Cost-benefit analysis framework

Jordi Casal

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Taking health decisions

- Problem definition
  - Data gathering
  - Identification of possible responses
  - Benefit/cost evaluation
  - Uncertainty evaluation
  - Application of the decision
  - Follow-up
Items to be included in an economic impact assessment of animal diseases

Health Impact

Health Losses
- Visible Losses
  - Dead people & animals
  - Thin people & animals
  - People & animals poorly developed
  - Low returns
  - Poor quality products
- Invisible Losses
  - Fertility problems
  - Change in population structure
  - Increased labour costs
  - Delayed sale of animals and products
  - High prices for livestock and livestock products

Expenditure & Reaction
- Additional Costs
- Lost Revenue

From Rushton, 2016
Cost / benefit analysis

Three different types of benefits and costs:

- **Easy to quantify.** Ex: ↑ milk production.
- **Difficult to quantify** (estimations): Ex. growing animals with a weight without market prices.
- **Intangible benefits.** Ex: prestige, satisfaction, consumer trust, etc.

**Benefit ??**

How can we calculate the revenues (the benefit)?

Benefit streams in the future or in a scenario are predictive – not definitive!

- For animal health decisions benefit streams are based on:
  - Epidemiological models
  - Market models
- Both types of models contain levels of uncertainty
Cost-benefit analysis

- There are also additional costs and additional benefits that occur in different years (time periods):
  
  They need to be converted to present values

- Metrics:
  - net present value (NPV: benefits - costs in present values)
  - benefit cost ratio (BCR: benefits / costs)

- Economic impact:
  - At the national level / At farm-level
  - For the Government / For the farmer

Cost benefit analysis (CBA) is a systematic approach to estimate the strengths and weaknesses of alternatives.

It is also defined as a systematic process for calculating and comparing benefits and costs of a decision, policy or (in general) a project.

Reaction costs
- Control activities in outbreaks
- Surveillance activities within the country
- Control activities in non-affected farms

Diseases loses
- Direct costs in affected farms
- Indirect costs
Control activities in outbreaks

- Outbreak investigations (to confirm outbreaks)
- Visit to the farm
- Testing
- Transport of samples to lab
- Lab technique

- Stamping out
- Personnel
- Materials used

- Compensation to farmers
- Compensation by herd

- Carcass disposal
- Personnel
- Burial

- Cleaning/disinfection
- Personnel
- Materials used

- Desinsectation

Control activities in non-affected farms

- Vaccination
- Visit to the farm
- Vaccine
- Other materials used
- Adverse reactions

Surveillance activities within the country

- Vector surveillance
- Visit to the farm
- Traps
- Trapping
- Personnel

- Wildlife surveillance
- Personnel
- Tests

- Awareness campaigns
- Personnel
Direct costs

Milk
Abortions
Hides

Indirect costs

Trade restrictions ➔ Animals
Semen
Embrios
...

Loose of opportunity ➔ Milk
Meat
Salaries
Fixed costs