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Biosafety and Biosecurity Measures in the Epidemiological Surveillance of Rabies Virus and Other Lyssaviruses in Mexico

November 19th, 2019

How big is the LATAM Region?

- **21** "***Spanish speaking***" countries

- **7** in Central America
- **16** in the Caribbean
- **12** in South America

+ dependent territories…..

What do we know about Mexico?

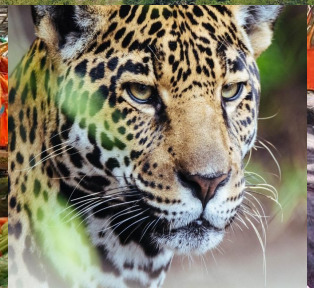




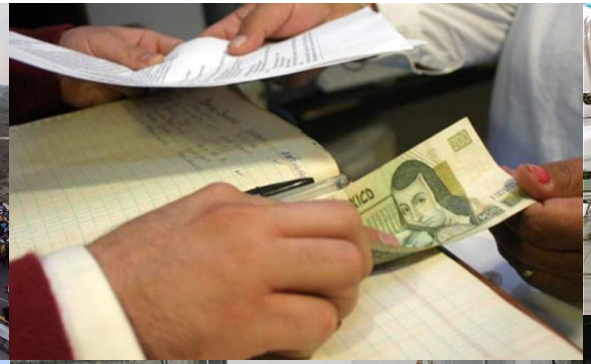




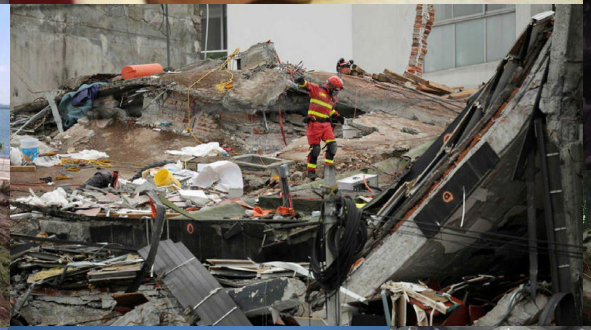




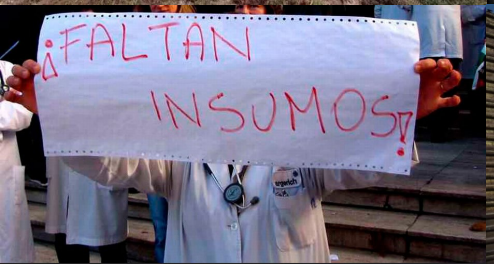

However we also know that…..

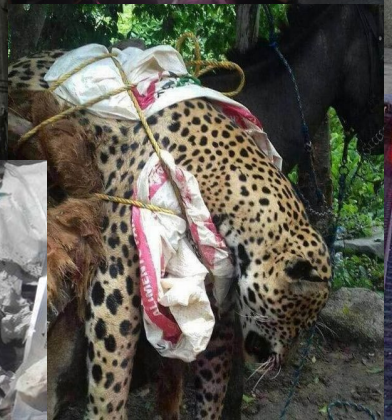













How big is the challenge?

Vigilamos:
°3,152 kilómetros en la frontera norte
°1,149 kilómetros en la frontera sur
°11,122 kilómetros de litorales

Para ello disponemos de:
°49 aduanas
°64 salas internacionales de pasajeros
°276 puntos de revisión

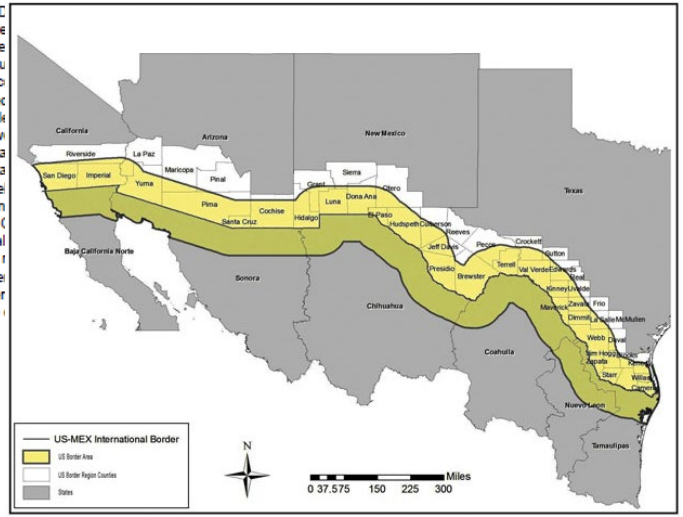
Source: SHCP 2019

RESEARCH

The U.S.-Mexico Border Infectious Disease Surveillance Project: Establishing Bi-national Border Surveillance

Michelle Weinberg,* Stephen Waterman,* Carlos Alvarez Lucas,† Veronica Carrion Falcon,† Pablo Kuri Morales,† Luis Anaya Lopez,† Chris Peter,‡ Alejandro Escobar Gutiérrez,§ Ernesto Ramirez Gonzalez,§ Ana Flisser,¶ Ralph Bryan,* Enrique Navarro Valle,# Alfonso Rodriguez,** Gerardo Alvarez Hernandez,†† Cecilia Rosales,‡‡ Javier Arias Ortiz,§§ Michael Landen,¶¶ Hugo Vilchis,## Julie Rawlings,*** Francisco Lopez Leal,††† Luis Ortega,‡‡‡ Elaine Flagg,* Roberto Tapia Conyer,† and Martin Cetron* for the Border Infectious Disease Surveillance Project Working Group†

In 1997, the Centers for D
the Mexican Secretariat of He
began the development of the
veillance (BIDS) project, a su
diseases along the U.S.-Mexic
a binational team implemented
system for hepatitis and febrile
The network developed surv
surveillance coordinators, esta
Mexican border laboratories, a
sharing and notification of se
BIDS facilitated investigation
Tamaulipas and measles in (
demonstrates that a binational
eral participation can create a
crosses an international borde
structure, and political barrier
collaboration will enhance the
tion projects such as BIDS



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What do we know about epidemiology efforts in the region?

PLOS ONE

RESEARCH ARTICLE

Zika virus: Epidemiological surveillance of the Mexican Institute of Social Security

Concepción Grajales-Muñiz[1], Víctor Hugo Borja-Aburto[2], David Alejandro Cabrera-Gaytán[1], Teresita Rojas-Mendoza[1], Lumumba Arriaga-Nieto[1], Alfonso Vallejos-Parás[1]*

1 Division of Epidemiological Surveillance of Communicable Diseases, Instituto Mexicano del Seguro Social (IMSS), Ciudad de México, México, 2 Unit of Primary Health Care, IMSS, Ciudad de México, México

* alfonso.vallejos@imss.gob.mx

Abstract

Introduction

At the end of 2015, the first cases of Zika were identified in southern Mexico. During 2016, Zika spread as an outbreak to a large part of the country's coastal zones.

Methodology

The Zika epidemiological surveillance system records cases with clinical symptoms of Zika virus disease (ZVD) and those confirmed by means of a reverse polymerase chain reaction (RT-PCR) assay. This report includes the suspected and confirmed cases from 2016. Incidence rates were estimated by region and in pregnant women based on the proportion of confirmed cases.

Results

In total, 43,725 suspected cases of ZVD were reported. The overall incidence of suspected cases of ZVD was 82.0 per 100,000 individuals and 25.3 per 100,000 Zika cases. There were 4,168 pregnant women with suspected symptoms of ZVD, of which infection was confirmed in 1,082 (26%). The estimated incidence rate of ZVD for pregnant women nationwide was 186.1 positive Zika cases per 100,000 pregnant women.

Conclusions

The incidence of Zika in Mexico is higher than that reported previously in the National System of Epidemiological Surveillance. Positive cases of Zika must be estimated and reported.

Check for updates

OPEN ACCESS

Citation: Grajales-Muñiz C, Borja-Aburto VH, Cabrera-Gaytán DA, Rojas-Mendoza T, Arriaga-Nieto L, Vallejos-Parás A (2019) Zika virus: Epidemiological surveillance of the Mexican Institute of Social Security. PLoS ONE 14(2): e0212114. https://doi.org/10.1371/journal.pone.0212114

Editor: Abdallah M. Samy, Faculty of Science, Ain Shams University (ASU), EGYPT

Received: July 13, 2018

Accepted: January 27, 2019

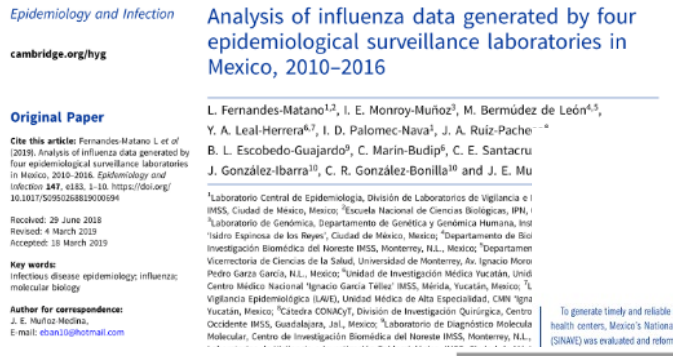
Published: February 11, 2019

Data Availability Statement: All files are available from the public repository database. https://figshare.com/articles/Zika_virus_epidemiological_surveillance_of_the_Mexican_Institute_of_Social_Security/7152377.

Funding: This work was supported by CONACyT (Mexico's National Science and Research Council). Through the Technical Committee and Fund Management International Cooperation in Science and Technology CONACYT (FONCICYT) number

Introduction

Zika virus (ZIKV) was originally identified in a sentinel rhesus monkey in the Zika Forest of Uganda in 1947. The virus is a member of the family Flaviviridae, genus *Flavivirus*, and is mainly transmitted to humans by *Aedes* genus of mosquitoes [1]. The first recorded outbreak



Epidemiology and Infection

cambridge.org/hyg

Original Paper

Cite this article: Fernandes-Matano L *et al* (2019). Analysis of influenza data generated by four epidemiological surveillance laboratories in Mexico, 2010–2016. *Epidemiology and Infection* **147**, e183, 1–10. https://doi.org/10.1017/S0950268819000694

Received: 29 June 2018
Revised: 4 March 2019
Accepted: 18 March 2019

Key words:
Infectious disease epidemiology; influenza; molecular biology

Author for correspondence:
J. E. Muñoz-Medina,
E-mail: eban10@hotmail.com

Analysis of influenza data generated by four epidemiological surveillance laboratories in Mexico, 2010–2016

L. Fernandes-Matano[1,2], I. E. Monroy-Muñoz[3], M. Bermúdez de León[4,5], Y. A. Leal-Herrera[6,7], I. D. Palomec-Nava[1], J. A. Ruíz-Pache[4], B. L. Escobedo-Guajardo[8], C. Marín-Budip[6], C. E. Santacru, J. González-Ibarra[10], C. R. González-Bonilla[10] and J. E. Mu

[1]Laboratorio Central de Epidemiología, División de Laboratorios de Vigilancia e I IMSS, Ciudad de México, México; [2]Escuela Nacional de Ciencias Biológicas, IPN, [3]Laboratorio de Genómica, Departamento de Genética y Genómica Humana, Inst 'Isidro Espinosa de los Reyes', Ciudad de México, México; [4]Departamento de Bio Investigación Biomédica del Noreste IMSS, Monterrey, N.L., México; [5]Departamen Vicerrectoría de Ciencias de la Salud, Universidad de Monterrey, Av. Ignacio Moro Pedro Garza García, N.L., México; [6]Unidad de Investigación Médica Yucatán, Unid Centro Médico Nacional 'Ignacio García Téllez' IMSS, Mérida, Yucatán, México; [7]L Vigilancia Epidemiológica (LAVE), Unidad Médica de Alta Especialidad, CMN 'Igna Yucatán, México; [8]Cátedra CONACyT, División de Investigación Quirúrgica, Centro Occidente IMSS, Guadalajara, Jal., Mexico; [9]Laboratorio de Diagnóstico Molecula Molecular, Centro de Investigación Biomédica del Noreste IMSS, Monterrey, N.L.,

To generate timely and reliable information for decision making in local health centers, Mexico's National Epidemiological Surveillance System (SINAVE) was evaluated and reformed. The reform was achieved by consen- sing a conceptual model ivation. data from 16 468 local ation from all health in- d instruments were cre- thened epidemiologists' nd assessed control ac- population.

ORM BEGAN WITH AN s of SINAVE by means utive interview, with a to detect potential solu- veral perceived prob- e first national meeting

the cutoff. Participants also considered which diseases should be reported immediately or weekly and whether a case study should be conducted. Listings were subjected to a frequency analysis, and three standardized formats were defined: a Weekly Report of New Cases of Disease (EPI-1-95), a Case Study (EPI-2-95), and an Outbreak Study (EPI-3-95). A pilot test was conducted for a 2-month period. Problems were discussed, and errors were detected and corrected.

At a third national meeting, the simple conceptual model of SINAVE reform, formats, manuals, and training program was

an epidemiology bulletin, and a training plan.

A National Committee for Epidemiological Surveillance (CONAVE) was created through ministerial agreement to make surveillance statutory and compulsory in the National Health System.[8] CONAVE was conceived and designed according to the model of academic committees. With Mexico's complex health system, CONAVE has a unique value, because, for the first time, all organizations had been actively involved at SINAVE, and the Official Mexican Norm for Epidemiology Surveillance mandates that in-

SUPPLEMENT ARTICLE

Evaluation and Reform of Mexican National Epidemiological Surveillance System

Roberto Tapia-Conyer, MD, MPH, MSc, Pablo Kuri-Morales, MD, MSc, Luis González-Urbán, IE, and Elsa Sarti, MD, ScD

Measles in Mexico, 1941–2001: Interruption of Endemic Transmission and Lessons Learned

José Ignacio Santos,[1,2] Miguel Angel Nakamura,[1,2] Miriam Veras Godoy,[1,2] Pablo Kuri,[3] Carlos Álvarez Lucas,[3] and Roberto Tapia Conyer[4]

[1]National Center for Child and Adolescent Health, [2]National Immunization Council, [3]National Center for Epidemiological Surveillance, and [4]Under-Secretary for Disease Prevention and Protection, Ministry of Health, Mexico

In Mexico, measles occurred in a cyclical endemic-epidemic pattern until the early 1970s. Beginning in 1973, routine vaccination augmented by mass vaccination campaigns led to a decrease in the incidence of measles until the 1989–1990 regional pandemic, when the measles attack rate rose to 80 cases per 100,000, resulting in 5899 deaths. Since the pandemic, measles elimination efforts in Mexico have resulted in increasing coverage to >95% among children aged 1–6 years with 2 doses of either measles or measles-mumps-rubella vaccine since 1996 and in coverage of 97.6% among children aged 6–10 since 1999. Surveillance data suggest that the transmission of indigenous measles virus was interrupted in 1997. After almost 4 years without measles cases, in April 2000, measles virus was reintroduced into Mexico and 30 laboratory-confirmed cases were reported. Detection of relatively few cases in nonprogrammatic age groups affirms the high immunization coverage and the sensitivity of measles surveillance in Mexico. We conclude that the specific strategies adopted for measles elimination have enabled Mexico to eliminate the endemic transmission of measles.

Mexico, a country with many problems but without rage

Published: - Nov 18, 2019

Mexico is the first country in the world declared free of rabies in humans transmitted by dogs, according to the World Health Organization

Representative pathogens identified in last 40 years (and counting….)

1972 Norovirus from diarrhea outbreak Norwalk Ohio 4 yrs. earlier
1973 Rotavirus Major cause of infantile diarrhea worldwide
1975 Parvovirus B19 Fifth disease; Aplastic
1976 *Cryptosporidium parvum* Acute enterocolitis
1977 Ebola virus Ebola hemorrhagic fever
1977 *Legionella pneumophila* Legionnaires' disease
1977 Hantaan virus Hemorrhagic fever with renal syndrome (HFRS)
1977 *Campylobacter sp.* Enteric pathogens distributed globally
1980 Human T-cell lymphoma leukemia lymphotropic virus-I (HTLV I)
1981 *Staphylococcus* Toxic shock syndrome with toxin tampon use
1982 *Escherichia coli*, O157:H7 hemolytic uremic syndrome
1982 HTLV II Hairy cell leukemia
1982 *Borrelia burgdorferi* Lyme disease
1983 Human immunodeficiency Syndrome-AIDS virus (HIV)
1983 *Helicobacter pylori* Gastric ulcer
1988 Human herpesvirus-6 (HHV-6) Roseola subitum
1989 *Ehrlichia chaffeensis* Human ehrlichiosis
1989 Hepatitis C Parentally transmitted non-A, non-B hepatitis
1990 Recognition that *Pneumocystis jiroveci* was unique from *P. carinii*
1991 Guanarito virus Venezuelan hemorrhagic fever
1991 *Mycoplasma penetrans* urogenital infection
1992 *Vibrio cholerae* New strain associated with O139 epidemic cholera
1992 *Bartonella henselae* Cat-scratch disease; bacillary angiomatosis
1992 *Tropheryma whippelii* Whipples Disease
1992 Barmah Forest (BF) virus – Arbovirus Australia
1993 Hantavirus Hantavirus pulmonary syndrome isolates
1994: Asian Taeniasis: Human Tapeworm infection
1994: Human herpesvirus 8=Kaposi's sarcoma-associated herpesvirus
1994 *Sabia virus* Brazilian hemorrhagic fever
1997: First Human outbreak of H5N1
1998: TT virus: a Transfusion Transmitted Hepatitis
1998: Nipah virus: Encephalitis
1999: *Anaplasma phagocytophilum* (Human Granulocytic Ehrlichiosis/Anaplasmosis)
2000: *Helicobacter canadensis* another cause of diarrhea
2001: Human metapneumovirus (hMPV): Resp infections
2002: *Corynebacterium appendicis:* appendicitis
2002: Dysgonomonas mossii :sepsis
2002: *Kytococcus schroeteri:* sepsis
2003: SARS - CoV
2003: "Bird flu" H5N1 new clad of birds & humans
2004: Human coronavirus NL63 (HCoV-NL63)
2005: *Porocephalus taiwana*: a new pathogenic pentastomid
2006: *Prevotella baroniae* septicemia and wound infection
2007: New Orya-Fever like agent: *Bartonella rochalimae* sp. Nov
2008 Lujo virus (Novel Arena virus of Africa)
2008 *Mycobacterium chimaera* (subtype of MAC)
2009 H1N1-2009 Pandemic
2009 *Wohlfahrtiimonas chitiniclastica* sepsis
2010 *Negativicoccus succinicivorans*
2011 Influenza A(H3N2)v virus
2012 Middle East Respiratory Syndrome (MERS- CoV)
2013 influenza A(H7N9)
2013 Severe fever with thrombocytopenia syndrome Virus (new bunyavirus)
2014 Avian influenza A H10N8

How epidemiological surveillance works in Mexico

- System for Epidemiological Surveillance (SUIVE) created in 1981.
- SUIVE publishes weekly bulletins detailing potential “emerging and re-emerging” diseases.

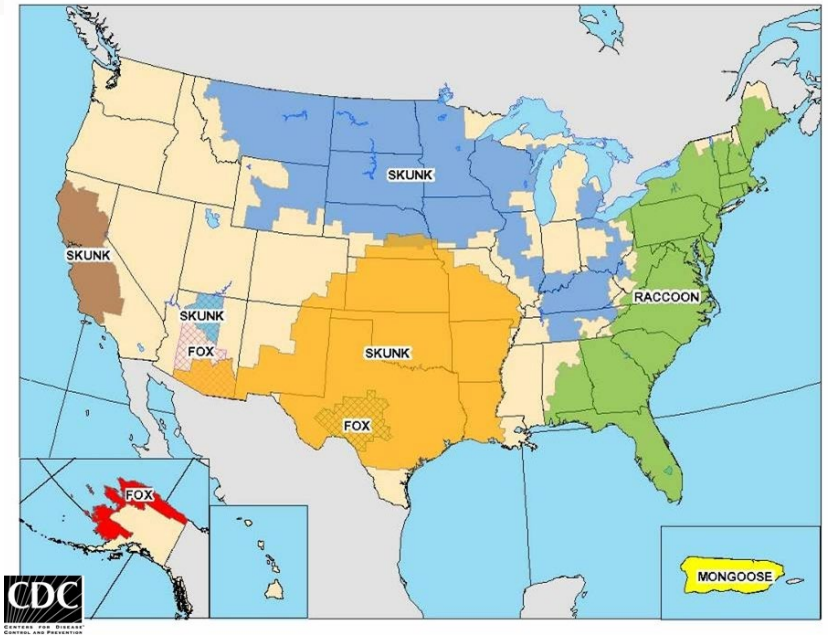
Talking about epidemiological surveillance…..

PRO/AH/EDR> Rabies - Americas (44): USA, dog, skunk, raccoon, fox, human exp

RABIES - AMERICAS (44): USA, DOG, SKUNK, RACCOON, FOX, HUMAN EXPOSURE
****
A ProMED-mail post
<http://www.promedmail.org>
ProMED-mail is a program of the
International Society for Infectious Diseases
<http://www.isid.org>

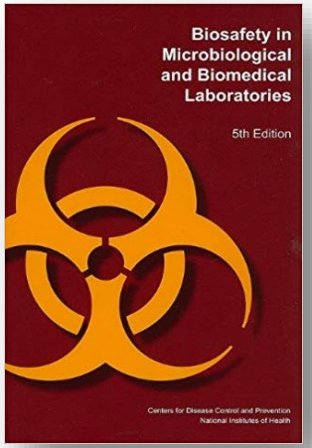
In this post:
[1] South Dakota/North Dakota: puppy, possible human exposure
[2] North Carolina: fox, human exposure
[3] New York: raccoon, human exposure
[4] Massachusetts: skunk, human exposure
[5] South Carolina: puppy, human exposure

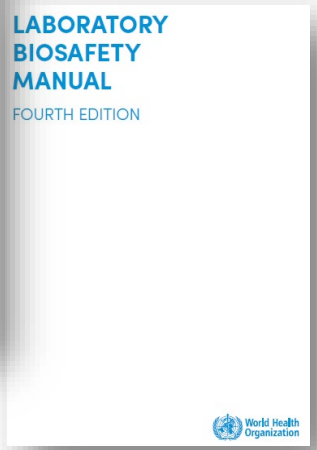
******
[1] South Dakota/North Dakota: puppy, possible human exposure
Date: Fri 30 Aug 2019
Source: Jamestown Sun [edited]
<https://www.jamestownsun.com/lifestyle/pets/4639568-After-puppy-tests-positive-for-rabies-health-departments-in-the-Dakotas-seek-owners-of-littermates>



Infectious diseases and the challenges that we face

- Epidemiological context
- Limited support/risk assessment
- ***"New Regulations"***
- Language, cultural barriers, professional background ...





But… how could we monitor something that it is difficult to detect?

Rabies

- In North America, rabies still persists in terrestrial meso-carnivore species and bats.
- Specific variants of the rabies virus are adapted to species.
- Wildlife species include: skunks, foxes, coyotes, and bats.

Rabies: Status in Mexico

- No human cases transmitted by dogs since 2006…
- Last canine case in 2017...

In 2017:

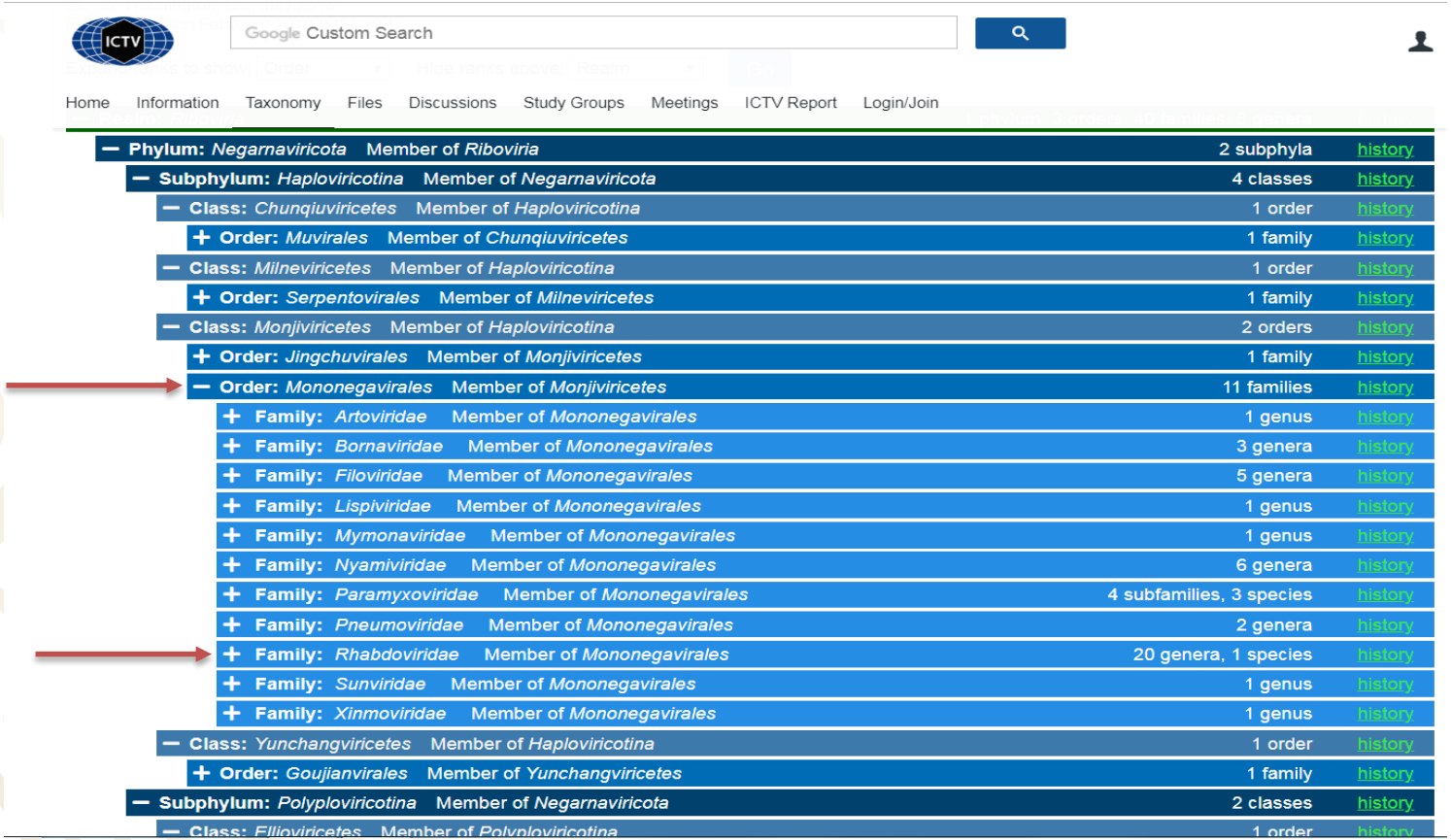
- 75% of positive cases diagnosed were puppies…
- Confirmed cases were non-vaccinated animals…

The North American Rabies Management Plan (NARMP)

- NARMP establishes a protocol for rabies management in North America.

- “Key strategy” in facilitating the planning processes.

Taxonomy of Lyssaviruses



ICTV

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− **Phylum:** *Negarnaviricota*	Member of *Riboviria*	2 subphyla	history
− **Subphylum:** *Haploviricotina*	Member of *Negarnaviricota*	4 classes	history
− **Class:** *Chunqiuviricetes*	Member of *Haploviricotina*	1 order	history
+ **Order:** *Muvirales*	Member of *Chunqiuviricetes*	1 family	history
− **Class:** *Milneviricetes*	Member of *Haploviricotina*	1 order	history
+ **Order:** *Serpentovirales*	Member of *Milneviricetes*	1 family	history
− **Class:** *Monjiviricetes*	Member of *Haploviricotina*	2 orders	history
+ **Order:** *Jingchuvirales*	Member of *Monjiviricetes*	1 family	history
− **Order:** *Mononegavirales*	Member of *Monjiviricetes*	11 families	history
+ **Family:** *Artoviridae*	Member of *Mononegavirales*	1 genus	history
+ **Family:** *Bornaviridae*	Member of *Mononegavirales*	3 genera	history
+ **Family:** *Filoviridae*	Member of *Mononegavirales*	5 genera	history
+ **Family:** *Lispiviridae*	Member of *Mononegavirales*	1 genus	history
+ **Family:** *Mymonaviridae*	Member of *Mononegavirales*	1 genus	history
+ **Family:** *Nyamiviridae*	Member of *Mononegavirales*	6 genera	history
+ **Family:** *Paramyxoviridae*	Member of *Mononegavirales*	4 subfamilies, 3 species	history
+ **Family:** *Pneumoviridae*	Member of *Mononegavirales*	2 genera	history
+ **Family:** *Rhabdoviridae*	Member of *Mononegavirales*	20 genera, 1 species	history
+ **Family:** *Sunviridae*	Member of *Mononegavirales*	1 genus	history
+ **Family:** *Xinmoviridae*	Member of *Mononegavirales*	1 genus	history
− **Class:** *Yunchangviricetes*	Member of *Haploviricotina*	1 order	history
+ **Order:** *Goujianvirales*	Member of *Yunchangviricetes*	1 family	history
− **Subphylum:** *Polyploviricotina*	Member of *Negarnaviricota*	2 classes	history
− **Class:** *Ellioviricetes*	Member of *Polyploviricotina*	1 order	history

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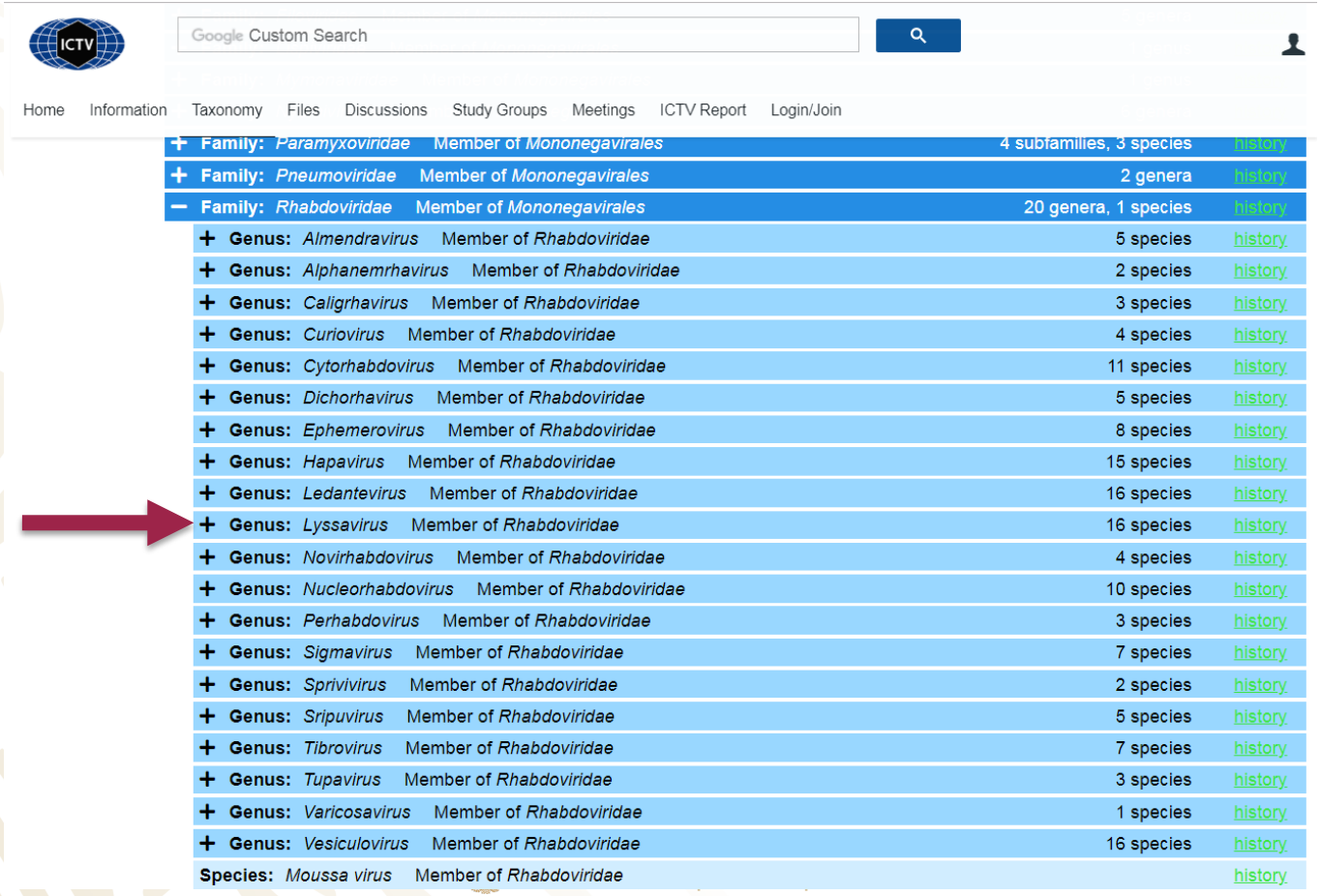
Source: ICTV Mayo 2019 https://talk.ictvonline.org/taxonomy/

Taxonomy of Lyssaviruses (cont.)



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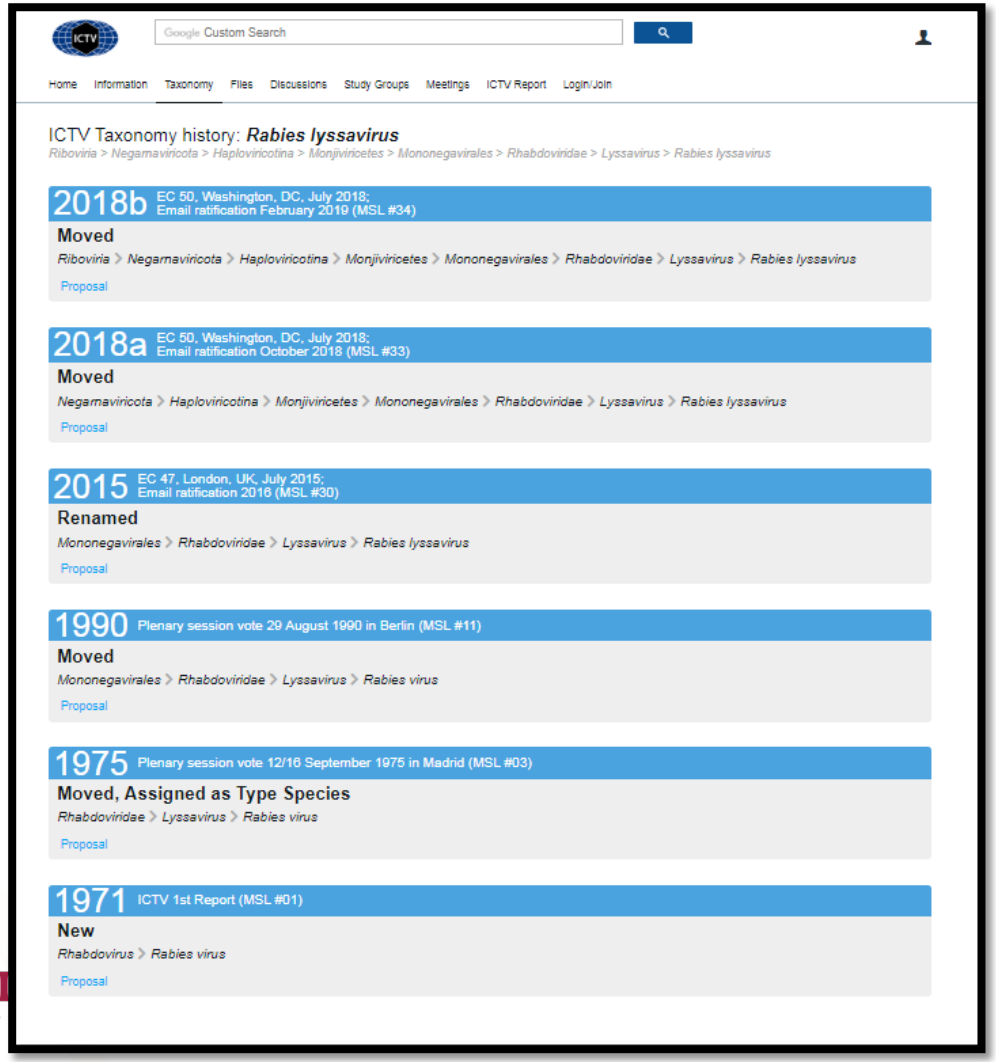
+ **Family:** *Paramyxoviridae* Member of *Mononegavirales*	4 subfamilies, 3 species	history
+ **Family:** *Pneumoviridae* Member of *Mononegavirales*	2 genera	history
− **Family:** *Rhabdoviridae* Member of *Mononegavirales*	20 genera, 1 species	history
+ **Genus:** *Almendravirus* Member of *Rhabdoviridae*	5 species	history
+ **Genus:** *Alphanemrhavirus* Member of *Rhabdoviridae*	2 species	history
+ **Genus:** *Caligrhavirus* Member of *Rhabdoviridae*	3 species	history
+ **Genus:** *Curiovirus* Member of *Rhabdoviridae*	4 species	history
+ **Genus:** *Cytorhabdovirus* Member of *Rhabdoviridae*	11 species	history
+ **Genus:** *Dichorhavirus* Member of *Rhabdoviridae*	5 species	history
+ **Genus:** *Ephemerovirus* Member of *Rhabdoviridae*	8 species	history
+ **Genus:** *Hapavirus* Member of *Rhabdoviridae*	15 species	history
+ **Genus:** *Ledantevirus* Member of *Rhabdoviridae*	16 species	history
+ **Genus:** *Lyssavirus* Member of *Rhabdoviridae*	16 species	history
+ **Genus:** *Novirhabdovirus* Member of *Rhabdoviridae*	4 species	history
+ **Genus:** *Nucleorhabdovirus* Member of *Rhabdoviridae*	10 species	history
+ **Genus:** *Perhabdovirus* Member of *Rhabdoviridae*	3 species	history
+ **Genus:** *Sigmavirus* Member of *Rhabdoviridae*	7 species	history
+ **Genus:** *Sprivivirus* Member of *Rhabdoviridae*	2 species	history
+ **Genus:** *Sripuvirus* Member of *Rhabdoviridae*	5 species	history
+ **Genus:** *Tibrovirus* Member of *Rhabdoviridae*	7 species	history
+ **Genus:** *Tupavirus* Member of *Rhabdoviridae*	3 species	history
+ **Genus:** *Varicosavirus* Member of *Rhabdoviridae*	1 species	history
+ **Genus:** *Vesiculovirus* Member of *Rhabdoviridae*	16 species	history
Species: *Moussa virus* Member of *Rhabdoviridae*		history

Source: ICTV Mayo 2019 https://talk.ictvonline.org/taxonomy/

New species submitted

Source: ICTV Mayo 2019 https://talk.ictvonline.org/taxonomy/

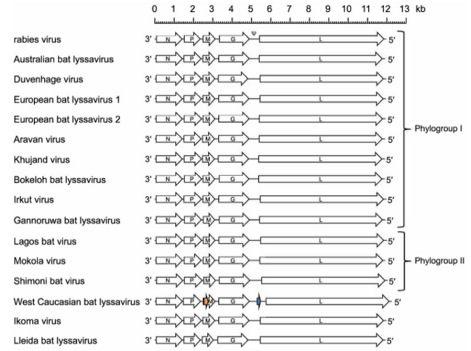


Genus *Lyssavirus*

Virus Taxonomy: 2018b Release

EC 50, Washington, DC, July 2018
Email ratification February 2019 (MSL #34)

- **Genus:** *Lyssavirus*
- **Species:** *Aravan lyssavirus*
- **Species:** *Australian bat lyssavirus*
- **Species:** *Bokeloh bat lyssavirus*
- **Species:** *Duvenhage lyssavirus*
- **Species:** *European bat 1 lyssavirus*
- **Species:** *European bat 2 lyssavirus*
- **Species:** *Gannoruwa bat lyssavirus*
- **Species:** *Ikoma lyssavirus*
- **Species:** *Irkut lyssavirus*
- **Species:** *Khujand lyssavirus*
- **Species:** *Lagos bat lyssavirus*
- **Species:** *Lleida bat lyssavirus*
- **Species:** *Mokola lyssavirus*
- **Species:** *Rabies lyssavirus*
- **Species:** *Shimoni bat lyssavirus*
- **Species:** *West Caucasian bat lyssavirus*



Derivation of names

Lyssavirus: from *Lyssa*, the Greek goddess of madness, rage, and frenzy.

Related, unclassified viruses

Virus name	Accession number	Virus abbreviation
Taiwan bat lyssavirus	MF472710	TBLV
Kotalahti bat lyssavirus	MF960865	KBLV

Virus names and virus abbreviations are not official ICTV designations.

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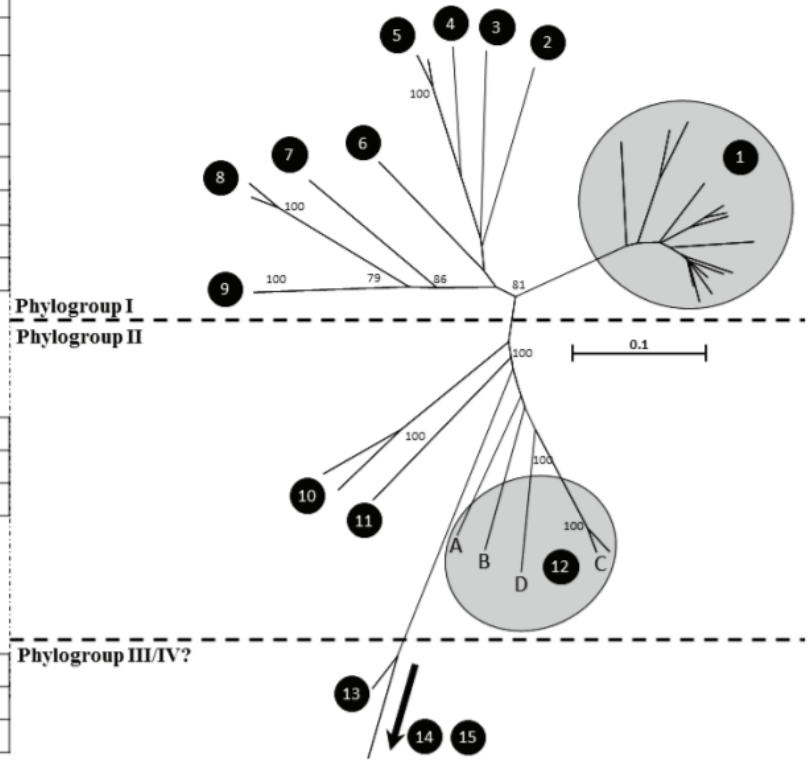
Source: ICTV Mayo 2019 https://talk.ictvonline.org/taxonomy/

New species

Rabies virus (RABV) (1865)
Lagos bat lyssavirus (LBV) (1956)
Mokola virus(MOKV) (1974)
Duvenhage virus (DUVV) (1971)
European bat lyssavirus 1 [EBLV-1] (1968)
European bat lyssavirus 2 [EBLV-2] (1986)
Australian bat lyssavirus (ABLV) (1996)
Aravan virus (ARAV) (2003)
Irkut virus (IRKV) (2003)
Khujand virus (KHUV) (2003)
West Caucasian Bat Virus (WCBV) (2005)
Shimoni virus (SHIBV (2009)
Bokeloh bat lyssavirus (BBLV) (2010)
Ikoma lyssavirus (IKOV) (2012)
Lleida bat lyssavirus (LLEBV) (2012)
Gannoruwa bat lyssavirus (GBLV) (2016)
Taiwan bat lyssavirus (TWBLV) (2016/2017)
Kotalahti bat lyssavirus (KBLV) (2017)

Source: Lyssaviruses and Bats: Emergence and Zoonotic Threat. ***Viruses*** *2014, 6, 2974-2990; doi:10.3390/v6082974*

No.	Virus	Distribution
1	RABV	Global
2	ARAV	Eurasian
3	KHUV	Eurasian
4	BBLV	European
5	EBLV-2	Europe
6	ABLV	Australia
7	IRKV	Eurasian
8	EBLV-1	European
9	DUVV	African
10	MOKV	African
11	SHIBV	African
12	LBV	African
13	WCBV	Eurasian
14	IKOV	African
15	LLEBV	European



Relationship between Lyssaviruses and bats species

Geographical distribution	Lyssavirus species	Bat species most commonly associated with lyssavirus infection	Common name	Transmission from bats implicated in human fatalities
The Americas	Rabies virus (RABV)	*Eptesicus fuscus*	Big brown bat	Yes
		Tadarida brasiliensis	Mexican/Brazilian free-tail bat	Yes
		Lasionycteris noctivagens	Silver-haired bat	Yes
		Perimyotis subflavus	Tri-coloured bat	Yes
		Desmodus rotundus	Vampire bat	Yes
Africa	Lagos Bat Virus (LBV)	*Eidolon helvum*	Straw coluored fruit bat	No
		Rousettus aegyptiacus	Egyptian fruit bat	No
		Epomorphorus wahlbergi	Wahlberg's epauletted fruit bat	No
	Shimoni Bat Virus (SHIBV)	*Hipposideros commersoni*	Commerson's leaf-nosed bat	No
	Duvenhage virus (DUVV)	*Miniopterus sp?*	Undefined	Yes
		Nycteris thebaica	Egyptian slit-faced bat	Yes
Eurasia	European Bat Lyssavirus type 1 (EBLV-1)	*Eptesicus serotinus*	Serotine bat	Yes
	European Bat Lyssavirus type 2 (EBLV-2)	*Myotis daubentonii*	Daubenton's bat	Yes
	Bokeloh Bat Lyssavirus (BBLV)	*Myotis nattereri*	Natterer's bat	No
	Aravan virus (ARAV)	*Myotis blythi*	Lesser mouse-eared bat	No
	Irkut Virus (IRKV)	*Murina leucogaster*	Greater tube-nosed bat	Yes
	Khujand Virus (KHUV)	*Myotis mystacinus*	Whiskered bat	No
	West Caucasian Bat Virus (WCBV)	*Miniopterus schreibersii*	Common bent-winged bat	No
	Lleida Bat Lyssavirus (LLEBV) *	*Miniopterus schreibersii*	Common bent-winged bat	No
Australasia	Australian Bat Lyssavirus (ABLV)	*Pteropus alecto*	Black flying fox and related sp.	Yes
		Saccolaimus flaviventris	Yellow-bellied sheath-tailed bat	Yes

* *Genetic data only reported to LLEBV*

NCBI Resources How To Sign in to NCBI

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National Institutes of Health

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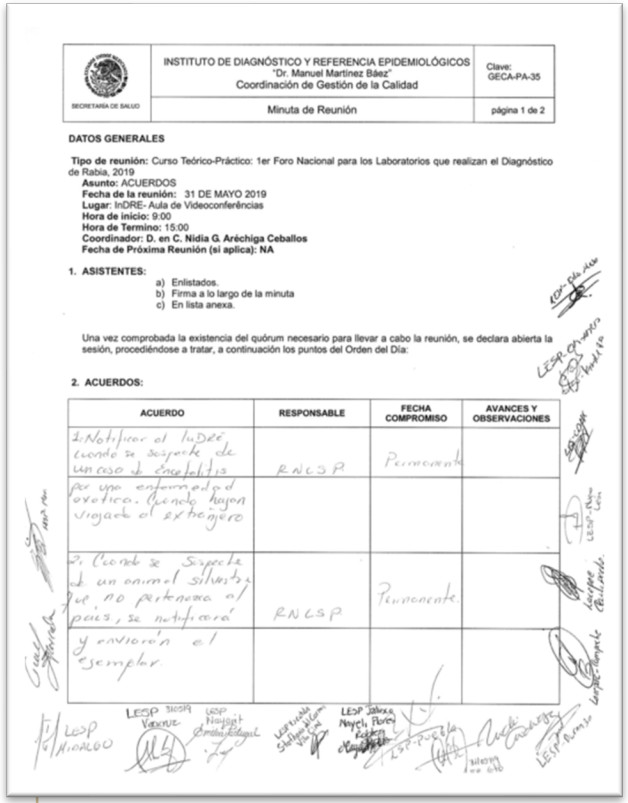
The solution…

- A strategic measure for increasing Rabies and other Lyssaviruses surveillance in the country and one action plan for the containment of these pathogens for an eventual introduction in NA.

Step 1: training (ISST), sign agreement and evaluation of lab capabilities



INSTITUTO DE DIAGNÓSTICO Y REFERENCIA EPIDEMIOLÓGICOS "Dr. Manuel Martínez Báez" Coordinación de Gestión de la Calidad	Clave: GECA-PA-35
SECRETARÍA DE SALUD — Minuta de Reunión	página 1 de 2

DATOS GENERALES

Tipo de reunión: Curso Teórico-Práctico: 1er Foro Nacional para los Laboratorios que realizan el Diagnóstico de Rabia, 2019
Asunto: ACUERDOS
Fecha de la reunión: 31 DE MAYO 2019
Lugar: InDRE- Aula de Videoconferências
Hora de inicio: 9:00
Hora de Termino: 15:00
Coordinador: D. en C. Nidia G. Aréchiga Ceballos
Fecha de Próxima Reunión (si aplica): NA

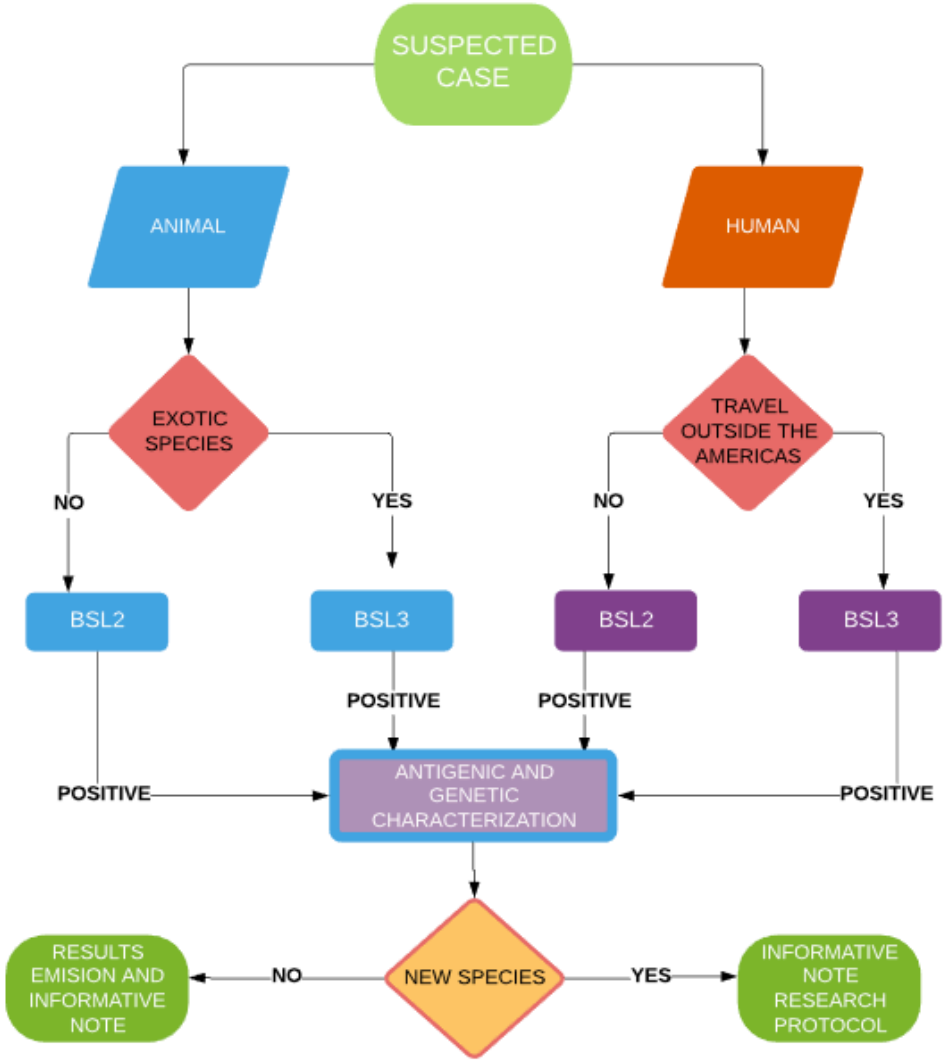
1. ASISTENTES:
a) Enlistados.
b) Firma a lo largo de la minuta
c) En lista anexa.

Una vez comprobada la existencia del quórum necesario para llevar a cabo la reunión, se declara abierta la sesión, procediéndose a tratar, a continuación los puntos del Orden del Día:

2. ACUERDOS:

ACUERDO	RESPONSABLE	FECHA COMPROMISO	AVANCES Y OBSERVACIONES
1. Notificar al InDRE cuando se sospeche de un caso de Encefalitis por una enfermedad exotica. Cuando hayan viajado al extranjero	RNLSP	Permanente	
2. Cuando se sospeche de un animal silvestre que no pertenezca al país, se notificará y enviarán el ejemplar.	RNLSP	Permanente	

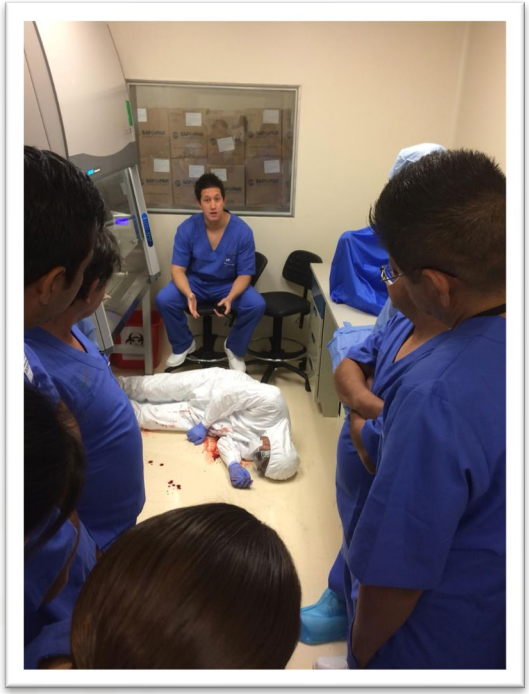
Step 2: Diagnostic and containment algorithm



Working on a National Level

Biosafety and Biosecurity measures for PH labs

- Annual training from 2008 up to date….
- Specific emergency response drills (lab diagnosis and contaiment).
- More than 120 staff trained...
- Strengthening of the inspection and surveillance program.



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Additional measures

- National cooperation with other agencies…
- Strategic communication national and international…
- Trained and certified shippers for the transport of Infectious Substances…

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Concluding remarks (International Level)

What we need to keep doing:

- Improve the exchange of information on epidemiologic events...
- Facilitate the international cooperation

Concluding remarks (National Level)

- Existing guidelines for epidemiological surveillance
- Emergency preparedness and response protocols.
- Experience and training (basic and specific).

General Direction of Epidemiology

Direction of Diagnosis and Reference
Direction of Services and Technical Support

Department of Virology (Rabies Lab Staff)
Department of Bacteriology
Department of Parasitology
Department of Molecular Biology
Department of Emerging Diseases
Department of Sample Control and Services

RNLSP

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Rabies Laboratories Network

Without laboratory: Baja California, Baja California Sur, Sinaloa, Colima, Ciudad de Mexico and Yucatan.

Quality control : Nayarit, Guerrero, Oaxaca, Queretaro y Michoacan

Diagnosis by FAT

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All is about emerging and re-emerging infectious diseases/pathogens……

“Sooner or later everything old is new again”……

Dra. Nidia Aréchiga Ceballos
Chief of Rabies Laboratory
nidia.arechiga@salud.gob.mx

MSc. Luis Alberto Ochoa Carrera
Head of the Epidemiological Surveillance and Research Laboratories Network (DLVIE)
Mexican Institute for Social Security (IMSS)
luis.ochoac@imss.gob.mx

Thank you for your attention

2019

AÑO DEL CAUDILLO DEL SUR

EMILIANO ZAPATA