

Meeting 4: Outbreak investigation

Reading

- Sergeant E, Cameron A, Baldock C (2004) Epidemiological Skills for Animal Health Professionals Volume 2: Epidemiological Problem Solving pp 1-36.
- Gay J (2003) Guide for Herd Problem Investigations. Available: <http://www.vetmed.wsu.edu/courses-imgay/OutBGuide.htm>

Presentations

1. The key steps in an outbreak investigation

Exercises

1. Work through one (or more) of the example examination questions below.
2. Work through one of the case studies below from Epidemiological Skills for Animal Health Professionals Volume 2: Epidemiological Problem Solving (make sure someone has a copy of the example answers).
 - Case study 5: Outbreak investigation – Fish deaths pp 83-101
 - Case study 6: Outbreak investigation FMD village outbreak pp 103-108
 - Case study 7: Outbreak investigation – Horse deaths pp 109-110

Example examination questions

1. You have been asked to provide epidemiological assistance to a prawn farming enterprise in Costa Rica (Central America). The farm consists of 30 prawn ponds on a 450-acre property. The ponds are stocked with post-larvals in March and June, and prawns are harvested in September and October. The farmer has noticed an increased number of birds over ponds preying on dead prawns.

On questioning, you are told that survival levels are well below average but vary with the location of the pond. Survival levels are as follows:

Ponds located on the north side of the enterprise – 39.5% (mean survival), south side 5%, west side 25%, east side 6%

Your experience in Australia is that survival rates of about 60% are normal. The farm has been operational for 7 years and is not the only farm in the area affected. There was a large variation in mortalities observed between ponds.

Notable similarities between ponds: water source, feed and feed practices (prawns are fed by broadcast), salinity, age and source of post-larvals.

Discernible differences between ponds: size, stocking density, average morning temperature and oxygen concentration, date of post-larval stocking.

Describe your approach to investigating these deaths (2005 written).

2. Recently a number of outbreaks of disease have occurred in wild or free living animals in Australia and NZ. Epidemiologists can play a central role in investigating these types of problems. Discuss the special challenges of investigating outbreaks of free living populations and outline how you would have advised wither fisheries or wildlife authorities investigating one of the following recent outbreaks:
 - a) death in pilchards
 - b) blindness in kangaroos
 - c) wobbly disease in possums (1996 written).

3. A large turkey breeding company has, on two occasions in the last 12 months, experiences extremely high mortality in birds placed with contract growers a day-old poults. Each placement involved several thousand birds. Ten to fifteen percent of the birds died between the ages of three and seven days. The problem then appeared to resolved spontaneously. The outbreaks occurred on two different properties, several months apart. The other eight contract growing properties have not yet experienced the problem. The farm managers keep very good records.

Describe in detail how you would investigate this problem and how you would prepare for a prospective investigation of similar outbreaks in the future (1997 written).

Additional reading/resources

- Den Boer JW et al (2002) A Large Outbreak of Legionnaires' Disease at a Flower Show, the Netherlands 1999. EID 8(1). Available: <http://www.cdc.gov/ncidod/eid/vol8no1/pdf/01-0176%20denboer.pdf>
- Ancelle T et al. A multifocal outbreak of trichinellosis linked to horsemeat imported from North America to France in 1993. American Journal of Tropical Medicine and Hygiene, 59(4): 615-619. Available: <http://www.ajtmh.org/cgi/reprint/59/4/615>
- Reintjes R et al. (2002) Tularemia Outbreak Investigation in Kosovo: Case Control and Environmental Studies. EID 8(1). Available: <http://www.cdc.gov/ncidod/eid/vol8no1/01-0131.htm>
- Reingold AL (1998) Outbreak Investigations—A Perspective EID 4(1). Available: www.cdc.gov/ncidod/eid/vol4no1/reingold.htm
- CDC: Epidemiology in the Classroom: Steps of an Outbreak Investigation. Available: <http://www.cdc.gov/excite/classroom/outbreak/steps.htm>
- Neumann GB (1990) Investigation of an Outbreak of Disease. In: Epidemiological skill. Proceedings 143, Postgraduate Committee in Veterinary Science, University of Sydney pp289-318.
- Gardner I (1990) Outbreak Investigation. In: Epidemiology at work. Proceedings 144, Postgraduate Committee in Veterinary Science, University of Sydney pp 7-13.
- Herd outbreak investigation resources for veterinarians: <http://www.vetmed.wsu.edu/courses-jmgay/OutBResources.htm>
- Thrusfield 3rd Edn pp 398-401