Surveillance design framework

Arianna Comin, ***Fernanda Dórea***, Ann Lindberg

WP4 - SVA

Birgit Schauer, Christoph Staubach, Katja Schulz

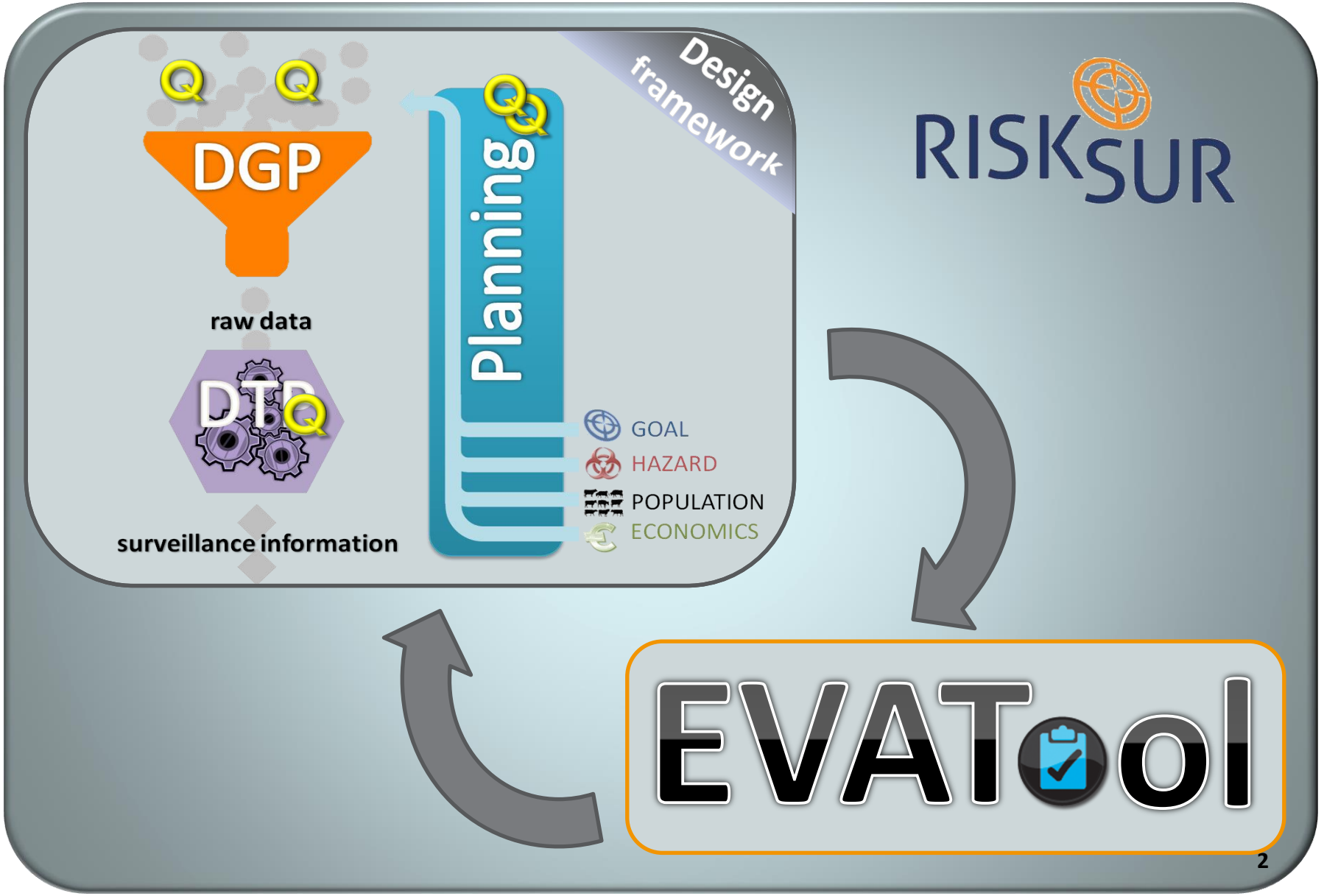
WP3 - FLI

Lucy Snow (APHA), Adam Brouwer (APHA) Marta Martinez (UCM)

WP2

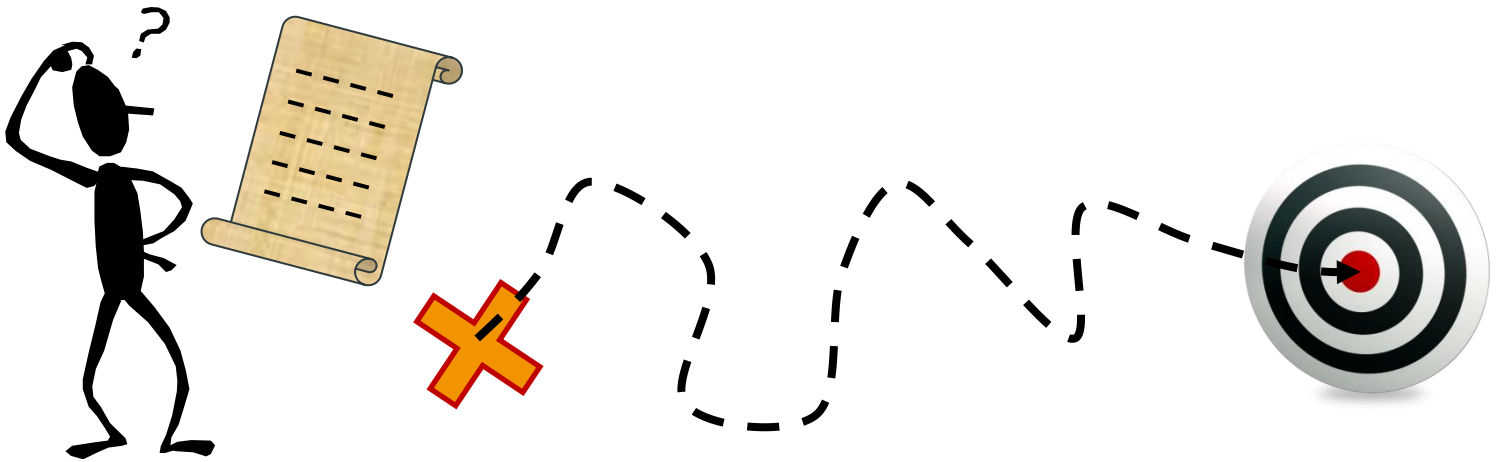
The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement N° 305169.

Surveillance 2.0



Basic concepts about design framework

- Guided tour
- No assessments of quality / goals achievement, etc



Target audience

- "***competent and technical level users who design, implement or evaluate surveillance strategies for infectious livestock diseases within the European Union***".

- Likely it will not be an individual, but rather a team, gathering knowledge in epidemiology and surveillance. The team is also expected to be supported by diagnostic experts and ideally an economist advisor.

Surveillance DESIGN

System

Bluetongue in Germany – Disease freedom documentation


OBJECTIVE


HAZARD


GEO Coverage


POPULATION


RISK CHARACTERISTICS

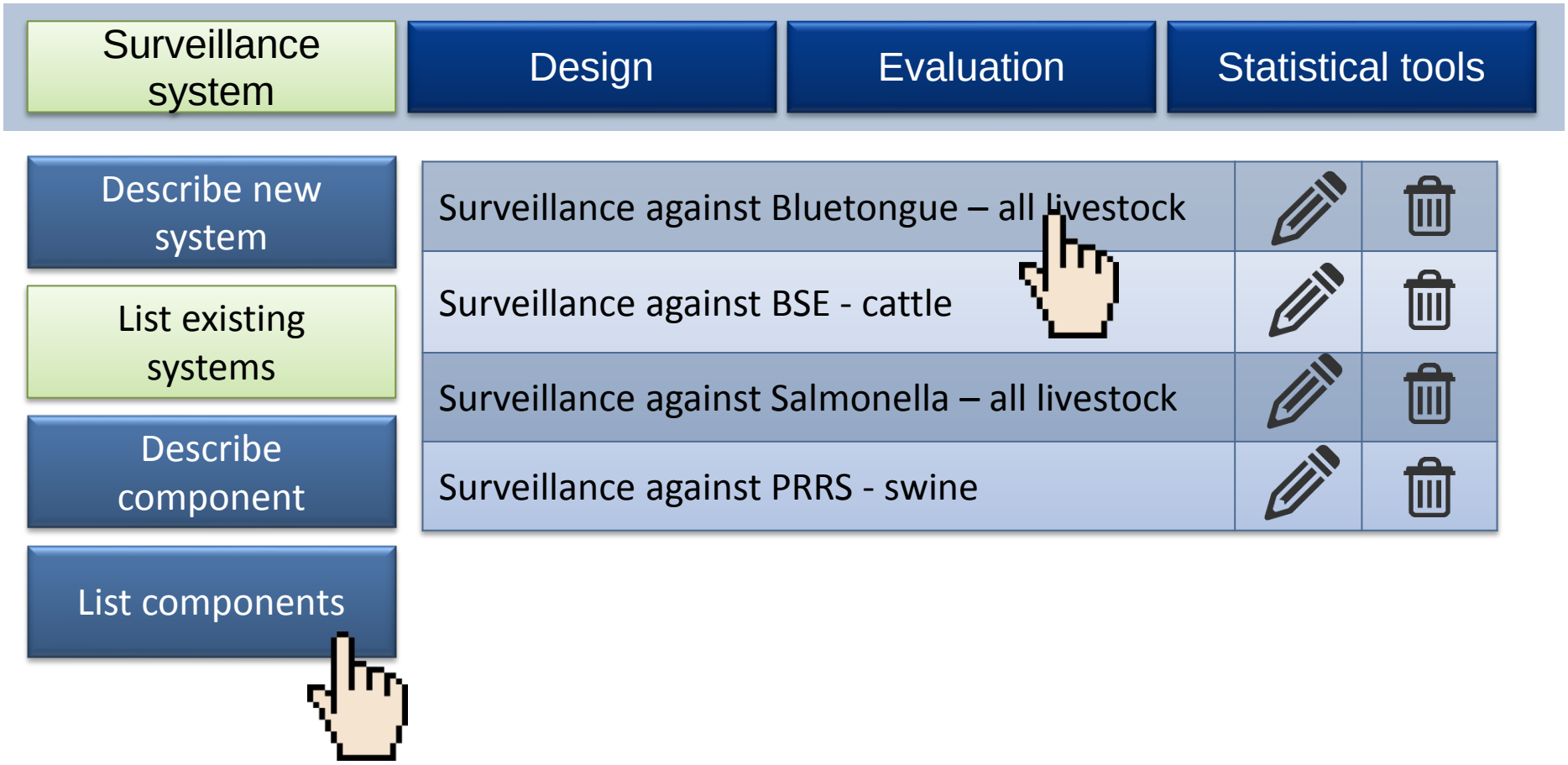
Components

- Active surveillance of sheep
- Passive surveillance of sheep
- Active surveillance of wild ruminants
- Active surveillance of cattle
- …

Design a component

- Target population
- Testing protocol
- Study design
- Sampling strategy
- …

Final product: Web-based tool



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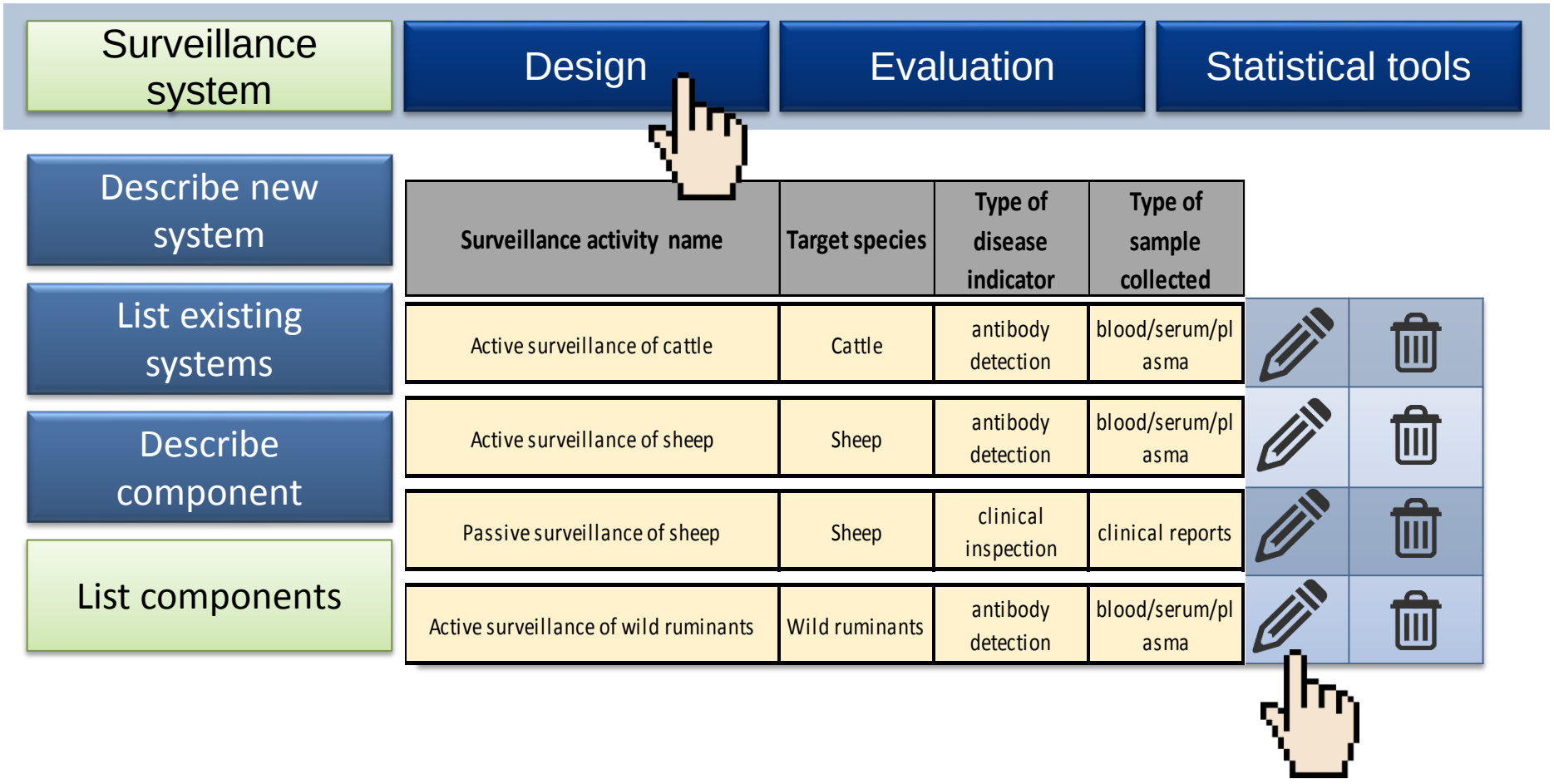

Surveillance DESIGN

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Bluetongue in Germany – Disease freedom documentation


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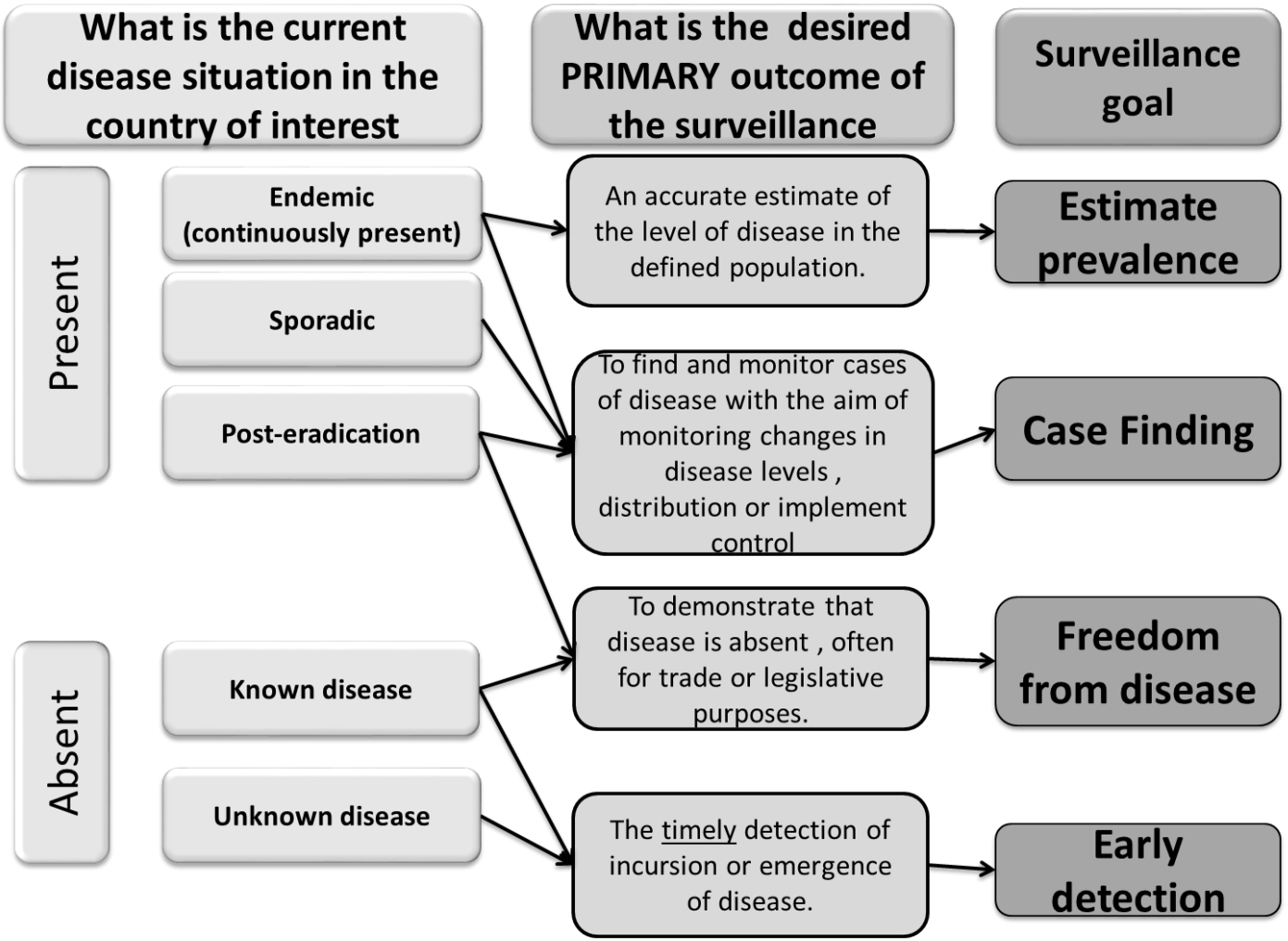
RISKSUR

HAZARD

1.1	Hazard
	Please write the hazard name in the box below:
	Bluetongue disease
	Visit the WIKI to get surveillance advice for particular hazards.

RISKSUR

OBJECTIVE



System → Components → Design

RISKSUR

RISK CHARACTERISTICS

A. Population level risk factors

Are there any population level risks affecting the risk of introduction, infection, detection or consequences. If so, click on the button to add risk factors. Then state the risk factor (one per field) and describe details in the field beside it. Please note that risk factors can also be protective (e.g. vaccination).

Geographical factors: e.g. clustering of the population, areas with high trade volume (within-country, import, illegal trade, ...), areas with high human population movements, ...

Specify risk factor	Higher risk of (check all that apply):	Describe details
Animal density	Introduction **Infection** Detection Consequences Undefined	Higher density increases opportunity for transmission
Landcover	Introduction **Infection** Detection Consequences Undefined	Influences vector abundance
Altitude	Introduction **Infection** Detection Consequences Undefined	Influences vector abundance

System → **Components** → Design

RISKSUR

Surveillance component	Target species	Target sector	Data collection point	Study type	Type of disease indicator	Type of sample collected
Active surveillance of cattle	Cattle	All	at the source (farm, wild life habitat, etc)	survey	antibody detection	blood/serum/plasma
Active surveillance of sheep	Sheep	All	at the source (farm, wild life habitat, etc)	survey	antibody detection	blood/serum/plasma
Passive surveillance of sheep	Sheep	All	at the source (farm, wild life habitat, etc)	passive	clinical inspection	clinical reports
Active surveillance of wild ruminants	Wild ruminants	na	at the source (farm, wild life habitat, etc)	survey	antibody detection	blood/serum/plasma
Trade investigations of cattle	Cattle	All	at the source (farm, wild life habitat, etc)	continuous data collection	antibody detection	blood/serum/plasma
Passive surveillance of cattle	Cattle	All	at the source (farm, wild life habitat, etc)	passive	clinical inspection	clinical reports
Active surveillance of goats	Goats	All	at the source (farm, wild life habitat, etc)	survey	antibody detection	blood/serum/plasma

System → Components → **Design**

RISKSUR

- Target Population
- Disease suspicion
- Enhancements
- Testing protocol
- **Study design**
- Sampling strategy
- Data Generation/ Sampling collection
- Transfer means
- Data Translation/ sample analyses
- Epidemiological analyses
- Dissemination of results
- Surveillance review

7 Study design

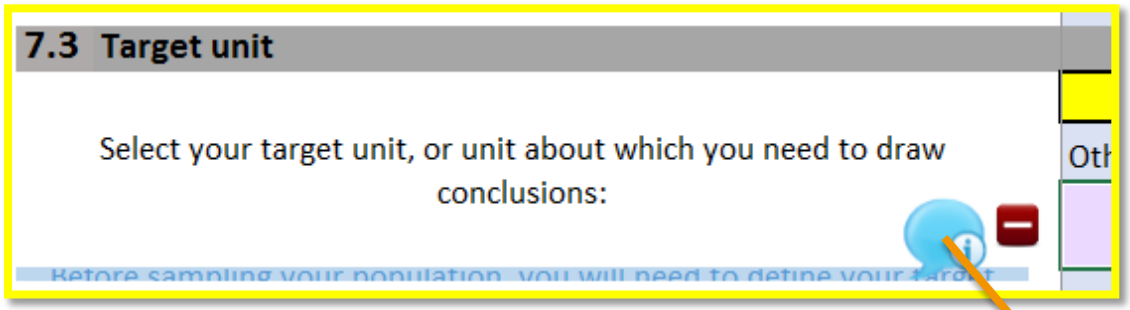
7.1-7.6 are likely NOT relevant for passive surveillance components. But please do refer to 7.7 and 7.8

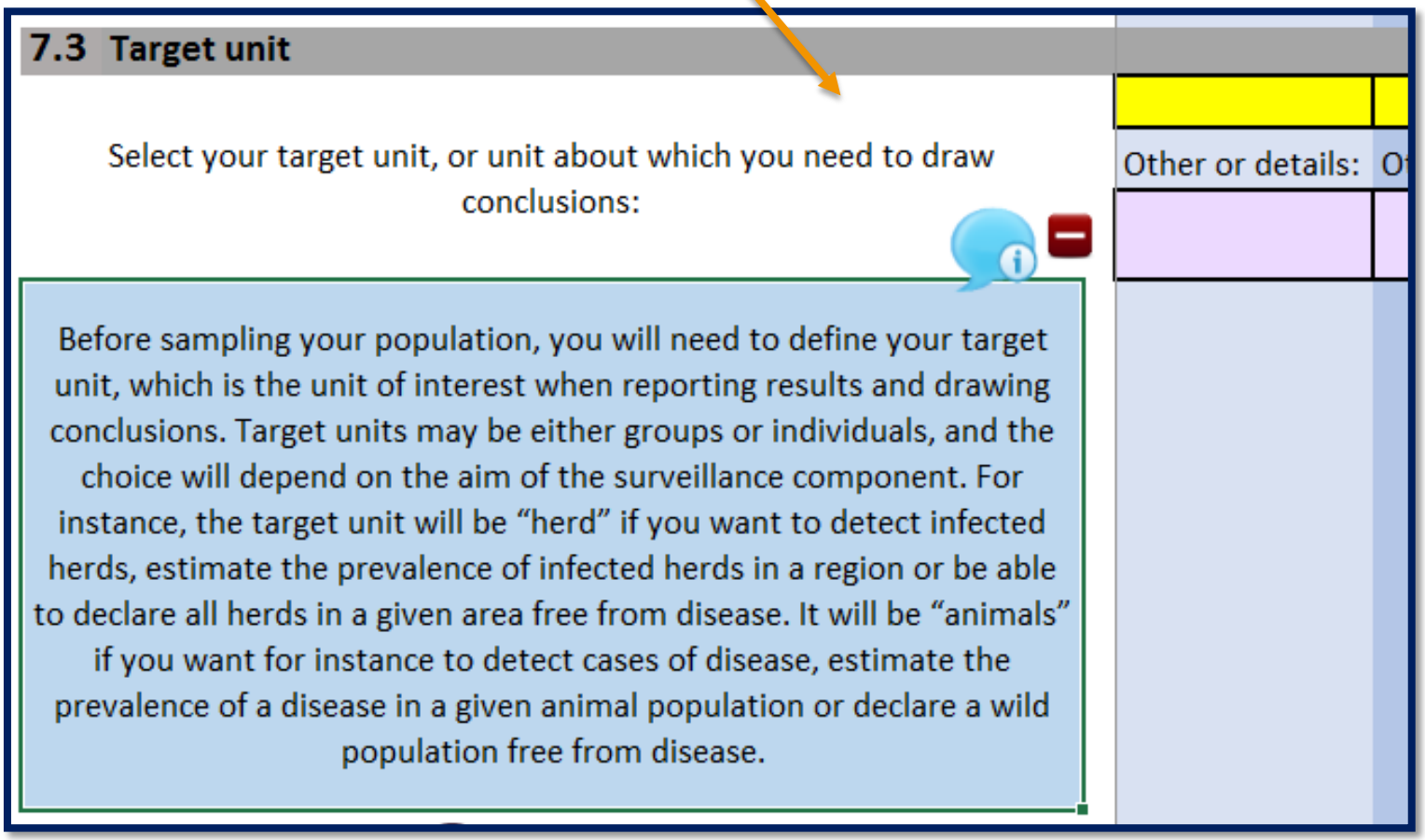
more

less

names of the components are imported from Section 2

	Component 1	Component 2	Component 3	Component 4	Component 5
7.1 Point of sample collection					
Informed in section 2 as pasted here. Use the field "other or details" to add more information if needed. Visite section 2 if you want to edit the point of sample collection.	abattoir				
	Other or details	Other or details	Other or details	Other or details	Other or details:
7.2 Selection of units					
Sampling will be detailed in the next section. However, the selection of units should consider carefully the availability of a sampling frame. If it is not possible to identify and locate farms/herds/flocks consider where animals can be located and sampled.					


7.3 Target unit
Select your target unit, or unit about which you need to draw conclusions:
Oth


7.3 Target unit
Select your target unit, or unit about which you need to draw conclusions:
Other or details:
Before sampling your population, you will need to define your target unit, which is the unit of interest when reporting results and drawing conclusions. Target units may be either groups or individuals, and the choice will depend on the aim of the surveillance component. For instance, the target unit will be “herd” if you want to detect infected herds, estimate the prevalence of infected herds in a region or be able to declare all herds in a given area free from disease. It will be “animals” if you want for instance to detect cases of disease, estimate the prevalence of a disease in a given animal population or declare a wild population free from disease.

	Component 1	Component 2	Component 3
7.7 Sensitivity of the testing protocol	Needed for sample size calculation		
Useful tools for Sensitivity and Specificity calculation (CLICK ON ICON): 			
Indicate the SENSITIVITY for the testing protocol above?			
Please note that for a study design that involves two stage sampling, the sensitivity at the higher level (primary sampling units, for instance herd) will be given by the sampling strategy, which is defined later in the sample size calculation. For the testing of the units of observation (secondary sampling units), the sensitivity is given by the testing protocol. The questions below refer to this latter sensitivity.			
Sensitivity for one single test should be given by the laboratory for			

Surveillance *RE-design*

The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement N° 305169.

REDESIGNING surveillance to improve performance

Now that you have documented the current (or desired) design of you surveillance system, it is time to think about how to strengthen the design by optimizing specific performance attributes.

To ***assess*** an attribute, please **visit the EVA tool**. To *re-design the system with the goal of improving a specific attribute*, please read below.

***Performance attributes related to the effectiveness of surveillance*, as well as *cost considerations*, are listed below. Click on each desired attribute to review your current design, in light of the links between specific design decisions and the effectiveness measures listed below.**

Along the redesign pages, the current design wil be presented to you, highlighting which steps are most relevant when redesigning surveillance to improve a specific effectiveness measure. Advice will also be given regarding redesign options. In order to change your design, use the links provided to revisit the design steps.

- Multiple hazards
- Representativeness
- Robustness
- Sensitivity
- Coverage
- Negative Predictive Value
- False Alarm Rate
- Bias
- Positive Predictive Value
- Timeliness
- Precision
- Cost

GLOSSARY

Which performance attributes are most relevant for my surveillance objective?

Back to the surveillance DESIGN start

Surveillance design Step	Effect on SENSITIVITY of Surveillance	names of the components are imported from Design Section 2				more / less
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		Component 1	Component 2	Component 3	Component 4	Component 5
1 Surveillance scenario						
1.1 Hazard						
1.2 Surveillance objective		estimate prevalence				
1.3 Geographical area covered						
1.4 Susceptible population		domestic pigs farmed wild boar				
1.5 Risk characteristics	**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.**	0		No risk declared		
		0		No risk declared		
		0		No risk declared		
		0		No risk declared		
		0		No risk declared		
		0		No risk declared		
		0		No risk declared		
		0		No risk declared		
		0		No risk declared		
		0		No risk declared		
		0		No risk declared		
		0		No risk declared		
2 Surveillance activities 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.**	cattle				
3.2 Target sector		dairy				
3.3 Sectors missed						

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GLOSSARY

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Back to the surveillance DESIGN start

Further developments

- Specific surveillance objectives
  - Early detection of disease
  - Freedom from Disease documentation
  - Case detection
  - Prevalence estimation

Outputs

- Surveillance activities **designed**
  - Set list of steps
  - Guidance through the steps
    - Tools
    - Wiki
- Surveillance activities **re-designed**
- Surveillance activities **documented**
  - Standardized Reports

THANKS!
We welcome your input

- **Content**
  - (available now and in active development)
- Webtool – **Summer** (test mode)

http://www.fp7-risksur.eu/

fernanda.dorea@sva.se