be viewed as proportionate given the challenges that pet owners will face in meeting the longer term welfare needs of the animal.

Enforcement of these controls will require a significant commitment of local authority time and resources. For more significant incidents or a wildlife outbreak, such restrictions are more likely to be imposed.

Restricting movement in and out of an Infected Area presents particular logistical and practical issues but is an option that will need to be considered at each stage of an outbreak.

5.10 Behavioural Restrictions

The use of behavioural restrictions will be determined depending on the particular circumstances of an outbreak but should be proportionate and practical. The key behavioural restrictions that could be enforced in an Infected Area are:

- **Leashing:** Requiring dogs to be on leads at all times when not on their owners' premises.
- **Muzzling:** Requiring dogs to be muzzled when outside their owners' premises.

As with other control measures, the use of these restrictions is likely to increase in line with the severity of the incident, the number of cases and their geographical locations and/or if there is a wildlife element to the outbreak. These restrictions could simply be encouraged through communications activities, or could be required and enforced as part of an Infected Area. The use of leads could be implemented almost immediately under any outbreak scenario as almost all dog owners have leads for their dogs. Not all dog owners own muzzles so Government would need to consider

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how these could be obtained and distributed if the use of muzzles were considered an appropriate control measure.

5.11 Animal gatherings

Animal gatherings within a declared Infected Area could be banned under the provisions of the Rabies (Control) Order 1974. However, the only way to ban a dog or cat show taking place elsewhere in the country under the terms of the Order would be to extend the Infected Area to include this location. Given practical and presentation challenges of extending the Infected Area, banning such gatherings is likely only to be considered a proportionate response in major outbreaks or where there is a risk that the disease could be spread by infected wildlife. If a scheduled animal gathering fell within a localised Infected Area then there is a high likelihood that it would be banned.

The alternative to banning an animal gathering would be to require dog and cat shows to be licensed which would allow shows to go ahead with certain restrictions such as requiring all participating animals to be vaccinated prior to the gathering and housed separately.

5.12 Control of strays

The control of strays is the responsibility of the local authority and is necessary to prevent stray or uncontrolled animals becoming a reservoir for the disease. Local authorities also have the power to seize animals (as do the police) if the owner fails to comply with any control provisions. Local authorities will need to locate detention facilities within their area and both AHVLA and Defra/WG will need to be informed via the LDCC of the location of these detention pounds. Local authorities have implementation plans for dealing with rabies outbreaks that will include identifying potential holding areas for stray animals. They should work closely with animal welfare shelters on monitoring of stray animals and when considering options for control.

The enforcement of these controls would require a significant commitment of local authority time and resources so the likelihood of using this control method would increase in line with the severity of the incident. If an animal from the stray population presents with rabies, then the control of stray animals will be an essential disease control measure.

5.13 Communications/raising awareness

An important control measure in all scenarios is informing the public and raising awareness, particularly among veterinarians and pet owners. See separate chapter for details of proposed communications strategy for dealing with a rabies outbreak.

Reporting of the Disease: Rabies is a notifiable disease in animals and humans. Communications encouraging reporting of suspicion of the disease will need to be developed in conjunction with the relevant local authority and key stakeholders.

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An increase in reporting of possible cases is likely as soon as an outbreak is declared, as vets adjust from a scenario where clinical signs are unlikely to arouse suspicion, to a position where clinical signs could indicate the disease.

A helpline will be set up for members of the public to report either wild or domestic animals behaving strangely or biting incidents. This could be a national or local helpline, depending on the scale of the outbreak.

Reporting of Bites: Until the extent of an outbreak is known, all animal bites received by pets or the human population within the designated area will need to be treated as potentially infected and will need to be reported as quickly as possible to a vet or doctor. Communications campaigns reinforcing this message will need to be undertaken by local authorities and stakeholders in conjunction with Defra and/or WG. Department of Health/HPA would be responsible for human health aspects of bites.

Part Six – Control – Wildlife Rabies

6.1 Introduction

A number of European countries have become rabies free in the past few years through the control of rabies in wildlife. Their experiences provide significant information about the best method for creating disease freedom. Advances in vaccination techniques mean that it should be possible to vaccinate widely through a potentially Infected Area and keep destruction of at risk animals to a minimum and initial modelling of disease spread among foxes and costs of vaccinating and culling is starting to indicate the circumstances under which each might be preferable.

All mammals are susceptible to rabies. Though epidemiological data suggests strains of terrestrial rabies appear to have a degree of host specificity, for disease control purposes we will take a precautionary position and assume that rabies virus can move readily between hosts of different species including from domestic pets to wildlife. This has important implications for control of rabies in the UK which has potentially susceptible species including foxes, badgers and domestic dogs and cats.

Our large fox population could potentially provide a significant reservoir for the disease so much of the vaccination effort would need to be directed at this species. Similarly, badgers, though not a significant reservoir in other countries, could prove to be so here, given our larger, more widely spread populations. Unaccompanied cats are a potential challenge in any rabies outbreak. Close cooperation between FERA and local authorities will be necessary to minimise the risks posed by both feral (i.e. wild) and stray cats as it is likely to be difficult to differentiate between the two types.

6.2 Confirmation of rabies in wildlife

Confirmation of rabies in wildlife will be made by the relevant CVO after advice from AHVLA and other experts. The decision can be taken to begin controls for a wildlife rabies incident without laboratory confirmation in wildlife, for example if a confirmed domestic rabies case has had the opportunity to infect wildlife. This is because of the relative difficulty of confirming rabies in wildlife and the possibility that it could go undetected for a long time.

Alternatively, rabies might be spotted in a wild animal. If rabies presented in a wild animal, either because its suspicious behaviour had led it to be reported and captured and then tested, or in a routine testing of a wild animal carcass then it would need to be assumed that a full scale wildlife rabies outbreak was a possibility as the animal would be very unlikely to be the primary case (only a small percentage of rabies cases in wildlife are identified). Detailed surveillance would need to be arranged to confirm the extent of spread in the wildlife population, and therefore to validate the size of the control area.

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6.3 Control measures

FERA's rabies model will be used to make an initial determination as to the size of the area of operations necessary to control the disease successfully as quickly as possible and the preferable intervention.

First confirmed case is in wildlife: A vaccination programme in the relevant area should commence immediately, even if there is no evidence of onwards transmission. The need for control without delay is supported by modelling work. Vaccines will be administered by baits rather than trapping, injection, and release.

First confirmed case is in a domestic animal and no epidemiological link to wildlife species can be identified: A wildlife vaccination programme should not be triggered until disease is confirmed or a significant epidemiological link to wildlife is identified during the investigation.

First confirmed case identified in domestic animals with potential epidemiological link to wildlife: In this case the monitoring of wildlife should be considered as a potential preparatory step, together with other evidence, by the Rabies Veterinary Experts Group whom should make a recommendation to ADPG.

The Veterinary Science team will coordinate actions in regard to wildlife disease control. In a case where there is a domestic animal rabies element to an outbreak, they will also need to liaise with Animal Health to coordinate efforts between domestic animal and wildlife control.

In any scenario involving wildlife, researching and undertaking appropriate surveillance into the numbers of badgers and feral cats present in the area surrounding the outbreak, together with identifying the effect the local habitat is likely to have on fox numbers should be considered in order to establish the different species that will need to be targeted and their likely population density.

Routine testing for rabies during rabies-free periods is not necessary unless clinical signs dictate otherwise. Wildlife rabies vaccination should continue for two years after the last confirmed case, and during this time routine testing of wildlife in the general area would be expected.

6.4 Species affected by control measures

Foxes: Powers under the Animal Health Act 1981 can be introduced if needed for the vaccination of foxes. The decision of what vaccine to use will be taken by the relevant CVO following advice from the Veterinary Experts Group who in turn will have discussed with the AHVLA and the wildlife rabies controller. Any vaccine not yet approved for use in the UK would require Ministerial approval. The distribution of oral baits will be done by FERA.

Poisoning baits can also be used to control the disease, in particular where the index case has been identified and a targeted cull supported by a ring vaccination policy is considered a viable option. However, there are a number of issues associated with the use of poisoning baits, particularly in urban locations – including the risk posed to pets and children and the fact that poisoning is more time consuming than

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vaccination - that would need to be taken into account before this was agreed as the preferred method of disease control. Epidemiological modelling and the economic aspects of alternative interventions should be considered for the specific case arising to determine the best intervention for wildlife as the disease progresses.

Vaccination should therefore be the preferred disease control method wherever possible once the necessary legal powers are in place. A series of vaccination interventions over several years may be required to achieve eradication.

Badgers: Although the red fox is the wildlife species most commonly associated with sylvatic rabies other carnivores can potentially be infected and transmit the virus. In the UK the second species of primary concern is the European badger. Badgers will be of concern in a rabies outbreak due to the high numbers prevalent in some areas of the UK. They do not receive much protection from vaccination, meaning that culling might be the only option. Should the badger be epidemiologically linked to the outbreak then the relevant practical, legal, and biodiversity implications of doing so will need to be considered.

Feral cats: Feral cats are considered to be a group of 3 or more un-owned, unconfined cats and are a possible bridge of transmission of the disease between domestic and wild animals. Close working with local authorities will be needed in any strategy relating to the control of feral cats, as stray domestic cats will remain the responsibility of the local authorities and overlap between these two groups is likely.

Feral cats are associated with urban industrial premises and large institutions like hospitals. Farm cats are not considered to be feral but instead are the responsibility of the owner, who could be placed under a statutory responsibility to confine the animals living on his or her land. Responsibility for enforcing this lies with the local authority.

Records of feral cat populations are not kept so work will have to be carried out to identify actual and potential feral cat populations.

Bats: The risk of rabies passing between other mammals and bats is extremely low. Bat populations would continue to be monitored by a [passive surveillance programme](#) during a rabies outbreak.

6.5 Areas for Control

Rural Areas: In rural areas it will be necessary to determine whether feral cats are present. It will also be necessary to determine the badger density in the area. It will be assumed that there are foxes in the area at a lower density than in urban areas. The lower number of human dwellings may also allow for more regular bait spread.

Issues that may present if the area to be subject to control measures is a rural area might include:

- Difficult terrain for manual baiting;
- Disseminating information about the baiting, especially if the area is one which attracts a lot of visitors;
- Difficulties with establishing the whereabouts of badger setts.

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Urban areas: In urban areas it will be assumed that foxes and feral cats will be present. Generally it will be assumed that badgers are not present unless local information suggests otherwise. If a control zone bisects an urban area, control measures will most likely be extended to include the whole of the urban area.

Issues that may present if the area to be subject to control measures is an urban area might include:

- The comparative high density of foxes in urban areas;
- Difficulties laying baits in areas with high human population density and a high number of domestic dwellings;
- Difficulties ensuring that baits remain undisturbed in areas that see a large amount of human and domestic animal traffic, for example parks;
- The large numbers of permissions/notifications that would need to be sought/delivered if baits were to be distributed on private land.

Part Seven – Communications

7.1 Communications Strategy

Good communications will be key at every stage of controlling rabies. Early, regular and consistent involvement with the media and stakeholders will be necessary in order to ensure that reporting is responsible, accurate and informative, promoting awareness of the issues involved and ensuring that the necessary control measures are understood and accepted, particularly within the Restricted Zone.

Local authorities, under the Civil Contingencies Act, will play a vital role in communicating with local residencies, businesses and the media. Interested parties such as animal charities, pet owner groups, breed groups and organisers of animal events will need to be kept involved and informed as they will be sending clear messages to their members and it is likely that they will be called on for quotes by the media. Involving as many groups as possible on a regular basis will help to ensure that the message that is disseminated is consistent and accurate.

Keeping the public informed of the nature of the risk and encouraging them to take important precautions in a proportionate manner will be a central principle in controlling the impact on human health, as well as the financial and societal impacts of a rabies incursion.

Key features of the communications strategy will include:

- Communications plan for each stage of an outbreak (suspect case, disease confirmed, during control measures, ongoing controls);
- Agreed key messages that cover several strands (awareness, risk reduction, context and proportionality, acceptance and support for government interventions);
- Public awareness campaigns to increase knowledge of the risks and the various risk reduction measures that people can take;
- Targeted communications aimed at pet owners and those at higher risk of coming into contact with suspect cases to facilitate cooperation with control measures, either voluntary or compulsory.

7.2 Communications in a wildlife rabies outbreak

Communications in a wildlife outbreak will be focused on promoting the safety of human and domestic animal health.

Transparency about the methods to be used will be necessary, for example if bait is to be laid, the public will need to be aware of the health and safety issues involved and how to identify and avoid bait, and encouraged not to interfere with the baits.

Practical advice disease prevention measures that will help control rabies in a wildlife outbreak will be encouraged through campaigns, aimed at pet owners, people living in the area subject to control measures, visitors to the area and children.

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Key messages that will need to be disseminated include:

- Dogs should be kept on leads and cats kept indoors wherever possible within the Infected Area;
- Any potential contact between a domestic pet and a wild animal must be reported to a vet;
- Any physical contact between a person and a wild mammal must be reported to the health authority immediately;
- Any bite by a susceptible domestic animal, known or unknown, must be reported to the health authority immediately;
- Members of the public that observe an animal acting uncharacteristically should report this to the specially established Helpline;
- Baits whether poison or vaccine based need to be undisturbed;
- Other communications will manage the necessary notifications and permissions required if baits are to be placed on private land and what to do if baits are disturbed.
- Should the outbreak of rabies involve wildlife and wider populations of animals be at risk then livestock owners need to be aware of the possibility of rabies occurring in their stock.

Part Eight – Glossary of abbreviations

ADPG	Animal Disease Policy Group
AHVLA	Animal Health and Veterinary Laboratories Agency
CVO	Chief Veterinary Officer
DH	Department of Health
FERA	Food and Environment Research Agency
JCC	Joint Coordination Centre
LDCC	Local Disease Control Centre
NDCC	National Disease Control Centre
NEEG	National Emergency Epidemiology Group
OIE	World Organisation for Animal Health
PEP	Post exposure treatment
RPID	Rural Payments and Inspections Directorate
WG	Welsh Government
WHO	World Health Organisation