



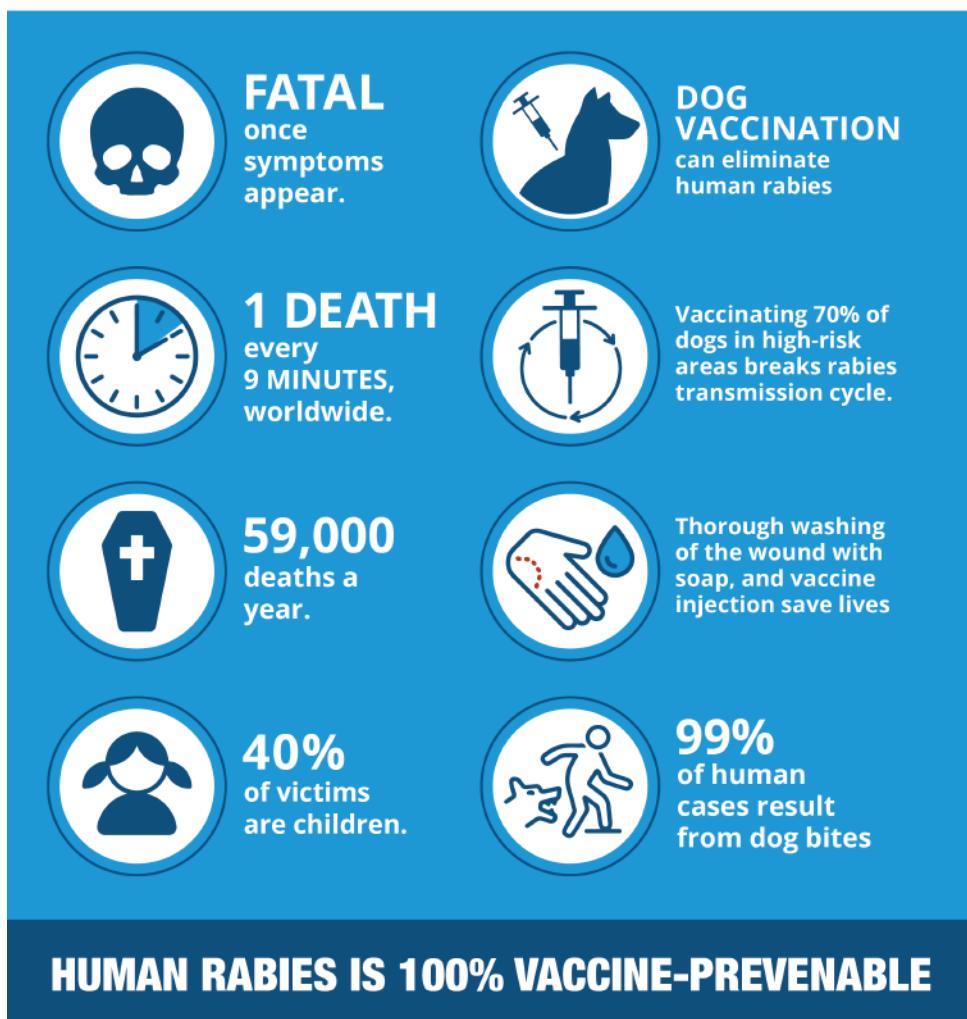
ANNUAL REPORT

January 2019 - December 2019

Rabies

Rabies is entirely preventable, and vaccines, medicines, tools, and technologies have long been available to prevent people from dying of dog-mediated rabies.

RABIES IS A MAJOR PUBLIC HEALTH PROBLEM



WWW.RABIESALLIANCE.ORG



Image: Key Facts and Figures

Nevertheless, rabies still kills about 59,000 people a year, mainly in rural areas of Africa and Asia. Of all human cases, up to 99% are the result of a bite of an infected dog.

Foreword: 2019 – Empower, Engage and Enable

Since our creation in 2007, we have worked resolutely to support communities living with the daily threat of rabies, one of the deadliest diseases on the planet.

In 2015, we called for global action to support a goal of zero dog-mediated human rabies deaths by 2030, and subsequently worked together with WHO, FAO and OIE (as the United Against Rabies) to create a joint approach to deliver this goal.

The “Zero by 30: Global Strategic Plan”, which was launched last year, reflects GARC’s overriding vision to place countries and their communities at the centre of efforts to tackle the disease. They are the heart of this Plan, supported by coordinated, collaborative efforts to effectively deliver support.

As set out in the first start-up phase of the Plan (up to 2020), GARC has focused its efforts on collaboration and coordination to empower, engage and enable countries to save human lives from this preventable disease. This year we achieved this by improving and leveraging our existing tools, networks, and expertise to strengthen the foundation for rabies elimination and further catalyze action.

We thank you all for your contribution and commitment to the Zero by 30 goal.



A handwritten signature in black ink, appearing to read "Louis Nel".

Professor Louis Nel
Executive Director

How we work – Catalyzing national action: Supporting countries and their communities

Phase 1 of our 'Zero by 30: Global Strategic Plan,' calls for building strong foundations to catalyze action.

In line with our vision to empower, engage and enable, GARC developed an integrated approach to assist at-risk communities and countries in tackling rabies.

- Our approach is led by local communities and thus reflects their needs and priorities, while including their local knowledge and expertise.
- It emphasizes coordination rather than individual, prescriptive efforts as these often fail to strengthen what are already fragile and resource-constrained health systems.
- It promotes inter-departmental collaboration to deliver a holistic governmental response to tackling rabies, often described as the One Health approach.



Image: Cover of United Against Rabies Global Strategic Plan

Multi-Staged Country-centric Approach

GARC's approach forms a **multi-staged cycle** that strengthens national health systems. The process is led by national governments and local communities, ensuring lasting results that address each country's unique challenges.

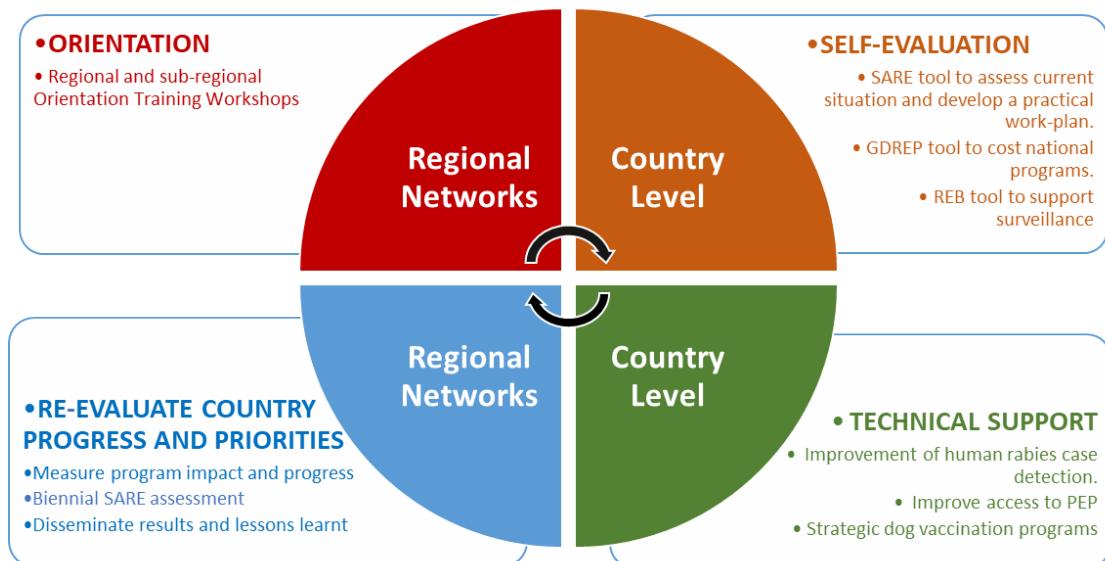


Image: GARC's Multi-Staged Country-centric Approach

Regional Network Workshops allow governments to share plans and experiences and foster transboundary cooperation. The networks provide an opportunity for countries to review progress, disseminate results, and be trained in the use of tools available to support their efforts, generating concrete actions (see Appendix 2 - Catalyzing Action).

Country Level engagement starts with the Stepwise Approach towards Rabies Elimination (SARE), which empowers governments to self-evaluate their current rabies situation, whilst facilitating and simplifying the complex task of prioritizing critical activities required to achieve elimination, packaged in a customized work plan.

To support the case for investment, the Global Dog Rabies Elimination Plan (GDREP) tool helps cost national elimination programs, providing an important estimate for advocacy and planning purposes. The Rabies Epidemiological Bulletin (REB) offers a "plug and play" One Health rabies surveillance system, which helps countries to ensure that relevant, high-quality rabies data can easily be collected and automatically analyzed, with user-friendly outputs that are ideal for monitoring the disease situation and planning interventions accordingly (See Appendix 3 – Tool Descriptions).

Deployment of Technical Training and Tools

Following the national, multi-day self-evaluation workshop that draws upon the suite of best-practice tools (including the SARE, GDREP, REB), national governments are tasked with implementing the activities that have been prioritized in line with their newly developed work plan and revised national strategies. As new tools, strategies and protocols are developed, GARC incorporates them into the workshop.

If the national government seeks external assistance, GARC and its international collaborators can offer technical assistance based upon the identified needs of the national authorities – outlined in their unique work plans. The technical assistance may consist of strategic vaccination campaign planning and training; information, education, and communication campaign design; resource development; and disease surveillance and laboratory strengthening.



Image: National Workshop Outputs

Historically, countries in the rabies endemic regions often serve as recipients of international projects, which may not necessarily correspond to their key priorities. In contrast, GARC's approach ensures that the health system strengthening and capacity building activities correspond to identified needs and national priorities, thus supporting countries where the need is greatest rather than responding to external priorities.

Empowering communities

Across the world, the poorest and most at-risk communities face the greatest burden of rabies yet received little support to tackle the disease.

Surveillance

Without empirical proof of the burden of rabies, the disease will remain neglected and underfunded. Unfortunately, rabies surveillance has been hampered by poor interaction between departments of agriculture and health, limited laboratory expertise and sample submission, and national health information systems not equipped to report on the disease. Furthermore, international health systems for rabies have suffered from under-reporting, further exacerbating the cycle of neglect.

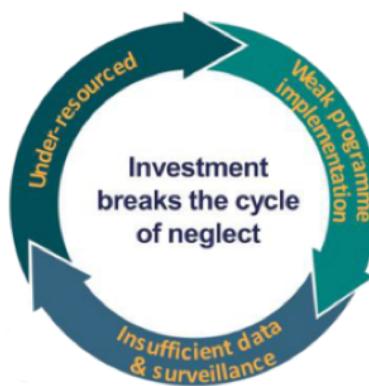


Image: Rabies - Circle of Neglect

We are not going to achieve the Zero by 30 goal without an investment in comprehensive disease surveillance.

It is essential to undertake ongoing, systematic collection, analysis and interpretation of health data to determine the appropriate public health action, monitor the impact of the rabies elimination programs, and effectively allocate limited resources for greatest impact.

GARC has developed three specialized tools to help rabies professionals in resource-constrained environments manage effective rabies surveillance and track vaccination at the community level:

1. **The Rabies Vaccination Tracker (RVT)** facilitates tracking and planning of strategic mass dog vaccination campaigns in real-time. Data is captured – either through the mobile app or through the specialized GARC Data Logger – to track each administered dose, generating evidence of vaccination coverage and helping to identify missed areas. The GARC Data Logger has been designed specifically to overcome the challenges of mobile phones in resource-poor environments.
2. **The Rabies Case Surveillance (RCS)** works with both laboratory or in-field diagnosis to map rabies-positive and -negative cases to identify rabies hotspots and outbreaks. This information can direct strategic mass vaccination campaigns or trigger emergency dog vaccination campaigns in outbreak areas.
3. **The Rabies Treatment Tracker (RTT)** supports rabies bite victims throughout their treatment, including SMS reminders to ensure they receive their full, life-saving course of treatment. It assists the health care professionals with the treatment schedule, vaccination compliance and basic patient management. Location-based information informs outbreak response.

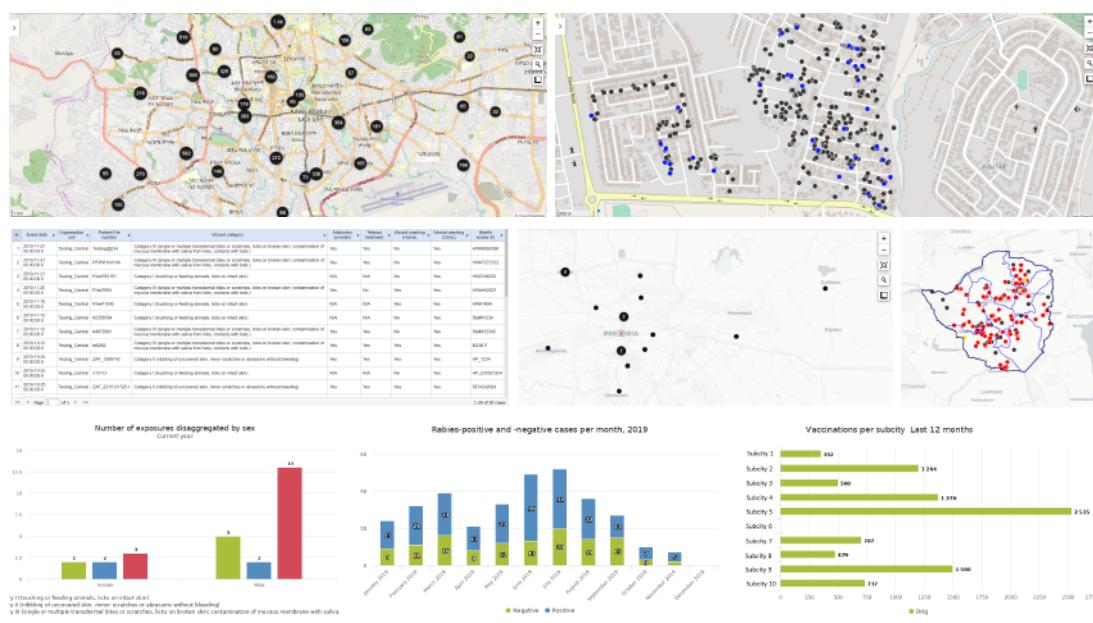


Image: Surveillance data and images used to support national government disease programs.

Each free-to-use surveillance tool can be used separately or linked to one another to build a complete, comprehensive national rabies surveillance system. The entire system has unique access rights, enabling simultaneous, program-specific use, while still maintaining integrity and data protection under national oversight.

Remote training modules, technical manuals, tutorial videos, and guidance on the implementation of specific activities are provided by GARC where required.

Government ministries tend to start with one tool, and as they gain expertise and understanding of the system, then take on additional elements.

Education

Providing relevant and easily understandable education to the public and to human and animal health professionals is essential if we are going to achieve the Zero by 30 goal. Many communities and public health professionals do not have access to the latest and most appropriate information to tackle the disease, resulting in the use of inappropriate measures for rabies prevention, control, and elimination.

The GARC Education Platform (GEP) was launched as a set of courses developed to improve the skills and knowledge of people working in rabies awareness and prevention. The courses are available online as well as delivered as part of in-country training and capacity building activities.

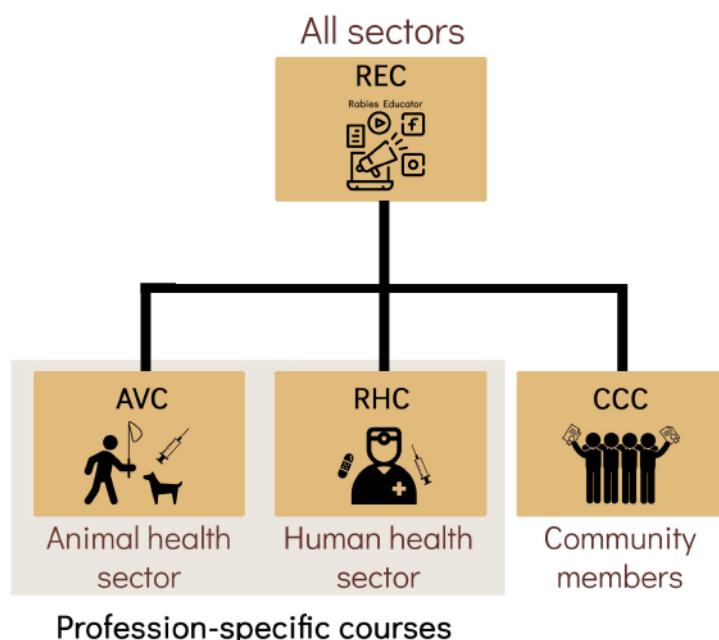


Image: Rabies Certification Courses

Following the initial foundational course – the Rabies Educator Certificate (REC) – there are several subsequent courses available:

- The Animal Handling and Vaccination Certificate (AVC) course directed to animal health professionals tasked with handling and vaccinating animals.
- The Community Coordinator for Rabies Certificate (CCC) course for individuals serving the community in an official capacity.
- The Rabies Healthcare Certificate (RHC) course for professionals working as human healthcare providers.

The courses are regularly reviewed and are updated as international guidance and standards are revised.

After completing each course, the graduate receives a certificate of achievement, which empowers people to become rabies advocates, focal persons, and experts across the globe.

2019 Activities

The Global Strategic Plan to End Human Deaths from Dog-mediated rabies by 2030 outlines three Objectives to reach the Zero by 30 goal. GARC's multi-staged cycle addresses all three Objectives.

We have reported on our 2019 activities within the Logic Framework that was developed by ourselves and our partners (WHO, FAO, OIE) in the context of the Global Strategic Plan (See Appendix 1).

The activities described in the Logic Framework are shared across the four partner organizations and as such, GARC is solely reporting on our own responsibilities and objectives.

Objective 1: Eliminate Rabies by effective use of vaccines, medicines, tools, and technologies.

Efforts to eliminate rabies have been fragmented across sectors and regions. National responses, where implemented, are often uncoordinated between the human and animal health sectors. Examples of best practice have emerged, but their hard-learned lessons have not been shared broadly. The world has the knowledge, tools, and technologies needed to eliminate rabies, what is missing is an effective use of these resources through coherent global and national strategies and coordinated, practical guidance and training. Objective 1 seeks to effectively use our joint strengths to advocate for rabies prioritization, to engage and educate stakeholders in the global fight, and to build capacity to create an enabling environment for countries to succeed.

Problem statement:

Every year tens of thousands of people die from rabies due to a lack of knowledge on rabies, its causes, and its prevention – both in public and professional circles. Furthermore, millions of animals are inhumanely culled due to misinformation and a lack of knowledge pertaining to appropriate preventative measures.

Global Strategic Plan Outcome:

1.1 Rabies Prevented Through Increased Awareness and Education

GARC's work in 2019:

Activity 1.1. Coordinate communication campaigns for World Rabies Day

GARC created and coordinates World Rabies Day – an international education and awareness day – which is celebrated annually on September 28. The theme selected for 2019 was 'Rabies: Vaccinate to Eliminate.'

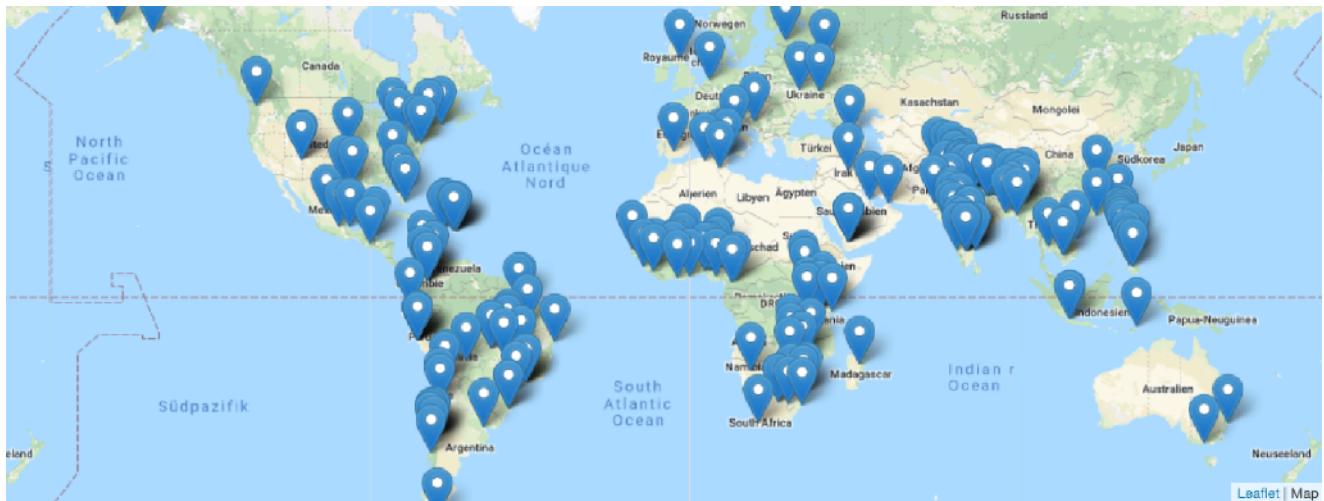


Image: Map of World Rabies Day Events

Despite only being able to capture the events reported to GARC, the total number of events across the world rose to 240 events in 2019.

There was a slight increase in countries recording an event, with 65 countries participating in World Rabies Day activities compared to 62 in 2018.



Image: Community Action Philippines

Each year, GARC reviews and refreshes its downloadable community engagement toolkits. The resources available include logos, event toolkits, courses, awareness resources and awards for community champions. These resources are available free on the World Rabies Day resource page: <https://rabiesalliance.org/world-rabies-day>

In 2019, the team invested significant resources to update the World Rabies Day materials and provide support to events and activities across the world. Google Analytics indicated 21,802 downloads from the website over a three-month period (August to mid-November) of these resources.

You can save their lives



Modifiable education posters were provided for the third year in a row. Thanks to our community, the modifiable posters were made available in new languages, as volunteers translated the posters as demand arose. The posters are now available in multiple languages and the main languages downloaded were English, French, Spanish, and Russian.

Image: Modifiable Posters

Communication and social media activities throughout the period were vibrant and far-reaching. Social media followers and page likes grew for both GARC and our End Rabies Now campaign.

The international press coverage included a joint release with the WHO, FAO and OIE, highlighting the shared determination across human and animal health agencies to tackle the disease. In support of the collaboration with the WHO, FAO and OIE, GARC also made its tools and approaches available on a Trello platform which combined the materials of the United Against Rabies collaboration.

Year	Events	Materials Downloads	Social Media Reach (Twitter)	Modifiable Posters Downloads	World Rabies Day Logo Downloads
2019	240	21,802	183,900	802	7,400
2018	197	11,577	94,600	662	3,700

Table: World Rabies Day in Numbers

Activity 1.2. Engaging partners, communities, and national governments to build awareness.

GARC continued to develop, refine, and promote the free online certificate courses aimed to help people educate themselves and their communities about animal bite prevention and rabies prevention and control – helping to keep themselves and their communities safe.

The courses are used for government capacity building and have been integrated into several veterinary university curricula. The Rabies Educator Certificate (REC) is the foundation certificate, empowering individuals to become community educators themselves, while the Community Coordinator for Rabies Certificate (CCC) permits graduates to become focal points for rabies prevention in their area.

The courses experienced significant growth in 2019 with a graduate pool of 8,985 people from across the world.

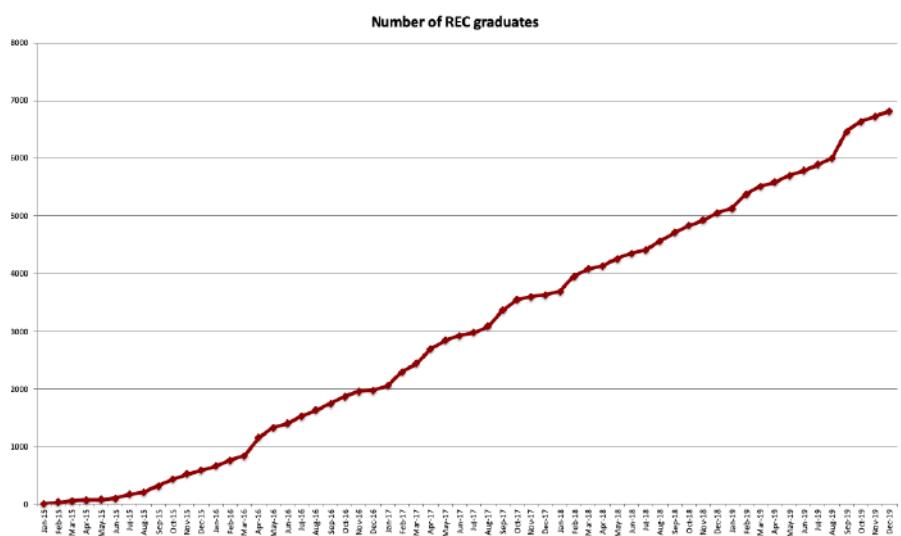
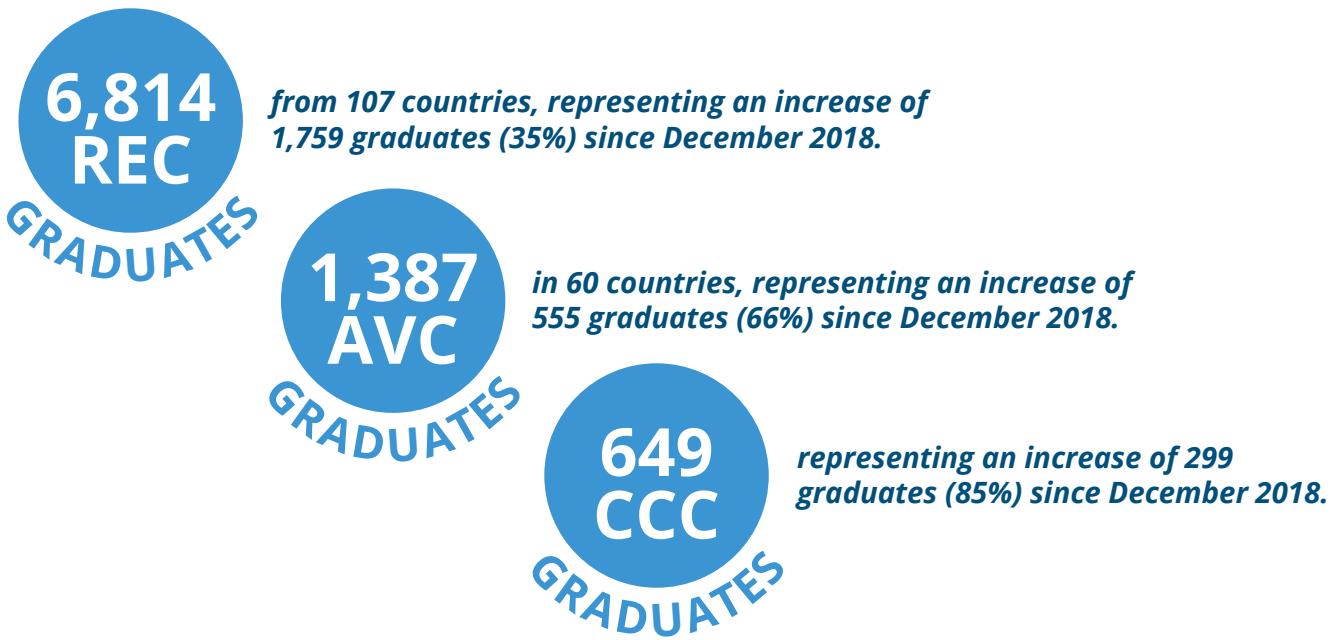


Image: Rabies Educator Certificate graduates

By the end of December 2019, there were:



"The course provides us with practical knowledge which are easily understood even by laypersons. The information within the course gave all the important points regarding rabies which can be directly taught to others within our community."

Anne Loreyn Damasco,
Staff member at the Animal Bite Treatment Center of the Batangas Medical Center, Philippines.

To gain an improved understanding of the reach and impact of the REC course, we undertook a survey of over 1,000 REC graduates (15% of the global community of certified rabies educators). Our results highlight the importance and impact of the “training of trainers” approach used in the REC course, with an estimated 5,65 million people being reached with rabies information through our 6,814 REC graduates between 2015 and 2019.

Protecting Children

Approximately 40% of all rabies deaths are children. GARC has developed specific approaches for at-risk communities and audiences including the integration of rabies education into the Philippines national school curriculum.



Image: School based dog bite prevention and rabies awareness education.

Working with the Department of Education, we pioneered the education integration at the sub-national level, over a five-year period (2012-2016), across two districts.

Following the successful pilots between 2012 and 2016, we have been working with the Department of Education to design and test the education program, which is now being rolled out nationally, benefitting an estimated 24 million students in 46 847 public schools every year. Teachers, school health personnel, parents and the community also benefit from audience-specific education through this program, reaching an additional 65,024 people annually. The initiative included preparation of lesson plans with messages on rabies as a disease, animal bite prevention, animal bite management, and responsible pet ownership in both English and Filipino.

In 2019, we also worked with the Department of Education on the training of school health personnel (medical doctors, dentists, nurses) in several regions of the country.

Problem statement:

Dog vaccination is a complex logistical process that needs to be data-driven for informed decisions so that the best results can be achieved with limited resources. Often, dogs are vaccinated without any data, meaning that important indicators like vaccination coverage and gaps in vaccination coverage cannot be identified or calculated.

Global Strategic Plan Outcome:

1.2: Rabies Is Prevented Through Increased and Effective Dog Vaccination

GARC's work in 2019:

Activity 1.2: Leveraging existing tools and promoting innovation to support effective dog vaccination and surveillance data to monitor and validate coverage.

To improve the efficacy of dog vaccination programs, GARC has developed two vaccine tracker tools that guarantee accountability for every dose of vaccine and can guide strategic vaccination programs.

With these tools, this is the first time that rabies vaccination programs in many parts of the world can identify and respond to high-risk areas, supported by epidemiological data.

Both tools track each dose of vaccine during a mass dog vaccination campaign and link with the user's personal computer.

GARC Data Logger (GDL)	<p>GARC pioneered the development of a GARC Data Logger, which works independently of mobile networks. It is sturdy and durable, designed for the most challenging environments, including operating in bright sunlight and rain.</p>		<p>What they do.</p> <ul style="list-style-type: none">• Planning vaccination campaigns• Tracking "static point" vaccination campaigns• Tracking "door-to-door" vaccination campaigns
Rabies Vaccination Tracker (RVT)	<p>For less resource constrained environments and programs, GARC developed the Rabies Vaccination Tracker (RVT) as a mobile app-based tracker, which can be downloaded onto a Smartphone.</p>		<p>What they do.</p> <ul style="list-style-type: none">• High-resolution maps• Street-level data resolution• Informative graphics• Vaccination coverage estimates• Ability to track vaccinator efforts

Vaccination trackers deliver real-time information on the dog vaccination campaign allowing vaccination coordinators to review progress and set daily targets and priority areas. The information is accessible from anywhere globally and can be shared via secure portals, should external technical expertise be sought.

2019 Case Study: Technical Support to Namibia

The Namibian government initiated a national rabies control program, which has been operational since 2017. During the early phases of the project, paper-based forms were used to collect vaccination data for each animal during the various vaccination campaigns. This approach, however, often resulted in data that were inconsistent and had to be processed manually using additional software and skilled expertise. This prevented real-time data analyses, which prevented the campaign manager from directing the vaccinators to poorly performing areas that would require repeated vaccinations.

To overcome these limitations and improve monitoring and optimization of the future mass dog vaccination campaigns, the government opted to use the GARC Data Logger (GDL) during the second phase of the national program (2019-2022). The GDL was used in conjunction with the Rabies Epidemiological Bulletin (rabies surveillance system) where the data was uploaded for automatic collation and analyses.

In the case of Namibia, the GARC Data Logger was the preferred choice over both paper-based and mobile phone app systems because of its versatility, ease of handling, and the technical support provided by GARC.

An additional consideration was the one-off cost of the GDL as opposed to the purchase and ongoing data costs associated with a mobile-based app. The initial purchase of 20 GDLs facilitated the tracking of 10557 vaccinated animals in 2019. As there are no additional running costs, this meant that the use of the GDLs only added USD 0,07 per animal after the first campaign. This additional cost per animal vaccinated will continue to decrease as the devices are used in future campaigns.

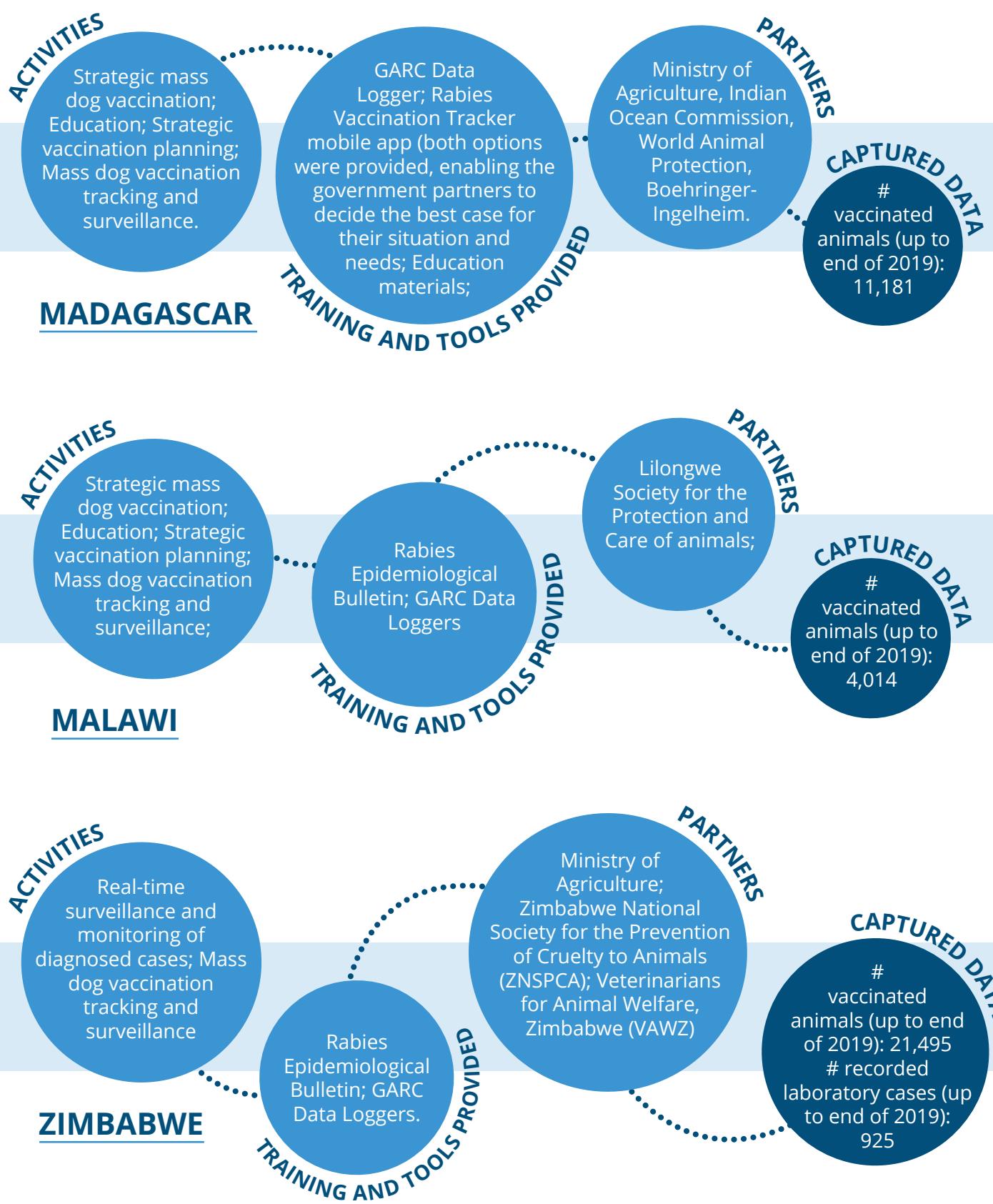
You can find the full scientific publication detailing the use of the GDLs in Namibia here: <https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0008948>

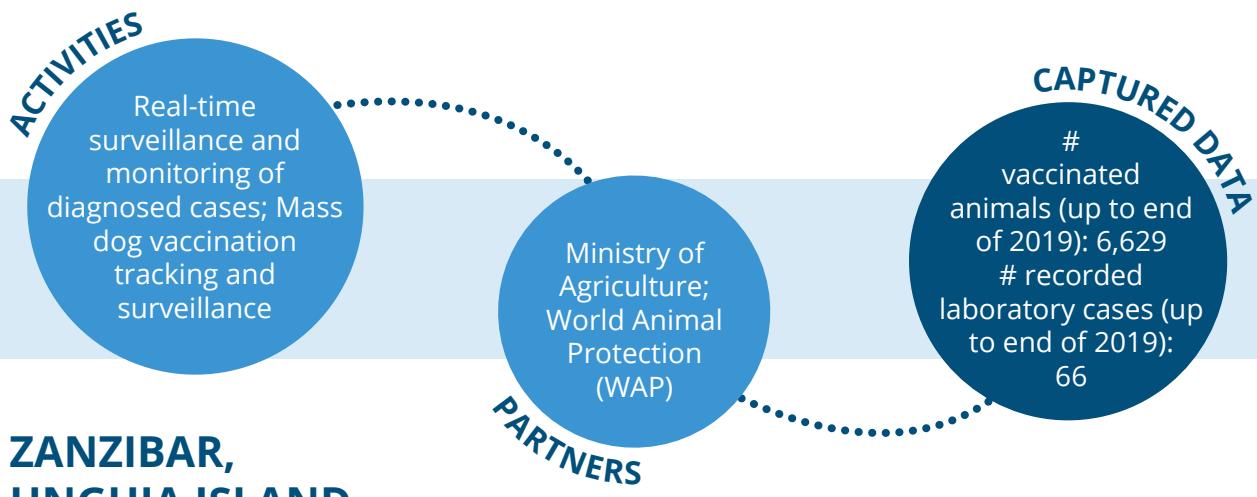
Project partners: Namibian Ministry of Agriculture, Water and Land Reform; the World Organisation for Animal Health (OIE) and the Friedrich Loeffler Institute (the National Institute for Animal Health, Germany).



Image: Vaccination Training Zanzibar

GARC provides technical assistance and responds to requests to support dog vaccination campaigns and improve rabies surveillance across the world. Ongoing support for monitoring and surveillance are part of the package that GARC provides to national programs. In 2019, our work included physical training in best practice and lessons learnt in the following locations:





ZANZIBAR, UNGUJA ISLAND



Image: Fixed-point dog vaccination campaign Madagascar

Problem statement:

Human rabies post-exposure prophylaxis (vaccine and immune globulin) is extremely expensive and is often unavailable in many developing countries. Typically, vaccine is available only in major centers and large hospitals and does not reach rural areas where it is often needed the most. Due to the excessive costs (the vaccine itself and the indirect costs like travel), poor patient management, lack of systematic reminders and other limitations, victims do not complete their full course of PEP, thus reducing the effectiveness of the intervention.

Global Strategic Plan Outcome:

1.3: Human Deaths from rabies exposure are prevented by ensuring equitable, affordable, and timely access to healthcare, medicines, and vaccine.

GARC's work in 2019:

Activity 1.3: Expanding Access to Vaccines

Timely, appropriate prophylaxis is almost 100% effective in preventing deaths from rabies. In June 2019, GAVI, the international organization responsible for routine immunization of over 822 million children across the world, announced that it would widen its portfolio to include human rabies vaccines as of 2021.

This is an essential step to achieve the “Zero by 30” goal and ensure equitable, affordable access to the poorest endemic regions of the world. GARC has actively supported the inclusion of human rabies vaccine into GAVI’s portfolio by contributing operational research and fostering collaborative efforts to demonstrate the commitment from the rabies community to this outcome.

Gavi’s support will include scaling up rabies PEP in countries where GAVI runs other vaccine programs. The greater availability and more targeted use of human rabies vaccines will affect supply chain management and therefore contribute to strengthening health systems, universal health coverage and ultimately, less out-of-pocket expenditure for people exposed to rabies.

Activity 1.3: Leverage existing tools to support the prudent use of PEP and RIG by health services.

Following requests from health professionals, GARC developed the Rabies Healthcare Certificate (RHC) to provide training to health care professionals on appropriate rabies treatment. The RHC is the fourth course available on the GARC Education Platform and incorporates the updated guidance from the WHO, which revised its position on rabies vaccines in 2018 to ensure the availability of safe, cost-efficient techniques for pre-and post-exposure vaccination in all countries. The certificate details these comprehensive guidelines in a concise, organized and easily understandable course, facilitating rapid uptake and better comprehension of complex themes. The RHC was launched in December 2018 and by December 2019, there were 135 graduates.

Activity 1.3: Engaging in bite prevention education and IBCM as strategies to reduce biological usage and forecast vaccine needs.

In 2019, GARC developed, tested, and rolled-out a Community-Based Rabies Surveillance System (CBRS). GARC’s Integrated Bite Case Management (IBCM) system allows for coordinated action following the identification of a potential rabies case. Both human and animal suspect rabies cases can be identified and tracked, whilst also being linked with one another (i.e. the bite victim is linked with the biting animal through the system). The automated SMS and email alerts serve to direct different expert teams to specific at-risk locations where an investigation and emergency intervention can take place, including strategic vaccination of dogs and education of the population.

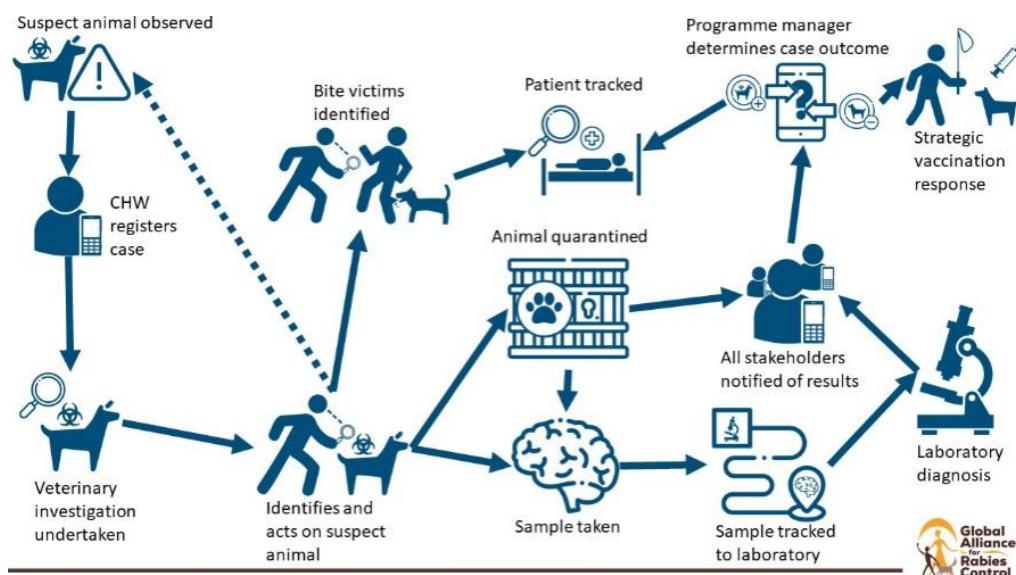


Image: GARC’s Community-Based Rabies Surveillance System

The approach improves PEP compliance by sending mobile text message reminders to the patient to attend the clinic for their treatment and assists the medical team by providing automated guidance as to the appropriate multi-dose vaccination schedules. Through these measures, it helps to reduce biological usage and wastage. For the animal health sector, the system tracks suspect animals through investigation, quarantine, laboratory diagnosis and final case outcome, providing data that will allow for either the termination of rabies treatment in the bitten person or immediate mass dog vaccination in the area where the animal was identified.

The CBRS is a specialized surveillance tool that fits into the larger Rabies Epidemiological Bulletin (REB) rabies surveillance system. In line with GARC's vision to enable and empower governments, the CBRS tool is open source (DHIS2) and the data remains the property of the government.

Objective 2: Generate, Innovate and Measure the Impact of Rabies Control Measures.

Efforts to eliminate rabies have been hampered by limited disease surveillance and a lack of harmonization of policies, guidance, and governance. This results in poor coordination between animal and human health and a lack of data to support effective decision-making. Objective 2 seeks to improve harmonization of international guidance and governance; and enable effective decision-making by ensuring the availability of reliable data and refining tools for countries to monitor and report data to strengthen the surveillance capacity and reporting systems.

Problem statement:

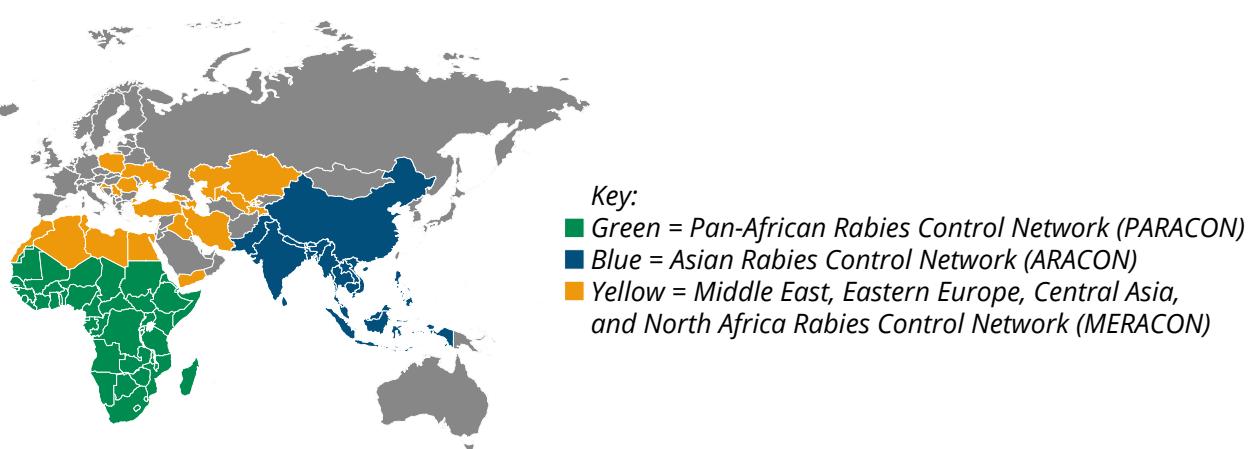
The global rabies community has developed a plethora of tools, resources, and guidelines to facilitate effective rabies elimination efforts. However, national governments lack the training, guidance, and ability to effectively demonstrate progress on a regional or global platform. Furthermore, because of the diverse set of tools available and the lack of a clear means to understand and select the most appropriate tool for the situation, rabies control progress in some countries remains gradual. These challenges are compounded by a lack of regional harmonization.

Global Strategic Plan Outcome:

2.1 Effective policies, guidance and governance are provided.

GARC's work in 2019:

As rabies does not recognize national boundaries, we work with national governments and local communities, supported, and led through three rabies regional networks.



GARC acts as the Secretariat of the three networks and provides ongoing support and capacity building to national governments in rabies endemic regions through the networks.

Activity 2.1: Engaging Countries and stakeholders to adapt existing tools for rabies prevention.

Following the collaboration with the FAO that focused on five West African countries (Côte d'Ivoire, Ghana, Guinea, Liberia and Senegal) in 2018, GARC undertook a focused capacity-building workshop to build upon the foundations already set in 2018 and continue to drive progress in the West African region in 2019.

The 2nd GARC-World Animal Protection rabies stakeholder workshop under the auspices of the Pan-African Rabies Control Network (PARACON) was held in Accra, Ghana, on 26 and 27 November 2019.

Government-nominated rabies focal persons from both the animal and human health sectors from the following countries participated in the workshop: Benin, Cote d'Ivoire, Gabon, Ghana, Liberia, Nigeria, and Sierra Leone.



Image: 2nd GARC-World Animal Protection Rabies Workshop, Ghana

The focus of this workshop was to provide a select number of West African countries with targeted support – specifically in the use and implementation of the recently developed rabies control tools. The workshop included training on the Rabies Epidemiological Bulletin, and other novel tools, including the Rabies Vaccination Tracker and Rabies Treatment Tracker. The final session of the workshop focused on Dog Population Management (DPM) and was led by World Animal Protection, a leading international animal welfare NGO.

In June 2019, in lieu of an ARACON network meeting, GARC helped organize a rabies meeting coordinated by the South Asian Association for Regional Cooperation (SAARC). Over 72 participants, including representatives of animal health, human health, and the wildlife/municipal sector from the seven rabies-endemic SAARC Member States, participated.



Image: South Asian Association for Regional Cooperation (SAARC) Meeting

The GARC team also carried out in-country Stepwise Approach towards Rabies Elimination (SARE) workshops in Sri Lanka, India and Nepal in advance of the meeting and supported our tripartite partners in facilitating in-country SARE workshops in the remaining Member States through the development of guides and toolkits for workshop facilitators, helping to empower others to conduct these workshops. The workshop mapped the rabies control programs in the SAARC Member states and used GARC tools to identify gaps and support the development of national and regional roadmaps to deliver the global elimination goal of "Zero-by-30".



Activity 2.1. Review existing rabies guidelines/tools to identifying conflicts and gaps.

Over recent years, there has been a proliferation and duplication of tools to support rabies control, with no repository or standard assessment for identifying the best-suited tools for each country's needs.

In response to this, in 2019 GARC with the FAO and US CDC felt it necessary to develop an evaluation matrix to objectively assess tools and highlight their applicability for differing needs. GARC launched a working group at the Partners for Rabies Prevention meeting to coordinate the work, resulting in the creation of the Surveillance and Information Sharing Operational Toolkit for Rabies (SISOT-R) evaluation matrix.

The tools will be scored against 7 critical areas, each containing a subset of detailed questions.

- Accessibility
- Data Collection and Needs
- Data Management and Utility
- Data Storage and Protection
- Flexibility of Tool
- Ease of Use and Training Needs
- Sustainability

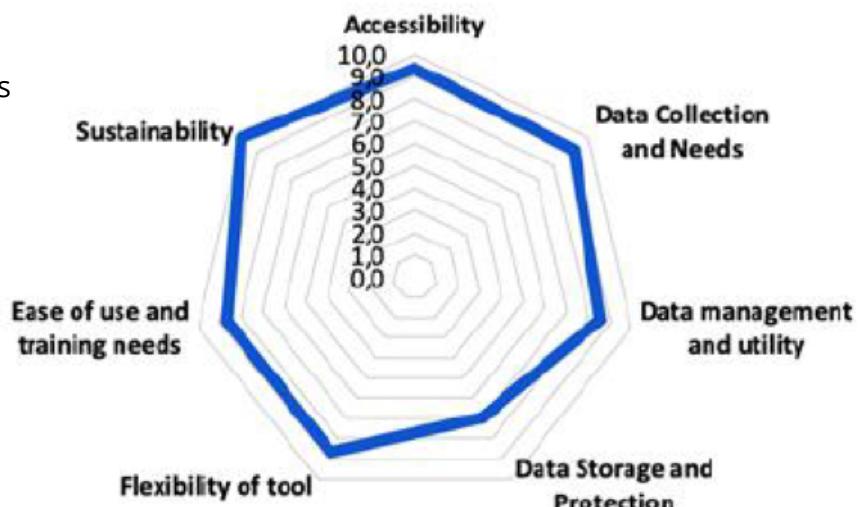


Image: Surveillance and Information Sharing Operational Toolkit for Rabies (SISOT-R) evaluation matrix outputs.

Problem statement:

Governmental stakeholders are often misinformed regarding the rabies situation in their country due to a lack of reliable data that is timely, easily understandable and of sufficient quality to guide their decision-making process. Thus, decisions are often made on poor-quality data, resulting in insufficient or ineffective interventions.

Global Strategic Plan Outcome:

2.2: Reliable data enables effective decision-making supported by appropriate technology and information.

GARC's work in 2019:

Activity 2.2: Engaging stakeholders in innovation in rabies diagnosis.

Rabies surveillance is essential to break the cycle of neglect and deliver Zero by 30. Unfortunately, the surveillance in rabies endemic countries is often limited to the areas close to the laboratories than can test for the disease. The limiting factors include:

- Lack of animal rabies cases being reported from the community.
- Insufficient training on sample collection and rabies diagnosis.
- Insufficient personal protective equipment for field staff doing sample collection.
- Inability to transport the samples to the laboratory.
- Insufficient laboratory reagents.
- Broken laboratory equipment.
- Laboratory distance (the laboratory is too far to transport samples effectively).



Image: RAIDER toolkit – Decentralized Community Surveillance

In 2019, GARC developed the “Rapid In-field Diagnosis and Epidemiology of Rabies” (RAIDER) toolkit to improve rabies surveillance at the community-level.

It draws upon an innovative approach and technology to address limited community surveillance. This is achieved by focusing on four work streams:

1. In-field collection of animal samples for diagnosis.
2. In-field diagnostic screening using an internationally accepted lateral flow device (LFD).
3. Using the GARC mobile phone application to capture and report the diagnostic result.
4. Sending the samples to the nearest diagnostic laboratory for confirmatory testing once an opportunity arises.

GARC worked with the Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe) (Italian health authority) and the UN FAO to refine the RAIDER toolkit. GARC is working with its partners and focal persons to identify an appropriate site to showcase the toolkit.

Problem statement:

It is difficult to accurately measure progress and success without accurate and reliable data. Although many countries are implementing rabies control initiatives, it is challenging to determine the impact and efficacy of those interventions without reliable monitoring and evaluation data. Without accurate and timely data, governments will not be able to declare freedom from rabies, even if their interventions are successful.

Global Strategic Plan Outcome:

2.3: Reliable data allows for constant and consistent monitoring and reporting of progress.

GARC's work in 2019:

Activity 2.3: Engage countries to highlight importance of data reporting and support them to improve.

Coordinated through the regional networks, GARC established a universal rabies surveillance platform.

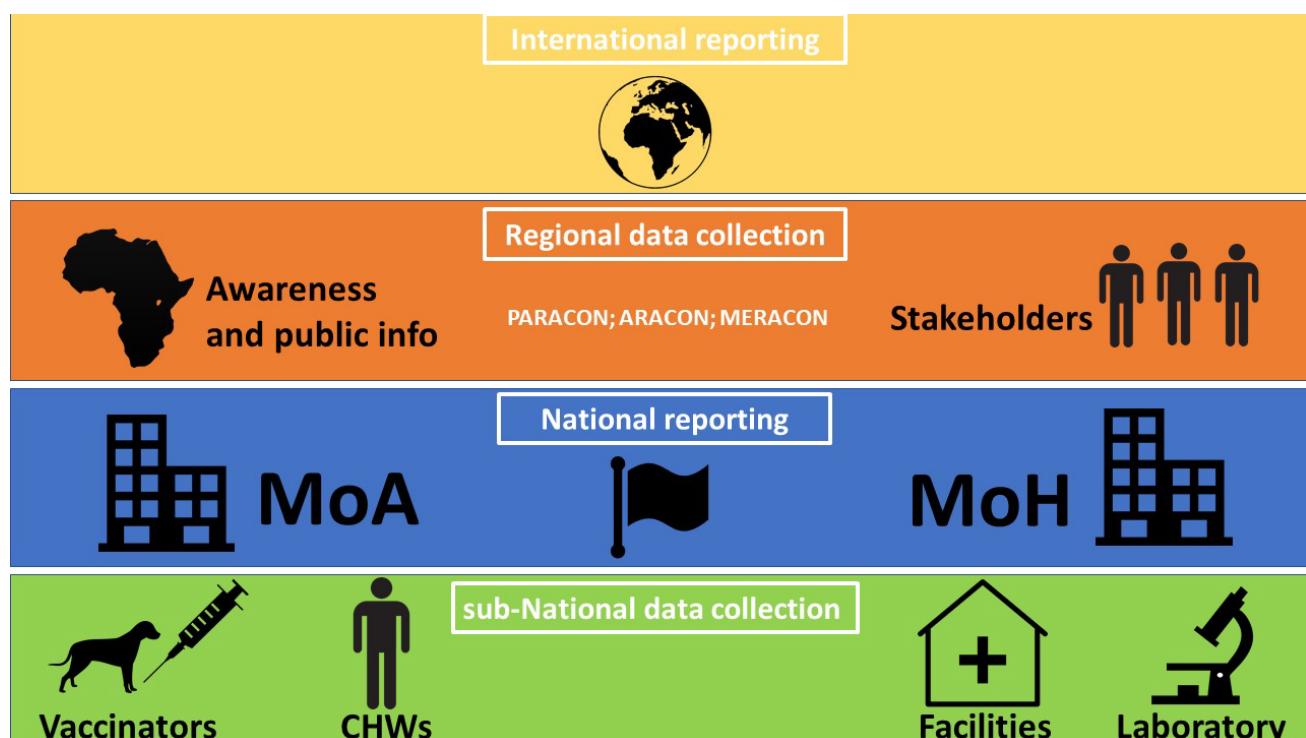


Image: Rabies Epidemiological Bulletin

The Rabies Epidemiological Bulletin (REB) is a web-based rabies surveillance system that over 46 countries, primarily on the African continent, have chosen to use to strengthen their decision-making processes and improve the monitoring of their rabies programs.

In line with GARC's vision to enable and empower governments, the system is open source (DHIS2) and the data remains the property of the government.

GARC, WHO, and FAO have coordinated harmonization of data indicators and data validation to ensure accurate monitoring of progress towards the 2030 goal. GARC has coordinated with these partners for greater interoperability among databases, thus relieving the burden on governments to submit data in different formats to different international organizations. Furthermore, GARC's Rabies Epidemiological Bulletin (REB) and the WHO integrated data platform (WHO Global Health Observatory) were built with the same software used by ministries of health for national health system and surveillance data.

Activity 2.3: Design and disseminate information on surveillance and data collection tools.

In 2019, GARC developed additional tools that fit within the REB to support sub-National data collection. The **Rabies Treatment Tracker (RTT)** supports rabies bite victims throughout their treatment and health professionals in patient management by using SMS reminders to ensure that patients receive their full, life-saving course of treatment and automated patient tracking and advice aspects to the system. The **Community-Based Rabies Surveillance System (CBRS)** allows for coordinated (human and animal health) action following the identification of a potential rabies case, providing a complete rabies surveillance package that tracks bite victims, the biting animal and every step towards the treatment of the patient and the outcome of the rabies case investigation.

Objective 3: Sustain Countries' Commitment and Resources.

The economic cost of rabies is disproportionately borne by the world's poorest and most disadvantaged communities in rural Africa and Asia where health systems are weak and under resourced.

People continue to die of rabies because it is a neglected disease, because their awareness of the disease is limited, because the disease remains uncontrolled in dogs, and because people lack access to basic medical care, such as PEP, following an exposure.

Because resources are scarce and it is the most marginalized that face the greatest risks, it is essential to support multi-stakeholder engagement to assist rabies endemic countries and show the impact of collaborative activities completed in national, regional and global rabies elimination programs.

Problem statement:

Multiple international stakeholders have an interest in rabies elimination, and all contribute towards driving rabies elimination in various countries and regions around the world. However, because of this diversity of stakeholders, efforts and individual agendas are often not aligned and partnerships are not formed, resulting in less effective interventions and support for national governments. International stakeholders should collaborate to achieve a result that is greater than the sum of its two parts.

Global Strategic Plan Outcome:

3.1 Key stakeholders are consistently and comprehensively engaged.

GARC's work in 2019:

Activity 3.1: Design and implement partnership strategies with the public and other sectors.

The Partners for Rabies Prevention (PRP) stakeholders comprise the major international rabies prevention groups including WHO/OIE collaborating centers, research institutes, animal welfare charities and representatives from vaccine manufacturers.

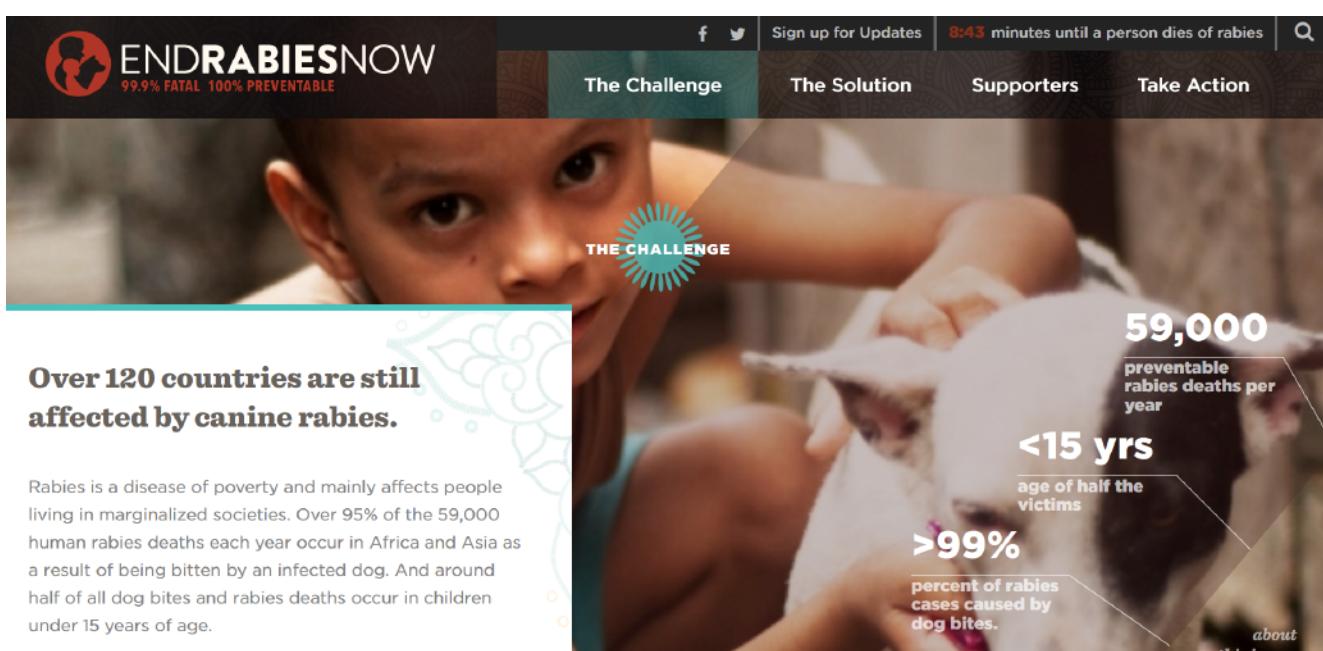
Since 2008, GARC has coordinated the group, and the 2019 Annual Meeting was held in London in July. The PRP explored how these partners could better coordinate tools and individual initiatives across the world. GARC presented the concept of a Surveillance and Information-sharing Operational Toolkit evaluation matrix (SISOT) adapted for rabies. GARC also provided an update on the Global Atlas, a tool under development that will provide information on individual country-based programs, with an intention to improve information and coordination of projects in specific geographic locations.

The PRP emphasized discussions on the engagement of partner organizations and institutions in implementation of the Global Strategic Plan. Each of the 20 partners present was given time to make a personal presentation, which was followed by debate and discussion on the vision and format of future engagement, contribution, and collaboration.

Activity 3.2: Roll out communication campaigns to endemic countries.

GARC launched the End Rabies Now campaign platform in 2015 to secure the commitment of the WHO, FAO and OIE to the goal of zero human deaths by 2030. Having secured our goal and having developed the Global Strategic Plan, GARC offered the platform to the United Against Rabies coalition to coordinate communication efforts. However, due to international institutional restrictions, the offer was not taken up.

In 2020, GARC will explore how to repurpose the platform to engage and inform stakeholders across the rabies endemic world.



Problem statement:

Resource mobilization remains one of the greatest challenges to rabies elimination efforts globally. National governments need to allocate substantial budgets to drive rabies elimination efforts, and these need to be supported with international aid packages that can provide stimulus to efforts where required.

Global Strategic Plan Outcome:

3.2 Efficient and effective use of finances and other resources

GARC's work in 2019:

Activity 3.2: Review mechanisms for resource allocation, cost-sharing mechanisms and fundraising.

The United Against Rabies collaboration established a resource mobilization sub-group to facilitate resource mobilization in support of the delivery of the Global Strategic Plan. The resource mobilization strategy has not been successful in 2019, in part, hampered by individual institutional priorities.

Activity 3.2: Organize regional workshops to engage countries in developing resource mobilization strategies.

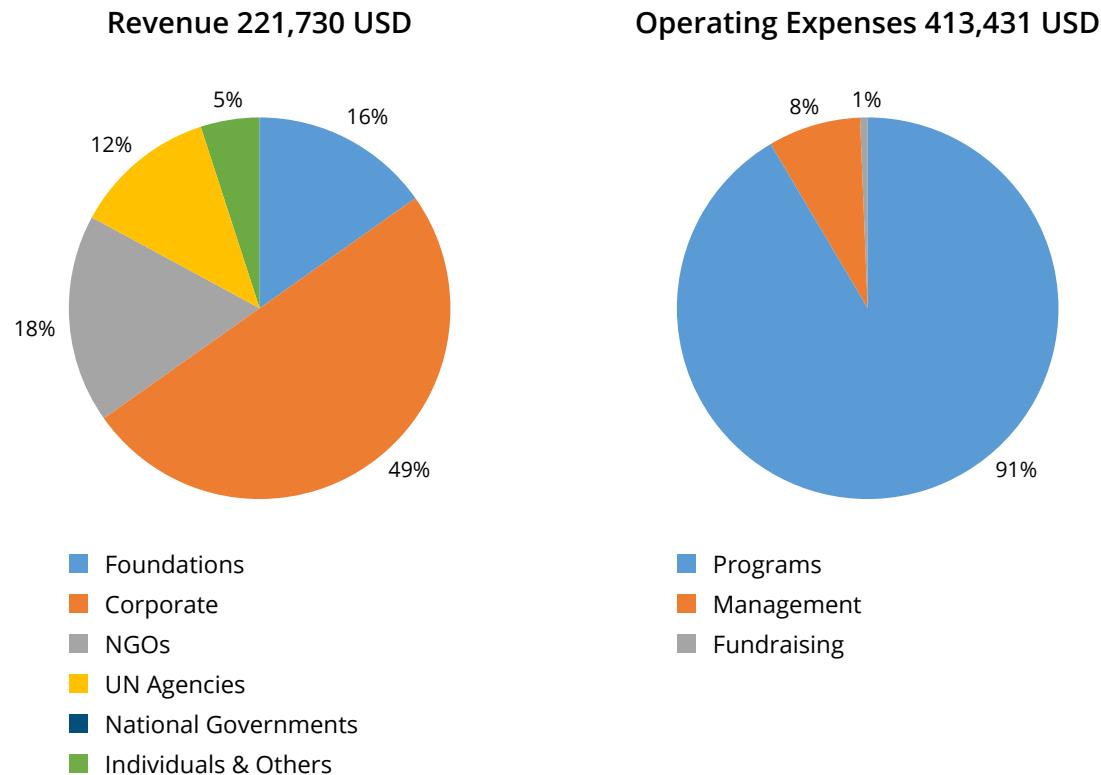
GARC's in-country workshops are designed to support the domestic and international resource mobilization efforts of the national governmental departments responsible for rabies control.

The national work plan generated through the Stepwise Approach towards Rabies Elimination (SARE) tool enables countries to prioritize needs and advocate for resources from their finance department and international donors.

"GARC provide technical assistance to update the national work plan for rabies. The updated plan, which used the SARE tool, allowed the department to advocate for, and receive an increase in funds to combat rabies from the ministry of finance."

Quote from Ivory Coast government rabies focal person.

Financial Accounts 2019



The 2019 revenue was significantly lower than 2018 (916,398 USD) as a major grant ended. This was compounded by the failure of the joint resource mobilization effort of the United Against Rabies collaboration.

In line with the end of the major grant, operating expenditure dropped from 689,454 USD to 413,431 USD. The 2019 shortfall was covered by grant funding that was carried forward from 2018, as well as through the use of GARC's financial reserves.

GARC will seek to reduce its expenditure further in 2020 alongside opportunities to secure additional resources to deliver support to governments and communities across the world. Careful financial stewardship and planning should ensure that GARC can withstand further unexpected outcomes in 2020.

GARC remains committed to the country-centric approach set out in the Global Strategic Plan and will continue to seek resources, alone and in partnership, to deliver support to rabies endemic regions across the world.

GARC's sister charitable organization, the Alliance for Rabies Control, registered in Scotland, United Kingdom in 2019 had an income of 67,068 GBP and expenditure of 85,743 GBP. The shortfall was covered by its reserves.

GARC would like to thank all its supporters and donors who make our work possible and share our Zero by 30 goal.

Publications - The science behind our work

GARC is a science-led organization that seeks to be objective in assessing our impact and work. To support this, we publish the results of our activities and approaches in peer-reviewed scientific journals to help the wider community to learn from our work, as well as to document the challenges that we faced.

In 2019, we published 5 scientific, peer-reviewed articles on our rabies control activities that encompassed health economics, education, surveillance, and epidemiology. Our health economic model supports our wider advocacy activities.

1. Coetzer et al 2019. A Novel Integrated and Labile eHealth System for Monitoring Dog Rabies Vaccination Campaigns. *Vaccines*. Volume 7. Issue 3.
2. Coetzer et al 2019. Epidemiological aspects of the persistent transmission of rabies during an outbreak (2010 – 2017) in Harare, Zimbabwe. *PLoS One*. Volume 14. Issue 1.
3. Amparo et al 2019. Impact of integrating rabies into the curriculum of public elementary schools in Ilocos Norte, Philippines on rabies knowledge and animal bite incidence. *Frontiers in Public Health*. Volume 7. Article 119.
4. Anderson et al 2019. A bioeconomic model for the optimization of local canine rabies control. *PLoS NTD*. Volume 13. Issue 5.
5. Mauti S., Léchenne M., Mbilo C., Nel L., Zinsstag J. (2019) Rabies. In: Kardjadj M., Diallo A., Lancelot R. (eds) *Transboundary Animal Diseases in Sahelian Africa and Connected Regions*. Springer, Cham.

Appendix 1 - Logic Framework for the United Against Rabies collaboration

Objective 1 : Elimination driven by effective utilization of vaccines, medicines, tools and technologies		
Outcomes	Outputs	Major activities
1.1 Rabies is prevented through increased awareness and improved education	1.1.1 Strategies put in place to educate and create awareness for rabies prevention	Establish awareness and educational campaigns Implement dog bite prevention strategies
	1.1.2 Localized tools and strategies created to promote responsible dog ownership	Encourage and educate about responsible dog ownership Conceptualize cultural differences that impact the societal role and value of dogs (e.g. ecology, human interaction)
1.2 Rabies is prevented through increased and effective dog vaccination	1.2.1 National strategies created and capacity improved for dog vaccination programmes	Optimize vaccination strategies Initiate capacity-building for dog vaccination Ensure rabies control strategies reach both confined and free-roaming dog populations Ensure ≥ 70% "at-risk" population coverage
	1.2.2 High-quality dog vaccine banks established and vaccines delivered to countries	Complete design, modelling and validation for stocks and vaccine banks Complete safety and quality checks for vaccine stocks and banks, where relevant Complete inspection of vaccine stocks and banks along supply chain, where relevant
	1.2.3 Countries supported to conduct effective dog vaccination campaigns	Identify and reach previously undetected or hard-to-reach dog populations Ensure appropriate structures and technologies are utilized Ensure efficiency of supply chain Ensure trained personnel are available to respond Implement programmes to match vaccine need with vaccine demand Promote guidelines for effective dog population management
1.3 Human deaths from rabies exposures are prevented by ensuring equitable, affordable and timely access to health care, medicines and vaccines	1.3.1 Improved treatment, and effective prevention, of potential and confirmed rabies exposures in humans	Promote the most safe, efficacious and efficient PEP techniques and IBCM Ensure PEP availability in primary point of care Train staff to assess and manage animal bite cases Employ accurate demand vaccine forecasting techniques Increase access to and affordability of RIG Promote less and fewer out-of-pocket expenditures for individuals Increase palliative care availability for end-stage patients
	1.3.2 High-quality and safe biological banks and stocks for humans established	Complete design, modelling and validation for stocks Establish communications, advocacy and engagement for bank(s) Define bank(s) relationship to supply chain Complete safety and quality checks for stocks Complete systematic inspection of vaccine stocks along supply chain
	1.3.3 Last mile strategy implemented to reach high-risk human populations	Identify and reach underserved human populations Ensure appropriate structures and technologies are utilized Ensure efficiency of supply chain Ensure trained personnel are available to respond Ensure vaccine need matches vaccine demand

Objective 2.1 : Policies, guidance and governance provide support		
Outcomes	Outputs	Major activities
2.1 Policies and guidelines, and governance to prevent human deaths from rabies exposure are created and adopted at regional and national levels	2.1.1 Clear guidance, strategies, priorities and legal frameworks at global, regional and national levels provided to prevent human deaths	Complete WHO and OIE recommendations and FAO guidelines Define guidelines for regulatory framework Update and embed stepwise approach to national rabies elimination policies and plans in line with the global framework Implementation of One Health approach embedded within strong human and animal health services
	2.1.2 Efficient and effective governance of regional and national rabies elimination programmes established	Establish cross-sectoral working group Establish roles, responsibilities and accountability
2.2 Appropriate technology and information are made available	2.1.3 Technology and health innovations to eliminate human deaths from rabies fostered	Incorporate existing tools and leverage existing programmes Promote ICT-based enablers including surveillance tools Promote supply chain innovations Promote innovation into new vaccines and vaccine strategies Promote innovative rapid and sensitive diagnostics Promote dog population management tools (e.g. movement control, contraceptive technology, identification)
Objective 2.2 : Reliable data enables effective decision-making		
Outcomes	Outputs	Major activities
2.3 Progress towards the goal is constantly and consistently monitored and reported	2.3.1 Robust disease surveillance in human and animals established, supported by improved diagnostics procedures	Initiate capacity-building for laboratory diagnostics Train staff in surveillance and diagnostic methods Promote innovative strategies for surveillance and diagnostic methods
	2.3.2 Accurate and comprehensive monitoring for new rabies cases	Identify, define and monitor indicators (e.g. bites, deaths, PEP usages, and clinical and laboratory data) Conduct constant and consistent surveillance of cases Ensure documentation of bite cases Monitor dog populations (e.g. numbers, geography, demographics, vaccination status) Establish and enhance reporting framework and reporting chain Assess baselines to evaluate progress and target responses Conceptualize social factors that negatively affect reporting Identify and reach areas in need of additional support Identify and use shortcomings as teaching and learning opportunities
	2.3.3 Regular and high-quality results reporting on programme impacts	Conduct frequent performance measurements Measure progress towards rabies elimination Showcase proof-of-concept programmes Demonstrate connections between programme and saving human lives Demonstrate cost-effectiveness and return on investment Create and utilize verification dossier for reaching zero human rabies cases Establish “final inch” strategies Generate plans for maintenance of rabies elimination once achieved

Objective 3 : To sustain commitment and resources		
Outcomes	Outputs	Major activities
3.1 Key stakeholders are consistently and comprehensively engaged	3.1.1 Increased stakeholder commitment through effective advocacy	Implement advocacy materials, roadmaps and strategies for all stakeholders Expand the range of and engage unique stakeholders within all sectors
	3.1.2 Sustained advocacy to highlight importance and feasibility of rabies elimination	Establish communications and engagement programmes Promote recognition of rabies as a global public threat and foster goodwill for elimination Generate recognition of dog vaccination as the most effective way to achieve rabies elimination
3.2 Financial and other resources are effective and used efficiently	3.2.1 Funding commitments to reach zero human deaths from rabies ensured and sustained	Complete and utilize vaccine demand modelling, supply landscapes and market economic projections Establish clear resource mobilization strategies Encourage countries to invest their own funds Utilize rabies and programme impacts to leverage success
	3.2.2 Sustainable programme financing strategies created, resources mobilized and use monitored	Generate an adequate supplementary budget and complete costings based on available data Promote and facilitate cost-sharing mechanisms (e.g. PPPs) Identify innovative funding mechanisms Foster synergies with other programmes Identify innovative funding mechanisms
3.3. Activities of the United Against Rabies collaboration are transparently reported to key stakeholders	3.3.1 Results and impact of United Against Rabies collaboration regularly monitored and reported to key stakeholders	Review of United Against Rabies activities in countries and regions using programme indicators Annual review and publication of all activities and budget of the United Against Rabies collaboration

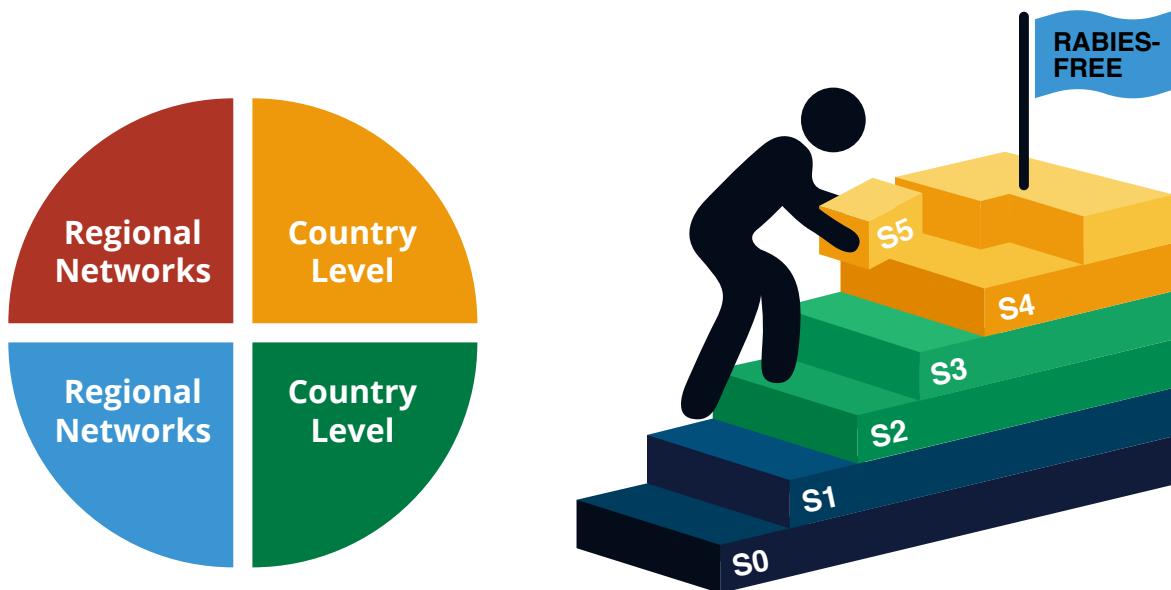
Appendix 2 - Catalyzing national action Supporting countries and their communities

The action-oriented workshops at the national and regional level drive concrete planning, surveillance, and vaccination activities by the national governments.

Inputs	Major Activity	Output	Outcome
Stepwise Approach towards Rabies Elimination (SARE) tool.	Update SARE with latest information from country.	Agreed One Health plans for rabies control through a comprehensive work plan. Prioritization of health system strengthening and capacity building needs.	Progressive pathway toward disease elimination. Improved inter-sectorial and transboundary cooperation.
National delegates provide updated surveillance data.	Updated surveillance data across agencies in the Rabies Epidemiological Bulletin.	Improved surveillance data from both human and animal health.	Improved data to support and drive control and elimination campaigns.
Updated tools.	Participants being introduced to new or updated tools.	Understanding of support available for national control efforts.	National control plans draw upon international community support to deliver more effective programs.

Appendix 3 - Description of Tools

The **Stepwise Approach towards Rabies Elimination (SARE)** tool offers a progressive pathway to control and eliminate the disease at the national and regional levels.



- The SARE tool consists of two components, viz. an assessment component and a work plan creation component.
- Using the SARE, governments can objectively assess the rabies situation across the country according to activities that form part of seven core categories critical to effective rabies control and elimination.
- Once the assessment has been undertaken, the SARE highlights completed and pending activities in a clear summarized form, together with a progress score that is automatically calculated based on the responses and achieved activities.
- In addition to the assessment component, the SARE facilitates the development of a unique work plan that is customizable, enabling national authorities to prioritize the pending SARE activities into a multi-year work plan that is based on clear objectives, responsible authorities and deliverables.
- The work plan helps set out government priorities, enabling government departments to seek funding for clearly defined objectives and deliverables developed using the SARE.
- The SARE exercise is repeated regularly to monitor progress and adapt workplans as a country progresses along the pathway to elimination.



The Global Alliance for Rabies Control is registered in the United States as a 501(c)3, non-profit organization.

It works alongside its sister charity, the Alliance for Rabies Control (no. SC037112), a registered charity in Scotland, United Kingdom.

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