



RABIES: 'ONE HEALTH'

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'Right to Care'

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South Africa

- Highest fatality rate of all infectious diseases
Preventable: pre/post -exposure prophylaxis (PEP)

DOG VACCINATION

★ **WHO NTD - 2030: elimination of human rabies from**

Major effect of COVID-19 on vaccination campaigns, PEP



Fatal encephalitis



World Rabies Day Sept 2011 Northern Cape South Africa

Source: Dr Kegakilwe, Veterinary Services

RABIES IS UNDER- RECOGNISED/UNDERDIAGNOSED ESPECIALLY IN CHILDREN

- RSA: 2017- 2022
- Majority of cases in children less than 15 years exposed to rabid dogs

Rabies Encephalitis in Malaria-Endemic Area, Malawi, Africa

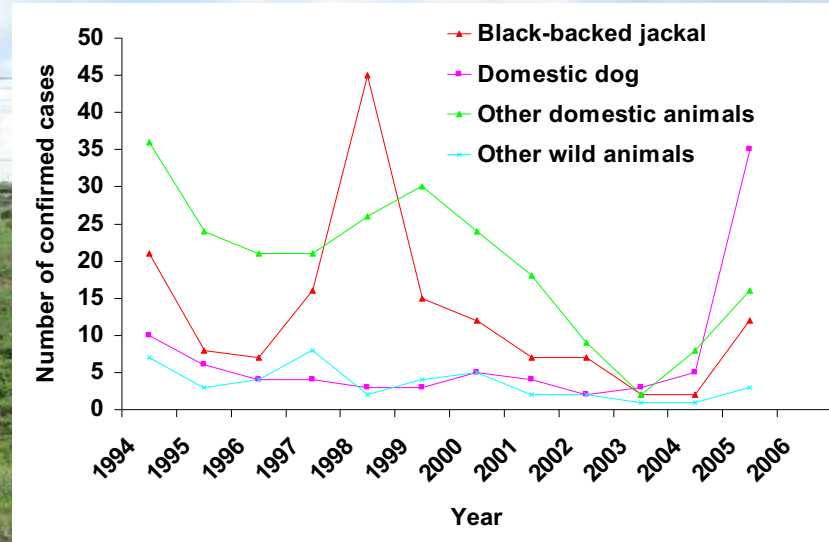
Macpherson Mallewa,*† Anthony R. Fooks,‡
Daniel Banda,† Patrick Chikungwa,§
Limangeni Mankhambo,† Elizabeth Molyneux,†
Malcolm E. Molyneux,† and Tom Solomon*

In a malaria-endemic area of Africa, rabies was an important cause of fatal central nervous system infection, responsible for 14 (10.5%) of 133 cases. Four patients had unusual clinical manifestations, and rabies was only diagnosed postmortem. Three (11.5%) of 26 fatal cases originally attributed to cerebral malaria were due to rabies.

EID 2007

LIMPOPO, SOUTH AFRICA

Initial physician diagnosis: typhoid, cerebral malaria, polio, meningitis , viral encephalitis



Numbers of laboratory-confirmed animal rabies cases Limpopo Province, South Africa 1994-2005



Incubation period: 7days -5years, average 12-15wks

Prodrome: fever, headache, hyperaesthesia at bite site

Paralytic or furious rabies



Plate 31: This child appeared to be thirsty but pushed the glass away when water was offered. Such behaviour is referred to as hydrophobia



Plate 32: A child with rabies showing marked anxiety



Plate 33: Death is inevitable when rabies clinical signs become apparent and consoling the family members must be given priority

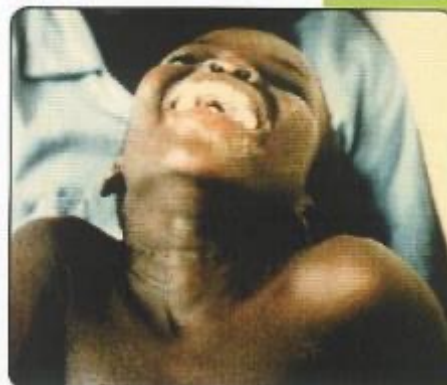
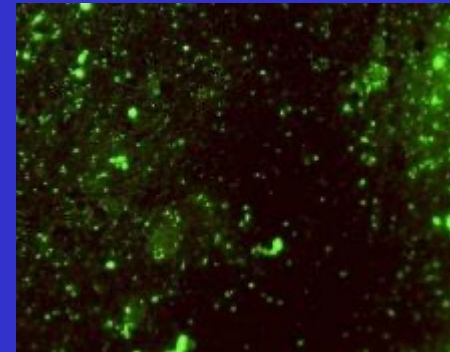


Plate 34: Generalised seizures are seen in preterminal rabies. Seizures may be elicited by sensory stimuli such as air movement, sound and attempts to drink

Case management

- Consider differential diagnosis
- Investigate and treat any treatable meningitis/encephalitis
- **Confirm the diagnosis:** history of animal exposure, laboratory tests (ante mortem- saliva, nuchal biopsy, CSF serology?? post - mortem brain tissue: histopath may miss Negri bodies, IFA best
- **Palliative care, sedation**
- **Family support**
- **Protection of health care workers:** vaccine course to those exposed to infected saliva
- **Notification of case to health authorities**



Survival after Treatment of Rabies with Induction of Coma

Rodney E. Willoughby, Jr., M.D., Kelly S. Tieves, D.O.,
George M. Hoffman, M.D., Nancy S. Ghanayem, M.D.,
Catherine M. Amlie-Lefond, M.D., Michael J. Schwabe, M.D.,
Michael J. Chusid, M.D., and Charles E. Rupprecht, V.M.D., Ph.D.

N Engl J Med 2005;352:2508-14.

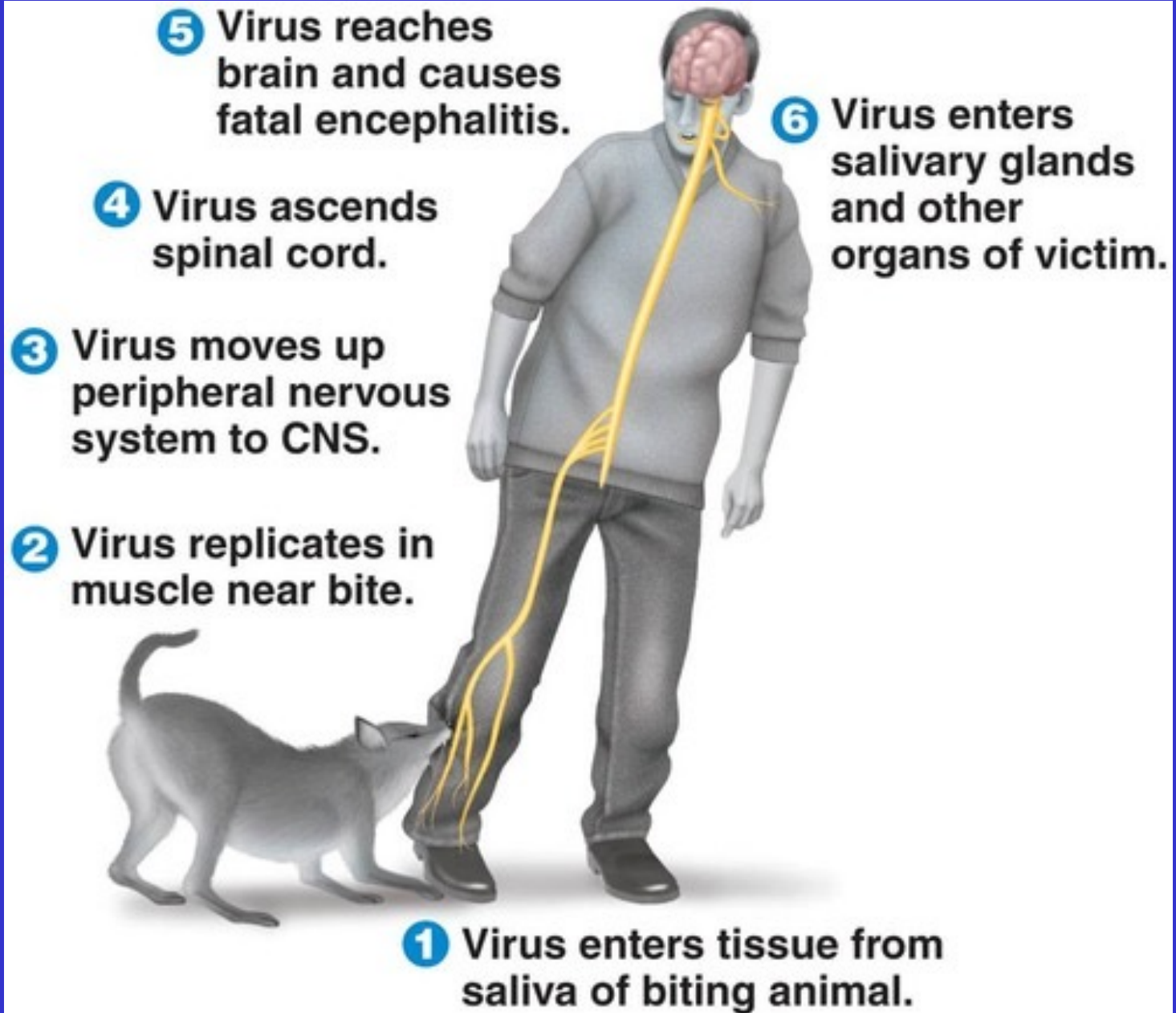
Fatal encephalitis



Rabies transmission to humans

- Virus cannot be transmitted through intact skin
- Virus in saliva of animals, transmitted through scratch/bite/lick of mucous membranes







Safe in babies, children,
pregnant women
IMI dose= 1 amp
Deltoid or anterolateral thigh

Cell-culture and embryonated egg-
based rabies vaccines (CCEEV's)
WHO pre-qualified–potency > 2.5 IU
Intradermal or intra muscular (deltoid)

Safe and effective and well-tolerated
BUT

Cost

Complex regimens

Cold chain

Accessibility

Induce immunity after 7-10 days

WHO-approved post-exposure rabies vaccination regimens

Regimen	Summary	Day (number of sites)						
		0	3	7	14	21	28	90
ID	2-sites ID on days 0, 3 and 7	✓ (2)	✓ (2)	✓ (2)				
IM	1-site IM on days 0, 3, 7 and between day 14-28	✓ (1)	✓ (1)	✓ (1)	✓ (1)			
IM	2-sites IM on days 0 and 1-site IM on days 7, 21	✓ (2)		✓ (1)		✓ (1)		

WER 2018
Lancet ID 2019

Rabies immunoglobulin for category 3 exposures-
max doses -HRIG 20IU/kg or equine RIG 40IU/KG- as
much as possible infiltrated into all wounds ASAP



Technique

Small/ v large/multiple wounds

NB Missed bites- animal incisors

HIGH RISK: Wounds on fingers,
head/face

Mucosal exposures ?

What if no RIG available

Delays in presentation to health facility

Allergic reactions



Previous PEP:

Vaccine boosters: imi
deltoid day 0 and 3

DID YOU KNOW
IF YOU'RE BITTEN BY A DOG YOU SHOULD
WASH THE WOUND WITH SOAP &
RUNNING WATER FOR 15 MINUTES, THEN
SEEK MEDICAL ADVICE?



- **WOUND CLEANING- NB**
- **Tetanus toxoid, antibiotics if required**
- **RISK ASSESSMENT FOR RABIES**

Decision for PEP made on risk of rabies transmission:
DO NOT SEND BLOOD FOR VIRUS/ANTIBODIES
DO NOT WAIT FOR RESULT IN ANIMAL

Risk assessments

- Animal species
- Circumstances re exposure
- Health, behaviour of animal
- Rabies in the geographic area
- Vaccine status of animal
- Vaccine status of victim
- Category of exposure

Typically notmice, rats, Bunny Park, zoo



Child bitten by vervet monkeys at
Lake St Lucia. KNP picnic site



Rock hyrax on Table mountain

**But..... beware puppies-
minimal rabies signs; often
unvaccinated**

Animal potentially rabid



Drooling, unsteady gait, sick or dead animal

Unprovoked attack

‘tame’ – wild animal

Unusually aggressive domestic animal

PEP if animal potentially rabid and category 2 or 3

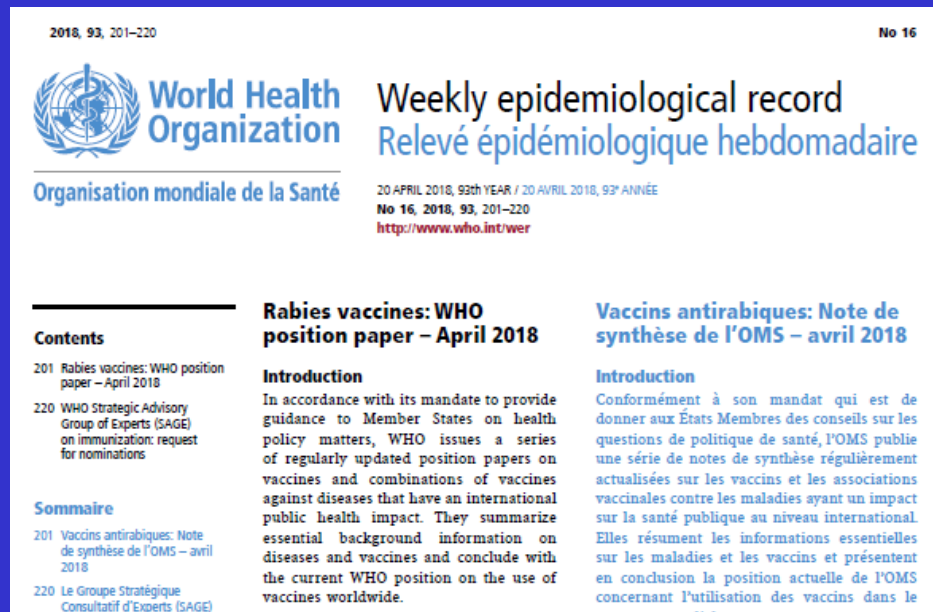
Category 1: petting, feeding , being in same room

- **Category 2:** Scratch (no bleeding), nibble of skin- **vaccine**
- **Category 3:** Lick of mucous membranes, lick of broken skin, bites or scratches that draw blood- **vaccine + immunoglobulin**



Rabies: Post-exposure prophylaxis (PEP): animal ill/died/behaviour + category 3 exposure

- **THOROUGH WOUND CLEANING-** lavage wound -syringe, 70% alcohol, iodine
- **DON'T** suture wounds if possible, no local anaesthetic
- **Rabies vaccine course**
- **Rabies immunoglobulin ASAP if category 3 exposure**



WHO 2018
National Guidelines

ALL CATEGORY 3 EXPOSURES



Jackal bite, Madikwe
Game Reserve. NWP

Mongoose bite,
Gauteng



Aardwolf bite,
N Cape

Yellow mongoose bite MPU
FAILED PEP



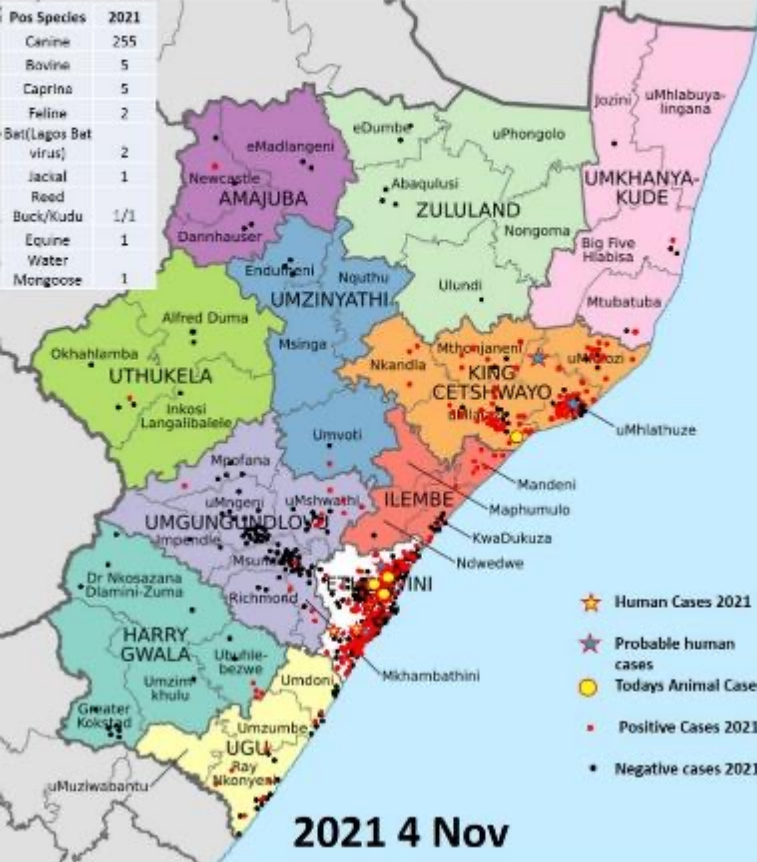


KwaZulu-Natal Rabies

1. Canine Gqandolosa Umfolozi municipality King Cetshwayo district
2. Canine KwaDabeka Ethekwini Metro
3. Canine Mchweni Ethekwini Metro
4. Canine KwaMuthi Uthmanzi Metro

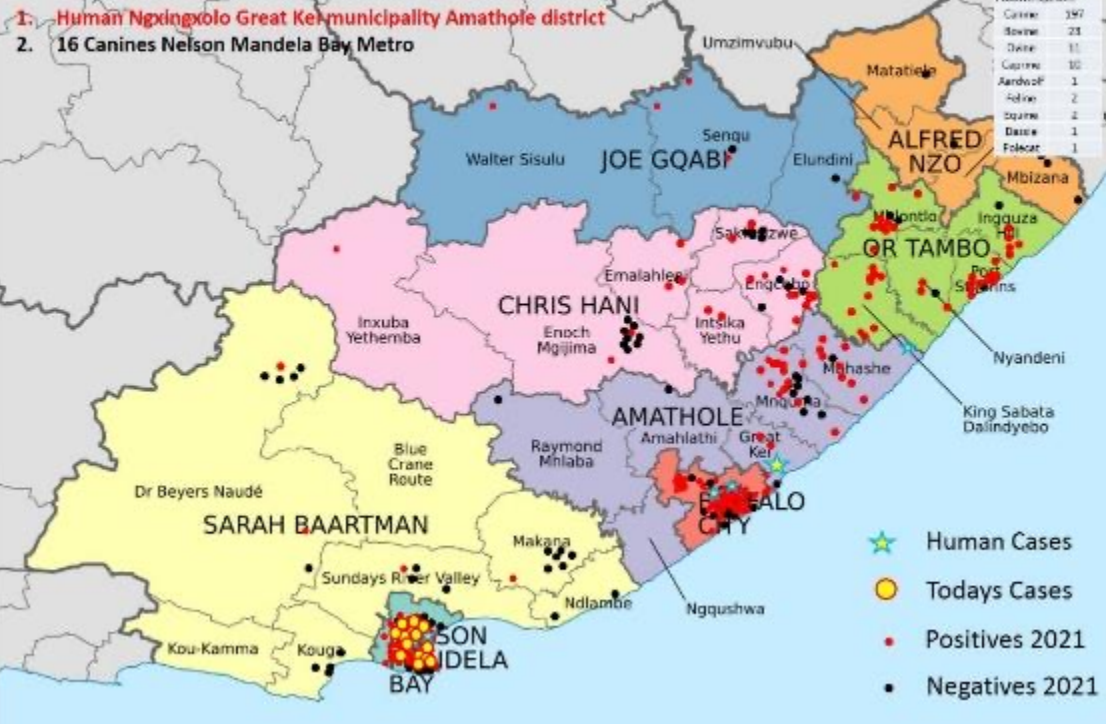
Animal Cases	Human Cases
282	3 (Confirmed) 3 (Probable)

Total Negative Animal samples -392



EASTERN CAPE RABIES 2-3 Nov 2021

Positive Animals	Negative Animals	Human
345	149	6



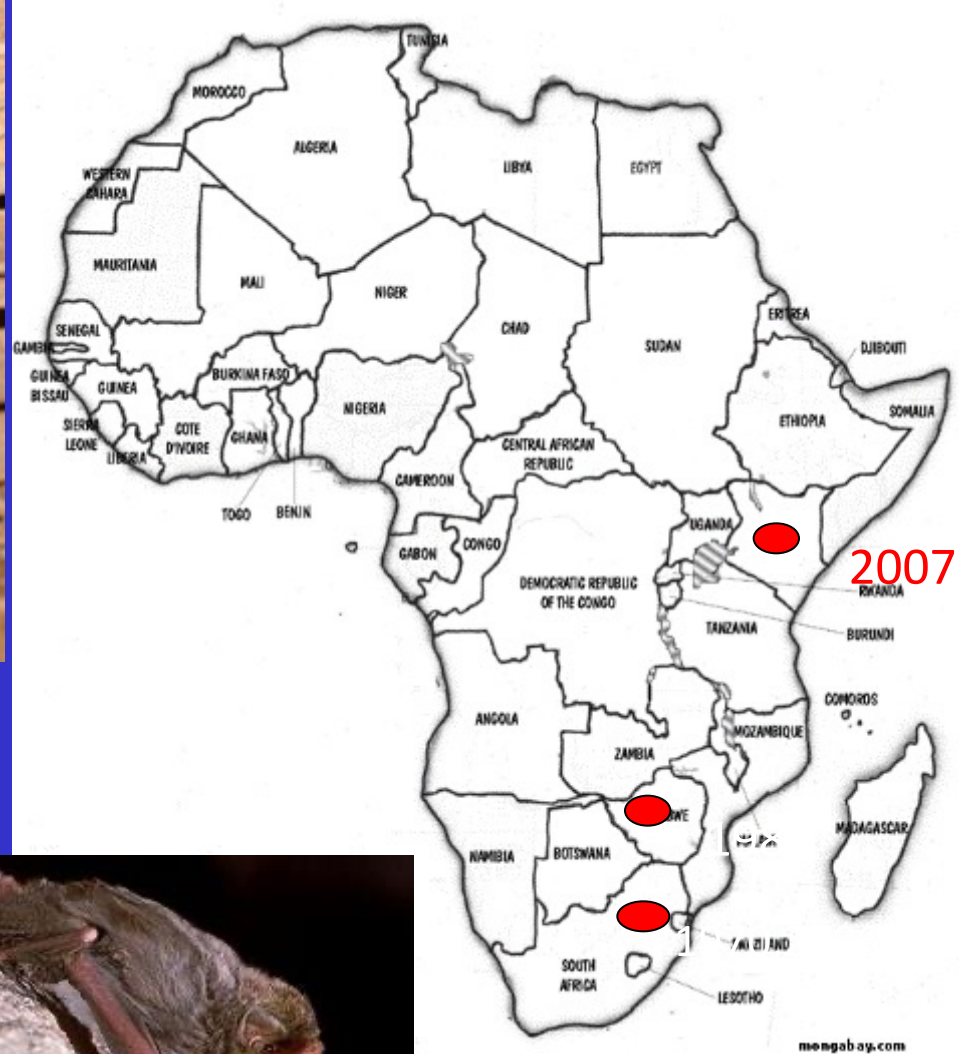
Western Cape: dog rabies Khayelitsha, .
Gordon's Bay, Strand



Fatal Human Infection with Rabies-related Duvenhage Virus, South Africa

Janusz T. Paweska,* Lucille H. Blumberg,*
 Charl Liebenberg,† Richard H. Hewlett,‡
 Antoinette A. Grobbelaar,* Patricia A. Leman,*
 Janice E. Croft,* Louis H. Nel,§ Louise Nutt,‡
 and Robert Swanepoel*

Duvenhage virus was isolated from a patient who died of a rabieslike disease after being scratched by a bat early in 2006. This occurred ≈80 km from the site where the only other known human infection with the virus had occurred 36 years earlier.



Pre-exposure prophylaxis

- Recommended for individuals at high risk of RABV exposure – **occupational**, travellers, individuals in highly endemic settings with limited PEP access, EPI ??? Remote areas
- 2-site ID or 1 site IMI on days 0 and 7
- PEP – no RIG, boosters day 0 and day 3
- Routine boosters every 2 years eg vets



WHO 2018

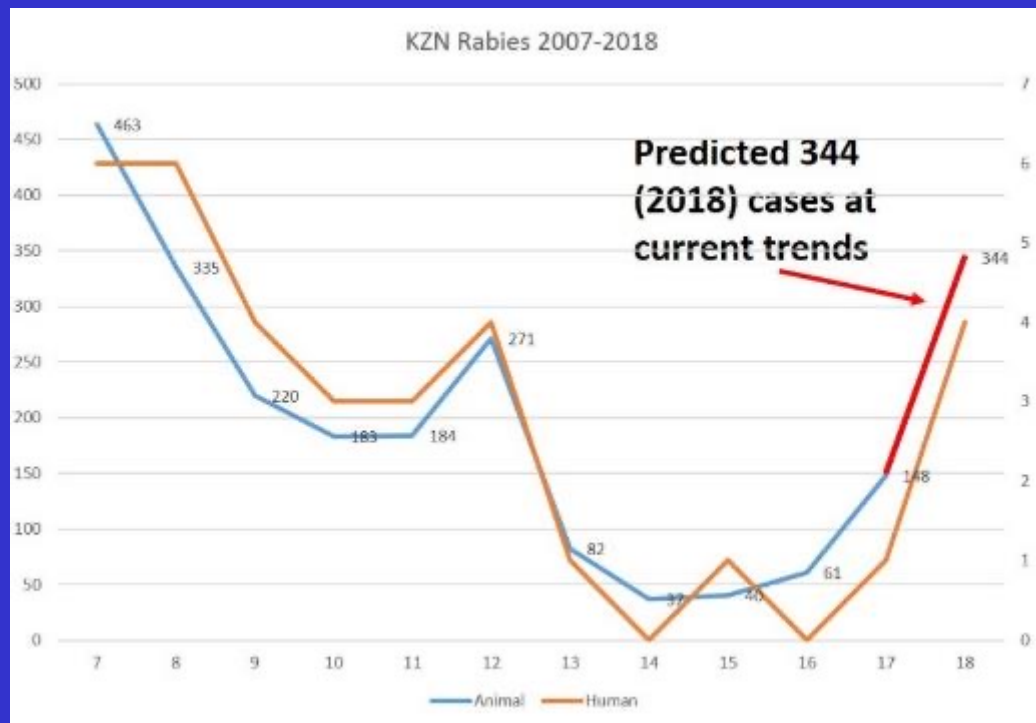
RSA 2022 www.nicd.ac.za

KwaZulu Natal Rabies

Control: 93% reduction in animal rabies cases during the project period.



Kevin le Roux
– rabies champion



Responsible animal ownership



Acknowledgements



Prof Robert Swanepoel
'Veterinarian extraordinaire'



Division of Public Health Surveillance
and Response. NICD



Centre for Emerging ,Zoonotic &
Parasitic Infections, NICD



Kevin le Roux
rabies champ



State Vets, far and
wide