

TVD team



Rabies...preventable human death

Rationale

Rabies occurs mostly in marginalised, vulnerable, and poor populations in Africa. Having 100% fatality within a short period requires urgent medical attention for a person bitten by the suspect or confirmed rabid animals. Post-exposure prophylaxis (PEP) is expensive, and most families cannot afford it, causing a catastrophic financial burden on the affected families. Most African Health systems can be prepared to save lives from rabies-related deaths and prevent them in collaboration with other local stakeholders. Strong and reliable data are lacking to endorse rabies control and elimination programs in Africa.

Key messages

- An estimated 59,000 people die yearly due to dog-mediated rabies, with a corresponding loss of 3.7 million DALYs.
- Estimated 36.4% of all deaths took place in Africa, however, and this could be an underestimation.
- Estimated 21,476 human deaths per year in Africa are attributed to dog-mediated rabies.
- Dogs cause 99% of all human cases of rabies as the primary cause of human rabies deaths.
- 70% of sustained vaccination coverage of dog populations requires stopping the disease transmission between dogs and humans. 1.34 million DALYs are lost annually.
- The PEP cost is estimated to be 5.80% of the average African's gross national income (GNP) or 51 days of wages, which most Africans cannot afford.

1. What is rabies

Rabies, a viral zoonotic disease caused by the rabies virus (lyssaviruses), begins progressive and fatal brain and spinal cord inflammation.

- Rabies can affect domestic and wild animals, but 99 % of all cases come from domestic dogs.
- The rabies virus transmits from infected animal saliva to bites, scratches, or mucosa (e.g., eyes, mouth, or open wounds) as direct contact.
- Fever, pain, and unusual or unexplained tingling, pricking, or burning sensations at the wound site are the early symptoms.
- As the virus spreads to the central nervous system (CNS), it inflames the brain and spinal cord, presenting neurological symptoms.
- Clinical rabies in humans is manageable but rarely cured, and only with severe neurological deficits.

- Current diagnosis tools cannot detect before the onset of rabies-specific signs: hydrophobia or aerophobia or history of contact with a suspected or confirmed rabid animal.
- Rabies in humans can only be confirmed intravital and post-mortem by detecting whole viruses, viral antigens, or nucleic acids from infected tissues such as the brain, skin, or saliva.

Clinically, rabies has two forms: furious rabies and paralytic rabies.

Furious Rabies:

- Symptoms: hyperactivity, excitable behaviour, hallucinations, lack of coordination, hydrophobia (an irrational fear of water), and aerophobia (an irrational fear of drafts or fresh air).
- Outcome: Tragically, death swiftly ensues, usually within a few days, due to cardio-respiratory arrest.

Paralytic Rabies:

- Incidence: accounting for approximately 20% of all human cases, this variant presents a less overt and typically lengthier clinical course than the furious form.
- Clinical Progression: It initiates with a gradual paralysis of muscles, originating from the site of the wound. Subsequently, a coma gradually takes hold, leading to fatality.

Managing rabies bites

Wound care

- Wash and flush wounds and scratches with soap and plenty of water. If an iodine solution is available, it can be applied.



Vaccination history

- History of tetanus toxoid vaccine is useful, especially for deep wounds caused by bites. If it has not been given previously, it should be administered.



Antibiotics

- Antibiotics can be prescribed for infection control if the wounds are at high risk of bacterial infection.



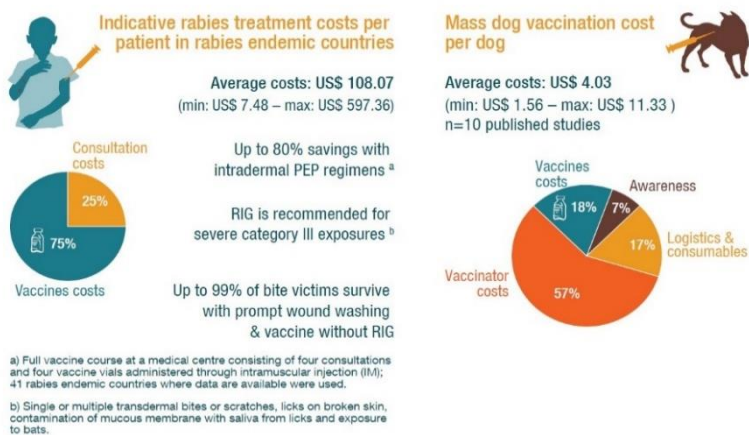
PEP

- Based on exposure categories, PEP with vaccines and rabies immunoglobulin should be given as soon as possible. Millions of people have received vaccinations for both pre-and post-exposure prophylaxis.

2. Public health impact, prevention and management

Prevention is the most effective solution

- Prevention of rabies is better than saving lives after the rabies occurrence in humans or being bitten by rabies-suspected animals. It has been a neglected tropical disease for many years, dating back to scientists' discovery of rabies. The disease should be eliminated over decades and not present as a public threat.
- In Africa, a significant effort is to raise awareness and allocate resources to reduce unwanted human deaths associated with rabies. Being a zoonotic disease in nature (transmitted from animals to humans), strong collaboration between human and animal health sectors is required to address both sectors as part of the One Health approach. A public awareness and education programme can inform the locals on how to prevent rabies and what to do after being bitten.
- Climate change-related wildlife movement may have an impact on certain rabies-infected species. Thus, rabies control in wildlife is required to prevent human transmission.



Vaccination is an effective method of reducing the rabies disease burden. Domestic animal vaccination campaigns can be integrated into local public programmes, particularly for dogs. Providing public services enabling local communities to access vaccines, pre-exposure, and post-exposure prophylaxis easily will save lives. Dog vaccination is key to stopping rabies transmission between dogs and from dogs to humans.

Figure 1: Cost of rabies post-exposure prophylaxis and dog vaccination (Source: WHO, zero by 30)



Treating people with rabies signs and symptoms is resource intensive, burdening the health-care delivery system, particularly in low-resource medical facilities where most residents rely on public health-care services. This puts a double burden on the healthcare system.

It has also imposed a heavy economic burden, estimated at USD 8.6 billion annually.

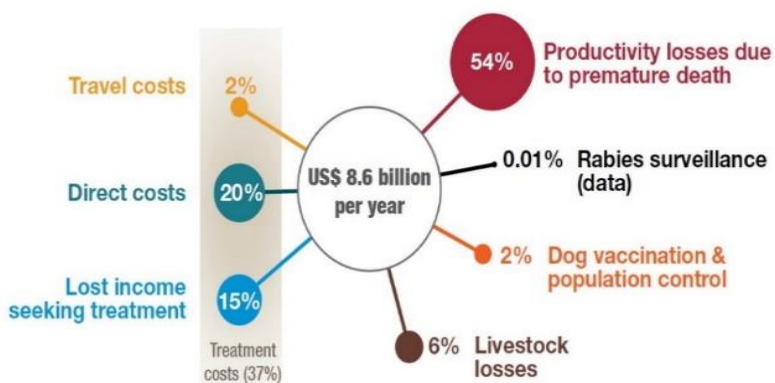


Figure 2: Rabies imposes a heavy economic burden (Source: WHO, zero by 30)

Integrated Bite Case Management (IBCM)

IBCM is an advanced surveillance method that connects veterinary professionals, human health professionals and communities, consist of the following:

- Investigations of bite cases and suspect rabid animals
- Safe animal capture and animal assessment
- Animal observation for 10 days
 - Healthy: quarantine
 - Signs of disease: euthanize and test for rabies
- Sharing of information across sectors for appropriate risk assessments to inform PEP decisions and joint reporting.

Rabies geographical regions

- Geographically, most rabies cases occur in Africa and Asia, where most countries government health budgets are underfunded, resulting in high out-of-pocket (OOP) health spending.
- Global rabies response must prioritise areas where inequality persists.
- Many geographical areas have no organised control or surveillance system, resulting in a poor information system.
- Underreporting, misdiagnosis, and a lack of local coordination among key actors are common issues that have led to underestimating disease burden. Without a country-level disease burden estimate, resources cannot be allocated efficiently.

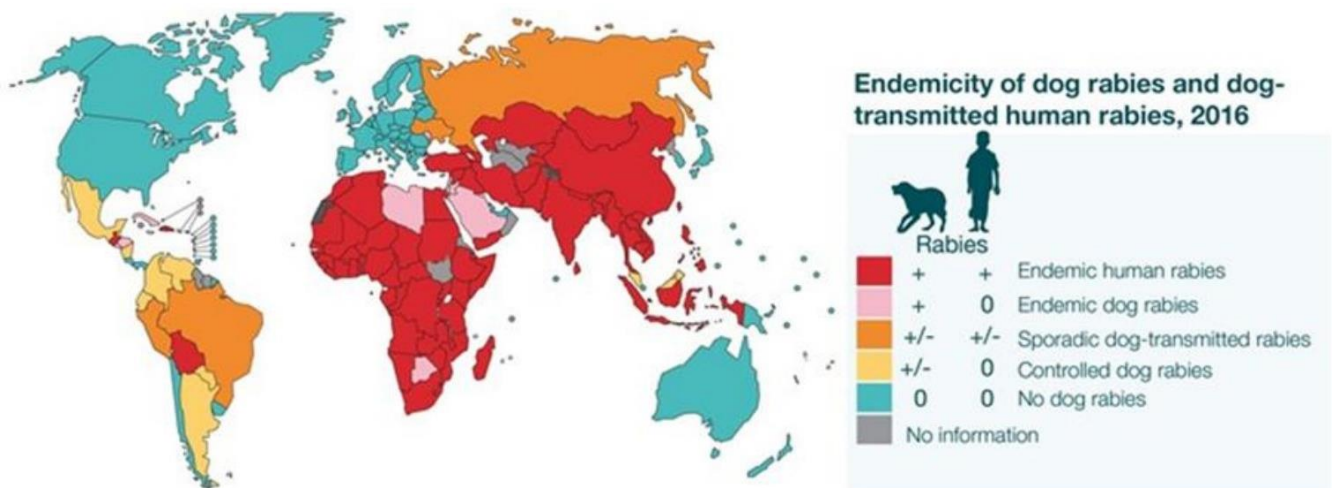
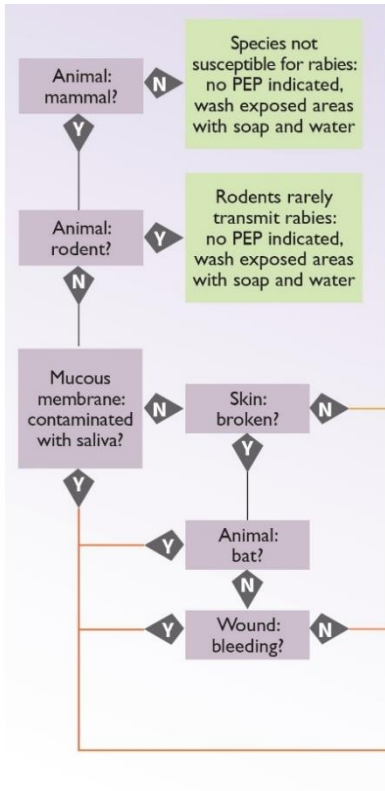


Figure 3: Endemicity of dog and human rabies, 2016 (Source: WHO, zero by 30)

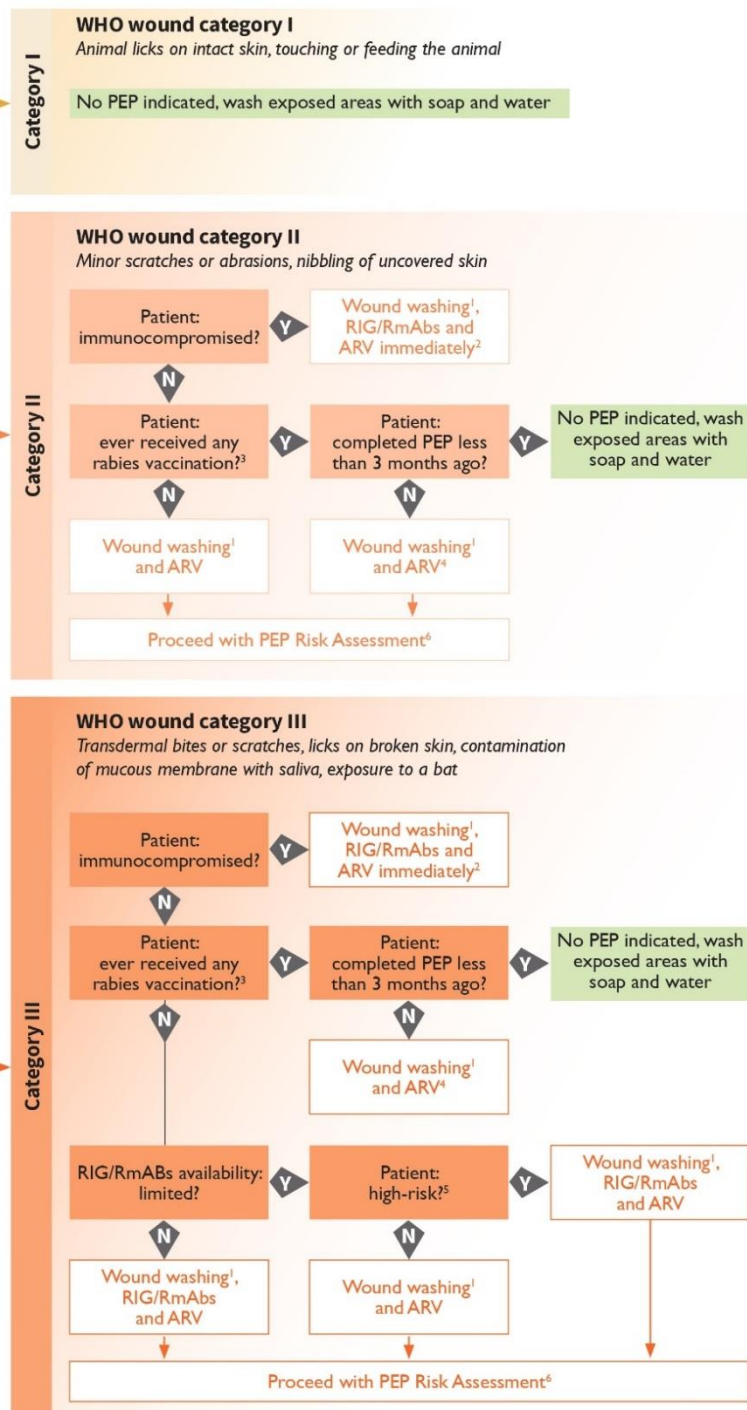
3. WHO response

- The WHO's 2021-2023 Roadmap for Global Control of Neglected Tropical Diseases defined rabies elimination targets, emphasising the importance of cross-sectoral coordination at the national, regional, and global levels.
- The Quadripartite Regional Coordination Group composed of Regional Representatives/Directors of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), the World Health Organization (WHO), and the World Organisation for Animal Health (WOAH-founded as OIE), together with the Pan-African Rabies Control Network (PARACON) of the Global Alliance for Rabies Control (GARC), collectively made a joint appeal to the regional and national leaderships, institutions, donors, development financiers, philanthropic organizations and individuals to unite resources and synergize efforts in order to expedite the realization of the global target to eliminate human deaths from dog-mediated rabies by 2030, in the African continent.
- The rabies subject is part of the capacity-building activities for one health workforce contributing to zoonosis disease control and response.
- Technical guidance is provided to countries in developing and implementing national rabies elimination plans. The priority areas are disease surveillance, data reporting and monitoring, and strengthening the overall data system.
- Vaccine investment strategy 2021-2025 developed in collaboration with Gavi, the vaccine Alliance, WHO supported the expansion of rabies PEP in Gavi-eligible countries.

Wound risk assessment is mandatory to determine rabies management steps



ARV = Anti Rabies Vaccine
 PEP = Post-Exposure Prophylaxis
 RIG = Rabies Immunoglobulin
 RmAbs = Rabies Monoclonal Antibodies
 Y = Yes, N = No



- 1 Wash the wound thoroughly with copious amounts of water and soap for 15 min and apply an antiseptic. This is a life-saving practice especially for immunocompromised patients.
- 2 When feasible, the RABV neutralizing antibody response should be determined 2–4 weeks after vaccination to assess whether an additional dose of vaccine is required.
- 3 This includes Pre-Exposure Prophylaxis (PrEP), previous PEP, or patients beyond the 7th day of PEP.
- 4 If PrEP or previous PEP was received: shorten the current vaccination schedule accordingly.
- 5 Patient with multiple bites, deep wounds, bites to highly innervated parts of the body (such as head, neck, face, genitals and hands), severe immunodeficiency, bites from an animal with probable (clinically) or confirmed (laboratory) rabies, exposure to a bat (bite, scratch or exposure of mucous membrane).
- 6 If your program does not have adequate surveillance to assess the offending animal (as recommended in the PEP Risk Assessment Decision Tree), PEP should be initiated immediately.

Figure 4: Decision tree to assess the rabies risk

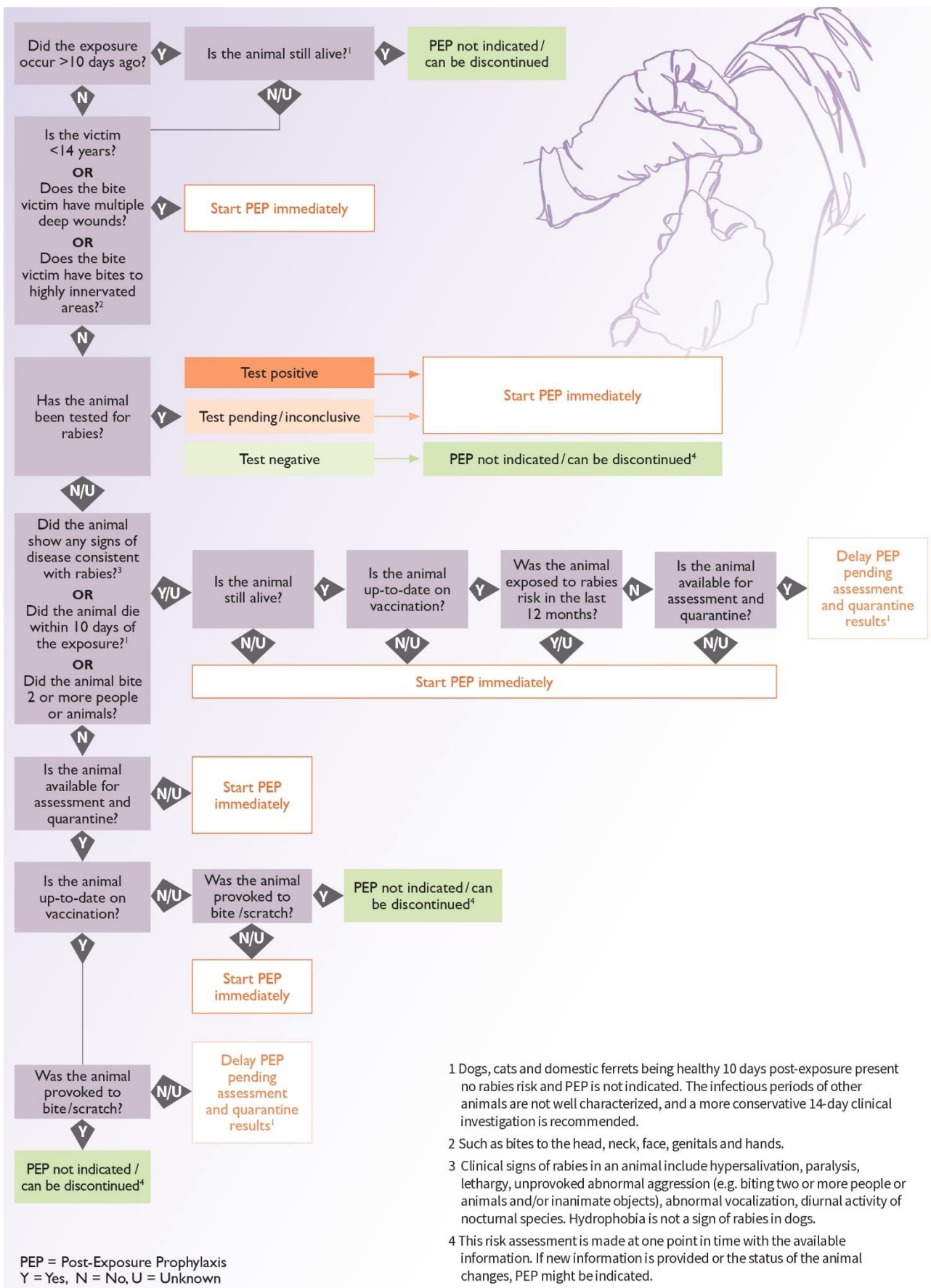


Figure 5: PEP risk assessment

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Sources

The Integrated African Health Observatory supported the production of the infographic.

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