

## Jackal rabies in Zimbabwe

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In Zimbabwe, two species of jackal are responsible for the transmission of rabies: the side-striped jackal (*Canis adustus*) and the black-backed jackal (*C. mesomelas*). Since 1950, when the present outbreak of rabies was first diagnosed in Zimbabwe, jackals have accounted for 22 % of confirmed cases of rabies.

In Zimbabwe, the side-striped jackal predominates in roughly the northern half of the country, which is of higher altitude and more moist, while the black-backed predominates in the drier southern half of the country. Commercial farmland appears to be exceptionally well suited ecologically for jackals and their populations are often dense in these areas. Jackals breed during the winter and whelp towards the end of September. Mating and whelping seasons in the black-backed jackal are of very short duration, usually lasting 2–3 weeks. The young remain in their dens until about November and dispersion takes place during March/April (Skinner & Smithers 1990). Few estimates of jackal population densities have been made. One which was done in a population of black-backed jackals five months before the start of a devastating rabies epidemic estimated a density of one jackal/km<sup>2</sup> (Bingham, unpublished).

The commercial ranching and crop farming areas yield the great majority of jackal rabies cases. Conversely, the areas of peasant agriculture support few cases of jackal rabies, probably due to lower jackal numbers caused by ecological competition with domestic dogs. Areas designated for National Parks or wildlife preservation often have prominent jackal populations, but for reasons that are not well understood, rabies has never become established in them.

Most cases of jackal rabies have occurred during intense epidemics. The front of a large epidemic in the Mashonaland area during 1979 to 1982 moved up to 20 km/month, and achieved a peak intensity four months after it began. In this epidemic rabies was present for 12 months before dying out (Foggin 1988).

The origin of jackal rabies epidemics is uncertain. An epidemic in 1991 to 1992 in the Marondera area was probably initiated by rabid dogs in an adjacent communal area. However, there were no reports of adjacent areas being affected by rabies in an outbreak in the south-east of Zimbabwe in 1991, and the first case of the epizootic of 1979 to 1982 was diagnosed in a jackal which was 70 km from the nearest other reported case of rabies at the time.

Jackal rabies appears to occur in localized areas in cycles of 4–8 years. In general, jackal rabies peaks during the winter months and troughs in the summer, a cycle which is probably related to territory establishment and associated increased contact rates in the winter, and care of the young in summer.

Clinically, jackal rabies is often passive. Rabid jackals will enter homesteads and approach humans, often during daylight. In these circumstances they are often killed by dogs. The incubation period in nine captive jackals inoculated intramuscularly with varying doses of rabies virus varied from 10–31 days with a mean of 16 days (Foggin 1988; Bingham, unpublished).

In surveys of jackal populations, a small proportion have had serum neutralizing antibodies and rabies virus in brain samples, although such cases are only found in sampling during epidemics. Jackals are potentially efficient vectors of rabies, being able to secrete large amounts of virus in the saliva. Salivary glands may contain over 10<sup>10</sup> median mouse intracerebral lethal doses (MICLD<sub>50</sub>) of virus/g of tissue. Jackals appear to be moderately sensitive to rabies virus, with 50 MICLD<sub>50</sub> inoculated intramuscularly being sufficient to cause infection (Foggin 1988).

The main victims of jackal rabies are cattle, as there is a significant association between cattle and jackal cases. In addition, the incidence of rabies in other wildlife species, for example honey badgers, civets,

mongooses and antelope species, increases during jackal epidemics. Jackals also infect dogs, and may initiate outbreaks in dogs, as occurred in the final stages of the large epidemic in 1982 when the front of the epidemic reached an area with a large dog population. Humans are not a prominent victim species: of 159 humans who have died of rabies in Zimbabwe since 1950, only two contracted the disease from jackals. However, 40 % of rabid jackals submitted for rabies testing between 1987 and 1991

were reported as having human contacts, 26% being bite contacts.

## REFERENCES

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