



**Global Alliance
for Rabies
Control**

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RABID BYTES

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EDITORIAL

Setting a Clear Pathway Towards Global Rabies Elimination

Over the last few years, this newsletter has charted an important progression--the strengthening and streamlining of GARC's work to support countries in their rabies elimination efforts.

Building on the evidence of pilot projects that demonstrated the feasibility of rabies elimination, we have developed the practical tools and the necessary networks for supporting successful rabies control efforts.

The strengthening of regional networks, first in Africa with the establishment of [PARACON](#), just took a significant step with the launching last month of [ARACON](#) in Asia. And now a similar network will be mirrored in the Middle East and Eastern Europe with the formation of the MERACON network this coming month. These platforms allow GARC and our partners to strengthen coordination and introduce national rabies focal points from many countries into rabies control planning and evaluation tools, providing the support necessary for success through workshops and training courses.

Participants can try these tools out with their own data, assess their program's needs and create their own work plans to move their program forward. The meetings also allow for another valuable process: the provision of feedback on how these tools can be improved, filling the remaining gaps that hold countries back.

The [Rabies Epibulletin](#), designed to support and improve rabies data reporting, is another tool being promoted at regional meetings. Data brought to the meetings from both health and veterinary services is added into country-focussed Epibulletin dashboards, which can then be tailored to suit a country's individual needs going forward. This data is vital to assessing and directing customized national rabies elimination plans, and from there, progress towards regional and global goals.

Once a country's rabies control needs and priorities have been established, scarce resources can be better utilised and expert help can be sought for [in-country capacity building](#) in areas where it is lacking. The expertise of many international organizations is already being channelled into training courses and other capacity building exercises in endemic countries that can be adapted to meet a country's needs.

GARC's advocacy work has also transformed over the years. [The World Rabies Day campaign](#) and the reassessment of the burden of canine rabies formed a solid foundation, but much has been built since then. GARC alongside the WHO, OIE and FAO has now built the case for global elimination and set a target date of 2030 for an end to human deaths from canine rabies. GARC now manages the [End Rabies Now campaign](#) to help promote awareness of the global aspirations, and United Against Rabies is now focused on developing a [business plan to achieve this goal](#). The plan will be launched before the end of May.

The global elimination business plan will be used to attract much needed resources for capacity building to allow countries to reach the targets set. A powerful package of support combining well-designed data and assessment tools, rabies vaccine banks, global awareness campaigns and expert support through regional rabies networks and in-country workshops now exists. In combination, these mechanisms provide a clear path that countries can follow to keep us on track to reach the global goal.

Louise Taylor, GARC

NEWS FROM GARC AND WRD

Protecting 4 Billion People Against Rabies Through Strengthened Regional Collaboration: The 1st ARACON Meeting

In Asia, more than 4 billion people continue to be at risk of rabies. Of the estimated 59,000 human rabies deaths every year, the majority (59.6%) occur in Asia. As an expansion of GARC's regional rabies networks, the [1st Asian Rabies Control Network \(ARACON\) Meeting](#) was held in Bangkok, Thailand from March 13th-14th 2018.

The global rabies conference in Geneva in December 2015 set the goal of eliminating canine-mediated human rabies by 2030 through the Global Framework for the Elimination of Dog-Mediated Human Rabies. Five pillars were identified to achieve rabies elimination: S-Socio-cultural; T-Technical; O-Organizational; P-Political; and R-Resources (STOP-R). Two of the key aspects highlighted were the importance of strengthening the intersectoral collaboration through the One Health approach (O-Organization) and creating avenues for participatory approach to exchange lessons learnt and experiences through regional collaboration (P-Political).



Country delegates develop rabies control workplans. Photo: GARC

In 2015, the Pan-African Rabies Control Network (PARACON) was formed with GARC as the secretariat to unify all existing networks and harmonize the rabies control and elimination efforts of all countries in sub-Saharan Africa. The PARACON meetings have become a way for country representatives from the medical and animal health sector to gain hands-on experience in strategic planning, implementation and evaluation of national rabies programs using tools developed by GARC in collaboration with other international organizations (FAO, US CDC, WHO). These tools include the Stepwise Approach towards Rabies Elimination (SARE); the Rabies Epidemiological Bulletin (REB); and the GARC Education Platform (GEP). The meetings also introduced the Global Dog Rabies Elimination Pathway (GDREP) developed by US CDC to guide high-level policy makers in determining the funds and resources to plan and conduct mass dog vaccinations. To date, 38 countries have joined the PARACON.

Now a regional network has been established for Asia. Organized by GARC in collaboration with the US CDC, a total of 45 participants attended the first meeting. Participants included 27 country delegates from 13 Asian countries as well as representatives from international organizations (FAO, OIE, WHO, US CDC), animal welfare organizations (Humane Society International, Four Paws, Blue Paw Trust), and several pharmaceutical companies.

Similar to PARACON, the meeting was designed to be informal, interactive through “learning by doing” wherein delegates were given time to explore the different existing rabies elimination tools. The 1st ARACON meeting enabled the first SARE assessments for many Asian countries and became a venue to launch the Practical Workplan component of the SARE tool. This additional component builds the pending activities from the SARE assessment into a country specific work plan complete with a GANTT chart, objectives, outcomes, deliverables, and number of years to completion.

Other highlights of the meeting were the sharing of lessons learnt from different countries (Thailand, Philippines, Indonesia, Sri Lanka, and Malaysia) in the implementation of national rabies programs as well as a presentation from

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GARC Statement on Dog Culling for Rabies Control

Stories appear with alarming regularity in the international media about authorities carrying out [mass stray dog culling](#) in response to rabies cases. Attracting fewer headlines is the high frequency of [routine culling](#) carried out month after month, and [year after year aiming to](#) curb rabies in stray dog populations. [In a recent article](#), World Animal Protection suggested that perhaps 10 million dogs are culled across the globe in the name of rabies control every year.

There is no doubt that stray dogs present many problems to public safety and environmental health, and it is no surprise that there are frequent calls for authorities to [do something about the problem](#). Often rabies gets caught up in the more general debate around free roaming dogs and dog overpopulation, and a rabies outbreak can be the tipping point at which authorities decide to respond.

Superficially, it may seem that reducing the dog population would help limit the spread of rabies, but the desire for authorities to be seen to be doing something hides a more worrying truth. Indiscriminate dog culling is simply not an effective way of controlling rabies, and worse, it undermines the development of a longer term solution that would work. Additionally, the use of culling can frequently result in a [backlash from the community](#), especially if inhumane methods are used.

To support those fighting for effective rabies control in their communities, GARC has prepared a statement for the [End Rabies Now campaign](#) on the use of dog culling in rabies control. This statement sets out the reasons why indiscriminate mass culling doesn't work, it describes the damage that culling can do to future control efforts, and it suggests more effective alternatives in response to a rabies outbreak centred on canine vaccination. These alternatives, as part of a longer term strategy, will see communities eliminate the threat of rabies for dogs and people alike.

You can find the statement on the End Rabies Now website [here](#).

Contributed by Louise Taylor, Scientific Director of GARC.



...ARACON continued from page 2.



Asian country delegates and representatives of supporting organizations. Photo:GARC

Vietnam on how a country aligns its rabies program based on a regional strategy, the ASEAN Rabies Elimination Strategy (ARES). FAO, OIE, WHO, provided examples on how they support rabies elimination efforts in the Asian region. An overview was also given regarding the United Against Rabies (UAR) initiative which is a global partnership between FAO, OIE, WHO and GARC to engage countries and other stakeholders from the national, regional and international level to generate high impact global response.

The meeting ended with an open forum between the country delegates and representatives from the international organizations. One of the key points during the discussion was the emphasis on regional cooperation and collaborative approach which are crucial due to the transboundary nature of rabies. The rabies incursion in Penang (2015) and Sarawak (2017) experienced by Malaysia, which used to be a rabies free country, is a case in point of this challenge and highlights the importance of regional coordination for strengthened early warning and rapid response between countries.

Contributed by Sarah Jayme, Asian Regional Coordinator for GARC. The meeting was made possible through the support of UBS Optimus Foundation, Four Paws, IDT Biologika, MSD Animal Health, and Sanofi Pasteur.

Diagnosing the Problem and Planning for the Future: Bolstering Rabies Control in Guinea

In the western reaches of the African continent lies Guinea, a country that made headlines globally during the Ebola outbreak that ended in early 2016. However, recent more exciting and positive developments in public health have emerged from the capital city of Conakry, where rabies control efforts have been buoyed through intensive trainings and workshops.

Through a collaboration between the UN FAO, USAID and GARC, an intensive rabies diagnostic training course was hosted at the Central Veterinary Laboratory in Conakry, Guinea from 22-24 March 2018 by the Guinea FAO office. Six laboratory personnel were trained in the use of the DRIT (Direct Rapid Immunohistochemical Test), an easy, cost-effective assay for the diagnosis of suspect rabies samples. The rabies diagnostic training was an important foundational step in improving rabies surveillance in the country, providing a strong platform for Guineans to advocate for support and raising awareness about rabies.

Later in March, a national workshop was held to demonstrate the various tools developed to assist countries in the creation and implementation of an effective and strategic national rabies elimination strategy. The workshop was organised and hosted by a collaboration between the UN FAO, USAID, GARC and the US CDC.

The Stepwise Approach towards Rabies Elimination (SARE) was undertaken in an intensive workshop that included a multitude of stakeholders and partners from various ministries (including Ministry of Health, Ministry of Animal Husbandry and the Ministry of Environmental Affairs), international organisations (WHO, OIE, FAO, CDC, GARC, USAID, Institut Pasteur) and the private sector, among others. This workshop truly encompassed the One Health spirit and resulted in a comprehensive self-assessment of the current situation in the country.



DRIT training graduates with their certificates outside of the Central Veterinary Laboratory in Conakry. Photo: GARC



Terence Scott (GARC) leads the workshop in the development of a national Workplan for rabies using the SARE-PWARE tool. Photo: GARC

Following the SARE analysis, the Global Dog Rabies Elimination Pathway (GDREP) tool was demonstrated by the US CDC as a tool to facilitate budgeting for a rabies control strategy, including the human resources required to achieve adequate animal vaccination coverage. With this powerful information at hand, a stronger and more accurate estimate of the needs of the country could be assessed and advocated for at the national level to drive any future rabies control campaigns.

Although both the SARE and the GDREP provide details of what is required to develop and implement an effective national rabies control strategy, a concrete means as to how these activities can be achieved was still lacking. A newly developed tool—the Practical Workplan towards Achieving Rabies Elimination (PWARE)—was developed by GARC to convert information from the SARE into actionable items, highlighting pending activities and then developing a concrete and detailed workplan on exactly **how** those pending activities can be accomplished. After many hours of fruitful discussions between the various partners, Guinea developed an actionable workplan and further prioritised several activities to be achieved in the coming months.

The workshop closed with positive remarks from the various international organisations and the encouragement of Guinea to implement and undertake those activities that were prioritised by the PWARE tool to drive their efforts of rabies elimination closer to the goal of being free from dog-mediated human rabies by the year 2030.

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

Share your message this World Rabies Day!



Rabies: Share the message.
SAVE A LIFE.

www.rabiesalliance.org/world-rabies-day

As most of you already know, World Rabies Day is a great annual opportunity to increase awareness by holding an event, getting the media interested in your work and connecting with the wider rabies prevention community.

The World Rabies Day 2018 theme is Rabies: **Share the message. Save a life.** This highlights the importance of education and awareness to prevent rabies. You can use this at many levels to share different messages, from the policy-level message to governments to commit to the 2030 deadline, to community-level messages about vaccinating dogs and treating bite wounds, and dog bite prevention education for school children.

Please register your event at <https://rabiesalliance.org/world-rabies-day/register>. You can also download banners with this year's theme at <https://rabiesalliance.org/world-rabies-day/event-resources/logos>.

Keep an eye out for more resources and activities as World Rabies Day approaches. We'll be sharing new customisable posters soon, and the 2018 World Rabies Day Awards will be launched in June with more categories to recognise even more rabies champions in the community.

We look forward to learning more about your World Rabies Day activities – you can get in touch at campaigns@rabiesalliance.org.

Contributed by Deepa Balaram, on behalf of the WRD team

NEWS FROM THE COMMUNITY

Vaccinating Dogs Protects from Wildlife Threats

Several recent stories in the news illustrate how wildlife can significantly impact rabies ecology in a particular region. Wild animals living near humans often interact with local dog populations and can modulate the threat of rabies—sometimes in unexpected ways—but the influence of wildlife on rabies transmission to domestic animals and people can be diminished by a fully vaccinated domestic dog population.

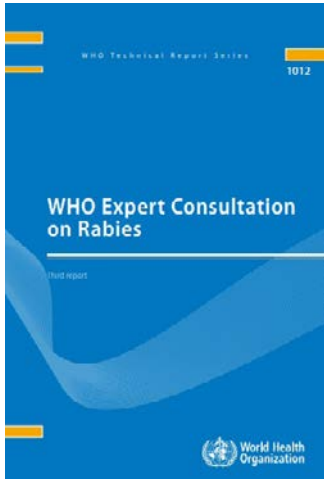
Wildlife can bring rabies into a community and infect non-vaccinated pets, which are then able to transmit the disease to humans. To maintain a barrier between wildlife-transmitted rabies and humans, effective vaccination of domestic and stray dogs in areas bordering wilderness habitats must be established.

Dropping baits to vaccinate wildlife against rabies is another strategy for keeping rabies incidence low in wildlife populations. Israel usually sees about 13-30 rabies cases a year, mostly in wildlife, but [news reports](#) have shown that cases have been increasing over the past year, with 17 cases in the first 3 weeks of 2018, and 74 cases in 2017, up from just 29 cases in 2016. The outbreak is attributed to wild jackals crossing over from Jordan—where the government does not treat the disease in domestic or wild animals—that bring the disease into Israel's northern valleys, heightening the prospect of a severe outbreak. Jackals normally don't interact with humans, but if infected, they become less inhibited and can more easily transmit the disease to farm animals or pets.

Israel usually controls rabies by scattering edible vaccine in the border regions, but a diplomatic crisis last year between Israel and Jordan prevented last year's wildlife vaccine distribution program from operating in the region. Over 3000 jackals live in the outbreak area, and [reports](#) indicate that the Israeli Nature and Parks Authority is now trying to control rabies in the jackal population by culling and scattering vaccine pellets more densely in problem areas. The Agriculture Ministry wants to ensure that the disease doesn't cross over to cats and dogs and is inoculating feral cats and providing rabies booster shots free of charge, with the hopes that keeping the

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WHO announces updated guidance on rabies



WHO is delighted to announce the publication of two new guidance documents, each the product of months of expert review.

Since the launch of the global framework to eliminate human rabies transmitted by dogs by 2030 in 2015, WHO has worked with the Food and Agriculture Organization of the United Nations, the World Organisation for Animal Health, the Global Alliance for Rabies Control and other stakeholders and partners to prepare a global strategic plan. This includes a country-centric approach to support, empower and catalyse national entities to control and eliminate rabies.

In this context, WHO convened its network of collaborating centres on rabies, specialized institutions, members of the WHO Expert Advisory Panel on Rabies, rabies experts and partners to review strategic and technical guidance on rabies to support implementation of country and regional programmes.

The new [WHO Expert Consultation on Rabies: WHO TRS N°1012 report](#) provides updated guidance based on evidence and programmatic experience on the multiple facets of rabies prevention, control and elimination. Key updates include: (i) surveillance strategies, including cross-sectoral linking of systems and suitable diagnostics; (ii) the latest recommendations on human and animal immunization; (iii) palliative care in low resource settings; (iv) risk assessment to guide management of bite victims; and (v) a proposed process for validation and verification of countries reaching zero human deaths from rabies.

The meeting supported the recommendations endorsed by the WHO Strategic Advisory Group of Experts on Immunization in October 2017 to improve access to affordable rabies biologicals, especially for underserved populations, and increase programmatic feasibility in line with the objectives of universal health coverage.

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...Wildlife and Rabies continued from page 5.

domestic animal population protected against rabies will help prevent the outbreak from spreading.

Sometimes critically endangered wildlife fall victim to rabies. Recently, an entire family of wild dogs living in Zimbabwe's Hwange National Park was eradicated by rabies, infected by with other wild predators in the park. Wild dogs are generally not vaccinated, and without protection from the disease, entire packs have succumbed to rabies, greatly concerning environmentalists and conservationists. A [Sierra Club article](#) revealed how vaccinating local domestic dogs around the park has helped prevent the transfer of rabies to and from wild African painted dogs, with the hopes of guarding this endangered species from extinction. The ring of vaccination around the park keeps the disease from spreading to and from domestic dogs and susceptible wild animals.

While unvaccinated wild animal reservoirs can spread rabies, wild predators can also decrease the population density of a reservoir species and reduce disease incidence. A [new study](#) published in *Frontiers in Ecology and the Environment* reported how leopards in Sanjay Ghandi National Park near Mumbai, India hunt stray dogs near the park's border as their primary source of food. About 40 leopards have been correlated with a lower incidence of rabies compared to surrounding areas of the city. It is estimated that 1500 dogs are killed annually by the leopards, reducing the dog density by a factor of ten compared to the rest of the city—and thereby reducing the incidence of rabies. It was estimated that the culling performed by the park's leopards prevented 1000 possible bites from dogs and 90 potential rabies cases.



Leopards living in Sanjay Gandhi National Park in Mumbai India have been attributed with decreasing rabies incidence by hunting stray dogs living nearby. Photo: Maheshshinde (<http://en.wikipedia.org/wiki/File:P1010426.JPG>) [Public domain], via Wikimedia Commons

Submitted by Laura Baker, GARC. From the Sierra Club, "As Rabies Scourges Painted Dogs, a Race to Vaccinate Domestic Breeds"; From the Times of Israel, [Animal rabies incidents quadruple, raising fears of outbreak among humans](#); From the Haaretz, "Israel on the Brink of a Rabies Epidemic, Thousands of Coyotes Killed"; From National Geographic, "How City-Dwelling Leopards Improve Human Health"

Prestigious Award for Rabies Research

Professor Sarah Cleaveland OBE FRS was awarded the 2018 Leeuwenhoek Medal and Lecture by the UK’s Royal Society for her pioneering work towards the elimination of rabies throughout the world. The award was named after the father of microbiology, Dutch microscopist Antonie van Leeuwenhoek.

Before receiving her award, Prof. Cleaveland delivered a public lecture at the Royal Society in London on April 17th entitled “Can we make rabies history? Realising the value of research for the global elimination of rabies”.

Prof. Cleaveland contributes to global rabies elimination efforts through the Global Alliance for Rabies Control, Partners for Rabies Prevention and other international expert groups.



Prof. Sarah Cleaveland (right) with Dr Julie Gallagher after the award lecture. Photo: GARC

Contributed by Kim Doyle of GARC. You can read more about and watch a recording of the lecture [here](#).

...WHO Guidance continued from page 6.

The collaborative mechanisms required to prevent rabies are a model for collaboration on One Health at every level and among multiple stakeholders and are a recipe for success.

Rabies is a vaccine-preventable disease. The provision of support to countries will end the pain and suffering due to rabies that burdens people, especially children. Investing in rabies control and elimination strengthens health systems, improves equity and access to health care and contributes to sustainable development.

Investment in rabies elimination is not only for elimination of this fatal but preventable disease but also for building capacity in the world’s most neglected regions.

This report, requested by countries, provides hands-on guidance to drive progress towards rabies elimination.

The new [WHO position paper on Rabies Vaccine](#), was published April as part of WHO’s series of regularly updated position papers on vaccines and combinations of vaccines against diseases that have an international public health impact. They summarize essential background information on diseases and vaccines and conclude with the current WHO position on the use of vaccines worldwide.

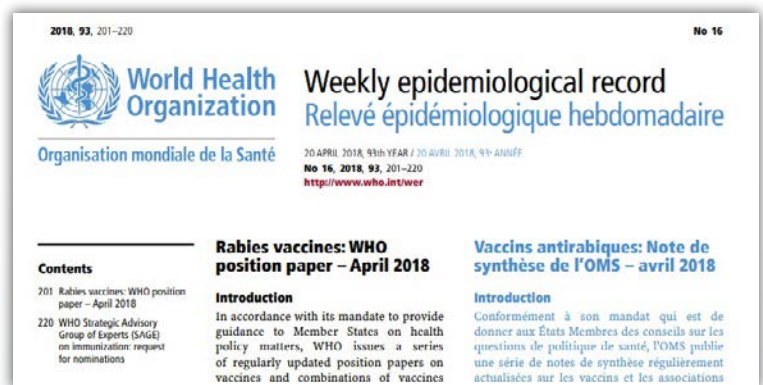
The papers are reviewed by external experts and WHO staff, and reviewed and endorsed by the WHO Strategic Advisory Group of Experts (SAGE) on immunization. The GRADE methodology is used to systematically assess the quality of the available evidence. The SAGE decision-making process is reflected in the evidence-to-recommendation tables.

The position papers are intended for use mainly by national public health officials. They may also be of interest to international funding agencies, vaccine advisory groups, vaccine manufacturers, the medical community, the scientific media and the general public.

This position paper replaces the 2010 WHO position on rabies vaccines. It presents new evidence in the field of rabies and the use of rabies vaccines, focusing on programmatic feasibility, simplification of vaccination schedules and improved cost-effectiveness. The recommendations concern the 2 main immunization strategies, namely vaccination for post-exposure prophylaxis and vaccination for pre-exposure prophylaxis. In the context of post-exposure prophylaxis, recommendations are also provided on the use of rabies immunoglobulins.

Recommendations on the use of rabies vaccines were discussed by SAGE in October 2017; evidence presented at the meeting can be accessed [here](#).

Contributed by Bernadette Abela-Ridder and Lea Knopf of the WHO Department of Control of Neglected Tropical Diseases





Recent Research

Advocacy / Policy

[Estimating the burden of rabies in Ethiopia by tracing dog bite victims.](#) 655 animal bite cases were traced to their communities and further victims identified. Annual suspected rabid dog exposures were estimated per evaluated urban, rural highland and rural lowland district at, respectively, 135, 101 and 86 bites, which led, respectively, to about 1, 4 and 3 deaths per 100,000 population. Average costs per completed PET were 23, 31 and 40 USD, which was significantly higher in rural districts. Extrapolation of the district results to the national level indicated an annual estimate of approximately 3,000 human deaths resulting in about 194,000 DALYs per year and 97,000 exposed persons requiring on average 2 million USD treatment costs per year countrywide.

[Rabies in the Americas: 1998-2014.](#) This paper presents longitudinal data for 21 LAC countries on dog vaccination, PEP and rabies surveillance. Dog and human rabies have decreased significantly, but differences in human and dog rabies incidence rates and dog vaccination rates were shown between low, middle and high-income countries. At the peak, over 50 million dogs were vaccinated annually in national campaigns in the countries represented. On average, over 2 million doses of human vaccine were applied annually. In the most recent survey, only 37% of countries reported that they had sufficient financial resources to meet the program objectives. The data show a sufficient and sustained effort of the LAC countries in the area of dog vaccination and provide understanding of the baseline effort required to reduce dog-mediated rabies incidence.

Diagnosis and Surveillance

[Evaluation of Monoclonal Antibody-Based Direct, Rapid Immunohistochemical Test for Rabies Diagnosis.](#) The dRIT test has a worldwide promising application, particularly in developing countries. However, no commercial conjugated antibody is available to meet the laboratory demand. We describe here the production of a monoclonal antibody (MAb) against rabies virus (RABV) N protein and its use as a biotinylated conjugate in a dRIT. Results showed that the dRIT had 100% specificity (95% CI 0.93-1.00) and 96.49% sensitivity (95% CI 0.88-1.00) as compared with the gold standard FAT. It therefore provides a simple, economical alternative to FAT.

[Application and Comparative Evaluation of FAT, dRIT and RT-PCR Tests for the Detection of Rabies Virus Antigen or Nucleic Acid in Brain Samples of Animals Suspected of Rabies in India.](#) DFA, dRIT and RT-PCR diagnostic tests were compared on 257 brain samples, including decomposed samples. The results confirm 100% corroboration between DFA and dRIT, buttress the applicability of dRIT in the simple and rapid diagnosis of rabies in animals, and reaffirm the suitability of RT-PCR for samples unfit for testing either by DFA or dRIT.

[Rabies surveillance in the United States during 2016.](#) During 2016, 50 states and Puerto Rico reported 4,910 rabid animals to the CDC of which 4,487 (91.4%) involved wildlife. Relative contributions by the major animal groups were as follows: 1,646 (33.5%) bats, 1,403 (28.6%) raccoons, 1,031 (21.0%) skunks, 313 (6.4%) foxes, 257 (5.2%) cats, 70 (1.4%) cattle, and 58 (1.2%) dogs. There was a 4.6% decrease in the number of samples submitted for testing in 2016, compared with 2015. No human rabies deaths were reported in 2016. Laboratory testing of animals suspected to be rabid remains a critical public health function and continues to be a cost-effective method to directly influence human rabies postexposure prophylaxis recommendations.

[Potential Confounding of Diagnosis of Rabies in Patients with Recent Receipt of Intravenous Immune Globulin.](#) This report describes six patients who were tested for rabies by CDC and who met CSTE criteria for confirmed human rabies and four patients who were found to have serum RLNAs despite having not been vaccinated for rabies. None of these 10 patients received a rabies diagnosis; rather, they were considered to have been passively immunized against rabies through recent receipt of intravenous immune globulin (IVIG).

PEP

[Management of dog bites by frontline service providers in primary healthcare facilities in the Greater Accra Region of Ghana, 2014-2015.](#) 57.8% of 232 frontline service providers were correct in that the rabies virus is the causative agent of rabies, 39.2% attributed it to a dog bite, 2.6% did not know the cause, and one person attributed it to the herpes virus. Only 15.5% knew the incubation period in dogs and the period required to observe for signs of a rabies infection. 42.2% of the did not know how to administer RIG. Of the facilities visited, 76% did not have the rabies vaccines and 44% did not know where to get rabies vaccines from. Most of the service providers (87.9%; 204/232) had never reported either a dog bite or a suspected case of rabies.

[Rabies Vaccine Hesitancy and Deaths Among Pregnant and Breastfeeding Women - Vietnam, 2015-2016.](#) During

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...Recent Research continued from page 8.

2015-2016, among 169 cases reported in Vietnam, two probable cases of rabies were reported in breastfeeding mothers and four in pregnant women, all of whom had been bitten by dogs. All six patients died. Three of the four pregnant women had cesarean deliveries. In each case, families reported the patient's fear of risk to the fetus or breastfed child as the primary barrier to receiving PEP.

Education

[A rabies lesson improves rabies knowledge amongst primary school children in Zomba, Malawi](#). Knowledge and attitudes towards rabies were assessed by a questionnaire before a primary school lesson, immediately after the lesson and 9 weeks later to assess the impact the lesson had on school children's knowledge and attitudes, and also in children who were exposed to a mass dog vaccination programme but did not receive the lesson. Knowledge of rabies and how to be safe around dogs increased following the lesson, and knowledge remained higher than baseline 9 weeks after the lesson. Knowledge was greater amongst school children who had received the lesson compared to those who had not indicating that the lesson itself was critical in improving knowledge.

Mass Dog Vaccination

[Impact of community-delivered SMS alerts on dog-owner participation during a mass rabies vaccination campaign, Haiti 2017](#). To improve awareness among dog owners, 600,000 text messages were sent to phones in two Haitian communes to remind dog owners to attend dog vaccination campaigns. A post-campaign household survey was conducted to assess dog owner's perception of the text messages and the impact. 91.9% of text-receiving dog owners indicated the text was helpful. In central point campaign areas, there was 73.1% attendance among those who received the text vs 36.4% among those who did not. In areas incorporating door-to-door vaccination over multiple days there was no significant impact of receiving a text.

[Qualitative Evaluation of the Five-Year 'Red Collar' Campaign to End Inhumane Culling of Dogs as a Method of Rabies Control](#). To end the inhumane culling of dogs in response to rabies, World Animal Protection launched 'Red Collar'; a five-year campaign (2011-2016) that worked with governments to promote the implementation of mass dog vaccination for rabies control. We present the findings from a qualitative evaluation of 'Red Collar', conducted both regionally and with national focus on Bangladesh, China, Indonesia, the Philippines and Zanzibar, Tanzania, based on semi-structured interviews and written contributions from stakeholders. The campaign successfully generated momentum for implementation of mass dog vaccination by targeted governments and lessons learned were established.

Epidemiology in Wildlife

[The spread and evolution of rabies virus: conquering new frontiers](#). Robust surveillance efforts combined with diagnostics and disease modelling are now providing insights into the epidemiology and evolution of rabies virus. The immune status of the host, the nature of exposure and strain differences all clearly influence infection and transmission dynamics. This review focusses on rabies in wildlife, synthesizes current knowledge in the rapidly advancing fields of rabies virus epidemiology and evolution, and advocates for multidisciplinary approaches to advance our understanding of this disease.

Upcoming Meetings

[NECTM7](#). The 7th Northern European Conference on Travel Medicine, in Stockholm, Sweden from 2 - 4th May 2018.

[5th International One Health Congress](#). The 5th International One Health Congress, with the overarching theme 'One Health in Underserved Communities' will be held in Saskatoon, Canada, 22-25th June 2018.

[6th ACC&D Symposium](#). 6th International Symposium on Non-Surgical Fertility Control for Dogs and Cats, to be held in Boston, MA, United States from 22-24th July 2018.

[NNN Summit 2018](#). The Neglected Tropical Disease NGO Network (NNN) 2018 summit, will be hosted by the Ethiopian Federal Ministry of Health and NGO partners, 24 - 26 September 2018 in Addis Ababa, Ethiopia.

[XXIX RITA Conference](#). The XXIX Rabies in the Americas (RITA) Conference will be held October 28 – November 2, in Buenos Aires, Argentina. More details will be available soon at www.ritaconference.org.

The editors of the GARC newsletter are Louise Taylor and Laura Baker. You can contact them through newsletter@rabiesalliance.org. Typesetting is by Pete Else. For further information on the Alliance's work see www.rabiesalliance.org.