National Wildlife Disease Surveillance Systems: an European perspective

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Surveillance =
“making good decision with poor data”
Outline: WILDLIFE SURVEILLANCE

- Use of data
- Aims
- Case definition
- Sampling
- Data storing
- Case studies
- Discussion
- Conclusion
What is surveillance

1° Monitoring
- Ongoing process
  - Real time
  - Early warning

2° Decision & management
- Information of veterinary services, other bodies
- Management options
  - Often fail
  - Protection & Prevention

K Capello et al. 2010, Eurosurveillance 15; (28)
Main use of surveillance data

Maps

Graph

H5N1HPAI, OIE

H. Roberts et al. 2011, DEFRA report

OIE information department

OIE Global conference on wildlife 2011
Data “extracted” for epidemiological studies

Incidence & seroprevalence of pestivirus infection in a population of Pyrenean chamois.


http://www.parcsnationaux.fr/layout/set/fiche/content/view/full/7568
Aims of wildlife surveillance

Natural habitat

Wild animal

Pathogen

Other species
Humans or domestic animals: target/ victim

Aims

Wildlife

Environment

Source

Release risk

Target
Wildlife can be target/ victim

Aims

Environment

Wildlife

Source

Exposure risk

Target
Main aims for surveillance in wildlife

**Exposure risk**
- Diseases affecting
  - Game species populations
  - Endangered populations
- Wildlife as sentinel (environment health)

**Release risk**
- Highly communicable pathogens
- Pathogens in wild
  - maintenance or
  - liaison host
- Possibly emerging pathogens

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OIE Global conference on wildlife 2011
Disease in wildlife

- **Affect** wild animal (victim)
- Surveillance based on **clinical signs**
- Important for game management, animal conservation.

Data for diseases surveillance

- Lesions
  - Tissue
  - Modification
- Aetiology
- Diagnostic

TB lesions in Roe deer

An example of syndromic surveillance in wildlife

Trend Monitoring & expected background noise
WARNS PETIT, E. 2011. PhD Univ Grenoble

See: Warns Petit, E. et al. 2010, BMC veterinary
Surveillance of pathogen in wildlife

Wild animals frequently are healthy carriers of pathogens: clinic is useless

A hidden danger
Carriage (infection/intoxication) in wildlife

- Target the pathogen (pathogen surveillance)
- Diagnostic test

Download: FAO “Wild bird highly pathogenic avian influenza surveillance.”
http://www.fao.org/docrep/010/a0960e/a0960e00.htm

Sampling

- Power/precision
- Enough data
- Reliability/representativeness

- i.g. CWD in Europe (EFSA report, 2010. 8, 10, 1861)

Randomised sampling or planed sampling

- True “active surveillance”...

- Does not exist, yet:

  Mostly sub sampling of hunted carcasses
“Ad hoc” or opportunistic sampling

- Probability of detection,
  A function of
  - Prevalence
  - Level of awareness

*Iceberg metaphor*
Data processing & management

- Transmission
- Validation & coding
- Storage
- Analysis


Case study: the SAGIR network

Field watcher: hunter, public

ONCFS

Anses FNC

Data storing

Data management

Communication

FDC

Interlocutor ONCFS

Veterinary laboratory

TERRIER, M.E. *et al.* 2006; Bull. Acad. Vet. Fr
Current situation of surveillance in Europe

Europe: state of the art

- 25 replies to the questionnaire/23 no
- Few generalist, country-scale surveillance
- Roughly 20,000 carcasses examined (minimum)
  - Most: gross lesions
  - Few: histology and parasitology
  - Some: bacteriology and virology
  - Occasionally: toxicology & serology
- 5 top diseases
  - Avian influenza, CSF, Rabies, Trichinellosis, Tuberculosis

Ryser-Degiorgis et al. 2009
Critical points arising with *ad hoc* and generalist wildlife surveillance

- **Diagnostic**
  - Quality of tests
  - Code (putting words & digits)
  - Skill, imputation

- **Data**
  - Complex (many species, many diseases...)

- **Lack of accuracy**
  - ? Population size & structure

- **Low frequency of notifiable diseases**
  - Difficulty of assessment
  - Financial and human cost of the network

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Aims

Case def.

Sampling

Data storing

Case studies

Discussion

Conclusion
Basic data needed

- **Unique**
  - Ref/ **Date**/ Tissue/ **Name of test or Modification**/ **test result**

- **Animal**
  - Context: Single/ cluster/ mass mortality
  - **Species name** (Genus species, e.g. *Cervus elaphus*)

- **Location**

- **Extra**
  - Age class
  - Sex
  - Tag (if any)
  - Cause of death or disease (+ imputation)
Consequences of notification

- The notification of a disease or even an infection of a wild animal can have a deleterious effect on trade.

http://samaw.com/mizoram-on-bird-flu-alert-india-h5n1-news/849
Risk resulting from wildlife infection (still) needs to be appropriately assessed

- Can the infection spread FROM wildlife to domestic animals?
- Are any cases in domestic animals notified?
- Are wild animals
  - Maintenance hosts
  - Spill over hosts?

credit: Texas A&M University; the photo is apparently from an outbreak in South Africa in 1897
Conclusion

- Good decision = good information
- Good information = A network = means human eyes, noses and ears in the fields...
- The best data = Accurate and simple
- Steady record
- Steady report

http://ecobinder.blogspot.com/2008/01/immature-red-shouldered-hawk-on-sanibel.html
WDA EWDA 2012 meeting

“Convergence in wildlife health"

61st International conference of the WDA
10th biennial conference of the EWDA
Marcy l’Etoile & Lyon (France)
from Sunday July 22nd through Friday July 27th
2012

http://wda2012.vetagro-sup.fr/
Existing report on Wildlife surveillance in Europe

Anonym (2005). (IREC) Ciudad Real, Spain, IREC.

Briones, V. (Editor, 2000), Universidad de Madrid: 70p.


General references on Wildlife surveillance


### “Wildlife” Defined

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- Pathogens and diseases from all four groups must be reported

- Wildlife Focal Points may be asked to report on Pathogens in:
  - Wild animal (free living)
  - Feral animals
  - Captive Wildlife (Zoos, Wildlife Parks, etc.)

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1 OIE Working Group on Wildlife Diseases 1999
Liaison, Maintenance, Spill-over, Vector, ...Victims...
Comparisons and sharing of data

- Standards
  - “Babel Tower”: we do speak the same language
  - Need of a medical nomenclature

http://secondthoughts.typepad.com/second_thoughts/2006/06/country_or_comp.html
Acknowledgments

- Prof F. LEIGHTON (OIE coll. Centre, Saskatoon)
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