



RABID BYTES

The newsletter of The Global Alliance for Rabies Control

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EDITORIAL

World Rabies Day—10 Years of Making the World Take Notice

Earlier in the year somebody remarked to us that the problem with World Rabies Day is that every day is ‘World Rabies Day’. His point was that he vaccinates dogs and educates communities about rabies every day of the year, not just September 28.

When World Rabies Day was launched in 2007, it was about motivating action. But, over the last 9 years, we have found that it is so much more than that. Registered World Rabies Day events are a window to the work that the rabies prevention community is doing to end rabies, be that in South Africa, Cambodia, Pakistan, or Peru, everyday. World Rabies Day is not just about taking action, it is a way of standing up together and making the world take notice. We encourage you to have a look at what is going on, and if you haven’t registered your event yet—even if (and perhaps especially if) it is something you do every day—please do so [now](#).

For event organisers, there is a range of free resources, including the [new modifiable posters](#). These are available in eight different languages, and enable you to upload your logo to quickly and easily create professional materials. If you’d like the posters in a different language, please get in touch with our campaigns team.

What is particularly exciting this year is the [World Rabies Day MSD Awards](#). We devised and launched these to recognise, reward, and bring attention to some of the work going on to fight rabies every day in affected communities. There has been an impressive array of entries, and we look forward to sharing the nominees’ work with you over the coming months.

Technology makes initiatives like the posters and the awards possible, but community outreach programmes, fundamental in creating the behaviour change that will eliminate rabies deaths, often lack funding to print, transport and distribute these materials. Almost all of the award nominees, even the funded programmes, would use the award funds to print and distribute awareness materials in their communities. There is **always** a need for outreach funding. If you’re a donor, please remember how important this component is in rabies elimination programmes.

Also in this edition of the GARC newsletter, we highlight new scientific articles about World Rabies Day and editorials using World Rabies Day as an opportunity to remind the international community of the on-going need to improve rabies control and the recent developments bringing an end to human rabies closer.

The tremendous activity around the 10th World Rabies Day by so many individuals and organizations looks to confirm again its value in advocating for improved rabies control and supporting the global elimination target of 2030 that is now in place. But we still need you. If you use social media, please include #WorldRabiesDay when posting about World Rabies Day, and —again—if you’re planning an activity, multiply its impact by [registering it](#). We value your time and contributions. Thank you for being part of the community.



Contributed by Liz Davidson and Deepa Balaram of the GARC World Rabies Day team.

NEWS FROM GARC AND WRD

Rabies and Primary Animal Healthcare Community Engagement, South Africa

In an exciting collaboration between the Global Alliance for Rabies Control and the University of Pretoria, 1000 *“Want a Friend, Be a Friend”* Booklets* were distributed to various schools in the Gauteng, Limpopo and North West Provinces of South Africa. The distribution of the booklets was undertaken by third year veterinary students of the Onderstepoort Veterinary Professional Life (VPL 300) course. The *Want a Friend* booklets were used as part of their community engagement module, which focused on rabies control in the community. The veterinary students were tasked with creating innovative and engaging ways to have the greatest positive impact on the community with which they worked.

The majority of veterinary students visited primary schools, using the *Want a Friend* booklet as the basis of their interactive sessions with the children. Through some ingenuity and creativity, veterinary students also planned their own talks, presentations and shows to encourage enthusiasm about the topic of primary animal healthcare, responsible pet ownership, bite prevention and rabies prevention.

“This booklet allowed us to structure our lesson plan in a fun and interactive manner as it gave us a fantastic guide line from which to work off”. – Michaela Simon at Onderstepoort Primary School

The booklets—combined with the interactive sessions planned by the veterinary students—enabled the school learners in each of the schools to learn about important topics related to health, animal welfare and safety in their communities in a fun way.

“The learners got involved, allowing us to have an interactive session where the learners showed their knowledge of animal welfare, as well as, to have some fun”. – VPL 300 Group 12 Students at Kosea Moeka Primary School

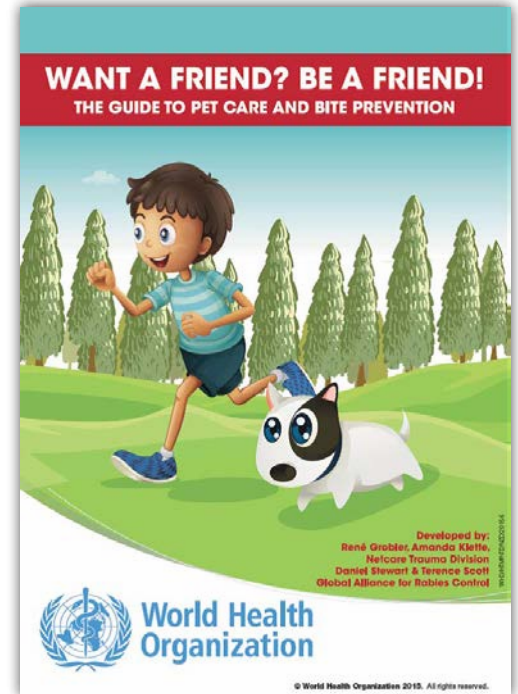
In order to ensure that the school learners retained the important information presented throughout the day with the VPL 300 students, each learner received a certificate showcasing that they know how to be safe around dogs from the back of the *Want a Friend* booklet. The certificate provided learners with a sense of importance and achievement, whilst also acting as a reminder about the things taught from the veterinary students.

“They seemed thrilled to have received a certificate for rabies education at the back of their books, which qualified them to be superheroes too!” – VPL 300 Group 31 students at Mogale Primary School

The continued education of communities, especially children, about responsible pet ownership, primary animal healthcare, dog bite prevention and rabies prevention will be an essential part in facilitating efforts towards rabies control and elimination, as well as promoting the humane treatment of animals. We hope that these community engagement efforts leave a long-lasting, positive impression upon communities and that the vital messages purveyed during these programmes is fostered and passed on to others.

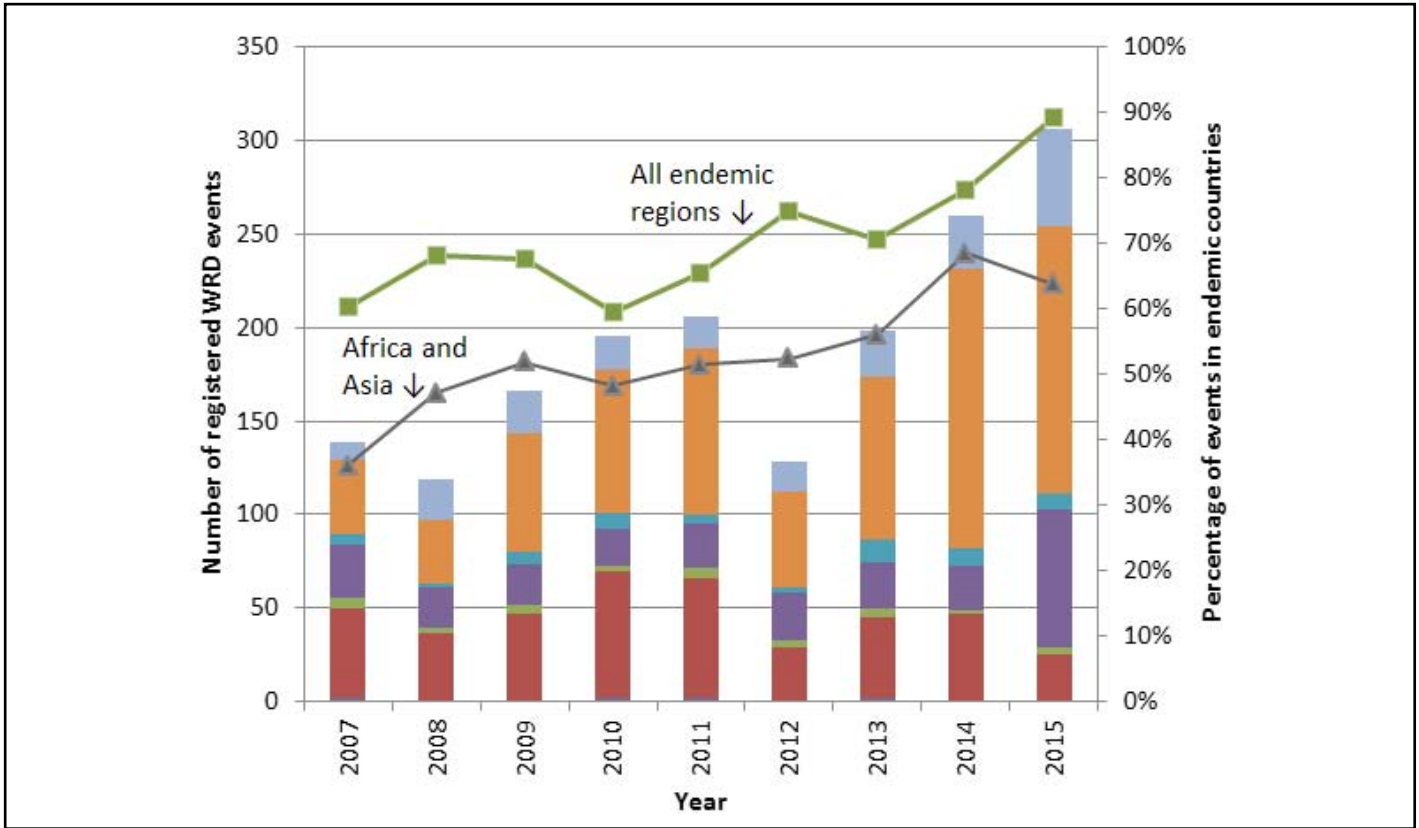
* *The printing of the booklets was supported by the Grant or Cooperative Agreement Number, [1U2GGH001874-01], funded by the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services. [The Want a Friend? Be a Friend!](#) booklet can be downloaded from the neglected tropical diseases section of the WHO website.*

Contributed by Terence Scott, GARC, and a member of the Pan-African Rabies Control Network (PARACON) Steering Committee.



International Publications Highlight WRD’s Value and Recent Progress

WRD is always an opportunity for action at all levels from local to international. GARC has been reflecting on the history, growth and development of WRD in an article entitled “World Rabies Day - a decade of raising awareness” to be published in the journal [Tropical Diseases, Travel Medicine and Vaccines](#) this month. It is very gratifying to see how the number of registered events has grown over the years—to a total of over 1700 up to 2015— and how increasingly the day is being utilized to raise awareness in rabies endemic countries.



The adoption of WRD to support rabies elimination targets in the Philippines is showcased in another article in the same issue entitled “World Rabies Day Campaign in the Philippines”. For last year’s WRD, 76 events were registered in the Philippines as many regions with canine rabies control programmes utilise the opportunity to maintain high awareness of the disease and its prevention. Celebrating the progress achieved, the highlight of the Philippines national WRD celebration is the Declaration of Rabies-Free Zones.

Additionally, editorials in two significant international health journals have utilised the opportunity of WRD to keep rabies on the global health agenda, and to report on progress in its control at the international level.

Together with OIE, FAO and WHO, GARC co- wrote an editorial in [The Lancet Global Health](#) entitled “2016: the beginning of the end of rabies?” which is due out soon. The article starts by reminding us that every time WRD comes around it is another uncomfortable reminder that preventable deaths are still occurring in the world’s most neglected communities. It reviews the progress made at and since the Global Meeting on Rabies in December 2015 and calls for the vaccines and tools we have available to be applied equitably in order that the elimination framework agreed upon can end human rabies deaths.

In the WHO’s Bulletin, an editorial entitled “[Rabies vaccine stockpile: fixing the supply chain](#)” by the NTD department and others announces a new WHO human rabies vaccine stockpile to compliment the dog rabies vaccine bank run by the OIE. The new stockpile should be operational by the end of 2017, addressing the desperate need for life saving vaccine to reach everyone who needs it after an exposure. It also announces an upcoming review of the WHO vaccine position paper, “WHO’s Strategic Advisory Group of Experts on Immunization”, will review advice on the use and scheduling of rabies vaccines and immunoglobulins in view of scientific evidence, programmatic feasibility and clinical practice in countries with a high incidence of dog bites.

Contributed by Louise Taylor, Scientific Director, GARC.

The Community Coordinator for Rabies Certificate



A community coordinator in Haiti helps to advertise an upcoming vaccination event

GARC is proud to announce the launch of its third online course on the GARC Education Platform - the Community Coordinator for Rabies Certificate (CCC).

The CCC course has been designed to provide more advanced and in-depth training for Rabies Educator Certificate (REC) graduates, enabling them to become actively involved in the protection of their community against rabies, whilst also ensuring the humane treatment of animals. While the REC focuses on community education, the CCC expands this knowledge to other elements of community welfare, helping the graduate to provide even more support to enable the community to prevent rabies. It covers information needed for a community coordinator to become a rabies reference point for their community, and to help the community work together with rabies control programmes to ensure vaccination programmes are successful. A particular interest in rabies, community welfare and a willingness to communicate with people are the only requirements of REC graduates to be proficient in the CCC course. The CCC course contents and expected outcomes makes this course an ideal tool for rabies control programme

managers who wish to train new staff members that will be directly involved in the communities where the programmes operate.

The new course is currently only available in English and can be accessed by going to the online GARC Education Platform (<https://education.rabiesalliance.org>). Because the CCC course follow up on the knowledge learned in the REC, an enrolment key is obtained after completing the REC course. Participants that have already completed the REC course, and wish to enroll for the CCC, can contact education@rabiesalliance.org.

We hope that you will enjoy the new course and that you will be able to benefit from the knowledge provided on the GARC Education Platform.

Contributed by Andre Coetzer of GARC, South Africa who manages the GARC education Platform.



Community coordinators can help advise on rabies control issues

NEWS FROM THE COMMUNITY

APCRICON 2016



APCRICON 2016 was the 18th Annual National Conference of Association for Prevention and Control of Rabies in India held on 9th & 10th July, 2016 in Bangalore, with the theme of **One health approach for prevention & control of Rabies: Opportunities & Challenges**.

Bangalore is a city which has the unique distinction of nurturing 3 pioneering Institutions, renowned for their work in the field of prevention & control of rabies in India: the Department of Community Medicine, Kempegowda Institute of Medical Sciences (KIMS), the Department of Neurovirology, National Institute of Mental Health & Neurosciences (NIMHANS) & the Departments of Microbiology & Pathology, Karnataka Veterinary College (KVAFSU).

About 600 delegates comprising of medical doctors, veterinarians, scientists & researchers from all over India & from 7 other Countries participated in the conference and exchanged their views & discussed about the newer developments in the field of rabies. Combined with the conference, a press meet was held at the Press Club, Bangalore on 8th July 2016 and a Continuing Medical Education (CME) programme on 'Laboratory Diagnosis of Rabies' was held on 8th July 2016 at Department of Neurovirology, NIMHANS, Bangalore with 26 participants from both Medical and Veterinary fields.

Continued on page 5...

...APRICON 2016 continued from page 4.

APCRICON 2016 was inaugurated on 9th July, 2016 at 9.00 AM by **Dr. Bernadette Abela-Ridder**, Team leader, Neglected Zoonotic Diseases, Department of Control of Neglected Tropical Diseases, WHO, Geneva. During the inaugural function, the APCRI Journal and APCRICON 2016 Abstract book/Souvenir were released and the APCRI Life time achievement award was given to Founder Secretary General of APCRI, Dr. Tapan Kumar Ghosh (Posthumously) and the Young Scientist award was conferred to Dr. Rachana A.R.

After the Inauguration, **Louis Pasteur Oration** was delivered by Dr. Bernadette Abela-Ridder; followed by **S. N. Madhusudana Oration** by Dr. S. K. Shankar, Emeritus Professor of Neuropathology, NIMHANS, Bangalore. A total of 17 lead lectures, 24 select oral & 60 poster presentations were made during the 2 day conference. A Round Table discussion on “Dog Population Management for Rabies Control” was also organized on 10th July 2016.



The conference concluded on 10th July 2016 with the following recommendations towards achieving “Dog mediated human rabies free India by 2030”.

- 1) Reassessing the burden of rabies in humans and animals.
- 2) Mapping the regional resources and expertise and building National capacity.
- 3) Mobilizing strong political commitment.
- 4) Improving availability and affordability of vaccines and rabies immunoglobulin (RIG), especially at the village / taluka level.
- 5) Compulsory licensing of pet dogs.
- 6) Monitoring & evaluation of ABC programme and its implementation on scientific basis.
- 7) Initiating the process for notification of rabies in the humans.
- 8) Expanding the network of rabies diagnostic laboratories in India.
- 9) Explore the feasibility of sourcing canine vaccines from OIE vaccine bank.
- 10) Maintaining uniformity in anti rabies vaccination schedule.
- 11) Study the circulation of rabies virus in wild animals.
- 12) Large scale training programmes for Veterinarians on collection of brain samples from suspected cases, packing and transportation to laboratories.
- 13) Involve local community / public in programmes.
- 14) Seek support from international agencies such as WHO, OIE, Private sectors and other stake holders.
- 15) To approach National Center for Disease Control (NCDC), Government of India to revise the plan of National Rabies Control Programme in the context of WHO mandate of dog mediated human rabies free world by 2030.
- 16) To establish a “Rabies Network of India” under APCRI to expedite, coordinate, liaise the concerned organizations and institutions and work towards better prevention and control of rabies activities in India.
- 17) To start “mass dog vaccination campaign” as a demonstration project of 3-5 years duration covering Bangalore.
- 18) To recommend WHO for revision of guidelines on rabies PEP with specific reference to application of RIGs.

Contributed by Dr. D. H. Ashwath Narayana, Vice- President, APCRI & Professor & Head, Department of Community Medicine, KIMS, Bangalore and Dr. G. Sampath, President, APCRI. **Dr. H S Ravish**, Organizing Secretary, APCRICON 2016, **Dr. Reeta S Mani** and **Dr Shrikrishna Isloor**, Organizing Joint Secretaries, APCRICON 2016. More information on APCRI is available at www.apcri.org.

Sustaining the Drive Towards Rabies Elimination in Kenya

As we celebrate the 2016 and the 10th World Rabies Day, Kenya will be observing the 2nd anniversary of the launch of her strategy for elimination of human rabies by 2030. The implementation plan was to start small by focusing on select pilot regions where the elimination strategies would be tested, demonstrate success in those pilot regions, and quickly scale up to the rest of the country achieving the target of zero rabies deaths in humans by 2030.

Although two years is a short period, there have been significant steps and events that have increased momentum towards realizing the vision of a rabies-free Kenya. One of the inspiring stories has been the quick buy-in and commitment to rabies elimination by the County Government of Makueni, a historic hotspot for rabies in Kenya, and one of the five counties identified to serve as pilot regions.

Last year, World Animal Protection partnered with Makueni County Government to start implementation of two of the main pillars of the rabies elimination strategy for Kenya: 1) mass dog vaccination reaching 70% of the dog population and 2) rabies awareness campaigns in schools. In response, the Makueni government matches dollar for dollar funding from World Animal Protection and in addition has committed its own funds to provide free post-exposure prophylaxis for all dog-bite victims reporting to county health facilities.



A man in Siaya who brought his 48 dogs for rabies vaccination

The Makueni County government has understood that investments in preventing rabies at the source through mass dog vaccination will in the long run save them the money spent on post-exposure prophylaxis. After a year of vaccinations, each campaign conducted during the three school holidays in a year, Makueni County has vaccinated dogs in all the sub-Counties and achieved 70% vaccination coverage in many of them. Importantly, they have conducted these vaccination campaigns using only vaccinators working within the County. If taken up by all the 47 Counties, funding rabies elimination campaigns using County funds will be a significant step towards success in rabies elimination in the country.

Rabies elimination requires coordination structures that bring together efforts from different sectors within government and non-government organizations. Through the Zoonotic Disease Unit, Kenya has established the [National Rabies Elimination Coordination Committee](#) (NRECC), which draws membership from various sectors including public health, animal health, security, education and research among others. In order to be effective, the functions of this coordination body are to be devolved to the Counties with creation of County Rabies Elimination Coordination Committee (CRECC) for each of the 47 administrative Counties. Two of the pilot counties, Makueni and Siaya, have constituted and established their CRECC's and are coordinating rabies elimination efforts in those areas.

Since the launch, Kenya has received funding that supports rabies elimination from various partners including the European Union through the World Organisation for Animal Health (OIE), the Wellcome Trust in support of operational research, World Animal Protection, CDC through the Global Health Security Agenda and is in discussion with other partners with possible additional funding. This kind of stimulus funding is critical in sustaining the drive towards rabies elimination in Kenya, and is needed to get the remaining three pilot Counties started.

In the last year, rabies has been covered in the local media almost every month (see [Youtube Videolink](#) and [article link](#)). This much-needed media attention to rabies is key in highlighting the burden of the disease and in increasing support for the implementation of the elimination strategy. Kenya now runs a rabies elimination website ([rabiesfreekenya.org](#)) and is active on social media through Facebook and Twitter (@rabiesfreekenya).

In December 2015, the World Health Organization (WHO), OIE, Food and Agricultural Organization of the United Nations (FAO) in collaboration with GARC set the global goal for the [elimination of dog mediated rabies by 2030](#), as aspiration and achievable target for the participating countries. This global push for rabies elimination provides additional drive to individual countries including Kenya to act; the time is now.

Thumbi Mwangi is a Wellcome Trust Fellow at Kenya Medical Research Institute leading rabies operation research in Kenya, an Assistant Professor at Washington State University and a 2016 Aspen New Voices Fellow

New MEEREB Website Supports Rabies Advocacy and Education Efforts

Fondation Mérieux, coordinator of the Middle East, Eastern Europe, Central Asia and North Africa Rabies Expert Bureau (MEEREB), has proudly launched, in early August, a new website. The site is designed to better inform and engage members in the 15-country MEEREB region (pictured above) and support the dissemination of information from actions and activities geared by MEEREB members and by our valuable partners.



MEEREB has broadened its content offerings on the website to provide an increased level of general information about rabies and improved access to educational and advocacy materials, a direct reflection of our organizational mission—to support efforts on all fronts to eliminate human rabies. The new site includes:

- A new FAQ with general information about rabies
- Links to past MEEREB meeting minutes
- An overview of MEEREB’s goals and work to support rabies control and prevention
- A map of MEEREB member countries
- Lists of partners
- Resources for veterinarians, rabies researchers, community health care workers and rabies activists
- Links to news stories related to MEEREB activities

Of particular interest to rabies community in this region are the scientific publications from MEEREB researchers and the meeting minutes from recent MEEREB meetings. Additionally, media and advocacy packages can be found in French and English—including links to posters, media kits, logos and flyers. Rabies educators can find posters to help promote classes where the Rabies Educator Certificate (REC) is offered.

We invite you to take a look! Click on the following link to see the new site: <http://www.meereb-network.org>

Contributed by Valentina Picot, Fondation Mérieux Research Advisor and Coordinator of the MEEREB network.

WSAVA’s One Health Award Recognizes Rabies Control Efforts

The [World Small Animal Veterinary Association \(WSAVA\)](#) has awarded their 2016 Global One Health Award to Dr Luke Gamble, founder of charities [Worldwide Veterinary Service](#) and [Mission Rabies](#).



The WSAVA Global One Health Award is presented by the WSAVA’s One Health Committee (OHC) to an individual who has promoted an aspect of One Health relevant to small companion animals. Previous recipients include Dr Nalinika Obeyesekere, CEO of Blue Paw Trust, for her work to improve standards of veterinary care in Sri Lanka, and Prof Lucille Blumberg of the National Institute of Communicable Disease in South Africa who led the country’s response team to the Ebola outbreak in West Africa. Interestingly, all three of these maintain a strong interest in rabies control alongside their other work.

Professor Michael Day, Chair of the WSAVA OHC, said: “The current most significant example of the importance of a One Health approach to disease control relates to the global fight against canine rabies - a disease that continues to cause an estimated minimum 59,000 human deaths each year. Luke is a world leader in this global fight. Mission Rabies runs mass vaccination campaigns and provides public education in Asia and Africa, having now vaccinated almost 400,000 dogs, spoken to over 500,000 schoolchildren and successfully controlled rabies in selected target areas.”

Dr Gamble will receive his Award at the 2016 [WSAVA World Congress](#), 27-30 September in Cartagena, Colombia, where he will also give a lecture on his work, entitled ‘One Mission’. “It’s a huge honour to receive this Award and I accept it on behalf of an amazing team - without whom - the projects would be impossible. It’s an utter privilege to be a part of the veterinary profession and fighting diseases like rabies is an incredible opportunity to champion both animals and people – something we can all identify with”, he said.

Adapted from the [WSAVA press release](#) by Louise Taylor, GARC newsletter editor and Scientific Director

La Raj du Chien: Confronting the rage of the dog in Haiti

Haiti is the most impoverished country in the Western hemisphere, despite being a mere 600 miles from one of the wealthiest countries in the world. The wealth disparity is obvious when you are in Haiti. Poverty surrounds you; over 70% of the population survives on a wage of \$2 USD per day. However, several weeks ago, on a hot August evening, I found myself at the top of a hill in what could pass for a five-star restaurant in the U.S., dining with a group of rabies experts and looking out over the city of Port-au-Prince. We had spent the day marching through dusty roads in an impoverished community only 30 minutes from the capital, capturing and vaccinating stray dogs as part of an effort to curb an ongoing rabies outbreak. Now we were dining on gourmet pizza and specialty iced drinks. Sometime after the appetizers had arrived but before the main course, my phone buzzed. I thought surely it was my wife sending a good-night message from the kids. Expecting a video of three kids bundled in pajamas with a *Goodnight Moon* book propped between them, my stomach sank when I instead saw a picture of young boy with sunken eyes and a blank stare with the caption: “Is this rabies?”

Hydrophobia: an irrational fear of water, often associated with the last stages of death in persons succumbing to rabies virus infection. I step away from the dinner table and click ‘play’. The shaky video shows a stream of water jet from a young Haitian doctor’s syringe, and splashes onto the bare chest of a frail 7 year old boy. As the water hits his chest he shrieks in terror, convulses, and writhes in his mother’s arms as she stares back at the doctor with a muted, expressionless face. She has seen her son terrorized by an invisible demon for the past 5 days and now acts numb to the gruesome scene that is unfolding in this rural health center. Confronting patients suspected of rabies with water is a common test in many developing countries; this reaction confirms the doctor’s suspicions – the boy has hydrophobia. The mother reveals that 6 weeks ago the boy was bitten by a stray dog. The doctor relays the grim prognosis and sends the two home; there is no care he can offer. Within 24 hours, the boy is dead.

The video was sent from a veterinarian-missionary in Haiti who has devoted her past five years to preventing these deaths. I happened to be in Haiti working with her on a dog vaccination program. It would be the first of two videos that week of young children with rabies that were sent to my phone, asking if there was any way to help. Twice I had to answer, just as the young doctor told the mother, after signs appear there is no effective treatment.



Haiti has an estimated 130 human rabies deaths annually, yet only about 7–10 are detected due to gaps in surveillance and the healthcare system. Finding and documenting these deaths so they no longer remain hidden has been a priority for the missionary and me. But the best preventive measures are vaccination of dogs, and this August, a team from the United States CDC, Christian Veterinary Mission, Humane Society International, and IDT Biologika, worked with Haiti’s ministry of agriculture to develop a more robust canine rabies mass vaccination program. Over 12 days, a team of 30 staff vaccinated over 10,000 dogs while also collecting critical evaluation data. Over the next several months the team will analyze the data and try to determine the best strategies for canine rabies vaccination in Haiti. This fall the results will be put to the test, when the ministry of agriculture runs a 100,000 dog campaign. And next year there is talk of 700,000 dogs, if the vaccines come in.

Written by Ryan M. Wallace DVM, MPH who has been involved in rabies control efforts in Haiti since 2012 working in close collaboration with Kelly Crowdis DVM of Christian Veterinary Mission who sent the videos.

Vaccine Trial Delivers Rabies Protection to Nearly Extinct Ethiopian Wolves

Newly formulated baits containing the rabies vaccine Rabigen® SAG2Dog have been successfully field-tested on three endangered wolf packs (*Canis simensis*) in the Bale Mountains of southeastern Ethiopia. [Recently published results](#) of this trial in the journal *Vaccine* indicate that the baits will deliver sufficient protection from the rabies virus, providing this dwindling population of wolves with an additional defense against extinction. Rabies has been identified as a significant threat to the continued existence of this rare population of canids, and efforts to control the transmission to the wolves by vaccinating the local domestic dog population did not achieve the desired protection due to frequent incursions from unvaccinated dogs traveling into the wolves' habitat.

During the vaccine trials, 21 wolves were trapped after consuming the bait vaccinations, with fourteen of these testing positive for the vaccine's biomarker. Additionally, the levels of antibody in 12 of the 14 positives were high enough to provide protective immunity, and 7 of the positives had titres above 0.5 IU/mL. All of the vaccinated wolves, except one, were still alive 14 months after trapping and testing.

The wolves have been plagued by rabies in recent years, with outbreaks occurring in 1991, 2003, 2008 and 2014. Declines in their populations have left as few as 500 wolves alive in the wild, and local habitat loss, as well as increased exposure to disease, continues to threaten their survival. Settlers near the national park in the Bale Mountains, the wolves' current habitat, have increasingly impinged on the park's borders and expanded into the wolves' territory, frequently bringing domestic dogs (and their diseases) into contact with the wolves. Domestic dogs in nearby villages are often hunted and eaten by the wolves, and the dogs regularly accompany villagers who use the park to graze goats and sheep, bringing the two populations of canids into close contact with each other.

To control the virus in wolves, the Ethiopian Wolf Conservation Programme (EWCP) carried out domestic dog vaccination programs, which focused on immunizing the local dog populations on the periphery of the park. However, these efforts did not achieve a satisfactory transmission barrier due to the dynamic nature of the domestic dog populations in this area. Researchers also embarked on a parenteral vaccination campaign, capturing and directly injecting the wolves, but found that these efforts were too expensive and time-consuming, not to mention stressful on the wolves. Conservationists then turned to an oral vaccine, only to find that the wolves did not like the liver-flavored bait that was already on the market. Scientists went on to reformulate the SAG2 vaccine so that it appealed specifically to the wolves' taste buds—and found that wrapping the bait in goat meat garnered maximal appeal.

University of Oxford researcher Claudio Sillero-Zubiri headed the study in collaboration with various infectious disease control and wildlife conservation organizations; he and his research team have now shown that immunizing the Ethiopian wolves with baits may provide a pre-emptive and less-labor intensive way to manage and prevent rabies outbreaks in these packs of rare wolves. "We now have a safe vaccine, a suitable bait, an efficient delivery method, and trained monitoring teams in place—all crucial steps which open up the possibility for scaling up the oral vaccination and protecting the wolf populations at risk before the disease strikes again," said Professor Sillero-Zubiri in an interview published in *Science Daily*.



Ethiopian wolf by Gert Vankrunkelsven (Own work) via Wikimedia Commons

Summarized by Laura Baker, GARC newsletter co-editor, from online reports in *Science Daily*, "[First test of oral rabies vaccine brings hope to the world's rarest canid](#)" and from *National Geographic*, "[Vaccines May Save Africa's Rarest Wolves from Extinction](#)". The full paper "[Feasibility and efficacy of oral rabies vaccine SAG2 in endangered Ethiopian wolves](#)" is by Sillero-Zubiri et al, published in *Vaccine*, and a ProMed report is available [here](#).

New MOOC on One Health



A new Massive Open Online Courses (MOOC), entitled “One Health: Connecting Humans, Animals and the Environment” will begin on November 7th. It has been designed by the University of Basel in Switzerland and will be led by Prof. Jakob Zinsstag, Prof. Esther Schelling and Prof. Bassirou Bonfoh. The course will explore the One Health approach and its value, answering questions such as: What are the many advantages of a closer cooperation between human and animal health? And What transdisciplinary processes can be set up to solve a particular One Health problem efficiently?

The course will require approximately 5 hours of work a week for 6 weeks. Registration is free for participants and once registered the course content can be accessed indefinitely. Personalised certificates are also provided for a fee, which includes transcripts and feedback from tutors.

For more information and registration, please visit www.futurelearn.com/courses/one-health



Recent Research

Economic Impacts

[Incidence and economic impact of rabies in the cattle population of Ethiopia](#). 532 cattle-owning households were surveyed and average economic losses per herd due to rabies were estimated at 49 and 52 USD per year for different farming systems. In affected herds the average losses per year were 228 USD and 477 USD.

[Rabies in Kazakhstan](#). From 2003 to 2015, a mean of 7.1 people died due to rabies per year and a mean of 64,289 individuals per annum underwent PEP. Rabies costs Kazakhstan \$20.9 million per annum, nearly half attributed to PEP and the loss of income whilst being treated. Life time loss of income for fatal cases was valued at \$5.4 million per annum and animal vaccination programmes and animal control programmes also contributed substantially to the economic losses.

Epidemiology

[Human Rabies in China, 1960-2014: A Descriptive Epidemiological Study](#). From 1960 to 2014, 120,913 human rabies cases were reported in mainland China, with peaks in 1981 and 2007. Cases are more common in August and most victims are farmers with a male-to-female ratio of 2.4:1. Since 2004, the number of cases has decreased by 65.2%, but the area of risk is expanding.

[Rabies awareness and dog ownership among rural northern and southern Chadian communities - Analysis of a community-based, cross-sectional household survey](#). A community-based survey in 40 villages in two southern and two northern regions of Chad was carried out to prepare for mass vaccination campaigns. Dog:human ratio of 1:5.2 in the south and 1:16.4 in the north were found and only 76% of the respondents had heard of rabies. Differences in rabies knowledge were identified between regions, and across religions and education backgrounds. 11% of respondents reported a family member being bitten by a dog in the past year, 31% of respondents knew someone who had died of rabies and 58% had encountered a rabid animal.

Dog vaccination

[The Vaccination of 35,000 Dogs in 20 Working Days Using Combined Static Point and Door-to-Door Methods in Blantyre, Malawi](#). Vaccination was conducted at 44 static point stations at weekends, followed by door-to-door vaccination sessions in the areas surrounding them. 23,442 dogs were vaccinated at static point stations and 11,774 dogs were vaccinated door-to-door. After the 20 day vaccination programme, vaccination coverage through door-to-door surveys estimated that 79.3% of 10,919 observed dogs were vaccinated. The human:dog ratio for the city was estimated at 18.1:1. Mobile technology facilitated the collection of data as well as efficient direction and coordination of vaccination teams in near real time.

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Human Exposures, Cases and PEP

[Post-Marketing Surveillance of Human Rabies Diploid Cell Vaccine \(Imovax\) in the Vaccine Adverse Event Reporting System \(VAERS\) in the United States, 1990–2015](#). A 25-year review of the US Vaccine Adverse Event Reporting System (VAERS) revealed 1,611 adverse reports after HDCV; 93 (5.8%) were serious. The three most common adverse events were pyrexia (18.2%), headache (17.9%), and nausea (16.5%). Four deaths appeared unrelated to vaccination. The study did not identify new or unexpected adverse reactions compared to pre-licencing studies.

[Human Rabies Survivors in India: An Emerging Paradox?](#) Survival from human rabies (although with severe residual deficits) has been reported in 6 patients in the last 6 years from India, and between 2012 and 14, a further 6 patients have been reported to have lived from 2 weeks to 3 months after onset of illness. Increases in access to intensive care and doctor's willingness to try to save patients may be responsible. However, treatment should not distract from prevention and India needs to scale up indigenous production of modern cell culture vaccines and promote the intradermal regimen.

[A Systematic Review of Human Bat Rabies Virus Variant Cases: Evaluating Unprotected Physical Contact with Claws and Teeth in Support of Accurate Risk Assessments](#). A systematic review to understand the risk of infection for individuals who have been potentially exposed to a suspect or confirmed rabid bat. A total of 41 verified human bat-rabies cases between 1990 and 2015 were all fatal. Seven (17.1%) reported a bite from a bat, Ten (24.3%) cases had unprotected physical contact (UPC) such as a bat landing on them or touching a bat's teeth. Seven (17.1%) cases had probable UPC. Questioning individuals about contact with bat teeth and claws may help identify additional exposures.

[Misdiagnosis of cerebral malaria initially as acute psychotic disorder and later as human rabies: a case report](#). A 17-year-old school girl presented with agitation and over talkativeness and was diagnosed as having an acute psychotic state. She later became drowsy and developed recurrent seizures and marked phobic spasms which prompted a diagnosis of rabies. However, later tests revealed cerebral malaria, which was treated with intravenous quinine and she was discharged with no residual neurological deficit.

Diagnosis

[Development of Primer Pairs from Molecular Typing of Rabies Virus Variants Present in Mexico](#). A total of 158 sequences of N gene from RABV were used to design primers for typing the four different RABV variants (dog, skunk, vampire bat, and non-hematophagous bat) which are most common in Mexico. Used in nested and/or real-time PCR, these provide an alternative technique for variant RABV typing.

[Localization of the rabies virus antigen in Merkel cells in the follicle-sinus complexes of muzzle skins of rabid dogs](#). Tactile hairs abundant in the muzzle skin are equipped with more than 2,000 sensory nerve endings. Muzzle skins were obtained from 60 rabid dogs diagnosed with rabies by dFAT and virus antigen was clearly detected in a part of the outer root sheath of hairs from each dog. The results suggest that hair follicles from muzzle skin could serve as a useful alternative specimen source for diagnosis of rabies.

Upcoming Conferences

The 41st World Small Animal Veterinary Association Congress is taking place September 27-30, 2016 in Cartagena, Colombia. See the [website](#) for further details.

The XXVII Rabies in the Americas meeting will be held in Belem Brazil from 23-28th October. The website is now available [here](#).

[The 2nd GLOBAL CONFERENCE ON ONE HEALTH](#) - Moving forward from the One Health Concept to One Health Approach. The conference will be held in Kitakyushu City, Japan from Nov 10th to 11th.

[The One Health EcoHealth 2016](#) conference will bring together the global One Health and EcoHealth communities in Melbourne, Australia, from December 4th to 7th.



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