Human and dog rabies vaccines and immunoglobulins

REPORT OF A MEETING

Geneva, 12–13 October 2015

PHOTO: Daniel Stewart
RABIES – the 100% preventable zoonotic Neglected Tropical Disease (NTD)

optimized supply & coordination = expedited achievement of ZERO deaths

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Executive summary

The World Health Organization (WHO) in collaboration with the World Organization for Animal Health (OIE) convened a meeting of country representatives, manufacturers and other stakeholders at WHO headquarters in Geneva, Switzerland on 12-13 October 2015, to discuss and develop ideas for improving the current system of procurement of quality-assured, safe and affordable dog and human rabies vaccines and rabies immunoglobulins (RIGs).

The objectives of the meeting were:
- to assemble forecasts of human and dog rabies vaccines and RIGs from specific countries;
- to understand the manufacturing capacity for rabies vaccines and RIGs, shortfalls and logistical needs;
- to obtain a shared understanding of global supply of vaccines and RIG needs or forecasts; and
- to explore bulk purchasing options for countries through WHO/UNICEF (human vaccine and RIG) and OIE/WHO (animal vaccine) mechanisms.

The current situation was presented by WHO and OIE experts, country representatives (from Bangladesh, Mexico, the Philippines, South Africa, Sri Lanka, Uganda and the United Republic of Tanzania), manufacturers of vaccines and RIGs, and the Strategic and Technical Advisory Group for Neglected and Tropical Diseases. The WHO-UNICEF mechanisms for vaccine procurement were presented using the example of a meningitis vaccine stockpile, and insights gained into the Pan American Health Organization (PAHO) revolving fund, the WHO prequalification process and OIE dog rabies vaccine banks.

Key messages

The participants identified and discussed four major issues: forecasting; quality of vaccines and RIGs; funding strategies; and procurement. The discussions confirmed the need for provision of a procurement mechanism and coordination for both dog and human vaccines and RIGs, with joint leadership from WHO and OIE. The importance of creating political will to raise awareness of rabies as a public health priority was emphasized.

Forecasting vaccine needs

Human vaccine:
- Proactive use of vaccine will progressively improve the accuracy of forecasts which will generate higher quality data over time. Consistent country forecasts will stabilize demand, production and availability of vaccine.
- Improved data will feed into national policies.
- Cost-benefit and value analyses (public health, healthy workforce, improved economy) will be key.
Manufacturers of human vaccine need to include intradermal routes of administration on product label.

**Dog vaccine:**
- Identifying dog vaccine requirements is fundamentally linked to country-level plans.
- There is a wide range of readiness, good work is being done and opportunities exist to share lessons learned and success stories, such as the use of a regional coordinating platform.
- Although 70% of dog population would ideally forecast vaccine needs, in the absence of population estimates identifying a corridor or source area and starting to vaccinate will start the process of building accurate dog estimates. Current estimates are available for 192 countries, but their quality varies.
- Vaccine manufacturers consider 18 months to 5 years a useful timespan for vaccine forecasts. However, donor funded programmes rarely extend beyond 3 years. Consolidated regional estimates will improve timing of requirements, including seasonal campaigns, leading to assured production and sales.

**Quality of vaccines and RIGs**
Quality assurance differs for dog vaccine, human vaccine and RIGs:
- For dog vaccine, the OIE has established and maintains intergovernmental standards for manufacturers; there is no OIE prequalification procedure for vaccine suppliers.
- For human vaccine, WHO prequalification procedures ensure that vaccines meet quality standards and are safe and efficacious.
- For RIGs, no international quality standards are available and minimum standards must be established to improve the quality of RIGs.
- Poor delivery systems can impact a vaccine's quality.
- The next-generation human vaccine (single or two-dose vaccine) should provide improvements, such as longer shelf-life and thermostability at ambient temperatures.
- Better and purer antigens will improve safety and efficacy and lead to greater quality overall.

**Funding strategies**
- Funding strategies for human and dog vaccines may need to consider support beyond the cost of the vaccines (for delivery, training, logistics, equipment, etc.).
- National joint human/dog programmes, as support by WHO, OIE, the Food and Agriculture Organization of the United Nations (FAO) and the Global Alliance for Rabies Control (GARC), lead to more effective programmes and better use of resources.
- There is no one solution for all countries: a variety of strategies is needed (national/regional/local).
- Donor funds should be considered “kick-starter injections” and not long-term solutions.
- Pooled funding and transparent tendering processes improve cost efficiency and drive competition.
- Political will is needed to raise awareness of rabies as a public health priority. Cost/benefit/value analysis is a key factor in creating that political will.
**Procurement**

- The ideal procurement system is one that benefits both manufacturers and recipients, with information on quantities and timing generated by reliable, accurate data from forecasting mechanisms.

- For human vaccine, an integrated “pull” and “push” system is envisioned: the pull part providing negotiation on behalf of countries (as for PAHO), with a focus on middle-income countries; the push part being donor funded (as for the system for funding oral cholera vaccine), with a focus on low-income countries.

- For RIGs, a pull system is preferred, with supply being made available to middle-income countries already engaged in control programmes. Another system would be needed for countries without programmes, with a focus on African countries.

- For dog vaccine, the current procurement mechanism used by OIE and WHO for vaccine banks works well. Expanding to a sustainable, long-term programme to cover African and other endemic countries requiring support was suggested. The PAHO procurement system has proven particularly effective in Latin America and could be used as a model.

**Next steps**

WHO and OIE are committed to working together to advance the rabies vaccine agenda, in collaboration with relevant partners and with the continued support and engagement of the participants at the meeting. Outcomes of the meeting and next steps will be presented at the conference on “Global Elimination of Dog-mediated Human Rabies – The Time is Now” (Geneva, 10-11 December 2015). An action plan specifying activities, responsibilities and timelines will follow.
Rabies is preventable through vaccination, yet dog-mediated rabies kills tens of thousands of people every year worldwide. In the past few years, proof-of-concept programmes using mass dog vaccination and post-exposure prophylaxis (PEP) have proven highly effective in controlling or eliminating dog-mediated human rabies in several endemic countries in Asia and Africa. This report addresses human rabies transmitted by dogs and not rabies transmitted by wildlife.

Currently, many countries with ongoing rabies elimination programmes do not have effective procurement systems for human and dog vaccines and rabies immunoglobulins (RIGs). Consequently, the price of the PEP remains high, its availability is erratic and the quality of the vaccines varies, leading to avoidable deaths and rabies outbreaks. To achieve the goal of global elimination of rabies as a health problem, quality-assured, safe human and dog vaccines and RIGs are needed. To ensure successful programme planning and expansion in the next 5 years and beyond, the current system of procurement must be improved.

The World Health Organization (WHO) in collaboration with the World Organization for Animal Health (OIE) convened a meeting of country representatives, manufacturers and other stakeholders at WHO headquarters in Geneva, Switzerland on 12-13 October 2015. The list of participants is annexed to this report.
2 Context

The meeting served to broker a common understanding of the current situation through presentations from WHO and OIE experts, country representatives (Bangladesh, Mexico, the Philippines, South Africa, Sri Lanka, Uganda and the United Republic of Tanzania), manufacturers of vaccines and RIGs (on current capacity, shortfalls and logistical needs) and on behalf of the Strategic and Technical Advisory Group for Neglected Tropical Diseases. The WHO–UNICEF mechanisms for vaccine procurement were presented using the example of a meningitis vaccine stockpile, and insights gained into the Pan American Health Organization (PAHO) revolving fund, the WHO prequalification process and the OIE dog rabies vaccine banks. Participants explored options for making products more easily available and developing partnerships among involved parties.

3 Key issues

Participants identified key issues, their scope and implications, and potential solutions.

Discussion of the following issues focused on ensuring reliable access to safe, efficacious vaccines and RIGs at optimal prices:

3.1 Forecasting

*Improved data collection will lead to more accurate, reliable forecasting and eventually to more stable, timely and consistent product availability.*

3.1.1 Human vaccine needs and demand

Accurately predicting the requirements for human vaccine is a significant challenge that calls for improved collection of high-quality data, analysis and projection. Data on bites, number of vaccines, compliance, lives saved, wastage, and intramuscular (IM) versus intradermal (ID) administration can inform regional/global projections.

Policies to increase awareness of rabies are important but must be clearly supported and driven by government to be successful. A national awareness strategy needs to include an action plan, establishment of an intersectoral coordinating group, resources, training and procurement systems. An initial pilot project (for example, through a GAVI, the Vaccine Alliance demonstration project), will be useful for evaluation and roll out based on lessons learned.
The two target markets for awareness building – public and private – each have different needs and dynamics. For PEP administration in India, for example, the model for the private market is IM.

Increased awareness of rabies prevention could provoke a surge in demand for PEP, much of which will be administered to people bitten by non-rabid dogs. This increased demand will require an adequate PEP supply to avoid shortfalls in those areas where it is needed most. Additionally, the continuum from data collection to infrastructure needs (such as vaccine handling, cold chain and distribution) and quality of product must be considered.

The assessment of advocacy, resources and tools at country level, including public, local, political, nongovernmental and other stakeholders, can inform further developments in awareness campaigns.

Cost–benefit and value analyses (public health, healthy workforce, improved economy) will be key factors for generating the political will that is crucial for success. The data to support such analyses exist (GAVI) and show that PEP is highly cost-effective in terms of illness averted/lives saved. Political/reputational risk must be factored into the analysis: a compelling case can be promoted to stimulate political will and change.

### 3.1.2 Dog vaccine needs and demand

As with human vaccine forecasting, identifying dog vaccine requirements is fundamentally linked to country-level plans. Good work is being done and opportunities exist to share lessons learned and success stories; however, it takes time to put plans into place.

There is a wide range of readiness. Some countries have action plans, some are developing plans, and some have no structure in place. Regional coordinating platforms work well in regions where they have been established (e.g. Latin America) and such regional mechanisms were suggested for other regions such as Africa.

A regional coordinating platform could provide a tangible mechanism, as well as partners and champions, to assist all countries in the region in developing action plans and identifying vaccine needs. Such a platform should involve OIE, WHO and FAO as well as regional groups such as ASEAN+3, PARACON, SAARC, SADC, REMESA and MEEREB. Country participation would include health and agriculture ministries and appropriate champions. Additional expertise and inputs could be provided where needed. The national plans should take a 5–10-year scope and include objectives and milestones. A regional strategy could also be designed based on the various country plans, which the coordinating platform would then use to forecast dog vaccine requirements.

Estimates of dog population size at the country level provide the key forecasting data. Current estimates are available for 192 countries, but their quality varies. For example, estimates based on a regional human population to dog ratio are generally not accurate, but do provide enough information for initial planning and a good place to begin forecasting. Demonstration of valid processes for collecting forecasting data (population size, surveillance data, etc.) should

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1 ASEAN+3, Association of South-East Asian Nations; PANACO, Pan-African Rabies Control Network; SAARC, South Asian Association for Regional Cooperation; SADC, South African Development Community; REMESA, Réseau Méditerranéen de Santé Animale; MEEREB, Middle East and Eastern Europe Rabies Expert Bureau.
be a requirement for applying to a vaccine bank. Additionally, common data collection would provide baselines and improved consistency.

For countries without an action plan, stimulus packages including between a few 10 000 and a few 100 000 vaccine dosages, dog catching material and other consumables, and training would provide a useful starting point. A step-wise approach would be used to develop expertise and competencies, establish infrastructure and design key performance indicators, including surveillance data, which will lead to better population size estimates. The programme could then be scaled up, with next steps including data collection on the cold chain capacity and a vaccine registration process. In collaboration with the regional coordinating group, each campaign would reflect the individual needs of each country.

Vaccine manufacturers consider 18 months to 5 years a useful timespan for vaccine forecasts. However, donor-funded programs rarely extend beyond 3 years. Consolidated regional estimates would improve timing of requirements, including seasonal campaigns, leading to assured production and sales. There are no manufacturing capacity shortages; the issue is the need for timely, accurate forecasts.

Regional vaccine banks for dog vaccination can help in providing stimulus packages, and create incentives at country level, build momentum and sustain the program.

### 3.2 Quality of vaccines and RIGs

Quality assurance differs for human and dog vaccines. The OIE has established and maintains intergovernmental standards for manufacturers of dog vaccines; there is no OIE prequalification procedure for vaccine suppliers. WHO has prequalification procedures for human vaccines to ensure that they meet necessary quality standards and are safe and efficacious. However, international quality standards are not available for RIGs and these should be established. Standards would lead to improved quality of RIGs within one year.

While procedures are in place to track the quality of human vaccine after their delivery, none are available to track dog vaccine other than specific programme management or national control measures, where they exist. Poor delivery systems can impact the quality of vaccines. A criterion for access to the OIE-managed dog vaccine banks is the assurance that adequate facilities are available.

The next-generation human vaccine (single or two-dose vaccine) should provide other improvements, such as longer shelf-life and
thermostability at ambient temperatures. A single-dose vaccine will be a “game changer.” Better and purer antigens will improve safety and efficacy and lead to greater quality overall.

Manufacturers noted the lack of, and need for, a clear position from WHO on the quality of RIGs. Core specifications are available from national and regional regulatory bodies that could provide a way forward. Stockpiling small amounts of RIGs to decrease delivery lead times would facilitate availability especially in emergency situations.

3.3 Funding strategies

Strategies for funding human and dog vaccines and RIG may need to consider support beyond the cost of the vaccines (to include delivery, training, logistics, etc.). Some funders fear that vaccines are provided but not used. Sustainable strategies will require commitment and engagement from national and local governments, including physical and human resources for programme implementation. Capacity building opportunities would be eligible under provisions and the implementation of the International Health Regulations and the OIE PVS Pathway².

Countries can draw on successful approaches (e.g. from the Philippines) that emphasize the high costs of PEP and loss of life to justify committing health resources to support the relatively lower cost of dog vaccination.

National joint human/dog programmes, as supported by WHO, OIE, FAO and GARC, lead to more effective programmes and better use of resources. Rabies is considered “a low hanging fruit” to stimulate better collaboration between human health and animal health services (One Health approach).

Other key messages included:
- There is no one solution for all countries: a variety of strategies is needed (national/regional/local).
- Donor funds should be viewed as “kickstarter injections” and not relied on for the long term.
- Pooled funding and transparent tendering processes improve efficiency.
- Political commitment at country level is required for sustainability.

3.3.1 Funding strategies for human vaccine and RIGs

For countries with high PEP coverage:
- Review systems and successes in other countries, such as the PAHO system and the national funding approach in the Philippines.
- For emergency situations, such as rabies outbreaks or vaccine shortages, an interagency coordinating group (ICG)-like specific funding mechanism will be needed and funding sources identified (e.g. health ministry through a PAHO-like approach or direct-to-donor approach). This emergency mechanism should also be applied to low-income countries with low PEP coverage.

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² WHO-OIE Operational Framework for Good Governance at the human-animal interface: Bridging WHO and OIE tools for the assessment of national capacities; http://www.oie.int/fileadmin/Home/fr/Media_Center/docs/pdf/WHO_OIE_Operational_Framework_Final2.pdf
For non-GAVI countries with limited PEP coverage:

- Sources of funding include donors and ministries of health. Co-funding strategies are ideal, as they increase sustainability over the long-term (through less reliance on a specific or consistent donor). Donors need to be identified at the country level.
- Products are vaccines only or combined vaccines and RIGs. The WHO policy of vaccine and RIGs for Category 3 bites, which often is estimated at 30% RIGs to 70% vaccine ratio, is a barrier to implementation.
- Improved quality of RIGs is urgently needed to expand the supplier base and reduce prices.

GAVI-eligible countries with limited PEP coverage:

- An investment case will be needed in 2018.
- Development assistance for health channels could include funding and/or technical support from neighbouring countries.
- Eligibility criteria to garner GAVI funds should not be overly demanding (for example, should not require a vaccination strategy, as countries with the highest need often have the least capacity to create or implement a strategy).
- A clear shift to ID needs to be made along with demonstrated capacity (treatment centres, infrastructure) to use vaccine and RIGs as well as feasibility of cost of operation.
- A pre-PEP strategy for specific high-risk populations could be explored.

The case for funding should be made: meet with donors, philanthropic organizations and health ministries. Demonstrate that there is a humanitarian imperative and that it is cost-effective; discuss elimination, value for money and equity.

A suggested source of support is the London Declaration on Neglected Tropical Diseases.3

### 3.3.2 Funding strategies for dog vaccines

OIE is working at both the disease and systems levels and encourages countries to hold WHO-OIE IHR-PVS national workshops4 to further build capacity and share outcomes to build better collaboration.

The funding system is complex. It includes funding for vaccines, equipment and resources and involves donors at the international, national and local levels.

### Barriers and challenges for countries include:

- Lack of clarity or acceptance of responsibility: Is rabies the responsibility of human health authorities or animal health authorities? Public health funding or veterinary funding? Role of local authorities and communities? Some countries cannot get past this hurdle.

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3 Uniting to combat neglected tropical diseases London Declaration.
http://unitingtocombatntds.org/sites/default/files/resource_file/london_declaration_on_ntds.pdf

4 WHO-OIE Operational Framework for Good governance at the human-animal interface: Bridging WHO and OIE tools for the assessment of national capacities
http://www.oie.int/fileadmin/Home/fr/Media_Center/docs/pdf/WHO_OIE_Operational_Framework_Final2.pdf
Establishing intersectoral coordinating groups (helpful in several countries, e.g. Kenya, the Philippines).

Vaccines are purchased but not used, or low-quality vaccines are used.

Dog vaccine programmes are not sustained.

The cost of vaccines may not be the greatest hurdle: delivery systems must be addressed as well.

Possible solutions include:

- In addition to the cost of the vaccine, providing funding to also cover equipment, distribution and resources for delivery of vaccines and data recording/collection. In some cases, buying fewer vaccines could ensure their proper use.

- Building efficiencies: common interests, pooled efforts (international, national, local), sustainability.

- Transparency in the tendering process will provide cost efficiencies and drive competition among companies.

- Using a one price market: a possible theoretical option but associated risks include decreased quality and availability; it should be handled carefully.

- Instituting a dog licence fee or tax payable by dog owners to contribute funds into a rabies vaccination campaign. This approach has been successful in Uruguay, raising over US$5 million towards the vaccination programme. However, such a system would be overly challenging for some countries.

- Using funds for strategic vaccination: only in regions or countries where the greatest need has been identified.
3.4 Procurement of human and dog rabies vaccines

The ideal procurement system is one that works well for both manufacturers and recipients, with quantities and timing coming from reliable and accurate data of forecasting mechanisms. Suggested procurement approaches vary among human vaccine, RIGs and dog vaccine. International organizations can help to facilitate the delivery of vaccines (human and dog) for public health interventions.

3.4.1 Procuring human vaccine and RIGs

Human vaccine
Manufacturers, funders and countries would need to agree on a common vaccine procurement mechanism. Rabies tends not to be as well supported by funders as other public health priorities: this is a major challenge and barrier. Improved forecasting data are needed to build a strong investment case; more/better data and analysis are needed to make rabies a public health priority.

Potential framework for procurement:
- Start small: Limited number of countries to launch the process and minimize risks for stakeholders.
- Time limited (2-3 years).
- Countries selected according to defined criteria of eligibility:
  - integrated national rabies control programme (emphasis on dog rabies control, surveillance, epidemiology, education, etc.) already implemented; and
  - capacities in place from the national to the local level for vaccine logistics and patient care.
- Consider using the EPI (Expanded Program on Immunization) delivery system.

An integrated “pull” and “push” system is envisioned: the pull part providing negotiation on behalf of countries (as PAHO does) with a focus on middle-income countries (needs to be defined) already engaged in rabies control programmes; the push part being donor funded (as for the funding system for oral cholera vaccines). The focus would be on low-income countries (needs to be defined). Mandatory subscription would be required to build capacity for a nationwide rabies control programme. A co-funding mechanism would connect the pull and push parts: for example, every €1 collected for the pull part would be matched by €1 from funding organizations to support the push part of the procurement system.

The result would be a “win-win” agreement: the demand will be controlled and planned (if possible through long-term (3–5 year) agreements; and the cost to manufacturers being covered with certainty, thereby reducing risk for manufacturers.
For success, all parties would need to agree on an "affordable" price and a coordination committee established to oversee the process including country selection, criteria development and regular communication (WHO, UNICEF, GAVI, GARC, OIE).

**Rabies immunoglobulins**

Today, it is estimated that 29 million patients require PEP, with 8–10 million vials of RIGs needed for Category 3 contact⁵. However, current production is limited to 2 million RIGs doses, 90% of which is in China (therefore a shortfall of at least 6–8 million doses exists).

The main barrier to product supply is the difficulty of obtaining raw material (plasma). The challenge is to increase the availability of raw materials during the next 3–5 years until other new products and lower cost products are developed.

**Possible solutions include:**

- Increasing the production of ERIG (equine RIG) as an alternative to RIGs. However, there is resistance due to the equine source; working with national regulatory authorities may make ERIGs more acceptable.

  - Reducing the use of RIGs in rabies controlled areas to expand product supply. However, liability issues arise from the perception that RIG is needed. More research and communication are needed.

  - Development of new products (e.g. Human mAbs).

A pull system would be best (negotiation on the behalf of the countries, as carried out by PAHO), with supply being made available to middle-income countries already engaged in rabies control programmes. Participation would depend on the country’s current situation, capacity, programmes, etc. Another system would need to be developed for countries not meeting the criteria, with a strong focus on African countries.

**3.4.2 Procuring dog vaccine**

The current mechanism for procurement used by OIE and WHO for vaccine banks works well. Expanding to a sustainable, long-term programme to cover African as well as other endemic countries requiring support was suggested. The PAHO procurement system has proven particularly effective in Latin America and could be used as a model.

Next steps:

- All manufacturers to identify how to work together, with WHO and OIE, with participation of representatives from WHO Collaborating and OIE/FAO Reference Centers.

- Confirm level of transparency or information-sharing.

- Draft the tender mechanism that would work best.

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Issue technical requirements (quantity and specifications) to enable manufacturers to decide whether they can participate. The OIE criteria and standards for vaccines and conditions of use should be followed in the applications for tender. Qualification or selection of (a) manufacturer(s) by OIE or WHO based on international standards should allow the importation of specified products without new registration in the country of destination.

A revolving vaccine bank mechanism minimizes risk as volumes increase, and sponsorship can be more easily secured. The risk sharing is not just for manufacturers but also for end recipients, so that once supply starts it can be built over time. The bank would be accessible to emerging markets and countries without funds but for which need is greatest. As markets emerge, opportunities for regional connections and regional groups would be created. The OIE prefers a continental approach (that is, working alongside relevant regional entities within the continent).

An antigen bank could have the following advantages:
- Need for less storage space (antigen could be stored in its concentrated state, contrary to vaccines).
- Reduced production lead time (antigen would be ready to use for vaccine production).
- Bank rotation maintained at specified stock level (by first in first out [FIFO]), to ensure management of the product’s shelf-life and avoid pre-emption of the bank.

The goal is to ensure reliable, predictable, continuous deliveries of dog vaccine to the field. Manufacturers asked to respond to a set or equalizing price will be influenced by the minimum quantity to manufacturers. The revolving bank process, with consistent funding, ensures growth with less risk and allows the supply to be consistently maintained. The OIE pilot projects in Asia and Africa have demonstrated that this is a viable, scalable, practical approach suitable for the needs of many countries. Stability of supply is very important and this would provide that sustainability.

In 2016, OIE and WHO will update the joint tender/procurement process, with joint criteria, for dog vaccine. It will first review countries with the greatest need for donor funded support. The mechanism will allow countries or international organizations to purchase directly from the vaccine bank (for dog vaccination).
4 Summary of key messages

The key messages of the meeting included the need to:

- Provide a procurement mechanism and coordination for dog and human vaccines and RIGs, with joint leadership from WHO and OIE.
- Use a revolving fund as an appropriate mechanism to support countries in acquiring quality-assured, timely vaccines at optimal prices.
- Forecast more accurately and reliably to ensure more stable and consistent product availability.
- Improve data collection.
- Manufacturing capacity is driven by demand and would be available for sufficient rabies vaccines. With improved confidence of stable and predictable requirements, manufacturers can plan appropriately.
- Urge human vaccine manufacturers to include intradermal routes of administration.
- Agree and formalize conditions of vaccine provision through vaccine banks (e.g. requirements for data recording, reporting and surveillance).
- Ensure funding strategies include support beyond the cost of the vaccines (e.g. for delivery, training, logistics).
- Create political will to raise awareness of rabies as a public health priority (cost/benefit/value analysis is a key factor).
- Establish or update manufacturing standards and specifications to improve quality of dog vaccine and RIGs.
- Stockpile small amounts of RIGs to decrease delivery lead time (such items are requested in emergency situations).
- Use single dose and thermostable vaccines as a “game changer.”
- Start small, have a vision and scale up progressively.
- Learn from the best practices of others.
- Start with countries that have rabies control programmes and strategies such that they can participate in a joint procurement system.

5 Next steps

WHO and OIE are committed to working together to advance the rabies vaccine agenda, in collaboration with relevant partners and with the continued support and engagement of the participants at the meeting. Outcomes of the meeting and next steps will be presented at the conference on “Global Elimination of Dog-mediated Human Rabies – The Time is Now” (10-11 December 2015, Geneva, Switzerland). An action plan specifying activities, responsibilities and timelines will follow.
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