Monkeypox Detection in the Western Hemisphere, 2003

The Wisconsin Perspective

Interagency cooperation is NOT optional !

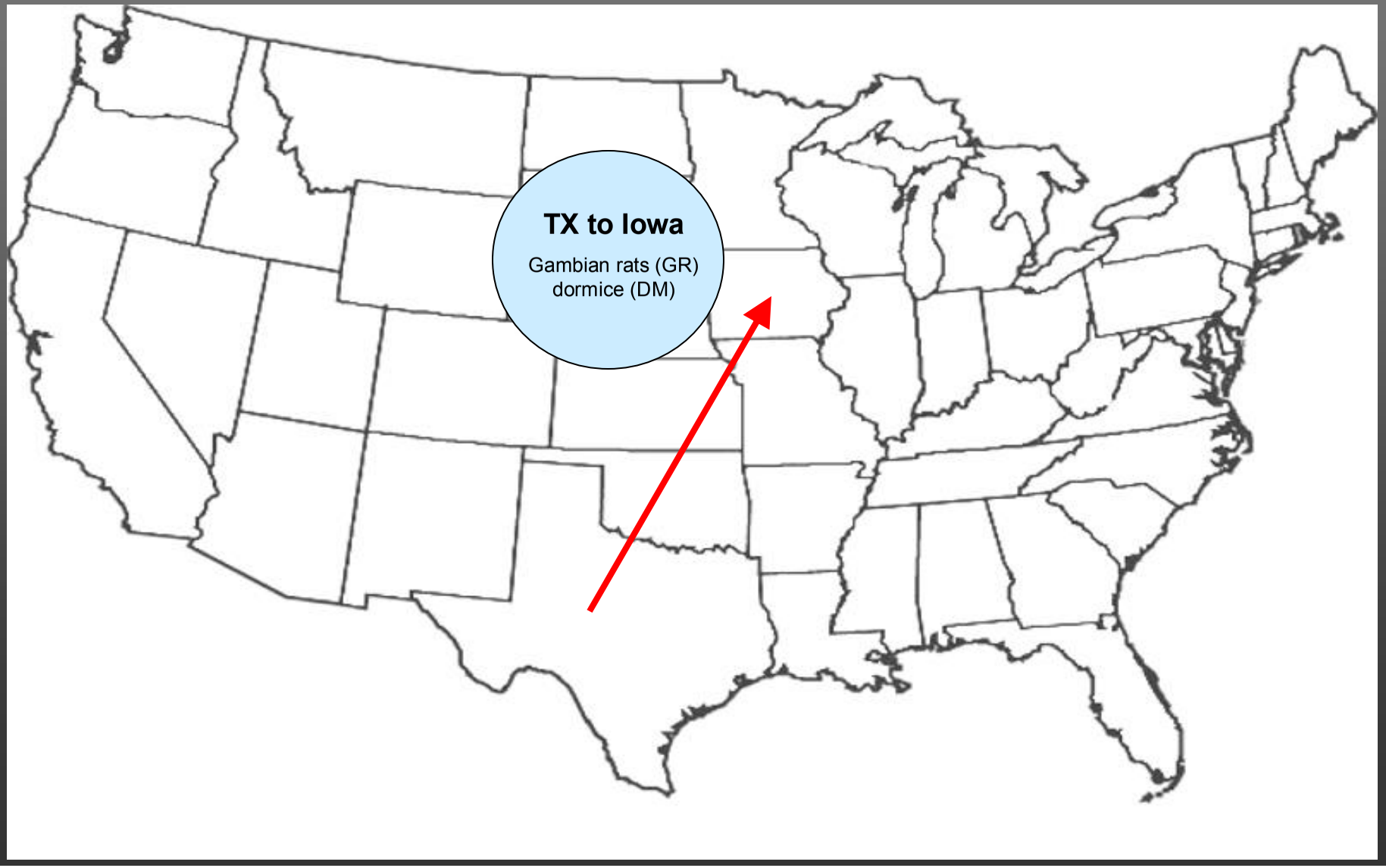
Tracing the introduction of Monkeypox: African rodents and prairie dogs

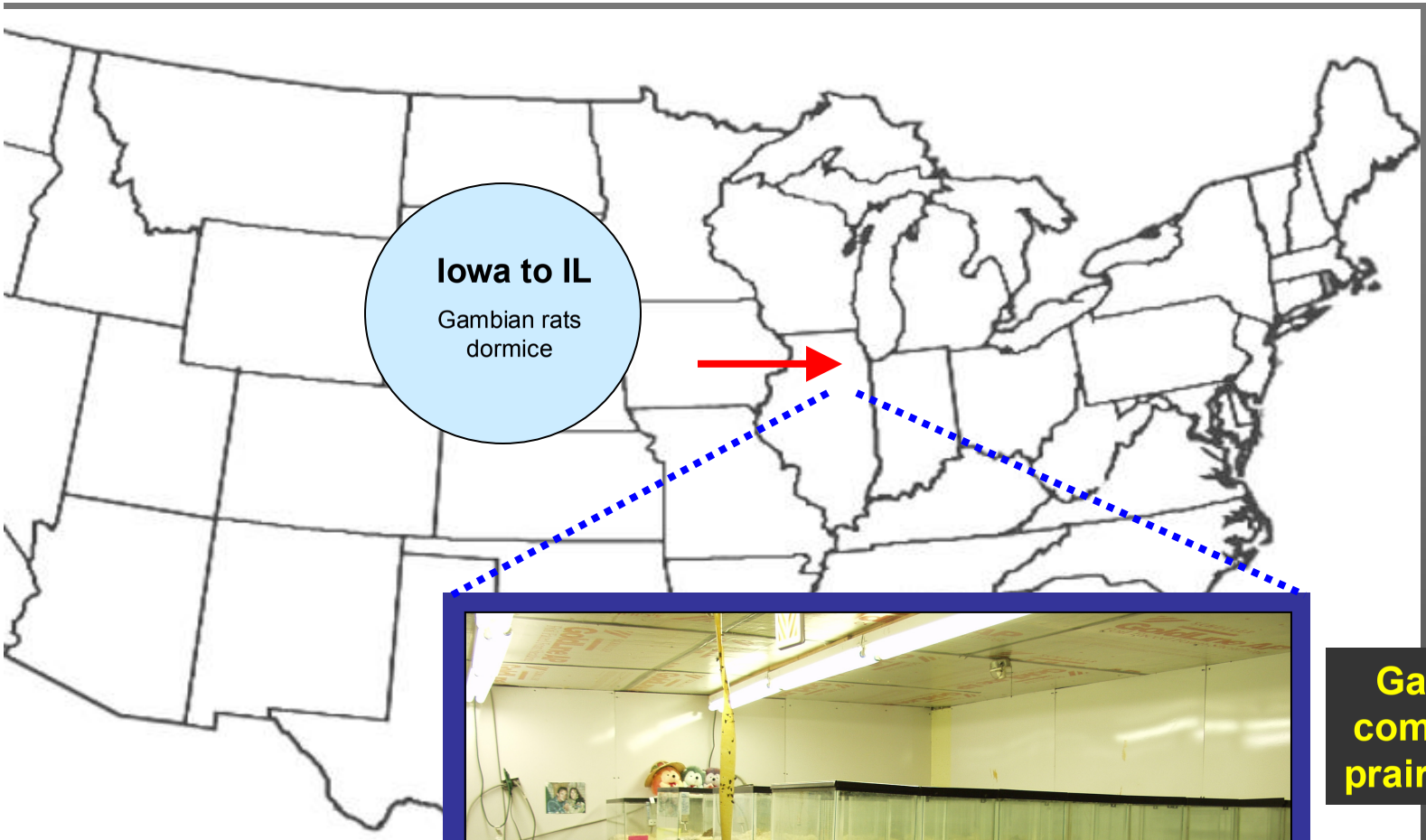
Ghana toTX

50 Gambian rats (GR)
53 rope squirrels (RS)
2 brush-tailed porcupines (BTP)
47 sun squirrels (SS)
100 striped mice (SM)
~510 dormice (DM)

April, 2003

Tracing the introduction of Monkeypox: African rodents and prairie dogs

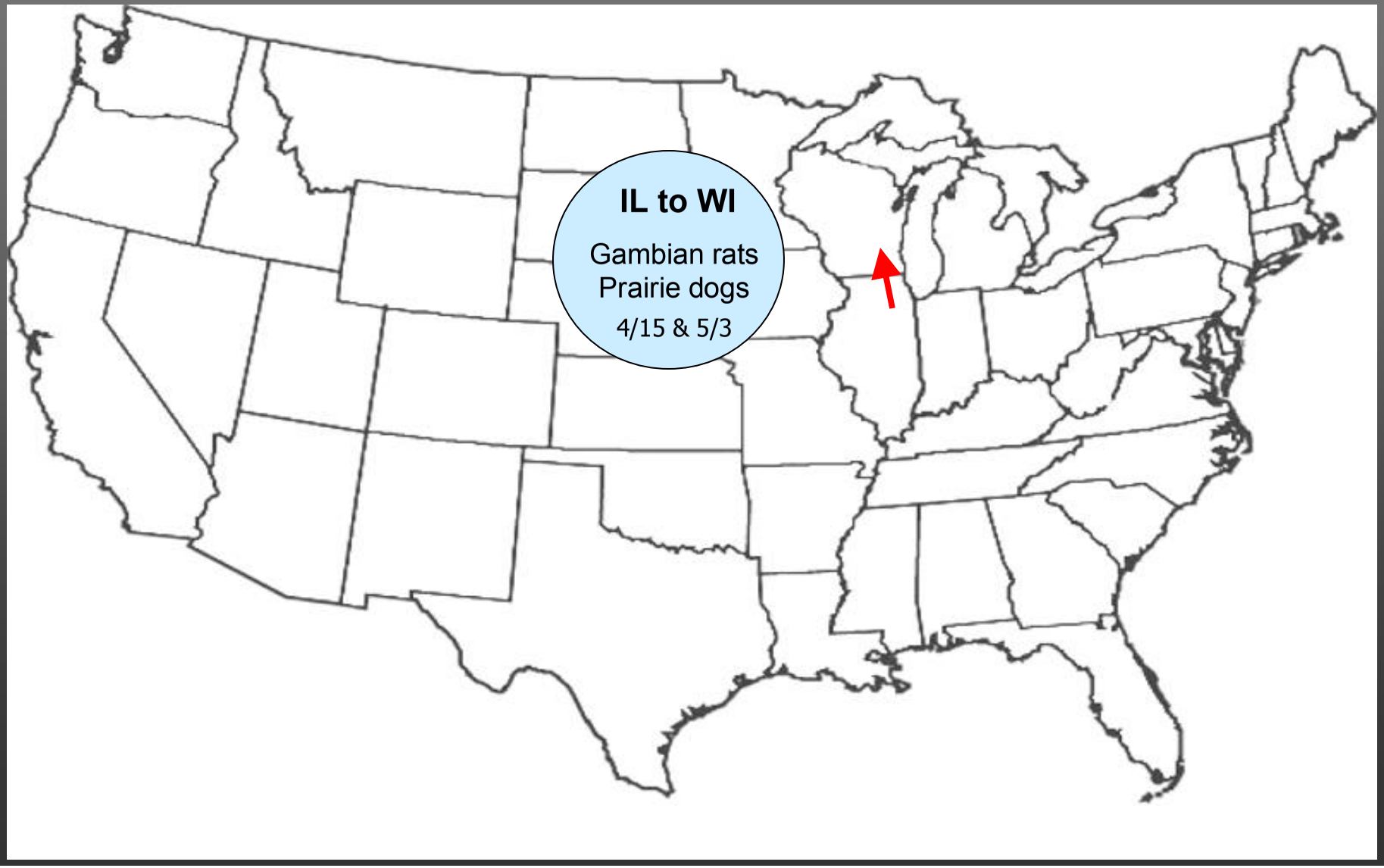




Gambian rats comingled with prairie dogs in IL

Innocent bystander

Tracing the introduction of Monkeypox: African rodents and prairie dogs



Prairie Dogs as Pets?

What could possibly go wrong?

Initial Report – May 24, 2003

- Initial report by private vet to Marathon County Health Officer of illness in child after bite from prairie dog that subsequently died.
- Local HO contacts DPH, DPH contacts clinician:

Private Vet Clinics

Local Health Depts

- 3.5 y.o. ♀ hospitalized 5/22 - cellulitis & febrile illness post prairie dog bite

- Ill prairie dog taken to vet clinic, died, enlarged LN to private vet dx lab for culture

- Gram negative rod growing in bacterial culture of LN

- Child treated empirically with doxycycline & ciprofloxacin

Private Med Clinics

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Primary inoculation site, Marshfield index case, 5/26/03
Hospital day 4, 13 days following prairie dog bite

Marshfield index case, 5/26/03
disseminated lesions

Image Courtesy of
Marshfield Clinic,
Marshfield, WI

SE Wisconsin patient 1 - Primary Lesion

Image Courtesy of Medical College of Wisconsin, Milwaukee, WI

Monkeypox Timeline

5/11- Two Pdogs purchased as a Mother's Day present at "swap meet" in Wausau

5/13- Pdog bites 3 y.o. on hand

5/16- Febrile illness in 3 y.o. with apparent cellulitis

5/20- Pdog dies; enlarged submandibular LN to private vet dx lab for culture.

5/22- Patient hospitalized

5/24- DPH notified. Gram neg. bacillus growing out of Pdog LN culture; tularemia suspected

5/26- Patient's mother has onset of "rash" and chills; lesion biopsied. Tularemia & plague ruled out in child.

Monkeypox Timeline (cont)

Private Med Clinics

5/30 – Hospital lab visualizes poxvirus-like inclusions in EM of mother's biopsy samples

5/31 – Index child's father develops prodrome

Local Health Depts

6/2-6/4 – DPH informed by Milwaukee HD of case of febrile vesicular illness in SE WI in adult male who sells exotic pets.

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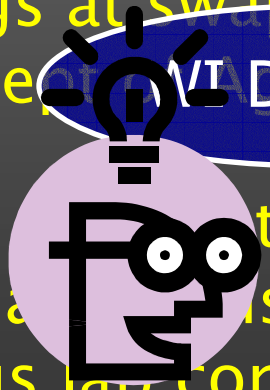
- He sold Pdogs at swap meet
- USDA & WI Dept Ag notified.

WI Dept. Ag



- DPH notified of presumptive orthopoxvirus ID in mother's EM and pus culture by hospital lab.
- CDC poxvirus lab contacted by DPH regarding specimen submission.

CDC

USDA

Electron Microscropy

Image Courtesy of Marshfield Clinic, Marshfield, WI

Monkeypox Timeline (cont)

6/5 – Additional cases in SE WI suspected

Private Med Clinics

6/6 – DPH issues emergency order banning import, sale, transport or display of Pdogs and animals in contact with Pdogs received after 4/1.

Local Health Depts

– CDC team visits Froedtert Hospital in Milwaukee

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6/7 – PCR confirmation of monkeypox-like virus by CDC

CDC

6/9 – WI Dept of Ag issues emergency order similar to DPH & imposes quarantines on individual animals.

WI Dept. Ag

6/11 – CDC and FDA issue national order prohibiting Pdog movement.

FDA

Response Activities

- Emergency orders for animal quarantines
- Infection control guidelines for HCWs treating ill persons
- Home isolation of human case-patients
- Serologically monitor pet store employees and veterinary staff (no asymptomatic seroconversions)
- Human case finding / active surveillance

Human Case Finding

- Multiple means of communication
  - Health Alert Network, WI DPH website
  - E-mails to providers, ICPs, local health depts
  - Regular conference calls with local health depts
  - Mass media releases → self-reporting urged

- Active surveillance of high risk groups via sx diaries or periodic phone interviews
  - Laboratorians working with cases' samples
  - Household/close contacts
  - HCWs caring for Mpox patients
  - Staff at vet clinics
  - Pet store employees/ visitors

Surveillance Diaries & Active Phone Surveillance of Contacts

- 21 days
- Temperature
- Rash
- 9 other symptoms
- Immediate report fever and rash
- Submitted weekly

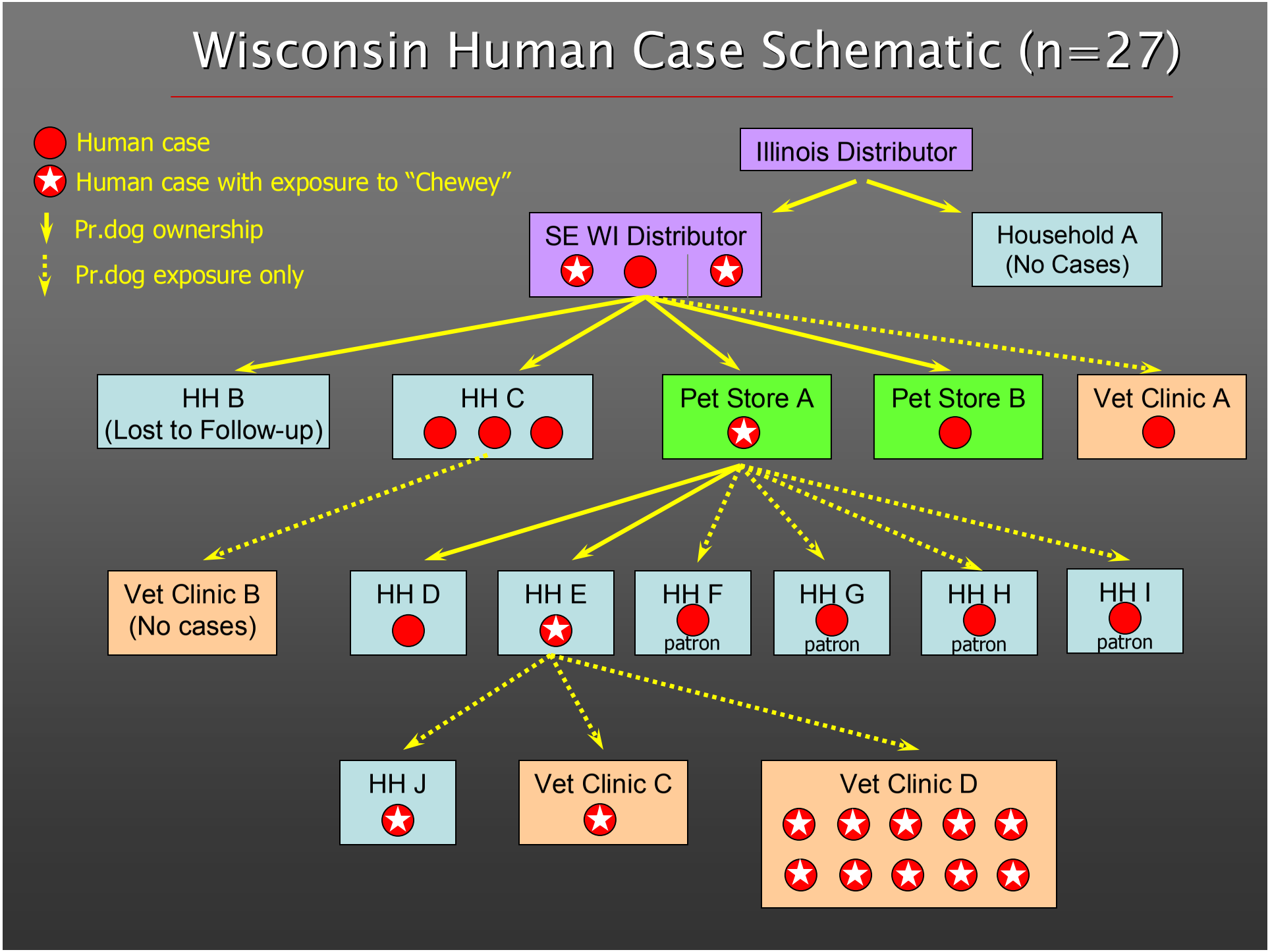
Active Surveillance Diaries

Exposure Group	Diaries	Cases
Field trips	166	0
HCW / med lab	126	0
Case contacts	89	0
Vet clinics	84	12
Pet store employees	25	2
TOTAL	490	14

Patient Questionnaire

- Adapted smallpox instrument
- Signs and symptoms
- Rash specifics
- Exposure hx
- Vaccine hx
- Medical hx

Wisconsin Human Case Schematic (n=27)



Veterinary Surveillance

Part I – Surveillance by private vet. clinicians

Private Vet Clinics

- Case definition with clinical & epi criteria developed
- Infection control precautions for vet clinics developed by CDC, DPH, Dept. Ag

WI Dept. Ag

- Vets to report suspected cases by phone to Dept. Ag

WVMA

- Standardized questionnaire to be administered

CDC

- Any human illness in HH to be reported to DPH
- Consultation available for necropsy submissions, specimen collection (not to be done at private vet clinics), disposal of bedding/waste

WI Vet Dx Lab

- IC precautions, request for reporting and case definition emailed to vets via WI Vet. Med. Assoc.

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Veterinary Surveillance (cont)

WI Dept. Ag

Part 2: Survey of other animals on premises where infected animals were housed

- Serum samples collected from owned pets by Dept of Ag veterinarians

Local Health Depts

  - Serology done by CDC: one asymptomatic dog weakly positive on generic orthopox serology

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- Animals housed in proximity to Pdogs at pet stores purchased by DPH, euthanized & tested for orthopox by PCR & VC by WI State Lab. All negative.

CDC

WI State Lab Hygiene

Veterinary Surveillance (cont)

Div. of Public Health

Part 3 – Sylvatic animal testing – *could Mpox virus now be established in native rodent populations?*

- Trapping studies around premises where known infected animals had been housed

USDA-WS

- Rodents, insectivores, and lagamorphs trapped, necrosied, and tested

DNR

- Trapping done by USDA/APHIS Wildlife Services staff using precautions as for hantavirus surveys
- Necropsies & testing performed in BSL-3 facility at USGS National Wildlife Health Lab

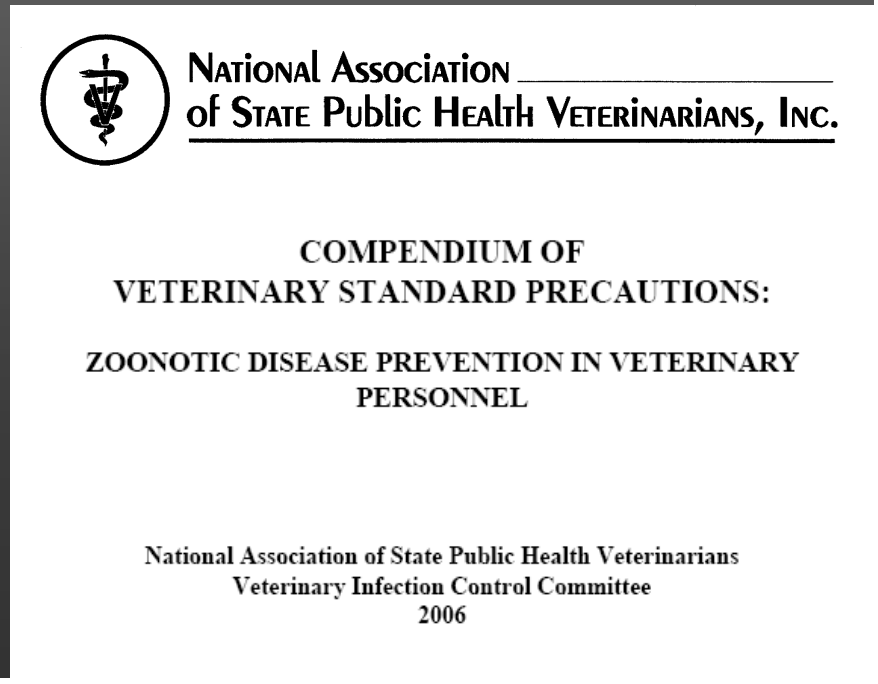
DOI-USGS
Nat Wildlf Health Ctr

Monitoring of Animals under Quarantine

- No monitored animals developed illness
- None of the animals housed in proximity to the infected Pdogs (in pet shops & private homes) were positive on lab testing except one weakly seropositive dog
- Quarantine lifted after 6 weeks for animals other than Pdogs (none became ill)
- Most prairie dogs euthanized; otherwise quarantined permanently

Public Health Lessons Learned

- Sometimes, when you hear hoofbeats, they really are zebras
- Bioterrorism preparedness really is dual use
- More regulation needed at state and federal level regarding import, export and movement of exotics
- Development / promulgation of IC guidelines to protect veterinary staff is needed


National Association of State Public Health Veterinarians, Inc.

COMPENDIUM OF
VETERINARY STANDARD PRECAUTIONS:

ZOONOTIC DISEASE PREVENTION IN VETERINARY PERSONNEL

National Association of State Public Health Veterinarians
Veterinary Infection Control Committee
2006

Public Health Lessons Learned

- Communicate regularly with your state & federal agriculture officials, state VMA, vet diagnosticians, and wildlife agencies
  - Define roles in emergencies
  - Understand their capacities and capabilities
  - Serve on interagency committees, common projects
    - ✓ Working together preferable to a "get acquainted" meeting

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