RISKSUR

RISKSUR Training Series

Evaluation of animal health surveillance

This lecture provides an introduction to the concept of evaluation, applied to the evaluation of animal health surveillance.

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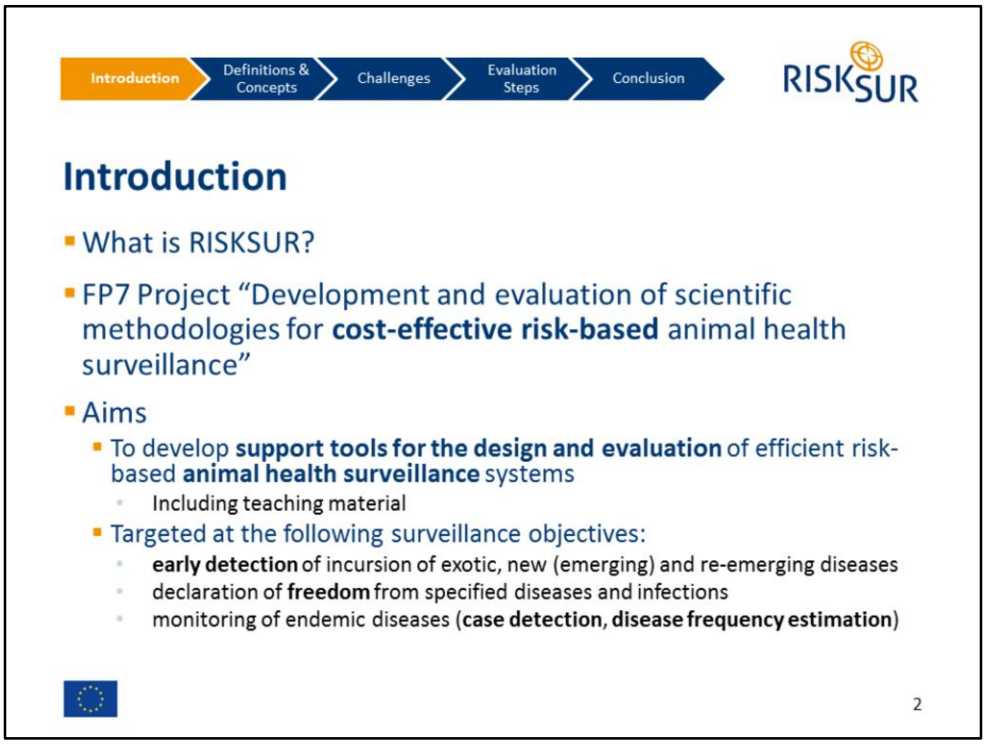
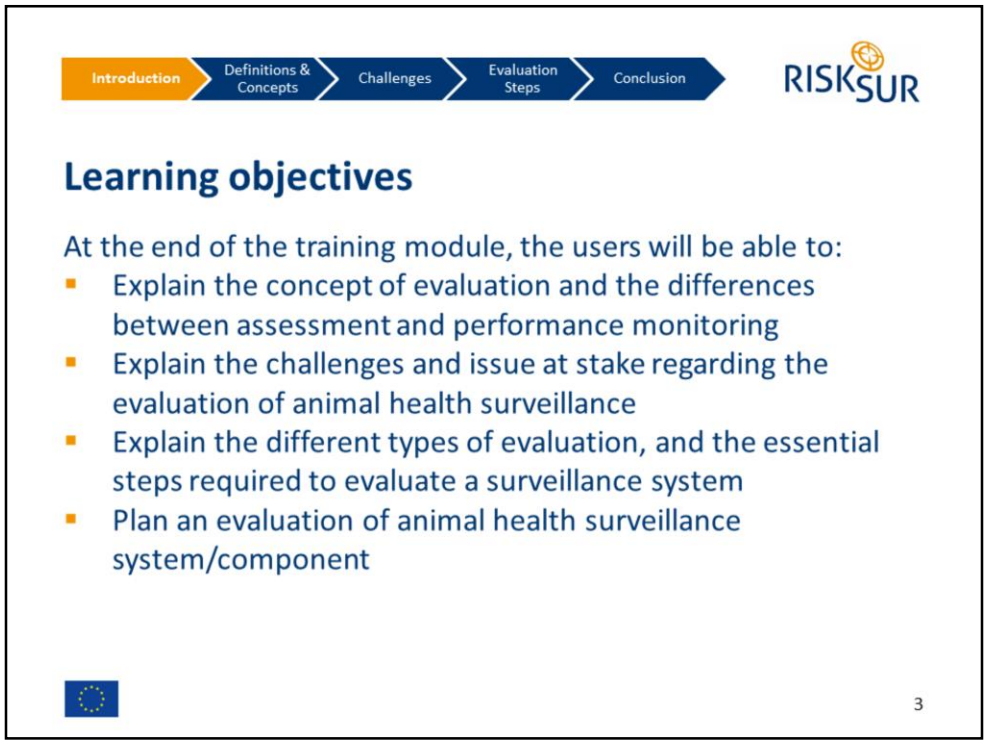
Hello and welcome to this online lecture on evaluation of animal health surveillance.

My name is Marisa Peyre and I am an epidemiologist at Cirad, a French Institute for international agricultural research for development. My field of research is the evaluation of animal health management policies, including surveillance and control of animal and zoonotic diseases. I have worked for the past 10 years on the evaluation of animal health surveillance both in developed and developing countries. Since 2012 I was in charge of the evaluation work package of the European union Risksur project on the development of cost-effective surveillance strategy based on risk. This lecture has been developed in the framework of this project. Thank you for joining today and I hope you will enjoy it.

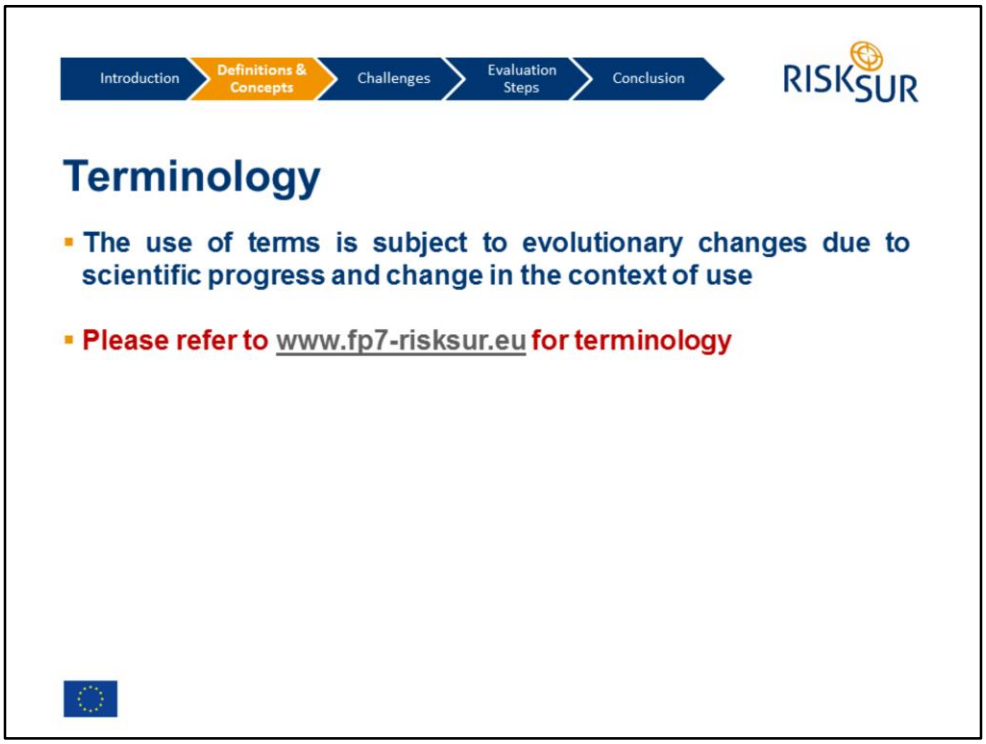
I expect the participants should be already familiar with the concept of animal health surveillance system or should undertake the previous course in this Risksur lecture series on the introduction of animal health surveillance before engaging in this lecture.



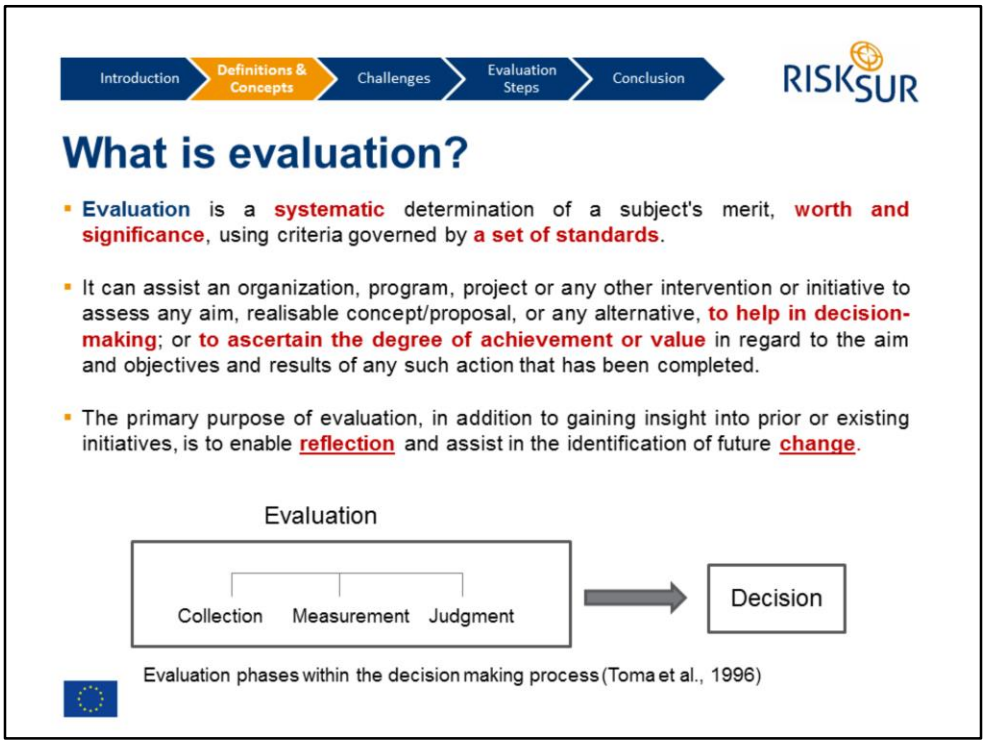
Risksur is an international research project funded by the European union from 2012 to 2015. This project has developed innovative methods to support the design and evaluation of risk-based surveillance systems, for the surveillance objectives of early detection of disease, freedom from disease documentation, case detection and the disease frequency estimation.



At the end of the lecture, the participants will be able to explain what is evaluation and the differences between evaluation, assessment and performance monitoring. They will be aware of the rational and challenges behind the evaluation of animal health surveillance, they will be aware of the different types of evaluation and evaluation guide and they will be able to plan an evaluation and follow the essential steps of the process to evaluate animal health surveillance. This lecture does not cover specific aspects of the implementation of the evaluation such as the selection and measurement of evaluation attributes and the economic evaluation methods which are covered in other modules of the RISKSUR training series.



First I would like to review some important aspect of the terminology. It is important to mention that the terminology is subject to evolutionary changes due to advances in science and the different context of application. You can refer to the RIKSUR glossary which is available online and which is meant to evolve according to the new developments.



What is an evaluation?

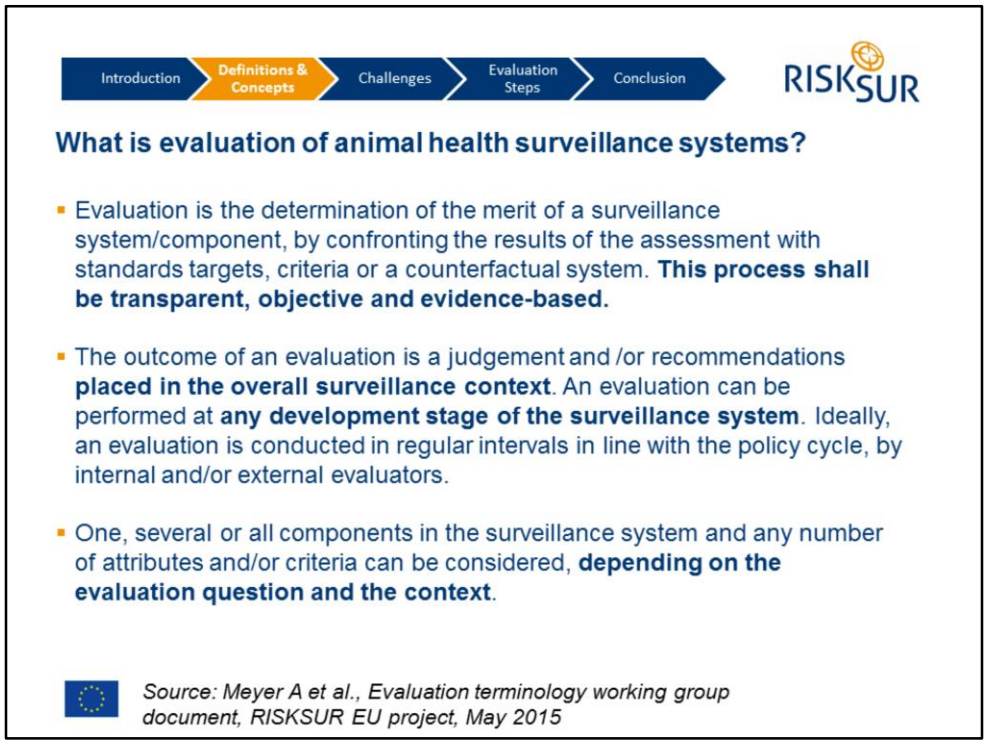
An Evaluation is a **systematic** determination of a subject's merit, **worth and significance**, using criteria governed by **a set of standards**.

It can assist an organization to assess any aim or any alternative, **to help in decision-making**; or **to ascertain the degree of achievement or value** in regard to the aim and objectives and results of any such action that has been completed.

The primary purpose of evaluation, in addition to gaining insight into prior or existing initiatives, is to enable **reflection** and assist in the identification of future **change**.

The evaluation process is closely linked to the decision making process and the need to advocate for changes. We will come back to these notions later on in this lecture.

It is important to emphasize that the definition of evaluation has to be tailored to the specific object and context of the evaluation.

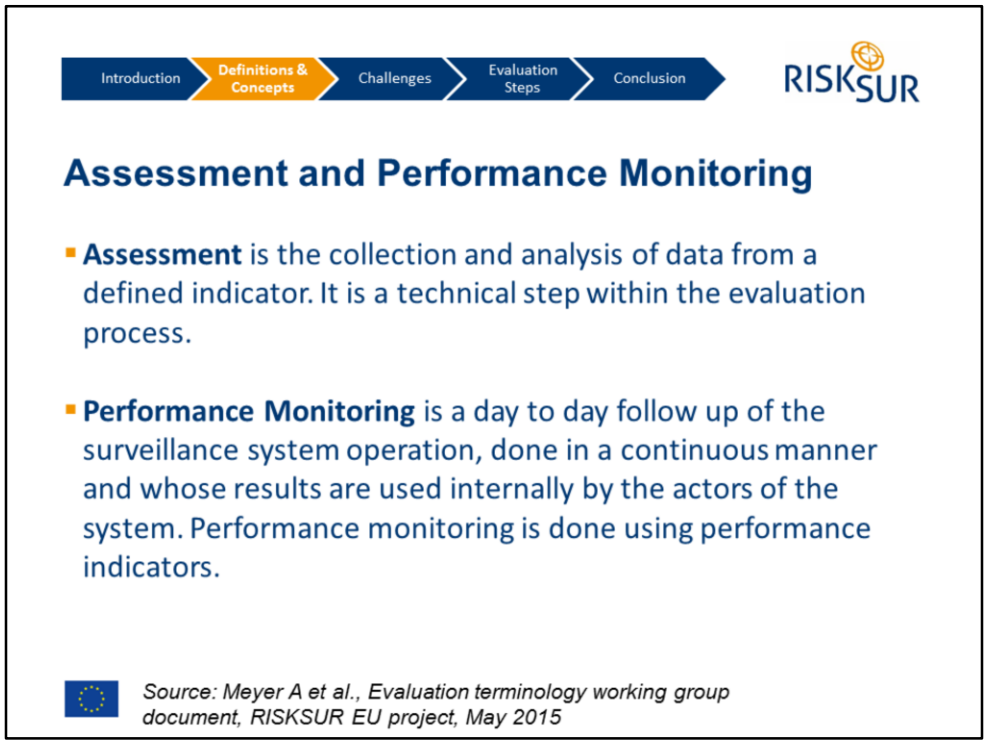


Indeed the evaluation of animal health surveillance system has been defined as:

the determination of the merit of a surveillance system/component, by confronting the results of the assessment with standards targets, criteria or a counterfactual system. **This process shall be transparent, objective and evidence-based.**

The outcome of an evaluation is a judgement and /or recommendations **placed in the overall surveillance context**. An evaluation can be performed at **any development stage of the surveillance system**. Ideally, an evaluation is conducted in regular intervals in line with the policy cycle, by internal and/or external evaluators.

One, several or all components in the surveillance system and any number of attributes and/or criteria can be considered, **depending on the evaluation question and the context**.



Evaluation is different from assessment and performance monitoring

An assessment is the collection and analysis of data from a defined indicator.

It is therefore a technical step included within the evaluation process.

Performance monitoring of a surveillance system is the day to day follow up of the system operation, in a continuous manner. The results are used internally by the actors of the system to control the quality of the process. Performance monitoring is done using performance indicators. The results of this monitoring can be used as data to inform the evaluation of the effectiveness of the system.

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Example of performance monitoring: monthly return of control/summary forms from field units

Mark (x) for each report received by the end of the reporting period, L (late) for reports received after the reporting period, and (–) where no reports are received

Form 1: Summary for the Year 20….

Reporting Unit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Reports for Yr 20….	Remarks
Unit 1 Mwanga	x	x	x	–	L	x	x	x	x	x	x	x	10	
Unit 2 Sojundi	x	x	x	x	x	x	x	x	–	x	x	x	11	requested forms
Unit 3 Luxo	x	x	x	x	x	x	x	x	x	x	x	x	12	
Unit 4 YellaN	x	x	x	L	–	–	x	x	–	–	–	–	5	wrong forms
Unit 5 Oropu	x	x	x	x	x	x	x	x	x	x	x	x	12	
Unit 6 Abala	–	x	x	x	x	x	x	x	x	x	x	x	11	
Unit 7 Jere	x	x	x	x	x	–	–	x	x	x	x	x	10	
Unit 8 Agua	–	–	x	x	x	x	x	x	x	x	x	x	10	funds for
Unit 9 Meni	–	–	–	–	–	–	–	–	–	–	–	–	0	
Unit 10 Ochor	x	x	x	x	x	x	–	x	x	x	x	L	10	asked for fuel
Unit 11 Mutum	x	x	x	x	x	x	x	x	x	x	x	x	12	
Unit 12 Jesso	–	–	–	–	–	–	–	–	–	–	–	–	0	
Unit 13 Nyindo	x	x	x	–	–	–	–	x	x	x	x	x	8	used wrong form
Unit 14 Temek	x	x	x	x	x	L	x	–	x	x	x	x	10	
Total Acceptable Reporting Units													***10***	
Total Units													**14**	

$$PI(\%) = \frac{10}{14} \times 100 = 71\%$$

- PI= (10/14)x100
  = 71%

Source: Performance indicators fro rinderpest surveillance, **IAEA-TECDOC-1261, http://www-naweb.iaea.org/nafa/aph/public/aph-tecdoc-1261.pdf**

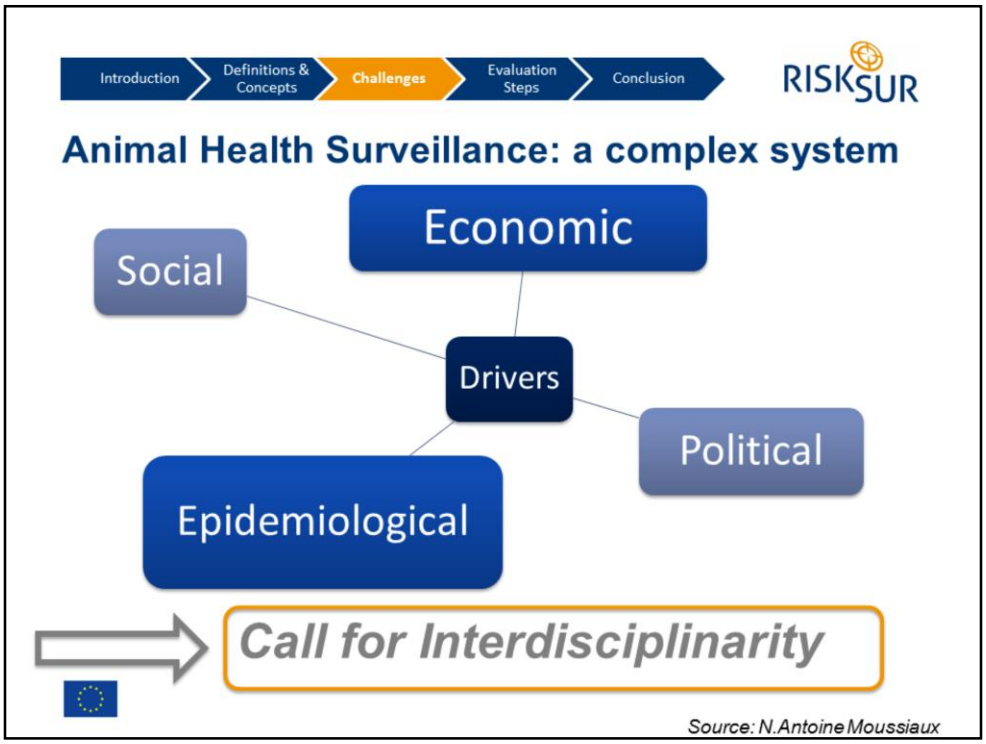
Here is an example of the monitoring of the **monthly return of control/summary forms from field units within the rinderpest surveillance plan of the International Atomic Energy Agency.** Each unit has recorder the reception of the monthly report using a cross mark or “L” if received late or a dash if not received. If a unit has received more than 8 reports on time it is classified as “satisfying”, the performance indicator measures the number of satisfying unit according to the total number of units considered. In this example 70% of the units are receiving a satisfying number of monthly reports.

Why do we do surveillance? We do surveillance to detect diseases and inform early reaction; freedom document, prevalence estimate etc… If we use the iceberg model, most of the disease cases are not reported or not detected.

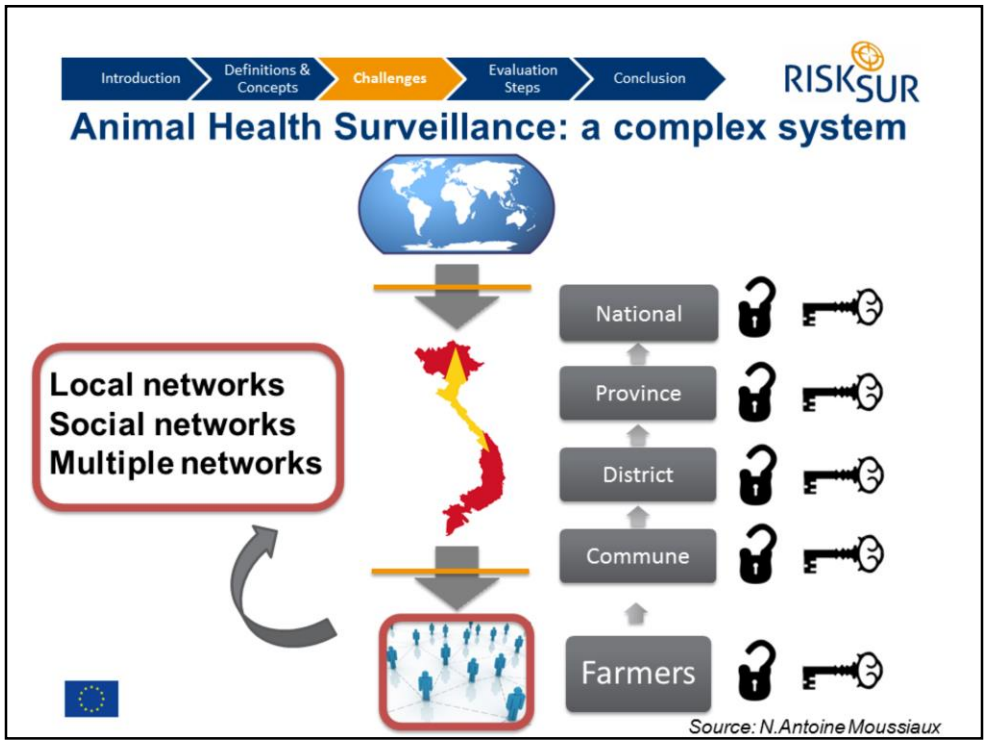
Passive surveillance represents the part of the cases which are detected and reported; active surveillance allows detecting more cases.

The evaluation of animal health surveillance will allow to identify the actions required to improve the system (either passive or active components or both) and increase the number of cases detected and report.

Of course it will always remain a part of non-detected cases.



So this is the theory, however in practice surveillance systems are complex systems which are influenced by many drivers, not only linked to epidemiological issues but also economical, social and political. This required the need for interdisciplinarity approaches.



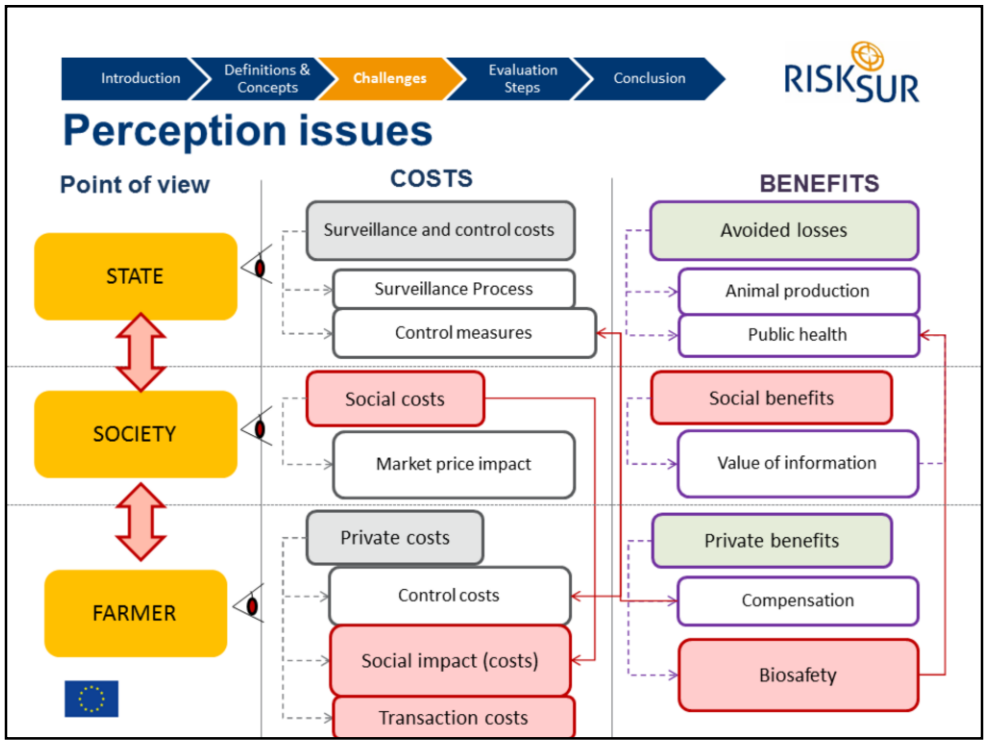
Moreover health or animal priorities differ between different levels from the international to the national level but also from the national to the local level.

We learn from social science and economics that

- global stakes leading to surveillance implementation by governments are not shared by local actors. This is often linked to gap in perceptions, gap in expectations.

[For example is south east asia, the surveillance of foot and mouth disease which is endemic in the region has becme a priority for the local government in line with the global eradication strategies recently launched by the world animal health organisation. However, the disease is not perceived as a priority by the local farmers].

And every level of the system holds the key to the animal health information, which could lead to under-reporting situation, local surveillance and disease management and therefore poor quality of the surveillance data generated by the system.

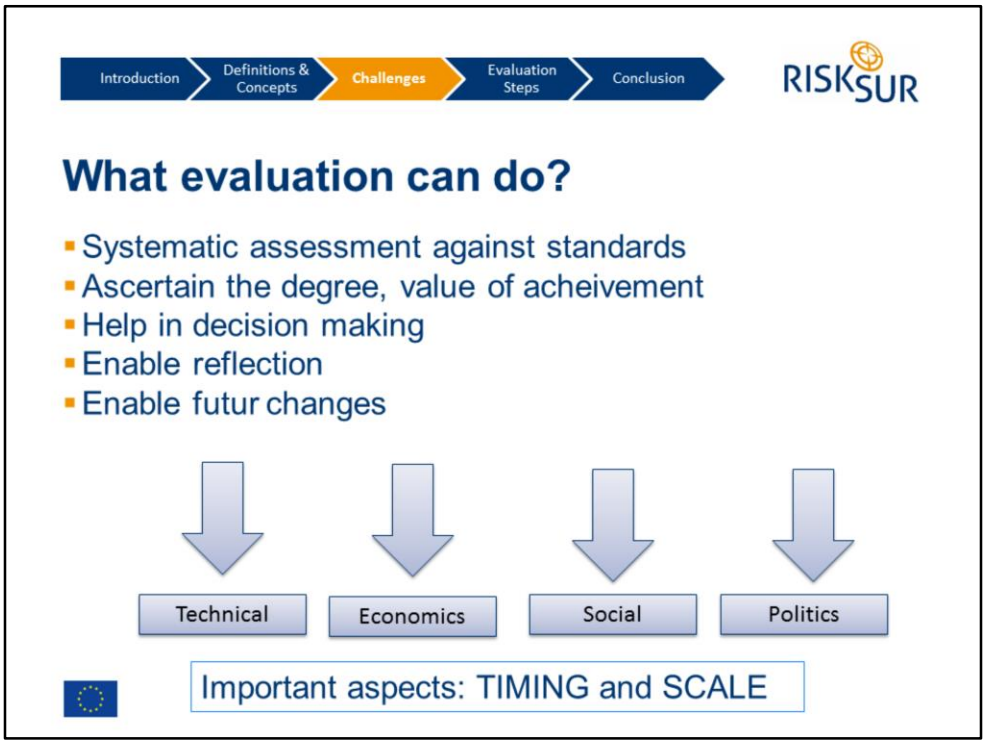


The perception of the cost and benefits involved in animal health disease management process (including surveillance and control) will be different according to the different point of views. It is important in the evaluation process to identify clearly the point of view taken. When looking at the farmer and society it is also important to understand that surveillance involves specific costs and benefits which are often not accounted for. This is mostly due to the fact that until recently there has been a lack of adapted methodology and a limited consideration of economic evaluation within the animal health surveillance evaluation process. Some of work implemented in the RISKSUR project aimed at addressing those two issues by developing an integrated framework for economic evaluation of surveillance and specific methods.

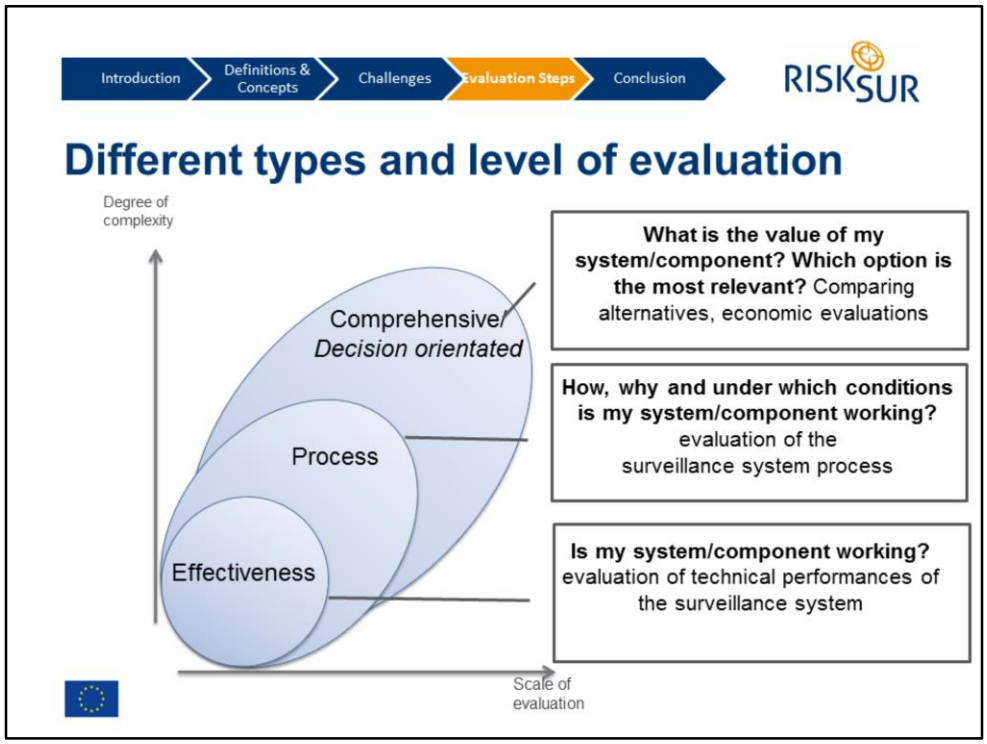
Why do we need to evaluate? There could be many perceptions about the primary purpose of evaluation.

Here is a non exaustive list, evaluation can contribute to **to informed decision making and more enlightened change** by ensuring better programs, systems, results; can help in **precipitating needed change** to take corrective actions; **to demonstrate data quality** and ensuring access to international trade market for example**; to ensure that the action taken will be effective; to advocate for funds. A very important aspect is that evaluation will contribute to ensure trust** and empowering all stakeholders not only by the demonstration of one or many of the elements already mentioned but also by **engaging them** in the evaluation process;

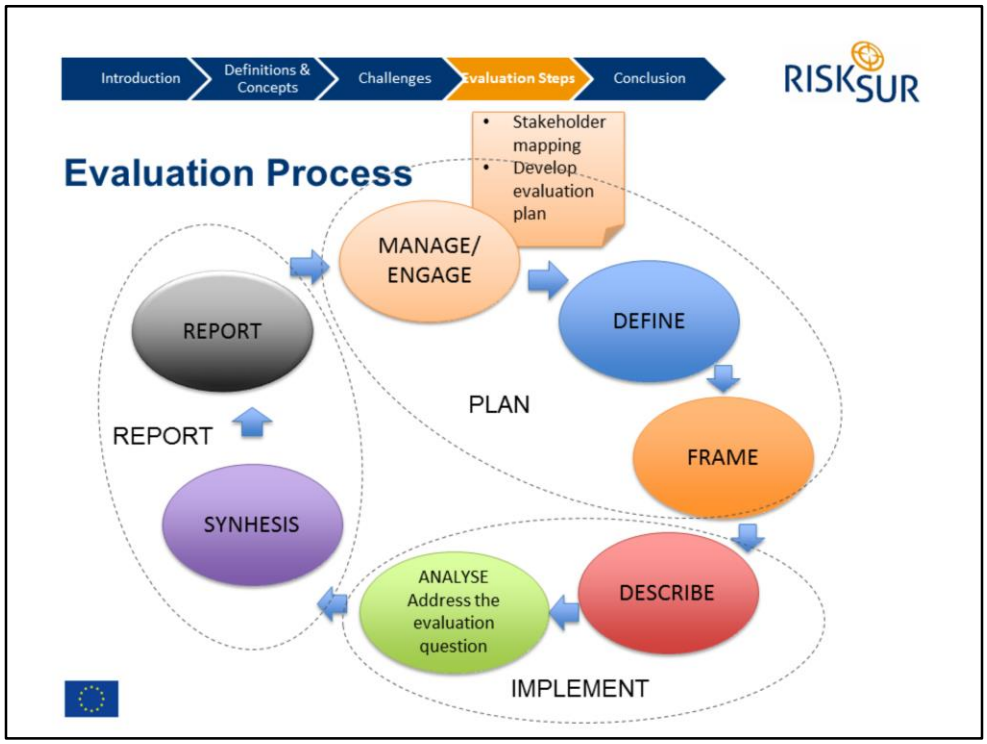
Evaluators should aim to construct and provide the best possible information to provide objective, independent and transparent information on the value of whatever is being evaluated.



In other words, evaluation can inform decision making on the value of the achievements and enable reflection for futur changes. This implies a combination of Technical, economic, social and political aspects. According to the timing, type and scale of the evaluation one or all of these aspects coulc be considered.



Moreover, the degree of complexity and resources needed to implement the evaluation will increase with the scale of evaluation. Effectiveness and process evaluation will adress the issue of understanding if the system is working and what are the underlying reasons. A comprehensive evaluation, also called True evaluation is addressing the issue of the value of the system and allows for comparision of more than one alternative. It is worth to mention that any of the evaluation mentioned could be performed either at the system or component level ; the evaluation can consider only the passive component or one or more active components, without considering the whole system.



The first step in the evaluation process is to plan the evaluation and define the object and context of the evaluation. This involves engaging with the decision makers, via stakeholder mapping and workshop for example to identify with them the gaps and needs required to frame the evaluation plan.

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Health surveillance evaluation guides

Authors	Name	Year	Area of surv.	Type
Drewe et al.	SERVAL	2013	AH	Framework
Malecki et al.	-	2008	EPH	Framework
Meynard et al.	-	2008	PH*	Framework
ECDC	-	2006	PH	Framework
Buehler et al. (CDC)	-	2004	PH*	Framework
HSCC	-	2004	PH	Framework
WHO	-	1997	PH	Framework
WHO	-	2006	PH	Guidelines
German et al. (CDC)	-	2001	PH	Guidelines
El Allacki et al.	Conceptual evaluation	2012	AH & PH	Method
Dufour	CCP	1999	AH	Method
Hendrikx et al.	OASIS	2011	AH	Tool
WHO	IPCAT	2011	PH	Tool
WHO	HMN assessment and monitoring tool	2008	PH	Tool
KTL	-	2004	PH	Tool

Source: Calba, C, Goutard, F. L, Hoinville, L., Hendrikx, P., Lindberg, A., Saegerman, C. & Peyre, M. Surveillance systems evaluation: a review of the existing guides. **BMC Public Health.2015**, 15:448. DOI: 10.1186/s12889-015-1791-5.

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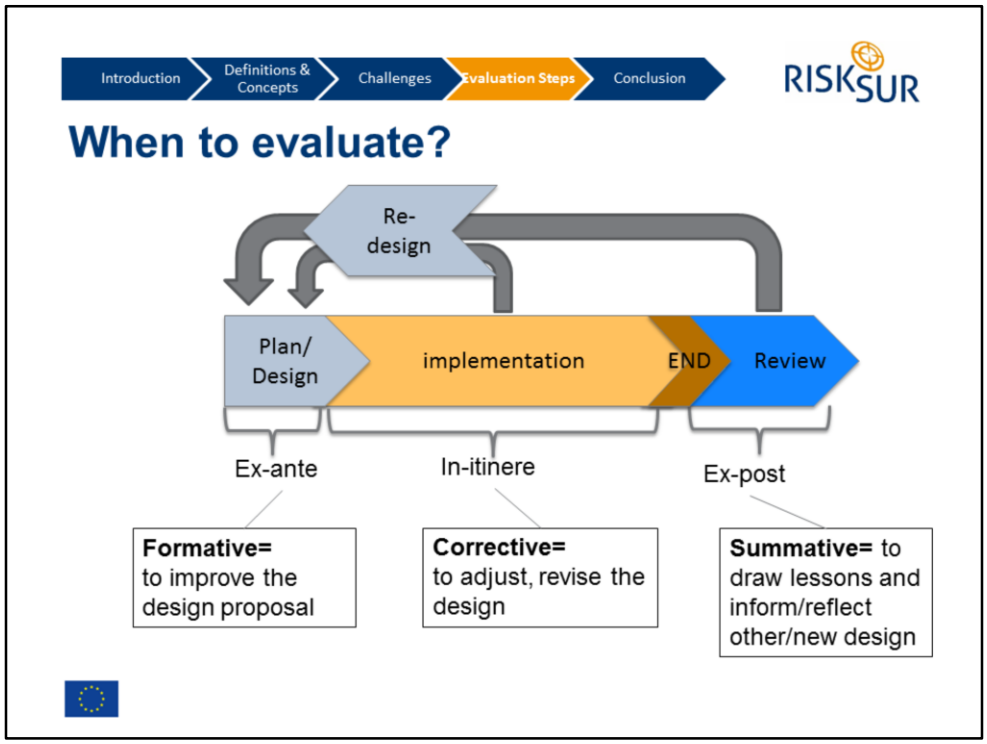
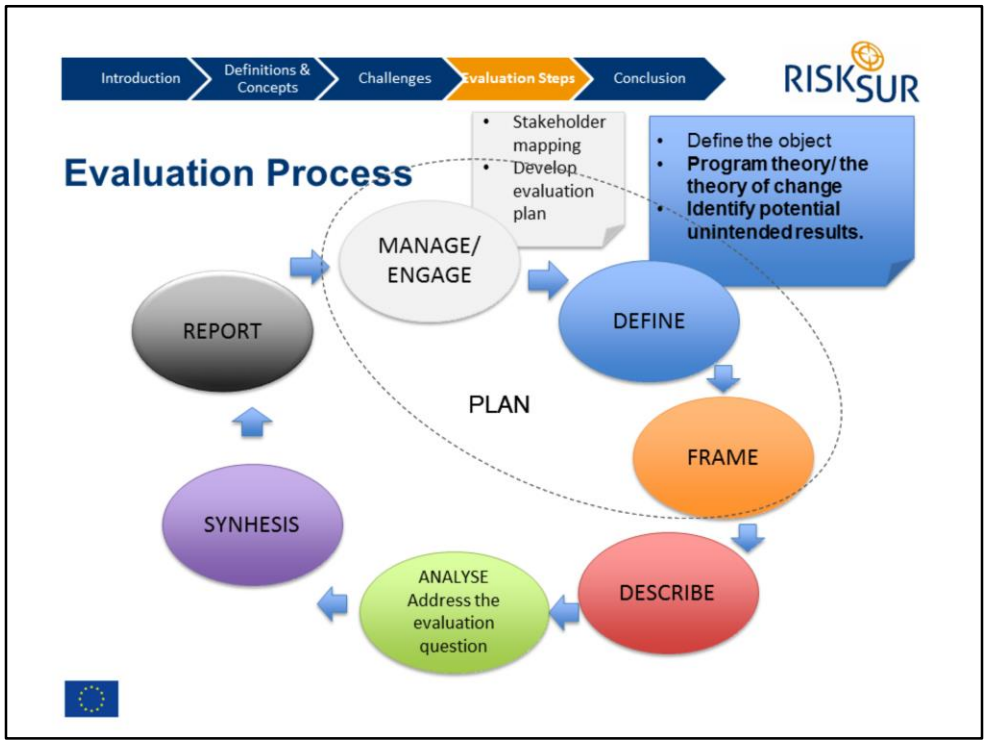
Many evaluation guides are available in the litterature to undertake such evaluation process. Within the framework of RISKSUR project we have reviewed those guides to identify the gaps and needs in the current methods and to provide elements of advantages and limits to help the user to select the most appropriate approach. This review by Clementine Calba is available for download in the pdf documents attached to this lecture. None of the current available guides provide a framework for a comprehensive evaluation (including economics) of health surveillance systems. An innovative framework was developed within RISKSUR project to fill in these gaps and allow for both deisgn and evaluation of animal health surveillance systems. More information on the EVA tool is available on the RISKSUR project website and this innovative tool is the object of another module in the RISKSUR training series.



Another important aspect of the planning is to decide on the timing of the evaluation. *EX-ANTE EVALUATION* could be performed to provide essential elements for the design and planning of the surveillance system (e .g. epidemiological models could be used to evaluate which sampling protocol will ensure highest effectiveness of the system and therefore inform on the sampling design; participatory studies to assess the local constraints and the acceptability of surveillance could be implemented to select between different organisation options). *IN-ITINERE EVALUATION* will be the most common type, the system will be regularly evaluated (e.g. annually; every two years; every time needed). The timing for evaluation will depend on the SS objective, purpose of surveillance and specific trigger points such as the evolution of the disease situation. Indeed, as for the surveillance which should be a dynamic process and evolves with the evaluation of the disease situation, the evaluation task should match each changes occurring in the socio-economic and/or epidemiological situation, in the surveillance design and implementation (e.g. evaluation will be performed to assess the performances of a newly introduced surveillance component and to review its added value; evaluation could be performed annually to ensure no changes in the surveillance process efficacy and to provides guarantee on the surveillance data generated). Specific elements (i.e. *TRIGGER POINTS*) which will motivate an evaluation should be especially defined in the Evaluation plan (e.g. unusual increase in the number of outbreaks; changes in exporting requirements; willingness to export etc…(cf text box 2)). *EX-POST EVALUATION* is very rare but could be implemented to reflect back on the lesson learned from the implementation of a SS which was stopped due to sustainability issues or because the disease was eradicated (e.g. rinderpest). **The first two types of evaluation are the most common as SS are rarely terminated**.



The second step in the evaluation process is to define the object under evaluation, including alternative strategy. The theory of change or program theory could be implemented to plan and ensure changes required, including unintended results.

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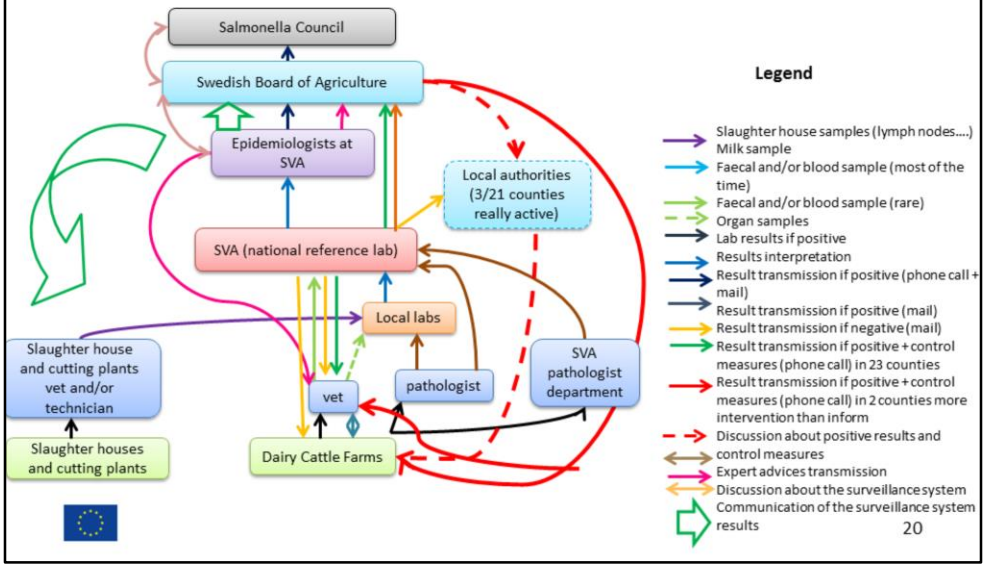
SYSTEM MAPING (Descriptive analysis of the system)



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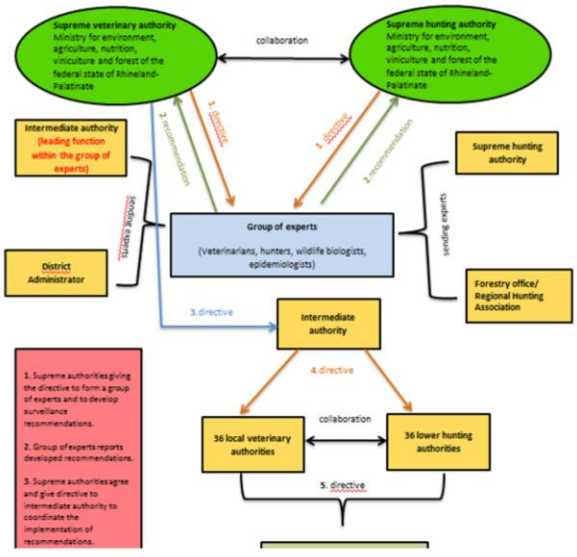
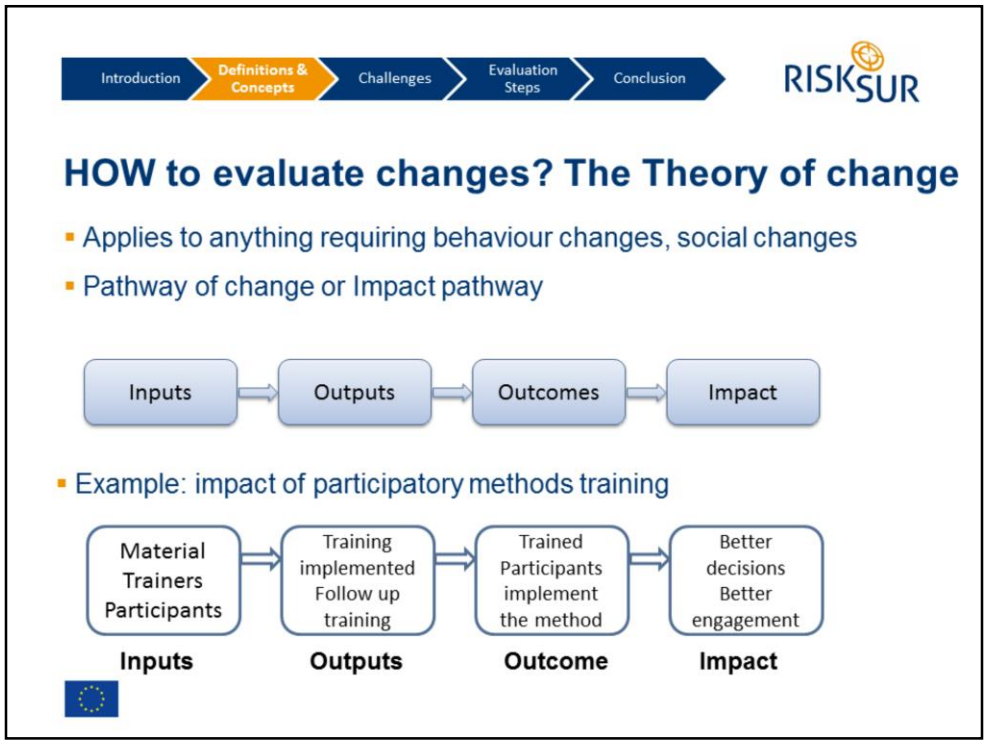
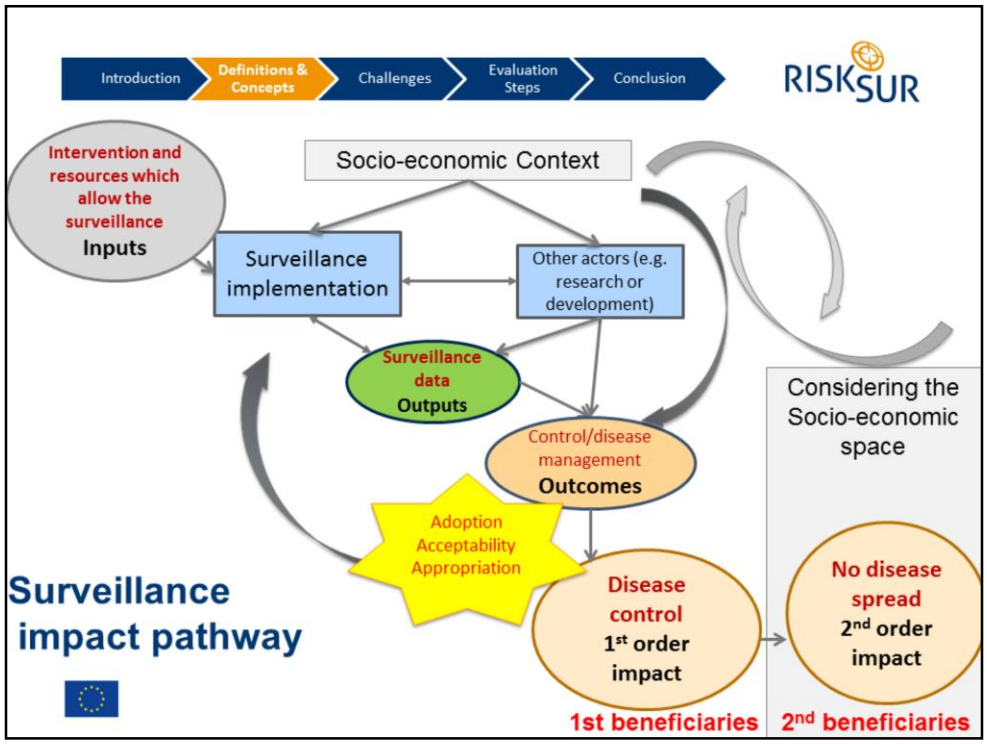


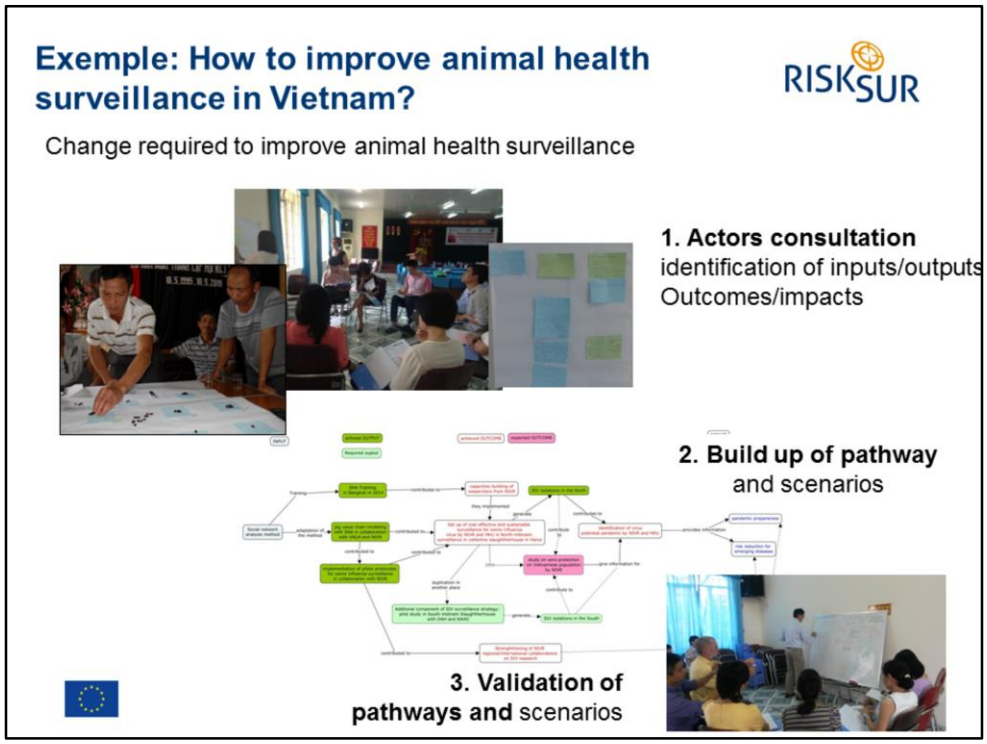


A Theory of Change defines all building blocks required to bring about a given long-term goal also called impact. This set of connected building blocks could be referred to as i**nputs**, the resources needed to implement the action, **ouptuts,** the results of the action, **outcomes** when the results are used by the beneficiaries of the action and the impact, which is what will stay after the end of the action. These blocks are displayed on a map known as a pathway of change or change framework or impact pathway, which is a graphic representation of the change process.

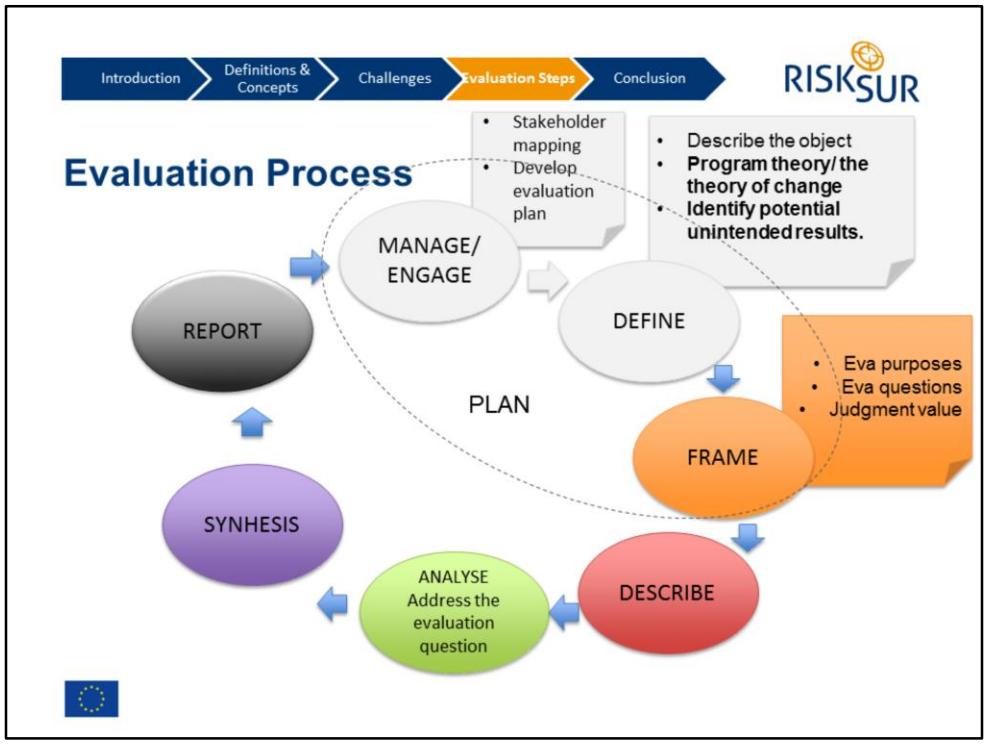
To give a simple example, the impact of training in a specific method requires Material, trainers and participants as inputs; the output of the training action will be that the training is implemented and follow up training as well; the participants of the training will implement the method, sometimes with some adaptation to fit their need, which represent the outcomes and this will results in the fact that better decision will be made with a better engagement of the community in the case of participatory approaches.



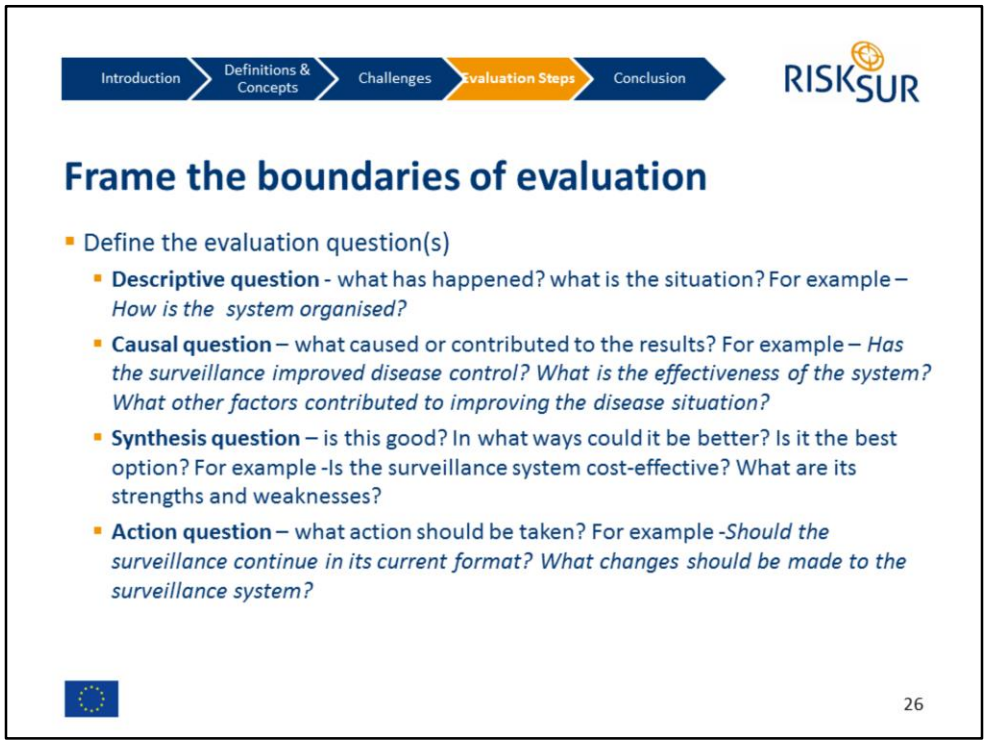
If we transpose this pathway to health surveillance; all the intervention and resources needed to implement surveillance represent the inputs; the data on disease outbreaks will be the ouptuts; the use of the surveillance data by the decision makers to inform disease management policy or the implementation of the control intervention will be the outcomes. All these are influenced by the soco-economic context under which the surveillance is being implemented. Outputs will only led to outcomes if there is adoption and appropriation of the outputs and therefore the issue of acceptability of the surveillance is of high importance and will have a direct effect on the implementation of the surveillance and its effectiveness. Then the outcomes will led to the control of the disease which represent the first order impact, the direct impact on the beneficiaries of the surveillance, often the farmers, and the second order impact the fact that the disease will not widely spread. Second order impact implies considering change in scale such as geographic and considering the socio-economic space of the surveillance.



A way of building up a change pathway is by doing actor consultation. Here is an example of the development of a change pathway to identify actions and changes required to improve animal health surveillance in Vietnam. The first part of the work was to work with the relevant stakeholder of animal health surveillance in Vietnam to identify the different blocks and linking processus between them. The second part was to build up the pathway including different scenarios to reach each of the outcomes listed. The final part was to validate back the scenario with the stakeholder and to select the most relevant pathway and changes in the strategy to be made to improve the surveillance. This approach not only allows to identify alternative strategy to develop but also represent the first step in the engagement of the stakeholders of the surveillance system in the evaluation process.



The last step in the plannification phase of the evaluation is to frame the boundaries of the evaluation by defining precisely the purpose of the evaluation, the evaluation question and the basis of the judement value which will be made to draw the recommendations.



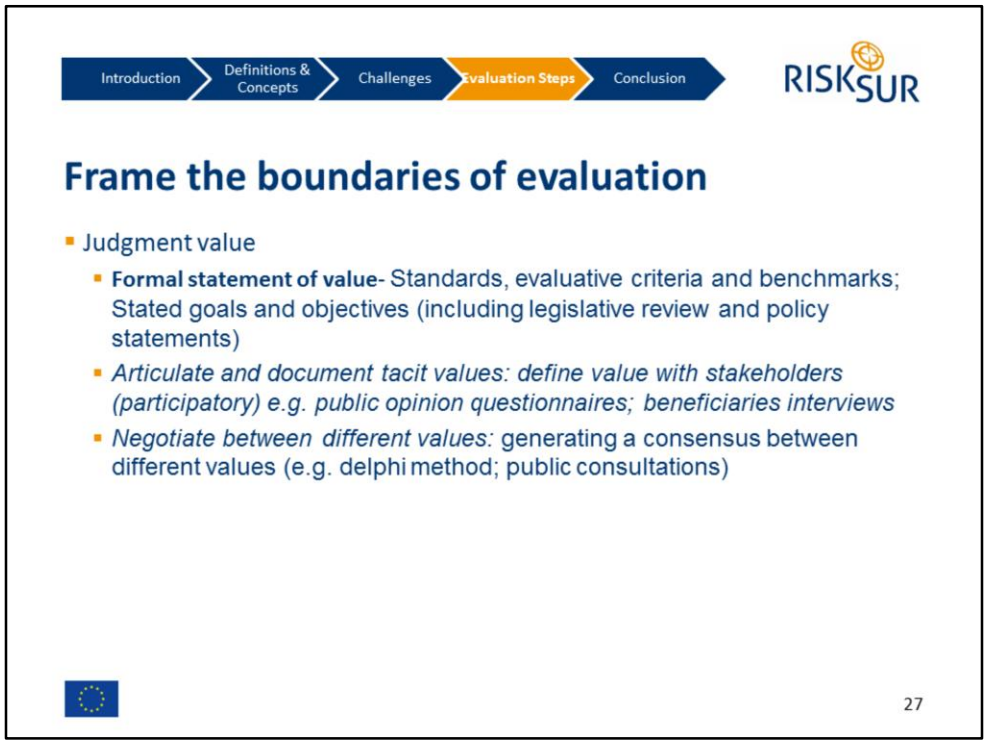
The Evaluation question could be descriptive, what is the current situation, how is my system organised?;

it could be causal, trying to understand the factors that contributes to the results of the surveillance, for example what is the effectiveness of the system?

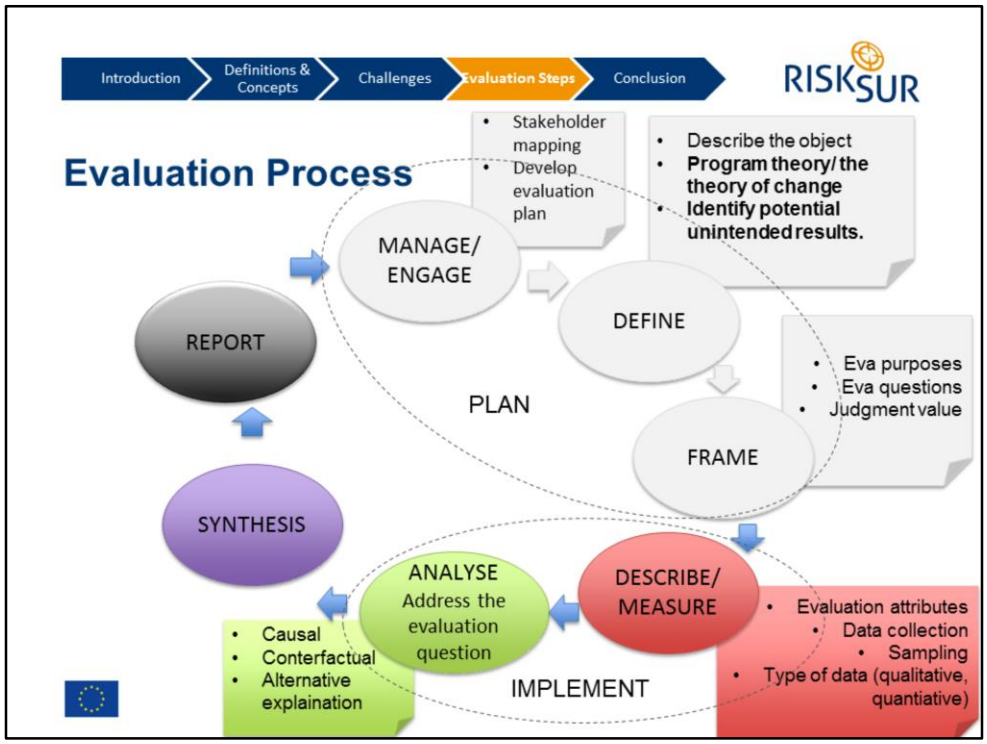
It could be a synthesis question, trying to understand what could be done better and which alternatives will be best, for example, is my system/component cost-effective.

It could be an action question related to identifying changes that should be made to improve the system.

It is important to notice that those questions could be related and more than one type of question could be asked during an evaluation process; for example is someone wants to know how is the surveilllance system performing, what are the factors influencing its effectiveness and which corrective action should be implemented to improve it.

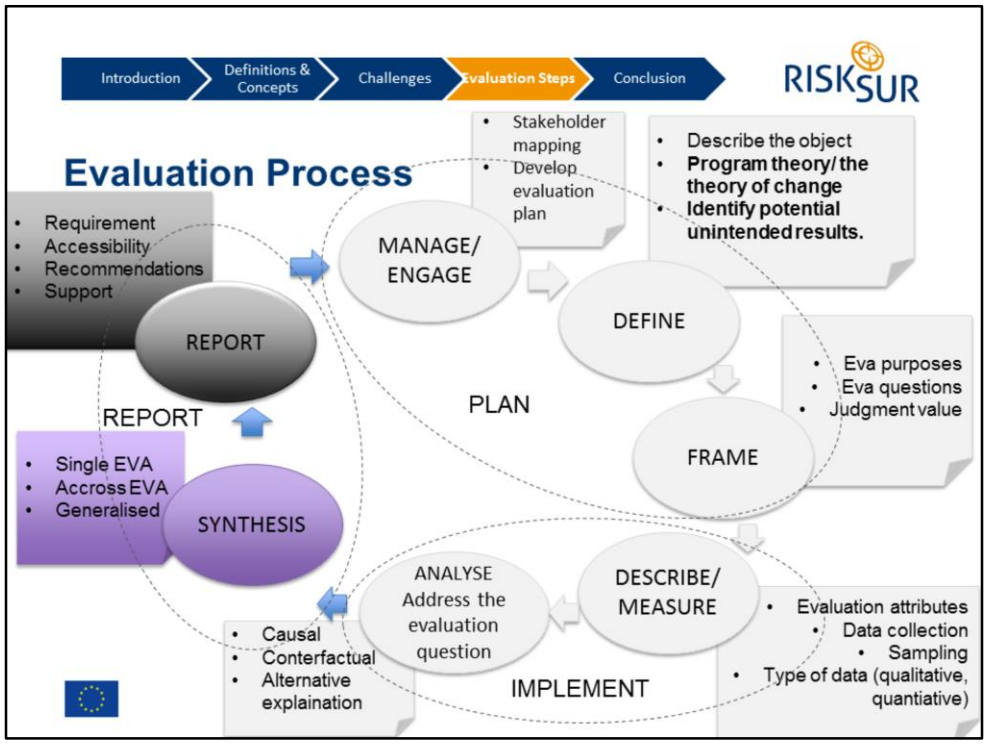


While the results of an evaluation will be organised data to informa on the effectiveness of the system, the outcome of the evaluation will always be a judgment value on these data and recommendations. This judgement value could either be made by the evaluator or by the decision makers but represent an essential aspect of an evaluation process and the difference between a technical report and an evaluation study. The judgment of value could either be made formaly by considering standards or stated goals, such European Union legislative requirement on the minimum level of disease prevalence to be able to detect to ensure freedom from disease. However a judgment value does not always have to be based on standards but could be especially defined with the relevant stakeholders, including or not a negocitation phase to generate a consensus. For example the minimum time required between case detection and control intervention could vary according to practical issues in some specific context.

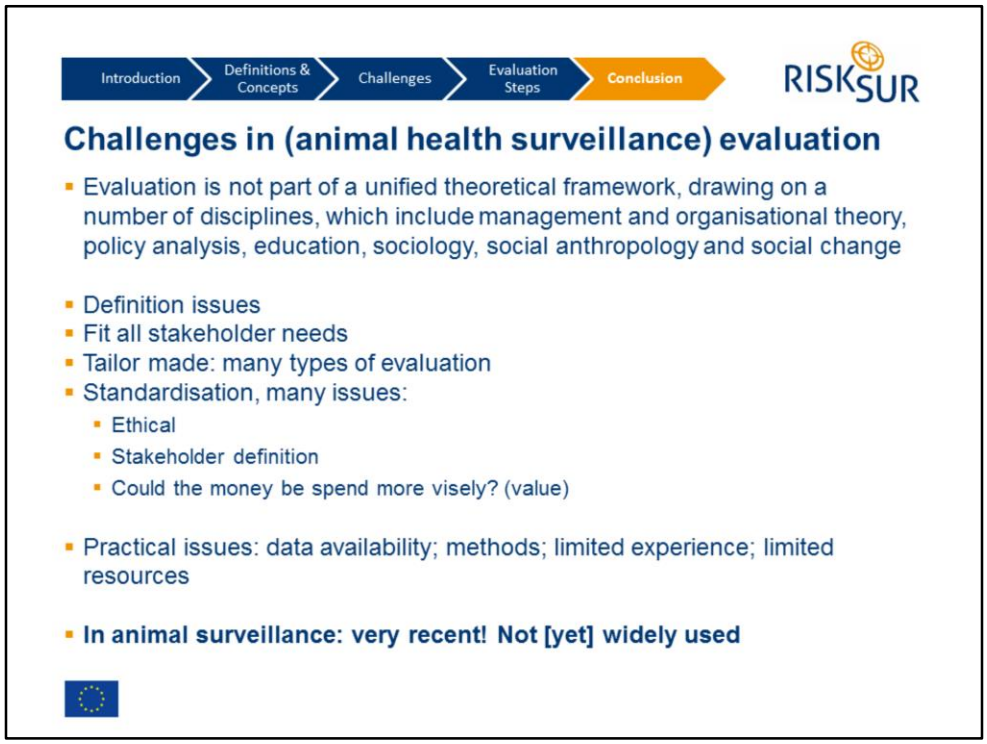


The next two steps in the evaluation process concerns the implementation of the evaluation itslef

These aspects, evaluation attributes and economic evaluation will be covered by another lecture in the RISKSUR training series

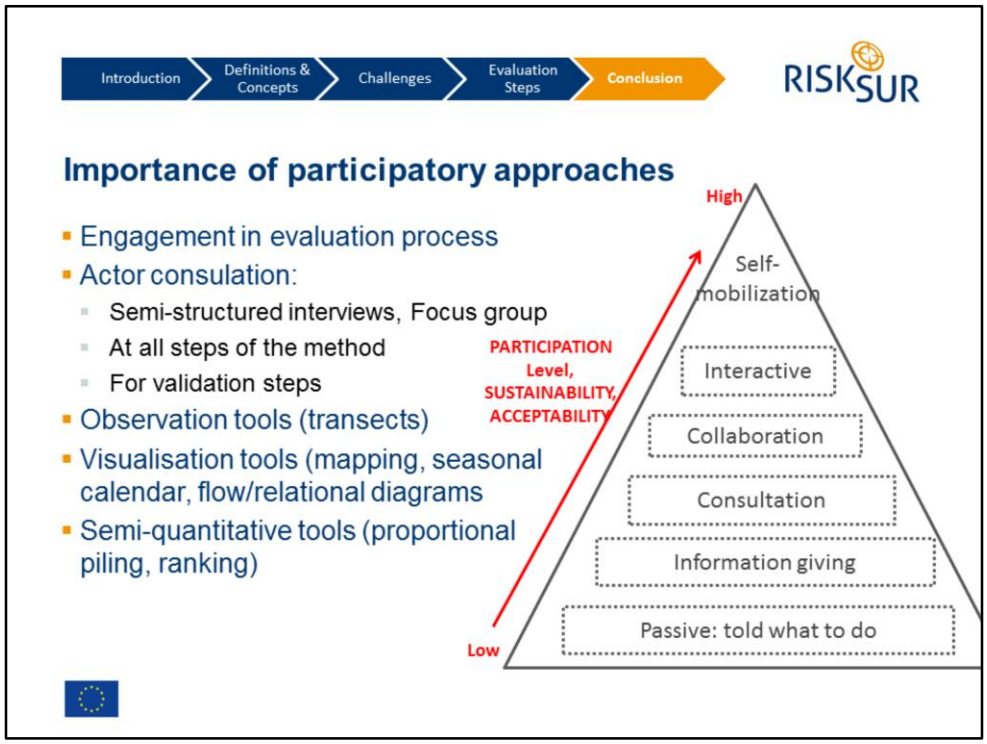


During the synthesis step, the data are combined to form an overall assessment of the merit or worth of the action, or to summarize evidence across several evaluations. This could be done by using methods such as multi-criteria analysis or economic evaluation (looking at the cost-effectiveness, cost-benefit or cost-utility of a surveillance program). At this stage the evaluator can assess how can the findings from this evaluation be generalized to the future, to other sites and to other strategies or if they are context specific only. The reportin step is essential to ensure that the results will be taken over by the relevant stakeholders or the decision makers. The initial requirements of the evaluation should be answered. Accessibility of the results to non scientific audience could be ensured by following the 1:3:25 principle (1 page outlines, 3 pages executive summary; 25 pages of findings and methods). Recommendations should be define with the decision makers and/or relevant stakeholders to be realistic and feasible, this could be done by actor consultation. To further support the use of the evaluation findings, the results could be valorised by media communication or publications in newsletter, scientific journals etc… For further information on how to report back the results of an evaluation, you can refer to the specific section in the RISKSUR EVA tool which will be available on the project webiste and to the link to the bestevaluation innitiative website provided below.

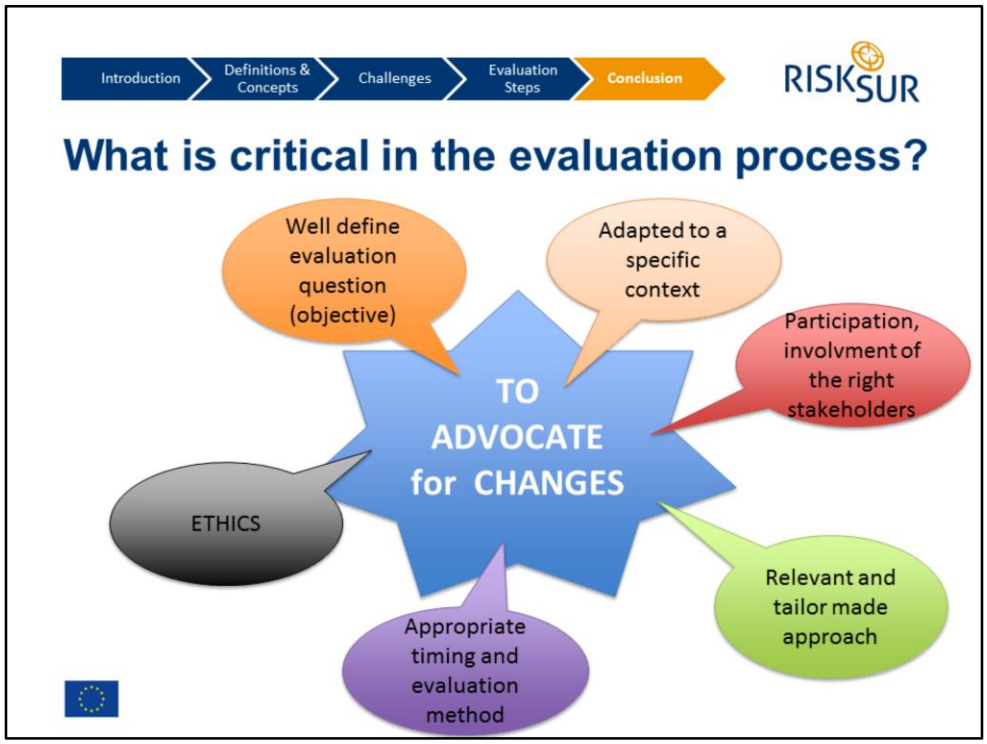


To summarise the main take home messages, it is important to remember that evaluation is not part of a unified theoretical framework, there could be as many definition of evaluation as there is object to evaluate. Evaluation is a multidisciplinary approach which refers to sociological approach such as social change, organisational therory etc… The evaluation process should be tailored to the object under evaluation and the stakeholder needs. Standardisation of this process is facing many barriers linked to ethics (which perceptions will vary with the cultural contexts), to the definition of who are the relevant stakeholders, and what is the value of animal health information. It is important to be aware that evaluation comes with a cost, as it is resources demanding and involves practical issues linked to the availability of methods and data for example.

For these reasons, evaluation and especially economic evaluation is a very recent and developing field in animal health surveillance and has not been widely used so far. The aim of the EVA tool develop within the RISKSUR project is to address in part those challenges and provide a practical and integrated evaluation framework to help promote the use of evaluation and economics in animal health field.



An essential aspect of a successfull evaluation is the use of the evaluation outputs to implement changes. This success is closely related to the degree of engagement of the decision makers in the evaluation process itself. The use of participatory approaches and tools such as focus group, actor consultation meetings at each step of the process and especially in the final steps when drawing the recommendations could help in reaching sufficient level of engagement and self mobilisation so the results could be taken over by the decision makers.



To conclude, to be able to advocate for changes and ensure outcomes of the evaluation process, you need to make sure that the evaluation question is well define, the evaluation plan is adapted to a specific context, that the right stakeholder are engaging in the process, the approach is tailor made and the timing appropriate and that the evaluator follows the best evaluation practices (including objectivity, integrity and transparency) to ensure that ethics are well considered in the process. You can find more information on the evaluator best practices on the american evaluation association and better evaluation initiatives in the weblinks provided below.

RISKSUR

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