



17<sup>th</sup> Meeting of Rabies Program  
Directors of the Americas

Bogotá - Colombia

12 -14 OCTOBER | 2023



# FINAL REPORT



**PAHO**



Pan American  
Health  
Organization



World Health  
Organization  
REGIONAL OFFICE FOR THE  
Americas

**PANAFTOSA**

Pan American Center for Foot-and-Mouth  
Disease and Veterinary Public Health

**17<sup>TH</sup> MEETING OF RABIES PROGRAM DIRECTORS OF THE AMERICAS  
REDIPRA 17**

*Bogotá D.C., Colombia, 12 -14 October, 2023*

**EXECUTIVE REPORT**

The REDIPRA 17 was held in the city of Bogotá, Colombia, in October 2023, on its fortieth anniversary, with the purpose of discussing the epidemiological situation of rabies in the region, the progress made, the "2024-2030 Regional Plan for the Elimination of Canine Rabies", the mechanism and benefits of obtaining validation/verification of the elimination of human rabies transmitted by dogs and canine rabies, as well as the adherence to and monitoring of the "Regional Program of the Americas for the Prevention and Control of Rabies Transmitted by Hematophagous Bats (*Desmodus rotundus*) In Susceptible Production Animals". Additionally, the meeting addressed the implementation of national pre-exposure prophylaxis (PrEP) policies for human rabies in at-risk populations and the role of the Revolving Fund of the Pan American Health Organization (PAHO).

Representatives from the national rabies surveillance, prevention, and control programs from the health and agriculture ministries of 27 PAHO/WHO member countries in the Americas attended this meeting. The countries included Argentina, Belize, Bolivia, Brazil, Canada, Colombia, Costa Rica, Cuba, Chile, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, the United States, and Venezuela. Also, rabies experts, observers from intergovernmental institutions, accredited entities from the civil society, accredited entities from the productive and commercial sectors, research institutes, universities, international agencies for technical and financial cooperation, technical professionals, and others participated in the meeting.

Technical documents were developed prior to the meeting to support the technical discussion promoted in REDIPRA17: The proposal for updating the "Regional Plan for the Elimination of Canine Rabies in the Americas," the "Report on the Rabies Situation in the Americas 2017-2022," and the "Report on Herbivore Rabies Programs 2021-2022." The documents were uploaded to the meeting's website, and country delegates had access days before the meeting.

With the agenda proposed and approved by the country delegates, throughout the meeting, data were presented for sessions that sparked discussions among the delegates and recommendations for each of the main topics for the Americas region. Ten recommendations were developed during REDIPRA17 for national programs:

- Recommendation 1. Adhere to and monitor the "Regional Plan for the Elimination of Canine Rabies 2024-2030" by the countries: details about the discussion and conclusions are presented in Session 6 of the Detailed Report.
- Recommendation 2. Adhere to and monitor the "Regional Program of the Americas for the prevention of rabies transmitted by hematophagous bats (*Desmodus rotundus*) in susceptible production animals": details about the discussion and conclusions are presented in Session 4 of the Detailed Report.
- Recommendation 3. Establish/strengthen national policies to prevent attacks and administer pre-exposure prophylaxis for human rabies transmitted by the *D. rotundus* (and other wild species) for populations in condition of vulnerability of at-risk areas of the countries: details about the discussion and conclusions are presented in Session 5 of the Detailed Report.

- Recommendation 4. Urge the countries to report to the SIRVERA new cases of human and animal rabies and update the data related to the implementation of programs: details about the discussion and conclusions are presented in Sessions 2, 4 and 6 of the Detailed Report.
- Recommendation 5. Consider the timely (time and quantity) use of the Revolving Fund for the procurement of the necessary immunobiologicals and supplies for national rabies programs: details about the discussion and conclusions are presented in Session 8 of the Detailed Report.
- Recommendation 6. Sustain the support from PAHO/WHO Collaborating Centers for strengthening laboratory diagnosis in the countries, jointly with PANAFTOSA/VPH-PAHO/WHO: details about the discussion and conclusions are presented in Session 3 of the Detailed Report.
- Recommendation 7. Urge the countries to request validation/verification of the elimination of dog-transmitted human rabies and canine rabies, in line with the timeline suggested by them: details about the discussion and conclusions are presented in Session 7 of the Detailed Report. The Table 1 presents the established dates for the countries:

*Table 1. Definition of dates in which countries will undergo validation for the elimination of dog-transmitted human rabies and canine rabies by 2030.*

<b>Validation</b>	<b>Countries</b>	<b>Year</b>
Yes	Nicaragua, Uruguay.	2024
Yes	Bolivia, Chile, El Salvador, Honduras, Perú.	2025
Yes	Argentina, Brazil, Costa Rica, Ecuador, Jamaica, Trinidad & Tobago.	2026
Yes	Belize, Cuba, Guatemala, Panama.	2027
Yes	Paraguay, Dominican Republic, Venezuela.	2028
Yes	Colombia	2030
Pending of confirmation	Guyana, Haiti, Suriname.	NA
Not applicable	United States, Canada.	NA
Certified validation -2019	Mexico.	Sustainable

- Recommendation 8. Urge the countries attending the REDIPRA 17 to collaborate, under PANAFTOSA/VPH-PAHO/WHO coordination, in the actions of programs for dog-transmitted human rabies in Haiti, Venezuela and Bolivia: details about the discussion and conclusions are presented in Session 9 of the Detailed Report.
- Recommendation 9. Urge all the involved players to apply the “One Health” concept in rabies surveillance, prevention and control: details about the discussion and conclusions can be observed in all sections of the meeting, with practical examples presented at Session 1 of the Detailed Report.
- Recommendation 10. Acknowledge Colombia and its representative institutions for their commitment with the REDIPRA 17, to PAHO’s Representative of Colombia for the unwavering support and to the regional experts for their technical support in the meeting.

RECOMMENDATIONS

17TH MEETING OF RABIES PROGRAM DIRECTORS OF THE AMERICAS  
REDIPRA 17

Bogotá D.C., Colombia, October 12-14, 2023

**RECOMMENDATION 1. Regional Plan for the Elimination of Canine Rabies in the Americas 2024-2030.**

1. Adhere to and monitor the “Regional Plan for the Elimination of Canine Rabies 2024-2030” by the countries.
2. Maintain technical cooperation – including virtually - from PANAFTOSA/VPH-PAHO/WHO to the countries, giving priority to Haiti, Venezuela and Bolivia, in coordination with PAHO/WHO Collaborating Centers and other involved players.
3. Promote/strengthen surveillance and control strategies for rabies at border areas, enabling joint actions among countries with technical cooperation from PANAFTOSA/VPH-PAHO/WHO and other relevant players.
4. Review/update/elaborate the legislation and protocols of national programs, considering the need for intersectoral collaboration, with technical cooperation from PANAFTOSA/VPH-PAHO/WHO and other relevant players.

**RECOMMENDATION 2. Regional Program of Rabies in Domestic Herbivores of the Americas.**

1. Adhere to and monitor the “Regional Program of the Americas for the prevention of rabies transmitted by hematophagous bats (*Desmodus rotundus*) in susceptible production animals”.
2. Establish/strengthen national programs of rabies transmitted by hematophagous bats in production animals, headed by Official Veterinary Services as competent authority with the possibility of involving other stakeholders, with the technical support of PANAFTOSA/VPH-PAHO/WHO and other involved players.

**RECOMMENDATION 3. National policies to prevent attacks and administer pre-exposure prophylaxis for human rabies transmitted by the *D. rotundus* (and other wild species) in vulnerable populations of at-risk areas.**

1. Establish/strengthen national policies to prevent attacks and administer pre-exposure prophylaxis for human rabies transmitted by the *D. rotundus* (and other wild species) in vulnerable populations of at-risk areas of the countries reporting attacks (Bolivia, Brazil, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Nicaragua, Panama, Peru, and Venezuela), with the technical support from PANAFTOSA/VPH-PAHO/WHO and other involved players.

**RECOMMENDATION 4. Regional Information System for the Epidemiological Surveillance of Rabies (SIRVERA).**

1. Recognize as adequate the updates presented by PANAFTOSA/VPH-PAHO/WHO for the SIRVERA, as a tool to support the management of national programs.
2. Urge the countries to immediately report to the SIRVERA new cases of human and animal rabies and update the data related to the implementation of programs.

**RECOMMENDATION 5. PAHO Revolving Fund.**

1. Consider the timely (time and quantity) use of the Revolving Fund for the procurement of the necessary immunobiologicals and supplies for national rabies programs.
2. Consider options for the creation of a solidarity mechanism supporting the supply of immunobiologicals and supplies for the elimination of dog-transmitted human rabies, prioritizing Haiti, Venezuela and Bolivia.

**RECOMMENDATION 6. PAHO/WHO Collaborating Centers for Rabies in the Region of the Americas.**

1. Recognize the essential role of PAHO/WHO Collaborating Centers for rabies in the Region of the Americas.
2. Sustain the support from PAHO/WHO Collaborating Centers for strengthening laboratory diagnosis in the countries, jointly with PANAFTOSA/VPH-PAHO/WHO.

**RECOMMENDATION 7. Validation/verification of the elimination of dog-transmitted human rabies and canine rabies (including historically free countries).**

1. Urge the countries to request validation/verification of the elimination of dog-transmitted human rabies and canine rabies, in line with the timeline suggested by them (see Detailed Report XXX), through the mechanism developed by PAHO/WHO with technical support from PANAFTOSA/VPH and other involved players.
2. Define a mechanism for validation/verification of the absence of dog-transmitted human rabies and canine rabies, specific for historically free countries with technical support from PANAFTOSA/VPH and other involved players.

**RECOMMENDATION 8. Proposal for the elimination of dog-transmitted human rabies, prioritizing Haiti, Venezuela and Bolivia.**

1. Urge the countries attending the REDIPRA 17 to collaborate, under PANAFTOSA/VPH-PAHO/WHO coordination, in the actions of programs for dog-transmitted human rabies in Haiti, Venezuela and Bolivia, in line with the suggested proposals (see final report).

**RECOMMENDATION 9. One Health.**

1. Urge all the involved players to apply the “One Health” concept in rabies surveillance, prevention and control in line with national and regional policies, particularly PAHO/WHO’s “One Health” policy.

**RECOMMENDATION 10. Acknowledgements.**

1. Acknowledge the Minister of Health and Social Protection (MSPS) and the Colombian Agricultural Institute (ICA) of Colombia, for their commitment with the REDIPRA 17 as well as their hospitality during the stay in the city of Bogotá and the Pan American Health Organization, through its Representative, Dr. Gina Tambini, and all her team, particularly to Dr. Guillermo González for the unwavering support.
2. Express special gratitude to Dr. Charles Rupprecht and Dr. Sergio Recuenco, for their unwavering, constant and invaluable support in the fight against rabies in the Americas.

(Approved in the plenary session of October 14, 2023)

## DETAILED REPORT

## OPENING CEREMONY

The ceremony was presided over by Dr. Guillermo Alfonso Jaramillo Martínez, Minister of Health and Social Protection (MSPS) of Colombia; Dr. Diana Lucía Villamil Torres, representing Dr. José Fernando Roa Ortiz, General Manager of the Colombian Agricultural Institute (ICA); Dr. Gina Tambini, Representative of the Pan American Health Organization (PAHO/WHO) in Colombia; and Dr. Ottorino Cosivi, Director of the Pan American Center for Foot-and-Mouth Disease and Veterinary Public Health (PANAFTOSA/VPH-PAHO/WHO).

PAHO/WHO representative in Colombia and PANAFTOSA/VPH-PAHO/WHO director welcomed and expressed their gratitude for the presence of the attendees and highlighted the ongoing efforts made by the countries of the Americas to achieve the goal of eliminating dog-transmitted rabies. Different strategies have been implemented compliant with the guidelines of the World Health Organization (WHO), adapted to the conditions of each country of the Americas, which allowed to strengthen surveillance, prevention, and control programs. Although rabies is still considered a neglected infectious disease among the most vulnerable and marginalized populations in conditions of poverty, with 40% of its victims being under the age of 15, a significant number of countries have succeeded in reducing cases of dog-transmitted human rabies and canine rabies, and in controlling rabies in wild animals. Mexico was highlighted as the country that achieved the goal of eliminating human rabies transmitted by dog bites, receiving WHO certification in 2019. Historically, neglected tropical diseases (NTDs) have affected marginalized communities in conditions of poverty, imposing a global economic and social burden, particularly in tropical regions. Despite challenges such as political instability in the countries, natural disasters, climate change, and other relevant factors predisposing to the emergence of various diseases, the WHO has been working on the fight against NTDs since 2007, issuing its first roadmap in 2012, updated in 2021, to end the neglect and achieve the Sustainable Development Goals: "*A Roadmap for Neglected Tropical Diseases 2021-2030*".

Similarly, PAHO has officially endorsed the work made on NTDs since 2009 and, in 2013, provided political support to the regional initiative. Starting in 2014, the strategic plan was created and in place until 2019, the year in which the Elimination Initiative 30+ was approved: "*A policy for an integrated and sustainable approach to communicable diseases in the Americas*", aiming to eliminate more than 30 communicable diseases and related conditions by 2030, including dog-transmitted rabies and canine rabies.

Government authorities from the MSPS and the ICA of Colombia emphasized the significance of rabies in the country since the 1950s and the effort that, over the years, led to the reduction of human and animal cases. Currently, the implemented measures achieved the control over human and canine rabies. However, it is crucial to continue conducting prevention and control in the region to avoid the emergence of new cases. Regarding rabies from wildlife origin, vaccination of cattle has been implemented, leveraging from foot-and mouth disease vaccination cycles. Joint efforts of all the countries of the region for the control of rabies can strengthen the shift in the perspective of the disease and benefit populations, particularly those in vulnerable conditions, mainly at border points where migrations are currently evident. This contributes to progressing towards the goal of eliminating dog-transmitted human rabies, canine rabies, and controlling rabies transmitted by wild animals.

They concluded by extending a warm welcome to all the participants.

Next, the certificate was presented to the Minister of Health of Colombia, recognizing his female dog Pink as the official pet of the 17th Meeting of the Rabies Program Directors of the Americas.

## OPENING SESSION: ELECTION OF CHAIRPERSON AND RAPORTEURS

The REDIPRA 17 was started, and the session proceeded with the introduction of participants representing 27 member countries of PAHO/WHO in the Americas from the health and agriculture sectors. Subsequently, the representative from Guatemala, Dr. Leila Camposeco, president of REDIPRA 16, handed over the presidency to Colombia, represented by Dr. Stephany Yepes (MSPS of Colombia). Additionally, Argentina and El Salvador volunteered to serve as rapporteurs.

## PLENARY SESSIONS

### SESSION 1. REPORT OF THE SECRETARIAT

Marco Vigilato, PANAFTOSA/VPH/PAHO/WHO

The report on the '*Update of Technical Cooperation Activities of the Regional Rabies Program in the Americas*' from 2017 to the present was presented, based on the recommendations of the last REDIPRA 16 held in Guatemala. Additionally, the work carried out by PANAFTOSA/VPH/PAHO/WHO on cooperation actions through the Zoonosis Unit for canine and wildlife rabies was highlighted.

Over the past 40 years, the historical perspective of the REDIPRA as a governance mechanism has involved the review of strategies outlined in the Regional Plan for the Prevention of Human Rabies. It has recommended actions to national control programs in the countries to ensure the process of eliminating dog-transmitted rabies and reducing the risk of rabies transmitted by wildlife species in the Americas.

During the last meeting held in Guatemala in 2017, ten recommendations were defined, and the technical cooperation activities carried out by PANAFTOSA/VPH/PAHO/WHO with various countries were presented, focused on strengthening surveillance, prevention, and control programs for rabies transmitted by dogs, herbivores, and wildlife, diagnostic and genetic sequencing capacity; laboratory surveillance; cross-border actions, and estimation of dog population; the support through the Revolving Fund for immunobiologicals; and encouraging support for the donation of rabies vaccines for dogs and cats in countries where they are unavailable for different reasons.

Mexico was spotlighted during the period between REDIPRA 16 and the current meeting, specifically in the years 2018 and 2019. During this time, Mexico consolidated information and analysis, leading to its recognition as the first country in the world to validate the elimination of dog-transmitted rabies. The secretariat provided technical cooperation to support the country in achieving this milestone. Other countries were encouraged to continue working towards this goal. However, in some nations, technical reviews have already been conducted with Paraguay, Ecuador, Brazil, and recently with Argentina, to achieve the validation process.

During the COVID-19 pandemic, seven virtual meetings were held to continue the program's work, with the participation of the countries. In these meetings the monitoring of rabies control activities was reviewed, particularly the implementation of vaccination campaigns during the pandemic, rabies in production animals and hematophagous bats; epidemiological surveillance and estimation of dog population, and examples from Peru, Argentina, Nicaragua, and Brazil, among others, were presented.

Finally, this year the free, updated and certified *Virtual Course for Rabies Prophylaxis* was made available, with more than 14 thousand participants in less than one year, and the importance of continuing to encourage the countries to promote this educational process was emphasized.

### 1.1 Dialogue among delegates.

The countries showed their appreciation for the technical cooperation provided by PANAFTOSA/PH/PAHO/WHO during this period of time for the strengthening of national rabies programs, particularly the cross-border work and the mediation between the countries following the recommendations of the REDIPRA 16. Some countries emphasized the need to work at the borders through joint actions, and they had the opportunity to build closer ties during the meeting. Besides, during the COVID-19 pandemic, continuous support was provided to the countries, which received important virtual guidance regarding rabies and other zoonoses. Mexico thanked PANAFTOSA for the ongoing collaboration in the process leading to validate the elimination of dog-transmitted human rabies and the post-validation follow-up provided to the country. Other countries also expressed their gratitude for the support received to date in the advanced work to achieve the goal of eliminating human rabies. The need to continue strengthening the wildlife rabies programs was emphasized. Additionally, the significant progress of the countries was highlighted regarding the process of reporting cases and program management through the Regional Information System for the Epidemiological Surveillance of Rabies of the Americas (SIRVERA).

## SESSION 2. ANALYSIS OF THE EPIDEMIOLOGICAL SITUATION OF RABIES IN THE AMERICAS - 2017 TO 2022

*Lia Buzanovsky, PANAFTOSA/PH/PAHO/WHO*

The epidemiological pattern of dog-transmitted human rabies in the region of the Americas from 1970 to 2019 showed a total of 6,818 human cases of dog-transmitted rabies by all variants, with a substantial decrease of more than 94% when comparing the 1970s with the 2010 - 2019 period (2,495 to 139 cases), using data recorded in the SIRVERA as the source of information. Due to the efforts and work carried out by countries over decades, adopting strategies such as annual mass vaccination campaigns with at least 80% of dogs vaccinated, effective care for exposed individuals, and ensuring the quality and availability of immunobiologicals for both humans and animals, as well as strengthening surveillance and laboratory diagnostic capabilities, health education, and responsible animal ownership, a significant reduction in human cases was observed in 2000, proportional to the decline in rabies cases in dogs by the canine variant. Between 2010 and 2019, only 10 countries reported human cases, while in the last three years (2020-2022), three countries reported human cases transmitted by dogs (Bolivia, Cuba, and Haiti).

From 2000 to 2022, bats were responsible for causing 339 human cases compared to 387 cases caused by dogs, particularly affecting vulnerable populations with limited access to medical care, often in remote areas. Where bats positive for rabies were identified, cases in cats were proportionally observed. In areas without evidence of canine variant circulation, there are 3 to 4 times more cases in cats than in dogs, largely due to the behavior of cats and their contact with bats in urban areas. Data provided by the countries in the system shows the number of cases in dogs in these countries: between 2017 and 2022, cases of rabies in dogs in areas with evidence of circulation of the canine genetic variant were six times higher than in areas without circulation. In the latter, cases are caused by occasional contacts of dogs with wildlife infected with other genetic variants of the virus.

From 2017 to 2022, a total of 9,351 rabies outbreaks were reported, with 12,169 cases in production animals such as cattle and horses. Among these, 97.4% of the cases occurred in areas inhabited by the hematophagous bat *Desmodus rotundus*, the main vector responsible for transmitting rabies to domestic animals and humans in rural and wild environments. In addition to bats, other wild animals are crucial for understanding the disease dynamics, especially raccoons, opossums, foxes, monkeys, mongooses, and wild canids. Cases in these species are widely distributed in the Americas, with specific genetic variants that can lead to cases of reverse transmission to domestic animal populations, such as dogs. Regarding epidemiological surveillance in the countries of the Americas, in the last six years, 659,194 animal samples were processed for rabies diagnosis, with a positive result of 5.6%, although the reported number of samples analyzed has been decreasing since 2018.



The most affected years were 2021 and 2022 due to the COVID-19 pandemic. Strengthening of epidemiological surveillance is expected in the countries of the Americas. In this regard, dog vaccination campaigns have achieved coverage of more than 196 million dogs and nearly 36 million cats vaccinated by the public sector in the last 6 years. Additionally, 2.5 million post-exposure prophylaxis (PEP) treatments were administered to humans, with 76% of the protocols conducted for exposure to dogs. All these efforts and work by the countries of the Americas have resulted in progress, allowing many to begin the process of validating the status of being free from dog-mediated human rabies.

## **2.1 Dialogue among delegates.**

Key points to highlight from this analysis include the efforts and commitment of the countries in reducing human rabies cases and sustaining these efforts over time; the management carried out by sectors responsible for public health work, complemented by the health and agricultural sectors; the strengthening of programs, particularly epidemiological surveillance of rabies; and preventive actions such as mass vaccination campaigns against rabies, which have been valued and have yielded results over the years. Likewise, challenges related to animal surveillance, the need for improved periodic reporting from countries, and intersectoral collaboration, especially with the environmental sector, are also important. Delegates emphasized the importance of maintaining the reporting of cases and negative tests in humans and animals to enable regional analyses and highlight the efforts made in the surveillance and identification of needs for strengthening and disease characterization, with a regional perspective. Updated data enables broader analyses for decision-making in public policies. There was a highlight on the importance of more detailed descriptions of human cases to precisely identify the conditions leading to their occurrence.

The role of cats in the increasing number of rabies cases over the last six years and their relevance in human transmission was discussed, as well as the clinical management of people exposed to these animals and the post-exposure regimen along with the need of reinforcing education of healthcare personnel and the general population, case capture and clinical management of attacked patients, since the risk of becoming a human case of rabies increases when prophylaxis fails. The perception of rabies risk from contact with cats is lower than the perception of risk from contact with dogs, therefore, it is necessary to continue with the awareness process among the population regarding cats and their key role in transmission. The handling of immunobiologicals, including cold chain preservation, was analyzed as well as the implementation and surveillance of events supposedly attributable to vaccination or immunization (ESAVI) which can occur after vaccination or immunization, although there have been no reports of such events in any of the countries in the Americas. It is worth noting that the Expanded Immunization Programs (EPIs) in place in the Caribbean and Latin American countries oversee rabies immunobiologicals. Some countries use immunobiologicals from the private sector, and it is important to ensure they adhere to the relevant guidelines for proper storage management.

One of the most significant limitations is the access to marginalized areas at risk of rabies from wild animals, necessitating the development of educational strategies to increase risk perception in populations in vulnerable conditions. In terms of surveillance, some countries highlighted the strategies implemented for intersectoral surveillance, involving the capture of wild animals for diagnosis of other public health events of interest, particularly yellow fever, which could reinforce surveillance for rabies. Additionally, there was emphasis on the need to strengthen surveillance efforts for rabies in bats in urban areas due to their widespread geographic distribution and direct contact with domestic animals. Some countries mention the need to strengthen the surveillance of rabies in wild animals such as foxes, with evidence of viral circulation of the canine variant concentrated in specific areas (Colombia and Brazil). This increases the risk of sharing the disease with other animals, primarily dogs, potentially limiting the validation of rabies elimination in the country. This calls for other countries to share their experiences with surveillance, prevention, and control strategies to coordinate processes of technical cooperation, expert intervention, and collaborative efforts across sectors in each country.

Some countries expressed interest in studying the implementation of oral vaccines for rabies control in wild canid populations. Countries with experience in actions using this strategy emphasized the need for significant resource investment and preliminary studies to determine epidemiological and environmental characteristics, risks, species involved, and potential impacts. They recommend exploring this possibility only in countries that have already eliminated canine rabies, which causes the major impact, as a complementary or alternative action.

Regional experts agree that this is a highly heterogeneous analysis of the epidemiological situation of rabies in the countries of the Americas which should result from a comprehensive approach from the sectors of human health, animal health, and their environments, linked to the governance of countries and technical cooperation actions. Over the six years of analysis, the occurrence of more than five million cases of exposure and aggression in the continent is highlighted, with 614,000 people receiving post-exposure prophylaxis (almost 12%) depending on the regulations of the countries, the classification of the aggression and exposure, the periodicity of reports (weekly, monthly, or without reports), and the healthcare provided to the victim. However, it is important to review the issue of bites and the actions taken to prevent exposure, which would lead to a reduction in immunization costs. On the other hand, it is necessary to strengthen epidemiological data consistently and periodically in all countries. Pre-exposure prophylaxis data, with over 148,000 people vaccinated over the six years, deserves better understanding, considering that they may be the result of pre-exposure programs for prevention or occasional prophylaxis.

### **SESSION 3. THE ROLE OF PAHO/WHO COLLABORATING CENTERS ON RABIES IN THE REGION OF THE AMERICAS.**

*Marco Vigilato, PANAFTOSA/PH-PAHO/WHO*

This segment was devoted to PAHO/WHO Collaborating Centers on rabies in the Region of the Americas, whose main activities are to provide cooperation and technical support, deliver training, conduct research, formulate guidelines, and develop new technologies (particularly regarding surveillance and diagnosis) in support of national programs. Two of the four centers were present at REDIPRA 17, Canada and Brazil, who play a significant role in supporting diagnosis and identifying variants, providing scientific advice or expertise, and their international role as reference centers and laboratories for rabies.

#### **3.1 WHO/PAHO Collaborating Center for epidemiology and control of rabies in carnivores.**

The director presented the activities of the Rabies Specialization Center of the Canadian Food Inspection Agency, which has been designated as a PAHO/WHO Collaborating Center since 1992. The center is located in Ottawa, Canada, and serves as the national reference laboratory and the reference laboratory of the World Organization for Animal Health. It has three main areas of action:

- Rabies diagnostic tests in humans and domestic animals, and confirmation of samples from wildlife for suspected animals, contact with humans or domestic animals, suspected human cases, and antigenic and molecular typing of the virus.
- Research and technology development focuses on applied research, with the main drivers being support to the national rabies program through the development of diagnostic tests and epidemiological studies (both at foreign and domestic level) and support to provincial rabies control programs.
- Consultancy services: as a designated national and international reference laboratory and collaborating center, the work with PAHO/WHO is primarily centered on providing materials and specialized knowledge through consultancy services. This collaborating center has a reference collection of virus isolates and monoclonal antibodies, as well as diagnostic conjugates, which are available at no cost once material transfer agreements are completed.

### **3.2 Zoonosis Control Center – CCZ PAHO/WHO Collaborating Center for Training and Research in Urban Zoonoses.**

The director of the Zoonosis Control Center presented the activities carried out as a PAHO/WHO Collaborating Center for training and research in urban zoonoses, designated since 1994 for canine rabies control in São Paulo, southeast Brazil, and the support provided to Brazil and other Latin American countries. Since then, it has received eight designations. It is a public health unit belonging to the municipal health surveillance system, currently known as the Division of Zoonosis Surveillance, which includes a Laboratory for Zoonosis Surveillance and Diagnosis of Vector-Borne Diseases. It provides support to health units in the city of São Paulo and other municipalities in the metropolitan region. The center processes human, animal, and environmental samples and combines existing services for rabies control, rodent control, and health education.

The work plan agreed with PAHO/WHO is currently underway and consists of three activities. The first is related to the establishment of a surveillance and control network for zoonoses, the second involves the development of technical materials on urban zoonoses, and the third is focused on applied research in this field. The actions regarding urban zoonoses, particularly rabies, focus on working with bats in urban areas, researching rabies and bats, conducting activities on animal vaccination, surveillance and monitoring of animal and human contact with bats, and managing animals in zoonosis control centers.

### **3.3 Dialogue among delegates.**

Regarding laboratory diagnosis, heterogeneity was identified in the region, depending on the countries' capacity, processes and needs. Some countries are well-equipped with central laboratories, and there is decentralization across regions, states, departments, or municipalities. In contrast, others have only one laboratory at the central level, some are just implementing and strengthening diagnostic capabilities, and some rely on other laboratories, even in different countries. Laboratory samples for rabies cases and surveillance undergo processing through techniques such as direct immunofluorescence. Some conduct biological tests, molecular tests (RTC-PCR), and genetic characterization of the virus. With respect to diagnostic capacity for human and animal rabies, most countries show organization through a National Reference Laboratory (at the central level). Some have formed a National Laboratory Network, decentralizing diagnosis at the departmental or regional level. While some laboratories confirm cases independently, others require central support and genetic characterization of the virus. Some countries collaborate with different nations for virus characterization. Funding depends on the country's organization and resource management distribution. Regarding sample collection, shipping is coordinated and financed through the laboratory network, sometimes by the nation and in other cases by the states. In some scenarios, diagnosis is strengthened by official veterinary services, in others by the health sector, and in some cases by both sectors.

Some countries expressed a lack of a central reference laboratory, requiring support from private laboratories. In some cases, there is a charge for processing the sample; however, the cost of shipping is covered by the public sector. Some are in the process of implementing diagnosis through the human health sector although a national reference laboratory from veterinary services is available.

In most countries, laboratory surveillance focuses on risk perception or delimited areas at risk of viral circulation, where monitoring is intensified. All countries agree on the guidance for obtaining samples from animals with nervous symptoms, or animals hit by vehicles, dead animals found on the street, among other aspects. In the case of aggressions involving domestic or wild animals, it is necessary to track and channel for obtaining samples for the diagnosis of rabies.

According to the competence of sectors, sample processing is carried out by the health sector for humans, dogs and cats, and in some countries, they process samples from wildlife and occasionally from bats. The agricultural sector processes samples from herbivores, bats and other wildlife for the diagnosis of rabies. However, some countries also process samples from dogs and cats in official veterinary diagnostic laboratories.

Strengthening laboratory surveillance in the countries of the Americas has not been easy, mainly due to some limitations in obtaining samples to ensure the quality of the information that, together with the sample, can provide valuable data in the epidemiological monitoring of the event. Some aspects are weaknesses in coordination with the private sector, including clinics and veterinary hospitals that can identify dogs and cats with neurological syndromes or sudden deaths without apparent cause to rule out rabies through laboratory testing. Similarly, the identification of run-over, dead, or sick animals with neurological symptoms falls under the purview of the public sector. Some countries have established sample collection through the private sector by supporting laboratories that send samples to the central level for the diagnosis of rabies, allowing the identification of possible cases and the delimitation of at-risk zones. In some countries, laboratory surveillance is carried out in at-risk areas where viral circulation by the V1 (dog) variant is suspected, implying constant monitoring, especially concerning wildlife.

In brief, the discussion revolved around the optimal number of samples for disease characterization, but the consensus was not only focused on quantity but also on the quality of information collected from animals by the surveillance system, developing alternatives for capturing animals under such conditions through both the private and public sectors, thus guiding the surveillance system toward evaluating and verifying all risks, making it more effective in utilizing resources to gather information. This approach will generate responses to the rabies situation, considering the distinct population and epidemiological characteristics of the countries.

In many countries, regulations on animal welfare are implemented, protecting wildlife and imposing certain limitations on sample collection for rabies diagnosis. However, most countries focus on risk perception or zones considered at-risk due to viral circulation, where monitoring is intensified. It is worth noting that in most countries the Environment Ministries are responsible for the protection of wild species, making it necessary to coordinate some processes from the point of view of the surveillance of these animal species.

Regarding the production chain, in the case of herbivores with nervous symptoms captured in slaughterhouses, the sample is collected and the carcass is disposed of. Commercialization or consumption is not allowed. In this regard, regional experts explain that there is no evidence from studies reporting cases of human or animal rabies resulting from the consumption of animals positive for rabies. However, they recommend to assess the risk since the virus is deactivated at high temperatures during cooking, but, if consumed raw, individuals should be referred to post-exposure prophylaxis.

Finally, the substantial reduction in the number of animal samples in the countries of the Americas was emphasized, making it necessary to reestablish the work in the region, improving the surveillance to that observed before the decades of the 1970s and the 1990s as a commitment of those in charge of programs to implement strategies, with the cooperation of the private sector, or to create a laboratory network or organized networks to facilitate the flow of samples and timely diagnosis.

**SESSION 4. ADHERENCE AND FOLLOW-UP OF THE REGIONAL RABIES PROGRAM IN DOMESTIC HERBIVORES OF THE AMERICAS***Felipe Rocha, PANAFTOSA/VPH-PAHO/WHO*

This presentation was aimed at addressing the occurrence and incidence of rabies, and a diagnosis of the regional situation of the disease in domestic herbivores in the Americas. Following some virtual meetings held during the COVID-19 pandemic in 2020 and 2021, difficulties related to rabies in domestic herbivores became evident. After a virtual REDIPRA, the heterogeneity of the actions taken by the countries was identified, with some having well implemented and consolidated actions and others still in the phase of problem identification. Consequently, it was necessary to propose a policy improvement in order to harmonize strategies, promote information exchange and monitor progress. A working team was formed with volunteer countries such as Argentina, Brazil, Colombia, Ecuador, Mexico, Paraguay, Peru and Uruguay, with the aim of building this program, whose elaboration ended during the first semester of 2021 and was approved in a virtual REDIPRA. Since then, information collection started, and a situation diagnosis was made to provide guidance to the technical cooperation and harmonized support between the countries.

This program relies on the SIRVERA, which provides information about program management in the countries of the Americas. Based on cases presented in the last six years in the region and the bovine animal population, the disease is distributed from Mexico to Brazil, the same region endemic to *Desmodus rotundus*, with these two countries reporting the largest absolute number of cases. During this period of time, 9,351 rabies outbreaks were reported, of which 12,169 consisted of cases in domestic herbivores.

In the SIRVERA, forms harmonized with the regional program were developed to allow the countries to assess each pillar in their national program and provide information with indicators to collectively identify the situation in the region. This diagnosis was based on relative data from veterinary service programs, without evaluation of the reforms. PANAFTOSA/VPH-PAHO/WHO's interest is to redirect cooperation in support to the countries in coordination with the actions developed, within the framework of international surveillance and technical cooperation actions.

There are differences in the subregions regarding the implementation of the actions proposed by the program. There were five indicators in a moderate state of development related to animal vaccination, outbreak mitigation, information systems, legislation and surveillance of attacks. There are five points in advanced and high level of development; particularly surveillance of suspected cases, and diagnostic capacities. Two common points with undeveloped goals are related to the difficulties in monitoring shelters of hematophagous bats and controlling their population. A total of 22 countries with endemicities caused by hematophagous bats are certainly experiencing rabies occurrence in their domestic animals. Of these, thirteen are following the regional program and have shared information about regional indicators with the SIRVERA. This allows to make a situation diagnosis of the entire region and identify priorities of technical cooperation. Of the 12 goals, three are prioritized for the work with the countries, such as surveillance of shelters, control of hematophagous bats population and outbreak control.

The situation analysis presented how national programs are focused on outbreak mitigation rather than preventive work, a statement supported by the regional program indicators reported by the countries. Countries were urged to conduct an internal analysis of their local capacities and challenges, at local level, using program indicators as a follow-up route. In conclusion, data on the outbreaks and the number of affected animals indicate a greater impact on small and medium-sized producers, posing a risk to the economic sustainability of families. It is necessary to focus cooperative efforts on reviewing legislation and surveillance, increasing commitment to shared data to guide technical cooperation, improving diagnostic capabilities, and implementing activities focused on outbreak mitigation and enhancing prevention work.

#### 4.1 Dialogue among delegates.

During the plenary session, a marked heterogeneity of herbivore programs was emphasized, each with specific challenges but allowing for mutual enrichment and benefiting from the ability to consolidate a system and promote program control actions.

It is important to mention that, with the work developed by the countries over the years, wildlife rabies control programs in production animals have not favored the achievement of satisfactory results due to various factors that helps perpetuate the disease. In this case, programs will always require investment not only to mitigate outbreaks but also for other prevention and control actions. Therefore, it is necessary to maintain a continuous updating of policies and regulations. Perhaps it will be necessary to carry out more updated economic studies in countries that lead to more accurate results, ensuring sustainability and reducing the risk of rabies transmission in animals and humans.

With reference to hematophagous bats and due to their survival characteristics, it has been noted that out of the three species of bats found in the American continent, only *Desmodus rotundus* participates actively in the transmission of rabies due to its ability to feed on domestic animals or any other animal, causing harm after attacking them. This primarily affects domestic herbivores, leading to significant economic losses and a predisposition to other issues such as screwworm infestations.

Due to the heterogeneity of regions, *Desmodus rotundus* is endemic in some countries, while others are only affected in border areas, and some have defined areas with or without viral circulation. However, regional experts agree that, due to modifications in ecological conditions, bats develop some adaptation processes in microclimates and locations where their presence had never been documented before. This includes altitudes above 3,000 to 4,000 meters above sea level. Positive identification of these animals with rabies in these areas suggests that, through their adaptability, they can survive and transmit rabies. It's worth noting that they are not migratory but have the ability to move according to their needs.

An important point to address is the control of hematophagous bats (*Desmodus rotundus*) due to being a wild species that has a significant impact on animal and human health. In many countries, animal welfare regulations usually protect all bat species, and across much of the Americas, population control is currently not allowed except when viral circulation foci are detected. It must be considered that maintaining protection for these animals also sustains the transmission of infection. However, it is essential to recognize that efforts to control this species have been ongoing for decades without successfully eliminating them. Hence, it is crucial to evaluate how beneficial the survival of the *Desmodus rotundus* is and its role in transmitting rabies to animals and humans.

In some countries, there has been a need to shift the program's approach, and the population control measure for hematophagous bats has been to assess the risk conditions and the impact on public health due to the presence of rabies outbreaks, subject to authorization from the competent authority (environment ministries). Therefore, preventive work is crucial, and it is necessary that producers are aware of national support programs for healthy production without causing harm in this regard. This has led to an increase in rabies vaccination for domestic herbivores in at-risk areas in some countries as a preventive measure, with a limitation imposed by the cost, which is borne by the producer rather than the government. In other countries, the control of these animals and their colonies, along with joint actions such as vaccination, has prevented the occurrence of rabies cases in herbivores for more than six years.

Rabies surveillance involves identifying suspicious outbreaks through veterinary services and implementing actions to control each of them, as well as findings and periodic reporting of aggressions against herbivorous animals. Hence the importance of fieldwork to instruct and educate on prevention measures, particularly the vaccination of animals, and the identification of populations of hematophagous bats.

## **SESSION 5. IMPLEMENTATION OF NATIONAL POLICIES FOR PRE-EXPOSURE PROPHYLAXIS OF HUMAN RABIES TRANSMITTED BY THE *D. ROTUNDUS* IN AT-RISK POPULATIONS**

*Marco Vigilato, PANAFTOSA/VPH-PAHO/WHO*

Historically, REDIPRA, PAHO, and PANAFTOSA/VPH-PAHO/WHO have recommended the use of pre-exposure prophylaxis in at-risk areas with populations in vulnerable conditions and the presence of wildlife, mainly hematophagous bats. These recommendations have been made over time in various meetings, starting from REDIPRA 11 in 2006, as well as in expert consultations on rabies transmitted by hematophagous bats, WHO expert consultations in 2013 and 2018, technical cooperation events, studies and publications, and the issuance of different epidemiological alerts for sylvatic rabies, all based on the advice of professionals with expertise in the field.

Following, some experiences with the implementation of pre-exposure prophylaxis will be presented:

### **5.1 Experiences of the countries.**

#### **5.1.1 Rabies vaccination strategy in Amazon communities at high risk of sylvatic rabies in Peru.**

*Moises Apolaya, Ministry of Health of Perú.*

The Ministry of Health of Peru shared the experience of the country in implementing the policy on rabies pre-exposure prophylaxis. Historically, the epidemiological behavior of human rabies transmitted by wild animals over the last 38 years showed 316 people from 12 departments, mainly in the Amazon region, who died from this cause.

The most affected were individuals under 15 years of age from indigenous communities in vulnerable populations and in at-risk zones, with two critical periods of human cases during the first five years of the 1990s and then between 2007 and 2011. Considering that traditional strategies applied in these indigenous populations had some limitations in terms of costs, cold chain and logistics, due to a considerable number of human deaths (55) from rabies between 2009 and 2011, and in view of the emergency, it was decided to implement other outbreak prevention measures that included the use of mosquito nets, protection of homes and beds, as well as the development of other activities respecting the customs of the population that involved training and raising awareness within the communities to detect bitten individuals and guide them to receive early prophylaxis where it was well-known that the Amazon region had a higher number of bitten individuals, contributing to 51% of rabies cases.

Additionally, education strategies were adopted in native schools, using educational material in their languages to convey knowledge about the concept of rabies and its complications. Similarly, a possible preventive solution with pre-exposure vaccination was considered and therefore, it was necessary to request the required budget to the central government and secure the commitment of the Ministry of Economy and Finance, as well as to coordinate vaccine donations from the private sector. The Ministry of Health established the pre-exposure rabies vaccination plan in at-risk communities from 2011 to 2013 aiming to reduce human cases in high-risk communities in the Amazon rainforest and central jungle. Its initiation was authorized by a resolution, and in 2011, pre-exposure vaccination was implemented with positive results, leading to its expansion to different locations and zones. With this approach, new cases were prevented, starting initially with high-risk indigenous communities in two provinces, and in 2012, interventions extended to three more regions in the Amazon (achieving a 62% coverage by 2013).

During 2015 and 2016, 16 cases of human rabies were reported in provinces where no pre-exposure vaccination intervention took place. Three of these cases involved military personnel. Consequently, in 2018, occupational pre-exposure prophylaxis was initiated with a limitation in completing the regimen due to personnel movements. Activities were adversely affected by the COVID-19 pandemic between 2020 and 2022, and they have currently been resumed.

As a legal basis, a health directive was issued in 2016 for the administration of pre-exposure vaccination for human rabies in populations from endemic and wildlife-exposed areas. This was done to ensure sustainability at the national level, guided by a technical document outlining the necessary procedures. In 2017, aiming to centralize all activities, another health technical standard for surveillance, prevention, and control of human rabies in Peru was developed. Additionally, various communication materials were created with the assistance of PANAFTOSA/PH-PAHO/WHO (flip charts and an intercultural rabies manual).

The implementation of the pre-exposure prophylaxis strategy poses a significant challenge in various healthcare establishments across different regions, especially in the most vulnerable communities. Despite the recognition influenced by various factors such as identity, religious beliefs, economic and political considerations, and native perspectives that have emerged in accepting this vaccination, the implementation of pre-exposure prophylaxis has allowed for the control of human rabies transmitted by bats. It has also concluded the intersectoral work where different ministries have to support processes, such as education, improving aspects related to housing, basic sanitation, electricity, and water. At the local and regional levels, the focus should be on developing projects that enhance housing conditions, control deforestation, and combat animal smuggling. Additionally, there should be consideration of other more sustainable production alternatives to enable native communities to establish suitable living conditions, thereby reducing the risk and possibility of rabies in these regions.

#### **5.1.2 Implementation of preexposure prophylaxis against human rabies for communities living in hard-to-reach areas of the Brazilian Amazon region.**

*Francisco Edilson Ferreira De Lima Júnior, Ministry of Health of Brazil.*

The Ministry of Health of Brazil shared the experience of working in communities, with the inclusion of pre-exposure vaccination against human rabies, emphasizing that from an epidemiological standpoint, Brazil has recorded 160 cases of human rabies transmitted by hematophagous bats in the last 37 years, identifying two critical periods: the first between 2004 and 2005 with 64 cases from 63 outbreaks, and the second between 2017 and 2018 with 16 cases and 13 outbreaks of human rabies caused by the same transmitter. In 2023, two additional human cases occurred, one resulting from a bovine infected by a bat and the other from a non-human primate. Most cases originate from the Amazon region of Brazil, with children under 12 years old being the most affected. None of the cases received appropriate and timely prophylaxis. The primary conditions contributing to these outbreaks included deforestation, fires, housing types, difficult access to post-exposure medical services, and exposure to bats. During these outbreaks, measures implemented included both pre- and post-exposure prophylaxis.

Given the issue of human rabies cases occurring in the Amazon region of Brazil, it was decided to implement two prevention strategies with a targeted approach to indigenous communities in this region. The first, in 2017, involved a pre-exposure rabies vaccination project aimed at standardizing future interventions in the at-risk human population. The prophylactic pre-exposure scheme used two doses at a 7-day interval, reaching nearly three thousand people and a completion rate of 71%. In 192 individuals neutralizing antibody assays were conducted before vaccination, and one and two years after the pre-exposure scheme application. Additionally, activities were carried out to identify aggressions in humans and control hematophagous bats.

The second strategy, named "Operation Drop 2022" [Operación Gota 2022] targeted populations in geographically hard-to-reach areas located in riverside, members from maroon communities and indigenous zones. This initiative involved collaboration between the Ministries of Health and Defense and was integrated into the national vaccination schedule. It encompassed individuals aged 2 and older, who received pre-exposure vaccination in two doses at a 7-day interval.



To continue this process in the country, it is necessary to proceed with the identification of other populations not included in Operation Drop that are eligible for pre-exposure vaccination, submit it for approval to the Technical Advisory Council on Immunization (CTAI) of the Ministry of Health, publish a technical document outlining the strategy, implement the vaccination schedule for other populations, continue monitoring bat bites in these locations, and publish a technical document with guidelines on the actions to be taken when bat bites occur in these populations, including measures directed at bats and the environment.

## 5.2 Dialogue among delegates.

The experiences shared by Peru and Brazil regarding the work carried out have been crucial in preventing cases of rabies in these indigenous communities, particularly vulnerable due to their interaction with bats. However, it is important to review the ecology of these animals and the roles they play in their colonies. Typically, the stronger bats feed two to four times a night to obtain a sufficient amount of blood and return to the colony to regurgitate for the benefit of the sick, pregnant females, and old animals that cannot fly and eventually see the opportunity to feed on the surplus, increasing the risk of virus transmission to humans and animals and the development of the disease. This suggests the need to identify at-risk areas, especially where attacks by these animals are common, particularly in regions where countries share the Amazon rainforest or in areas where natural resource exploitation (mining) occurs, thus implying the implementation of strategies primarily focused on prevention in areas with a history of a high number of human rabies cases. Countries agree on inquiring about the recommended number of doses to be implemented for pre-exposure prophylaxis. Experts affirm that, according to the current WHO recommendation, based on scientific information supported by the Expert Consultation on Rabies 2018, the pre-exposure prophylaxis regimen consists of two doses at a 7-day interval after the first dose. Under special conditions and considering some limitations in communities at risk for rabies, a single dose could be used; however, there is no evidence that a single dose is sufficient to induce long-term immunity (> 1 year), so monitoring is recommended in these communities. Monitoring in these populations through antibody measurement was mentioned as an option to determine the need for a booster dose, as there is no technical document to support this.

Regarding pre-exposure prophylaxis, the perception of risk is higher in individuals who, due to their occupational characteristics, have a greater risk of exposure to the virus, and so, they generally complete the full regimen, and their ongoing monitoring is important for antibody measurement and necessary boosters, especially in the case of vaccinators, personnel involved in outbreaks, field epidemiological investigations, shelter monitoring, and zoo workers and nature reserve employees, among others. It is likely that this situation has limitations in vulnerable indigenous communities with limited geographic and health service access, mainly because they live in areas where coexistence with hematophagous bats is common, and the perception of the risk to virus exposure is low.

Therefore, countries have undertaken local community work activities, mainly with local agents or community leaders, aiming to raise awareness about the importance of rabies as a disease, transmission and prevention mechanisms, education strategies, and educational materials translated into different languages. This facilitates adherence to processes and the implementation of pre-exposure prophylaxis, a challenging and complex task, especially in areas with a history of a high number of human rabies cases or bat attacks, where cultural characteristics and beliefs attribute the disease to other processes.

Some countries have established the healthcare system for indigenous communities at the national level, deploying trained professionals to work in these populations along with other vaccinations that communities are already receptive to and accustomed to receiving every year, facilitating adherence to this strategy. In other communities, due to the cultural context, acceptance may be lower and may require previous and more extensive community work.

Another complementary issue addressed complementary to the interventions in at-risk areas, where difficulties have been observed, is related to the identification records of individuals in indigenous communities, especially those not officially registered or lacking documentation. In some situations, it has been necessary to return to the area to carry out the registration and identification process. In other cases, it is done through campaigns implemented in these areas.

Within the characterization of the risk zone, it is important to consider the best time of the year to implement the pre-exposure scheme in the countries of the Americas, based on the epidemiological behavior of the disease. Although it is known that in the continent the major peaks of rabies in cattle occur between January and March, each area has its peculiarities that will depend on what the region requires based on cases of human rabies, attacks by hematophagous bats, cases of rabies in wildlife and herbivores. Therefore, the intervention with prophylaxis should precede the occurrence of these outbreaks.

Besides Peru and Brazil, other countries have had some type of experience in implementing pre-exposure prophylaxis, not only due to the occurrence of cases of human rabies but also because certain vulnerable areas have been identified through isolated efforts that require improvement in terms of information, indigenous settlements, community work, awareness, education, and monitoring both before and after vaccination. Other countries are initiating the process, some have decided to revisit the issue, initially relying on the experience of Peru and Brazil and the characterization of at-risk areas. Other countries are willing to start the process but require support from other nations.

Experts remind that the pre-exposure vaccination plan is not a solution for all, it is a specific solution, with the first step being an evaluation in the countries, especially in tropical zones and the Amazon, where hematophagous bats inhabit and the evidence of bites increases the risk of developing the disease in the presence of viral circulation. The costs should then be analyzed, involving the national government, and implementation should then be considered only if all criteria are met.

It was explained that all funding for activities carried out by Peru and Brazil comes from each country, and PANAFTOSA/VPH-PAHO/WHO will be responsible for the technical cooperation process, participating in professional and expert discussion groups. However, the operational aspect involves all levels within the country, from national to local, as they are responsible for implementing the strategy.

Likewise, there was a discussion about the protection factor, recognized by titration of antibodies against rabies, with a minimum value of 0.5 IU/ml. It was emphasized that this value was agreed upon in a context where laboratories identified that it could be determined in immunized individuals, and consequently, this value became a concept of the level of protection, but it doesn't necessarily reflect reality. For specific populations, pre-exposure prophylaxis does not eliminate the need for post-exposure booster prophylaxis in case of exposure but provides an extra protection factor to vulnerable populations, given their risk conditions.

In Central American countries crossed by the Maya jungle (Mexico, Belize, and northern Guatemala) – one of the largest forests in the Americas after the Amazon region – a collaborative project between countries is underway, regarding protected areas. This project is funded by German cooperation and is focused on surveillance in wildlife, especially in dead animals, to develop interventions in communities that do not have access to health facilities and where hematophagous bats inhabit. After characterizing this region, there may be a need to update the guidelines for the care of individuals attacked, including pre-exposure prophylaxis. Additionally, each country has been undertaking various activities, such as informing the population at borders, the jungle, and the risks. Similarly, work is being done in laboratories to address cases of paralytic rabies in cattle and to raise awareness among populations about reporting rabies outbreaks in cattle and ensuring the pre-exposure prophylaxis program.

Some countries mentioned the importance of working on borders, especially in jungle areas, where the risks shared between countries and affecting various indigenous communities can be identified, and where collaborative efforts and strengthening border zones are necessary. Similarly, the increasing migratory situation in recent years through risky jungle areas has prompted a continuous review and ongoing efforts supported by PAHO, particularly in the Darien region between Panama and Colombia. This involves increasing medical personnel for local care, reinforcing surveillance by official veterinary services and border police, implementing rabies vaccination in dogs, cats, and wild animals, and addressing peripheral areas where animal cases have been reported.

## **SESSION 6. REGIONAL PLAN FOR THE ELIMINATION OF DOG-TRANSMITTED HUMAN RABIES 2024**

*Felipe Rocha, PANAFTOSA/VPH-PAHO/WHO*

In the context of the presentation, it was explained that since the last update of the Action Plan for the Elimination of Human Rabies Transmitted by Dogs in 2013 during the REDIPRA 14, significant progress has been made in terms of technology, operational and managerial capabilities in the countries of the Americas, a decade of major changes amid the heterogeneity of countries, their social and economic management, substantial changes in their capabilities, the occurrence of communicable diseases, and significant changes in the epidemiological situation of canine rabies in the region that prompted the need to provide new tools for guiding actions for the control of dog-transmitted rabies in the Americas from the public health sectors with the support of the official veterinary services of the countries.

This led to the development of a work plan for the update of the regional plan, with the establishment of the working group, regular meetings, the voluntary participation of the Ministries of Health of Argentina, Brazil, Cuba, Ecuador, El Salvador, Honduras, United States, and Venezuela, and now the presentation of the plan for approval at the current REDIPRA 17. The plan's update outlined common, harmonized, and standardized objectives, goals, activities, and indicators for the countries in the Americas region with the purpose of strengthening capacities for the management of human and animal rabies, preventing further deaths and the reintroduction of the disease, in line with principles of equity, solidarity among all, and political commitment to eliminate dog-transmitted human rabies throughout the region. Consequently, following with the plan will also support countries in the process of validating their status as free from dog-transmitted human rabies.

Aligned with the plan's second objective, which focuses on establishing requirements for achieving validation and verification of the status of the countries as free from dog-transmitted human and canine rabies, there is the "Elimination Initiative 30+" through which in 2019, the Member States of the Pan American Health Organization (PAHO) approved the elimination of over 30 communicable diseases and related conditions by 2030. This initiative is based on four pillars: strengthening and integrating health systems, enhancing surveillance and health information systems, addressing environmental and social determinants of health, and strengthening governance, administration, and finances. Human rabies transmitted by dogs is included in the list of the 30 communicable diseases slated for elimination.

It is important to mention that the Regional Plan for the elimination of human rabies transmitted by dogs and canine rabies is not the validation process itself. Instead, the plan has goals that support the indicators for validating the status of being free from dog-transmitted human rabies, which will help identify the strengths that demonstrate this process. In this scenario, the SIRVERA is on the verge of becoming not only an information tool for cases and negative tests but also a management tool for national programs.

### **6.1 Use of the Regional Information System for the Epidemiological Surveillance of Rabies – SIRVERA.**

The SIRVERA plays a significant role in strengthening national programs for rabies control in the Americas. It encourages integrated rabies surveillance among countries and promotes information exchange between the public health and the animal health sectors. It is a database in continuous progress serving as a tool for countries to work towards the elimination of human rabies transmitted by dogs and canine rabies, and the control of wildlife rabies. The system is publicly accessible and contains a historical record of case occurrences in the region since 1970 and it also includes a graphical panel displaying results. The registered data originates from information shared by countries, encompassing cases and their distribution across the continent, as well as the quantity of negative samples in humans and animal samples of all recorded species.

The SIRVERA includes the tool to track the regional plan for the elimination of canine rabies to support countries in the organization of all goals and indicators. Likewise, this panel is already integrated to the reporting of positive and negative cases and negative tests and, as migration is done automatically, the relevant information is registered in the form.

The update of this system based on the different epidemiological situations in our region according to these scenarios, aligned with the plan based on objectives, goals, and performance indicators, is a tool that supports countries in monitoring the validation process for states free from dog-transmitted human rabies, and the elimination of canine rabies is a commitment that has been approved by the representatives of the countries in the Americas, providing organizational support and helping identify program strengths in the SIRVERA.

### **6.2 Dialogue among delegates.**

The secretariat mentioned that the regional plan was devised by the countries for countries with different realities and brings the indicators up to discussion together with the plan proposed by the representatives who voluntarily participated in the development, using the SIRVERA as the management tool. All this was done with the purpose of supporting rabies surveillance and control but also to further facilitate countries seeking validation to have this information systematized, even when the dossier will be submitted. The discussion focused on some requirements to meet the goals within the validation process, especially regarding vaccination campaigns that are not conducted in historically rabies-free countries, as there have been no cases of dog-transmitted rabies for many years. Rabies vaccination for dogs and cats, even for other animal species, is only carried out by the private sector. Efforts are underway to increase the number of samples to strengthen rabies surveillance and meet the established indicators.

The secretariat stated that, based on the epidemiological scenario, without the occurrence of dog-transmitted rabies cases for many years, it is not necessary to demonstrate the specific situation and the type of activities being carried out, as it is not a necessary condition. Regarding the number of samples for laboratory surveillance, no specific estimated numbers will be used. The validation process aligns with the requirements, indicators and components of the process established by the WHO. The SIRVERA is a tool that can support countries in organizing the required information; however, each country can build its own tool for validation. Once all the requested information is available, the process can be initiated with support from PANAFTOSA/VPH-PAHO/WHO.

Regarding the process of requesting validation, an example from Mexico was discussed, which underwent the process without prior experience after almost three years of developing the dossier, in times when there was no tool to support the country in organizing the data. However, some countries such as Chile, Uruguay, the United States, and Canada, which have not had canine or dog-transmitted human rabies cases for more than 50 years, have a particular condition, and this may require a different process.

Different situations will arise depending on the country and its progress in surveillance and control of dog-transmitted human rabies and canine rabies:

- A country may not have all the required information, so evidence needs to be created, while another country has all the data since 1970 stored in the SIRVERA and it is necessary to review the information from the last 5 years, then provide a year of support, and finally undergo validation.
- A country may not need to use the SIRVERA, so the dossier can be built gradually, and progress may be similar to what was done in Mexico, but the idea is that the system helps with those needs.
- Some conditions need to be considered, such as the WHO goal where a country must be free of dog-transmitted human rabies for at least two years. However, this is not acceptable in our region because the historical epidemiological behavior has shown some countries without cases of dog-transmitted human rabies for two or three years and cases occurring the following year. For this reason, the secretariat decided to extend the time period to 5 years without the occurrence of cases.
- In Uruguay, the process can start promptly, but perhaps characterization needs to be done with some samples to determine whether those canine cases are derived from hematophagous or non-hematophagous bats. Such adjustments are made to demonstrate that there is indeed no rabies of canine origin. It is worth noting that Uruguay and Chile have the conditions to start the process immediately due to the historical absence of human rabies cases.
- There is a gradual progress with countries that are already working such as Argentina, Brazil, Colombia, and Peru, where each situation is already being reviewed. In other countries with human rabies cases such as Bolivia, Haiti, potentially Venezuela, Cuba, and the Dominican Republic, the process has not started yet, but approaches can be made, and these tools help strengthen and improve surveillance in their national programs. Regarding the situation in Guatemala, which had several cases of human rabies between 2016-2017, there have been no occurrences of these cases since 2018, therefore, Guatemala could be a country to request validation. However, considering Guatemala's history, it is suggested to send the data to the system and monitor for the next 2 or 3 years to verify and then start the validation process, in order to demonstrate the robustness of its National System.

The importance of starting the process was emphasized given the five-year deadline to achieve the goal and trying to work diligently to achieve it in different countries. However, it is necessary to analyze whether it is feasible for the region to meet this goal. A good representation is the Caribbean region where there are historically countries that are free, while others still have canine rabies. Due to the heterogeneous conditions of the countries, several questions arise, such as: What will happen with countries that never validate? Will the region be perceived as free without the validation? Will we consider that the region is free without validation of the countries, some because they do not meet the criteria for not having laboratory surveillance, and others due to any other factor?

Therefore, it was stated that in countries where there has never been canine rabies, such as those in the Caribbean region, some even without wildlife rabies (from hematophagous bats), the validation process is timely. The work should be done throughout the region of the Americas, integrating those countries that have historically never had cases because there is scientific and empirical evidence of not allowing the virus to enter. In some Caribbean countries, there are cases of canine rabies, and the goal is to work in accordance with the plan. The countries invited to REDIPRA are now 27, and there is another group of countries and territories that are members of the PAHO in which it is worthwhile to implement the process according to their epidemiological conditions.

The importance of surveillance was emphasized, as what is not monitored cannot be found. Migrations have overwhelmed countries and the region, with migration crises due to political or climatic issues, and it is essential to understand how countries are reflected in this context—a key word to consider the heterogeneity. Thanks were reiterated to the volunteer countries that participated in the process of updating the canine rabies elimination plan. This effort will enable countries in the Americas to achieve various indicators for validation.

The WHO document refers to the validation process for the status of free from human rabies transmitted by dogs, while the verification of the status of being free from canine rabies is a subsequent step. The WHO suggests collaborating with other organizations such as the World Organization for Animal Health (WOAH) because in other continents, those responsible for prevention in animals, particularly for rabies in dogs, are veterinary services. However, in the Americas, the Ministries of Health handle this responsibility. Therefore, conceptually, the validation responsibility lies with the WHO, and the verification responsibility lies with the WOAH. However, at country level, both processes are the responsibility of the public health sector. In this region, both issues need to be addressed, and countries that prepare to meet both conditions will do so through the PAHO (whether validation and/or verification), but internally, the coordination of both processes will be handled by the REDIPRA as a governance mechanism.

The genetic characterization of circulating variants will help identify the origin of the rabies virus and, supported by high vaccination coverage at the borders, this would allow verification without affecting the country's health status. It is important to mention that validation/verification is not a goal but a country's condition and, at any time, cases of rabies transmitted by dogs may appear, leading to the loss of the validation/verification status.

### **6.3 Dialogue among delegates for the validation process.**

Afterward, PANAFTOSA/PH-PAHO/WHO urged the member countries to implement the strategy for the validation of dog-transmitted rabies programs, and the countries then shared the most relevant aspects of their programs and set a tentative year to show the country's validation condition.

The most important aspects described by the countries are:

- The delegate from Argentina mentioned that the country has been working with the SIRVERA for a long time and has its own data generation and information systems to load information into the system. In fact, they are awaiting the approval of the rabies plan resolution.
- The delegate from Belize pointed out the lack of a greater number of agents and economic resources for the program to strengthen surveillance. There are no cases of rabies in dogs. Currently, hospitals capture, document, report and investigate patients presenting with dog or cat bites.
- Besides, the delegate from Bolivia stated that they are working with nine departmental services and municipal centers; vaccination campaigns have been organized to achieve 80% vaccination coverage, in order to cover departments and municipalities in two days, including borders and peripheral areas. For surveillance, there are three laboratories at no cost. However, opportunities are lost when the cost of diagnosis has to be covered – mainly in Cochabamba and Santa Cruz de la Sierra, places with several risk factors – as well as the strengthening of actions based on the rabies plan.
- The delegate from Canada mentioned that, since 1967, they have been part of this process, but still have cases of rabies in wildlife, especially Arctic foxes, red foxes, skunks, and raccoons. There are various initiatives at the federal level, such as animal testing regulations and animal protection, public education, and health professionals. In Canada, there are 10 provinces and three territories, each of which is responsible for rabies surveillance and control. The Ministry of Natural Resources makes significant efforts in terms of wildlife protection and disease mitigation.
- The delegate from Chile stated that the country has not had cases of rabies by the canine variant since 1972, has a quite strengthened surveillance system, and, after the last REDIPRA, has implemented a strategy at the northern border of the country. Therefore, if they start consolidating the documentation and demonstrating all this, they would request validation and verification in approximately one year. However, it is still not clear how many samples need to be processed for laboratory surveillance.

- In the same way, the delegate from Colombia indicated that the country has made significant progress in the rabies program, and surveillance shows that there have been no cases of human rabies transmitted by dogs for over 10 years, despite some challenges such as migrations, limitations at the border, and the armed conflict that makes it difficult to intervene in rabies outbreaks. The validation and verification process would be an interesting tool to assess the current status of the country, serving as a rating or starting point, and to project a date to achieve validation. It is important to mention the limitation faced with the environmental sector, due to competence issues, which have created significant difficulties.
- On the other hand, the delegate from Costa Rica mentioned having many advantages, including a central laboratory and regional laboratories that, even though they do not conduct the test they support the safe handling and shipping of samples. The cost is covered by the government, even for those from the private sector. There is a close relationship between the Ministry of Human Health and the operational sector, serving as a strength that ensures timely field follow-up and attention. Systems are in place to continuously collect information. A limitation is in the wildlife aspect due to a lack of coordination with the Ministry of Environment.
- The delegate from Cuba stated that they have partially and inconsistently met various indicators in all provinces of the country. Activities supported by the SIRVERA will be implemented to position themselves in the processes. The last case of human rabies transmitted by dogs occurred in 2021; therefore, 5 years with no cases must elapse from this date to proceed with validation.
- In turn, the delegate from the Dominican Republic mentioned that the last case of human rabies transmitted by dogs occurred in 2019, and accordingly, validation could be performed in 2025. Although the country has cases of canine rabies throughout the territory, rabies is endemic due to the presence of wild animals (mongooses). Efforts are being made to strengthen surveillance to determine if the goal can be achieved.
- The delegate from Ecuador pointed out that while there have been no recorded cases of rabies in dogs since 2006 and in humans since 2011, there is no follow-up evidence from subsequent years ruling out new cases of rabies. Retrospectively, they would meet the over 5-year time requirement for validation, and next year they would collect samples again to justify that there is no rabies in the country and proceed with the steps for validation or the question arises as to whether it is necessary to resume the 5-year-period. In this situation, PANAFTOSA/VPH/PAHO/WHO recommended sustaining surveillance for at least 2 to 3 years to verify if the virus is actually not circulating, but each country is autonomous in deciding the entry date.
- The delegate from El Salvador mentioned that the country has had no cases of human rabies since 2008, so they had considered starting the validation process. There is continuous surveillance of the disease with recent updates. In this case, PAHO support is necessary to initiate validation.
- On the other hand, the delegate from Guatemala stated that there have been no cases of dog-transmitted rabies in the country for 6 years. They have also had 3 consecutive years of negative results in dog samples. There are some limitations, such as low vaccination coverage over the last 5 years at the municipal level. Surveillance is affected by having only one diagnostic laboratory that consolidates samples at the National Institute of Health. Strengthening surveillance in animal health and in several municipalities for wildlife rabies is needed.
- The delegate from Guyana expressed that there have been no cases of rabies in humans or dogs but they have been reported in cattle. Vaccination by farmers is somewhat complex. He does not undertake to establishing a date because the epidemiological situation and actions being carried out in endemic and border areas with Venezuela and Brazil still need to be assessed.
- On the other hand, the delegate from Haiti indicated that they currently have some cases of rabies, despite the agreed commitment, due to social problems affecting the country's security. Rabies vaccination campaigns in dogs were initiated in 2019 but had to be suspended because of the COVID-19 pandemic in 2020, and then, in 2021, the president was assassinated. Vaccination campaigns were restarted this year, but there is a need to reinforce diagnosis and epidemiological response before considering the validation process.

- In turn, the delegate from Honduras stated that the last case of human rabies transmitted by dogs occurred in 2009. In 2020, there were two cases of canine rabies without characterization of the virus variant. Access to the documentation of the process is important to gradually collect information and then make the official request to PANAFTOSA/VPH-PAHO/WHO.
- On the other hand, the delegate from Jamaica mentioned that the country is free of rabies. There is a need for more awareness among the population, doctors, and veterinarians, who should report and investigate dog bites. Political support and guidelines for validation are necessary.
- Likewise, the delegate from Nicaragua commented that, since 1999, the country has not had cases of human rabies transmitted by dogs. In 2019, a case occurred in a dog. They have a tool being installed in health centers with parameters that allow improvement. Laboratory surveillance is also carried out. The country is ready to start validation because they have been working on this for a long time.
- On the other hand, the delegate from Panama mentioned that the country has not had cases of human rabies from dogs since 1972 and rabies in dogs since 1986. Since 2005, Panama has implemented severe regulations and made efforts to address dog and cat vaccination. Awareness campaigns have been conducted to educate the population about the disease and to encourage animal rescuers to use registered sites to control any type of zoonosis. There will be a change of government next year, and efforts will be made to establish at least the regulatory foundations to move forward with the validation process.
- The delegate from Paraguay expressed having some indicators fulfilled. There have been no cases of human rabies from dogs since 2004. The country did have canine rabies in 2020 and 2021, but the variant has not been identified due to the epidemiological history of contact with wild animals; the laboratory component is missing. There are certain challenges, including the laboratory component and the adherence of the private sector. Centralized laboratory and sample collection throughout the national territory are limiting factors. The strategic committee involves all three parts (health, agriculture, and the private sector), although there is no regulation compelling the private sector. Regarding humans, there are no negative laboratory results related to deaths from encephalitis. The secretariat recommended processing some samples with neurological syndromes because differential diagnosis is required in humans.
- On the other hand, the delegate from Peru mentioned having significant strengths in the regulatory aspect and ongoing activities. However, there is a challenge related to vaccination coverage in some specific regions such as Arequipa, which they plan to improve soon. The country is ready for the preparation to move towards validation.
- Similarly, the delegate from Trinidad and Tobago mentioned that the last case of canine transmission to humans was in 1914 (over a hundred years ago). They have not had cases in dogs but have had cases in hematophagous bats. They are seeking a project to collect the necessary samples for validation and support from external laboratories is required for sample analysis.
- The delegate from Suriname affirmed that the country has had no cases of human rabies since 1995. There is a need to increase diagnostic capacity and sample collection, as the population is located in very distant areas.
- Additionally, the delegate from Uruguay said that the country has no cases of human rabies or rabies in dogs but has cases in hematophagous bats. They need to increase diagnostic capacity for laboratory and animal samples.
- Finally, the delegate from Venezuela indicated that the country faces two significant challenges: the first is related to rabies diagnosis, which is concentrated at the central level; and the second is the access to rabies vaccines. While overcoming these gaps, strengthening will require at least two years.

After the survey conducted with the 27 countries regarding the decision to undergo validation for the elimination of dog-transmitted human rabies and the preliminary definition of tentative dates, 22 countries agreed to enter the validation process. However, in a subsequent session of the meeting and after an internal review within each country, during a later session, confirmation of the dates was requested.



Table 1. Definition of dates in which countries will undergo validation for the elimination of dog-transmitted human rabies and canine rabies by 2030.

Validation	Countries	Year
Yes	Nicaragua, Uruguay.	2024
Yes	Bolivia, Chile, El Salvador, Honduras, Perú.	2025
Yes	Argentina, Brazil, Costa Rica, Ecuador, Jamaica, Trinidad & Tobago.	2026
Yes	Belize, Cuba, Guatemala, Panama.	2027
Yes	Paraguay, Dominican Republic, Venezuela.	2028
Yes	Colombia	2030
Pending of confirmation	Guyana, Haiti, Suriname.	NA
Not applicable	United States, Canada.	NA
Certified validation -2019	Mexico.	Sustainable

Similarly, the president expressed gratitude for the commitment of the countries that have worked for decades on rabies control and encouraged them to achieve the objectives for disease elimination. Additionally, after presenting the plan, countries requested approval to be discussed in a later session to conduct the respective review.

## SESSION 7. MECHANISMS AND BENEFITS OF VALIDATION/VERIFICATION OF THE ELIMINATION OF DOG-TRANSMITTED HUMAN RABIES AND CANINE RABIES

*Verónica Gutiérrez, Secretary of Health of Mexico.*

In Mexico, rabies was included as part of the group of priority communicable diseases in public health, being the first significant zoonosis in the country to be addressed for elimination. Sustainability mechanisms were implemented based on the recommendations of the expert group on rabies from its inception to the latest version in 2018, adapted to the country's social and economic conditions. Moreover, PANAFTOSA/VPH-PAHO/WHO has played a crucial role in all the strategies implemented in the country, hence the plan towards the elimination of human rabies.

In Mexico's experience in obtaining validation for the elimination of dog-transmitted human rabies, work has been underway since October 2019 with four strategies. The first strategy involved the implementation of massive, intensive and free rabies vaccination campaigns for dogs and cats, with the participation of 32 federal entities covering the entire territory on a single date that spanned a week of work, with an additional week to achieve a minimum 80% vaccination coverage using cell culture biologics. The second strategy focuses on prophylaxis for individuals exposed to the virus. A system is in place for health units to identify individuals attacked. Less than 10% is administered in case of dog attacks due to animal vaccination, limiting the initiation of prophylaxis in case of any dog or cat attack. This differs in cases of attacks by wild animals, where intervention must occur in 100% of affected individuals. The third strategy is related to a surveillance system to measure incidence in humans and animals, especially in dogs and cats. This system strengthens the other strategies and has allowed, over time, to develop evidence of a reduction in cases of dog-transmitted human rabies and canine rabies.

For the fourth strategy, Mexico has a national network of laboratories with the capacity for diagnosing rabies in animals and humans. Efforts are being made to expand the capacity of the laboratory network to reach every corner of the territory. Authorized laboratories perform diagnostic confirmation through direct immunofluorescence, allowing verification of virus circulation. In positive cases of rabies, genetic characterization of the virus is carried out to monitor the circulation of the canine variant. Laboratory surveillance of the rabies virus is the fourth strategy, with monitoring in dogs and cats to detect suspicious animals with neurological symptoms and a national registration system in the health unit where samples from dogs, cats, or wild species are collected. Over time, the number of samples has been decreasing; for this reason, an estimated number cannot be specified.

Additional strategies include dissemination through mass media, with a media plan to inform the population, at national level, about the advantages of vaccinating their dogs and the dates of national weeks or days. There are also preventive measures for wildlife, some communications on social media and mass media, radio, announcements by loudspeakers and television. However, everything comes from the program focused on social communication to manage the strategy; every year, different materials are available.

México's process took six years until its validation in 2019. Achieving this recognition requires collaborative efforts from the health and agriculture sectors to integrate the information required by WHO and to carry out joint actions, such as mass vaccination and support in the surveillance system for rabies cases in animals. The validation process allowed Mexico to strengthen various areas, including interinstitutional collaboration between the health and agriculture sectors and the creation of an interactive platform that encompasses all information related to rabies cases in the country.

### **7.1 Steps to obtain recognition.**

To be eligible for this recognition, six steps were considered:

- The agreement to share information among the involved sectors, as established by WHO (2014), regarding all the requirements that needed to be fulfilled. Consequently, the agricultural sector was invited to join and start being part of these processes, under the coordination of the public health sector.
- In 2016, the information from the involved sectors was submitted, and efforts were made to integrate disaggregated information at the national level through regular meetings over approximately a year and a half.
- Between 2017 and 2018, PAHO translated the dossier and sent the official request to the WHO expert group.
- In 2019, a rabies mission visited to verify the information submitted. During the visit, the experts conducted a thorough examination of the information about the surveillance, laboratory, program, and agriculture components.
- On October 22, 2019, the WHO concluded, based on the evidence provided in the dossier and the recommendation from the Dossier Recommendation Group, that Mexico has achieved the validation of the elimination of dog-transmitted rabies as a public health problem.

### **7.2 Dialogue among delegates.**

The presidency expressed gratitude for the comprehensive presentation of Mexico's experience, an initiative by the country for voluntary certification that highlights the commitment, sustainability, monitoring, and evaluation of the process, as well as the new challenges they are facing.

Delegates from the countries of the Americas congratulate Mexico for the recognition achieved after six years of joint efforts to eliminate dog-transmitted rabies.

Subsequently, different points were reviewed by the delegates based on which, with the experience of Mexico, regional experts, and other countries, recommendations could be implemented for action development. The first discussion was about pet importation and the establishment of measures or requirements to avoid affecting the sanitary status in countries regarding the entry of dogs, cats, or animals susceptible to rabies. According to Mexico's experience, the responsibility lies within the agriculture sector, and the requirements should be strict for animal entry into the country. Criteria for accepting animals are a decision made by each country based on technical guidelines available in the literature. In Latin America, the challenge lies in the limited access to laboratories with the necessary capabilities to conduct the tests required by other countries, especially those in Europe.

One of the challenges is the control at borders to prevent the entry of animals with rabies from neighboring countries, mainly due to the arrival of migrants traveling with their pets. According to Mexico's experience, animals entering the different states of the country and various shelters where people with pets arrive are vaccinated; prophylaxis is carried out in case of any exposure. It is important to genetically characterize rabies cases occurring at borders and in dogs accompanying migrants to identify the virus variant.

Expanding the vaccination process and coverage is suggested at both national and state levels for sustainable and proper development. According to the country's experience, rabies vaccination is carried out in a decentralized manner, funded by the government of each state. A quarterly evaluation mechanism and periodic follow-ups are maintained, wherein, if the target is not met, vaccination must be constant. In Mexico, 80% coverage is indicated. Encouraging the participation of different states or entities involved in mass vaccination goals is important to achieve the desired coverage. The verification of national targets enables guidance and monitoring states regarding the number of animals vaccinated during each campaign, and supporting them in reaching the stipulated coverage.

Vaccination credibility is crucial for people to participate in vaccination campaigns. However, incidents can occur during or after vaccination, known as AEFI. To address this, there is a platform to receive reports of such incidents. It is mandatory to report any incident at the time of vaccination, and there is a 12-hour window for reporting. For each report associated with vaccination, the provider should assume responsibility for hospitalization, necropsy of the animal, or ruling out any issues with the vaccine. All this is regulated in the field of canine rabies.

Regarding the estimation of the dog and cat population, historical data was initially used, based on surveys conducted in Mexico by state, locality, and municipality. Each entity already has its own survey and has information about the number of animals to be vaccinated. This year, an update of the survey will be conducted, although there is already an estimate of the dog and cat population in Mexico.

The difference in cost between the oral vaccine for dogs and the vaccine routinely used is being analyzed. According to Mexico's experience, the study conducted did not allow to determine the cost of the vaccine. Following the results, it may be possible to consider administering it in certain areas and, in that case, evaluating its cost. The secretariat emphasized that oral vaccination does not replace parenteral vaccination; however, it could be a specific strategy for use in special conditions.

The experts raise questions regarding the suspension of mass rabies vaccination campaigns for dogs and cats in Mexico from the public sector. There is evidence suggesting a national trend, especially in large cities, to shift the responsibility of vaccination from the public service exclusively to the private sector. However, there are marginalized areas with wildlife where there are no veterinarians available for private vaccination services. It is essential to collaborate with local governments accustomed to conducting campaigns, trust the private sector, and delegate the responsibility for mass vaccinations to them.

**SESSION 8. PAHO REVOLVING FUND***Oscar Vargas, PAHO/WHO*

PAHO/WHO Revolving Fund was described as a technical cooperation mechanism responsible for supporting countries of the region of the Americas in gaining access to vaccines and medical supplies, and a means to enhance the purchasing power of 41 countries and territories in Latin America and the Caribbean for the different products they offer, such as 47 different types of vaccines.

The Revolving Fund's assistance to countries is grounded in principles of equity to ensure access to vaccine supplies, the high quality of vaccines prequalified by the WHO, transparency in processes and pricing, and Pan-Americanism, while the commitment of Member States is solidarity in demand for achieving lower prices.

In the regional strategy for rabies elimination, the Revolving Fund provides support in the access and supply of products such as rabies vaccines and immunoglobulin for human use, and as from 2015, the rabies vaccine for dogs and cats.

Once the demands from the countries are submitted, the Revolving Fund is responsible for the placement, monitoring, and coordination of the logistics of purchase orders with manufacturers, overseeing the reception in the country, customs clearance, and national distribution.

**8.1 Dialogue among delegates.**

The countries mention some delays in the arrival of vaccines, impacting plans for vaccination campaigns within the established dates. The Revolving Fund recommends reviewing internal coordination and the necessary documentation within a country for the entry of vaccines through customs and avoiding delays in batch release. Where necessary, countries can seek PAHO's support to connect and facilitate the loan of supplies from other countries in the event of a shortage of human immunoglobulins or any other biological for various reasons.

The countries mentioned that they have received a communication from the Revolving Fund indicating a potential shortage of human rabies immunoglobulins, and in this situation, the possibility of seeking support from other countries could be significant. PAHO expresses its readiness to assist other countries for solutions, such as loans of supplies, for example.

In some countries, human rabies immunobiologicals are not included in the demand for vaccines required by the Expanded Program on Immunization - EPI - and, for this reason, they may be excluded from the credit request. The Revolving Fund reaffirms the availability of a 60-day credit for rabies immunobiologicals and, therefore, suggests that each country should coordinate internally to make a request that includes human rabies vaccines and others that fall within the same financing.

The offer of the Revolving Fund responds to the demands made by the countries according to their needs. This applies in the case of vaccines for herbivores, where the Revolving Fund does not currently offer vaccines for herbivores. However, if countries demand this biological product, the Revolving Fund has the possibility to initiate the process so that countries can acquire it. Likewise, it is important for countries to be aware of the various options for requesting the Revolving Fund to acquire these inputs, depending on each country's needs.

**SESSION 9. PROPOSAL FOR ELIMINATING DOG-TRANSMITTED HUMAN RABIES IN SELECTED COUNTRIES**

Marco Vigilato and Felipe Rocha, PANAFTOSA/VPH-PAHO/WHO

**9.1 Cross-border actions.**

First, a video was shared as a product of the experience of actions developed for the prevention and control of rabies in border areas within the framework of the technical cooperation between Brazil and Bolivia to eliminate canine rabies in both countries. Since 2007, they have been working together to combat leishmaniasis and rabies. Then, the countries of the Americas shared the progress of the collaborative efforts done in their borders:

Colombia engaged in discussions with Ecuador, Peru, and Venezuela, to coordinate actions for municipalities near the border with each country and to promote awareness of collaborative efforts. Similarly, Colombia describes a positive experience in vaccination activities at the border with Ecuador. However, this year, vaccination campaigns could not be conducted due to difficulties with the availability of the biological product.

Since 2016, Ecuador has participated in international initiatives with neighboring countries such as Colombia. It is expected to initiate discussions with Peru soon. Similarly, Ecuador faced challenges related to the availability of biologicals for border vaccination.

For the past 4 years, Chile has had a work plan for the northern part of the country that includes borders. The challenge lies in the irregular crossings due to the abnormal entry of animals from Bolivia. Additionally, it notes that there is still a low perception of the risk of rabies in the country, which could be detrimental.

In Panama, although collaboration with veterinarians at border crossings is quite permeable, vaccination has been implemented along the border for many years. Health posts are established to attend to all migrants. There is an ongoing project for the border with Colombia to provide mobile medical control centers and attend to the large number of migrants entering the country. Since the migration route is a difficult access for dogs, migrants hardly bring these animals, thus reducing the risk of the entry of the canine rabies virus through the border crossing.

There have been activities at borders for many years, such as those of Uruguay since 2007, with collaborative efforts with Brazil, besides being part of teams with Argentina and Brazil for controlling populations of *Desmodus rotundus* bats and providing health education. A growing need emerges for joint research for diagnosis and support among international laboratories, as the rabies program involves not only dog vaccination but also considering the various components to be developed through international cooperation to eliminate dog-transmitted rabies. The activities carried out at the border of Uruguay, Argentina, and Brazil call for the involvement and integration of Paraguay for prevention at the border and the coordination of cooperative actions for rabies in herbivores.

After PANAFTOSA/VPH-PAHO/WHO brings up the subject regarding collaborative work between countries, and during the meeting break, dialogue was facilitated to initially address the intention for collaboration among bordering countries, which will undoubtedly pave the way for the development of actions to control rabies transmitted by dogs and wild animals. The countries express their intention to initiate joint actions that will open the door to the development of activities for the control of rabies transmitted by dogs and wild animals. Brazil expresses interest in working with Venezuela in the border area, similar to the work done with Bolivia. Colombia intends to form an alliance with Panama for the control of the screwworm and the hematophagous bat *Desmodus rotundus*. Bolivia, jointly with Peru, has started rabies vaccination for dogs and cats at the border, strengthened the border with Chile, and worked with Brazil. However, the circulation of the rabies virus in dogs is significant in its territory, increasing the risk for neighboring countries without evidence of circulation.

For this reason, joint efforts among countries are needed to prevent the entry of infected animals from Bolivia. It is proposed to create a strategy to have vaccination cards at all borders and for the movement of animals by land.

## **9.2 Regional collaboration mechanisms.**

The importance of mutual support among countries in a collaborative effort to achieve the goal of eliminating dog-transmitted human rabies and canine rabies, as well as controlling rabies in herbivores caused by wild animals in the countries of the Americas was emphasized, while preserving the principles of equality and social justice.

Haiti expressed gratitude to Brazil and the Dominican Republic for their donations of rabies vaccine, which have enabled the development of vaccination campaigns. Due to its current challenges, the other member countries are requested to be co-participants in these support actions continuously, and there is an urge to replicate them throughout the region to achieve the elimination of dog-transmitted rabies by 2030. In this regard, the Dominican Republic and Brazil are committed to continuing their donations to Haiti.

The efforts made by Brazil in donating over 450,000 doses of canine rabies vaccine to different countries of the Americas were emphasized, particularly because the goal is the elimination of dog-transmitted rabies in the region. With the effort of all countries, constant cooperation is fundamental and a priority, especially in countries like Haiti, facing social and economic challenges that would impact the outcome. Moreover, Brazil has developed a zoonosis management course that will address the topic of rabies in both virtual and in-person modalities and will be made available to other countries in the region by June 2024. PANAFTOSA/VPH-PAHO/WHO offers support to countries for the translation of Brazil's virtual course and any other virtual courses they wish to share with the entire region.

Mexico shared its experience regarding the management of a strategic reserve that was useful at a certain point. However, it adds that it should be considered that the creation of a fund or the purchase of a larger percentage of vaccines will not be used domestically. Mexico also mentions the support provided to Belize and Guatemala with loans of human rabies vaccines and expresses its willingness to assist in the shipment of vaccines and immunoglobulins to these countries. The Mexican Agency and the one in Honduras are teaming up to cooperate for the control of paralytic rabies in cattle.

Bolivia mentions the country has had epidemiological conditions for other diseases that influence the management of canine rabies control and affect the budget for executing actions, prevention, and control, particularly regarding (non-biological) medical supplies. Therefore, Bolivia emphasizes the need for technical, logistical, and material cooperation to strengthen the collection and shipping of rabies samples from dogs and wild animals, improve the cold chain for biologicals, and support human resources for vaccination. Furthermore, it requests training on the methodology for estimating the dog population. The country requests a visit from an experienced entity to its laboratories to assess the effectiveness of the diagnosis. The importance of strengthening communication with communities in their dialect so that the importance of rabies is understood, is highlighted.

Argentina offers its capacity to contribute human and animal biologicals, technical review for countries in need, and expresses the intention to resume mirror vaccinations with Bolivia. The country is also willing to provide technical assistance and laboratory support to help Bolivia. However, it mentions difficulties in communication between countries regarding the delivery of border reports, especially in reporting outbreaks between borders.

Cuba requests support in transportation and the necessary cold chain for vaccines and reagents for the direct immunofluorescence technique in diagnosis. The Pasteur Institute offers assistance to countries that request reagents if they do not have the conditions to obtain them, along with the availability of various techniques for sample collection and diagnosis.

Likewise, Venezuela mentions that the country is working on strengthening all the components of its national rabies program and requests international support due to weaknesses in the country concerning diagnosis in the network of public health laboratories, difficulties in accessing vaccines, and the need for technical strengthening in rabies epidemiological surveillance.

The Secretariat mentions the presence of observers from different sectors and institutions that participated in the development of the REDIPRA 17, that could contribute to strengthen the process for the elimination of dog-transmitted human rabies and canine rabies. In this regard, representatives are asked for authorization to make a brief presentation, understand their technical potential, and if possible, their willingness for technical cooperation. Among them, it is worth mentioning representatives from the academia, the civil society, NGOs, and other technical observers from various countries.

The International Regional Organization for Agricultural Health (*Organismo Internacional Regional de Sanidad Agropecuaria* – OIRSA) shares its experience in canine and animal population estimation methodologies. In turn, it invites to strengthen the articulation between the academia and governments. The World Organisation for Animal Health provides technical expertise from laboratories to interested countries and helps share tools and resources among nations. In addition, the International Humane Society has expertise in canine population surveys and programs for population control.

The Secretariat acknowledges the commendable willingness of the countries to support those in need and emphasizes that without this support it would not be possible to achieve the goal by 2030. In this regard, it insists on the need for incessant and sustained support over time because eliminating rabies requires years of work. It suggests being a bit more ambitious in proposing cooperation mechanisms and presents two scenarios: the first relates to the proposal that countries consider acquiring an additional percentage of rabies vaccine doses to be donated to a fund and then distributed among those needing support. The second scenario could involve the creation of a fund not only for REDIPRA members to contribute but also for the private sector to advocate and appeal to donors.

## **SESSION 10. ADDITIONAL AND PENDING TOPICS**

*Marco Vigilato, PANAFTOSA/VPH-PAHO/WHO*

### **10.1 Perception of the risk of wild rabies caused by hematophagous bats.**

*Luis A. Lecuona Olivares, Animal and Plant Health Inspection Service. US Agricultural Department.*

The presentation focused on the behavioral and biological characteristics of the hematophagous bat *Desmodus rotundus* that could be related to the occurrence of rabies in colonies and populations of these animals in rural areas of the Americas. There are still several poorly elucidated factors about these animals and their relationship with maintaining and transmitting rabies to other animals and among them. Therefore, there is still a path to demystify the animal. Research and work related to this species should be encouraged in order to generate evidence and more knowledge for rabies control in domestic animals.

### **10.2 Suggestions and approval of the Regional Plan for the Elimination of Canine Rabies 2024.**

After the plan review by country delegates, Chile makes an observation mentioning that vaccination coverage in border areas is not clear and proposes incorporating a note "in specific priority zones".

Once the adjustment is made, the plan is submitted to the countries for consideration again and it is approved as the "*Regional Plan for the Elimination of Human Rabies Transmitted by Dogs and Canine Rabies 2024*".

## **PRESENTATION, DISCUSSION AND APPROVAL OF REDIPRA 17 RECOMMENDATIONS**

*Baldomero Molina, PANAFTOSA/VPH-PAHO/WHO*

In the plenary session, 10 (ten) recommendations were presented, discussed, adjusted to the observations, and approved. They are appended to this report as Annex II.

## **CLOSURE OF THE MEETING**

After the participation of the Director of PANAFTOSA/VPH-PAHO/WHO and International Advisor on Communicable Diseases of the PAHO/WHO Representation in Colombia, the meeting is adjourned. - List of participants. Annex III

Bogotá D.C., Colombia, October 14, 2023



## ANNEXES

## ANNEX I. AGENDA

17<sup>TH</sup> MEETING OF RABIES PROGRAM DIRECTORS OF THE AMERICAS - REDIPRA 17

Bogotá D.C., Colombia. October 12-14 2023

## Thursday, October 12, 2023

08:00 - 08:30	Registration
08:30 - 09:00	Opening Ceremony of the REDIPRA 17. Dr. Guillermo Alfonso Jaramillo, Minister of Health and Social Protection (MSPS). Dr. Juan Fernando Roa Ortiz, General Manager, Colombian Agricultural Institute (ICA). Dr. Gina Tambini, Representative of the Pan American Health Organization in Colombia. Dr. Ottorino Cosivi, Director of PANAFTOSA/PH-PAHO/WHO
09:00 - 09:15	Round for the introduction of participants
09:15 - 09:30	Election of the president and rapporteur
09:30 - 10:30	Secretariat Report: Update on technical cooperation activities of the Regional Rabies Program in the Americas (30'). Dialogue among delegates (30').
10:30 - 11:00	Break.
11:00 - 12:00	Analysis of the Epidemiological Situation of Rabies in the Americas (30'). Dialogue among delegates (30').
12:00 - 13:30	Lunch.
13:30 - 14:30	Role of the WHO/PAHO Collaborating Centers in Rabies in the Region of the Americas (45'). Dialogue among delegates (15').
14:30 - 15:45	Adherence to and monitoring of the “Regional Rabies Program on Domestic Herbivores in the Americas (30'). Dialogue among delegates (45').
15:45 - 16:00	Break.
16:00 - 17:30	What is missing for the implementation of national pre-exposure prophylaxis policies for human rabies transmitted by the <i>Desmodus rotundus</i> in at-risk populations? (15'). Examples of the countries (45'). Dialogue among delegates (30').
18:30	Socializing

## Friday, October 13, 2023

08:30 - 08:45	Summary of the previous day
08:45 - 10:30	Presentation and discussion of the “Regional Plan for the Elimination of Canine Rabies 2024-2030” (30'). Use of the SIRVERA (30'). Dialogue among delegates (45').
10:30 - 11:00	Break.
11:00 - 12:00	Mechanism and benefits of validation/verification of the elimination of dog-transmitted human rabies and canine rabies (30'). Dialogue among delegates (30').
12:00 - 13:30	Lunch.
13:30 - 14:30	PAHO Revolving Fund (30'). Dialogue among delegates (30').
14:30 - 15:30	Proposal for the elimination of dog-transmitted human rabies in selected countries. Transborder actions.
15:30 - 16:00	Break.
16:00 - 17:30	Proposal for the elimination of dog-transmitted human rabies in selected countries. Mechanisms of regional collaboration

## Saturday, October 14, 2023

08:30 - 09:00	Summary of previous days.
09:00 - 11:30	Presentation and approval of Recommendations.
11:30 - 12:00	Acknowledgments and closure of the meeting.

**ANNEX II. LIST OF PARTICIPANTS**

**DELEGATES:**

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## 17<sup>TH</sup> MEETING OF RABIES PROGRAM DIRECTORS OF THE AMERICAS – FINAL REPORT

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## 17<sup>TH</sup> MEETING OF RABIES PROGRAM DIRECTORS OF THE AMERICAS – FINAL REPORT

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## 17<sup>TH</sup> MEETING OF RABIES PROGRAM DIRECTORS OF THE AMERICAS – FINAL REPORT

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### **El Salvador**

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### **Francia**

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### **Guatemala**

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## 17<sup>TH</sup> MEETING OF RABIES PROGRAM DIRECTORS OF THE AMERICAS – FINAL REPORT

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