

Fact Sheet: Rabies

RABIES IS...

99.9% fatal.

Rabies is a disease caused by a Lyssavirus (named after Lyssa, the Greek goddess of rage and madness). It affects the central nervous system and is transmitted through the saliva and nervous tissue of an infected animal. As the disease progresses, symptoms can include delirium, aggression and hallucinations, as well as hydrophobia (fear of water) and foaming at the mouth (related to the paralysis of muscles involved in swallowing)¹. Rabies causes immense suffering for the patient, enormous distress for relatives and is 99.9% fatal—one of the highest case fatality rates of any known disease. Children are very vulnerable to dying of rabies because of their frequent interactions with dogs and their small size.

Although the rabies virus is distributed globally, with only Antarctica and a few island territories considered rabies virus free, canine rabies is well controlled or even eliminated in many countries.

Transmitted overwhelmingly by dogs.

More than 99% of human rabies cases are caused by dog bites². While other mammals such as bats, foxes and raccoons can transmit rabies to humans, the overwhelming majority of cases are caused by dogs. Many animals die after suffering the horrific symptoms of rabies but dogs suffer a secondary problem: fear of rabies transmission from dogs regularly prompts mass dog culling in many countries. This creates a territorial vacuum and encourages potentially rabid dogs to move into the area. Experts agree that indiscriminate dog culling does not stop rabies².

A neglected tropical disease.

Rabies is one of 17 major neglected tropical diseases, its control more difficult because it is a neglected zoonotic (transmitted from animals to humans) disease, and is endemic in most of the world³, but canine-mediated rabies has been effectively controlled in most parts of the Americas and Europe, thanks to effective policies, prioritisation, strong health care infrastructure and funding. Because canine rabies is no longer a threat to many countries, it does not receive the attention and funding it needs to be wiped out in countries where it is still endemic. Today, it continues to kill an estimated 59,000 people a year, many of whom are children living in Asia and Africa, where 95% of deaths occur⁴.

A disease of poverty.

Despite being 100% preventable, rabies continues to cause immense human and

animal suffering, claiming tens of thousands of human lives and countless animal lives every year and has significant economic impacts⁴. Overwhelmingly it afflicts the world's poorest, most vulnerable, people. Rabies is a disease of poverty because it continues to be a daily threat for millions of people, predominantly in poor communities that do not have access to vaccinations, post-exposure treatment or live in areas with weak human and animal health infrastructures⁵. While there is preventive life-saving treatment following exposure to the virus, it must be administered in several courses over a period of time, before symptoms appear. Many families potentially exposed to rabies do not have access to treatment, or cannot afford the direct and indirect costs, such as travel to and from clinics and hospitals or time away from their work, to receive the full course.

Preventable after exposure, but before symptoms appear.

Post-exposure prophylaxis (PEP) is a course of injections that protects humans against rabies after exposure to the virus. It consists of a series of rabies vaccinations and, where available, immunoglobulin (antibodies against the rabies virus) injections into the wound. The number of vaccine doses and the days on which they are given may follow a different regimen, but one dose on days 0, 3, 7, 14 and 28 is the most common². Every year, it is estimated that more than 29 million people receive post-bite treatment to prevent rabies at a direct cost of over \$1.7bn⁴. While PEP is an effective way to prevent rabies in humans after exposure, it is expensive compared to preventive dog vaccination, and has no impact on the source of the problem.

Still a threat.

While canine, or dog, rabies has been eliminated in countries like the US and the UK, it continues to take the lives of people around the world. Annual economic losses because of the disease are around 8.6 billion US dollars, mostly due to premature deaths, but also because of the cost of human post-exposure vaccines, lost income for victims of animal bites, livestock losses, and other costs⁴. There are a number of reasons why rabies remains a threat, including:

- Lack of awareness – Communities often do not have essential information about wound care or treatment. In rural areas of some countries in Asia and Africa, some continue to seek the help of traditional healers to prevent or cure rabies.
- Lack of coordination – As a zoonotic disease, rabies prevention often falls under the remit of various human and animal health agencies. It is essential that these agencies are joined-up in their approach to the problem and that the economic burden is shared to achieve a common goal: elimination of rabies among dogs and humans.
- Lack of data – Accurate surveillance (or monitoring) of rabies is critical to provide a clear picture of the rabies burden so that an effective response,

including funding and policies, can be planned and implemented. This includes diagnostic capabilities, a legal requirement to report rabies cases to the authorities, and continued monitoring once rabies has been controlled to prevent future deaths.

- Lack of capacity – This includes knowledge, the sufficient availability of quality vaccines and immunoglobulin (at a price people can afford), and diagnostic facilities. These often fall short of what is needed in rabies-endemic areas, leading to poor responses in vulnerable communities and continued deaths.
- Lack of funding – Even when country leaders recognise the critical need to eliminate rabies, a lack of funding can prevent an effective response. These countries would benefit from support from nations like the US and UK to provide critical resources to help end deaths due to canine rabies for good.

BUT RABIES IS ALSO...

100% preventable.

Effective tools and methods exist to stop the spread of canine rabies to humans. The most practical and cost-effective way to end canine rabies is mass dog vaccination, which saves the lives of both dogs and humans². Sustained vaccination of at least 70% of dogs in a rabies-endemic area creates herd immunity and eliminates canine-transmitted rabies. For individuals bitten by a rabid dog, effective treatment, known as post-exposure prophylaxis (PEP)—a series of injections and sometimes immunoglobulin—can help save lives if received within a brief period of time after exposure, and before symptoms appear.

The End Rabies Now campaign aims to significantly raise the profile of rabies as a global neglected tropical disease. The campaign's mission is to galvanise global support and funding for ending human deaths from canine-mediated rabies by 2030. Find out more at www.endrabiesnow.org.

Key References

1. Jackson AC. Human Disease. In: Jackson AC, ed. *Rabies: Scientific Basis of the disease and its management*. Third ed: Academic Press; 2013:269-298.
2. WHO. *WHO Expert Consultation on Rabies, Second report*. Geneva: World Health Organization;2013.
3. WHO. *The Control of Neglected Zoonotic Diseases: from advocacy to action. Report of the fourth international meeting held at WHO headquarters, Geneva, Switzerland, 19-20 November 2014*. Geneva: World Health Organization;2015.
4. Hampson K, Coudeville L, Lembo T, et al. Estimating the global burden of endemic canine rabies. *PLoS Negl Trop Dis*. Apr 2015;9(4):e0003709.
5. WHO. *Rabies: Rationale for investing in the global elimination of dog-mediated human rabies*. World Health Organization;2015.