**Model parameters.** Name, description, default values and source of all parameters used in the rabies simulation model adapted from [1].

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | description | Default value | Source |
| Max\_time | how long (simulated days) the model should run | 10000 | ― |
| population parameters | | | |
| starting\_population | dog population size at the start of the simulation | 813 | [2] |
| birth rate | assumed to be equal to death rate | 0.1260504 | - |
| death rate | proportion of population that dies per year - implemented as a Poisson distribution for daily number of dogs taken out of the population  for example, On the 1st day, Poisson is (813\*0.1260504)/365 and a number from this distribution is selected as the number of dogs to be taken out of the population that day | 0.1260504 | [2] |
| Field population structure | proportion of dogs in each of the roaming dog categories for the Field population structure | Explorer category: 0.29,  Roamer category: 0.29,  Stay-at-home category: 0.42 | [3] |
| Stay-at-home Dominant structure | proportion of dogs in each of the roaming dog categories for the Stay-at-home Dominant structure | Explorer category: 0.2,  Roamer category: 0.2,  Stay-at-home category: 0.60 | assumption |
| Roamer Dominant structure | proportion of dogs in each of the roaming dog categories for the Roamer Dominant structure | Explorer category: 0.2,  Roamer category: 0.6,  Stay-at-home category: 0.2 | assumption |
| Explorer Dominant structure | proportion of dogs in each of the roaming dog categories for the Explorer Dominant structure | Explorer category: 0.4,  Roamer category: 0.2,  Stay-at-home category: 0.2 | assumption |
| index dog(s) related parameters | | | |
| Index\_region | definition of the case(es) is hierarchical: if index\_dog is defined, all other are not used in the model; else if index\_community is defined, index\_region is not used in the model | NA | ― |
| index\_community | NA | ― |
| index\_dog | NA | ― |
| nb\_index\_dogs | 1 | ― |
| disease states related parameters | | | |
| infectiousDelay | Incubation period: time period between exposure (bite) and infectiousness | Pert(22.8,25.8,29) | [4–6] |
| clinicalDelay | Subclinical period (time period between infectiousness and occurrence of typical rabies clinical signs; this parameter mainly influences the detection of rabies as the detection delay starts with the beginning of the clinical phase) | Unif(1,3) | [7,8] |
| mortalityDelay | Clinical period (time period between start of clinical signs and death) | Pert(2,4.7,12) | [4–6] |
| Prop\_furious\_dog | Proportion of dogs developing furious rabies | Unif(0.1,0.6) | [9] |
| Within and between household contact/transmission related arguments | | | |
| cont\_prob\_sameHH | Daily contact probability of dogs within the same household | Unif(0.94,1) | [1] |
| EE kernel | Distance kernels that define the probability of a daily contact for households located a given distance apart. The individual functions (Weibull, 3- or 4- parameter logistic) are used to create pert distributions  median = median,  minimum = 2.5%,  maximum = 97.5% | Median = Weibull (0.001303, -0.578108, -10.607419, 2.333159) | [10] |
| 2.5% = Weibull (0, -0.2095, -17.1428, 3.8934) | [10] |
| 97.5% = Logistic (0.9413, 0.004717, 113.7, 51.24) | [10] |
| ER kernel | Median = Weibull (0, -0.4352, -9.7898, 2.0414) | [10] |
| 2.5% = Weibull (0, -0.1929, -14.4917, 3.2238) | [10] |
| 97.5% = Logistic (0.75355, 0.01377, 158.81465, 53.71570) | [10] |
| ES kernel | Median = Weibull (0, -0.5189, -8.3546, 1.9440) | [10] |
| 2.5% = Logistic (0.1235, 60.3060, -10.0984) | [10] |
| 97.5% = Weibull (0.004483, -0.813974, -9.184410, 1.895362) | [10] |
| RR kernel | Median = Logistic (0.7863, 70.2314, -16.1642) | [10] |
| 2.5% = Weibull (0.000481, -0.577691, -11.069992, 2.745385) | [10] |
| 97.5% = Logistic (0.8598, 127.8663, -30.3622) | [10] |
| SR kernel | Median = Logistic (0.7776, 61.2093, -12.6910) | [10] |
| 2.5% = Logistic (0.5502, 36.8422, -12.9916) | [10] |
| 97.5% = Logistic (0.8591, 104.0302, -23.3257) | [10] |
| SS kernel | Median = Weibull (0, -0.8131, -12.2370, 2.9838) | [10] |
| 2.5% = Weibull (0, -0.5567, -11.2435, 2.9152) | [10] |
| 97.5% = Logistic (0.9055, 81.8654, -20.6504) | [10] |
| bite\_prob\_sameHH | probability of bite given a contact within the same household | Unif(0.01,0.05) | assumption, high chance of bite assumed as dogs from same household are living close together |
| increasedBiteProb\_sameHH | increase of the bite probability when the dog is becoming rabid | 3 | assumption, higher chance of bite assumed for dogs showing clinical signs |
| bite\_prob\_betweenHH | probability of bite given a contact between dogs from different households | Unif(0.05,0.1) | assumption, less than within household contacts |
| increasedBiteProb\_betwHH | increase of the bite probability when the dog is becoming rabid | 3 | assumption, higher chance of bite assumed for dogs showing clinical signs |
| transmissionProb | probability of rabies transmission given a bite (regardless of type of contact) | Pert(0.45,0.49,0.52) | [4] |
| between district movement parameters | | | |
| movements\_permanent | daily frequency of permanent movements per dog, can be defined for each district separately | Unif (0.000146,0.000146) for all districts | [1] |
| movements\_shortTerm | daily frequency of short term movements per dog, can be defined for each district separately | 0 | [1] |
| probs | matrix defining the relative probability of between district dog movements from one district to another in the same region | 4 to neighbouring districts; 1 to other district | [1] |
| Rabies detection parameters | | | |
| detectPeriod\_firstCase | time (days) for detection of rabies after the start of clinical signs for the first case | Pert(14,21,28) | assumption; relatively short compared to [11] due to increased disease awareness |
| detectPeriod\_secondCases | time (days) for detection of rabies after the start of clinical signs for all other cases in the region | Pert(1,2,4) | assumption |
| control strategy vaccination | | | |
| reactVacc\_covLevel\_reference | definition of the vaccination coverage can be based on the dog population (i.e. a given percentage of dogs will be vaccinated irrespective of whether they are living in the same or different household; "dog") or on the household level (i.e. a given percentage of households will be vaccinated and all dogs in that household are vaccinated; "household") | “dog” | - |
| vaccination\_goal | vaccination goal is either "community" or "region", indicating whether the goal of the vaccination strategy is to vaccinate all dogs in the community or region where rabies is detected | “region” | - |
| start\_vacc\_delay | time (days) between the detection of the first rabid dog and the start of the vaccination campaign | 7 | assumption |
| vacc\_capacity | maximum number of dogs vaccinated per day | 50 | assumption |
| reactive\_vacc\_cov | immunization coverage of the three roaming categories | block design of 0.5, 0.7 and 0.9 | - |
| protectionDelay | delay (days) between vaccination of the dog and the protection of the dog via vaccination. There is no protection from vaccination prior to when protection is reached | Unif(7,14) | [12-14] |
| vaccEfficacy | efficacy of the vaccination if the dog is vaccinated before last\_vacc day after the exposure of the dog to rabies | Unif(0.92,0.96) | [12,13,15,16] |
| reduced\_vaccEfficacy | efficacy of the vaccination if the dog is vaccinated before last\_vacc day after the exposure of the dog to rabies | Unif(0.05,0.25) | assumption |
| late\_vacc | number of days determines the change of the vaccination efficacy (from vaccEfficacy to reduced\_vaccEfficacy) | Unif(2,4) | [17,18] |

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