

AN OVERVIEW OF THE DIFFERENT TYPES AND LEVEL OF EVALUATION: FROM THEORY TO APPLICATION IN HEALTH SURVEILLANCE

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ABSTRACT

Evaluation is a systematic assessment against standards, which can ascertain the degree/value of achievement, help in decision-making, enable reflection, and enable future changes. Different levels of evaluation may be considered including technical, process, economic, social, and political elements according to the needs and purpose of evaluation. In any evaluation process, one should always consider the point of view taken, the timing of evaluation, the period under evaluation, and the level of evaluation. This chapter presents some theoretical concept of evaluation ideology and reviews the different types of evaluation available in the literature and how they can be applied to evaluate animal health surveillance systems.

2.1 Introduction

2.1.1 EVALUATION IDEOLOGY AND CLASSIFICATION ATTEMPTS

As developed by House [1], current evaluation models are based on a common liberal ideology. Hence, evaluation responds to fundamental features of liberalism: freedom of choice, individualism, and empiricism [1]. First, freedom of choice must be understood as conditioning the meaningfulness or usefulness of evaluation. Evaluation is indeed supposed to make sense with respect to one's decision-making, might it be that of the person under evaluation, of the evaluator, or the client of the evaluation. Second, individualism, which considers the individual to preexist to society, deeply influenced the methods of evaluation. Derived from economics, sociology, psychology, and often termed as methodological individualism, these methods consider the individual as the relevant unit to understand decision-making and the performance of a human system. Third, empiricism defines a mode of enquiry and knowledge, a relation to reality that is mediated through senses. Current evaluation methods may refer to objectivist ethics, when evaluation is founded on information that is congruent between independent observers or sensors (otherwise stated, information that can be verified). On the opposite, evaluations may follow subjectivist ethics, when considering any information derived from unique personal experiences, disregarding the need for or accepting the impossibility for crosschecking that information.

Evaluation approaches have been developed following two major disciplinary schools based on different ethical considerations: (i) *the utilitarian models*, where “the good” is determined by what maximizes some single, explicit interpretation of happiness for society as a whole; (ii) *the intuitionist or pluralist models*, which considers that there is no single interpretation of “the good” and these interpretations need not be explicitly stated nor justified (Table 2.1) [1, 3]. The utilitarian model is essentially based on objectivist methods that are used to acquire knowledge capable of external verification (intersubjective agreement) through publicly inspectable methods and data (e.g., experimental research). The intuitionist or pluralist models are mainly based on subjectivist methods used to acquire new knowledge based on existing personal knowledge and experiences that are (explicit) or are not (tacit) available for public inspection (e.g., accreditation).

Within these two main options, utilitarian and objectivist or pluralist and subjectivist, House [1] further distinguishes between eight types of evaluation (Fig. 2.1):

- *System analysis*, where evaluation looks at few quantitative measures (e.g., performance levels) and compares the differences in programs with different performance levels [1].
- *Behavioral objectives*, where program objectives are defined according to specific performance level that are linked to specific behaviors or actors in the system (Tyler model) [3].
- *Decision-making*, which structures the evaluation by the decision to be made. Recommendations on these decisions have to be made by the evaluator (Stufflebeam model) [4].
- *Goal free*, which reduces the bias of the evaluation process by not informing the evaluator of the initial goal of the programs, the evaluator must explore all outcomes (Scriven's model) [4].
- *Art criticism*, where the evaluator has sufficient experience and training to make judgment on the program under evaluation (Eisner's artistic evaluation model) [5].
- *Accreditation*, which reviews pre-collected information by people who run the programs. The reviewers make comments approving or disapproving the program [3].
- *Adversary*, which is used to present the pros and cons of a program (quasi-legal procedures, often in the form of trial by jury) [3].
- *Transaction*, which concentrates on the process itself. It uses informal investigation methods based on empirical case studies (Stake's model) [7].

The type of evaluation implemented will also differ according to its target beneficiaries: *elite evaluation* focuses on the interests of managers and professionals (e.g., connoisseur studies), whereas *mass perspective*

evaluation focuses on consumers and participatory approaches (e.g., consumer perception studies).

Evaluation may also be classified according to its objectivity level and its external influences:

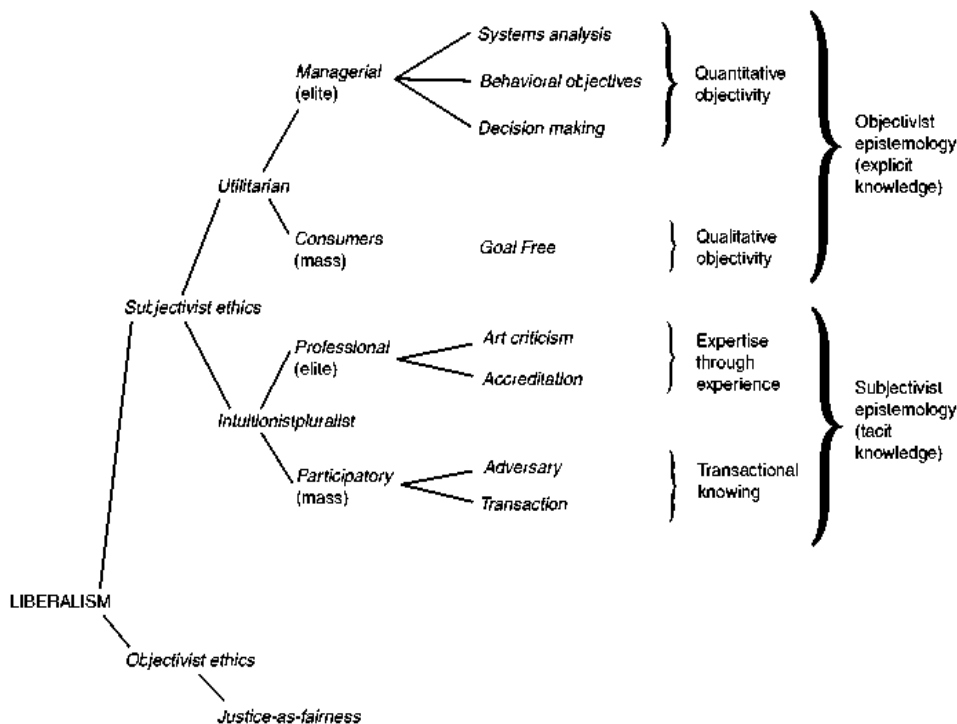
- Pseudo-evaluation: Promotes a positive or negative view of an object regardless of what its value actually is and might be politically controlled (selected information), public relation (positive image).
- Quasi-evaluation: The questions orientation includes approaches that might or might not provide answers specifically related to the value of an object. For example, focusing only on questions of knowledge without addressing any questions of value (e.g., experimental research).
- *True evaluation*: The values orientation includes approaches primarily intended to determine the value of an object (e.g., decision-oriented, consumer-oriented studies).

Table 2.1 A taxonomy of major evaluation models (adapted from [1])

Type	Model	Major audiences	Assumes consensus on	Methodology		Outcomes		Typical questions	References
Utilitarian	System analysis	Decision makers, managers	Goals: Known cause and effect; quantified variables	Cost-benefit analysis	Objectivity	Efficiency	Social efficiency	Are the expected effect achieved? Can the effects be achieved more economically? What are the most efficient programs?	Rivlin [2]
	Behavioral, objectives		Prespecified objectives; quantified outcomes and variables	Attributes assessment		Productivity; accountability		Are the objectives achieved? Is the program producing?	Alkin [3]
	Decision-making		General goals; criteria	Surveys, questionnaires, interviews; natural variation		Effectiveness; quality control	Is the program effective? What parts are effective?	Vedung [4]	
	Goal free	Consumers (mass)	Consequences; criteria	Bias controls, logical analysis; modus operandi		Consumer choice, social utility	What are <i>all</i> the effects?	Vedung [4]	

Type	Model	Major audiences	Assumes consensus on	Methodology		Outcomes		Typical questions	References
Intuitionist/ pluralist	Art criticism	Practitioners, consumers (elite)	Critics; standards	Critical review	Subjectivity	Improved standards	Personal understanding	Would an expert approve the program?	Mathison [5]
	Accreditation		Criteria, panel, procedures	Review by panel; self-study		Professional acceptance		How would professional rate this program?	Stufflebeam and Coryn [6]
	Adversary	Practitioners, consumers (mass)	Procedures and judges	Quasi-legal procedures		Resolution		What are the pros and the cons of the program?	Alkin [3]
	Transaction		Negotiations, activities	Case studies; interviews; observations		Understanding; diversity		How is the program perceived for different	House [7]

Fig. 2.1 A scheme relating major evaluation models to the philosophy of liberalism [1]



2.1.2 METHODOLOGICAL SPECIFICITIES

Objectivist methods will work on defining techniques others could use. The intuitionist relies on training and experience to ensure that truth is served (Table 2.2). The subjectivist approaches are less interested in the absolute truth than in relating the evaluation to the particular experience of the audience (their truth) in order to obtain valid insight from the group for whom the evaluation is done (which are the basic principles underlying participatory approaches). The evaluation is intentionally context-bound and findings are interpreted in context. Because of its greater experience of the context, “the audience interpretation of an event may be superior to that of the evaluator” [1]. Managerial utilitarian models (e.g., system analysis; behavioral, objectives; decision-making) require a common goal, a consensus on the goal of a particular program is reached, and this consensus defines the purpose of evaluation and the evaluation information generated is “scientifically objective” (because of based on quantitative facts rather than qualitative observations). These models also rely on the cause and effect relationship. For example, Scriven model consists in reaching objectivity by controlling bias using a set of organizational and social approaches and relying on the intersubjectivity principle (Table 2.2).

Table 2.2 Main differences between the objective and subjective approach in current evaluation models

	Utilitarian approach—objective	Intuitionist/ pluralist approach—subjective
Validity	Predicting one observable category from another	Relative to the condition of the human mind. “What is valid for one person may not be valid for others.”

Method	Defining techniques other could uses Prediction is the goal One individual perception is regarded as being subjective, objectivity comes with a number of congruent observations	Training and experience. Multiple perspectives. Qualitative emphasis rather than quantitative.
Utility	Maximizing society interest Rigid separation between observers and facts Single standard of social utility to be compared to	Maximizing the observer interest. Based on personal judgment and personal desire. Each individual is the best judge of event for himself.

2.1.3 DECISION-MAKING IN EVALUATION MODELS

Classic liberalism sees society as an association of self-determining individuals who cooperate with others for self-interest ends [8]. Mills considers the individual best to judge of its own interest (internal sphere) and that the government (external sphere) should only interfere to maximize satisfaction (utility concept based on the utilitarian model: estimate of future consequences of various alternatives) (Fig. 2.2a). Mills recognized, however, that if the individuals are not the best judge then the state might legitimately interfere (Table 2.3, Fig. 2.2a). In modern liberalism and utilitarian models [2], the government provides the effectiveness standards to base the judgment and make the choices in the public interest (Table 2.3, Fig. 2.2b). Intuitionist/pluralist models rely on professional authority (e.g., art criticism; accreditation and adversary models) or a combination of scientific authority and participation in evaluation (Table 2.3). Only democratic pluralism based on groups rather than individual diversity sets the grounds for getting the government to act in a certain direction (“balance-of-power” theory) [1]. Stake states that the evaluator “must remain responsive to any legitimate interest” but is not obliged to represent any specific point of views. Only active involvement will push representation of a group point of view in the evaluation. In this way, legitimate groups define issues and only a few issues are to be explored.

Fig. 2.2 Classical liberalism (Mills) (a); modern liberalism (Rivlin) (b); pluralism (Stakes) (c)

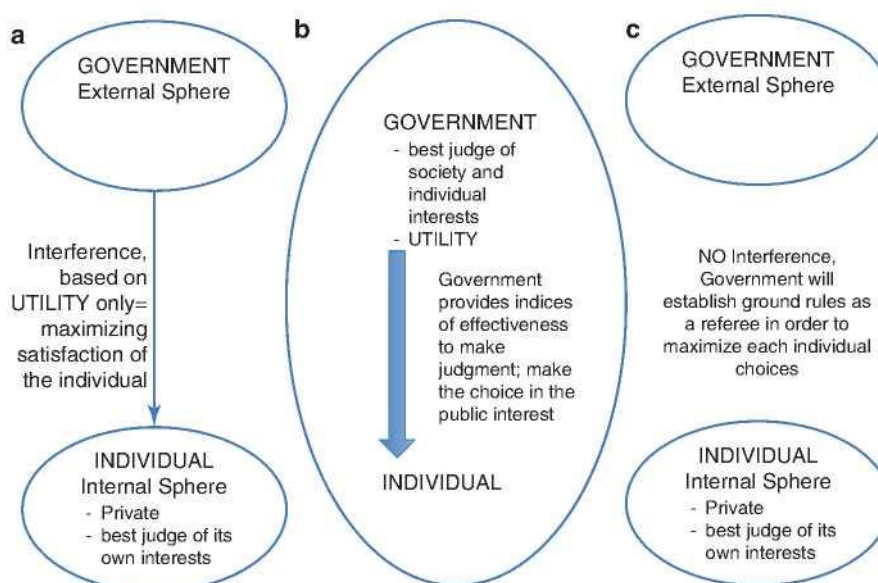


Table 2.3 Decision-making in evaluation models

Utilitarian evaluation models	Intuitionist/pluralist evaluation models
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Relegate decision-making to the government. The government evaluates, defines the problems, and takes action to maximize	Rely on participatory decision-making to maximize local and individual choices rather than social utility. Problems are
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2.1.4 REVISITING THE MAIN EVALUATION MODELS TO ANIMAL

Health Evaluation

We have revisited the evaluation model typology presented in the previous section and developed by House in the 1970s and widely used until now, in line with the new developments in evaluation approaches in the field of animal and public health (Table 2.4).

All the models described in the previous section rely on the freedom of speech principle, which believes that only the competition of ideas will strengthen the truth. Under House typology, the managerial evaluation “has something of a watchdog function” and tends to be based on “scientifically objective information.” Scientifically objective information is based on using objective methods such as tests or questionnaires to ensure reproducibility of the results. The data are analyzed using objective quantitative techniques in the sense that they can be verified by logical inspection regardless of who uses the techniques. In its extreme form, it entirely excludes nonquantitative data.

Until recently, health surveillance approach has followed a modern liberalism approach [2] (Fig. 2.2b), considering the government as the best judge of society interest and making choices in health surveillance strategies in the public interest. Mainly utilitarian objective evaluation approaches based on technical assessment of the effectiveness or efficiency have been implemented to follow this model.

Since a rising interest in improving animal health surveillance to prevent pandemics (see Chap. 1), evidence has shown that such models require either strong acceptability by the people implementing the action and/or strong regulation and/or strong enforcement and control. In any case, this requires high-level resources (human and financial). Low reporting or detection of disease is a major challenge in animal health surveillance. This could be reduced by active surveillance implementation, which also requires high level of resources. Moreover, recent work has highlighted issues beyond technical and resource ones, linked to social acceptability of the actions [15, 16]. Even in high-resources settings (e.g., industrial countries), it has become clear that other issues were at stake beyond regulation, control, and active implementation [17, 18].

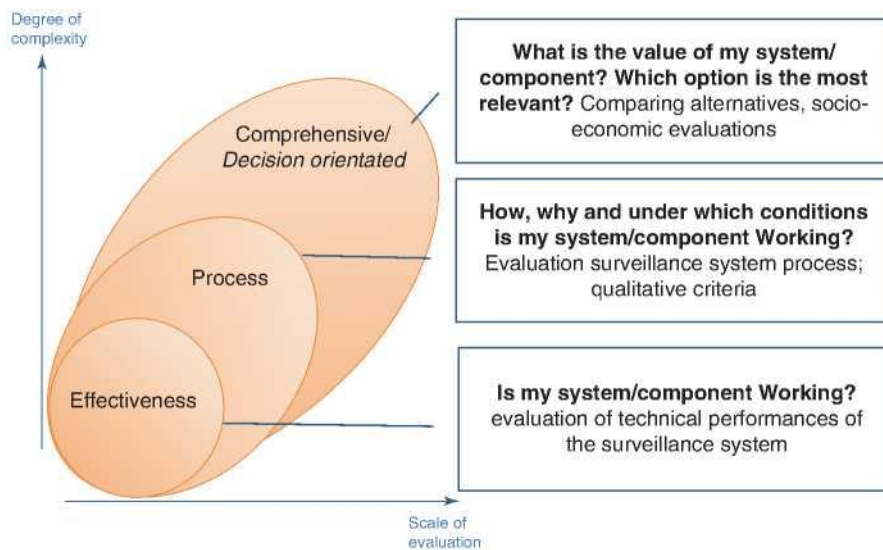
Till now, evaluation in animal health has mainly also followed similar objective utilitarian models, which aims to ensure reliability of the outcomes; using methods that will achieve high-observer agreement as opposed to procedures that may have much greater validity (Table 2.1, Fig. 2.1). As argued by House [1], utilitarian evaluation, even if based on quantitative or qualitative objectivity, could not guarantee performances of the programs in practice. Indeed, reliability is not a guarantee of validity.

In the past 10 years, we and other research groups have developed approaches to account for the individual perceptions following objective methodological approaches to benefit social efficiency (using personal understanding to improve social efficiency; ensuring that individual understanding will benefit to social efficiency), mixing up the different evaluation models to promote developmental evaluation approaches that do not advocate for any particular evaluation content, model, or method: such as *context evaluation*, *utilization-focused evaluation*, and *empowerment* (Box 2.1, Table 2.4, Fig. 2.3) [3].

Table 2.4 Revisiting major evaluation model taxonomy, applied to animal health evaluation current approaches

Main evaluation question and objective	Evaluation type	Type of method		Decision-making	Examples	References
<i>Is my system/component working?</i> Evaluation of technical performances of the surveillance system	Technical effectiveness	Quantitative	Objective	Common goal/ target effectiveness	Capture/recapture method; new effectiveness rational	Grosbois et al. [9], Vergne et al.
	Functional effectiveness	Qualitative (semi-quantitative)	Reduce bias of subjectivity	Individual perceptions	AccePT	Calba et al. [11] (see Part IV)
<i>How, why, and under which conditions is my system/component working?</i> Evaluation of surveillance system process and qualitative criteria	Process	Qualitative (semi-quantitative), expert consensus	Reduce bias of subjectivity	Common goal, standard (“ideal system”)	OASIS, expert opinion	Hendrikx et al. [12] (see Part IV)
<i>What is the value of my system/ component? Which option is the most relevant?</i> Comparing alternatives, socioeconomic evaluations	Efficiency/ value	Quantitative	Objective	Maximizing society benefits	Cost-benefit analysis	Truong et al. [13] (see Part III)
	Efficiency/ value	Quantitative Multiple observer consensus	Reduce bias of subjectivity	Maximizing individual benefits for society benefit	Willingness to pay/ contingent valuation, choice experiments	Pham et al. [14] (see Part III)

Fig. 2.3 Health surveillance evaluation scale, purpose, and degree of complexity



Box 2.1 Developmental Evaluation Approaches [3]

Context evaluation: A “bottom-up” approach to (1) framing the questions and use the context; (2) negotiating agreement on acceptability of design, measures, and procedures; (3) data collection and reporting; and (4) interpretation and facilitation of use.

Utilization-focused evaluation: “The evaluation focus on the intended use of the evaluation outcomes by the intended users; it should be judged by its utility and actual use: looking at how real people in the real world apply evaluation findings and experience the evaluation process.”

Empowerment evaluation: “Aims to increase the likelihood that programs will achieve results by increasing the capacity of program stakeholders to plan, implement, and evaluated their own programs.”

2.2 The Different Types of Evaluation

2.2.1 THE DIFFERENT PURPOSES OF ANIMAL HEALTH SURVEILLANCE EVALUATION

The main objective of evaluation of animal health surveillance system is to promote changes and reflect on the system in place. Six main specific objectives have been identified related to design/planning, optimization of resource allocation, decisionmaking, quality of data, ensuring trade, and ensuring stakeholder trust (Fig. 2.4).

Evaluation provides advocacy elements for ad hoc changes of the system (fine tuning) and (re-)planning and (re)design, to terminate the activities (exit strategy) or to generate good practices information [19].

Evaluation of animal health surveillance system can have a different focus that will influence the evaluation question, the methods used, and the type of recommendations (Box 2.2).

Technical (or effectiveness) evaluation: Is about assessing the performances of a surveillance system (e.g., sensitivity, timeliness) to evaluate its capacity to reach its objective (e.g., disease control).

Process (or functional) evaluation: Is about assessing the conditions in which the system is performing and the elements of the system organisation and function that will affect its performances to make

corrective actions to improve the system performances. Evaluation of the system process will allow to better understand the reasons behind limited performances. This will allow meaningful, adapted, and therefore more sustainable recommendations for effectiveness improvement, linked to the specific context of the system itself (see Part VI). Process evaluation will also allow to identify direct or indirect impact of a change in the surveillance activities, which will inform a cost-analysis (see Sect. 2.3)

Comprehensive or integrated evaluation: Is about integrating evaluation of system effectiveness and process to ensure all elements affecting the system performances are considered; this will improve sustainability and impact of the actions (e.g., assessing the system sensitivity and the acceptability of the actors of the system, which impacts the sensitivity level in order to promote changes to improve reporting and increase sensitivity) and could include economics (understanding decision-making in resource allocation by the system actors to improve its efficiency).

Box 2.2 Different Evaluation Focus

Focus on facts and value judgment: A study designed to assist some audience to assess an object's merit and worth; for example, what are the strengths and weaknesses of my surveillance system process?

Focus on reaching objectives and quantitative measurement: A critical assessment, in an as objective manner as possible, of the degree to which a service or its component parts fulfill stated goals; for example, is the level of detection of disease cases sufficient to control the disease?

Focus on process and results (e.g., M&E): A systematic, rigorous, and meticulous application of scientific methods to assess the design, implementation, improvement, or outcomes of a program, based on predefined indicators; for example, what is the level of the specific performance indicators defined in my surveillance system.

Fig. 2.4 Objectives of the evaluation of surveillance system [19]

OBJECTIVES OF THE EVALUATION OF SURVEILLANCE SYSTEMS¹:

1. To inform the design and re-design: to facilitate choice between different options; to identify alternative options. E.g. to improve the system, to compare different design.
2. To inform local decision makers optimisation of resource allocation: balance between performances/improvement of the system and resources involved.
3. To inform local decision makers choice between different animal health management programmes: benefit of the system for the society.
4. To provide information on the quality of the surveillance data generated, and real disease situation.
5. To inform trade regulation authorities: quality of the surveillance data and real disease situation.
6. To ensure stakeholder trust is obtained: at local and global level; effect on sustainability and efficiency of the system; "to ensure trust and keep trust"

¹Workshop results SVEPM 2015 Belgium

2.2.2 WHEN TO EVALUATE

Evaluation can be performed *ex ante* (i.e., before the implementation of the system), *in itinere* (i.e., while the system is in place and running), or *ex post* (after the end of the system). Surveillance systems are rarely

terminated; therefore, *ex ante* and *in itinere* are the most commonly applied moments for evaluation in animal health surveillance. Table 2.5 provides a link between timing and surveillance objectives. Figure 2.6 provides the list of potential trigger points that will motivate the need to evaluate.

- *Ex ante evaluation* is meant to be formative, that is, to provide essential elements to improve the value of the proposal, project, organization—could be performed to provide essential elements for the design and planning of the surveillance system. For example, 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 organization options (Fig. 2.5).
- *In itinere* evaluation is meant to be corrective, that is, to adjust the value of the proposal, project, organization—implies either regular evaluation moments of the surveillance system (components), for example, annually, every 2 years, as needed. The timing for evaluation will depend on the purpose of surveillance, objective of the surveillance system (component), and on specific trigger points such as the evolution of the disease situation. It can be done to assess its performances and its added value. When done with regular intervals, it provides information on process efficacy and data output. Already when planning the system and its evaluation, it is good to include those elements that will trigger undertaking evaluation (Fig. 2.5).
Ex post evaluation is meant to be assumptive, that is, drawing lessons from completed action, project is very rare but can be implemented to identify lessons to be learned from the implementation and running of the surveillance system (component). The surveillance system (component) could have been exited due to sustainability issues or because the disease was eradicated (e.g., rinderpest surveillance) (Fig. 2.5).

Table 2.5 Links between evaluation timing and objectives

Steps of the object under	<i>Ex ante</i>	<i>In itinere</i>	<i>Ex post</i>
Planning	Expected outputs, incomes, expected		
Design	How to reach the outputs,		
Implementation	What to do to reach the outputs, outcomes, impact	Which outputs, outcomes, and impacts were reached and/or required outputs and outcomes to reach the impacts	
Redesign; replanning		What to implement to reach the missing/new outputs, outcomes, and impacts	Which outputs, outcomes, and impacts were reached What went wrong/right; what should be done/ corrected in a new process (lessons learnt)

Fig. 2.5 The different timing of evaluation

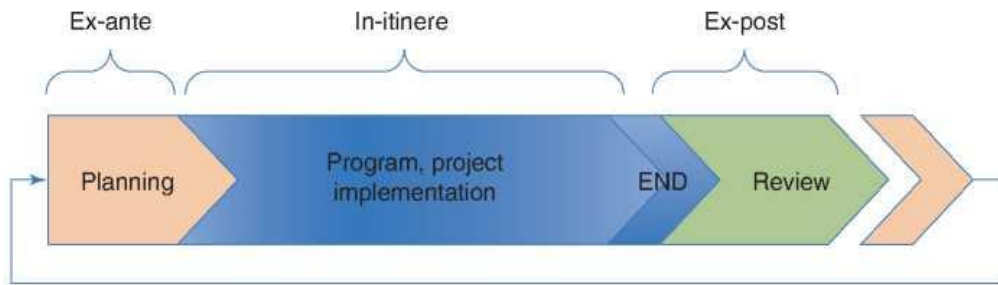


Fig. 2.6 Trigger points for evaluation in animal health

DIRECT OR INDIRECT¹ TRIGGER POINTS FOR EVALUATION OF A SURVEILLANCE SYSTEM²

- Change in local disease situation, e.g. increase in outbreaks number, incursion of disease
- Change in disease control options
- Change in surveillance design, e.g. introduction of novel surveillance component
- Public health issue
- Change in neighbouring countries, international disease situation, e.g. increase in risk of introduction
- History of surveillance and timing since last evaluation
- Political request, legislative requirement
- Risk awareness perception issue; society perception
- Trade requirements
- Socio-economic context, e.g. reduction in budget triggers need for improve resources allocations and cost optimisation

¹Those points could be interlinked

²Workshop results SVEPM 2015 Belgium

2.3 Best Evaluation Practices

The American Evaluation Association has defined specific criteria for evaluators to ensure best practices in evaluation (source: American Evaluation Association; [http:// www.eval.org/p/cm/ld/fid=51](http://www.eval.org/p/cm/ld/fid=51)):

- Implement systematic enquiry
- Adhere to highest technical standards
- Explore strengths and shortcomings of evaluation questions and approaches
- Communicate approaches, methods, and limitations accurately
- Hold appropriate competences to undertake the evaluation
- Show appropriate respect
- Take responsibilities in the implementation and reporting of the evaluation
- Ensure integrity/honesty including
 - Independence: no conflict of interest
 - Impartiality: considering all stakeholders; links between findings and recommendations
 - Transparency: all relevant stakeholders' needs to be aware of the evaluation aim and detail process:

take into account general and public interests; include all relevant stakeholders in the process; balance client and stakeholder needs; examine assumptions and potential side effects; present results in understandable forms

2.3.1 EVALUATION OF BEST PRACTICES INITIATIVES

- UN Evaluation Group: to establish UN norms and standards for evaluation (<http://www.uneval.org/>)
- OECD-DAC Evaluation Group: to improve development evaluation standards.
- MDB Evaluation Cooperation Group: to share lessons from MDB evaluations and promote evaluation harmonization and collaboration.
- BetterEvaluation initiative: to share information to improve evaluation ([http:// betterevaluation.org/](http://betterevaluation.org/)):
- “An international collaboration to improve evaluation practice and theory by sharing and generating information about options (methods or processes) and approaches.”

2.4 Conclusion

We have seen that until recently evaluation in animal health had mainly been based on quantitative or qualitative objective approaches that could not guarantee performances of the programs in practice. It is therefore recommended to mix different evaluation approaches to take into consideration the specific context and needs of the users of the evaluation outcomes. This book aims to promote the use of such an integrated evaluation approach, under best evaluation practices, to account for technical, process, and socioeconomic aspects of surveillance systems. Specific methods to do so are presented through the different following parts of this book.

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