Post-Vaccination Survey: Estimation of Vaccination Coverage

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Key points
- A postvaccination survey of the area must be conducted to ensure that the vaccination coverage is greater than 70% of the total dog population for that area.
- The survey needs to occur within 72 hours (3 days) of the conclusion of vaccination.
- If at least 70% coverage is not achieved, revaccination must occur until this target is reached.

Risks and precautions
- It is strongly recommended that all staff involved in mass vaccination of dogs complete the full course of preexposure vaccination. This should be ensured by the relevant line manager of the vaccinator staff.
- Anyone bitten or scratched should wash the wound immediately under running water for 15 minutes with soap, then disinfect with ethanol (700ml/l) or iodine (tincture or aqueous solution) if available, and immediately go to the nearest approved hospital or bite treatment centre for an assessment of whether postexposure rabies vaccination is needed - this includes staff that have been previously vaccinated.
- Vaccination team members should not attempt to net or capture a dog without training.
- If dogs are observed to show potential signs of rabies refer to the guides Rapid Response to Suspect Rapid Dog Alerts and Euthanasia of Rabid or Suspect Rabid Dogs.

Related guides
Preparation for Vaccination
Vaccination Day
1. Introduction

After all vaccinations have been completed, a survey of the vaccination area must be conducted to ensure that the vaccination coverage is greater than 70% of the total dog population for that area. This needs to occur within 72 hours (3 days) of the conclusion of vaccination, otherwise collars may have disappeared or paint may have washed off and survey results will be unreliable.

The survey needs to be conducted correctly so that an accurate estimate of coverage is achieved. If it is not done correctly, a village with coverage below 70% may not be identified and revaccination not conducted, leading to an ineffective program.

*Note: Some dogs can become frightened after vaccination and may be difficult to find.

2. Materials & personnel

The following materials and personnel are recommended for the survey:

<table>
<thead>
<tr>
<th>Materials/equipment</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorcycle (if available) or 1 bicycle (if skilled counter)</td>
<td>1 per team</td>
</tr>
<tr>
<td>Helmets</td>
<td>1 per person</td>
</tr>
<tr>
<td>Reporting forms, pens and clipboard</td>
<td>1 per team</td>
</tr>
<tr>
<td>Mobile phone (and credit vouchers if required)</td>
<td>1 per team</td>
</tr>
<tr>
<td>Human First Aid box including soap, water, towels, band aids, cotton wool, bandages, antibacterial cream, antiseptic</td>
<td>1 per team</td>
</tr>
<tr>
<td>Rabies Postvaccination Survey Worksheet</td>
<td>1 per team</td>
</tr>
<tr>
<td>Rabies Postvaccination Survey Summary Form</td>
<td>1 per team</td>
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</tbody>
</table>

Personnel

- Each team should consist of one officer to record and one motorcycle driver (unless on bicycles).
- Survey Coordinator: one recommended for every 5–10 survey teams. The coordinator should be responsible for:
  - scheduling surveys, preparing and resourcing teams
  - ensuring prompt data collection and feedback to vaccination teams on coverage achieved
  - analysing patterns in coverage – including whether some vaccination teams are consistently achieving low or high coverage and amending/learning from their strategies to improve vaccination coverage overall

*Note: If one key data coordinator for the program is preferred, this coordinator may also be responsible for the collection, storage and reporting of data received from the Vaccination Coordinator.

3. Preparation

**Determining how long to survey for**

To determine how long to survey the area for, use either of the two following methods:

**Surveying for a minimum period of time**

*Assumptions:*

- On vaccination days the number of dogs vaccinated is accurately recorded.
- All the vaccinated dogs are marked for identification.
As a general rule, dogs should be counted for a **minimum of 3 hours**, covering the entire area if possible or, if not, samples from each segment of the area. Time required will increase with the size of the area to survey.

**Counting a minimum number of dogs**

**Requirement:** An estimate of the local dog population size.

An alternative to just surveying for a minimum period of time is to calculate the minimum number of dogs to be counted in order to achieve a reliable estimate of coverage. This method is recommended for larger areas such as cities, and representative samples from each segment should be surveyed.

i) Using the estimated number of dogs in the local population, N (see ‘Methods for estimating population size’ in the guide *Preparation for Vaccination*), the following formula can be used:

\[ S = \frac{96}{1 + \left(\frac{96}{N}\right)} \]

Where:
- \( N \) = estimated dog population in the area
- \( S \) = Minimum number of dogs to be surveyed

For example, for an estimated population size of 150 dogs, the minimum number of dogs to be surveyed is:

\[ S = \frac{96}{1 + \left(\frac{96}{150}\right)} = 58.5 \text{ (round up to 59).} \]

ii) Give this estimate to the survey teams the day before the survey so they know the minimum number of dogs to be surveyed in the village.

**Meet with the community leader**

- Take a map of the village to ensure that the survey teams cover the entire area.
- Establish the transect for the survey and mark this on the map.
- Confirm the survey schedule with the community leader.
- Ask the community leader or a representative to accompany the teams so that they can assist in finding as many dogs as possible. It would be best if this was **not** the same person who accompanied the vaccination teams to eliminate potential bias.

**Survey data form**

Fill in the relevant information on the *Rabies Postvaccination Survey Worksheet* before starting the survey including: name of village, date, date of the previous vaccination and the target sample size to be surveyed.

**4. Survey method**

**Timing**

Surveys are best carried out during the cooler hours of the day when the dogs are active and their owners are likely to be at home (for example, early morning and late afternoon / early evening).

Survey the village for a **minimum of 3 hours** even if the minimum number of dogs is counted before then.

**Moving through the area/s**

- Only one person should count for each village.
- Move through the village making a **zigzag across the length and width of the village** to ensure there is no bias for certain parts.
• Use a method of travel to allow them to move at a reasonable rate of progress to reduce the number of times a dog is seen more than once but also allow a thorough search. Walking will allow for a thorough count but is slow. Cycling and walking the bike, when needed, is a good compromise.

• Move quietly and inconspicuously so as to not scare off dogs.

• Move down every street, counting each dog they see and searching for dogs in potential hiding places (e.g. undercars, drains).

• Access all roads and avoid recounting the same street.

• Visit all areas along the transect including beaches, small streets, markets, slaughterhouses, mosques/temples/churches, hospitals, construction sites and cemeteries.

• For open public areas such as parks or waste ground, it is usually possible to scan effectively from a vantage point or by walking across them.

• Stop to talk to local people to ask about their knowledge of both roaming and confined dogs in the area.

**Recording**

All dogs seen must be recorded as either vaccinated (as indicated by a collar or paint spray/gentian violet) or not vaccinated on the Babies Postvaccination Survey Worksheet. (Note: Puppies under 9 months of age will have paint not collars).

If it is easier for recording, simple and cheap handheld counters can be used and final figures tallied on the sheet at the end of the survey.

Do not leave the village until at least the minimum number of hours have been completed, and the minimum number of dogs have been counted (if this method is being used).

• If the required number of dogs cannot be found, the village must be recounted at the next convenient time. If the required number still cannot be counted, send both results to the Survey Coordinator.

Ensure that the worksheet is filled in correctly and submitted to the Survey Coordinator by submitting it in hardcopy and/or by SMS or calling in the results.

### 5. Reporting coverage & re-vaccination

**Calculate the percentage of dogs vaccinated**

The following calculation should be used by the Survey Coordinator to calculate the vaccination coverage:

\[
\text{Number of marked dogs seen on survey} \times 100 \quad \text{Total number of dogs seen with and without marks}
\]

**Note:** If some dogs were reported by the vaccination team as vaccinated but not marked, add these to the number of marked dogs to calculate the true vaccination coverage.

**Report coverage**

The coverage [%] achieved must be reported to the Vaccination Coordinator and then to the Vaccination Teams to ensure feedback on their performance.

• **If 70% or more of the dogs have been vaccinated**, the village is considered complete.
Re-vaccination
If less than 70% have been vaccinated, the Vaccination Team must return to the village within one week of the first vaccination, to vaccinate any unvaccinated dogs. Following the second round of vaccination the survey team needs to return to conduct a survey again within 3 days. This process should continue until at least 70% has been reached. (Also refer to example below).

6. Estimating dog population size: First round vaccinations
At the conclusion of the first round of vaccinations, the estimated dog population for the village should be calculated using the following formula that combines data from the vaccination and survey teams:

\[
\frac{\text{Number of vaccinated dogs} \times \text{total number of dogs seen on survey}}{\text{Number of marked dogs seen on survey}}
\]

Data regarding coverage and dog population estimates must be submitted to the provincial/national rabies committee by the Survey Coordinator. This figure is required for estimating the minimum number of dogs to vaccinate for the second round of vaccinations (see the guide Preparation for Vaccination).

Example (Courtesy of FAO, Indonesia)
- 100 dogs vaccinated
- Post-vaccination survey identified 50 dogs vaccinated (with marking or collar) and 26 unvaccinated.
- Estimation dog population = \( \frac{100 \times 76}{50} = 152 \)

This figure can then be used to estimate the number of dogs still to be vaccinated to reach at least 70% coverage.

\[ 70\% \times 152 = 106.4 \approx 107 \text{ Dog} \]

Hence at least 7 more dogs need to be vaccinated minimum to get 70% coverage.