Increasing the sensitivity of the surveillance system is understood as increasing the probability of finding positive cases, if positive cases exist. To assess the sensitivity of the system, consult the EVA tool, to re-design the system with the goal of increasing sensitivity, read through the advice below.

	Surveillance design step	Advice for improvement of SENSITIVITY
1	**Surveillance system**	
1.1	**Hazard**	
1.2	**Surv. Objective**	
1.3	**Geographical area covered**	
1.4	**Susceptible species**	
1.5	**Risk characteristics**	The use of risk-based surveillance can increase sensitivity when the surveillance objective is case detection or demonstrating freedom. This does not apply for surveillance components aiming at estimating disease frequency, because non representative sampling will lead to biased estimates. It is particularly important to pay attention to risk characterisation when the sensitivity of the system must be strenghtened. Geographical: Sensitivity can possibly be increased by targeting for example areas with high population densities, complex movement patterns, special geographical features or other population level risks and high-risk periods that may affect the risk of infection.
2	**Components overview**	
3	**Target population**	
3.1	**Target species**	Coverage is expected to indirectly increase sensitivity. You may consider activating the performance advice also for the coverage attribute.
3.2	**Target sector**	
3.3	**Sectors missed**	
3.4	**Geographical area covered**	
3.5	**Target criteria**	Risk-based targeting can increase sensitivity.
3.6	**Percentage covered**	
4	**Disease suspicion**	
4.1	**Definition**	The definition or criteria used to identify a suspect case should be broad enough to cover all aspects and variations in the clinical presentation. Where disease is difficult to detect based on clinical signs and probability of detection is low, consider including other criteria such as risk factors or production factors.
4.2	**Obligations**	Legal requirements to report notifiable disease can significantly increase the likelihood that suspect cases are reported. However, depending on the consequences of reporting the opposite may occur.
4.3	**Notification procedures**	The ease with which the observer can report suspect cases to the authorities will encourage reporting. Avoid complex or difficult reporting proceedures that may deter notifications and thus reduce sensitivity.

4.4	**Actions upon suspicions**	Consider carefully the consequences of reporting and the implications of this for the observer. Where consequences are percieved to be negative e.g. movement restrictions placed on the farm, this may negatively affect the sensitivity so consider ways to improve trust between observer and investigator and ensure any precautionary measures are kept to a minimum until disease is confirmed. Consider the duration of the precautionary measures so that the impact is minimal on the suspected premises. Preparedness: Ensure labs are ready to recieve and test samples at short notice. Chain of command: Ensure the test results reaches the suspect premises in a timely manner to lift measures asap or to carry out contingency plans.
4.5	**Actions upon confirmation**	
5	**Enhancements**	Incorporating enhancements into the surveillance can increase the sensitivity by encouraging participation or raising awareness of the surveillance and the disease.
6	**Testing protocol**	Choose (in conjunction with those responsible for laboratory analysis) a suitable testing option for this component to achieve high sensitivity, considering factors affecting analytical and diagnostic sensitivity as well as costs.
6.1	**Type of test to be carried out**	
6.2	**Type of sample to be collected**	
6.3	**Pooling**	If the target unit is the animal, then testing pooled samples will have a lower sensitivity compared to testing individual samples. If the target unit is a group of animals (such as herd) then testing pooled samples can increase the sensitivity in detecting infected herds (especially when the hazard under surveillance is expected to be present at a low prevalence).
6.4	**Screening/first test**	Contact laboratory personnel to find out the most sensitive tests available, and what type of samples they require. Aim for high sensitivity and specificity if possible. Specificity is not so crucial as long as confirmatory testing is used. Also consider factors such as ease of application, costs and ease of standarization. Finally, the choice of test may also depend on individual characteristics (e.g. production type or age), geographical featuers (distance from the laboratory) and other factors.
6.5	**Confirmatory/ second test**	The use of tests in series (screening and then confirmatory) reduces sensitivity. If screening is needed (due to costs) consider the tests with high sensitivity. Two tests can also be used in parallel (samples positive in any of the two tests are considered positive) in order to increase sensitivity. Also consider factors affecting diagnostic sensitivity in the field of in the laboratory such as adequate cool chain, training of field staff, quality assurance in the field and in the laboratory and the use of positive controls.
6.6	**Further details**	

7	**Study design**	Study design will influence sample size, which in turn determines sensitivity. Furthermore, study design also affects other PA's such as bias, timeliness2, coverage, representativeness and NPV (see comments for these PAs) which in turn affect the sensitivity of the entire surveillance system.
7.1	**Point of sample collection**	Carefully choose the sampling point as this influences the ease of accessing individuals, the preparedness of individuals to cooperate, the availability and quality of a sampling frame, representativeness and timeliness, all of which may indirectly affect sensitivity.
7.2	**Selection of units**	
7.3	**Target unit**	
7.4	**Sampling unit**	
7.5	**Sampling design**	
7.6	**Number of units in the target population**	
7.7	**Sensitivity of the testing protocol**	
7.8	**Specificity of the testing protocol**	
8	**Sampling strategy**	Step with high potential to increase sensitivity. See specific attributes below.
8.1	**Sampling at the primary sampling unit (PSU) level:**	Lower design prevalence (assuming a prevalence under 50%) will increase sensitivity. Higher confidence will increase sample size, which can increase sensitivity to detect at least one positive case
8.2	**Sampling at the secondary sampling unit (SSU) level:**	Lower design prevalence (assuming a prevalence under 50%) will increase sensitivity of components aiming at estimating prevalence. Higher confidence will increase sample size, which can increase sensitivity to detect at least one positive case.
8.3	**Selection criteria WITHIN the population**	Risk-based targeting can increase sensitivity. This is not the case when the goal is to estimate prevalence.
8.4	**Risk-based allocation**	Risk-based targeting can increase sensitivity. This is not the case when the goal is to estimate prevalence.
8.5	**Sample size calculation**	Sensitivity can be increased with greater sample size. For a fixed sample size, sensitivity can also be increased by using risk-based designs (visit the WIKI for more information and help).
8.6	**Sample allocation at the primary level**	The use of convenience sample can decrease sensitivity. Purposeful sampling is only associated with increased sensitivity when risk-based criteria are used.
8.7	**Sample allocation at the Secondary level**	The use of convenience sample can decrease sensitivity. Purposeful sampling is only associated with increased sensitivity when risk-based criteria are used.
8.8	**Sample collection timeline**	
9	**Data Generation/ Sampling collection process**	
9.1	**WHO will collect the samples?**	More specialized labor can result in better sensitivity.

9.2	**HOW will samples be collected?**	A well-defined protocol (a protocol that aims to have samples collected that accurately reflect the true disease status) and appropriate training can improve sensitivity.
9.3	**WHEN/HOW OFTEN will samples be collected?**	Repeated sampling of the same unit improves herd sensitivity and consequently suveillance sensitivity.
9.4	**Training**	Appropriate training can improve sensitivity, in particular for sampling approaches that are complicated (e.g. require clinical assessment prior to sampling) or require cautious sample management.
9.5	**Follow-up**	If lack of follow up means the sampling plan will not be fulfilled, so either not all samples are taken or the wrong samples are taken, this will influence sensitivity.
10	**Transfer means**	
10.1	**HOW will samples be transferred?**	This step influences time and possibly temperature so anything related to time and temperature that influences the ability to detect a positive sample will influence sensitivity. For example, bacterial growth, die-off, lysis or other types of deterioration of sample materials.
10.2	**WHEN/HOW OFTEN will samples be collected?**	
10.3	**Training**	
11	**Data Translation/ sample analyses process**	
11.1	**WHO will perform the analyses?**	More specialized labor can result in better sensitivity. When selecting institutions to carry out analysis ensure good quality assurance, auditing proceedures and internal expertise in the methods employed.
11.2	**HOW will samples be analysed**	Consider the sensitivity of the method to be used, espectially if it is dependent on observational data or subjective interpretation.
11.3	**WHEN/HOW OFTEN will samples be collected?**	
11.4	**Expected LOAD**	
11.5	**Training**	A well-defined protocol and appropriate training can improve sensitivity.
11.6	**Follow-up**	Monitoring the information recieved can ensure problems with compliance, coverage or sample/data quality can quickly be rectified and thereby increase the sensitivity of the system in the longer term.
12	**Epidemiological analyses**	Syndromic surveillance: the method of analusis chosen may influence the likelihood of detection and hence sensitivity e.g. flags or alert thresholds.
12.1	**Are there any epidemiological DATA that need to be collected?**	
12.2	**WHO will perform the analyses?**	
12.3	**HOW will epidemiological analyses be performed?**	
12.4	**WHEN/HOW OFTEN?**	
12.5	**Training**	

12.6	**Data management needs**	
12.7	**Software needs**	
13	**Dissemination of results**	Actively disseminating results can improve engagement of surveillance stakeholders, and as a consequence improve sensitivity.
13.1	**WHO will disseminate the results?**	
13.2	**WHO is the TARGET of dissemination?**	
13.3	**HOW will results be disseminated?**	
13.4	**WHEN/HOW OFTEN?**	
14	**Surveillance review**	Review system regularly based on the sensitivity points detailed in this framework. Review can be necessary for instance in order to identify when new (more sensitive tests) become available, whether risk-based surveillance can be implemented or improved.
14.1	**Who**	
14.2	**When**	
14.3	**How often**	