Guidelines for designing animal disease surveillance plans to improve understanding of CBPP epidemiology and infection

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3rd meeting of the SGE on CBPP of the GF-TADs for Africa
Theme: Surveillance

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OUTLINE

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5. Role of Laboratories in CBPP surveillance programs

6. Take home messages

Sources of information

Reference texts/publications/Presentations consulted

➤ **Texts:**
- Rev. Sci. Tech. Off. Int. Epiz. 1997, 16 (3) 888-904
- WOAH: Terrestrial Animal Health Code Chapter 1.10 (Application for official recognition by the OIE of free status for CBPP) (https://www.woah.org)
- WOAH recommended standards for epidemiological surveillance systems- Appendix 3. (http://www.oie.int/eng/normes/MCode/A_00153.htm)
- FAO Animal Health Manual No. 6 (Rome, 1999): Manual on the Preparation of National Animal Disease Emergency Preparedness Plans
- FAO Animal Health Manual No. 8 (Rome, 1999): Manual on livestock disease surveillance and information systems
- FAO Animal Health Manual No. 10 (Rome, 2000): Manual on participatory epidemiology. Methods for the collection of action-oriented epidemiological intelligence.
- FAO Animal Health Manual No. 14 (Rome, 2002): Manual on the preparation of CBPP contingency plans
- Guidelines for designing animal disease surveillance plans, FAO 2021 (https://openknowledge.fao.org)

➤ **Presentations:**
- Veterinary building capacity in CBPP epidemiosurveillance (F. Thiaucourt: OIE Workshop, Addis Abeba du 28 - 31 January 2002)
- Proposition de guide de surveillance de la PPCB (F. Bendali: Coordination Régionale PACE Bamako; Atelier PPCB Méthodes Sérologiques, Bamako, février 2003)
- WOAH ad-hoc group on CBPP surveillance systems. Challenges and aspirations in the control of CBPP: abattoir surveillance: 13 June 2023

Some highlights

➢ Surveillance is the <u>collection, analysis, and interpretation of data</u> for decision-making.

➢ The main purpose is early <u>detection of disease as to guide interventions</u>. The sooner a disease is found before it makes progress along the epidemic curve, the better it is.

➢ Strong surveillance system is essential to provide decision-makers with <u>quality and timely information</u> on the status of animal diseases in a country, enabling them to develop effective disease control programs and respond rapidly to emerging threats to livestock and public health.

➢ Effective surveillance involves more than just collecting samples or conducting laboratory tests. It requires <u>thoughtful planning</u> to ensure that the benefits outweigh the costs and that all steps are properly set up.

➢ The type of surveillance applied depends on the <u>desired outputs needed</u> to support decision-making.

➢ A procedure should be in place for the rapid collection and transport of samples from suspect cases to a <u>laboratory</u> for analysis.

Some highlights

Surveillance has two common types/methods:

➢ **Passive (continuous) surveillance:** based on the detection of suggestive signs and systematic reporting of suspected cases.

➢ **Active surveillance:** based on organized and planned collection and testing of samples, even in the absence of any clinical signs.

Several approaches to apply the two surveillance types :

- **Risk-based surveillance:** surveillance strategy focussing on where the disease is most likely to be present (high-risk areas)
- **Targeted surveillance:** form of active surveillance that collects data on specific diseases
- **Random surveillance:** form of active surveillance in targeted sites and animals selected randomly
- **Abattoir surveillance:** routine surveillance to detect disease at abattoir based on suspected lesions
- **Participatory surveillance:** community-based surveillance following a participatory approach
- **Event-based surveillance:** passive reporting of disease event from the field agents
- **Sentinel surveillance:** monitoring of herds/species from a limited number of selected sites based on risk
- **Syndromic surveillance:** non-specific diagnostic indicators (one or more clinical signs).

What is CBPP?

- One of the most important diseases in Africa
- Classical animal movement disease
- Huge economic losses (cost unknown)?
- Endemic in sub-Saharan Africa (true prevalence unknown)?
- Listed as notifiable disease by WOAH (former list A)
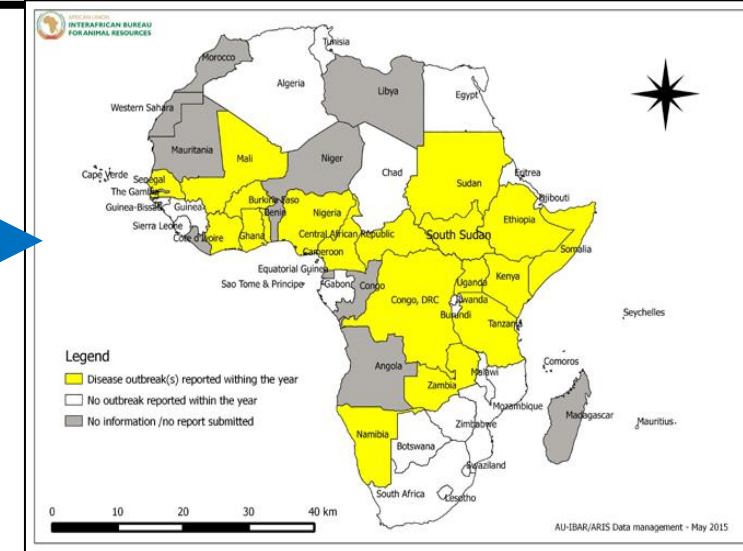
1. Respiratory disease
2. Pleural fluid
3. Hepatization and fibrin on the lungs (unilateral) ⎤ acute lesions
4. Marbled appearance of the lungs when cut ⎦
5. Lung adherence ⎤ chronic lesions
6. Pulmonary sequestrations ⎦
7. Caused by *Mmm*

Legend
- Disease outbreak(s) reported withing the year
- No outbreak reported within the year
- No information /no report submitted

AU-IBAR/ARIS Data management - May 2015

CBPP reporting in FAO/ECTAD-WCA countries through AHSR

➢ Since 2019, the FAO Regional Office for ECTAD-WCA has been collecting data on the animal health situation from its member countries.

➢ Objective: To share information with countries and the international community (via FAO/EMPESS) to improve visibility and control preparedness.

Table 1: Frequency of weekly reporting by ECTAD-WCA countries on their animal health status (2019-2024)							
Country	**Year**						
	2019	**2020**	**2021**	**2022**	**2023**	**2024**	**Total**
Benin	NA	NA	NA	NA	0	1	**1**
Burkina	0	5	6	2	0	1	**14**
Cameroun	1	5	5	8	1	1	**21**
CDI	0	2	1	0	3	0	**6**
Ghana	1	5	6	1	0	2	**15**
Guinée	0	5	10	9	5	3	**32**
Liberia	0	2	6	8	5	0	**21**
Mali	0	4	8	9	3	2	**26**
Niger	NA	NA	7	10	7	2	**26**
Nigeria	NA	NA	7	9	4	1	**21**
RDC	0	3	9	9	6	2	**29**
Sénégal	1	5	10	8	7	3	**34**
SL	1	4	10	10	5	1	**31**
Total	**4**	**40**	**85**	**83**	**46**	**19**	**277**

CBPP reporting in FAO/ECTAD-WCA countries through AHSR

CBPP is endemic in WCA Africa but under reported.

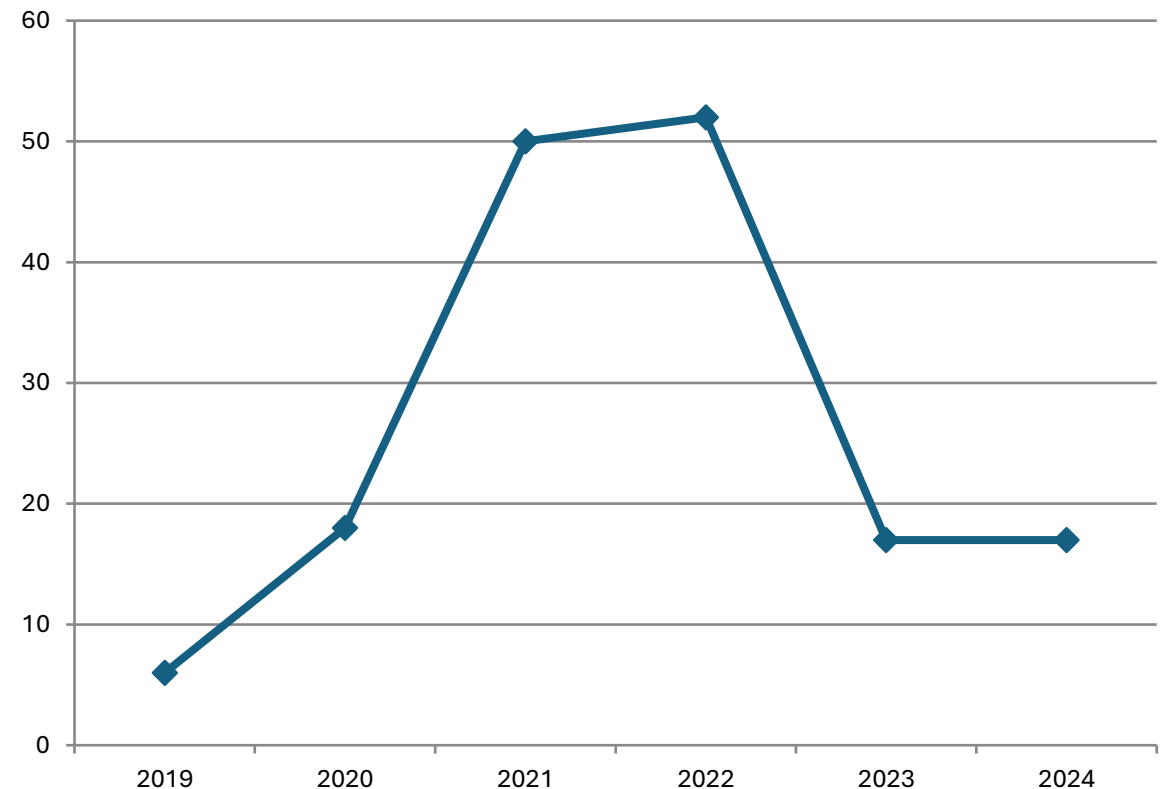| Table 2: Number of CBPP outbreaks reported per country and per year (2019-2024)							
Countries	**Year**						
	2019	2020	2021	2022	2023	2024	Total
Benin	N/A	N/A	N/A	N/A	0	0	0
Burkina	0	0	0	0	0	0	0
Cameroun	1	1	2	5	1	2	12
CDI	0	0	0	0	0	0	0
Ghana	3	0	0	0	0	1	4
Guinée	0	5	22	12	6	4	49
Liberia	0	0	0	0	0	0	0
Mali	0	3	1	0	0	2	6
Niger	N/A	N/A	2	5	1	0	8
Nigeria	N/A	N/A	0	0	0	0	0
RDC	0	0	1	27	8	7	43
Sénégal	1	8	20	3	1	1	34
SL	1	1	2	0	0	0	4
Total	**6**	**18**	**50**	**52**	**17**	**17**	**160**

Fig. 1: Evolution of CPPP outbreaks per year (2019-2024)

Proposed approaches for CBPP surveillance

➢ In general, <u>many farmers remain silent</u> about disease cases or localized outbreaks when losses are limited to just a few animals, fearing health control measures (movement restrictions, slaughtering…) that can cause them <u>enormous unreimbursed economic losses</u>.

➢ In the case of CBPP (endemic countries) the following three methods should be considered:

1. Abattoir surveillance

2. Participatory surveillance/community diagnosis.

3. Serological surveillance (random sampling)

➢ In non-endemic countries, the following methods should be considered for early detection :

1. Abattoir surveillance
2. Risk-based serological surveillance (transversal survey)
3. Sentinel surveillance : monitoring of herds/species from a limited number of selected sites based on risk

1. Abattoirs/slaughterhouses/traditional butcheries surveillance

Definition: active target surveillance to detect a disease based on lesions.

Interest:
Opportunity to use meat inspection at abattoirs/slaughterhouses to enhance CBPP detection without outbreaks being officially declared (abattoirs as sentinels for CBPP detection).

According to the Terrestrial Animal Health Code (WOAH, 2009), the most effective method of CBPP surveillance is an enforced meat inspection program in the abattoirs followed by laboratory confirmation of suspicious cattle.

Potential advantages:
- CBPP suspicious lesions (chronic cases) can be detected there.
- Can suggest the situation of the disease without outbreaks being officially declared.
- Practical and reliable solutions for countries without clinical CBPP cases.
- Relatively inexpensive and easy collection of diagnostic specimens for veterinary lab testing
- Collection of photos for educational/awareness purposes.
- Provision of relatively constant supply of surveillance data.

Potential challenges:
- Issues of animal identification and traceability (difficulties of tracing back the origin of the animals to the infected herds for further investigations and interventions).
- Issues of differential diagnosis (need well trained meat inspectors and lab testing).
- Issues of data management (need strong relationships between inspection services and veterinary services for data analysis).

2. Participatory surveillance

Definition: form of passive surveillance with the involvement of the community or farmers in collecting and reporting health information following a participatory approach (community-based surveillance).

Interest:
- Have mutual trust with cattle owners to ensure their active participation as to improve understanding of animal health problems. It is recognized that local people have very rich and detailed knowledge about the animals they keep and the diseases that can gravely affect their livelihoods.
- Should be integrated into national surveillance systems

Potential advantages:
- More inclusive and increase ownership of the farmers in the surveillance system
- Empower stakeholders and gives a voice to those who are often not heard
- Increase sustainability by relying on formal and informal stakeholder networks
- Provide a strong basis for the common identification of socially acceptable solutions

Potential challenges:
- Biases associated with the population that chooses to participate
- Limited specificity because of reliance only on syndromic definitions of disease
- Issues related to ensuring consistent participation
- Lack of control over the characteristics of the population sample.

3. Serological surveillance

Definition: measurement of antibodies to get an idea of current prevalence and geographic distribution

Interest:
- Opportunity to monitor progress of a program control strategy or the spread of a disease to manage it effectively.

Potential advantages:
- Serological surveillance is not the preferred strategy for CBPP, but relatively more "objective" than other surveillance approaches
- Allow to get an idea of current prevalence and geographic distribution of the disease.

Potential challenges:
- Costs (field missions, materials, transport of samples to laboratories, reagents…).
- Survey is more likely to be carried out on a small subset (a random sample) of population than on a larger cross-section of animals, and the question of sampling error then comes into play.
- Objections of farmers to the taking of blood from live animals.
- Animals are not always easy to handle when it comes to taking samples.
- Issues of specificity and sensibility of currently available lab tests.
- Issues of differentiation of vaccinal and infectious antibodies (vaccination or cross-reactive sera).
- Issues related to nomadic herds present a special problem.

Role of Laboratories in CBPP surveillance programs

Veterinary Diagnostic laboratory is a vital component of disease surveillance and control.

Accurate and timely laboratory information are the foundation upon which disease treatment, prevention and control programs are based.

Therefore, it is essential that:

- Laboratories maintain the standard norms.

- Field staff be regularly trained on the sampling techniques as well as updated with the requirements for preserving, packaging and transporting samples.

- Maintain good links between the epidemiological teams and the diagnostic labs for rapid collection and transport of samples from suspect cases for lab. diagnoses.

Take Home Messages

Effective surveillance involves more than just collecting samples or conducting laboratory tests. It requires <u>thoughtful planning </u>to ensure that the benefits outweigh the costs and that all steps are properly set up.

Therefore, it is suggested that:

- All the surveillance approaches should require good links between the epidemiological teams and the diagnostic labs for <u>rapid collection and transport of samples </u>from suspect cases to a laboratory for diagnoses.
- A procedure should be in place for basic <u>meat inspection training </u>and the recognition of characteristic lesions.
- Animal <u>identification and traceability </u>system is key to support abattoir surveillance and easily detect the origin of infected animals (the infected herds).
- Although there is no CBPP wildlife reservoir, <u>non-bovine ruminants (goats) </u>should also be included in surveillance schemes as potential reservoirs.
- <u>Molecular epidemiology tools </u>may be considered as they may eventually indicate the probable origin of new outbreaks.
- Surveillance of <u>vaccination programs </u>and their efficacy assessment is key.

THANKS