



Partners for Rabies Prevention

Minutes from the fifth Meeting of the
Partners for Rabies Prevention,
21-25 May 2012, in Banna, Italy

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Introduction and meeting agenda

Louis Nel was nominated to Chair the meeting and Betty Dodet accepted the responsibility of Rapporteur to record the minutes. Participants introduced themselves and the meeting was opened with a dinner and reception at the Banna estate.

SESSION 1 – RESEARCH PILLAR

1.1 Global burden of rabies – Katie Hampson – Discussion and next steps

KH presented an update on the progress of the global burden of rabies study. A cluster-based approach is being used, grouping together countries within regions where rabies epidemiology and development indices are similar. Preliminary results suggest that the current burden of rabies is around 70 000 human deaths per year, with a worldwide economic impact of about \$4 billion each year (including, human prophylaxis: \$500 million; dog vaccination: \$160 million; livestock losses: \$800 million) BUT there are still many uncertainties, including:

- dog vaccination coverage – a 10% deviation could have a large impact. For instance, the figures for Zimbabwe and Bolivia are questionable;
- the cost of dog vaccination;
- the bite incidence;
- the use of nerve tissue vaccine (NTV) and the incidence of adverse events;
- the incidence of rabies in livestock. This may have an important impact.

Proposed actions:

- PRP members are invited to send any relevant data they have
- *Dog vaccination coverage*: it could be easier to use a ratio rather than absolute figures.

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- *Cost of dog vaccination:* the number of vaccines used can be obtained by vaccine producers, but the price for the public: private sector can vary from 1:5. Vaccine prices also vary according to the region and the customer. How to standardize the price? According to JM (Merial), the 'acceptable' price for the population is 50 cents/dose. But, as stressed by KH, in some places, it is 10 cents/dose. According to BM, for the Philippine projects, it is 45 cents/dose. However, the price of the vaccine represents only a fraction of vaccination price. For instance, in the Philippines, it is estimated to be US\$2/vaccination.
- *Use of NTV:* For Latin America, MV could provide data
- *Rabies incidence in livestock:* The OIE network can probably provide data on rabies incidence in livestock. However, as stressed by KdB, laboratories reporting cases in domestic animals usually do not specify the animal species. Farmers do not bother for diagnosis, due to cost, except in the few countries where compensation for loss exists.
 - o Work animals (horses, donkeys) also have to be considered.
 - o In Latin America – high incidence of rabies in livestock transmitted by vampire bats.
 - o In Africa, rabies cases in livestock poorly reported, except Botswana and S Africa.
 - o Livestock deaths have a high economic burden (dog deaths have no economic cost)
- *When critical data is not available,* it was agreed that the best way is to use the DELPHI method, with estimates from PRP experts.
- *Since so far, the number of human deaths is uncertain,* agreed to try to avoid quoting the “55 000 deaths annually” – Rather mention “several tens of thousands” or similar phrase.
- *Rabies disease burden expressed as disability-adjusted life years (DALYs):* DALY evaluation is important since it takes in to account both disability and death, but often, people do not know what DALYs are. It is consequently important to explain how the DALYs were calculated, since our results are different. It is thus recommended to use Chris Murray’s model to run our data through to generate DALYs in his ‘official’ way, to compare to our model and avoid criticism.

1.2 Blueprint for Rabies Control and Prevention – Tiziana Lembo – Part 1 Elimination of canine rabies – Updates, translation report

The Blueprint has been translated into French’ Spanish, Portuguese Arabic and Russian (<http://www.rabiesblueprint.com>). Revisions of translations have been completed courtesy of PAHO, Novartis, FAO and CDC. PRP agreed that the Blueprint should be translated into Mandarin. EU and FAO could be asked for support; proof readers will have to be identified.

Revisions to the Rabies Blueprint – first round since launch in 2011.

- A new case study has been added: the Kwazulu Natal program.
- How to quote the Rabies Blueprint in journals have been added with link to the original publication:
 - o Suggested citation for this resource: Partners for Rabies Prevention (2010). Blueprint for Rabies Prevention and Control. Available at <http://www.rabiesblueprint.com/>.
- Reference of articles on the Blueprint in scientific journals has been added:
 - o Lembo T, on behalf of the Partners for Rabies Prevention (2012). The Blueprint for Rabies Prevention and Control: A Novel Operational Toolkit for Rabies Elimination. *PLoS Negl Trop Dis* 6(2): e1388. doi:10.1371/journal.pntd.0001388.
- New resources on human prophylaxis:
 - o Hampson K, Cleveland S, Briggs D. Evaluation of cost-effective strategies for rabies post-exposure vaccination in low-income countries. *PLoS Negl Trop Dis* 2011;5(3): e982.

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- The Immunological Basis for Immunization Series: Module 17: Rabies WHO, 2011.

Revision of existing sections

- The communication section was revised by PC
- The vaccine cold chain section reviewed by AV and CS and revised accordingly
- Broken links were replaced (OIE, FAO, GARC)
- URLs were edited to incorporate the page titles, previous URLs still function

Suggested revisions for 2012

- *New case study to be added:* An example of a programme where legislation has benefited a rabies control programme: arbitration strategy whereby owners of offending unvaccinated dogs are obliged to meet the costs of PEP for bite victims as opposed to get charged in a court of law for failing to vaccinate their dogs (Kisumu, Kenya)
- *Address efficacy of PEP in immunocompromised individuals* (especially in patients with HIV/AIDS (currently only safety issues for PEP in this population are considered)
- *Data reporting:*
 - Include more specific recommendations regarding the development and implementation of a data reporting system
- *Dog euthanasia section to be revised* based on Mexico experience:
 - ie. use of Pre-euthanasia sedation - Xylazine and Telazol or Zoletil (Tiletamin and Zolazepam) IM
- *Dog vaccination*
 - OIE revised part C of their guidelines. According to CR, these were not data, but comments. They should not be included, but they could be linked.
 - Use of IM injection of vaccine on the hind leg for dogs that are difficult to handle to be emphasized;
- *Veterinary vaccines:* Freeze-dried rabies vaccines still produced & available in some places

The European Union has included costs for revisions of translations into the 2012 work plan. It was agreed that 2 years of revisions would be incorporated at once at the end of 2012.

The new version/translations of the Blueprint should be available on a CD. Support from the industry would be appreciated.

Impact of the Canine Rabies Blueprint

Several articles describing the Blueprint have been published.

- **International Health** (commentary) 2010, 2: 161-162 (Briggs, D – “Reducing the global burden of rabies”).
- **Journal of Global Infectious Diseases** 2010, 2: 201-202 (Johnson, N – “State of the globe: Rabies is still rampant and needs action”).
- **Rabies Bulletin Europe** 2010, 3/34: 8-9 (Lembo, T & PRP – “Development of a Blueprint for Rabies Prevention and Control”).
- **Veterinary Medicine International** 2011: 923149 (Lembo, T et al. – “Renewed global partnerships and re-designed roadmaps for rabies prevention and control”).
- **PLoS NTD** 2012: 6(2): e1388 (Lembo, T on behalf of PRP – “The Blueprint for Rabies Prevention and Control: A novel operational toolkit for rabies elimination”).
- **Rabies, THIRD EDITION** (ed. Alan Jackson). Elsevier Inc. *In press* (Lembo T, on behalf of the PRP – “Blueprint for rabies prevention and control”).

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Evaluation of the impact of the Rabies Blueprint website

Visitors to Blueprint website have come from virtually all continents, including 161 countries or territories and from 1901 cities. This toolkit is being used as a guide for the implementation of canine rabies control programmes in various places, ie the Philippines, Uganda, Benin, Afghanistan, Peru, Bolivia, Haiti, and Indonesia.

In the Philippines, the Blueprint has been used to revise the national recommendations.

However, there is no standardized system to evaluate the impact of the adoption of the Rabies Blueprint guidelines on rabies control efforts in individual countries. The following actions have been proposed in order to collect information on the use of the Blueprint website.

- Post a questionnaire on the website to obtain information on usability and applicability from a range of countries, or
- Collect information on pilot intervention studies based on the Rabies Blueprint

How to increase awareness about the Blueprint

Although the Blueprint has been widely disseminated among the scientific community, it may not be known of by policy makers. An action plan should be defined in order to better reach government representatives and policy makers, for instance establishing new links with other websites, including websites of GARC / PRP members, which could upgrade the visibility of the Blueprint website in the search engines.

1.3 Blueprint for Rabies Control and Prevention – Thomas Mueller – Part 2 Fox rabies ORV

All parts are now complete and have been reviewed by external reviewers from Europe, the Mediterranean region and America. Final comments are being incorporated.

Most of the comments were very positive.

Some comments related to the fact that several described strategies or recommendations may differ from existing WHO or EU recommendations. It has to be stressed that the Blueprint gives the opinion of experts, it is not an official document; it is different from the national recommendations (although it can be used to draft national recommendations). It may be different from WHO or EU guidelines, but has been endorsed by expert representatives of WHO and the EU who are part of the PRP.

It was suggested to have a table on oral rabies vaccines, with recommendations for vaccine storage. Such a list was not included on purpose, since the Blueprint does not want to promote any specific vaccine. For storage, it is indicated to follow the recommendations of the vaccine producer.

Another question was about the Communication plan section. Should there be a specific section or should one refer to the communication section of the canine Blueprint? It was agreed to have a link with the canine section on communication, and to add 1 or 2 specific cases/examples for fox rabies.

The final text document should be completed by the end of July.

1.4 Notifiability study – Louise Taylor

Survey designed to map countries by notifiability and its implementation status, in order to determine major barriers and draft a roadmap for driving policy change. Goal is to improve the reporting of human rabies cases and thus increase the priority for rabies control.

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The survey designed by PC and Jesse Blanton (CDC), as per the Guidelines for Evaluating Public Health Surveillance Systems (MMWR 2001;50(RR13):1-35.). Also reviewed & evaluated by team from Sanofi Pasteur.

Survey is available online at <http://www.surveymonkey.com/s/rabies-notifability-survey-PC> (English), <http://www.surveymonkey.com/s/enquete-notification-rage-PC> (French) and <http://www.surveymonkey.com/s/Encuesta-notificacion-rabia-PC> (Spanish). Over the last 8 months, the survey has been distributed to the Rabies Expert Bureaux, SEARG, PAHO, CVA, Pasteur Institutes, Sanofi Pasteur Field affiliates, Rabies Bulletin Europe Network, and Personal contacts

As of mid-May, 94 responses, from 82 different respondents had been received. The numbers are still slowly rising. The analysis of responses is still in progress.

It shows that rabies is notifiable in 55 countries; not notifiable in 5 countries (Bangladesh, India, Indonesia, Pakistan, Saudi Arabia). This is fewer countries than expected, especially that there were none in Africa. Whether the systems actually work is questionable in some cases.

Barriers to rabies becoming notifiable that were identified:

- Lack of legislation, awareness, accountability;
- Lack of facilities and human resources in the health care system;
- Other health priorities such as HIV/AIDS, TB, malaria, influenza, polio;
- Absence of good reporting system;
- Poor health delivery system and lack of awareness,;

More information is needed from African and eastern European countries, and from Russia.

1.5 Update in research – Charles Rupprecht – Research on dogs, diagnostics & protecting kids

Pre-exposure vaccination of infants in Amazonia

In Amazonia, rabies is transmitted to humans by vampire bats. People living in remote locations in poor housing are at nightly risk of attack. PEP is out of reach since they are far from health services. In addition, vampire bites may be unrecognized. In this context, PreP of infants is recommended. In a trial conducted by CDC, PrEP is administered with DTP, in the framework of EPI.

Diagnostic at the point of care

Testing for rabies at the point of care is essential for confirming exposure and if PEP is required.

Three different molecular tests for diagnostic of rabies at the point of care have been tested:

- The first one did not recognize country variants;
- The second one did not recognize variants from Africa;
- The third one had a high sensitivity to all Lyssa variants, with a good specificity. Can it be used also for surveillance?

Immunocontraceptives for dogs

The development of a one shot combination rabies and immunocontraception (GnRH) vaccine is in progress. After encouraging results in mice, a proof of concept study has been conducted on 6 dogs. The use of the GnRH immunocontraceptive did not affect the ability of dogs to seroconvert in response to the rabies vaccine. The level of acceptable adverse events is to be evaluated. Contraceptive methods may be the solution for dog population management; injectable is preferred to orally administration, in order to avoid any risk of hazardous ingestion by humans.

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SESSION 2. CAPACITY BUILDING PILLAR

2.1. Developing a progressive control pathway (PCP) for rabies – K de Balogh

How to promote a One Health approach in developing countries?

In these countries, there is often no functioning surveillance of animal rabies; diagnostic of rabies is requested only in case of a bite to humans. The experience from Latin America could be an example to be adapted to other countries, in the perspective of South-South collaboration. Mexico, Brazil are emerging countries that become donor nations. Brazil gives assistance to Mozambique and Angola (Africa).

A regional strategy has to be established. Each country must have its own budget and its own program. Rabies elimination is a stepwise process, the target being no human rabies cases.

Rabies elimination being a regional approach (e.g.: ASEAN Plus Three), countries in the region need comparative indicators to compare progress within the Region and between Regions, to be able to make self-assessment of their situation and progress at National level; and provide progress indicators for donors/investment. A step-wise approach is the way forward to eliminate rabies in the region.

FAO has developed for Foot-and-Mouth Disease a Progressive Control Pathway (PCP) approach that could be adapted for classifying country progress in rabies control and elimination. This tool can be applied to measure (and communicate) country progress within regional roadmaps, and aims at starting countries along a pathway of activities from measuring risk to risk management, covering the stages before they could apply for recognition of disease freedom.

The Progressive Control Pathway recognises that differences in risk of infection occur between (and within) infected countries, that countries are at different stages in managing the risk of infection. The PCP applies a risk reduction approach in which each Member State is encouraged to develop national risk reduction strategies that are supportive to the regional effort

SESSION 3 – PROJECTS PILLAR

3.1. Chad – “One Health Framework for Estimating the Economic Costs of Zoonotic Diseases on Society” – Jakob Zinsstag

Intervention costs are a major issue when selecting strategies for rabies control in developing countries. Thus, an integrated epidemiological and economic framework was developed using a "One Health" concept and taking into account the cross-sector economic impact of zoonoses. It links the outputs of animal and human disease transmission models, economic impact models and evaluation of management options. The model allows for comparison of the cost-benefits and cost-effectiveness of different interventions, in particular the trade-off between interventions in humans alone or in combination with interventions in the animal host.

The cost of parenteral rabies vaccination of dogs was calculated for the city of N'Djamena, Chad. It included public costs (vaccine, syringes and needles, varying with output number of dogs vaccinated, equipment of vaccination points; staff per diem, transportation and accommodation; information of the population) and private costs (lost work time for dog owners and cost of dog transportation to vaccination point). It confirmed that mass dog vaccination could be a comparatively cheap and ethical way to both control the disease in animals and prevent human cases and exposure, especially in developing countries.

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Simulations for the situation in N'Djamena showed that a culling policy is less likely to interrupt transmission as compared to mass-vaccination strategy, and socially not acceptable, while a mass campaign allowing single parenteral vaccination of at least 70% of the canine population would be sufficient to interrupt transmission of rabies to humans for at least 6 years. The cost-effectiveness of mass dog vaccination was compared to that of PEP which would not reduce future human exposure. Results showed that it is more cost-effective to combine parenteral dog-vaccination campaigns and human PEP compared to human PEP alone beyond a time frame of 7 years.

An estimation of the cost of dog rabies elimination in N'Djamena is under way; and the results should be known by the end of 2012.

Towards rabies elimination in N'Djaména, Chad

In 2003, there were 1.2 dogs per household, 1 dog / 20 people, about 23'000 dogs in total in N'Djamena. Only 5-10% were ownerless; 61% are free in their movement; only 19% are vaccinated against rabies; and there is a high population turnover.

Studies carried out between 2000 and 2006 showed that the rabies virus is endemic with an incidence of 1.4/1000 dogs and a reproduction rate of nearly 1. There were 2.3 humans exposed per rabid dog; 83% of rabid dogs had owners, but they were not confined; 68% people know that dogs can transmit rabies; 62% of asked people think rabies is curable

In 2011, the estimated rabies incidence in dogs was 0.22/1000 dogs, but this low incidence is probably due to under-reporting linked to a lack of awareness. About 2.5 humans were exposed per rabid dog; over 50% of them children under 15 years

A new dog demographic survey has been conducted to update the existing data. A mass vaccination campaign is planned in October 2012 in N'Djaména. Negotiation on co-funding with the Chadian government is on-going. The first reunions concerning the vaccination campaign have been held with authorities and partners involved end of 2011. An operational plan has been established together with the veterinary services delegation ministry of agriculture and CSSI, (élevage). A communication campaign will take place to raise awareness and raise surveillance.

Vaccination campaign

The vaccination campaign will start on 28th September 2012. It brings together several partners, including the Swiss TPH; the Centre de Support en Santé International (CSSI), the Laboratoire de Recherches Vétérinaires et Zootechnique de Farcha (LRVZ), the Direction des Services Vétérinaires (DSV), and the Ministry of livestock production. It will be conducted free of charge for the population, and will follow the procedure and example of the pilot campaigns and guidelines of the rabies blueprint (GARC). It will be accompanied by a communication campaign to raise rabies awareness and integration of rabies education in school curriculum, according to the Filipino example. The objective is to vaccinate 80% of the city's dog population in two consecutive mass vaccination campaigns and bring the rabies incidence down to 0 by the end of 2013.

Comments :

It is proposed that dog vaccination in N'Djamena be free of charge for dog owners. This is in contrast with the approach adopted in the Philippines, where the Bohol project is based on responsible dog ownership; a fee of 30 cents per dog is asked to pet owners. This allows for sustainability of the project.

Using the model developed for estimation of the cost of rabies elimination in N'Djamena, the cost of rabies elimination in Tanzania would be less than the weekly profits from Exxon.

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3.2. Update on rabies control activities in Bali – Katinka de Balogh

Bali Island has been historically free from rabies until 2008. On 23 November 2008, a first human case of rabies was reported. On 26 November 2008, the first dog case was reported in Bukit Peninsula, Badung District. The Bukit Peninsula has a human population of 117,000 inhabitants over 96 km² and 15,000-23,000 dogs (dog population density of 150/km²; owned dog: human ratio = 1:5-8).

A FAO mission in 2008 observed a poor awareness of rabies in Bali. There was no FAT diagnosis available at DIC Denpasar. A Rabies Control Plan had been elaborated and some activities had been initiated, but there was a lack of coordination and a controversy on dog elimination with strychnine.

The mixed strategies used by the local government Livestock Services between 2008-mid-2010 (targeted dog vaccination and dog elimination) to try to control rabies, however rabies spread to all 9 districts of Bali, and the human rabies cases increased.

In September 2010, the Bali local government, in cooperation with the Bali Animal Welfare Association (BAWA) started a 1st round of mass dog vaccination, funded by the World Society for the Protection of Animals (WSPA) and AusAID.

A second round of mass dog vaccination was conducted May – Sept 2011 by the Government of Indonesia (GOI), primarily funded by GOI, with an additional support from AusAID, USAID, and FAO, with the objective of eliminating rabies from Bali Island.

The target was vaccination of at least 70% of dogs (with the use of locally-produced dog-catching nets for stray dogs), as part of a coordinated strategy including capacity building, public awareness and SMS reporting. During the 2nd campaign, 234,974 dogs were vaccinated, out of an estimated dog population of 280,000 – 330,000 (estimated vaccination coverage **71 - 84%**)

As a consequence, the number of animal rabies cases decreased by 77% from 2010 to 2011, and the number of human rabies cases decreased by 72% from 2010 to 2011.

A third round of dog mass was initiated on 27 March, 2012. So far, 137,000 dogs have been vaccinated in over 2,000 sub-villages thus far, with an average coverage of **85%** in the areas vaccinated. This campaign has been slowed down because of delays in vaccine procurement.

Currently, most Bali activity is funded by GOI, (including vaccine and operational cost). Donor support is primarily for capacity building/training, coordination, technical support. Now, the total estimated dog pop is about 350,000.

The total number of human deaths is now 140 (3 cases so far in 2012). Maintenance of surveillance intensity and response capacity is planned until at least 2015.

3.3. The Bill & Melinda Gates project update – François-Xavier Meslin

Funding of the pilot projects funded by the B&MG Foundation will end Dec 2013. Conclusions are to be made, lessons taken from the failures & successes & next steps defined. The sustainability of the project is not granted.

A decrease in the number of bites has been observed in Tanzania; but it is not clear whether it is due to the education program, or because bite victims do not go to the clinics. The high cost of dog vaccination in the project in Tanzania was discussed. Actually, 75% of the costs correspond to the per diem for the government personnel when they are out of office. Vaccination of dogs was entirely free of charge for dog owners, and there was no government commitment in the project. It was recognized that governments should be involved in such projects, as well as the community. Betsy Miranda suggested

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that vaccination costs can be decreased by using trained volunteers rather than government officers as dog vaccinators, however this is not legally possible in Tanzania under a government led project.

The main issue is the sustainability of these projects. This can be obtained by increasing involvement of community and all stakeholders; involvement of local governments, and pet owners; stimulating local innovation, organizing regional workshops with governments; and establishing partnerships with programs for control of other diseases. The innovations from the Bohol model could be adapted to the various social contexts. In order to catalyze government involvement, regional workshops could be organized; rabies prevention and control programs could be conducted jointly with other programs for control of other diseases.

3.4. Rabies situation in Latin America and Caribbean Region – M. Vigilato

In 2013, Latin America will celebrate 30 years of rabies elimination program. The control of canine rabies across Latin America is the largest-scale recent success story in rabies control, and international agreements have been key to its success. Since a regional initiative was launched in 1983 to eliminate canine rabies, the average number of cases of human and dog rabies in the region has undergone a reduction of over 95%. Human deaths due to canine rabies have fallen from almost 300 per year in the 1980s to 16, 13, 6, and 24 (13 in an outbreak in Haiti), in the years 2008 to 2011. This is based on a strategy of mass dog vaccination, timely provision of post exposure prophylaxis, education and surveillance.

In the past 20 years, the number of human rabies cases was reduced by 90% due to collaboration between countries of the Region, and partner support both technically and financially. In 2010, less than 20 cases of human rabies transmitted by dogs were reported to PAHO/WHO, but it should be emphasized that human deaths attributable to rabies transmitted by dogs are no longer acceptable in the 21st century because efficacy-proven tools are available for effective control of rabies transmission.

A resolution signed in all PAHO countries in October 2009 set a goal for elimination from the region by 2015. Regular international meetings of both medical and veterinary ministries, and meetings of all the rabies program country directors have been vital in keeping the program moving towards elimination. Chile, Uruguay, some areas of Peru and Mexico have already declared themselves free of canine rabies, Costa Rica and Nicaragua are in the process and 5 other countries are programmed for this self-declaration. PAHO is helping countries to apply for official WHO-sanctioned canine rabies free status (satisfying the criteria of 2 years without a rabies case).

As canine transmitted human rabies deaths decline, maintaining vigilance is critical and difficult, so many former rabies control centers have been converted into zoonoses control centers to widen their remit and avoid capacity being lost altogether where canine rabies is no longer perceived as a problem.

As the number of cases fall, the reduction to cases to zero becomes the challenge. The majority of cases now are in Bolivia and Haiti, and 16 hotspots of canine rabies transmission have been identified so that efforts can be focused towards elimination from the continent. These hotspots are often in very remote areas with many challenges but the reporting of cases from these hotspots is being strengthened to provide accurate data.

The PAHO model stands as an excellent example of international cooperation and assistance, with all governments committing to the joint agreements and more developed countries assisting the resource-poor countries. For example, Brazil has donated 20,000 doses of rabies vaccine and 1,000 vials of RIG to Haiti, and has technical cooperation agreements with several other countries. In July 2011, a canine vaccination campaign on the Peru/Bolivian border was carried out by teams from both countries (see

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picture) and another cross-border campaign is planned for Honduras/El Salvador border areas. PAHO's expertise on dog mass vaccination campaigns against rabies and coordinating Meetings of Directors of Rabies Control Programs could be shared to help other countries in Africa and Asia. It is clear that while canine rabies is declining, in countries such as Brazil, Ecuador and Peru, wildlife (primarily vampire bat) transmitted rabies continues to be present. In 2004 and for the first time, more people died as a result of exposure to bats (particularly vampire bats), than to dogs in South America. PAHO recently recommended the incorporation of Pre-Exposure Prophylaxis against rabies into the Expanded Programme of Immunization for high risk Amazonian areas where the population is far from medical help.

Continental Information Systems have been established. Red spots have to report weekly, and both ministries of health and agriculture have access to the information. Reference laboratories have been established since 1996; it is programmed to have a network of reference laboratories, as well as a network of directors of rabies programs, and an interagency forum.

A memorandum of understanding has been signed between GARC and PAHO. Several activities are carried out jointly by GARC and PAHO, such as the Prize for Latin America and Caribbean for the best event in the Region, and participation on Webinar for WRD; collaboration, review, translation (Portuguese, Spanish) and distribution to the PAHO members countries of the Global Burden of Rabies Survey; review of Spanish and Portuguese translations of the Rabies Blueprint; review and distribution to the PAHO countries member of the rabies notifiability survey, etc. Antirabies centers have become zoonosis control centers (>300 such centers in Brazil).

Need to think about the way forward. Surveillance must be maintained after the country is rabies free – especially since there is still rabies in the wild, and the possibility of spill-over is ever present.

3.5. Europe and surrounding countries – T. Müller

The European Union is financing or co-financing many disease elimination programs in Europe and surrounding countries, including elimination of rabies in wildlife through ORV. Between 1978 and 2010, ORV programs covered an area of more than 1.9 million square kilometers. In 2010, ORV was conducted in Poland, Latvia and Estonia, Slovenia, Croatia, Serbia, Bulgaria, and Turkey. In 2011, ORV was conducted in the same countries except Turkey, and was initiated in Bosnia-Herzegovina.

Rabies cases are reported in Rabies Bulletin Europe; reporting is not mandatory and submission can be accomplished online.

Greece has been rabies free for decades, but there is no surveillance system. Enhanced surveillance in Macedonia has indicated one single case in a red fox in the border region. Greece has started surveillance efforts, but they start from nothing.

Strategic consideration for future fox ORV campaigns in Turkey

Rabies within Turkey is principally a disease of domestic dogs with occasional cases observed in domestic cattle (World Health Organization, 1998; Aylan and Vos, 2000). At the end of the 1990s, rabies rapidly spread among foxes in the Aegean region of Turkey. This spread likely resulted from spillover infection from dogs and led to increased rabies cases among cattle. In order to control the outbreak, a program of oral vaccination of foxes against rabies was introduced. In the selected vaccination area three annual campaigns were undertaken during the winter months between 2008 and 2010, whereby the vaccine baits were distributed exclusively by plane using a density of 18 baits per km². No fox-mediated rabies cases were

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reported in the ORV area, which demonstrated the feasibility of fox rabies control by ORV in Turkey. [Un H et al. Oral vaccination of foxes against rabies in Turkey between 2008 and 2010. Berl Munch Tierarztl Wochenschr 2012 May-Jun;125(5-6):203-8).

However, the ORV area was too small and fox rabies further spread inland and, after cessation of ORV campaigns, fox rabies re-emerged in previous ORV area.

3.6. Update on the GARC projects in the Philippines – Betsy Miranda

Bohol Project on dog rabies prevention and elimination

This program has produced a seismic shift in rabies control, from government dependent implementation to a community led movement.

Every year, over 185,000 children are taught in school about rabies and responsible pet ownership. These children are effective at spreading this knowledge to their families and the broader community.

The program steadily enforced mandatory dog registration and vaccination. A small fee is charged for dog registration, which helps to fund the on-going program costs and subsidizes human post-exposure vaccines. In 2011, over 70% of the dogs have been vaccinated (~46 000) and have dog tags(cost: ~11 000 USD).

Dog movement control focusses on coastal villages, in order to prevent reintroduction of rabies. Disease surveillance and monitoring have been strengthened, and response teams are in place on the island to deal with suspected rabies cases and take steps to stop the disease spreading. This allowed for the rapid detection of a rabid dog in April 2011, which was followed by response within one week.

Five animal-bite treatment centers have been established, and bite management protocol clearly defined. A referral system has been established and bite reporting at village level has been strengthened. Around 2000 PEPs were administered in 2011. High risk members of task forces received PrEP (with a single booster).

In 2007, when GARC began their rabies control project, Bohol was ranked as the 4th highest region in the Philippines, averaging 10 deaths per year. No rabies deaths have been reported on Bohol since 2009, whereas, in the 2 years prior to the implementation of this program, there were 10 human cases of rabies per year. The Bohol population feels safer now that most dogs have been vaccinated; they are also more involved and better informed, as the activities are initiated at the village level.

An important aspect of the Bohol program is that it has been built to be self-sustainable, so that it can continue when the funding from the Global Alliance and other NGOs is no longer provided.

In December 2011, the Bohol project received the prestigious Galing Pook award. This annual award is presented by the President of the Philippines and recognizes 10 local governance projects for excellence. It was held up as an example for other communities to emulate in their rabies control. It is powerful endorsement of the project model and a step forward in global rabies control. *The Galing Pool Foundation Awards Committee recognized that transforming the public's attitude and cultural practices towards responsible pet ownership is perhaps Bohol's longest lasting contribution to the global campaign to eliminate rabies.*

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The rabies project has been expanded in the Philippines; it is being replicated in Nias, Indonesia, and adapted to projects in Chad (Africa). The educational component has been adapted to Tanzania (Africa).

3.7. Children against rabies - Evaluation of a prevention campaign on rabies exposure burden among school age children living in El Nido, Philippines – B. Miranda

This is a prospective observational assessment of the impact of implementing a rabies prevention educational program in elementary school children of El Nido Island in The Philippines, a remote rural area (estimates: 35 650 inhabitants; 5 700 children 5-12 years in 2009) with a high incidence of dog bites. The project is conducted in collaboration with The Philippines Ministry of Health, El Nido Municipality, with the support of Sanofi Pasteur.

The primary objective of the study is to estimate the incidence of contact with rabies suspected animals in school-age Philippines children (grades 1-5) using active surveillance and compare this to estimates from the existing passive surveillance system (collected by ABTC).

The secondary objective is to compare the incidence of contact with rabies suspected animals in school-age Philippines children (grades 1-5) and the use of post exposure vaccination and treatment collected in the ABTC before and after intervention and to assess the health economic impact of the intervention.

By May 2012, >4 700 children were enrolled (70.5% of the target population) in the 27 public elementary schools; 142 (3.2%) had a history of animal bite. Follow ups were made in September and December 2011; March and June 2012. The number of bites among children 5-15 years decreased steadily, from more than 25 in July 2011 to 1 or 2 in March 2012.

In addition, these children received Pre-exposure vaccination (3 doses, ID) in January-February 2012.

3.8. WSPA project update – E Russell

The WSPA is conducting a global campaign, the Red Collar Campaign. The campaign name is inspired by the red collars used in Bali, which became an island-wide symbol of vaccination and protection, as well as other rabies vaccination projects. The goal of the campaign is to convince Governments that culling is not the way to control rabies, but that mass dog vaccination is.

This campaign is divided into 4 projects, each one covering a different aspect of the campaign:

- *Building a strong evidence base*
- *Championing our solution - mass vaccination*
- *Proving that mass vaccination solution works:* Five countries have been chosen for proof of concept projects.
 - *Being ready to stop new or renewed threats of culling and to respond to a 'crisis' situation.*

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3.9. Kenya – K. de Balogh

FAO and the US CDC have been involved in a vaccination campaign around Lake Victoria's port of Kisumu, Kenya's third largest city, in response to a spike in rabies cases that have killed people, dogs and livestock.

SESSION 4. ADVOCACY PILLAR

4.1. An approach to the World Health Assembly – C. Rupprecht

2011 was marked by the adoption of the One Health Partnership for rabies elimination.

Time is up now to have a vision: the elimination of canine and human rabies. The technology is here, the effective strategies are known, and initiatives such as the World Rabies Day, GARC and PRP are in place.

During the last Strategic Technical Advisory Group for Neglected Tropical Diseases (STAG-NTD) meeting, rabies was listed among the six high priority neglected zoonotic diseases that has been identified for control and elimination, based on their health and economic burdens; the availability of tools for their prevention and/or control; political commitment and funding. It was recommended to establish a global rabies control strategy in dogs and humans.

A resolution for the World Health Assembly calling for canine rabies elimination was discussed in Banna and a draft circulated further to the meeting. The finalized version was sent on July 9th.

This document is to be used to generate letters in support of canine rabies elimination from Ministers of Health to the Director General of the WHO. All contacts are to be used for as much global coverage as possible. For the 132nd Executive Board (EB) meeting in January 2013 to decide the WHA agenda, letters from ministers must reach the Director General's office as soon as possible and **no later than end of August**. One fact to note is that in June, the Director General of WHO approved the submission to the EB of a generic Neglected Tropical Disease (NTD) resolution urging Member States to follow the NTD roadmap which includes regional rabies elimination targets. The rabies specific resolution could be 'hooked' on to the generic NTD one.

Anyone who can follow up with contacts should also inform CR (for the Americas), JZ (for Africa) or DB (for Asia) in order to compile who has been contacted.

4.2 Global rabies strategy document – F.X. Meslin

A document on global strategy for dog rabies elimination should be prepared to support the resolution. This document could be based on the existing documents, for instance the documents from the ASEAN Plus Three and documents from other meetings, and on the Blueprint. Dr Gongal had a meeting on this issue in Bangkok (June 2011) (see also his publication: Human rabies in the WHO Southeast Asia Region: forward steps for elimination. *Adv Prev Med* 2011; doi:10.4061/2011/383870 - <http://www.hindawi.com/journals/apm/2011/383870/>)

To this 'common document', data should be added to fill the gaps for Africa, Middle East. This should be achievable within one year, so that it can be submitted to the next SAGE meeting next April.

The Global rabies strategy document is a global business plan to raise both attention and money, many PRP members considered this missing and it was also followed a suggestion to the WHO NTD STAG

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(Strategic and Technical Advisory Group) meeting held in April 2012 in Geneva. It must give a vision within a global perspective; details must not obscure the vision. A good example could be the Document Stop TB.

Replacement of François-Xavier Meslin

PRP expressed their concern that FX Meslin might not be replaced after retirement, or replaced by somebody who might not be dedicated to rabies control.

It has been decided to send letter to the Director, WHO, asking WHO asking for replacement of FX Meslin

Letters should be sent by:

- **PRP:** Debbie will draft letter from PRP and include country list of WRD event countries. It should be emphasized that global elimination of rabies planning requires a post for rabies in WHO, and rabies is the only zoonotic disease with targets for elimination set. Encourage member countries wherever to write to D-G also (e.g. draft at REB and SEARG meetings).
- OIE and FAO: They are more and more involved in rabies elimination and might announce next year a One Health agenda for commitment to dog rabies elimination
- Industry could also send a letter to the Secretary of SAGE.

SESSION 5. COMMUNICATIONS PILLAR

5.1. The Rabies Educator Concept – Peter Costa

In order to help increase international capacity for rabies education efforts in a sustainable, community-led manner and not to replace the role of a public health professional treating human or animal patients, GARC is designing the Rabies Educator Certificate (REC) program. It aims to train lay-persons in rabies prevention and control education. After successful completion of the REC program, it is envisioned that those trained will possess the knowledge and skills necessary to conduct rabies prevention information programs in their own communities, including for example: what constitutes an exposure to rabies, proper wound washing, the need to seek medical treatment, responsible pet ownership, etc.

As a first step, a survey is being conducted to seek input and opinions from rabies key opinion leaders, as the initial stage in the development of a Rabies Educator Certificate (REC) program (http://surveymonkey.com/s/GARC_REC).

5.2. World Rabies Day Webinars

Webinars are organized for the World Rabies Day, but they could be organized also on other days.

The 3rd Annual WRD Webinar to be held September 20-21, 2012. The Webinar brings together noted leaders in rabies research, One-Health advocates, professionals, students and World Rabies Day event planners in real-time to discuss the important public health issue of rabies while providing a forum for dialogue within and across disciplines.

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The two day event will focus on canine rabies elimination; human rabies surveillance, prevention and intervention; wildlife rabies control; information and education campaigns and building sustainable programs. Day 1 (Sept 20) of the Webinar will concentrate on presentations from Asia, the Middle East, Europe and Africa. Day 2 (Sept 21) will spotlight talks from North America, Latin America and the Caribbean Regions.

5.3. The Rabies Expert Bureaux

The Rabies Expert Bureaux (-REBs) are regional networks of rabies experts (clinicians, researchers, public health officers) who meet regularly to discuss the regional rabies situation; exchange experience, contribute to find solutions to regional specific problems and to prevent and control rabies in humans.

In order to strengthen the One Health approach for rabies prevention and control, these networks will include veterinarians and representatives of the Ministries of Agriculture. This is made possible by an unconditional grant from Merial, in addition to the unconditional support from Sanofi Pasteur to AREB.

The Asian Rabies Expert Bureau (AREB) is a network of > 40 experts from 12 Asian countries (Bangladesh, Cambodia, China, India, Indonesia, Laos, Myanmar, Pakistan, Philippines, Sri Lanka, Thailand, Viet-Nam) who meet annually since its establishment (2004).

Established in 2007, *the Africa Rabies Expert Bureau (AfroREB)*, is a network of >40 experts from 15 francophone African countries (Algeria, Morocco, Tunisia, Benin, Burkina Faso, Ivory Coast, Mali, Niger, Senegal, Togo; Cameroon, Congo, Gabon, The Central African Republic, and Madagascar. They meet every two year; the 3rd AfroREB meeting was held in Casablanca, May 2011.

The first meeting of the *Middle East and Eastern Europe Rabies Expert Bureau (MEEREB)* was held in Istanbul, Turkey (June 2010), with a 2nd meeting in June 2012, in Paris. It includes representatives from 9 countries (Egypt, Iran, Turkey; Croatia, Serbia, Georgia, Romania, Kazakhstan, and Ukraine).

SUMMING UP

A productive workshop on a Progressive Control Pathways for Rabies was held on the second day of the meeting, to gain the group's approval of and input to developing such a document. It was agreed that work on developing a Progressive Control Pathway would be carried out by the PRP group, led by the FAO.

A series of resolutions from the meeting were decided upon and the wording refined by the group. These resolutions covered the main outputs of the meeting, including;

- That current rabies control projects had been reviewed, found to be making progress towards reducing suffering and death, and that the lessons learned have local and global relevance.
- A major effort would be made to promote a resolution on canine rabies elimination to be presented at the 2013 World Health Assembly.
- The PRP group would advocate for WHO to continue to provide a leadership role in supporting rabies control and prevention activities after the retirement of Dr Francois Meslin.
- The group were in agreement that rabies notifiability and timely reporting of rabies outbreaks were vital to.

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A follow up meeting will be held at the RITA meeting in October in Sao Paulo, Brazil.

The chairman, Prof Louis Nel thanked all the participants for an informative and very productive meeting and closed the proceedings.