Request for comments

RFC20051213AR: Cost accounting parameters

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Applies to: Model description v1.0.3

Type of change: Addition to the specification

Summary: The proposed change describes the parameters needed to track direct costs associated with a disease outbreak.

Justification: Legacy versions of *SpreadModel* featured undocumented cost accounting parameters. Most if not all of these are present in NAADSM/SC, but they are not yet available in NAADSM/PC. The specification changes presented here will serve as a basis for incorporation of cost accounting features in NAADSM/PC and will ensure that costs are treated the same way in the PC and supercomputer versions of the program.

Change: This change would add a new section to the existing model specification document:

9. Costs

Direct costs associated with destruction and vaccination during an outbreak may be calculated.

9.1 Costs associated with destruction

There is a fixed cost associated with appraisal of each destroyed unit, regardless of the number of animals in the unit. The cost associated with cleaning and disinfection each unit is also fixed regardless of the number of animals in each unit.

Beyond these fixed per-unit costs, the per-animal costs for euthanasia, carcass disposal, and indemnification apply.

The total cost of destruction *for each unit* of a particular production type is calculated as follows:

(Appraisal cost + Cleaning and disinfection cost)
+ [(Number of animals in the unit)
× (Cost of euthanasia + Cost of indemnification + Cost of disposal)]

The total cost of destruction *for each production type* is calculated as:

(Number of units destroyed) × (Appraisal cost + Cleaning and disinfection cost)
+ [(Total number of animals destroyed) × (Cost of euthanasia + Cost of indemnification
+ Cost of disposal)]

Parameters for destruction costs

Parameters specified for each production type:

- Appraisal cost **per unit**
- Cost of cleaning and disinfection **per unit**
- Cost of euthanasia **per animal**
- Cost of indemnification **per animal**
- Cost of carcass disposal **per animal**

9.2 Costs associated with vaccination

There is a fixed cost associated with vaccination set up for each vaccinated unit, regardless of the number of animals in the unit. The cost of vaccination of each animal in the unit is added to this fixed unit cost.

The cost of vaccination of each animal will depend on the total number of animals vaccinated. For each animal up to a specified threshold, only a baseline vaccination cost applies. For each animal over this threshold, an additional cost applies.

The total cost of vaccination *for each production type* is calculated as follows:

If the threshold is not reached:

[(Number of units vaccinated) × (Cost of site setup)]
+ [(Total number of animals vaccinated) × (Baseline cost per animal)]

If the threshold is reached:

[(Number of units vaccinated) × (Cost of site setup)]
+ [(Threshold level) × (Baseline cost per animal)]
+ [(Total number of animals vaccinated– Threshold level) × (Baseline cost per animal
+ Additional cost per animal)]

Parameters for vaccination costs

Parameters specified for each production type:

- Number of animals of this production type that can be vaccinated before the cost of vaccination increases
- Baseline cost of vaccination **per animal** (this cost applies until the specified threshold has been met)
- Additional cost of vaccination **per animal** for each animal beyond the specified threshold
- Cost of vaccination site setup per **unit**

End of changes