



**Global Alliance
for Rabies
Control**

The newsletter of The Global Alliance for Rabies Control

NOVEMBER 2017 ISSUE 55

RABID BYTES

Editorial: <i>Global Strategies</i>	1
Global Initiative Gets Underway	2
World Rabies Day Awards	3
Ilocos Norte Recognized as Top Performer.....	4
World Rabies Day Events.....	5
Strategic Dog Vaccination in Zanzibar.....	7
World Rabies Day Social Media	8
GARC by the Numbers	8
GARC & Knowledge Channel Partnership.....	9
Rabies Epidemiological Bulletin Improvements ..	10
Open Science Helping to Eradicate Rabies	11
Dog Vaccinations in Zimbabwe by VAWS	12
WHO Rabies Prophylaxis Recommendations	13
Recent Research	14
Upcoming Conferences	15

EDITORIAL

Uniting Global Strategies and Regional Activities to Support Rabies Control

On this year's World Rabies Day (WRD), a major new initiative was founded by the FAO, OIE, WHO and GARC – the [United Against Rabies Collaboration](#) – the biggest anti-rabies initiative yet, which melds a global business strategy for rabies elimination into an ambitious plan to end human rabies deaths by 2030. This initiative will take international rabies control efforts to the next level as we move forward to help all countries build the capacity to reach elimination of human rabies deaths. Designed to help make rabies elimination a priority for rabies endemic countries, the plan provides a much-needed roadmap for ensuring all countries can meet the 2030 goal. It will support rabies-endemic countries as they develop national plans and provide the training and education resources that must be in place to reach these elimination goals. GARC is proud to be part of the United Against Rabies collaboration, and we view this partnership with other global health leaders as crucial in the fight against rabies.

In addition, an [expert review of the effectiveness of pre and post exposure prophylaxis](#) was recently approved by the Strategic Advisory Group of Experts (SAGE) committee at WHO and will be incorporated into the upcoming revised WHO expert report. Amongst other recommendations is the adoption of a new 3 visit intradermal regimen for rabies post-exposure prophylaxis that will allow for a shorter and more cost-effective schedule of vaccinations. As part of efforts at the international efforts we anticipate that these new international guidelines will be helpful improvements and make it easier to provide treatment and prevent even more deaths in resource-challenged environments where essential, life-saving vaccines may be in short supply.

These collaborative efforts by global health leaders and the new international guidance for rabies prevention will have little impact without the efforts of those boots-on-the-ground, everyday people who are leading local and regional rabies control efforts. Reflecting on the WRD events of September is always a humbling experience as we consider just how many people are working for improvements to rabies control efforts across the world. The [many varied events](#) held around the world to build rabies awareness often do not garner international press-releases or sustained media attention, but these local events are the crux of effective rabies control efforts. To bring rabies awareness to the far-flung corners of the world, messages must be adapted to fit the culture and people of the area; it has been truly inspiring to see the innovation and resourcefulness used by community health workers and leaders to produce such inventive WRD events this year.

We also celebrate some outstanding contributors to rabies control efforts making a difference in their communities. GARC is honoured to present its [annual WRD/MSD awards](#), and our winners were announced in early November. Our diverse set of awardees hail from many different regions and types of organizations—from animal protection groups to individual community health workers—and we hope that these awards will continue to encourage others to support this vital community work. In addition, we are especially happy to report that the government of the Philippines [honoured our partners in Ilocos Norte with an award](#) recognizing excellence in their rabies control program implementation.

So, it is with renewed enthusiasm that we look forward to the opportunities that 2018 will bring. As a community committed to rabies prevention, we need to deepen our resolve, strengthen our links with like-minded organisations, and continue to push our advocacy efforts to make sure policy makers understand the importance and value of rabies prevention. As GARC's CEO Prof. Louis Nel said in relation to the United Against Rabies collaboration, *"There is no reason for anyone to die of rabies in today's world, and rabies endemic countries have made its elimination a priority. With strong and sustained commitment from the human and animal health sectors, we can and will end this deadly disease"*.

Contributed by Laura Bake and Louise Taylor, newsletter co-editors, GARC

NEWS FROM GARC AND WRD

Towards a Rabies-Free World as Unparalleled Global Initiative Gets Underway



The following is a press release jointly issued by GARC, WHO, OIE and FAO on September 28th, 2017.

World Rabies Day marks the announcement of the biggest global anti-rabies initiative, as the World Health Organization (WHO), the World Organisation for Animal Health (OIE), the Food and Agriculture Organization of the UN (FAO) and the Global Alliance for Rabies Control (GARC) reveal an ambitious plan to end human deaths from dog-transmitted rabies by 2030.

Global Partners Announce Plan to End Human Deaths from Dog-Transmitted Rabies by 2030

The plan – ‘Zero by 30: The Strategic Plan’ – centres on a One Health approach and addresses the disease in a holistic and cross-sectoral manner while highlighting the important role veterinary, health and educational services play in rabies prevention and control.

“The plan ensures support to countries in developing national plans, and provides innovative training and education tools across regional rabies networks,” said Dr Bernadette Abela-Ridder on behalf of the four partners. “Vaccines are a key component of the global plan and a trigger for national programmes. The United Against Rabies collaboration provides leadership and advocates for resources critical to reaching zero human rabies deaths by 2030.”

‘United against Rabies’ builds on more than ten years of global partnership, research and evidence- building to demonstrate the feasibility of eliminating dog-transmitted rabies. The plan places a magnifying glass on the problem of continued human deaths from rabies and helps to make this a priority disease for key international organizations and governments.

Ending Human Deaths from Dog-Transmitted Rabies

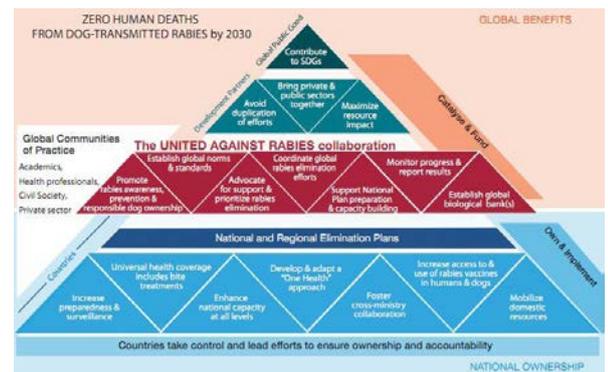
The world has the knowledge, technology and vaccines that are needed to eliminate rabies. The plan supported by the four partners aims to:

- prevent and respond to dog-transmitted rabies by improving awareness and education, reducing human rabies risk through expanded dog vaccinations, and improving access to healthcare, medicines and vaccines for populations at risk.
- generate and measure impact by implementing proven effective guidelines for rabies control, and encouraging the use of innovative surveillance technologies to monitor progress towards “Zero by 30”.
- demonstrate the impact of the “United against Rabies” collaboration in national, regional, and global rabies elimination programmes, in order to ensure continued stakeholder engagement at all levels and sustained financing to achieve “Zero by 30”.

Rabies Is 100% Preventable

Rabies – a viral disease that occurs in more than 150 countries and territories – is usually fatal once symptoms appear. Dog-transmitted rabies accounts for about 99% of human rabies cases. It is estimated that 59,000 people die from rabies every year.

Rabies is a disease of poverty, a disease of neglect. The world’s poorest are the most affected as they cannot afford treatment or transport for care. People’s livelihoods are also affected when livestock get rabies, a loss estimated at over US\$ 500 million per year.



The United Against Rabies collaboration will support countries’ elimination efforts and encourage development partners and the global community of practice to contribute towards the global goal for rabies elimination

Continued on page 3...

...*Global Initiative* continued from page 2.

However, rabies is 100% preventable by ensuring access to life-saving treatment following dog bites; and by vaccinating dogs to reduce risks and ultimately to eliminate the disease at its animal source. Ending human deaths from rabies requires strengthening human and animal health services; and increasing political commitment.

Many countries where rabies is of concern recognize it as a priority communicable disease with significant impact on people’s health and their country’s economy. This does not usually translate into adequate resources and actions to end rabies. Simply put, rabies falls between the cracks.

“Working across sectors to eliminate human rabies aligns with WHO’s mission to leave no one behind by building a better, healthier future for people all over the world” said Dr Ren Minghui, WHO Assistant Director-General for HIV/AIDS, Tuberculosis, Malaria and Neglected Tropical Diseases. *“Eliminating human rabies contributes to the goal of providing affordable and equitable health care, while working with partners to prevent the disease in dogs, which is the most frequent source of infection.”*

“As the mass vaccination of dogs is unanimously recognized as the exclusive approach to eradicate the disease in humans, this United against Rabies plan is a crucial step to bring together intentions, resources and actions towards our common goal,” highlighted Dr Monique Eloit, Director General of the OIE. *“Elimination of dog-mediated rabies is achievable, and we will make sure that it is achieved.”*

“FAO is excited to be a part of the development of the United against Rabies initiative to eliminate dog-transmitted rabies. Rural communities suffer the most from this preventable disease. Rabies puts not only their own health and wellbeing at risk, but also that of their animals, which can be a major or sole source of their livelihoods. FAO has been supporting vaccination campaigns and the development of community-based programmes to prevent and eliminate rabies. This new initiative will enhance that work and can play an essential role in FAO’s overall goal to build stronger rural communities,” said Ren Wang, FAO Assistant Director-General.

GARC’s CEO Professor Louis Nel, *“There is no reason for anyone to die of rabies in today’s world, and rabies endemic countries have made its elimination a priority. With strong and sustained commitment from the human and animal health sectors, we can and will end this deadly disease. The United Against Rabies plan is a vital collaboration of GARC, WHO, FAO and OIE which will allow us to support these countries to reach the goal of zero deaths by 2030”.*

One Health Heroes Celebrated with World Rabies Day Awards



The World Rabies Day Awards celebrate unsung heroes who keep their communities safe from rabies. On the occasion of One Health Day, the Global Alliance for Rabies Control (GARC) and MSD Animal Health are honoured to announce this year’s award recipients from across the world.

The 2017 World Rabies Day Award recipients are [Nowzad](#) (Afghanistan), [Lilongwe Society for the Protection and Care of Animals](#) (Malawi), [Kurdistan Organization for Animal Rights Protection](#) (Iraq), [Suvis Sao Miguel Paulista](#) (Brazil), [Dr Rakesh Chand](#) (Nepal), [Mr Mawethu Kunyu](#) (South Africa), [Mr Bojan Veselica](#) (Bosnia & Herzegovina) and [Dr Kelly Crowdis](#) (Haiti).

Their inspiring work includes organising mass vaccination campaigns, outreach into communities to administer vaccinations and educate families, improving shelter conditions, training local health workers, vaccinations in migrant camps and advocating for better laws. The Awards hope to encourage more support for their work and shine a light on some of the great community efforts going on around the world to end rabies.

Dr Kelly Crowdis of the Christian Veterinary Mission, recipient under the *Individual – Americas* category:

I am honored to be a recipient of a 2017 World Rabies Day Award and to receive this acknowledgement from the global community for the great strides Haiti has made to control canine rabies. The progress we have made would not be possible without Dr. Max Millien, Agr. Ing. Ludder Fleurinors, Vet Tech. Pierre Dilius in the Haitian Ministry of Agriculture. We plan to use these funds to market a local, ethically produced artisanal product which will be

Continued on page 6...

Ilocos Norte Awarded as Top Performing LGU in Rabies Elimination

In recognition for their continuous rabies elimination efforts, the Province of Ilocos Norte was awarded as one of the Top Performing Local Government Units during the 2017 National Rabies Summit. They were presented with the award as part of the World Rabies Day celebration in the Philippines, on September 28. The National Rabies Prevention and Control Committee recognised Ilocos Norte for having zero human and canine rabies, 70% dog vaccination coverage and 90%-95% completion of Post-Exposure Prophylaxis in 2014-2016. Ilocos Norte has also been consistently conducting various activities on rabies awareness in the community. This is the 2nd year in a row that the province has received an award for their rabies program.

The Global Alliance for Rabies Control (GARC) and the UBS Optimus Foundation were partnering with the Province of Ilocos Norte to eliminate rabies from 2012-2016. The Communities Against Rabies Exposure (CARE) Project was implemented in the province along with other project sites in the country.

Through the CARE Project, various activities were conducted in the province, including: mass dog vaccination especially in high risk areas, prevention of dog bites and human rabies through information campaigns, strengthening of diagnostics and surveillance systems, community awareness and mobilization, and integration of rabies education into elementary schools.



The Ilocos Norte team receive their award on World Rabies Day

The rabies elimination in the province has been a collective effort from various stakeholders such as the government agencies, academe, private sectors, community members, and GARC.

To achieve the required dog vaccination coverage, led by the Provincial Veterinary Office, volunteers from the villages were trained to help in the rabies program especially on dog surveys, dog registrations, and the reporting of animal bite incidents.

Several rabies awareness approaches were piloted in the province to reach different groups of the community. Health and Agriculture personnel were trained as rabies educators to conduct seminars in their respective communities. Radio programs and plugs, local newspapers, television stations, and the web were also used as media to promote rabies awareness to the



A dog is vaccinated at one of the many vaccination posts

public. Other information materials such as posters, brochures, fliers, and tarpaulins were distributed and placed in strategic areas throughout the province.

Rabies education messages were also integrated in the school curriculum to reach the elementary students. Key messages include rabies awareness, bite prevention and management, and responsible pet ownership. For younger children (ages 3-5 years old), Early Childhood Intervention was conducted in day care centers to promote responsible pet ownership through interactive storytelling and games.

Ilocos Norte also actively celebrates World Rabies Day every year. They conduct Rabies Quiz Bee for elementary students since 2013, and other events to promote rabies awareness and responsible pet ownership. Ilocos Norte is indeed making great efforts to make its province rabies-free.

Contributed by Eunice Mendoza of the GARC Philippines team. To learn more about Ilocos Norte's efforts in rabies elimination, please see [here](#).

World Rabies Day Events Raise Global Awareness of Rabies Prevention Efforts

To support its goal of “Rabies: Zero by 30”, GARC called on governments, organisations and individuals to hold events for World Rabies Day 2017 that would create positive ripple effects throughout their communities to improve rabies awareness.

The response from the rabies community was resounding. Local citizens banded together with government officials, university lecturers, local NGOs, veterinary professionals and students. This resulted in 229 events being held in 56 countries, all to mark World Rabies Day.

Numerous mass animal vaccination drives, including events in [South Africa](#), the [United States](#) and [India](#), were held across several continents. They were held in both rabies-endemic and rabies-free countries. This underscores the importance of rabies-related events even in unaffected countries for these nations to remain rabies-free.

Many of these drives were complemented by rabies-awareness campaigns. Exhibitions were attended, pamphlets were distributed, post-awareness quizzes were taken and aced, and lots of fun, food and drink were involved. Some creative souls seized the opportunity to get fit and exercise their dogs at the same time. For instance, a 10-kilometre [National Awareness Run for Rabies](#) was organised in Kenya. Also, a [fun fair](#) was organised in the Philippines, in conjunction with rabies-awareness education, free vaccinations, games and snacks. Several fashionistas also got the opportunity to show off their impeccably dressed dogs in the [Dog Gone Cute](#) fashion show in the Philippines. Participants were required to show proof of good dog ownership, including up-to-date rabies vaccinations.



Copyright: Carlie Rooivlag Rabies



Copyright: Republic of Kenya Zoonotic Disease Unit

Children have long been identified as a particularly vulnerable population for rabies exposures. It was heartening to see that that several people recognized this and organised activities aimed at children. In Taiwan, a [24-page children’s manga comic](#) on rabies was created by the National Taiwan University and Japan’s Kyoto Sekai University. The Taiwanese government has also expanded the elementary school curriculum to include rabies awareness, especially for children in mountainous regions. Teenagers were not excluded; an [inter-public high school mural painting contest](#) was organised in Manila, Philippines, where teen artists were invited to draw and paint their interpretation of the “Zero by 2020” theme. (The Philippines hopes to be rabies-free by 2020.)

Rabies-centered media talk shows were prevalent over the past few months. For instance, a news segment, [“Let’s Talk about Rabies”](#) was televised in Nigeria on 28th September. [Radio shows](#) were also held in several countries such as Kenya, India, France, and the Philippines. These broadcasts would have greatly benefitted the populations in rabies-endemic countries, and they complemented the intense awareness campaigns in rural and remote areas.

World Rabies Day was a chance to reinforce the One Health concept amongst medical and veterinary professionals. [The Caribbean Animal Health Network](#) organised webinars and workshops and devised a “Keep Rabies Out” toolkit for Caribbean public health officials to improve rabies surveillance, control and prevention efforts in the region. Webinars were also organised by the [Indonesian Ministry of Agriculture](#), the [OIE in Tunisia](#), the [Pasteur Institute in Iran](#), and the [Food and Agriculture Organisation \(FAO\) of the United Nations](#). The Animal Hospital Complex in Oyo, Nigeria organised [monthly meetings](#) for medical and veterinary doctors to share information with each other, and also consult with townspeople.



Copyright: Miss Fei Shih-Huai and Mr. Mitsuru Sugaya

World Rabies Day 2017 proved that power and status were not needed to make a big difference. Event organisers showed that with passion and a dash of creativity, huge strides can be made in the fight against rabies while having fun at the same time.

Contributed by Dr. Jnaneepriya Krishnasamy, GARC volunteer

...WRD Awards continued from page 3.

distributed internationally to create a sustainable income to fund a human rabies vaccine bank for persons who cannot afford the vaccine or travel expenses for vaccination, since the vaccine is only available in metropolitan centers. It will also support the purchase of training materials for our childhood rabies prevention school course which educates over 5,000 children annually.

Rabies kills around 59,000 people around the world every year, and although it is almost 100% fatal, it is also 100% preventable. It is a model One Health disease, with coordinated action required across the human and animal health sectors to make a difference.

Dr Sulaiman Tamer Saed from Kurdistan Organization for Animal Rights Protection, award recipient in the *Organisations – MEEREB* category:

This award gives me the strength, stability, insistence and determination to progress towards working day and night to educate the common people of Kurdistan and the Kurdistan Regional Government, especially the relevant authorities such as health, veterinary, environment, municipalities, tourism, media and education of the seriousness of zoonotic diseases, specially Rabies.



Mawethu Kunyu in South Africa



Lilongwe SPCA in Malawi

As the major international organisations gear up efforts to eliminate this deadly disease by 2030, with the launch of a One Health strategic plan by the World Health Organization (WHO), the World Organisation for Animal Health (OIE), the Food and Agriculture Organization of the UN (FAO) and GARC, it is important to recognise the immense role played by the thousands of organisations and individuals working tirelessly at the community level to save the lives of people and animals.

Dr Rakesh Chand, recipient in the Individuals – Asia category: Fighting against Rabies is my passion, but a tough passion to follow. This award is a pat on my back confirming I am on the right track. A motivation to push my efforts even more. I will be receiving this honor on behalf of Nepal, my fellow Veterinarians and the many organizations which are fighting tirelessly towards Rabies control. This is not just an encouragement for me but also for many others, especially the youngsters back home. This achievement is sure to spur a wave of individuals and organizations committed towards making a stop to the disease. The situation is bad, but the dream for a Rabies free better tomorrow will continue.

For photos of the award recipients or further comment, please contact media@rabiesalliance.org
A complete list of the award recipients is available [here](#).

World Rabies Day Awards: [World Rabies Day](#), held every year on September 28th, is observed by the United Nations as an [International Day](#). Coordinated by the [Global Alliance for Rabies Control](#), it is a day to raise awareness about rabies and how to prevent this deadly disease, and hundreds of events are held around this day by organisations and individuals around the world.

The World Rabies Day Awards, now in their second year, aim to highlight the work done by dedicated individuals and organisations to end rabies in their communities. Two awards (one for individuals and one for organisations) are given in each region - Asia, Sub-Saharan Africa, MEEREB and the Americas, with a focus on community-based initiatives. Organised by Global Alliance for Rabies Control and MSD Animal Health, each award consists of US\$ 1,200 or resources of equal value, an award plaque and a certificate.

The Award [shortlist](#) was announced on World Rabies Day. The judging panel consisted of individuals from the WHO, FAO, OIE, CDC, MSD Animal Health and GARC, along with votes from MSD employees.

Towards Freedom from Canine-Mediated rabies in Zanzibar: Island-Wide Strategic Dog Vaccination

The popular tourist destination of Zanzibar is located off the eastern coast of Africa. If you ask any tourist or local resident what is noteworthy about Zanzibar they will most likely tell you all about the white sandy beaches, blue tropical waters and long history of Stone town. What you probably won't hear about is how Zanzibar has been taking large strides towards controlling and eliminating rabies using mass dog vaccination. In fact, Zanzibar is very close to being declared the first region in Africa to be free from rabies!



The team of Zanzibari dog vaccinators in the field. Photo: GARC

Between 2009 and 2015, Zanzibar undertook the “Rabies Control and Dog Management Project” in collaboration with World Animal Protection, an international non-profit animal welfare organization. Over the course of the seven-year period that the program was operational in Zanzibar, the dog population was subjected to multiple rounds of annual rabies vaccination and a good overall vaccination coverage was achieved in the early years of the project. Despite the annual fluctuation in the estimated vaccinated coverage over the seven-year period, the overall vaccination coverage was sufficient enough to ensure a steady decline in the number of clinically confirmed canine rabies cases, until what was suspected to be the last case of canine rabies was diagnosed clinically in 2015. At this point, the Zanzibar government

hoped to officially declare the island free from canine rabies.

In 2016, the Global Alliance for Rabies Control (GARC), in collaboration with the Zanzibar government, established an active rabies surveillance program on the island. Since then, a small number of rabies-positive cases have been detected, preventing the declaration of freedom from canine rabies on the island. In response, the government took immediate action. Instead of undertaking a large-scale mass dog vaccination campaign similar to those performed in the past, the local authorities collaborated with GARC and World Animal Protection in the development of a strategic vaccination program designed to focus primarily on areas where rabies cases have been detected, before moving outwards in a wave-like manner. This approach ensured that rabies transmission would be rapidly interrupted, before moving to the surrounding areas where healthy, but unvaccinated, dogs reside.

To support the strategic dog vaccination campaign, GARC assisted with the planning of the campaign and its roll-out, in order to help guide the local authorities during their efforts. After many months of preparation, planning and public awareness campaigns across the island, the collaborative project started when the first dog was vaccinated against rabies on the 1st of August 2017. GARC was present in Zanzibar for the first two weeks of the campaign in order to assess, assist and guide the teams in a number of areas, including humane animal handling, and vaccination techniques. After using the two weeks to empower the local authorities with all of the skills and tools that they would need to make the campaign a success, the program has continued successfully under the direction of the local authorities, ensuring a sustainable approach over the coming months.

The campaign started, assuming an immunologically naïve dog population and that no humans or animals were truly safe from rabies on the island. As of 6th October 2017, the campaign has been ongoing for 3 months and the estimated vaccination coverage is approximately 24% and growing daily. More importantly, all of the areas where rabies cases have been detected have been vaccinated and the campaign is now moving away from those cases in order to reach the dogs residing in the neighboring villages. The local authorities are working hard towards ensuring a 70% vaccination coverage across the entire island within next 2 months.

If you would like to contribute to the success of the strategic dog vaccination campaign in Zanzibar you can make a donation to GARC. For every \$5 donation that we receive, GARC will ensure that one more dog, its owner and all of the people in the surrounding area, are protected from rabies by receiving a life-saving dose of rabies vaccine.

Article written by Andre Coetzer, GARC SA



Map showing the location and number of dogs vaccinated across Zanzibar island in early October

World Rabies Day Social Media Campaigns Captured a Global Audience

On World Rabies Day, GARC reached 70,000 people through [Facebook](#) and [Twitter](#), and throughout the month of September alone, over 150,000 people viewed our social media content.

Tens of thousands of people visited the [GARC](#) and [End Rabies Now](#) websites on World Rabies Day, with a large number of readers viewing the new ["Zero by 30" strategic plan](#) that was announced in conjunction with the OIE, FAO and WHO.

As the main facilitator of World Rabies Day, GARC provided 24-hour content updates, delivering posts from our teams in the Philippines, the United Kingdom and the United States over the course of the entire day.

GARC uploaded content to Facebook and Twitter containing useful facts about rabies, dog ownership, and bite prevention. Several posts focused on events commemorating World Rabies Day, tying-in all of the online activity with what was happening in the offline world.

In addition, GARC's Scientific Director, Louise Taylor, participated in a [Twitter chat](#) on World Rabies Day, organised by Health4Animals with other rabies experts from Africa, Latin America and Europe, a platform which allowed Dr. Taylor to offer a global perspective of regional rabies prevention projects.

While World Rabies Day is largely focused on events in the offline world, it's becoming increasingly important to provide people with an online space for discussing rabies control, especially if there are no nearby events. Each year we will continue building the conversation using the hashtag #WorldRabiesDay. Please join us next year!

Contributed by Sophie Kay, GARC



Visits to GARC's Facebook page surged on World Rabies Day; this post was the most popular.

GARC by the Numbers

GARC is pleased to announce its annual report on activities completed in 2016. The new presentation style presents key statistics to give you a snapshot of the breadth of activities that we were involved in over the year. You can read the report [here](#).



Starting Them Young: GARC and Knowledge Channel Partner for Rabies Education

Knowledge Channel Foundation, Inc. (KCFI) and the Global Alliance for Rabies Control (GARC) have teamed up in the Philippines to develop educational videos, e-learning modules, and teaching guides as part of their ongoing work to educate children about rabies.

While KCFI operates the Knowledge Channel (KCh), the first and only TV, online, and offline transmedia that focuses on the Philippines' basic education curriculum, GARC brings life-saving information on rabies, animal bite management and prevention, and responsible pet ownership to the most at risk – the primary school children in public schools in far-flung communities.

Given the vulnerability of children to dog bites and consequently, rabies exposure, GARC, through the support of the UBS Optimus Foundation and in close coordination with the Philippines



Film frame from the Knowledge Channel's "Bino, Buboy and their pet dog Bantay, true friends" (translated from Filipino)

National Rabies Prevention and Control Committee, has targeted children through education interventions over the years. GARC and KCFI believe that educating children at a young age about rabies prevention will help prevent dog bites and rabies over the long term as well.

The development of these multimedia learning resources (MMLR) began in October 2015 in coordination aside from the two organizations, with the Department of Education (DepEd), Department of Agriculture-Bureau of Animal Industry (DA-BAI) and Department of Health-Disease Prevention and Control Bureau (DOH-DPCB) which provided content and technical guidance in scripting and production. A Focus Group Discussion (FGD) with target learners – primary graders and their teachers was also conducted for each video episode to ensure that the materials are age-appelling, relevant, and effective.

Two of the video episodes were aired and included in KCh's Payong K-Lusugan (Health Advice) series on Health Education while the e-learning modules – two animated videos – became part of the Kuwentong Pambata (Stories for Children) series for Day Care to Grade 3. These were broadcasted nationwide and were even made available for free broadcast in the Asia-Pacific Region through ABS-CBN's Intelsat 19. They are also available through the KCh Portable Media Library (PML) – an external hard drive loaded with KCh videos and other learning resources which are distributed in schools through KCFI's Learning Effectively through Enhanced and Evidenced-Based Pedagogies (LEEP) and KCh's learning portal (www.kchonline.ph) as well as GARC and KCh's Youtube Channels. English subtitles have been added to the videos for an international audience.

The videos have been featured during the Rabies Awareness Month and World Rabies Day celebrations in the Philippines. Aside from students and teachers, the videos have also benefited more than a hundred partners from the human and animal health sectors especially those from local government units who have direct access to communities. Their responses have been overwhelmingly positive and they welcomed the additional resources which targeted an age group that needed the most attention.

At present, GARC is working closely with the DepEd to integrate rabies education into the national K-12 curriculum. With KCh's reach, the video episodes are expected to benefit more than 4 million children in more than 4,000 public schools in 67 provinces, more than 10,000 out-of-school youth enrolled in DepEd's Alternative Learning Systems (ALS), and more than 100,000 teachers of formal schools and community learning centers with access to KCh.

This project is a testament to GARC and KCh's commitment to support the national government's goal of achieving a rabies-free Philippines by the year 2020. It is also a push to realize that educating young minds is crucial for long-term behavior change.

Contributed by Dane Medina, communication officer for GARC Philippines office and Edric Calma of Knowledge Channel.

New features and Expert Opinions for The Rabies Epidemiological Bulletin to Expand the Tool's Reporting Capacity

Terence Scott, a GARC team member, recently attended the DHIS2 Experts Academy held in Oslo, Norway from 14-18 August 2017 to present a poster on the unique use of the DHIS2 system for rabies surveillance.

Without adequate surveillance as a component of rabies control and elimination, it is difficult to determine the burden of the disease and, at later stages, to show freedom from rabies. This has resulted in a number of scientific publications (including Taylor and Nel's "[Global epidemiology of canine rabies: past, present, and future prospects](#)" in 2015) referring to the cycle of neglect, whereby poor surveillance limits a country's capabilities to control and eliminate rabies as well as hindering its ability to advocate support towards rabies control and elimination efforts.

Historically, few resources and tools were available for countries to improve their rabies surveillance, and the onus fell upon each country to develop their own surveillance and reporting system for rabies. However, in 2016, GARC –through the PARACON network –launched the [Rabies Epidemiological Bulletin](#), a tool developed primarily to address the need for improved rabies reporting.

Aiming to replace the out-dated country reports previously submitted to the PARACON network, the Rabies Epidemiological Bulletin is an online, customisable data collection and analysis platform based on the DHIS2 system (a reporting system currently used extensively throughout Africa) that is designed to be used not only at a national level, but also at lower administrative levels within the country. Due to the successes of using this tool within the PARACON network, this Bulletin will be expanded to include other global networks, making this platform available to all countries that may want to use the tool.

All of this information is available in the public domain, but most people are not aware of what happens behind-the-scenes to ensure that the Rabies Epidemiological Bulletin continues to develop and improve with new features, interactive interfaces, and improved usability so that countries can collect more comprehensive and accurate data more easily. The Rabies Epidemiological Bulletin was launched in 2016, but the GARC team worked for more than seven months to build the initial system. After its development and initial implementation, countries provided feedback and requests for further improvements and features. This resulted in the need for GARC to work more closely with the DHIS2 developers, as well as the massive expert community working on software improvements, developments and implementation.

To address this, Terence Scott, a GARC team member, recently attended the DHIS2 Experts Academy held in Oslo, Norway from 14-18 August 2017 to present a poster on the unique use of the DHIS2 system for rabies surveillance. The majority of DHIS2 systems are used for human health surveillance, so coupling this platform with animal health surveillance was a novel approach. Furthermore, GARC worked closely with developers and other global international organisations to learn new functionalities, uses, programmes, system implementations, approaches and methods to improve the Rabies Epidemiological Bulletin. With this new-found knowledge and experience, the Rabies Epidemiological Bulletin will continue to improve so that data collection, analysis and dissemination will be easier for countries to participate in surveillance activities.

Furthermore, the collaboration between the WHO and GARC with regards to data reporting was strengthened at the experts' academy to ease the reporting burden on countries by automatically sharing the relevant data between the Rabies Epidemiological Bulletin and the WHO Global Health Observatory. New features such as automated data sharing, new mapping features, scorecards, improved visuals and other enticing uses of the Bulletin can be requested and implemented for countries. If your country is interested in the use or further implementation of the Rabies Epidemiological Bulletin, please feel free to contact GARC for further discussions.

Submitted by Terence Scott, GARC and member of the Pan-African Rabies Control Network (PARACON) Steering Committee. For more information about the Rabies Epidemiological Bulletin, please refer to the publication "[Addressing the Disconnect between the Estimated, Reported, and True Rabies Data: The Development of a Regional African Rabies Bulletin](#)".



Figure 1. Terence Scott (GARC) presenting the Rabies Epidemiological Bulletin at the DHIS2 academy in Oslo, Norway. Photo : DHIS2 expert's academy

NEWS FROM THE COMMUNITY

Open Science Helping to eradicate Rabies by 2030

An ebook of all the articles is free to download.

A Frontiers research topic on the [control and elimination of dog-mediated human rabies](#) provides a vital overview of the challenges but also the opportunities to eradicate this deadly disease by 2030. The highly relevant and timely information will help rabies control researchers and practitioners from [veterinary](#), [public health](#) and other sectors in their rabies elimination efforts.

Rabies kills a person every nine minutes. The occurrence of rabies is highly related to poverty, with almost all cases occurring in Africa and Asia. Over 99% of the people die from rabies because they have been bitten by a rabid dog. Once clinical signs appear, it is almost 100% fatal. Although rabies is one of the earliest-described [infectious diseases](#), it is still categorized as a NTD (Neglected Tropical Disease). The disease exerts such a high burden on neglected communities due to inequality in access to proven rabies control measures.

But change could be on the way. On World Rabies Day this year, World Health Organization (WHO), the World Organization for Animal Health (OIE), the Food and Agriculture Organization of the UN (FAO) and the Global Alliance for Rabies Control (GARC) announced the new United Against Rabies collaboration's ambitious '[Zero by 30](#)' strategic plan to eliminate human deaths from dog-transmitted rabies by 2030. Activities helping to reach this goal are also occurring in rabies-free countries. For example, in the US and in several European countries, alliances against neglected tropical diseases exist, such as in the UK, Germany and more recently Switzerland and France.

The Frontiers research topic — [Towards Elimination of Dog Mediated Human Rabies](#) — comes at the perfect time to support countries to move more quickly towards a rabies-free future. It brings together [veterinary science](#) publications on epidemiological, educational, policy-related and economic aspects of dog and human rabies surveillance and control. The articles include experience and lessons learned from small- and large-scale rabies control programs, research aimed at improving the design and cost-effectiveness of rabies control programs, and analysis of the resources needed to expand rabies control efforts.

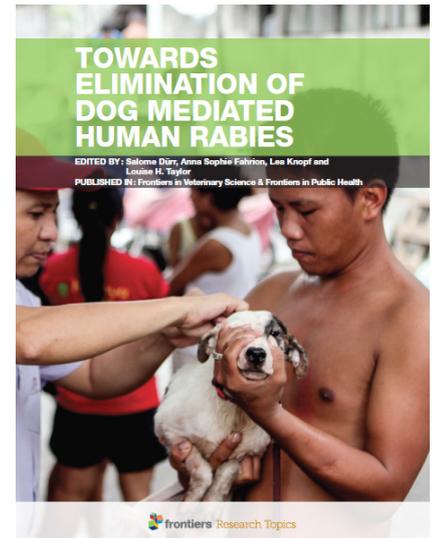
The research topic addresses concrete activities that will help reach the 2030 goal to eliminate human rabies from the planet. It starts with demonstrating the burden of the disease. Only by knowing how frequent rabies is in different countries, can control programs be planned, implemented and their success evaluated. The availability of high-quality surveillance data to support control efforts is absolutely vital. Second, improving the design and cost-effectiveness of rabies control programs is required. How many dogs should be vaccinated to control the disease in the different regions, countries and districts? Should adult dogs or puppies be targeted for vaccination? How should the vaccination coverage in free-roaming dogs be most ideally assessed? What is the effect of dog population management strategies, i.e. neutering of the dogs? What is the economic benefit of a One Health communication? Answers to all these questions can be found in the articles within the research topic.

Planning and budgeting to reach the global goal will also be vital. Almost all endemic countries are low-income countries where money to fund country-wide dog vaccination campaigns is very hard to find. One article in this research topic calculates the money, vaccine and personnel required over the next 13 years to be able to reach the 2030 goal, and the shortfall based in estimated current spending. The need for innovative funding sources to deal with this challenge, and one possible solution, Development Impact Bonds, are presented in another article of this research topic.

Overall, the research topic shows that knowledge and tools are already available to eradicate rabies. However, challenges and barriers remain. Long-term intensive programs are required to be able to achieve sustainable elimination rather than a temporary reduction in cases, which will eventually lead to resurgence of the cases. It is also crucial to plan interventions and control programs using a One Health approach that equally involves stakeholders from the veterinary and public health sectors. Only by working can a disease like rabies can be tackled.

View the research topic online or download the e-book: [Towards Elimination of Dog Mediated Human Rabies](#)

This article, by Salome Dürr, Anna Sophie Fahrion, Lea Knopf and Louise Taylor the Research Topic Editors, first appeared as a [blog post on the Frontiers website](#).



Animal Welfare Agency in Zimbabwe Vaccinates Over 6,000 Dogs Against Rabies

Zimbabwe's animal welfare agency, VAWS, has conducted a number of rabies vaccination campaigns in 2017 throughout the country, immunizing and sterilizing over 6,000 dogs, in addition to their education, outreach and training programs to promote animal welfare.

Veterinarians for Animal Welfare Zimbabwe (VAWZ), an NGO registered as a private voluntary organisation of animal welfare inspectors, has been in operation since April 2010. Their staff works countrywide, dealing with animal welfare issues in domestic animals, livestock, and wildlife. Melanie Hood, the lead animal welfare officer, is in charge of the day-to-day running of VAWZ, as well as general operating procedures. Inspectors Edmore Takaopwa, Bernard Ndlovu and Livison Chareka are active on the ground, assessing the standards of animal welfare across the country. In addition, Dr. Isaac Moyo and Mr. Lovemore Ncube run the Victoria Falls Animal Health and Welfare Centre.

Through education and training, VAWS creates a greater awareness of animal welfare issues, as well as investigating possible cruelty cases. In addition, VAWZ has a number of special projects. Amongst these are our rural rabies vaccination and sterilization campaigns.

In Zimbabwe, the dog population is estimated to be around 700,000, and the majority of these animals live in the vast, rural areas, where their owners have little or no access to veterinary treatment for their animals. In addition, funding constraints within the government's Department of Veterinary Services (DVS) have further reduced access to veterinary care, so that country-wide rabies vaccination targets have not been reached. Incidents involving rabid dogs have been increasing, with schoolchildren being the most vulnerable population because they most often come into contact with free roaming dogs while walking to and from school. The majority of dog owners in these areas are subsistence villagers who do not have the means to pay for vaccinations, making the need for dedicated rabies vaccination campaigns a priority, which VAWS has now included in our special projects.

Working closely with the DVS and other NGOs, VAWS identified the areas in Zimbabwe where annual vaccinations campaigns needed to be held, taking into account the population of humans and animals, the number of reported rabies cases, available resources, travel distances, and staffing logistics. At all designated sites, DVS personnel played an integral part in ensuring the success of each campaign.

In 2017, campaigns were held in Caledonia, Christon Bank, Honde Valley, Victoria Falls, Bikita/Nyika and Beit Bridge – with a total of 6,268 dogs being vaccinated. Further campaigns for this year will be held in the Hwedza and Mazowe districts. At all these sites (with the exception of Bikita/Nyika), a team of veterinarians sterilized the dogs brought for vaccination at the same time. Many of the dogs brought in by their owners required additional veterinary treatment for medical problems such as wounds that required stitching and diseases needing medication. At the majority of sites, the dogs were also given de-worming medication.

The response and enthusiasm to these campaigns from local communities is amazing, and the difference made to the lives of their animals is incredible. It is so rewarding to return year after year to witness the improvement in both the condition of the dogs and the general, overall welfare of the animals.

Educating the community about the dangers of rabies, as well as other animal welfare issues, remains a top priority for VAWZ. Our inspectors have all attended and passed the [GARC Rabies Educator \(REC\) and Animal Handling and Vaccination \(AHV\) certificates](#), which has given our team a solid foundation in rabies control methods from which they can competently carry out these duties.

Through fundraising and donations, VAWZ is able to vaccinate and sterilize free-of-charge in the rural communities in Zimbabwe. However, the present economic hardships are making it more difficult to access funds, limiting the number of dogs we are able to vaccinate. There is a desperate need to expand our campaigns to help prevent further loss of life, both in humans and animals, from this preventable disease.

Submitted by Mel Hood, Animal Welfare Officer for [Veterinarians for Animal Welfare Zimbabwe \(VAWZ\)](#), an NGO run by a management committee of private and government veterinarians that is answerable to the Council of Veterinary Surgeons. VAWZ is housed in the Wildlife Veterinary Unit of the Zimbabwe Department of Livestock and Veterinary Service and is closely linked to this government office through a signed memorandum of understanding. VAWZ Animal Welfare Inspectors are appointed as such by the Minister of Environment and Water and Climate.



Rabies Vaccination Campaign, Beit Bridge, Southern Zimbabwe. Credit: VAWZ

WHO's Working Group on Rabies Vaccines and Rabies Immunoglobulins Forms New Recommendations

Updated, more practical recommendations are necessary to improve the public health impact of biologics against rabies.

In July 2016, a rabies working group was formed by WHO to review evidence on several aspects of rabies prophylaxis to try to improve such recommendations. Specifically they were asked to (i) assess evidence and country practices in the use of human rabies vaccine and rabies immunoglobulins (RIG), including that of targeted vaccination of high risk communities in rural settings; (ii) review the new evidence on the need for pre-exposure prophylaxis (PrEP) booster doses and the cost-effectiveness of the interventions; (iii) assess the most recent evidence on the potential shortening of post-exposure prophylaxis (PEP) schedules and new regimens; (iv) review the evidence and revisit the current WHO position for RIG and monoclonal antibody use with the view to improve access to care and increase public health impact; (v) assess the implementation and evidence of the current recommendation on intradermal use of cell culture-derived vaccines (CCV); (vi) assess the economic burden of rabies and cost-effectiveness of vaccination to inform rabies vaccination strategies (including vaccination in the context of other control strategies); (vii) consider new vaccines in different phases of clinical trials or in the process of obtaining WHO prequalification and/or national market authorization by mid/end 2016.



A patient receives ID PEP in the Philippines. Photo: GARC

At a meeting held in October 2017, the group presented its findings to the Strategic Advisory Group of Experts on Immunization at WHO for their consideration. Amongst the conclusions of the meeting were that:

- PEP regimens administered intradermally (ID) are cost and dose-sparing, even in clinics with low patient throughput.
- Three PEP regimens have proven effective and are recommended depending on health service and patient needs. **The IPC regimen:** 2-site (0.1 ml per site) ID on days 0, 3 and 7; the **Essen regimen:** 1-site (1 vial per site) IM on days 0, 3, 7 and 14-28, unrestricted for all populations, and the **Zagreb regimen:** on 2-sites IM on day 0 and 1-site IM on days 7 and 21.
- Patients with documented immunodeficiency should be evaluated on a case-by-case basis, and generally given a full course of PEP with RIG.
- Accelerated PrEP regimens for all age groups of healthy individuals of the general population are either a 2-site (0.1 ml per site) ID regimen on days 0 and 7, or a 1-site (1 vial per site) intramuscular (IM) regimen on days 0 and 7.
- PrEP can be considered in populations with very high bite incidence above 5% annually and should be based on assessment of the local context and epidemiology.
- There is no contraindication for use of PrEP and PEP, including for children, pregnant women, immunocompromised individuals and those receiving chloroquine or hydroxychloroquine.
- New evidence from Cambodia and Tanzania shows that when thorough wound washing and prompt administration of vaccine is provided to category III bite victims, 99% survive.
- Trials and programmatic experience indicate that infiltration of RIG in and around the wound neutralizes rabies virus within hours and RIG administered intramuscularly distant to the wound is of limited value. These recommendations will allow RIG dose sparing by calculating the maximum dose based on body weight, but injecting only the volume needed to infiltrate the wound(s). Guidance for aseptic use of remaining RIG will need to be developed.
- Equine RIG (eRIG) is clinically equivalent to human RIG (hRIG) and skin testing prior to its administration should be abandoned.

The SAGE committee recommended that these updates are made to allow a more efficient, prudent and equitable use of human rabies biologics, particularly in endemic settings.

Summarised by Louise Taylor of GARC from WHO webpages. The meeting documents — including presentations and background readings can be found [here](#) and a summary of the meeting is available [here](#). The full meeting report will be published in the WHO Weekly Epidemiological Record on 1 December 2017.



Recent Research November 2017

A round-up of recent publications relevant to GARC's core missions

Dog Vaccination

[Census and vaccination coverage of owned dog populations in four resource-limited rural communities, Mpumalanga province, South Africa.](#) In four different villages of Bushbuckridge Municipality, cross-sectional surveys of 2969 households were carried out. 942 owned dogs were reported, with the populations being young and skewed towards males. Vaccination coverages were all above the 20% - 40% threshold required for herd immunity to rabies (38%, 51%, 65% and 74%). For the preparation of vaccination campaigns, the relatively stable dog:human ratio (between 1:12 and 1:16) is recommended to estimate the number of dogs per village.

[Evaluation of immune responses in dogs to oral rabies vaccine under field conditions.](#) A traditional mass dog vaccination campaign in Haiti was supplemented with ORV using blisters of live-attenuated, vaccine strain SPBNGAS-GAS in intestine bait, distributed by hand. Serum was collected from 107 dogs and RFFIT used to detect neutralizing antibodies and ELISA to detect rabies binding antibodies. 38/41 (92.7%) dogs that received parenteral vaccine had detectable antibody (RFFIT >0.05 IU/mL), compared to 16/27 (59.3%) dogs that received ORV or 21/27 (77.8%) as measured by ELISA. Of 291 oral vaccines offered; 283 dogs consumed the bait; 272 dogs were observed to puncture the blister, and only 14 blisters could not be retrieved by vaccinators and were potentially left in the environment. Parenteral vaccination remains the most reliable method, however ORV represents a viable strategy to supplement existing parental vaccination campaigns in hard-to-reach dog populations.

PEP

[Effect of counselling on health-care-seeking behaviours and rabies vaccination adherence after dog bites in Haiti, 2014-15: a retrospective follow-up survey.](#) A retrospective follow-up survey of 115 bite victims who were counselled by Haiti's integrated bite case management (IBCM) programme, classified by active surveillance decisions of exposures to confirmed, probable, suspected, or non-rabies animals. IBCM counselling was associated with a 1.2 times increase in frequency of seeking medical care and of 2.4 times increase in vaccination uptake. This is estimated to equate to a 65% decrease in rabies deaths.

[Development and characterization of novel chimeric monoclonal antibodies for broad spectrum neutralization of rabies virus.](#) Potent monoclonal antibodies to neutralize a broad spectrum of rabies viruses were developed by screening hybridomas received from the U.S. CDC. Two kinds of chimeric human antibodies (chimeric #7 and #17) were constructed by cloning the variable regions from selected hybridomas and the constant region of a human antibody. Two antibodies were bound to antigenic site III and I/IV, respectively, and were able to neutralize 51 field isolates of rabies virus and neutralize rabies viruses with high efficacy in an in vivo test using Syrian hamster and mouse models.

Wildlife Rabies Control

[Oral vaccination of wildlife using a vaccinia-rabies-glycoprotein recombinant virus vaccine \(RABORAL V-RG®\): a global review.](#) Approximately 250 million doses of RABORAL V-RG® have been distributed globally since 1987. V-RG is genetically stable and its safety has been evaluated in over 50 vertebrate species, with no adverse

Continued on page 15...

...*Recent Research* continued from page 14.

effects observed. Immunogenicity and efficacy have been demonstrated under laboratory and field conditions in target species including fox, raccoon, coyote, skunk, raccoon dog, and jackal. Field application of RABORAL V-RG has contributed to the elimination of wildlife rabies from three European countries and of the dog/coyote rabies virus variant from the United States of America (USA). ORV programmes in west-central Texas, the Eastern USA and Israel have reduced or contained rabies in foxes, racoons and other species.

Diagnostics

[Development of molecular confirmation tools for swift and easy rabies diagnostics](#). Novel assays, such as HighSpeed RT-qPCR and isothermal recombinase polymerase amplification (RPA) were designed and tested with a view to developing approved methods for confirmatory diagnosis of rabies. Magnetic bead-based rapid extraction methods delivered nearly comparable sensitivity and efficiency of RNA recovery to conventional methods. All the newly developed molecular tests were able to detect different rabies virus strains in a markedly reduced timeframe compared to the standard diagnostic assays.

Canine Rabies Epidemiology

[Re-emergence of rabies virus maintained by canid populations in Paraguay](#). Paraguay has registered no human cases of rabies since 2004, and the last case in dogs, reported in 2009, was due to a bat variant. In 2014, dog that bit a boy was diagnosed positive for rabies. The dog was not vaccinated and had been attacked by a crab-eating fox. Samples from a dog positive for rabies in the same region in 2015 and 11 samples from an outbreak in Asuncion, 1996 were also characterized. The antigenic profile of the samples, AgV2, was compatible with one of the variants maintained by dogs in Latin America. The virus can still circulate in wildlife and may still be transmitted to domestic animals and humans.

Upcoming Conferences

The 10th Asia for Animals conference will be held in Kathmandu, Nepal from 2nd to 5th December 2017. The theme is Changing Human Behaviour. For more information see afakathmandu.com

The 18th ICID (International Congress on Infectious Diseases) will be held in Buenos Aires, Argentina from 1 March 2018 - 4 March 2018. Further details are available [here](#)

NECTM7, the 7th Northern European Conference on Travel Medicine, will be 2 May 2018 - 4 May 2018 in Stockholm, Sweden. Further details on their [website](#).

The 6th ACC&D International Symposium on Non-Surgical Fertility Control for Dogs and Cats, will be held in Boston, MA, United States, from 22 -24 July 2018. This is an opportunity to learn, discuss and network with innovators about the most promising advances to prevent unwanted litters and use new and existing tools effectively in the field. The agenda is currently being planned and the organizers wish to hear from those interested in presenting their work. Abstracts are due January 15, 2018. See www.acc-d.org/resource-library/symposia/6th-symposium or email symposium@acc-d.org for more information.

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.