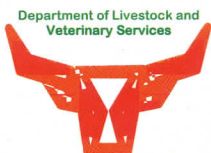




ZIMBABWE

Zimbabwe Rabies Control Guidelines in Humans and Animals

1st Edition



World Health
Organization

EUROPEAN COMMISSION



Humanitarian Aid

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May 2012



Department of Livestock
and Veterinary Services



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Foreword

Rabies is an acute encephalomyelitis affecting all warm blooded animals. It is a natural disease of jackals, bats, (the reservoir hosts), dogs, cats, and other wild carnivores. Rabies is also one of the most dreaded viral zoonoses with a world-wide distribution and no cure in both humans and animals. More than 3.3 billion people live in regions where rabies is endemic. Approximately 55 000 people die from rabies each year, that is, approximately 1 person every 10 minutes. The vast majority of these deaths occur in Asia and Africa, and children are at particularly higher risk because of their proximity to domestic animals.

Because of the nature of its transmission, rabies has a potential to occur anywhere in Zimbabwe and no one is absolutely safe from the disease. The disease has however been more frequently reported and confirmed in Matabeleland North and Matabeleland South provinces, Bikita, Chegutu, Chiredzi, M^l Darwin, Gokwe, Gutu, Hurungwe, Kadoma, Makoni, Mazowe, Murehwa, Mutare, Mutasa, Mwenezi, Zaka, Seke and Wedza districts. Rabies is also frequently reported in urban and peri-urban settlements.

The transmission of rabies is from the reservoir hosts to domestic animals and then to humans. Control of rabies and its elimination therefore requires a comprehensive, concerted and multi-sectoral approach, "**The One Health Concept**", whereby the wildlife, veterinary and human health experts must work together. Wildlife authorities work with communities that are at the wild life-domestic animal interface, increasing awareness for preventive and control measures, while the veterinary experts work on efforts to prevent and control rabies exposure in domestic animals, and human health experts treat the exposed persons and conduct public awareness.

It is possible to eliminate rabies as has been demonstrated by seven countries, mostly in Europe, which have been declared completely free of rabies. While there are challenges in controlling rabies in wild carnivores, its **control in domestic carnivores** can have a **significant impact on human exposure**. The Zimbabwe Veterinary Services are aiming to eliminate dog rabies by 2028, mainly through urging regular vaccination of dogs and cats and conducting public dog vaccination campaigns at least twice a year. Countries which have succeeded in eliminating rabies have demonstrated that if control measures at the wildlife and domestic animal interface are effective, human exposure to rabies is greatly minimized. In the interest of public health protection, animal rabies is a specified disease according to the Animal Health Act Chapter 19:01 and Statutory Instrument 188 of 1991.

The Ministry of Health and Child Welfare monitors dog and animal bites cases in humans. Rabies is notifiable under the Public Health Act Chapter 15:09. In managing dog bite cases and targeting the anti-rabies vaccine and immunoglobulin, MOHCW relies on information on the vaccination status of the implicated vector species (dogs or cats), from the Veterinary Services. Post exposure vaccination for human costs about USD150 for a full course, but may not guarantee freedom from development of rabies, while vaccinating a dog costs only USD1 and with at least 80% vaccine coverage, guarantees up to 90% protection of people from rabies. Rabies vaccines for both animals and humans are not locally manufactured, and over the past decade both Ministries have struggled to avail adequate vaccines for routine vaccination programs and outbreak control. This has led to a significant increase in both animal and human rabies with high human catastrophes.

Dog population control especially of stray dogs is vital in the control of human rabies, and this requires enforcement of local authority bye-laws to control domestic animals in both rural and urban areas. This also requires the cooperation of the communities, animal welfare groups and pet owners in ensuring responsible pet ownership. Since 2008, the Global Coalition on Rabies Control has designated the **28th of September** each year as the **World Rabies Day**, and Zimbabwe has held events to commemorate this day annually since then. Among the successes of this awareness event has been the rallying together of wildlife, veterinary, human health, education, security, local authorities, community leaders and communities which has led to increased public awareness and demand for animal vaccination.

These guidelines are intended to serve as an education and information tool for use in all facets of rabies control to assist both animal and human health workers in standardizing rabies control practices in Zimbabwe.

The development of these guidelines included inputs from veterinary, local authority representatives as well as human health experts in an attempt to standardize the management, prevention and control of rabies by all stakeholders throughout the country, thereby contributing to an effective national rabies control program. This document will be reviewed and revised as necessary to align it with any new developments.



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List of Abbreviations

BRIDH	Beatrice Road infectious Disease Hospital
CFR	Case Fatality Rate
CSF	Cerebral Spinal Fluid
DALYs	Disability-Adjusted Life Years
DPC	Disease Prevention and Control
DPR	Disaster Preparedness and Response
DNO	District Nursing Officer
DVFS	Division of Veterinary Field Services
ECHO	Humanitarian Aid department of the European Commission (formerly: E uropean C ommunity H umanitarian Aid O ffice)
EDC	Epidemiology and Disease Control
FA	Fluorescent Antibody
FAT	Fluorescent Antibody Test
HDCV	Human Diploid Cell Vaccine
IFAT	Immuno-fluorescent Antibody test
IHR	International Health Regulations
IM	Intra Muscular
MOHCW	Ministry of Health and Child Welfare
NIHR	National Institute of Health Research
NPO	National Professional Officer
NTDs	Neglected Tropical Diseases
OIE	World Organization for Animal Health
ORV	Oral Rabies Vaccines
PCECV	Purified Chicken Embryo Cell Vaccine
PCR	Polymerase Chain Reaction
PEDCO	Provincial Epidemiologist and Disease Control Officer
PEHO	Provincial Environmental Health Officer
PEP	Post-Exposure Prophylaxis
PHEIC	Public Health Emergency of International Concern
PPE	Personal Protective Equipment
PVRV	Purified Vero Cell Vaccine
SCD	Standard Case Definition
SEHO	Senior Environmental Health Officer
SIC	Sister in Charge
WHO	World Health Organization

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1. Introduction

1.1 Background

Rabies is a fatal viral zoonotic disease, transmitted to humans mainly through contact with virus containing secretions from infected animals into fresh open wounds or scratches. Rabies is a communicable disease capable of infecting all mammals. The viral pathogen concentrates in tissues of the central nervous system. Upon infection the host often exhibits behavioural changes and ultimately dies in most cases. Dogs are the main source of human rabies in Zimbabwe. Fox (*Vulpes vulpes*) transmitted rabies which was predominant in Europe until about 1991 this was eliminated in a number of countries through the use of an oral vaccine administered to foxes in the wild.

Dogs are the main vector species of rabies in Africa and responsible for most (approximately 97%) of the human rabies deaths worldwide. In more than 99% of all human rabies cases, the virus is transmitted through dog bites; half of the global human population lives in canine rabies-endemic areas and is considered at risk of contracting rabies. People who are most at risk of rabies live in rural areas, and children are at highest risk. About 30% to 60% of the victims of dog bites are children below the age of 15 years. Children often play with animals and are less likely to report bites or scratches. However, rabies also often occurs in urban and peri-urban areas due to encroachment of wild vector species especially when they contract rabies. Therefore no one is 100% safe from rabies in endemic countries. The risk of rabies exposure in humans has been reduced considerably with the availability of effective vaccines when used to protect domesticated dogs and cats.

It is estimated that about 56% of human rabies-related deaths worldwide occur in Asia and 44% in Africa, particularly in rural areas on both continents. In Africa and Asia, these deaths are responsible for 1.74 million disability-adjusted life years (DALYs) lost each year. An estimated 10 million people worldwide receive post-exposure treatment after being exposed to animals suspected of rabies. The estimated annual cost of rabies is US\$ 583.5 million, most of this cost being borne by Asian countries due to the large amounts of Post-Exposure Prophylaxis (PEP) administered. Most PEP needs are borne by patients who can least afford to pay.

1.2 Overview of rabies situation in Zimbabwe

Rabies has been recorded since the 1950s when the first case was detected in the country after more than 10 years with no reported cases. While rabies can affect all mammals, caninids, in particular the domestic dog are of importance as they have the preponderance to transmit the virus. The jackal is considered the most important reservoir host in Zimbabwe. Spread of infection into domestic animals and the human population is mainly through dogs. The domestic dog (*Canis familiaris*) is thought to have arrived about 1000 years ago. Numbers of free ranging dogs have tended to increase in communal lands where they interact with reservoir jackals along boundaries with wildlife reserves and game-holding commercial farming areas. Therefore patterns of rabies may tend to follow land use being more common in areas with active agricultural activities.

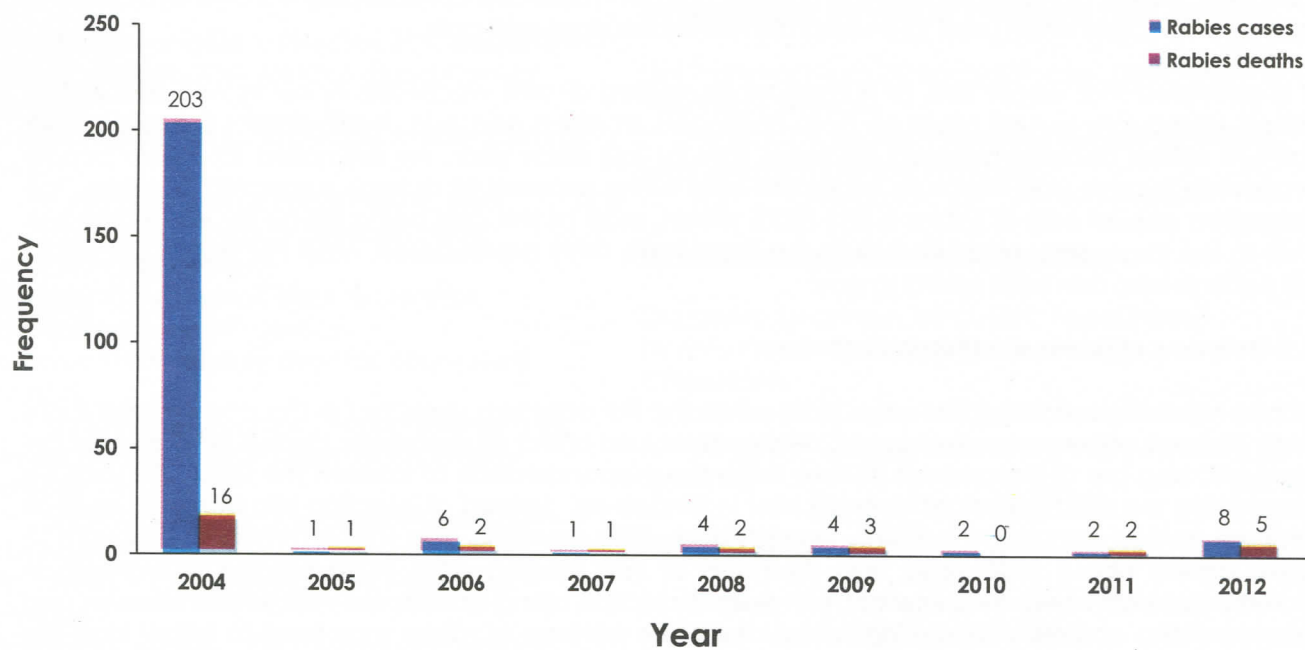
Rabies is a notifiable for the primary reason of protecting the public health (Public Health Act, Chapter 15:09). Rabies control in animals is the primary responsibility of the Veterinary profession under the Animal Health Act, Chapter 19:01. On average 150 confirmed animal cases are reported every year and the disease is considered under reported. Effective prevention and control of rabies in dog populations and access to human anti-rabies post-exposure prophylaxis can substantially reduce the burden of rabies in human populations. Rapid and accurate laboratory diagnosis of rabies in humans and animals is essential for timely administration of post-exposure prophylaxis. Laboratory tests are available for a diagnosis to be made within a few hours, so that correct prophylactic decisions can be made. In spite of this, no comprehensive one-stop guidelines for use by stakeholders have been in place for the management of this zoonotic disease.

Table 1: Reported cases of dog bites and rabies-related deaths in humans by province, Zimbabwe, 2009-2011

Province	2009			2010			2011		
	Susp. cases	Con. cases	Deaths	Susp. cases	Con. cases	Deaths	Susp. cases	Con. cases	Deaths
Manicaland	0	0	0	1	0	0	23	0	0
Mashonaland East	0	0	0	0	0	0	0	0	0
Mashonaland Central	428	0	2	505	0	0	562	2	1
Mashonaland West	0	0	0	16	0	0	36	0	2
Matabeleland North	51	0	0	85	0	0	90	1	1
Matabeleland South	0	0	0	0	0	0	0	0	0
Masvingo	0	0	0	0	0	0	0	0	0
Midlands	222	0	1	251	3	1	242	0	2
Harare	0	0	0	0	0	0	0	0	0
Bulawayo	0	0	0	0	0	0	0	0	0
Total	701	0	3	858	3	1	953	3	6

Source: NIHR, Key: Susp. cases= Suspected cases; Con. case= Confirmed cases

Figure 1: Trends of Rabies in animals, Zimbabwe, 2004-2012



Source: Division of Veterinary Field Services

2. Epidemiology

2.1. Causative agent

Rabies virus belongs to the order Mononegavirales, viruses with non-segmented, negative-stranded RNA genomes. Within this group, viruses with a distinct "bullet" shape are classified in the Rhabdoviridae family, which includes at least three genera of animal viruses, Lyssavirus, Ephemerovirus, and Vesiculovirus. The genus Lyssavirus includes rabies virus, Lagos bat, Mokola virus, Duvenhage virus, European bat virus 1 & 2 and Australian bat virus. **Rabies virus** is the **most important lyssavirus** globally. The virus infects the central nervous system, ultimately causing an inflammation of the brain and is always fatal once symptoms develop. The rabies virus is present predominantly in the saliva of rabid animals and is usually transmitted from animal to animal and from animal to humans through the bite of a rabid animal.

2.2. Mode of transmission

All warm-blooded mammals are susceptible to rabies virus infection, but only a few species are important as reservoirs and vectors of the disease. While bats are important as reservoirs in North America, and foxes in Europe, the chief reservoir species in Zimbabwe is the wild jackal. Rabid jackals will often and uncharacteristically encroach on human settlements and transmit the virus to domesticated animals and humans, through bites. The infection of domesticated dogs and cats starts a typical rabies outbreak as more domesticated animals and people are put at risk. Cattle and other non-carnivore domestic animals can also infect humans although this is rare. Apart from transmission through bites of infected animals, exposure to secretions especially saliva of infected animals directly into a fresh open wound or scratch or onto delicate mucous membranes will result in infection. Iatrogenic transmission through organ transplants has also been recorded.

Facts to note about rabies transmission:

- One cannot get rabies by patting an animal
- Saliva from an infected animal must get through the skin, usually from a bite, scratch, cut or wound.
- If a person or animal is infected with the rabies virus, it generally takes 3 to 8 weeks for the virus to multiply and cause signs and symptoms of rabies. This is relative to the closeness of the bite site to the head.
- In rare cases this period may be as short as few days or as long as several years
- The length of the incubation period depends in part on the wound severity, wound location in relation to the nerve supply, and relative distance from the brain amount and variant of the virus, the degree of protection provided by the clothing and other factors.
- If rabies post-exposure immunizations are not begun before the infection progresses to the central nervous system, rabies is always fatal
- Rabies is communicable during the period of salivary shedding of rabies virus. Literature documents that dogs, cats, and ferrets shed virus a few days prior to clinical onset and during illness. The period of communicability is 3-7 days in dogs and cats before onset of symptoms and throughout the course of the disease. All mammals are susceptible to varying degrees which may be influenced by the virus strain.
- An animal infected with rabies virus will not live beyond 10 days following onset of clinical signs

2.3. Signs and symptoms of rabies in humans

In humans, the incubation period is highly variable and may be 3-8 weeks or more depending on the severity and site of the wound. Clinical signs of rabies are variable. The early symptoms of rabies in people are similar to those of many other illnesses such as flu and these include

- fever,
- headache,

- general weakness,
- There may be also discomfort or a prickling or itching sensation at the site of bite.

These symptoms may last for days. As the disease progresses, more specific symptoms appear and may include

- insomnia,
- symptoms of cerebral dysfunction,
- anxiety, aggressiveness, hallucinations, confusion, agitation, hydrophobia (fear of water),
- hyper-salivation (increase in saliva), dysphagia (difficult of swallowing)
- Slight or partial paralysis, altered vocalization.
- Progression to death is rapid and usually occurs specifically within days of the onset of neurological symptoms. Without medical attention after the onset of symptoms the duration of the illness is usually 2-6 days, sometimes longer. Death is usually caused by respiratory paralysis and known to be accelerated by convulsions.
- In unvaccinated humans, rabies is always fatal if post-exposure prophylaxis is not administered before the onset of symptoms.

2.4. Classification of rabies cases in human

2.4.1. Clinical case definition

A person with one or more of the following: headache, neck pain, nausea, fever, fear of water, anxiety, agitation, abnormal tingling sensations or pain at the wound site, when contact with a rabid animal is suspected.

- **Suspected case:** a case that is compatible with the clinical case definition
- **Probable case:** a suspected case plus history of contact with a suspected rabid animal
- **Confirmed case:** a suspected case that is laboratory-confirmed

2.4.2. Human exposure to rabies

Possible exposure: A person who had close contact (usually a bite or scratch) or handling saliva of a suspect rabid animal

Probable exposure: A person who had close contact (usually a bite or scratch) with an animal displaying clinical signs consistent with rabies at time of the exposure.

Exposed: A person who has had close contact (usually a bite or scratch) with a laboratory-confirmed rabid animal

2.5. Signs of rabies in animals

In domestic animals the incubation period is generally 3-12 weeks, but can range from several days to months, rarely exceeding 6 months. There are two forms of rabies in animals: the paralytic and the furious form

Symptoms of the paralytic form in animals

- Change in behavior to docility
- Profuse salivation
- Paralysis of the throat muscles and inability to swallow
- Drooping of the lower jaw, in dogs and cattle
- General paralysis, coma and death in a few hours

Symptoms of the furious form in animals

- Change in behavior to aggressiveness
- An alert and anxious facial expression
- Characteristic howling
- Biting of inanimate objects
- hydrophobia
- Dilation of pupils
- Hypersensitivity to noise and general agitation
- Loss of all fear and caution to humans especially in jackals
- Young puppies will often be seen chasing imaginary objects and bite unpredictably
- Rampant roaming and wild attacks on other animals and people
- Incoordination
- Convulsions
- Progressive paralysis and death not more than 10 days from the onset of symptoms

Syndromes in dogs

The typical syndrome often called "**the mad dog syndrome**" is fairly easy to recognize due to the irrational and vicious nature and considerable change in behavior. Dog rabies can however be confusing when it presents as a paralytic disease often tempting the unsuspecting person to examine for difficulty to swallow in search of a foreign body, leading to occupational and sociological exposures, complicating and delaying reporting and follow-up actions.

2.6. Epidemiological surveillance

Rabies is a notifiable disease within the national health and veterinary systems. Surveillance of both human and animal rabies is essential for early case detection and to monitor effectiveness of control and prevention programs. Surveillance of rabies is the basis for any programme of rabies control. Surveillance should be premised on effective reporting of human and animal rabies cases and underpinned by laboratory confirmation to enable prompt and effective preventive immunization in animals and PEP of human patients.

Surveillance procedures

- The Director of Veterinary Services generally authorises officers of the Zimbabwe Republic Police (ZRP) who are trained to restrain, detain and possibly destroy suspect rabid cases. Private Veterinary practitioners are also under obligation to handle and notify suspected rabies cases
- Owners are advised to report any suspect animals to the nearest Government Veterinary Office or to the nearest Police post/station or health centre
- Any suspicious human contact should be reported to the ZRP or the nearest clinic for follow-up measures
- Detained animals should be placed under veterinary quarantine until proven not infected
- Whole heads or brain tissue of animals dying from suspected rabies should be submitted to the Central Veterinary laboratory in Harare, for laboratory confirmation
- Jackals and other wild animals found dead should be similarly sampled for laboratory confirmation
- Samples submitted for rabies should be tested in the shortest possible time and the results notified to source by the quickest means
- A database for all animals tested for rabies is maintained by the Department of Veterinary Services for analysis and dissemination
- An emergency response system allows provincial veterinary officers to mount vaccination campaigns in dogs should they feel the rabies incidence is rising
- Dog and cat owners are encouraged to always ensure that their pets are vaccinated every three years (provide vaccination schedule in annex by Veterinary team). In line with current international recommendations, annual revaccination of domestic dogs and cats is advised

- Rapid exchange of information with veterinary services in charge of animal rabies surveillance and control is required.
- Epidemiological investigation of outbreaks: investigation of all rabies foci, identifying sources of infection as well as humans and animals exposed or possibly exposed. The investigation forms shown in Annexes 1, 2 and 3 should be used.
- Submission of samples from each suspect human case for laboratory confirmation.

2.6.2. Recommended data elements of human rabies exposure

Case-based data

Unique identifier, name, age, sex, geographical information, date of onset of symptoms, date(s) of bite/scratch, geographical information (location) of biting episode(s), bite sites, category of exposure, local wound treatment, vaccination history (bitten person), previous serum treatment, current treatment, outcome; details of biting animal, vaccination history (animal), samples taken, samples outcome, outcome.

Aggregated data reporting

- Exposures by geographical information on biting episode, biting animal, outcome in animal and human populations.
- Surveillance of deaths from human rabies

Recommended data analyses, presentation, reports

- Number of human rabies deaths and rabies cases in animals (by species), by date of presentation.
- Human exposures by location and dates of biting/scratch episode, animal species at origin of exposure and by outcome in human and in animal populations.
- Cases by geographical area (e.g. district), dates of biting/scratch episode, type of animal, occupation and outcome.

3. Laboratory diagnosis

Rabies can only be reliably diagnosed by laboratory tests on glycerol or formalin-preserved brain samples using a variety of tests.

- The main test on fresh samples includes the Indirect Immuno-fluorescent Antibody test (IFAT).
- Fresh brain materials can further be injected into mice brain for multiplication if results to initial IFAT tests are doubtful.
- The demonstration of Negri bodies on a stained histopathology slide is also confirmatory.
- Old decayed samples can be subjected to immunohistochemistry or nucleic acid tests
- ELISA tests have been successfully demonstrated on serum from exposed patients although this test is not generally available.

When a person is bitten by a pet that appears sick or by a wild animal, the biggest concern is rabies. No test can determine whether the rabies virus has been transmitted to the person immediately after the bite. The animal is kept under quarantine for 14 days and evaluated to determine whether the person requires treatment. A suspected animal that has bitten a person is killed if possible, so that its brain can be examined. If a person who has been bitten by an animal becomes increasingly confused and agitated or paralyzed, the diagnosis is probably rabies. At this point, tests can detect the rabies virus; one or more of the following test should be performed:

- Detection of rabies virus in clinical specimens, preferably brain tissue (collected post mortem) and confirmation of rabies viral antigens by direct Fluorescent Antibody Test (FAT) or by ELISA.
- Detection by FAT on skin biopsy or corneal smear (collected ante mortem).
- FAT positive after inoculation of brain tissue, saliva or Cerebral Spinal Fluid (CSF) in cell culture, or after intra-cerebral inoculation in mice or in suckling mice.

- Detectable rabies-neutralizing antibody titre in the serum or the CSF of an unvaccinated person.

Safety precautions in handling rabies virus should be taken to avoid infection. Remove the head of the suspected animal (dog, other domestic or wild animals); wrap head completely such that no blood is oozing out. Where possible, request a veterinarian to assist in the collection and preservation of the specimen (See Annex 4)

Note

For confirmation of all cases of rabies including human and animal cases, samples should be sent to the Central Veterinary Laboratories.

4. Prevention measures

4.1. General prevention methods to be observed

Responsible pet ownership

It is critical for owners to

- Ensure that vaccination cover in all dogs, cats up-to-date at all times
- comply with quarantine orders on any biting animals
- comply with Public Health Act Chapter 15:09, Animal Health Act Chapter 19:01 and local authorities by-laws
- Take the pet to a veterinarian to receive a rabies booster if pets come into contact with a jackal
- Keep all pets in some type of enclosure a house, fenced yard or kennel and not allowed them to roam free.
- Keep pets on a leash when they are outside their enclosure
- Prevent uncontrolled breeding of dogs and cats
- Approach the veterinarian for population control measures
- Report any suspicious animal behaviour for veterinary investigation

Avoid attracting wild animals that might have rabies into your yard or home

- Keep garbage bins covered with tight-fitting lids
- Do not leave pet food outdoors
- Prevent animals from getting into your home by placing a cap on your chimney, keep garage doors closed and eliminate places where animals can take up residency
- Exclude bats from houses and structures near homes

Avoid contact with wild animals

- If you encounter injured or orphaned wildlife, contact local animal control or a game warden for assistance
- Never touch or pick up a wild animal without gloves
- Sick animals may be infected with rabies
- Teach children not to feed or touch wildlife (including bats)

Avoid contact with stray animals and animals you do not know

- Stray cats and dogs are more likely to come in contact with wildlife that could be infected with rabies
- Do not pat or feed such animals; rather, call the veterinary officer in your area

If you see an animal that looks like it has rabies

- Do not approach the animal or try to help it
- Contact your local veterinary services or health department for assistance.

If you are bitten or possibly exposed to rabies

- Immediately wash the wound thoroughly with lots of running water preferably warm using soap or povidone iodine solution. This should not however be considered sufficient except where test results in animal samples are negative.
- If you cannot confine the biting animal, pay close attention to what it looked like and where it went so this information can be quickly shared with veterinary officers or other persons involved with trying to locate the animal for observation.
- Seek medical attention from a health care provider.
- All animal bites should be reported to veterinary officer or the local health facility or the police.
- Immunize any person with proven or probable exposure to rabies and administer rabies immunoglobulin in case of severe exposure

Pre-exposure prophylaxis

- Humans at high risk (e.g. laboratory personnel, veterinarians, handlers, wildlife personnel) must receive pre-exposure immunization
- Pre-exposure vaccine regimen: 1 dose of Rabies vaccine, human diploid cell in IM on days 0, 7, 28 with booster every 2 years.

4.2. Prevention measures related to domestic animals

Effective animal vaccines that provide a considerable duration of immunity have been developed and mass parenteral vaccination programmes remain the mainstay of canine rabies control. Prevention measures include the following:

- Ensure adequate vaccine stocks and other resources required in vaccination campaigns
- Annual vaccination campaigns should be conducted throughout the country at about the same time. High vaccination coverage targeting at least 80% of the dog population is necessary
- All dogs and cats above the age of 3 months when presented should be immunized
- All vaccinated animals should be identified by a tattoo or a vaccination certificate
- Engagement and/or mobilization of the communities, stakeholders and the media in vaccination campaigns is encouraged for the control of rabies
- Dog tie-up campaign should immediately follow the vaccination campaign and all unvaccinated stray dogs will be destroyed on sight

The principal challenge is effective delivery of vaccines to ensure adequate vaccination coverage in the reservoir dog population. To ensure effective coverage, vaccination programmes should consider the local ecology of the dog population, involve coordination of related sectors and incorporate culturally appropriate education procedures.

4.3. Prevention measures related to wildlife

- Seclusion of domesticated and wild animals
- Keep wildlife (jackals) population under control
- Destruction of suspected rabid wildlife with assistance of National Park and Wildlife
- Research and development of an oral vaccine for wildlife, e.g. through baiting

Note: A person exposed to rabies by any wild mammal should immediately report the incidence to the health care provider who, in consultation with the public health authorities and the veterinary services, can evaluate the need for post-exposure prophylaxis (Annex 6).

4.4. Recommended Public Health Action

- Maintain active surveillance of rabies in animals
- Detect and respond promptly and appropriately to cases and outbreaks of rabies
- Isolate patient if rabies develops to prevent infection of others
- Establish epidemiological links by investigation and notify health authorities through the health information system
- Immediate reporting of cases using the T1 form and routine monthly summary reports using case based reporting form and T2 form (Annexes 2 and 3)
- Post exposure prophylaxis to prevent rabies
- Promote public awareness of rabies
- Immunize contacts if patient develops rabies
- Target immunization campaign for domestic or wild animals in high-risk areas
- To ensure effective coverage, vaccination programmes should consider the local ecology of the mammal population, involve coordination of related sectors and incorporate culturally appropriate education efforts.
- International measures: strict compliance by common carriers and travelers with national laws and regulations in most countries in line with provisions of OIE Terrestrial Animal Health Code. Certificates of health, vaccination and origin are required.

5. Rabies control activities

5.1. Management of bitten patients

There is no specific treatment for rabies once clinical signs and symptoms of the disease have begun. Therefore, **prevention is the key**. Wounds resulting from exposures to animals, especially if rabies is suspected, should be immediately and thoroughly washed with soap and water, followed by ethanol (surgical spirit) or povidone iodine dressing. Medical attention should then be sought to determine if anti-rabies immunizations should be initiated and to evaluate wounds for tissue damage and need for antibiotics to prevent bacterial infections commonly associated with animal bites.

Before a decision is made to start rabies post-exposure treatments, all attempts should be made to capture the biting animal, if available, and have it evaluated to determine if it has rabies:

- Wild animals may need to be euthanized and their brains tested for rabies.
- A healthy dog, cat or ferret that bites a person must be confined for 10 days and observed for signs of rabies. The animal should be released if it is not dead in 10 days.
- Pets with no current history of rabies vaccination by a veterinarian must be quarantined at a veterinary hospital or recognized animal control facility. If the animal is not available for testing, the decision to undergo treatment is usually based upon a health/veterinary officer recommendation.

5.2. Management of animals exposed to rabies

Management of a pet bitten by a rabid animal depends on the circumstances of the exposure and whether the exposed animal was currently vaccinated. If the animal has not been currently vaccinated:

- Report to a veterinarian for immediate vaccination and wound treatment
- Following vaccination, ensure that the animal is tattooed to indicate vaccination status or obtain a valid official rabies vaccination certificate endorsed by an authorized person
- Otherwise have the animal placed under quarantine until rabies can be ruled out

- Make every attempt to safely secure the suspect rabid animal for placement in quarantine and further observation for 10 days, or to be put down by a veterinarian or authorized person for a brain tissue examination post mortem rabies

If the bitten animal is already vaccinated

- Check that the vaccination date is still valid
- If no longer valid, immediately have the animal vaccinated and quarantine for 10 days
- If valid, the animal should get the booster vaccination

5.3. Treatment of human rabies cases

Once a person begins to exhibit signs of the disease, survival is rare. To date less than 10 documented cases of human survival from clinical rabies have been reported and only two have not had a history of post-exposure prophylaxis. Disease prevention includes administration of both passive antibody, through an injection of human immune globulin and a round of injections with rabies vaccine.

Effective treatment within a few days, but as soon as possible after exposure to rabies, can prevent the onset of symptoms and death. The rabies post-exposure consists of

- Local treatment of the wound, immediately followed by
- A series of rabies **Human Diploid Cell Vaccine** inoculations administered in the deltoid muscle of the arm on day **0, 7 and 21**.

The rabies immune serum and vaccinations are both very safe and effective, but can be costly. While it takes only one or two days to confirm animal rabies in straightforward cases, laboratory diagnosis may be delayed for a variety of reasons.

Despite the availability of this highly effective vaccine, rabies is best managed through prevention measures in the vector population of dogs and cats. In case laboratory confirmation is delayed, treatment should not await the results of laboratory diagnosis especially if the veterinary opinion indicates rabies. Generally, post-exposure prophylaxis in humans is 100 times more costly than a preventive vaccination program in domesticated pet animals.

Note:

- For **adults and older children**, the **deltoid area** is the only acceptable site of vaccination
- For **younger children**, the **outer aspect of the thigh** may be used
- Vaccine should **NEVER** be administered in the gluteal area

5.3.1. Pre-exposure treatment

Individual pre-exposure immunisation should be offered to persons at high risk of exposure, such as animal handlers, Veterinarians, National Parks and Wild Life personnel. Give:

Table 2: Rabies pre-exposure treatment regimen, 6th Edition EDLIZ 2011

Medicine	Adult dose	Frequency	Duration
Rabies vaccine, human diploid cell in IM	0.5ml	single doses	on day 0, 7 and 28 only
<ul style="list-style-type: none"> • Give a booster every 2-3 years 			

5.3.2. Post-exposure immunisation

Rabies **PEP** is a **medical urgency NOT an emergency**. The severity and location of the wound (severe wounds or wounds near the head and neck are at higher risk), and circumstances of the bites should be considered in the decision to start PEP. Potentially exposed persons can normally afford to wait 48

to 72 hours for an animal to be located for quarantine or for rabies testing results. Other treatment such as wound care, antibiotics and tetanus immunization may be indicated. Wounds resulting from dog and other animal bites, especially if rabies is suspected, should be thoroughly cleaned with soap and running water, followed by ethanol (surgical spirit) or povidone-iodine solution as soon as possible and not sutured.

Table 3: Post-exposure treatment regimen for adult, Zimbabwe, EDLIZ 2011

Type of risk	Medicine	Adult dose	Frequency	Duration
High Risk	In a previously unvaccinated or incompletely vaccinated individual, where there is a high risk of rabies, i.e. broken skin, uncertain animal history or strong suspicion of rabid animal, or the bite is on the head, neck and upper part of the body, give:			
	human rabies immunoglobulin (instilled and infiltrated locally around the wound)	10 IU/kg	once only	-
	and human rabies immunoglobulin IM (gluteal)	10 IU/kg	once only	-
	Vaccinate using the abbreviated multi-site regimen: 2-1-1 vaccination schedule (EDLIZ 2011)			
	Rabies vaccine (human diploid cell) IM (upper arm site)	0.5ml in each arm	one dose	on day 0
	Then	0.5ml in one arm	one dose	on days 7 and 21
	This regimen 2-1-1 is particularly recommended when no immunoglobulin is required, i.e. when contact consists in nibbling of uncovered skin, minor scratches or abrasions without bleeding, or licks on broken skin.			
Low Risk	where the risk of rabies is low, i.e.: <ul style="list-style-type: none"> • skin not broken or other contact (e.g. with infected meat) • bite from domestic animal with overdue booster vaccination against rabies Follow the 2-1-1 vaccination schedule, but without giving immunoglobulin			
Minimal-no risk	In previously vaccinated individuals give a single booster dose of rabies vaccine			

Note:

- Immuno-suppressed patients should be given both the immunoglobulin and the vaccine
- Use a separate syringe and needle for each dose; store vials at 4-8°C after reconstitution and use as soon as possible.

5.4. Management of epidemics

Conditions under which epidemics may occur

- Introduction of the virus into a rabies-free area with a fully susceptible animal population.
- Affected areas where the dog/human population ratio is high, with little dog supervision and immunization.
- Affected areas with animal outbreaks where no human rabies vaccines/immunoglobulin are available.
- Hunting communities with many hunting dogs and frequent contact with wild animals

If an epidemic arises from a new introduction at one site, intensive vaccination of dogs in combination with dog and cat population control and movement restriction measures to be implemented immediately.

5.4.1 In animals

- Undertake a dog immunization campaign at least twice a year to ensure vaccination coverage of all new animals and those needing re-vaccination, aiming at covering at least 80% of the dog population within 1 month.
- Seek destruction of suspicious wild animals and seek laboratory confirmation of rabies status
- Population control programs for dogs and cats through spaying and neutering
- Enforcing dog licensing regulations
- Public awareness on responsible pet ownership
- Selective and humane capture and elimination of strays dogs and cats not in complying with legislation may be conducted in outbreak situations.

5.4.2 In humans

- Ensure availability of vaccine and immunoglobulin in the affected area
- Train medical staff in defining when post-exposure prophylaxis is needed, categories of exposures and in the use of the correct injection technique
- Investigate animal outbreaks and identify human contacts with suspect animals
- Immunize any person with proven or probable exposure to rabies

5.4.3 Other aspects

Procurement of equipment and drugs

- A 1-ml syringe and a needle for each IM injection (intra-dermal needles and syringes for intra-dermal vaccination).
- Vaccine amounts: between 3 and 4 vials, depending on vaccination need method used.
- Only the following vaccines meet WHO safety, potency and efficacy requirements when used for post-exposure intra-muscular treatment of rabies:
 - **Human Diploid Cell Vaccine (HDCV)** is the only one **approved for used in Zimbabwe**: e.g. Rabivac is one of the brands of vaccine
 - Purified Vero Cell Vaccine (PVRV): e.g. Verorab, Imovax, Rabies vero, TRC Verorab
 - Purified Chicken Embryo Cell Vaccine (PCECV): e.g. Rabipur

Cost of PEP and cost of vaccinating dogs: the World Health Organization estimates that

- **One full PEP** including administration of rabies Immunoglobulin + associated patient transport costs and income loss, will cost the average patient around **\$100** (\$93 in Africa and \$106 in Asia)
- Cost of **vaccinating one dog** in a mass vaccination campaign is around **\$2** (with \$ 0.30 worth of vaccine)
- On average 2000 PEP are needed per million inhabitants per annum and there are on average 100 000 dogs per million people
- But effective dog rabies control with good surveillance leads to reduction in PEP and related costs over time and eventual savings when elimination is reached (5 to 10 years horizon).

Special considerations/other interventions

- It is theoretically possible for person-to-person rabies transmission to occur since secretions may contain the virus; this has not however been documented. As a precaution, medical and health care staff must wear mask, gloves, and goggles. In hospitals and other institutions caring for several rabid patients, pre-exposure vaccination of medical and nursing personnel should be considered. Do not use organs of patients with rabies or any neurological disease for transplantation.
- PEP should be offered to relatives, nursing rabies affected patients
- Inter-sectoral cooperation of medical and veterinary services, community involvement and participation are required for targeted response and control in animal reservoirs.

F. Action Taken

1. Fourteen-day tie-up order
 - a. Start:/...../.....
 - b. Finish:/...../.....

2. Laboratory Confirmation
 - a. Specimens [tick]
 - i. Collected and submitted
 - ii. Not collected
 - b. Results
 - i. 1. Positive (Lab n°:.....)
 - ii. 2. Negative (Lab n°:.....)
 - iii. 3. Pending [tick]:.....

G. Recommendations (Tick from list below)

1. Rabies Post Exposure Treatment
2. Wound management only

Name of Veterinary Official:

Designation:.....

E.C n°:

Station:.....

Signature:

Annex 2: Collection and dispatch of animal specimens by the Veterinary Services

People responsible for collecting specimens must be vaccinated against rabies

Performing unprotected necropsies or autopsies involves a particularly high risk. The use of protective clothing such as mask, gloves and a gown as well as glasses when examining and handling rabies suspected (human or animal) patient and conducting necropsies/autopsies is mandatory. This should protect staff from droplet infection to face and eyes, sites at greatest if not only risk.

Animals seen exhibiting rabies signs should be put down (euthanized) without causing damage to the brain. Protective clothing, which should include gloves, an overall, a plastic apron, gumboots and face mask, must be worn while removing the brain.

Collection of specimens should occur in a dedicated post-mortem room or in the field. It is advisable that a bucket and disinfectant be available for onsite cleaning. The minimum equipment required is a coarse-bladed saw, a knife, a scalpel, forceps, scissors and a spatula.

After cutting off the head skin should be divided in the mid-line and the skull split along the mid-line into two halves using a coarse-bladed saw. This divides the brain as well. The brain should then be carefully removed with the aid of the scissors and forceps. In large animals sawing across just in front of the base of the horns is useful for opening the skull.

All bovines with neurological symptoms that test negative for rabies are tested for Bovine Spongiform Encephalopathy (BSE). Although BSE has never been diagnosed in Zimbabwe, on-going surveillance is essential to prove that the country remains disease free.

One half of the brain samples should be submitted in 50% glycerol -saline and the other half in 10% formalin and placed in a leak-proof bottle. If preservative is not available brains may be stored in empty bottles and submitted without delay on ice by courier service, or hand-delivered to the laboratory.

Rabies can be diagnosed from any part of the brain, the spinal cord, peripheral nerves and salivary glands. However, the test is most reliable using the thalamus, pons medulla oblongata, hippocampus and cerebellum

The specimen bottles should each be enclosed separately in a plastic packet and then placed a metal container with a lid and the metal container in a rabies specimen box. The box should contain copious quantities of shredded paper, or other absorbent material, to absorb any fluid that may leak from bottles. Accurate documentation on the correct submission form and a complete case history are extremely important for guiding laboratory diagnosis.

The rest of the head and carcass should be burnt or buried in a plastic bag. After removal of brain all equipment and work surfaces must be thoroughly disinfected and cleaned before removing the brain of another animal. All disposable clothing should be disinfected or autoclaved before washing.

Annex 3: Notification Form (T1)

Notification of Infectious Diseases Ministry of Health and Child Welfare T1

Section 19 of the Public Health Act (Chapter 15:09)

Note: All suspected cases of notifiable diseases listed on the cover must be notified to the DMO or Officer In-Charge of a district by telephone and then followed up with copies of this form to the DMO and PMD/City MOH

From: <hr/> <hr/> Name of clinic/hospital/area	To MOH City: ----- DMO District: ----- PMD Province: -----
--	---

I hereby notify to you that the under-mentioned person is suffering/has died from -----

Diagnosis -----

Confirmed by laboratory test: Yes / No

Type of test -----

Date of onset: -----

Date of admission/Detention: ----- case number -----

Name: -----

(First name)

(Surname)

Age: ----- Date of birth: ----- Sex: -----

Identification particulars: -----

Physical address on admission/disease detection: -----

Length of stay (at the above address): -----

Communal land: ----- Chief/Chairman -----

Headman/Ward: ----- Kraal/Village: -----

Nearest dip-tank/school: -----

Next of kin: -----

Usual residential address if different from above: -----

Name and address of employee/school: -----

Give physical addresses of places visited during last month and length of stay

Place of probable infection: ----- Date of onset: -----

Probable source of infection: ----- Date of probable infection: -----

Transferred to: ----- Date of transfer: -----

Notifying officer: ----- Title: -----

(in capitals)

Date: ----- Signature: -----

Instructions for completing the T1 notification of infectious diseases

For all levels of care

T1 is the form for notification of Infectious Disease. The list of notifiable diseases is as follows:

<ul style="list-style-type: none">• Anthrax• Chicken pox• Cholera• Diphtheria• Hepatitis (all forms)• Human African Trypanosomiasis• Meningococcal Meningitis• Pandemic influenzas (H5N1, H1N1)• Plague• Poliomyelitis	<ul style="list-style-type: none">• Rabies• SARS• Typhoid• Typhus• Viral Haemorrhagic fever• Yellow fever• Tuberculosis (TB) and Leprosy are also notifiable, but they continue to be notified on TB Form 4 and TB Form B for TB, and the Leprosy form for leprosy.
---	---

Purpose

It has been found necessary to notify the above diseases because:

- the way in which they spread needs closer monitoring if they are to be controlled;
- It is important that the Provincial Medical Directors (PMDs), City Health Directors and other local authorities know what action has been taken to control the spreading of the diseases;
- It is a statutory requirement that Zimbabwe reports cases and deaths from these diseases to the World Health Organization

Who fills in the T1

Any clinician who makes diagnosis of any of the notifiable diseases should complete the Form T1 in triplicate immediately after the diagnosis is made.

When to fill in the T1

All suspected and laboratory confirmed cases of the above should be notified immediately to the District Medical Officer by the fastest means possible (telephone if available). The notifying clinician should then complete a T1 form in triplicate.

How to fill in the T1

T1 forms are provided to be filled out in triplicate. Ensure that all the copies are legible. Most entries on T1 are self-explanatory, but a few notes may be useful:

- **CAPITAL LETTERS** should be used on all entries made
- **Double-wording:** Whenever alternatives are given for example (" suffering from" or "has died" or confirmed by laboratory test" or "suspected cases") the inapplicable words should be carefully crossed out, or the appropriate box should be ticked
- **Age or/ and Date of Birth:** it is important to record the date of birth as well as the age to confirm that the age is accurate because in many cases these do not match. If the age is not known, the estimated age should be given
- **Physical address:** This refers to the village name, village head, and chief of the area if it's in rural area and, farm name and number or house number, street name and suburb if it's in an urban area.

Annex 4: Summary of Notification Information T2

**National Health Information System T2
Ministry of Health and Child Welfare
Month Return on Notifiable Diseases**

District: **Month and year:**

Disease	Suspected cases	Laboratory confirmed cases	Deaths
Anthrax			
Chicken pox			
Cholera			
Diphtheria			
Hepatitis (all forms)			
Human African Trypanosomiasis			
Leprosy			
Meningococcal meningitis			
Pandemic influenzas (H5N1, H1N1)			
Plague			
Poliomyelitis			
Rabies			
SARS			
Tuberculosis			
Typhoid			
Typhus			
Viral Haemorrhagic fever			
Yellow fever			

Remarks: _____

Date reported: _____ **Reported by:** _____

Name: _____ **Title:** _____

Annex 5: Basics Facts about Rabies

1. Introduction

Rabies is a serious fatal disease of animals and humans. Once an infected animal or human being is showing signs of the disease, treatment is not possible. An increase in the number of animal/dog bites has been reported throughout the country. Exposure of humans to rabid animals is of increasing concern in Zimbabwe.

2. What is rabies?

Rabies is a disease of the brain caused by a virus called the rabies virus. The rabies virus is present in the saliva, brain and spinal cord tissue of an infected animal.

3. Where does rabies come from and how is it transmitted?

Rabies virus is present predominantly in the saliva of rabid animals. Wild animals, particularly the jackal, maintain the virus in the wild. Domestic animals, particularly the dog, get the disease from the jackal when they fight. Once in the dog, virus spread from dog to dog and to other animals is achieved through dog bites. Men become infected from the bite of an infected animal, mainly the dog due to the close association.

4. Exposure defined

When an exposure has occurred, the likelihood of rabies infection varies with the nature and extent of that exposure. Under most circumstances, two categories of exposure (bite and non-bite) should be considered. The most dangerous and common route of rabies exposure is from the bite of a rabid animal. An exposure to rabies also might occur when the virus, from saliva or other potentially infectious material (e.g., neural tissue), is introduced into fresh, open cuts in skin or onto mucous membranes (non-bite exposure). Indirect contact and activities (e.g., petting or handling an animal, contact with blood, urine, or feces, and contact of saliva with intact skin) do not constitute exposures.

5. In what forms does the disease present in animals?

- The dumb or paralytic form
- The furious form

6. Signs of rabies in animals

Dumb/Paralytic form

- Change in behavior to docility
- Profuse salivation
- Paralysis of the throat muscles and inability to swallow
- Drooping of the lower jaw, in dogs and cattle
- General paralysis,
- coma and death in a few days

Furious Form

- Change in behavior to aggressiveness
- An alert and anxious facial expression (the so-called Sardoniac Grin)
- Change in the appearance of the eyes highly irritable to noise and general agitation
- Loss of all fear and caution to humans especially in jackals
- Young puppies will often be seen chasing imaginary objects and bite unpredictably
- Biting inanimate objects
- Rampant roaming and wild attacks on other animals and people
- Staggering
- Convulsions
- Progressive paralysis and death not more than 10 days from the onset of signs
- Fear of water
- Unusual vocalization/howling sounds

7. Signs and Symptoms of rabies in humans

The incubation period is highly variable. In humans it is 3-8 weeks, sometimes even more, depending on the severity and site of the wound. Clinical signs of rabies are variable. Early symptoms of rabies in people are similar to those of many other illnesses and may be very similar to those of flu. The signs include:

- fever,
- headache,
- general weakness,
- There may also be discomfort or a prickling or itching sensation at the site of bite.

These symptoms may last for days. As the disease progresses, more specific symptoms appear and may include:

- Sleeplessness
- Anxiety
- excitability
- hallucinations
- confusion
- agitation
- aggressiveness
- hydrophobia (fear of water)
- Hyper-salivation (increase in saliva)
- Difficulty in swallowing
- Slight or partial paralysis
- Altered vocalization
- Progression to death is rapid and this usually occurs specifically within days of the onset of neurological symptoms. Without medical attention after the onset of symptoms the duration of the illness is usually 2-6 days, sometimes longer, death is usually caused by respiratory paralysis. The condition can be speeded up by convulsions
- In unvaccinated humans, rabies is always fatal if post-exposure treatment is not administered before the onset of symptoms.

8. Treatment

Specific treatment

Once a person begins to exhibit signs of the disease there is no treatment. Patients are sedated awaiting death.

Management and vaccination following an animal bite

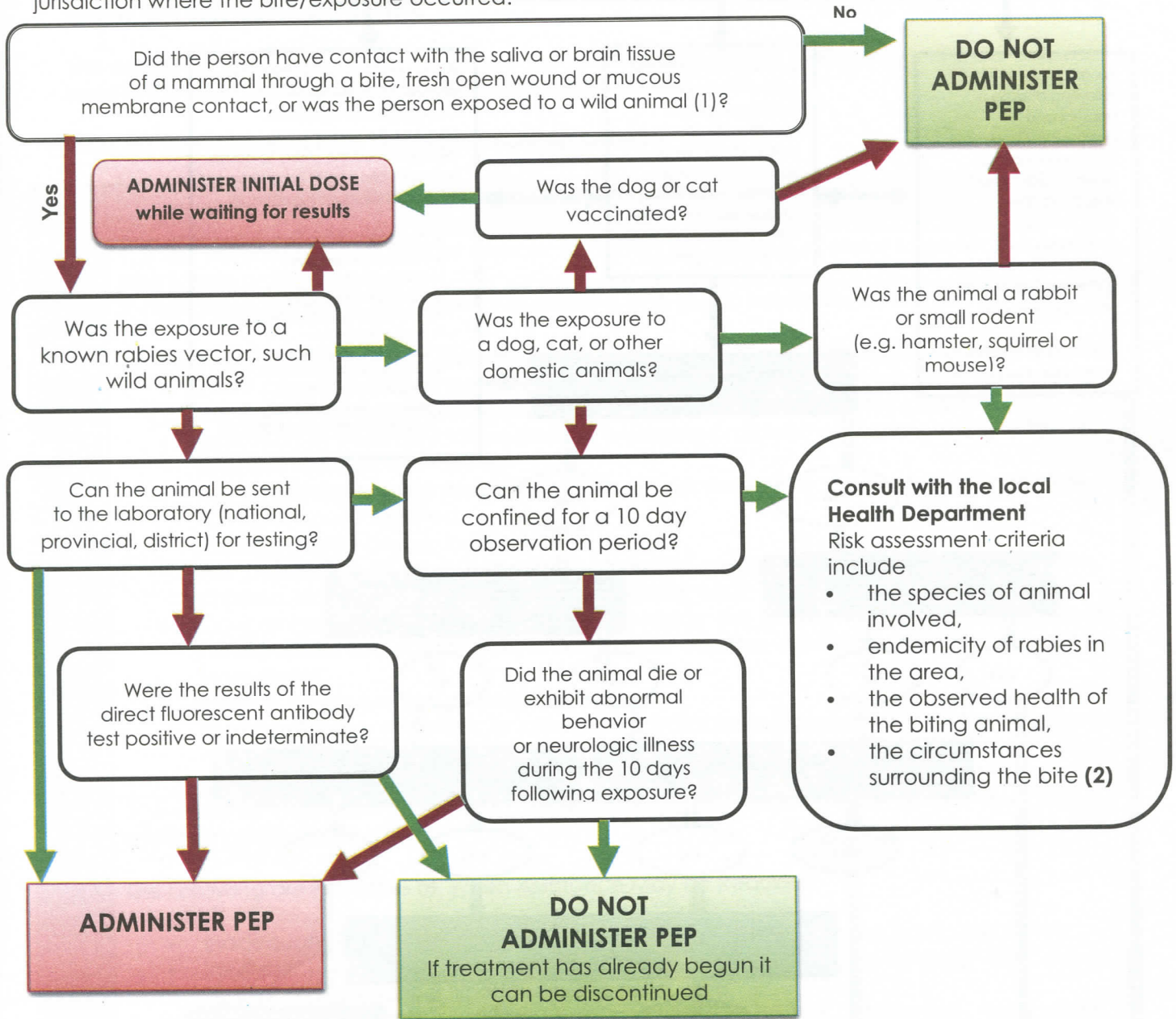
- Appropriate wound cleansing with lots of running water and soap
- Immunization within a few hours after contact with a suspect rabid animal can prevent the onset of rabies and death.

9. Rabies prevention and control measures

- It is critical to vaccinate all dogs and cats
- Keep dogs in fenced or walled premises, do not allow dogs to roam freely
- Avoid attracting wild animals and stray dogs that may have rabies into your premises, practice proper garbage disposal
- Avoid contact with wild animals and teach children not to touch or feed wild animals
- Avoid contact with stray animals
- If you see an animal that looks like it has rabies, do not approach or try to help it
- Report all suspected rabies cases to the nearest veterinary officer or health worker so that appropriate action can be taken
- Comply with local authority by-laws with respect to keeping of dogs and cats
- Discourage uncontrolled breeding by castrating (neutering) or spaying dogs and cats

Annex 6: Human Rabies Post-Exposure Prophylaxis Algorithm

The law requires that all animal (mammal) bites be reported to the local health department in the jurisdiction where the bite/exposure occurred.



(1) In addition to obvious bites or mucous membrane exposures, the CDC suggests that PEP be considered in cases where there is a reasonable probability that contact with a bat may have occurred (e.g., a deeply sleeping person awakens to find a bat in the same room; an adult witnesses a bat in the room with a previously unattended child; the exposed person is mentally disabled or was intoxicated when the exposure occurred), and rabies cannot be ruled out by testing the bat. PEP would not be warranted for other household members who do not meet these exposure criteria. Consult your local health department for questions regarding uncommon incidents

(2) Unprovoked exposures are rare and are typically characterized by an animal crossing neutral space to attack. Provoked exposures may include the following: attempting to feed an animal, contact with an injured animal, entering an animal's territory, picking up, petting or playing with an animal, attempting to break up a fight between animals, walking, running or riding a bicycle past an animal.

Examples for the application of the IHR Decision Instrument for the assessment and notification of events that may constitute a PHEIC

The examples appearing in this Annex are not binding and are for indicative guidance purposes to assist in the interpretation of the decision instrument criteria.

Does the event meet at least two of the following Criteria?

Is the public health impact of the event serious?	I. Is the public health impact of the event serious?
	1. <i>Is the number of cases and/or number of deaths for this type of event large for the given place, time or population?</i>
	2. <i>Does the event have the potential to cause a high public health impact?</i>
	3. <i>Is external assistance needed to detect, investigate, respond and control the current event, or prevent new cases?</i>
	<p>The Following are Examples of Circumstances that Contributed to High Public Health Impact:</p> <ul style="list-style-type: none"> • Event caused by a pathogen with high potential to cause epidemic (infectiousness of the agent, high case fatality, multiple transmission routes or healthy carrier). • Indication of treatment failure (new or emerging antibiotic resistance, vaccine failure, antidote resistance or failure). • Event represents a significant public health risk even if no or very few human cases have yet been identified. • Cases reported among health staff. • The population at risk is especially vulnerable (refugees, low level of immunization, children, elderly, low immunity, undernourished, etc.). • Concomitant factors that may hinder or delay the public health response (natural catastrophes, armed conflicts, unfavourable weather conditions, multiple foci in the State Party). • Event in an area with high population density. • Spread of toxic, infectious or otherwise hazardous materials that may be occurring naturally or otherwise that has contaminated or has the potential to contaminate a population and/or a large geographical area. <p>The Following are Examples of When Assistance May be Required:</p> <ul style="list-style-type: none"> • Inadequate human, financial, material or technical resources – in particular: • Insufficient laboratory or epidemiological capacity to investigate the event (equipment, personnel, financial resources) • Insufficient antidotes, drugs and/or vaccine and/or protective equipment, decontamination equipment, or supportive equipment to cover estimated needs • Existing surveillance system is inadequate to detect new cases in a timely manner.
IS THE PUBLIC HEALTH IMPACT OF THE EVENT SERIOUS? Answer "yes" if you have answered "yes" to questions 1, 2 or 3 above.	

Is the event unusual or unexpected?	II. Is the event unusual or unexpected?
	<p>4. <i>Is the event unusual?</i> The Following are Examples of Unusual Events:</p> <ul style="list-style-type: none"> • The event is caused by an unknown agent or the source, vehicle, route of transmission is unusual or unknown. • Evolution of cases more severe than expected (including morbidity or case-fatality) or with unusual symptoms. • Occurrence of the event itself unusual for the area, season or population.
	<p>5. <i>Is the event unexpected from a public health perspective?</i> The Following are Examples of Unexpected Events:</p> <ul style="list-style-type: none"> • Event caused by a disease/agent that had already been eliminated or eradicated from the State Party or not previously reported.
<p>IS THE EVENT UNUSUAL OR UNEXPECTED? Answer "yes" if you have answered "yes" to questions 4 or 5 above.</p>	

Is there a significant risk of international spread?	III. Is there a significant risk of international spread?
	6. <i>Is there evidence of an epidemiological link to similar events in other States?</i>
	<p>7. <i>Is there any factor that should alert us to the potential for cross border movement of the agent, vehicle or host?</i></p> <p>The Following are Examples of Circumstances that May Predispose to International Spread:</p> <ul style="list-style-type: none"> • Where there is evidence of local spread, an index case (or other linked cases) with a history within the previous month of: • international travel (or time equivalent to the incubation period if the pathogen is known) • participation in an international gathering (pilgrimage, sports event, conference, etc.) • close contact with an international traveller or a highly mobile population. • Event caused by an environmental contamination that has the potential to spread across international borders. • Event in an area of intense international traffic with limited capacity for sanitary control or environmental detection or decontamination.
<p>IS THERE A SIGNIFICANT RISK OF INTERNATIONAL SPREAD? Answer "yes" if you have answered "yes" to questions 6 or 7 above.</p>	

Risk of international restrictions	IV. Is there a significant risk of international travel or trade restrictions?
	8. Have similar events in the past resulted in international restriction on trade and/ travel?
	9. Is the source suspected or known to be a food product, water or any other goods might be contaminated that has been exported/imported to/from other States?
	10. Has the event occurred in association with an international gathering or in an area intense international tourism?
	11. Has the event caused requests for more information by foreign officials or international media?
<p>IS THERE A SIGNIFICANT RISK OF INTERNATIONAL TRADE OR TRAVEL RESTRICTIONS? Answer "yes" if you have answered "yes" to questions 8, 9, 10 or 11 above.</p>	

Notification to WHO under Article 6 of the International Health Regulations

States Parties that answer "yes" to the question whether the event meets any two of the four criteria (I-IV) above, shall notify WHO under Article 6 of the International Health Regulations

Event Risk Assessment

Definition

Risk assessment is a recurring process that continues from the time the event is first detected by MOHCW, to the time the event is "closed".

IHR Core requirements

- Nominate a district level authority responsible of risk assessment
- Set up a risk assessment committee composed of
 - a medical clinician
 - a public health microbiologist/laboratory scientist
 - an environmental health officer
- Ensure that the committee is reachable 24 hours every day by all means of communications
- Initiate assessment within 24 hours after the verification of the event, the short brief by the rapid response team and then the investigation report
- Notify immediately concerned authorities once a signal is considered as a PHEIC

Tools for Risk Assessment

The main tool for risk assessment is the Decision Instrument. The following list of risk questions does not intend to be exhaustive but rather enable rapid event assessment. These questions supplement Annex IV). In addition, once the aetiology of the event is known, further refinement of the risk assessment may be required.

- Does the event fulfil the minimum criteria for notification in accordance with the decision instrument?
- Has sufficient information been provided to adequately assess the event? What additional information is required to predict disease/hazard spread and event impact?
- Is there evidence that international spread of the hazard and/or disease has already occurred?
- Do other States need to know about this event in order to prevent or prepare for similar occurrences?
- What is the reported incidence, prevalence, morbidity and mortality, if available?
- In what context is this event occurring (vulnerability assessment - population at risk, technical [e.g. diagnostic capacity], response and support infrastructure, socio-political, ecological/environmental, etc.)?
- Do WHO guidelines indicate the need for international contact tracing or food/product recall? Has there been a request for WHO's assistance in international contact tracing?
- Have similar events in the past resulted in the international spread of disease?
- Are evidence-based prevention and control measures available, and can they be implemented in the affected State without assistance?
- Does the event pose a threat to the routine safety and sanitary environments for travellers, or constitute a public health emergency at designated ports of entry?
- What is the public perception of risk, level of community reaction and level of media interest?
- What will happen if WHO does nothing?
- Should WHO make recommendations for the international control of this event? (consequence - Senior Management will be notified and briefed, options will be presented)
- What might be the unintended consequences of WHO involvement (legal, political, economic etc.)?
- Is the response to the event by other State Parties commensurate to the risk?

Outcome of Risk Assessment

Although the risk assessment is on-going and iterative, at any point in time an event can be at one the following risk levels, with the noted consequent actions:

Discard

No international risk and no international risk expected close the event, document the assessment in EMS

Monitor

The event is currently of no international public health importance but requires continuous assessment;

Disseminate

Transmit event information to the international community to prepare or prevent similar events:

Escalate

To senior management as Event Management Group (EMG) and/or other WHO units cannot reconcile their differences in the technical assessment of an event or for information dissemination;

Recommend: to senior management to invoke PHEIC procedure.

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