International Symposium on Veterinary Epidemiology & Economics – Maastricht, 20th-24th August 2012

Sensitivity of mortality reporting by the French oyster farmers

C. Lupo[1], A. Osta Amigo[1], Y.-V. Mandard[2], C. Peroz[3], I. Arzul[1], C. François[1], C. Garcia[1] & T. Renault[1]

Background and Objectives

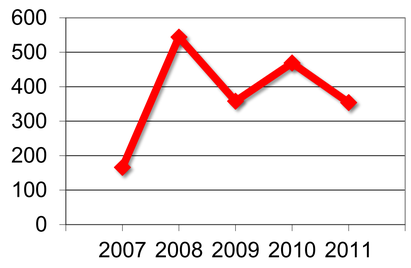
- As **diseased shellfish** seldom show symptoms, a **mortality event** represent the only sign leading to **disease suspicion**.

  Disease surveillance in shellfish is notably based on **passive mortality event reporting by shellfish farmers** to the local competent authority.

  The key **quality indicators** for passive surveillance are **reactivity** (*i.e.* timeliness of reporting) and **sensitivity** (*i.e.* completeness of reporting).

- Since **2008**, **increased mortality outbreaks** occur in France in spat of Pacific oyster *Crassostrea gigas*, leading to economic losses. As indicated on Figure 1, the number of reported mortality events varies from one year to another.

Figure 1: Number of farmers reporting mortality events, Charente-Maritime bay



What do the yearly variations reflect?
- the **epidemiological situation**
- the **farmers involvement in the reporting system**

?

Objective of the study:
To assess the yearly sensitivity of the reporting system in oysters

Methods…

Capture-recapture analysis

.Estimated **total number of oyster farmers concerned** with mortality cases **N**, $CI_{95\%}$

Chapman's estimate :

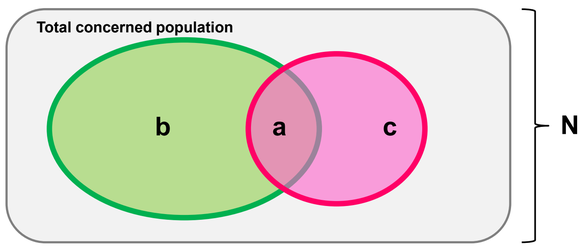
$$N = a + b + c + \frac{b.c}{a+1}$$

$$Var(N) = \frac{(a+b+1).(a+c+1).b.c}{(a+1)^2.(a+2)}$$

.Estimated sensitivity Se , $CI_{95\%}$ of source 1

Se = (a + b) / N

Figure 2: Representation of a two sources capture-recapture analysis



Underlying assumptions

Population is closed *OK*

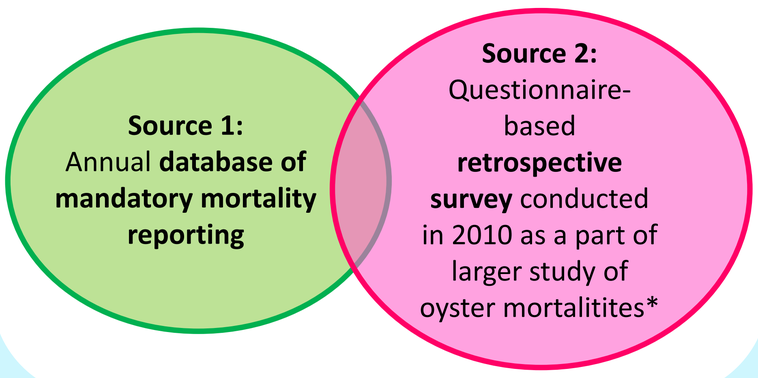
Only true cases …

Sources are independent *OK*

No heterogeneity of catchability among individuals *No but stratification : OK*

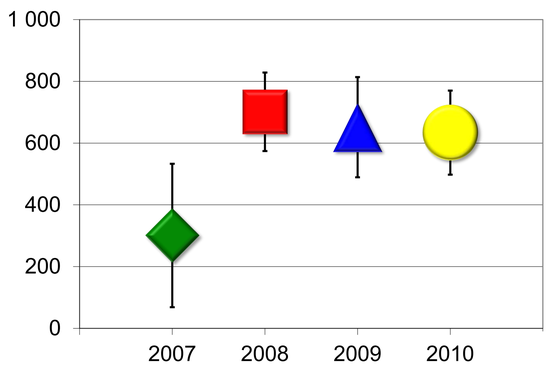
… and Material

Case definition: Oyster farmer concerned with mortality case
Place: Charente-Maritime, France (1/3 of French oyster farmers)
Time period: 2007-2010



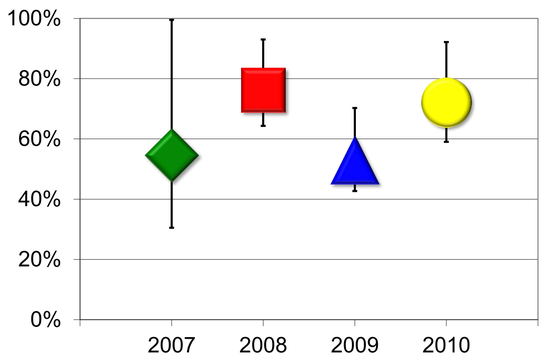
Results

Figure 2: Estimation of the **number N of overall concerned** oyster farmers by increased mortality events



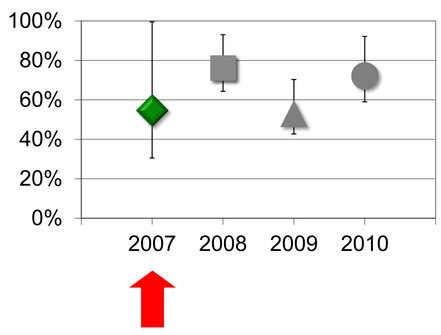
High increase in 2008 then apparent stability of the phenomenon

Figure 3: Estimation of the **sensitivity Se** of mortality reporting

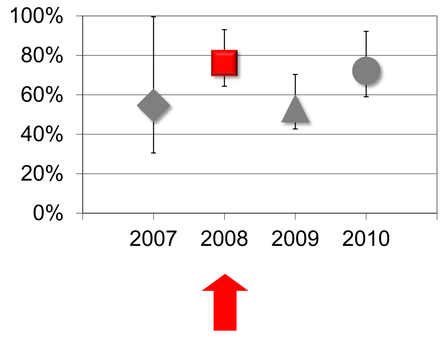


Yearly variation (P<0,001) **of the sensitivity**

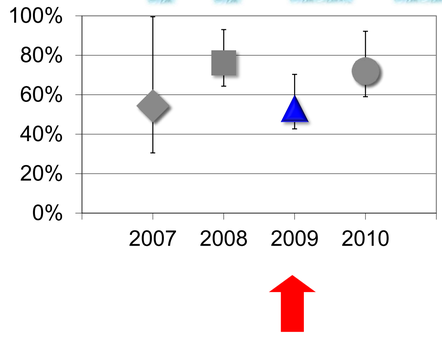
Discussion

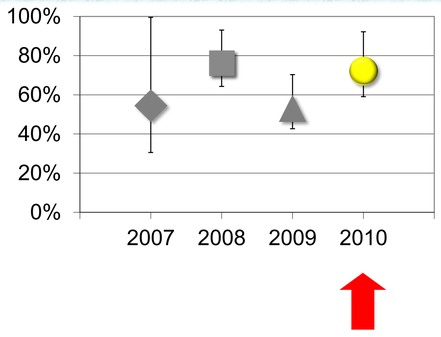


no outbreak, normal situation
significant under-reporting
→ basal level of reporting?



increased outbreaks
sensitization campaigns to report and improved awareness of the farmers





obtention of financial aids varied among years whereas the mortality outbreaks did not decrease
→ alternance of motivation to report / deception and under-reporting?

- Mortality reporting is potentially a good source of surveillance information but **not consistent over time.**
- **Bottlenecks** for reporting **and solutions to facilitate** reporting have to be identified to improve sensitivity of the reporting system, whatever the epidemiological situation is on a long-term period.

* C.Lupo, P.Ezanno, I.Arzul, C.François, C.Garcia, C.Jadot, J-P.Joly, T.Renault & N.Bareille (2011). How network analysis of oyster movements can improve surveillance programs? Annual meeting of National Reference Laboratories for Mollusc Diseases, La Rochelle France, 15-17 March 2011.

[1] *IFREMER-French Research Institute for Exploitation of the Sea, La Tremblade, France*
[2] *Departmental Direction for Territories and Sea, La Rochelle, France*
[3] *ONIRIS-Veterinary School & INRA, Nantes, France*

Contact: clupo@ifremer.fr