

# RABIES

## **Bug of the Month In-service**

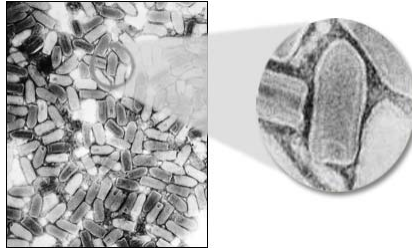
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Dr. Shauna Hudson, Public Health, SCHR

### Outline of BOM Presentation

- Information about the rabies virus
- Animal rabies in Canada, Saskatchewan, and SCHR
- Human rabies in Canada
- Animal bites in SCHR
- Management of animal bites in SCHR
- Questions

## Rabies

- Rabies virus is an RNA virus classified in the Rhabdoviridae family, Lyssavirus genus
- Rabies is a neurotropic viral infection that has two clinical presentations:
  - Encephalitic (furious) rabies (80%)
  - Paralytic (dumb) rabies (20%)
- Rabies is nearly uniformly fatal.
  - 3-6 well documented cases of survival, all with some pre or post-exposure prophylaxis



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## **Rabies Virus – Incubation Period**

- “The length of the incubation period depends in part on wound severity, wound location in relation to nerve supply, and relative distance from the brain; the amount and variant of virus; the degree of protection provided by clothing; and other factors.”
- Incubation period:
  - is highly variable but usually 3 to 8 weeks (average incubation period is 30 to 90 days).
  - periods of less than 4 days have been reported for bites to the head and neck.
  - periods of up to 7 years have been reported.
  - less than one year in 95% of cases.

## **Rabies Virus – Period of Communicability**

- “Defined periods of communicability of animal hosts are only known with reliability in domestic dogs, cats, and ferrets, and are usually for 3–7 days before onset of clinical signs (rarely over 4 days) and throughout the course of the disease.”
- “Most rabid dogs, cats, and ferrets may shed virus for a few days before there are obvious signs of illness.
- No case of human rabies in the United States has been attributed to a dog, cat, or ferret that has remained healthy throughout the standard 10-day period of confinement.”

## Rabies – Modes of Transmission

- Virus-laden saliva from a rabid animal introduced through a bite or scratch (and very rarely into a fresh break in the skin or through intact mucous membranes).
- Other routes of transmission:
  - Airborne spread (bat caves).
  - Transplants (cornea, solid organs and blood vessels).
  - Person-to-person transmission is theoretically possible.

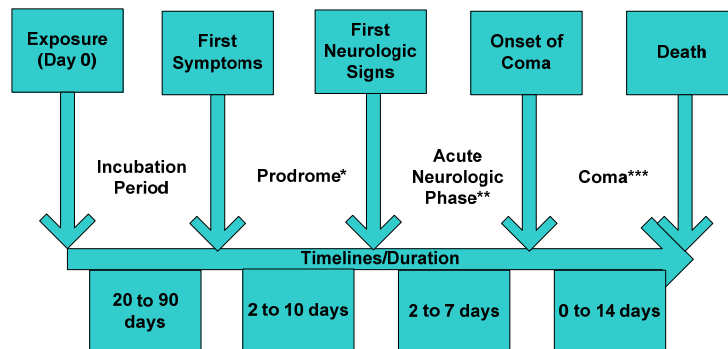
## Rabies - Neurologic Signs and Symptoms

- Encephalitic (furious) rabies (80%)
  - The more common, agitated (furious) form presents with the classic symptoms of hydrophobia or aerophobia with a rapidly progressing encephalitis and death.
    - Intermittent agitation
    - Autonomic instability
    - Severe spasms of pharynx and/or stridor
    - “Hydrophobia” or “aerophobia”

## Rabies - Neurologic Signs and Symptoms

- Paralytic (dumb) rabies (20%)
  - The paralytic form of the disease manifests as progressive flaccid paralysis, has a more protracted course and is more difficult to diagnose.
    - Paralysis develops early and continues progressively until death
    - Changes in sensorium may not present until late in course
    - Less dramatic clinical course

## Clinical Course of Rabies in Humans



\* Prodrome - Fever, headache, anorexia, malaise, pain, paresthesia at the bite site

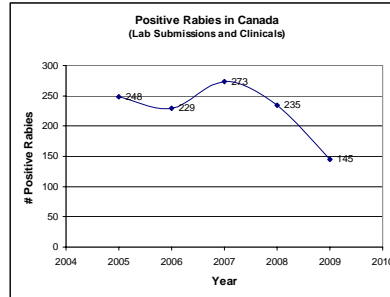
\*\* Acute Neurologic Phase – Anxiety, CNS signs, paralysis, hydrophobia, delerium, hallucinations

\*\*\* Coma – Pituitary dysfunction, hypotension, cardiac arrhythmia, cardiac arrest, coma

Source - INFECTIOUS DISEASES OF ADULTS – May 3 to May 7, 2010 - STAFF OF THE MASSACHUSETTS GENERAL HOSPITAL UNDER THE AUSPICES OF THE HARVARD MEDICAL SCHOOL DEPARTMENT OF CONTINUING EDUCATION - N. Basgoz

## Epidemiology of Rabies in Canada

- In Canada, in 2005 to 2010, **there were an average of 226 positive rabies in animals per year.**
- For 2010, there were 123 confirmed rabies cases in Canada.
- Predominant species with rabies in 2010 are bats (39%) and skunks (49%).



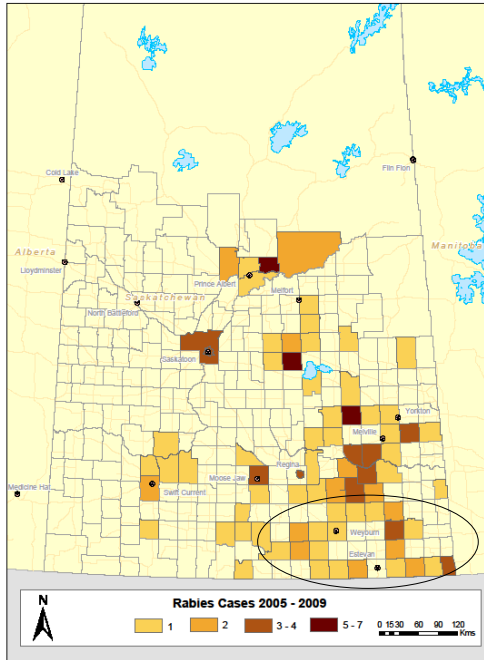
Source: Canadian Food Inspection Agency

## Epidemiology of Rabies in Canada

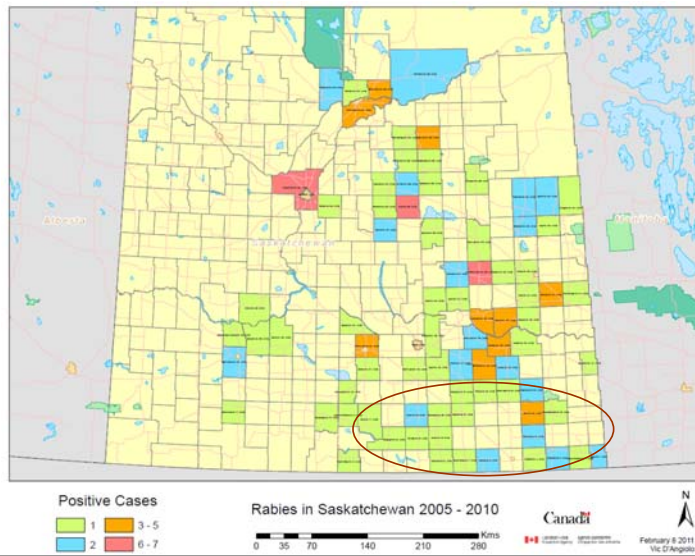
- In 2007, a 73 year old Alberta man died after developing rabies 6 months after a bat bite while sleeping. He did not seek medical attention after the exposure. (CDC, MMWR, 57(08):197-200)
- In 2000 and 2003, two people in Canada died of rabies infection, one in Quebec (2000) and one in BC (2003).
  - These were first cases of human rabies in Canada since 1985.
  - The most likely sources of infection for both these people were unrecognized bat exposures.
- From 1924 to 2007, a total of 24 people in six provinces have died of rabies in Canada: Quebec (12), Ontario (6), Saskatchewan and Alberta (2) and British Columbia and Nova Scotia (1 case each).
- In 2004, the US Centers for Disease Control and Prevention confirmed the first reported case of rabies following solid organ transplantation.

Source: Canadian Immunization Guide, 2006

CFIA Rabies  
Map  
Saskatchewan  
2005-2009



CFIA Rabies Map  
Saskatchewan  
2005-2010

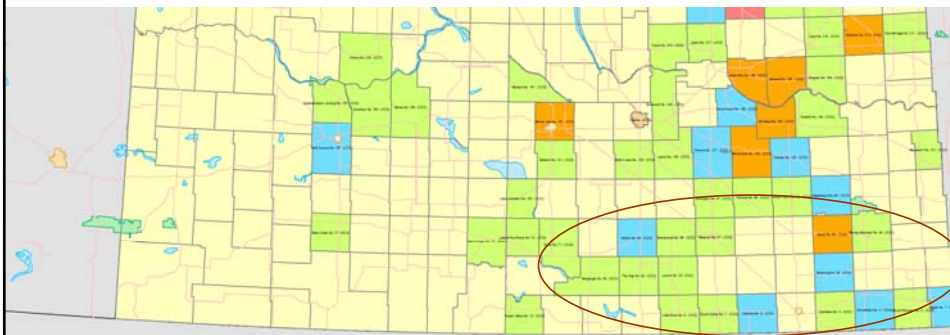


## Animal Rabies in SCHR and Saskatchewan

Year	Sun Country Health Region	Saskatchewan
<b>2005</b>	<b>9 (37.5%)</b>	<b>24</b>
<b>2006</b>	<b>16 (48.5%)</b>	<b>33</b>
<b>2007</b>	<b>4 (25.0%)</b>	<b>16</b>
<b>2008</b>	<b>3 (9.1%)</b>	<b>33</b>
<b>2009</b>	<b>0</b>	<b>24</b>
<b>2010</b>	<b>0</b>	<b>22</b>

32 (21.1%) of the 152 animal rabies cases in Saskatchewan from 2005 to 2010 occurred within SCHR.

CFIA Rabies Map  
Saskatchewan  
2005-2010



Positive Cases



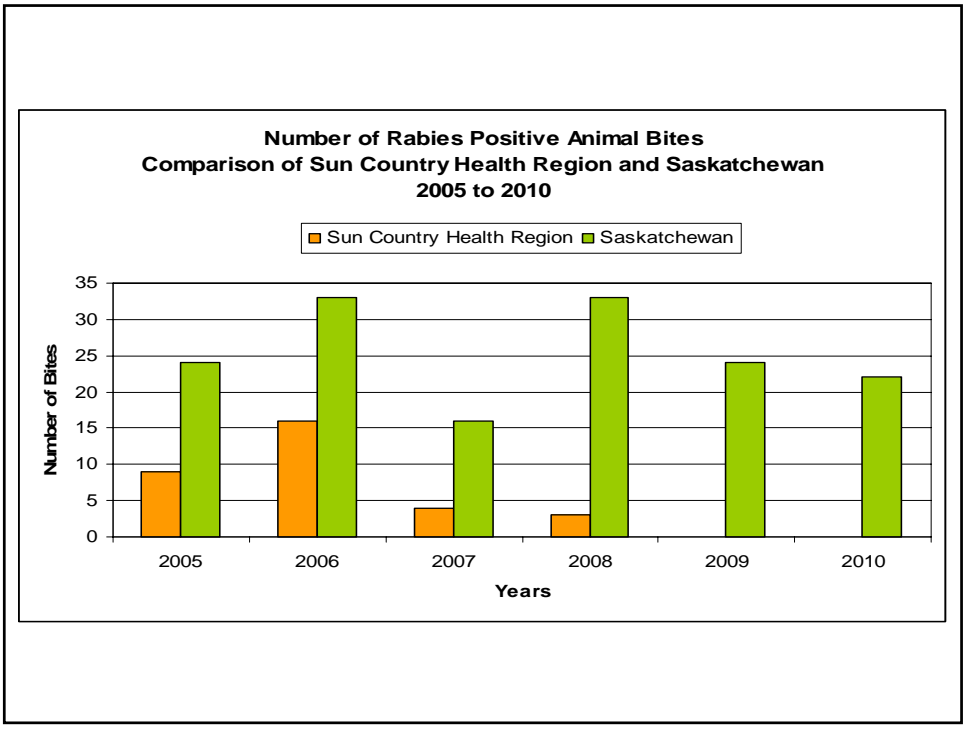
Rabies in Saskatchewan 2005 - 2010



Canada

Canadian Food Inspection Agency Agence canadienne d'inspection des aliments





## Animal Rabies in SCHR and Saskatchewan

- The CFIA report indicates skunks were the animal most commonly reported with rabies in Saskatchewan from 2005 to 2010:

- 71.05% of Saskatchewan cases
- 75.00% of SCHR cases

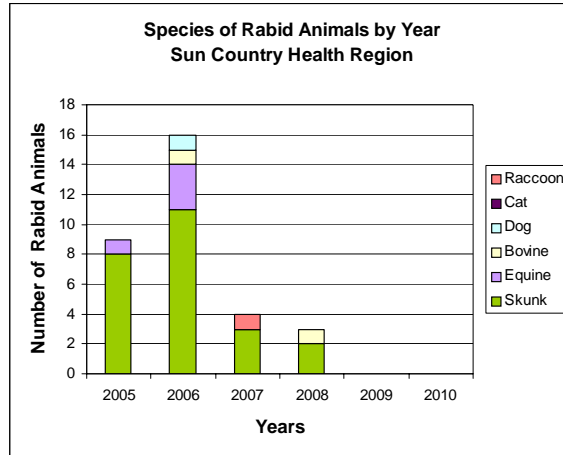


Species of Rabid Animals, 2005 TO 2010

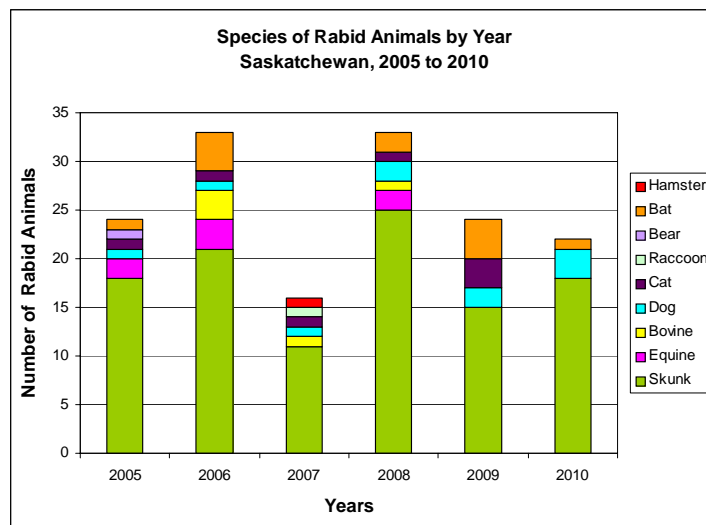
Animals	SUN COUNTRY HEALTH REGION	SASKATCHEWAN
Skunk	24	108
Equine	4	7
Bovine	2	5
Dog	1	10
Raccoon	1	1
Cat	0	7
Bat	0	12
Bear	0	1
Hamster	0	1
Total	32	152



## Animal Rabies in SCHR



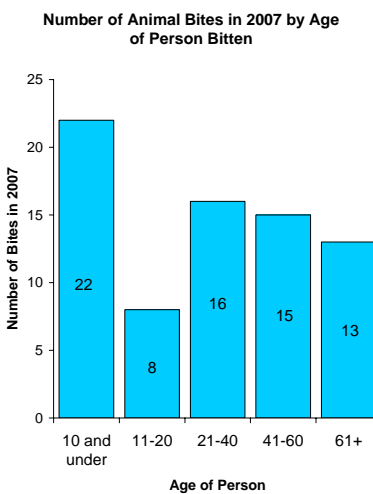
## Animal Rabies in Saskatchewan



## Animal Bites – SCHR 2009

- In SCHR in 2009, there were 116 animal bite investigations.
  - There were a total of 8 cases where rabies post-exposure prophylaxis was recommended.

## Animal Bites by Age – SCHR 2007



## Rabies Prevention

- Animal vaccination
- Education about animal bites
- First Aid /good wound care after exposures
- Post-exposure prophylaxis

## Wound Care and Prevention of Rabies

- All wounds should be flushed thoroughly and cleaned with soap and water as prompt and thorough wound care is essential to prevent the rabies virus from entering the body and leading to infection.
  - The rabies virus may remain localized to the area of the bite for a variable time.

(tetanus vaccine and rabies vaccine)

## Public Health Role Animal Bite Investigation

- Factors used in determining whether prophylaxis is required:
  - Species of animal - skunks, foxes, raccoons, bats, cattle, stray dogs and cats.
  - Investigation of the incident – behavior of animal (provoked/unprovoked), vaccination history of animal, etc.
  - Type of exposure – bites, non-bite (contamination of scratches, abrasions/cuts on skin or mucous membranes and other exposures to saliva or other potentially infectious material).

### Rabies Post-exposure Prophylaxis Guide

Animal Type	Evaluation and Disposition of Animal	Post-exposure Prophylaxis Recommendations
Dogs, cats or ferrets	<ul style="list-style-type: none"> <li>•Healthy &amp; available for 10 days of observations.</li> <li>•Rabid or suspected of being rabid.</li> <li>•Unknown</li> </ul>	<ul style="list-style-type: none"> <li>➤Prophylaxis only if animal develops signs of rabies.</li> <li>➤Immediate immunization &amp; RIG.</li> <li>➤Consult public health for advice</li> </ul>
Bats, skunks, raccoons, foxes and most other carnivores; woodchucks	Regard as rabid unless geographic area is known to be free of rabies or until animal proven negative by lab tests.	Immediate immunization & RIG.

## Rabies Post-exposure Prophylaxis Guide

<b>Animal Type</b>	<b>Evaluation and Disposition of Animal</b>	<b>Post-exposure Prophylaxis Recommendations</b>
Livestock, rodents and lagomorphs (rabbits, hares, pikas)	Consider individually.	Consult public health officials. Bites of squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, mice, etc almost never require anti-rabies treatment.

## Questions/Comments

- Questions from the audience
- Questions from Grant and Shauna
  - Why do we observe the animal for 10 days?
  - If a person has no symptoms of rabies after 10 days do they still need rabies post-exposure prophylaxis?
  - If the person has not started rabies PEP within 10 days is it too late to start?

## Thank You to Contributors

- Tolu Oyebode
- Kristin Waroma
- Shirley Blyth
- Laraine Tremblay

## References/Sources

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- <http://www.rabiesblueprint.com/>