Canine Rabies Blueprint - Evaluation

5.6.1. How can we find out if the canine rabies control programme has been successful?

Any disease control programme should include a continued review process or evaluation to assess the effectiveness of the interventions that are being applied. The evaluation should ideally begin with the establishment of baseline data on the epidemiological, economic and social impact of the disease. This will help to identify gaps in knowledge and adapt the goals, objectives and methods or actions as required. For example, as the programme progresses over time, the measured changes in the epidemiological situation or changing attitudes in public awareness might require a reconsideration of the chosen rabies control measures and their prompt adaptation to the improving or stagnating situation. Defining impact indicators such as such as rabies prevalence, dog bite incidence, PEP courses delivered or dog vaccination coverage are useful for evaluating rabies control programmes. A selection of indicators are listed below.

Rabies surveillance plays a critical role in the monitoring of the programme and it is the key indicator for the success of any intervention. If not already in existence, a surveillance programme should be established (click here for more information or refer to the Rabies Surveillance Blueprint on how to establish an effective system). Decrease/absence of rabies requires verification and residual foci must be detected rapidly. There are a number of indicators described in this section that will help you determine the effectiveness of your programme. Note that these indicators relate to the dog vaccination component of the programme. Click here for guidelines on monitoring and evaluation of dog population management programmes.

Click here for guidelines on evaluation of public awareness and communication plans.

5.6.2. Has the programme reached enough dogs?

Mass vaccination programmes should reach an appropriate number of animals each year (at least 70%, but depending on the setting this threshold could be higher, e.g. in populations with very high turnover, or lower, e.g. in areas where dog movements are restricted) and maintain this level of coverage over time until rabies cases have been eliminated through frequent (at least annual)
vaccination campaigns. Vaccination coverage should be determined prior to the start of the mass dog vaccination programme and following each subsequent campaign as due to dog population turnover and introductions of dogs, the number of dogs present in a given area may fluctuate. If resources are limited and coverage cannot be estimated following each campaign, it is important that vaccination campaigns are still conducted. Click here for details of how to estimate vaccination coverage.

5.6.3. Has the programme had an impact on dog rabies cases?

The collection and analysis of data on dog rabies cases is important to help you determine whether the intervention has had an impact on dog rabies in the target area. These data need to be compiled before, during and after the campaigns to evaluate the impact over time. Data on rabies cases in other animal species should also be examined to evaluate the impact of dog rabies control on the incidence of rabies in other species.

5.6.4. Has the programme had an impact on human rabies deaths, bite exposures and demand for human post-exposure treatment?

The reduction/elimination of human rabies death is the final goal of any dog rabies control programme. Often, residual human cases constitute the only indicator of the maintenance of dog rabies or its reintroduction in a defined (geographic or administrative) area. Hospital records of human rabies cases and exposures from suspected rabid animals (during pre- and post- canine vaccination campaign periods) are useful indicators of the relationship between mass dog vaccination and human rabies. In areas where no hospital records are available, information may be gathered by household surveys as explained here.
Information on human rabies cases can also be recorded by other means such as death records and *verbal autopsies* by specialists. The number of Human vaccine doses used can assist in evaluating the cost- effectiveness of dog vaccination compared to prevention of human rabies through human rabies post-exposure prophylaxis only. Analyses of data obtained from any unvaccinated areas compared to the target (vaccinated) areas can also be carried out, but care needs to be taken to interpret data from different areas.

5.6.5. How well do dogs respond to vaccination?

The safety and efficaciousness of modern cell-culture vaccines produced according to OIE [2] standards (see here) currently used for parenteral immunization of dogs are widely recognised. It is therefore not necessary to conduct a serological confirmation of vaccination success. However, in some situations determining rabies antibodies after vaccination may be necessary when evaluating the success of novel strategies (e.g. oral vaccination) or to ensure correct administration and maintenance of cold chain. The determination of rabies antibodies is also required for the international movements of dogs (see Chapter 5 here). Click here to read more on monitoring and indicators of success of oral vaccination campaigns.

Evaluating antibodies against rabies after vaccination can be operationally difficult and generally requires substantial investment in labour and capital: samples need to be collected pre- and post-vaccination at specific intervals and standard laboratory analyses (measuring neutralizing antibodies) are costly and currently can only be carried out in specialized laboratories (i.e. WHO Collaborative Centers for Rabies and OIE [2] reference laboratories for rabies, listed here). Because of the expense of serological surveys, it is best to only use modern efficacious vaccines than risk jeopardizing campaigns with poorer quality vaccines produced by manufacturers not recognized by international regulatory agencies.
5.6.6. Self-Assessment of national rabies programmes

The Stepwise Approach towards Rabies Elimination (SARE) is a planning and evaluation tool to assist countries when developing national rabies programmes to control rabies and eventually eliminate dog transmitted rabies in their country. The tool has been developed upon request from dog rabies endemic countries. SARE is not prescriptive nor is it intended to replace existing regional or national rabies control strategies, but may serve as self-assessment tool and a practical guide to developing a stepwise approach towards rabies control and eventual elimination. The full SARE is presented in Section 6.
Below is an overview of the Stepwise Approach towards Rabies Elimination.
The dark blue boxes describe the rabies situation at each stage and the lighter blue boxes the key indicators that must be reached in order to move on to the next stage.

As Latin-American countries are reaching elimination of dog transmitted rabies, a multi-criteria decision analysis (MCDA) model has been developed by the Pan American Health Organization (PAHO). This tool helps the evaluation of rabies programmes across the region and to identify the best investment strategy for countries and territories to improve and efficiently maintain their rabies control efforts.

[1] World Health Organization