Preparing Rabies Vaccination Data of Veterinary Health Professionals for Analysis and Best Practices for Rabies Vaccination for Animal Handling Personnel

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Presentation Outline

Introduction

- Rabies overview

Applied Practice Experience

- Learning objectives
- Background
- Activities performed and products developed

MPH Competencies

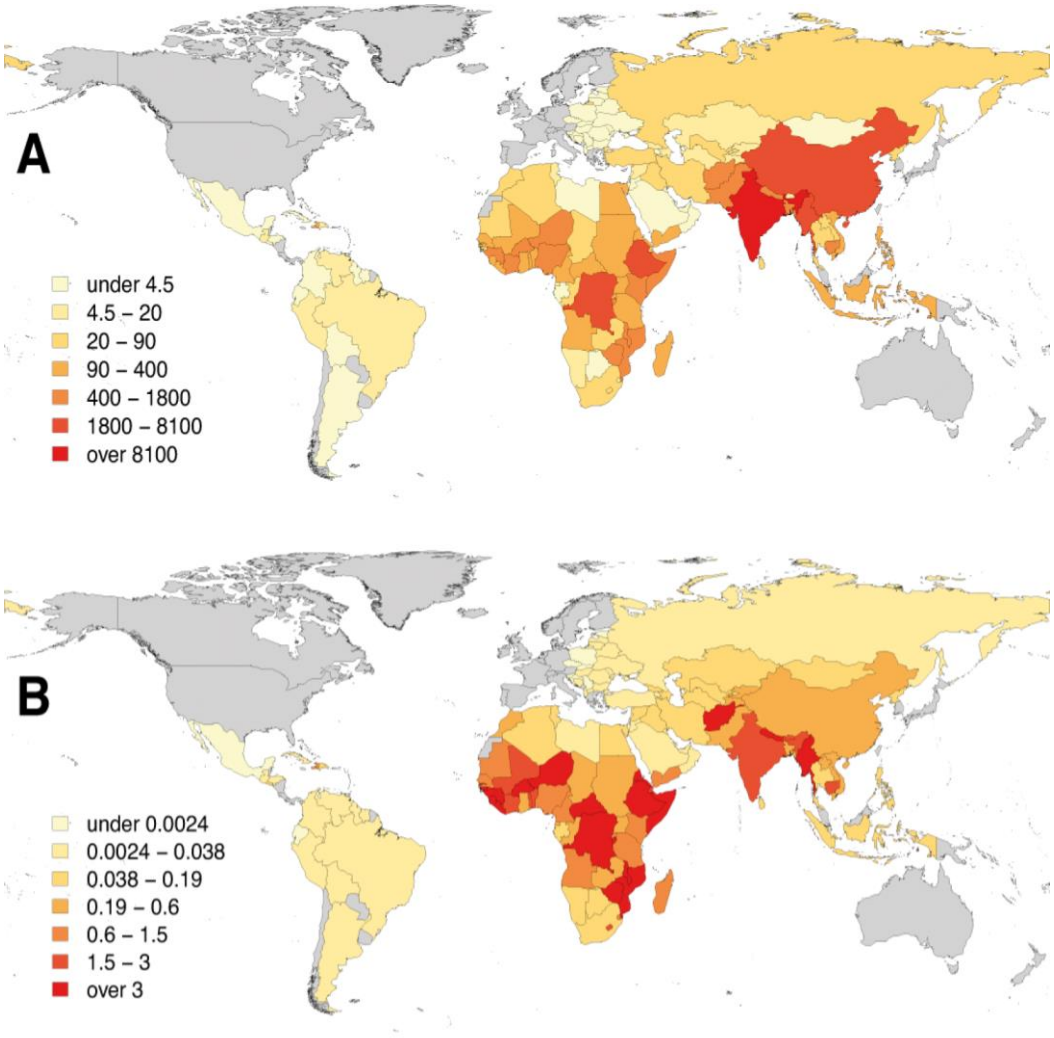
Introduction

- Rabies is a zoonotic viral infectious disease.
- It is caused by RNA viruses in the family Rhabdoviridae, Genus *Lyssavirus*, most often by rabies virus (RABV).

https://www.thetraveldoctor.com.au/world-rabies-day-2013/

- Rabies occurs in more than 150 countries and territories around the world.
- According to the WHO, there are more than 59,000 deaths caused by rabies per year globally
- over 95% of the cases occur in Asia and Africa.

https://urbananimalveterinary.com/event/why-vaccinating-for-rabies-is-important/

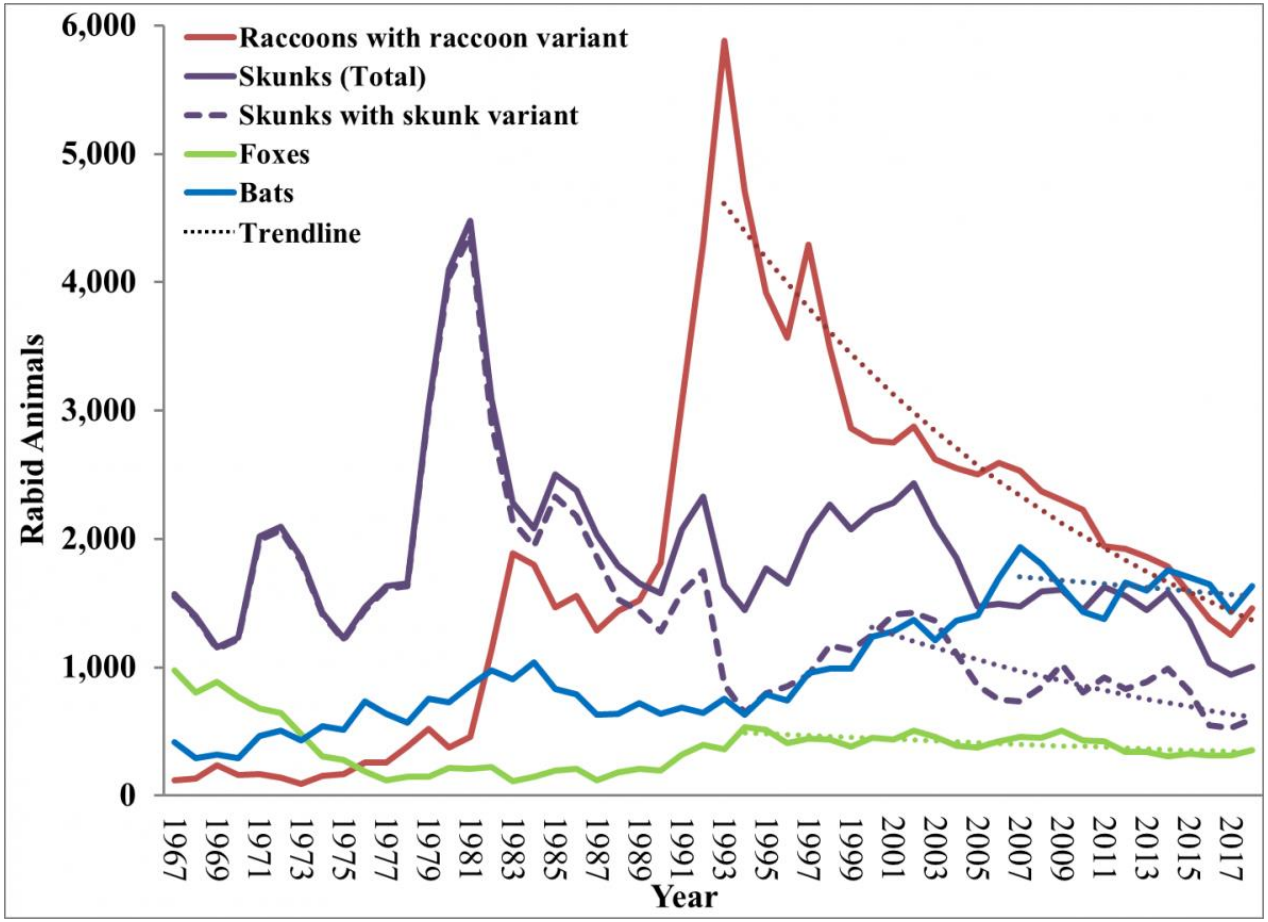


A: Human deaths from rabies

B: Death rates per capita (per 100,000 population)

(WHO Expert consultation on rabies TRS n°1012, 2017)

- Rabies in the U.S



https://www.mountsinai.org/health-library/diseases-conditions/rabies

- Rabies is transmitted by the bite or scratch of rabid animals but may also result from non-bite exposures
- The symptoms of rabies at the first stage may be nonspecific
- Clinical signs will progress to other neurological signs

- Once clinical signs appear, there is no effective treatment for rabies.
- This is a significant global public health concern, particularly for people who are at risk.
- Rabies can be prevented by vaccination in both humans and animals.

https://www.infectiousdiseaseadvisor.com/home/topics/vector-borne-illnesses/rabies-vaccine-may-be-able-to-be-administered-in-similar-fashion-to-ppd/

Applied Practice Experience

Objectives

- To design data preparation workflow that is ready to use for statistical evaluation from Rabies Laboratory Kansas State University and to create the protocol of data preparation
- To develop interprofessional teamwork and communication skills virtually during to the COVID-19 pandemic situation
- To communicate risk of rabies and vaccination to animal handling personnel by creating a summary and a poster

Background

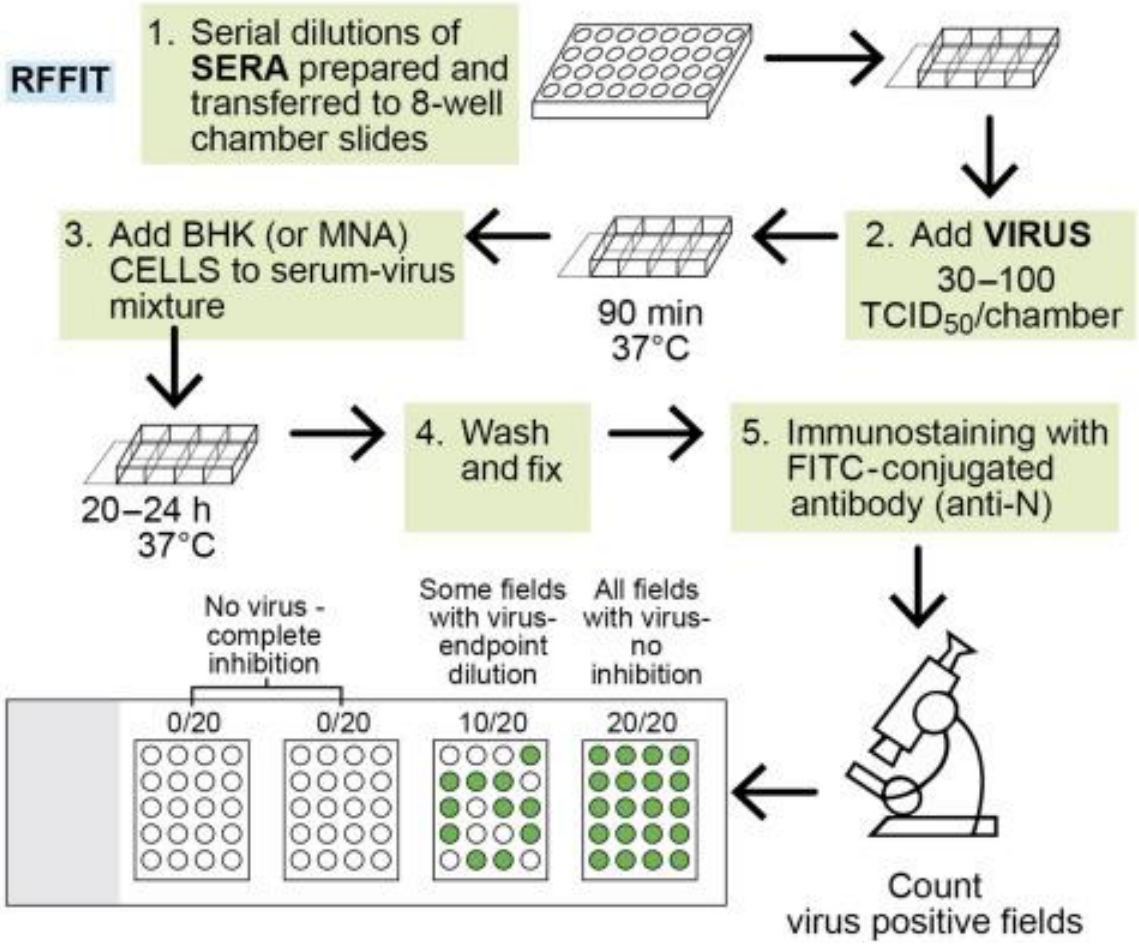
- The Rabies Laboratory of Kansas State University is the primary diagnostic lab for the states of Kansas and Nebraska.
- The tests measuring rabies antibodies includes;
  - Fluorescent Antibody Virus Neutralization (FAVN) test
  - Rapid Fluorescent Focus Inhibition Test (RFFIT)
  - Enzyme-linked immunosorbent assay (ELISA)
- Both the ACIP and the WHO recommend the RFFIT to be the current gold standard serological assay for rabies.

RFFIT

- The RFFIT test is recommended for measuring post-vaccination immune responses and for determining whether booster vaccination is necessary.

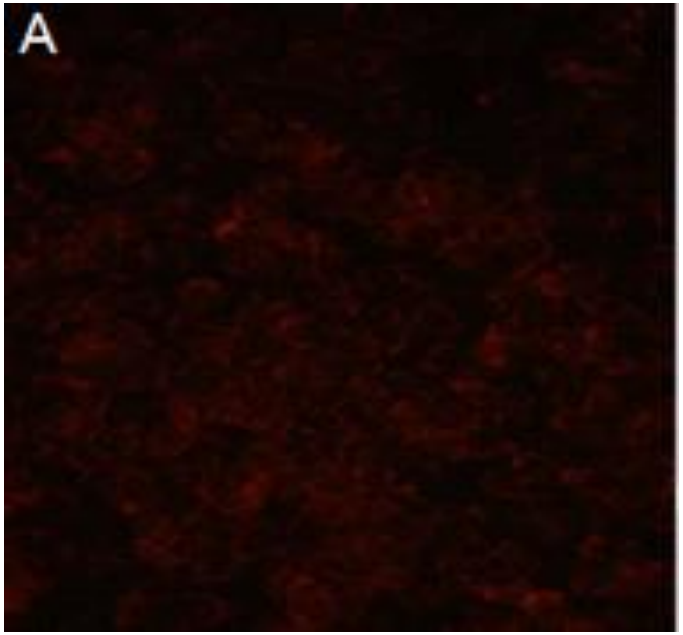
http://www.ksvdl.org/rabies-laboratory/rffit-test/

RFFIT

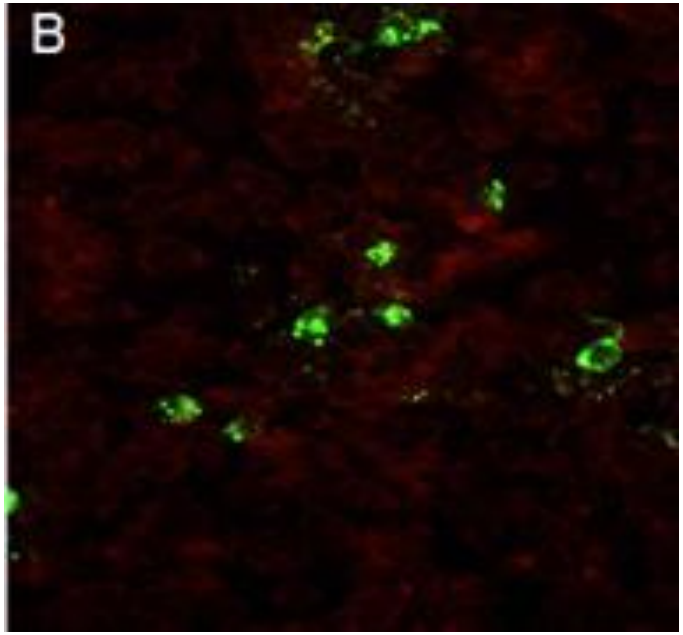


https://www.sciencedirect.com/science/article/pii/B9780128187050000133

RFFIT



An example of a microscopic field where virus has been neutralized



An example of a microscopic field where virus was not neutralized

https://www.cdc.gov/rabies/specific_groups/hcp/serology.html

Activities performed and products developed

Preparing human laboratory data for statistical evaluation

Summary of the process of preparing a set of human laboratory data for statistical evaluation

Summary of the best practices for rabies vaccination and booster timing for personnel handling animals

Poster for educating animal handling staff on rabies control and prevention

Preparing human laboratory data for statistical evaluation

ID	male	yob	region	conf	date	titer	Initial_vx	initial_vx_reason	booster1	booster1_reason	booster2	boster2_reason	booster3	booster3_reason	Last_booster	Last_booster_reason	Note

Template for Human Laboratory Data for Statistical Evaluation

- Sources of data

  1. VetView

     -The laboratory information management system (LIMS)

     -The excel spreadsheet is a report generated by VetView containing all the results such as patient name, date of draw, results, etc.

Conference number

titer

ID

date which each sample was drawn

REF_CASE_NO	RESULT_VALUE	ACCESSION_NO	RECEIVED_DATE	SAMPLED_DATE	ITEM_NUMBER	ANIMAL_ID	REF_CASE_NO	TEST_CODE	RESULT_VALUE	STATUS_CODE
CVC-186	>/= 0.5 IU/mL	R15-026537	9/1/2015 3:42:15.820000 PM AM	8/29/2015 12:00:00.000000	1	XXX XXXX	CVC-186	RFF-1033	>/= 0.5 IU/mL	F
CVC-185	>/= 0.5 IU/mL	R15-026538	9/1/2015 3:42:17.367000 PM AM	8/29/2015 12:00:00.000000	1	XXX XXXX	CVC-185	RFF-1033	>/= 0.5 IU/mL	F
CVC-184	>/= 0.1 IU/mL	R15-026539	9/1/2015 3:42:18.913000 PM AM	8/29/2015 12:00:00.000000	1	XXX XXXX	CVC-184	RFF-1033	>/= 0.1 IU/mL	F
CVC-183	>/= 0.5 IU/mL	R15-026540	9/1/2015 3:42:20.523000 PM AM	8/29/2015 12:00:00.000000	1	XXX XXXX	CVC-183	RFF-1033	>/= 0.5 IU/mL	F
CVC-181	>/= 0.1 IU/mL	R15-026542	9/1/2015 3:42:23.757000 PM AM	8/29/2015 12:00:00.000000	1	XXX XXXX	CVC-181	RFF-1033	>/= 0.1 IU/mL	F
CVC-179	>/= 0.5 IU/mL	R15-026544	9/1/2015 3:42:26.975000 PM AM	8/29/2015 12:00:00.000000	1	XXX XXXX	CVC-179	RFF-1033	>/= 0.5 IU/mL	F
CVC-178	>/= 0.5 IU/mL	R15-026545	9/1/2015 3:42:28.835000 PM AM	8/29/2015 12:00:00.000000	1	XXX XXXX	CVC-178	RFF-1033	>/= 0.5 IU/mL	F
CVC-177	>/= 0.5 IU/mL	R15-026546	9/1/2015 3:42:30.600000 PM AM	8/29/2015 12:00:00.000000	1	XXX XXXX	CVC-177	RFF-1033	>/= 0.5 IU/mL	F
CVC-176	>/= 0.5 IU/mL	R15-026547	9/1/2015 3:42:32.288000 PM AM	8/29/2015 12:00:00.000000	1	XXX XXXX	CVC-176	RFF-1033	>/= 0.5 IU/mL	F
CVC-175	>/= 0.5 IU/mL	R15-026548	9/1/2015 3:42:34.319000 PM AM	8/29/2015 12:00:00.000000	1	XXX XXXX	CVC-175	RFF-1033	>/= 0.5 IU/mL	F
CVC-174	>/= 0.5 IU/mL	R15-026549	9/1/2015 3:42:36.256000 PM AM	8/29/2015 12:00:00.000000	1	XXX XXXX	CVC-174	RFF-1033	>/= 0.5 IU/mL	F
CVC-173	>/= 0.5 IU/mL	R15-026550	9/1/2015 3:42:38.178000 PM AM	8/29/2015 12:00:00.000000	1	XXX XXXX	CVC-173	RFF-1033	>/= 0.5 IU/mL	F
CVC-172	>/= 0.1 IU/mL	R15-026551	9/1/2015 3:42:40.022000 PM AM	8/29/2015 12:00:00.000000	1	XXX XXXX	CVC-172	RFF-1033	>/= 0.1 IU/mL	F

2. The completed rabies titer submission forms called "Rabies Serology for Vaccine Titer Response by RFFIT Screen Method for Human Specimen Only"

-The forms are electronically completed by each participant per rabies titer event and printed at the event for signature and sample processing.

-These forms are saved as scanned pdfs in batches

Rabies Serology for Vaccine Titer Response by RFFIT Screen Method for Human Specimen Only

Kansas State Veterinary DIAGNOSTIC LABORATORY

The Rabies Laboratory
Kansas State University
2005 Research Park Circle
Manhattan, KS 66502

Phone: 785-532-4483
Fax : 785-532-4474
Email: rabies@vet.k-state.edu
http://www.ksvdl.org/rabies-laboratory/

All fields need to be printed legibly. Handwritten information is subject to interpretation by laboratory personnel.

For Lab Use only
Draw Date:

First Name: _____ DOB: _____

Last Name: _____ Sex: ___

Address: _____

City: _____ **State:** _____ **Zip Code:** _____

Phone Number: _____ Fax Number: _____

Email Address: _____

(Rabies Titer Results will be sent to the above email address in 3-4 weeks. All other results will be mailed in 2-3 weeks.)

Rabies Vaccination History: _____

☐ Rabies Titer Screen	☐ Prostate Specific Antigen (PSA)	☐ Thyroid Panel w/TSH
☐ Comprehensive Metabolic + Lipid Panel	☐ Lyme Disease Antibody (test code: 29477)	☐ Brucella antibody, IgG (test code 982)
☐ CBC w/ Differential	☐ Vitamin D	☐ Hepatitis C
☐ Glycohemoglobin A1C	☐ Highly Sensitive C-Reactive Protein	PIL Client ID# 3036 - ONSITE WELLNESS Osgood Kenneth, MD
☐ Lead Levels		

I, the participant named below, have read, understand and agree to the terms of the Rabies Titer Profile/Lab Analysis Notice and Consent provided and attached hereto. No attempts by the participant to modify or amend this form will change its terms or in any way be binding upon the Kansas State University Rabies Laboratory, OnSite Wellness, or other related parties.

Participant's Signature: _____ **Date:** _____

*A signed Rabies Titer Profile/Lab Analysis Consent Form must accompany the lab sample in order for the Kansas State Rabies Laboratory, OnSite Wellness, or other related parties to analyze the sample and release the lab results

Examiner/Collector Information: (To be completed at time of sample collection)

Participant's initials indicate verification the barcode labels on the specimen tubes match the barcode and firt and last name on this form

Serum Draw Date/Time: _____ **Fasting Sample?: Yes:** ___ **Hours** ___ **No** ___

Sample Obtained: **Yes** **No** (If no, please explain: _____)

I, the examiner named above, verify that the enclosed specimens were collected according to the instructions provided by the Kansas State University Rabies Laboratory. I verify that these specimens are the specimens taken from the participant named on this form. I have verified the barcode labels on the specimen tubes match the barcode first and last name on this form.

Examiner's Signature: _____ **Date:** ___

Payment: CashNet Receipt: _____ Check Number: _____ Cash: $_____ by _____

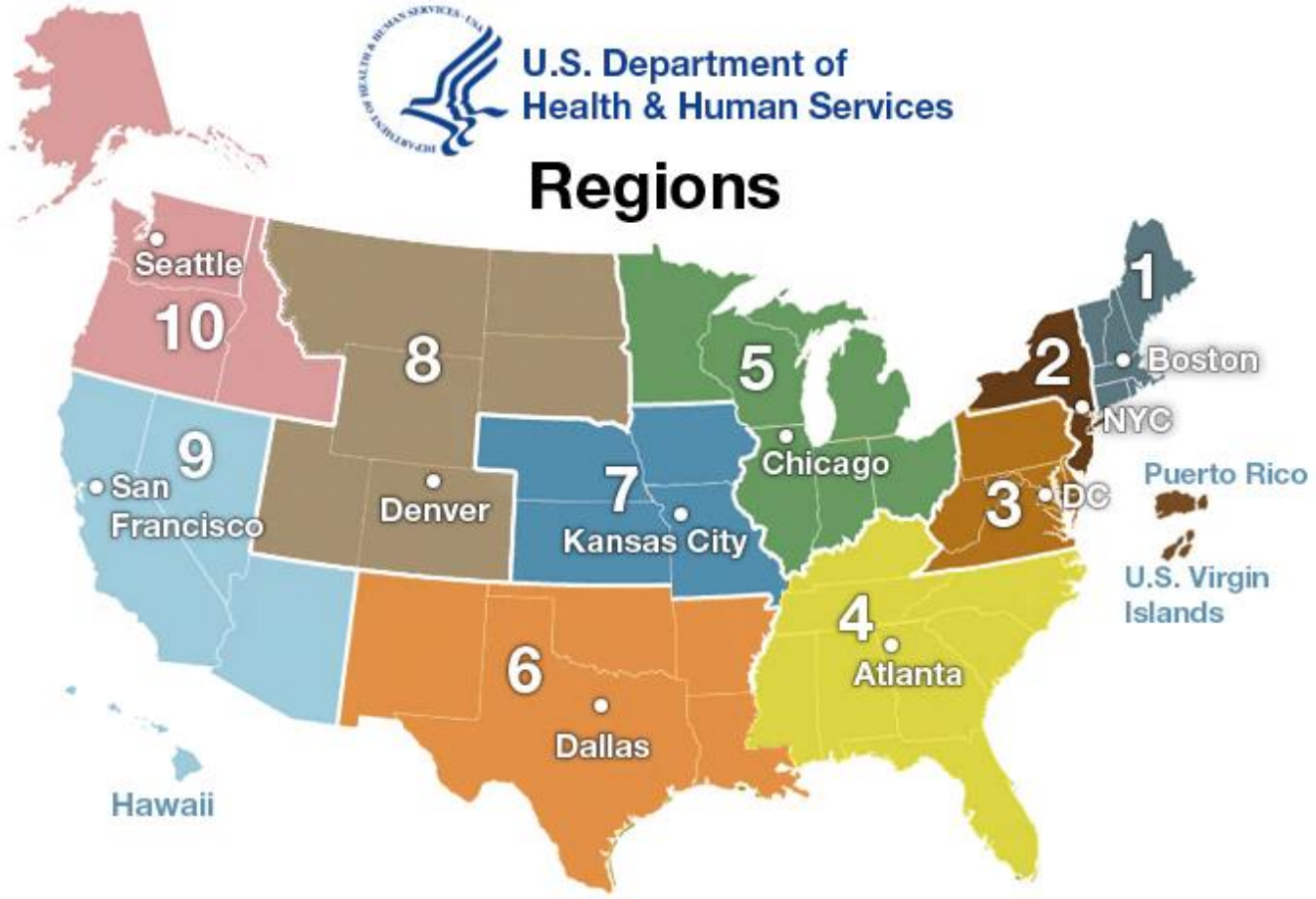
Version 7/2017

Draw date& Conference No.

Date of birth

State

Vaccination history



Regions in the United States classified by United States Department of Health and Human Services

3. Excel spreadsheet files which are compiled from the data entered into the electronic submission form

Conference number

Tube ID (Nam	Client First	Client Last	Address	City	State	Zip	Phone #	Fax #	Email	Tube ID (Na	Date of Dra	Test order	Sample Ty
AVMA-3997	XXX	XXXX	XXXXXXXXXX	XXX	Texas	XXXXX	XXXXXXX	0	XX@XX	AVMA-3997	7/13/2018	RFF-1033	SERUM
AVMA-4095	XXX	XXXX	XXXXXXXXXX	XXX	South Dakot	XXXXX	XXXXXXX	0	XX@XX	AVMA-4095	7/13/2018	RFF-1033	SERUM
AVMA-3993	XXX	XXXX	XXXXXXXXXX	XXX	Arizona	XXXXX	XXXXXXX	0	XX@XX	AVMA-3993	7/13/2018	RFF-1033	SERUM
AVMA-3935	XXX	XXXX	XXXXXXXXXX	XXX	Colorado	XXXXX	XXXXXXX	0	XX@XX	AVMA-3935	7/13/2018	RFF-1033	SERUM
AVMA-3933	XXX	XXXX	XXXXXXXXXX	XXX	New York	XXXXX	XXXXXXX	0	XX@XX	AVMA-3933	7/13/2018	RFF-1033	SERUM
AVMA-4024	XXX	XXXX	XXXXXXXXXX	XXX	Illinois	XXXXX	XXXXXXX	0	XX@XX	AVMA-4024	7/13/2018	RFF-1033	SERUM
AVMA-4041	XXX	XXXX	XXXXXXXXXX	XXX	Colorado	XXXXX	XXXXXXX	0	XX@XX	AVMA-4041	7/13/2018	RFF-1033	SERUM
AVMA-4049	XXX	XXXX	XXXXXXXXXX	XXX	New Mexico	XXXXX	XXXXXXX	0	XX@XX	AVMA-4049	7/13/2018	RFF-1033	SERUM
AVMA-4072	XXX	XXXX	XXXXXXXXXX	XXX	Florida	XXXXX	XXXXXXX	0	XX@XX	AVMA-4072	7/13/2018	RFF-1033	SERUM
AVMA-3938	XXX	XXXX	XXXXXXXXXX	XXX	New Mexico	XXXXX	XXXXXXX	0	XX@XX	AVMA-3938	7/13/2018	RFF-1033	SERUM
AVMA-3900	XXX	XXXX	XXXXXXXXXX	XXX	Colorado	XXXXX	XXXXXXX	0	XX@XX	AVMA-3900	7/13/2018	RFF-1033	SERUM
AVMA-4079	XXX	XXXX	XXXXXXXXXX	XXX	North Caroli	XXXXX	XXXXXXX	0	XX@XX	AVMA-4079	7/13/2018	RFF-1033	SERUM
AVMA-3983	XXX	XXXX	XXXXXXXXXX	XXX	Texas	XXXXX	XXXXXXX	0	XX@XX	AVMA-3983	7/13/2018	RFF-1033	SERUM
AVMA-3992	XXX	XXXX	XXXXXXXXXX	XXX	Wisconsin	XXXXX	XXXXXXX	0	XX@XX	AVMA-3992	7/13/2018	RFF-1033	SERUM
AVMA-3932	XXX	XXXX	XXXXXXXXXX	XXX	Maine	XXXXX	XXXXXXX	0	XX@XX	AVMA-3932	7/13/2018	RFF-1033	SERUM

Data from 1. VetView

Data from 2. submission forms

Excel spreadsheet files

Tube ID (Name or ID#)	Client First	Client Last	Address	City	State	Zip	Phone #	Fax #	Email	Tube ID (Name or ID#)	Date of Draw	Test ordered (RFFIT screen or RFFIT endpoint)	Sample Type	ID	male	yob	region	conf	date	titer	initial_vx	initial_vx	booster1	booster1 _reason	booster2	booster2 _reason	booster3	booster3 _reason	Last booster	Last booster_ reason	Note
AVMA-3997	xxx	xxxx	xxx	xxx	Texas	xxxxx	xxxxx		0 xxxxx	AVMA-3997	7/13/2018	RFF-1033	SERUM	R18-031711	0	1959		AVMA-63997	7/13/2018	>/= 15.0 IU/mL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TESTED BY kSTATE 2017
AVMA-4095	xxx	xxxx	xxx	xxx	South Dakota	xxxxx	xxxxx		0 xxxxx	AVMA-4095	7/13/2018	RFF-1033	SERUM	R18-031710	0	1986		AVMA-84095	7/13/2018	2.4 IU/mL	2013	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	August 2013
AVMA-3993	xxx	xxxx	xxx	xxx	Arizona	xxxxx	xxxxx		0 xxxxx	AVMA-3993	7/13/2018	RFF-1033	SERUM	R18-031709	0	1973		AVMA-93993	7/13/2018	>/= 0.5 IU/mL	1998	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1998
AVMA-3935	xxx	xxxx	xxx	xxx	Colorado	xxxxx	xxxxx		0 xxxxx	AVMA-3935	7/13/2018	RFF-1033	SERUM	R18-031708	0	1991		AVMA-83935	7/13/2018	>/= 0.5 IU/mL	2011	N/A	2013	low titer	N/A	N/A	N/A	N/A	N/A	N/A	Vaccination series done in 2011, one booster in 2013 due to low titer- most recent titer was in 2014 and was sufficient
AVMA-3933	xxx	xxxx	xxx	xxx	New York	xxxxx	xxxxx		0 xxxxx	AVMA-3933	7/13/2018	RFF-1033	SERUM	R18-031707	0	1955		AVMA-23933	7/13/2018	>/= 0.5 IU/mL	2015	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2015
AVMA-4024	xxx	xxxx	xxx	xxx	Illinois	xxxxx	xxxxx		0 xxxxx	AVMA-4024	7/13/2018	RFF-1033	SERUM	R18-031706	0	1982		AVMA-54024	7/13/2018	>/= 0.5 IU/mL	2006	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	January 2006
AVMA-4041	xxx	xxxx	xxx	xxx	Colorado	xxxxx	xxxxx		0 xxxxx	AVMA-4041	7/13/2018	RFF-1033	SERUM	R18-031705	0	1971		AVMA-84041	7/13/2018	>/= 0.5 IU/mL	2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Two doses in 2002
AVMA-4049	xxx	xxxx	xxx	xxx	New Mexico	xxxxx	xxxxx		0 xxxxx	AVMA-4049	7/13/2018	RFF-1033	SERUM	R18-031704	0	1977		AVMA-64049	7/13/2018	>/= 0.5 IU/mL	2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	given 2001

ID	male	yob	region	conf	date	titer	initial_vx	initial_vx	booster1	booster1_reason	booster2	booster2_reason	booster3	booster3_reason	Last booster	Last booster_reason	Note
R20-000192	1	1961	3	AAEP-6748	12/8/2019	>/= 0.5 IU/mL	1998	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1998?
R20-000168	1	1959	5	AAEP-6749	12/8/2019	>/= 0.5 IU/mL	1981	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1981
R20-000162	0	N/A	9	AAEP-6750	12/8/2019	>/= 0.1 IU/mL	1996	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1 of the series in 1996
R20-000156	0	1957	9	AAEP-6751	12/8/2019	LESS THAN 0.1	1990	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1990
R20-000180	0	1977	4	AAEP-6752	12/8/2019	>/= 0.5 IU/mL	2003	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2003
R20-000186	1	1959	5	AAEP-6753	12/8/2019	>/= 0.5 IU/mL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1989	N/A	Last booster 1989
R20-000174	0	1979	8	AAEP-6754	12/8/2019	>/= 0.1 IU/mL	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	~2009
R20-000150	0	1967	2	AAEP-6755	12/8/2019	>/= 0.5 IU/mL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	yes
R20-000144	0	1966	8	AAEP-6756	12/8/2019	>/= 0.5 IU/mL	1999	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1999
R20-000191	0	1949	4	AAEP-6757	12/8/2019	>/= 0.5 IU/mL	1999	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20 years ago rabies series
R20-000179	0	1964	4	AAEP-6758	12/8/2019	>/= 0.1 IU/mL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
R20-000173	0	1960	4	AAEP-6759	12/8/2019	>/= 0.5 IU/mL	2004	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15 years ago
R20-000185	0	1992	8	AAEP-6760	12/8/2019	>/= 0.5 IU/mL	2015	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	vaccinated in 2015
R20-000161	0	1981	5	AAEP-6761	12/8/2019	>/= 0.5 IU/mL	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2009
R20-000167	0	1982	1	AAEP-6762	12/8/2019	>/= 0.5 IU/mL	2009	pre exposure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	given pre exposure 2009 titer in 2010 was adequate
R20-000155	0	1991	4	AAEP-6763	12/8/2019	>/= 0.5 IU/mL	2013	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Vaccinated in 2013
R20-000149	0	1984	1	AAEP-6764	12/8/2019	>/= 0.5 IU/mL	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1/1/2008
R20-000190	0	1978	8	AAEP-6767	12/8/2019	>/= 0.1 IU/mL	2009 or 2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2009 or 2010, completed series
R20-000135	0	1982	4	AAEP-6793	12/9/2019	>/= 0.5 IU/mL	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2009
R20-000076	1	1954	9	AAEP-6795	12/9/2019	>/= 0.1 IU/mL	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2010
R20-000125	0	1983	6	AAEP-6798	12/9/2019	>/= 0.5 IU/mL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2018	N/A	last vaccine in 2018
R20-000088	0	1957	4	AAEP-6800	12/9/2019	>/= 0.1 IU/mL	1982	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1982
R20-000107	0	1992	9	AAEP-6801	12/9/2019	>/= 0.5 IU/mL	2014	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2014
R20-000120	0	1977	3	AAEP-6802	12/9/2019	>/= 0.5 IU/mL	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	loading series 2000
R20-000100	1	1980	9	AAEP-6803	12/9/2019	>/= 0.5 IU/mL	2004	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2004
R20-000124	0	1986	5	AAEP-6804	12/9/2019	>/= 0.5 IU/mL	2011	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	vaccinated in vet school 2011
R20-000126	0	1980	4	AAEP-6805	12/9/2019	>/= 0.5 IU/mL	1993	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1993
R20-000112	0	1975	8	AAEP-6806	12/9/2019	>/= 0.5 IU/mL	1998	1998	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1998
R20-000121	1	1958	4	AAEP-6807	12/9/2019	>/= 0.1 IU/mL	1985	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1985
R20-000089	0	1961	8	AAEP-6808	12/9/2019	LESS THAN 0.1	1999	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1999
R20-000095	0	1989	2	AAEP-6809	12/9/2019	>/= 0.5 IU/mL	2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2012
R20-000114	0	1984	5	AAEP-6810	12/9/2019	>/= 0.5 IU/mL	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	series in 2008
R20-000077	0	1975	4	AAEP-6811	12/9/2019	>/= 0.5 IU/mL	2001-2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2001-2002
R20-000113	0	1982	9	AAEP-6812	12/9/2019	>/= 0.5 IU/mL	2004	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Spring2004
R20-000101	0	1955	6	AAEP-6813	12/9/2019	>/= 0.5 IU/mL	1979	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	human diploid 1979
R20-000082	0	1986	3	AAEP-6815	12/9/2019	>/= 0.5 IU/mL	2015	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2015
R20-000102	0	1988	3	AAEP-6816	12/9/2019	>/= 0.5 IU/mL	2010-2011	N/A	2016	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Booster 3 years ago, Initial series was in 2010-2011
R20-000108	0	1979	5	AAEP-6817	12/9/2019	>/= 0.5 IU/mL	1990	post exposure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	post exposure series in 1990
R20-000090	0	1987	9	AAEP-6818	12/9/2019	>/= 0.5 IU/mL	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Series of 2 vaccines in 2009
R20-000096	0	1963	2	AAEP-6819	12/9/2019	>/= 0.5 IU/mL	1985	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1985
R20-000122	0	1992	2	AAEP-6820	12/9/2019	>/= 0.5 IU/mL	2014	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Vaccinated in 2014
R20-000078	1	1966	10	AAEP-6821	12/9/2019	>/= 0.5 IU/mL	1992	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1992
R20-000084	1	1968	4	AAEP-6822	12/9/2019	>/= 0.5 IU/mL	1994	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1994
R20-000115	1	1953	4	AAEP-6823	12/9/2019	>/= 0.5 IU/mL	1995	post exposure	2005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Approx 1995 post exposure Approx 2005 vaccination
R20-000128	0	1980	10	AAEP-6824	12/9/2019	>/= 0.5 IU/mL	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	vaccinated in 2009
R20-000123	0	1981	4	AAEP-6825	12/9/2019	>/= 0.5 IU/mL	2011	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2011
R20-000109	0	1975	7	AAEP-6826	12/9/2019	>/= 0.5 IU/mL	2003	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3/2003
R20-000103	0	1982	5	AAEP-6827	12/9/2019	>/= 0.5 IU/mL	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2009
R20-000079	1	1946	8	AAEP-6828	12/9/2019	LESS THAN 0.1	1976	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1976
R20-000097	0	1972	5	AAEP-6829	12/9/2019	>/= 0.5 IU/mL	1999	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1999
R20-000098	0	1987	8	AAEP-6830	12/9/2019	>/= 0.1 IU/mL	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Vacc. Approx 2008? No titer drawn
R20-000085	0	1968	3	AAEP-6831	12/9/2019	>/= 0.5 IU/mL	1989	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1989
R20-000104	1	1984	8	AAEP-6832	12/9/2019	>/= 0.5 IU/mL	2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2012
R20-000093	0	1982	10	AAEP-6837	12/9/2019	>/= 0.5 IU/mL	2006	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2006
R20-000099	0	1989	1	AAEP-6838	12/9/2019	>/= 0.5 IU/mL	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes 3 shot series 2008
R20-000129	1	1992	Ash Shariqah	AAEP-6840	12/9/2019	>/= 0.5 IU/mL	2018	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	one year ago, five doses
R20-000119	1	1953	7	AAEP-6846	12/9/2019	>/= 0.5 IU/mL	1998	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	five shot series 1998?
R20-000130	0	1989	7	AAEP-6847	12/9/2019	>/= 0.5 IU/mL	2011	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2011
R20-000060	0	1987	4	AAEP-6853	12/9/2019	>/= 0.5 IU/mL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2012	N/A	Last vaccinated 2012
R20-000057	0	1978	5	AAEP-6857	12/9/2019	>/= 0.5 IU/mL	2004	N/A	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	initial vaccines in 2004, 1 booster in May 2009
R20-000061	0	1962	9	AAEP-6858	12/9/2019	>/= 0.5 IU/mL	1985	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1985
R20-000062	0	1987	9	AAEP-6859	12/9/2019	>/= 0.5 IU/mL	2014	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2014
R20-000070	0	1987	3	AAEP-6860	12/9/2019	>/= 0.5 IU/mL	2015	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	vaccine 2015
R20-000063	0	1991	9	AAEP-6861	12/9/2019	>/= 0.5 IU/mL	2014	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	vax 2014
R20-000064	0	1988	9	AAEP-6862	12/9/2019	>/= 0.5 IU/mL	2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	vaccinated in 2012
R20-000068	0	1982	1	AAEP-6863	12/9/2019	>/= 0.5 IU/mL	2005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2005
R20-000053	0	1960	4	AAEP-6864	12/9/2019	>/= 0.5 IU/mL	1984	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1984
R20-000069	0	1982	3	AAEP-6865	12/9/2019	>/= 0.5 IU/mL	2006	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	vaccinated in 2006
R20-000055	0	1970	4	AAEP-6866	12/9/2019	>/= 0.5 IU/mL	1993	N/A	1993	N/A	1999	N/A	N/A	N/A	N/A	N/A	N/A
R20-000058	1	1981	10	AAEP-6867	12/9/2019	>/= 0.1 IU/mL	2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2010
R20-000071	0	1965	4	AAEP-6868	12/9/2019	>/= 0.5 IU/mL	1988	N/A	1997	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1988 initial, 1997 booster
R20-000065	0	1956	9	AAEP-6869	12/9/2019	>/= 0.5 IU/mL	had several	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	had several years ago
R20-000066	0	1975	9	AAEP-6870	12/9/2019	>/= 0.5 IU/mL	1997	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1997 (in vet school)
R20-000059	0	1967	7	AAEP-6871	12/9/2019	>/= 0.5 IU/mL	2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2009 (Approximately)
R20-000067	0	1984	1	AAEP-6872	12/9/2019	>/= 0.1 IU/mL	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2008
R20-000056	0	1985	3	AAEP-6873	12/9/2019	>/= 0.5 IU/mL	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2008
R20-000054	0	1968	1	AAEP-6874	12/9/2019	>/= 0.5 IU/mL	2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	vaccinated 2000
R20-000072	0	1958	9	AAEP-6875	12/9/2019	>/= 0.5 IU/mL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
R20-000016	0	1989	5	AAEP-6896	12/10/2019	>/= 0.5 IU/mL	2005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Vaccinated~2005
R20-000011	0	1963	6	AAEP-6898	12/10/2019	>/= 0.5 IU/mL	1989	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1989
R20-000012	1	1951	5	AAEP-6899	12/10/2019	>/= 0.5 IU/mL	2004	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15 years
R20-000031	1	1958	5	AAEP-6915	12/10/2019	>/= 0.5 IU/mL	1982	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1982
R20-000030	1	1963	7	AAEP-6918	12/10/2019	>/= 0.5 IU/mL	>10 years	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	>10 years
R20-000027	0	1980	5	AAEP-6919	12/10/2019	>/= 0.5 IU/mL	2005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	initial 3 dose series in 2005
R20-000021	1	1974	5	AAEP-6920	12/10/2019	>/= 0.5 IU/mL	2019	post exposure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	series of 4 vaccines post exposure in July 2019
R20-000017	1	1981	9	AAEP-6921	12/10/2019	>/= 0.5 IU/mL	2008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2008

An example of prepared human laboratory data for statistical evaluation

Summary of the process of preparing a set of human laboratory data for statistical evaluation

Source of data

1. VetView is used in Kansas State Veterinary Diagnostic Laboratory (KSVDL). It is the laboratory information management system (LIMS) which is a software-based system with features that support a modern laboratory's operations. The features include workflow and data tracking support, flexible architecture, and data exchange interfaces. The excel spreadsheet is a report generated by VetView upon entering the search information of 'client' (the Vet Conference account #) and the output requested (patient name, date of draw, results, etc.). This is one excel that contains all the results. It is named 'RabiesTiterBooth – Excel' and is a summary to list the rabies titer results from all the 'client' rabies titer booth events.
2. Each of the completed rabies titer submission forms called "Rabies Serology for Vaccine Titer Response by RFFIT Screen Method for Human Specimen Only" are associated with each result. The forms are electronically completed by each participant per rabies titer event and printed at the event for signature and sample processing. Next, these forms are saved as scanned pdfs in batches (10 total files), named 'Submission Forms Batch x.pdf' (x representing the batch number).
3. Excel spreadsheet files which are compiled from the data entered into the electronic submission form., named "'Name of conference' 'M-YYYY'", each conference/year spreadsheet contains entered data from all participants in that conference.

Methods

1. Open the RabiesTiterBooth_20210106smm file, the VetView generated report, re-formatted to adjust columns for use in the VLOOKUP formulas, see below, step c. This file will be used as source of data to copy to each conference/year excel spreadsheet ("'Name of conference' 'M-YYYY'").
2. Open the conference/year excel spreadsheet file.
   a. Copy the 'Tube ID (Name or ID#)' column to the A column. The Tube ID will be used to link with the RabiesTiterBooth_20210106smm file.
   b. Label each column after the last column, which is column O, starting with column P as ID, male, yob, region, conf, date, titer, initial_vx, initial_vx_reason, booster1, booster1_reason, booster2, booster2_reason, booster3, booster3_reason, and Note, respectively.

Difficulties

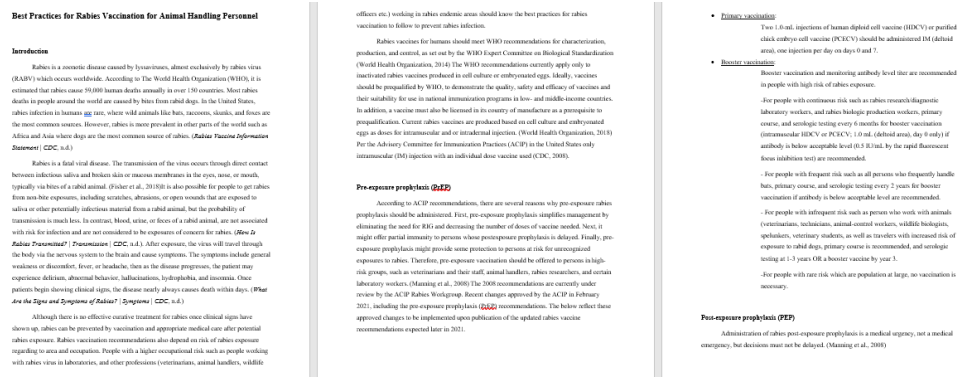
1. The submission forms did not scan in order, so it is hard to find each sample and fill in the gender, year of birth, and vaccination history.
2. Some of the data used a formula (the format is 'formula'), so when processing the data, these data is needed to be copied and pasted value to a new sheet first.
3. Some conferences do not have an excel spreadsheet containing data from all participants, so data needs to be pulled out from the VetView manually.
4. Some of the data is missing. E.g., The participants did not fill out in some part or they did not state the vaccination history clearly.

Discussion

- The template that the evaluators designed needed to be adjusted to make it consistent with the data collected.
- The submission forms were not scanned in order.
  - This could be solved by scanning the submission form in order.

- For long term use, using available technology with the submission forms could help to make it less complicated.
  - Electronic signature
- Some of the participants could not remember when they were vaccinated
  - In the future, if vaccination can be recorded and the participants can access the information online, this could be another way to solve this problem.

Summary of the best practices for rabies vaccination and booster timing for personnel handling animals



Best Practices for Rabies Vaccination for Animal Handling Personnel

Introduction

Rabies is a zoonotic disease caused by lyssaviruses, almost exclusively by rabies virus (RABV) which occurs worldwide. According to The World Health Organization (WHO), it is estimated that rabies cause 59,000 human deaths annually in over 150 countries. Most rabies deaths in people around the world are caused by bites from rabid dogs. In the United States, rabies infection in humans are rare, where wild animals like bats, raccoons, skunks, and foxes are the most common sources. However, rabies is more prevalent in other parts of the world such as Africa and Asia where dogs are the most common source of rabies. (*Rabies Vaccine Information Statement | CDC*, n.d.)

Rabies is a fatal viral disease. The transmission of the virus occurs through direct contact between infectious saliva and broken skin or mucous membranes in the eyes, nose, or mouth, typically via bites of a rabid animal. (Fisher et al., 2018)It is also possible for people to get rabies from non bite exposures, including scratches, abrasions, or open wounds that are exposed to saliva or other potentially infectious material from a rabid animal, but the probability of transmission is much less. In contrast, blood, urine, or feces of a rabid animal, are not associated with risk for infection and are not considered to be exposures of concern for rabies. (*How Is Rabies Transmitted? | Transmission | CDC*, n.d.). After exposure, the virus will travel through the body via the nervous system to the brain and cause symptoms. The symptoms include general weakness or discomfort, fever, or headache, then as the disease progresses, the patient may experience delirium, abnormal behavior, hallucinations, hydrophobia, and insomnia. Once patients begin showing clinical signs, the disease nearly always causes death within days. (*What Are the Signs and Symptoms of Rabies? | Symptoms | CDC*, n.d.)

Although there is no effective curative treatment for rabies once clinical signs have shown up, rabies can be prevented by vaccination and appropriate medical care after potential rabies exposure. Rabies vaccination recommendations also depend on risk of rabies exposure regarding to area and occupation. People with a higher occupational risk such as people working with rabies virus in laboratories, and other professions (veterinarians, animal handlers, wildlife officers etc.) working in rabies endemic areas should know the best practices for rabies vaccination to follow to prevent rabies infection.

Rabies vaccines for humans should meet WHO recommendations for characterization, production, and control, as set out by the WHO Expert Committee on Biological Standardization (World Health Organization, 2014) The WHO recommendations currently apply only to inactivated rabies vaccines produced in cell culture or embryonated eggs. Ideally, vaccines should be prequalified by WHO, to demonstrate the quality, safety and efficacy of vaccines and their suitability for use in national immunization programs in low- and middle-income countries. In addition, a vaccine must also be licensed in its country of manufacture as a prerequisite to prequalification. Current rabies vaccines are produced based on cell culture and embryonated eggs as doses for intramuscular and or intradermal injection. (World Health Organization, 2018) Per the Advisory Committee for Immunization Practices (ACIP) in the United States only intramuscular (IM) injection with an individual dose vaccine used (CDC, 2008).

Pre-exposure prophylaxis (PrEP)

According to ACIP recommendations, there are several reasons why pre-exposure rabies prophylaxis should be administered. First, pre-exposure prophylaxis simplifies management by eliminating the need for RIG and decreasing the number of doses of vaccine needed. Next, it might offer partial immunity to persons whose postexposure prophylaxis is delayed. Finally, pre-exposure prophylaxis might provide some protection to persons at risk for unrecognized exposures to rabies. Therefore, pre-exposure vaccination should be offered to persons in high-risk groups, such as veterinarians and their staff, animal handlers, rabies researchers, and certain laboratory workers. (Manning et al., 2008) The 2008 recommendations are currently under review by the ACIP Rabies Workgroup. Recent changes approved by the ACIP in February 2021, including the pre-exposure prophylaxis (PrEP) recommendations. The below reflect these approved changes to be implemented upon publication of the updated rabies vaccine recommendations expected later in 2021.

- Primary vaccination:

  Two 1.0-mL injections of human diploid cell vaccine (HDCV) or purified chick embryo cell vaccine (PCECV) should be administered IM (deltoid area), one injection per day on days 0 and 7.

- Booster vaccination:

  Booster vaccination and monitoring antibody level titer are recommended in people with high risk of rabies exposure.

  -For people with continuous risk such as rabies research/diagnostic laboratory workers, and rabies biologic production workers, primary course, and serologic testing every 6 months for booster vaccination (intramuscular HDCV or PCECV; 1.0 mL (deltoid area), day 0 only) if antibody is below acceptable level (0.5 IU/mL by the rapid fluorescent focus inhibition test) are recommended.

  - For people with frequent risk such as all persons who frequently handle bats, primary course, and serologic testing every 2 years for booster vaccination if antibody is below acceptable level are recommended.

  - For people with infrequent risk such as person who work with animals (veterinarians, technicians, animal-control workers, wildlife biologists, spelunkers, veterinary students, as well as travelers with increased risk of exposure to rabid dogs, primary course is recommended, and serologic testing at 1-3 years OR a booster vaccine by year 3.

  -For people with rare risk which are population at large, no vaccination is necessary.

Post-exposure prophylaxis (PEP)

Administration of rabies post-exposure prophylaxis is a medical urgency, not a medical emergency, but decisions must not be delayed. (Manning et al., 2008)

Rabies pre-exposure prophylaxis guide – United State, 2008

Risk category	Nature of risk	Typical populations	Pre-exposure recommendations
Continuous	Virus present continuously, often in high concentrations. Specific exposures likely to go unrecognized. Bite, non-bite, aerosol exposure.	Rabies research laboratory workers; rabies biologics production workers.	Primary course. Serologic testing every 6. months; booster vaccination or if antibody titer is below acceptable level. *
Frequent	Exposure usually episodic, with source recognized, but exposure also might be unrecognized. Bite, non-bite, or aerosol exposure	Rabies diagnostic laboratory workers, cavers, veterinarians and staff, and animal-control and wildlife workers in areas where rabies is enzootic. All persons who frequently handle bats.	Primary course Serologic testing every 2 be years; booster vaccination if antibody titer is below acceptable level. *
Infrequent (greater than population at large)	Exposure nearly always episodic with source recognized. Bite or non-bite exposure.	Veterinarians and animal-control staff working with terrestrial animals in areas where rabies is uncommon to rare. Veterinary students. Travelers visiting areas where rabies is enzootic and immediate access to appropriate medical care including biologics is limited.	Primary course. No serologic testing or booster vaccination.
Rare (population at large)	Exposure always episodic with source recognized. Bite or non-bite exposure.	U.S. population at large, including persons in areas where rabies is epizootic.	No vaccination necessary.

* Per the ACIP 2008 the minimum level of antibody is complete neutralization at a 1:5 serum dilution in the RFFIT. A booster dose should be administered if the titer falls below this level.

Introduction

Rabies pre-exposure prophylaxis risk category

Pre-exposure prophylaxis (PrEP)
- Primary vaccination
- Booster vaccination

Post-exposure prophylaxis (PEP)
- For previously vaccinated people
- For previously unvaccinated people

Educational Poster

RABIES Why is it important?

- Rabies is a disease that can spread between animals and people which occurs worldwide.
- Once clinical signs appear, rabies is deadly and there is no effective treatment.
- However, rabies can be prevented by vaccination and appropriate medical care after potential rabies exposure.

PRE-EXPOSURE PROPHYLAXIS

Risk category	Pre-exposure recommendations
Continuous risk: Rabies research laboratory workers; rabies serum and vaccine production workers.	• 3 shots of rabies vaccines injection on days 0, 7, and 21 or 28 • Immune level testing every 6 months; booster vaccination if the immune level is below the recommended minimum
Frequent risk: Rabies lab workers, cavers, veterinarians and staff, and animal-control and wildlife workers in areas where rabies is always present. All persons who frequently handle bats.	• 3 shots of rabies vaccines injection on days 0, 7, and 21 or 28 • Immune level testing every 2 years; booster vaccination if the immune level is below the recommended minimum.
Infrequent risk: Veterinarians and animal-control staff working with animals in areas where rabies is uncommon to rare. Veterinary students. Travelers visiting areas where rabies is always present and health care is limited.	• 3 shots of rabies vaccines injection on days 0, 7, and 21 or 28. • No immune level testing or booster vaccination
Rare risk: Most US population, including persons in areas that have rabies outbreak.	• No vaccination necessary.

POST-EXPOSURE PROPHYLAXIS

Vaccination status	Treatment
Not previously vaccinated	• Immediate wound cleansing with a solution that can destroy the virus • Serum injected at the wound • Rabies vaccine administered into muscle, 1 each on days 0, 3, 7, and 14.
Previously vaccinated	• Immediate wound cleansing with a solution that can destroy the virus • Serum should not be injected • Rabies vaccine injected into a muscle, 1 each on days 0 and 3.

FOR MORE INFORMATION

- Ask your health care provider.
- Call your local or state health department.
- Contact the Centers for Disease Control and Prevention (CDC):
  - Call 1-800-232-4636 (1-800-CDC-INFO) or
  - Visit CDC's rabies website (https://www.cdc.gov/rabies/index.html)
- Visit https://www.rabiesaware.org to check rabies information by state

-"Grupprecht, C. E., Briggs, D., Brown, C. M., Franka, R., Katz, S. L., Kerr, H. D., Lett, S. M., Levis, R., Meltzer, M. I., Schaffner, W., & Cieslak, P. R. (2010). Use of a reduced (4-dose) vaccine schedule for postexposure prophylaxis to prevent human rabies: recommendations of the advisory committee on immunization practices. MMWR. Recommendations and Reports : Morbidity and Mortality Weekly Report. Recommendations and Reports / Centers for Disease Control. https://doi.org/10.1016/j.annemergmed.2010.05.020
-World Health Organization. (2018). WHO Expert Consultation on Rabies: Third Report. In World Health Organization technical report series.
-Rabies | CDC. (n.d.). Retrieved May 7, 2021, from https://www.cdc.gov/rabies/index.html

Rabies overview

Pre-exposure prophylaxis

Post-exposure prophylaxis

Other information

MPH Foundational Competencies

Number and Competency		Description
4	Interpret results of data analysis for public health research, policy, or practice	For the prepared human laboratory data for statistical evaluation, data previously collected was transcribed into an anonymous data table.
16	Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making	In many places where personnel handling animals are not aware about rabies, the summary and poster that I created will help empower personnel to have better understanding and awareness of rabies.
18	Select communication strategies for different audiences and sectors	The step-by-step summary of the process of preparing a set of human laboratory data for statistical evaluation. Creating the poster for educating animal handling staff on rabies control and prevention.

Number and Competency		Description
19	Communicate audience-appropriate public health content, both in writing and through oral presentation	Creating the summary of the process of preparing a set of human laboratory data for statistical evaluation and a summary of the best practices for rabies vaccination and booster timing for personnel handling animals. The poster for educating animal handling staff on rabies control and prevention for communicating with different audiences at worksites.
21	Perform effectively on interprofessional teams	Working with the evaluators from University of Washington School of Public Health.

Acknowledgements

- MPH committee and Preceptor
  - Dr. Susan Moore
- Major advisor
  - Dr. Ellyn Mulcahy
- MPH committee
  - Dr. Justin Kastner
- MPH office
  - Barta Stevenson
- Colleagues from the University of Washington School of Public Health
  - Julianne Meisner
  - Joni Anderson
- My family and friends

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Thank you