

Hot Topics Rabies & Ebola June 21, 2018

Jackie Dawson, PhD

Public Health Epidemiologist and RERC

Chelan, Douglas, Grant, Kittitas and Okanogan
Counties

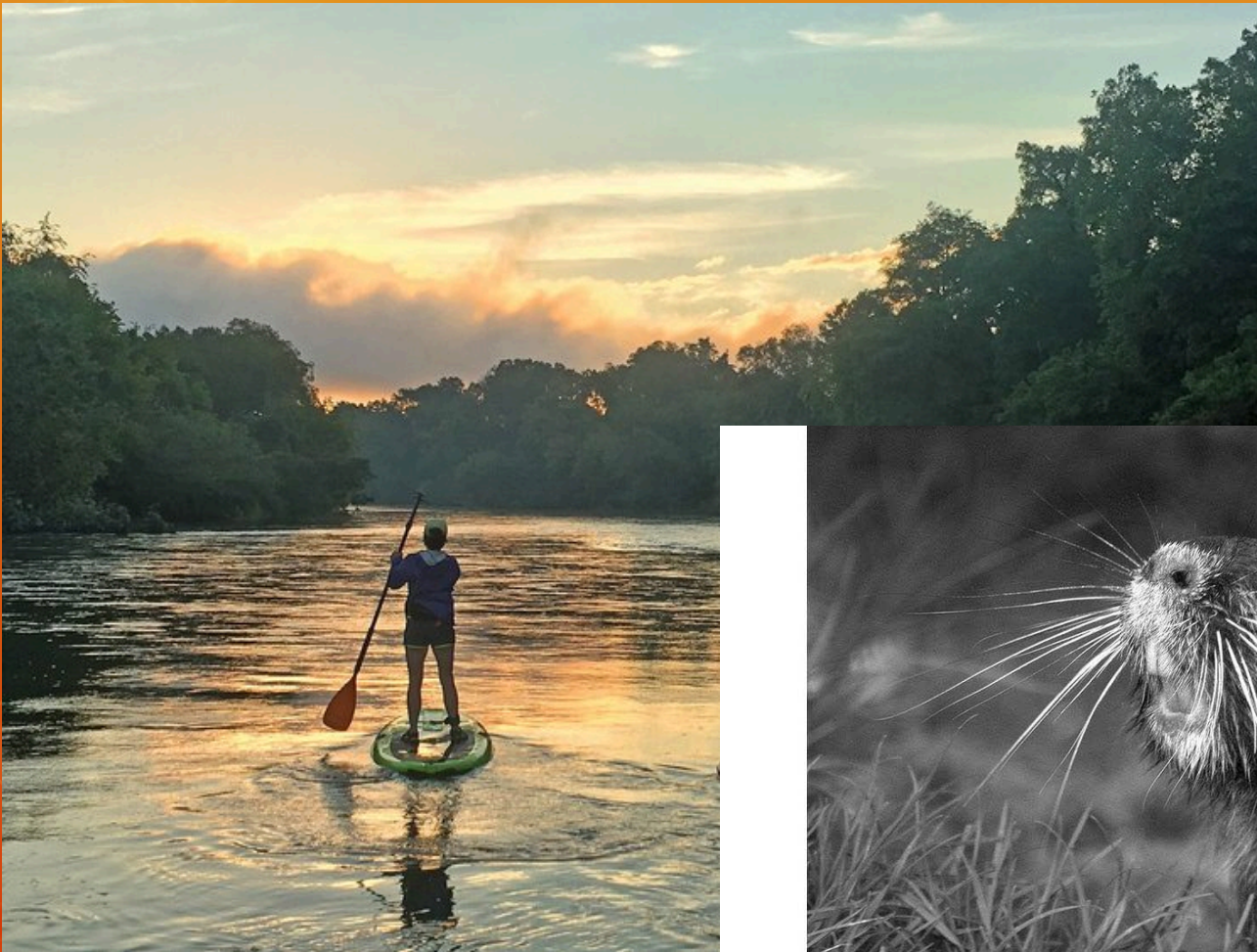
509-886-6428

Jacqueline.Dawson@CDHD.WA.GOV

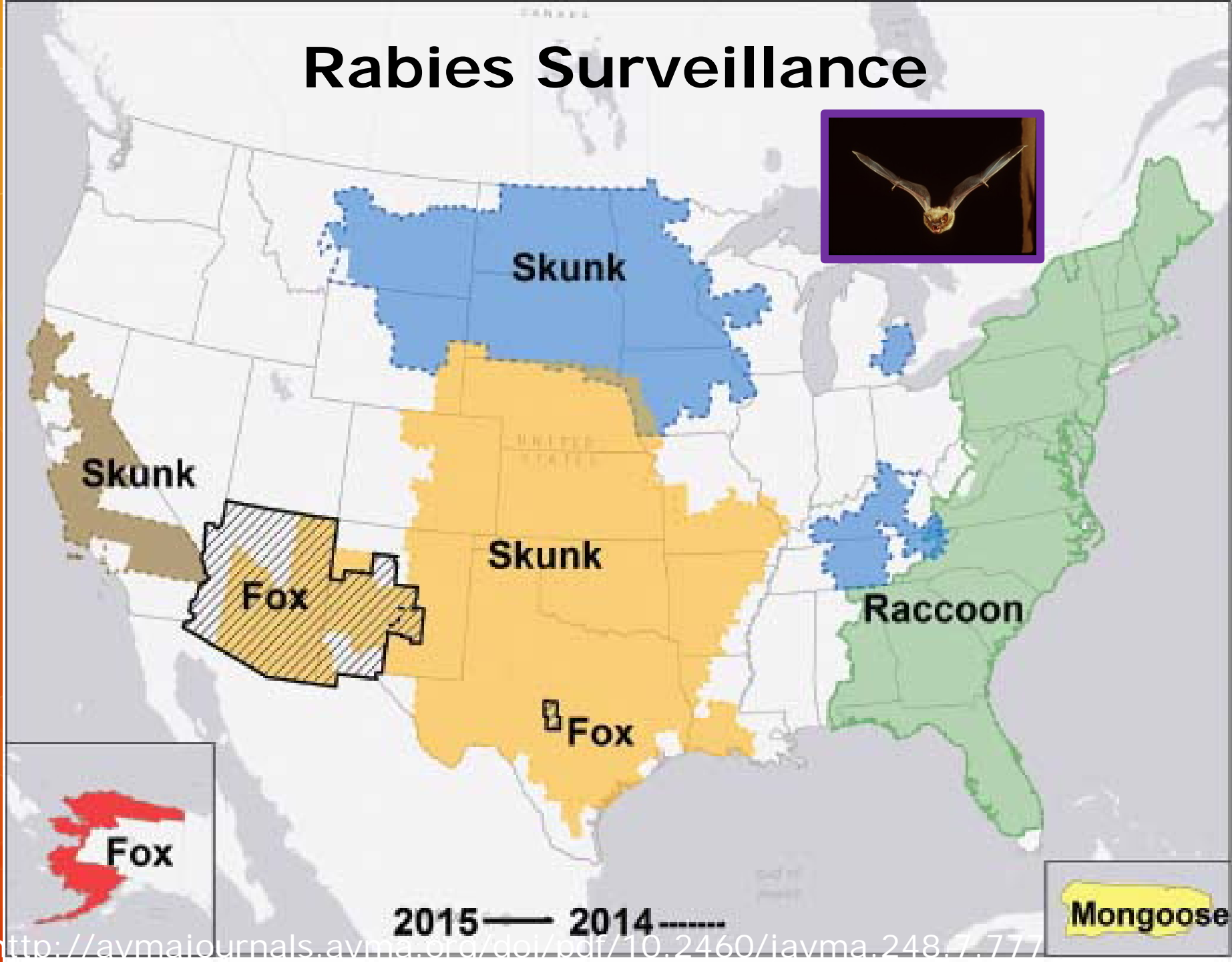
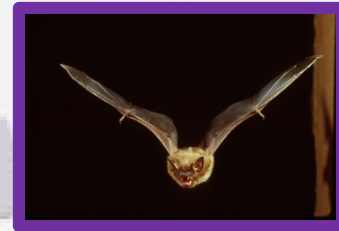


Beaver that attacked paddle boarder was rabid

- The attack, which occurred on the popular North Carolina (Asheville Lake), sent a 67-year-old woman to Mission Hospital with lacerations and bites on her leg and both hands.



Rabies Surveillance

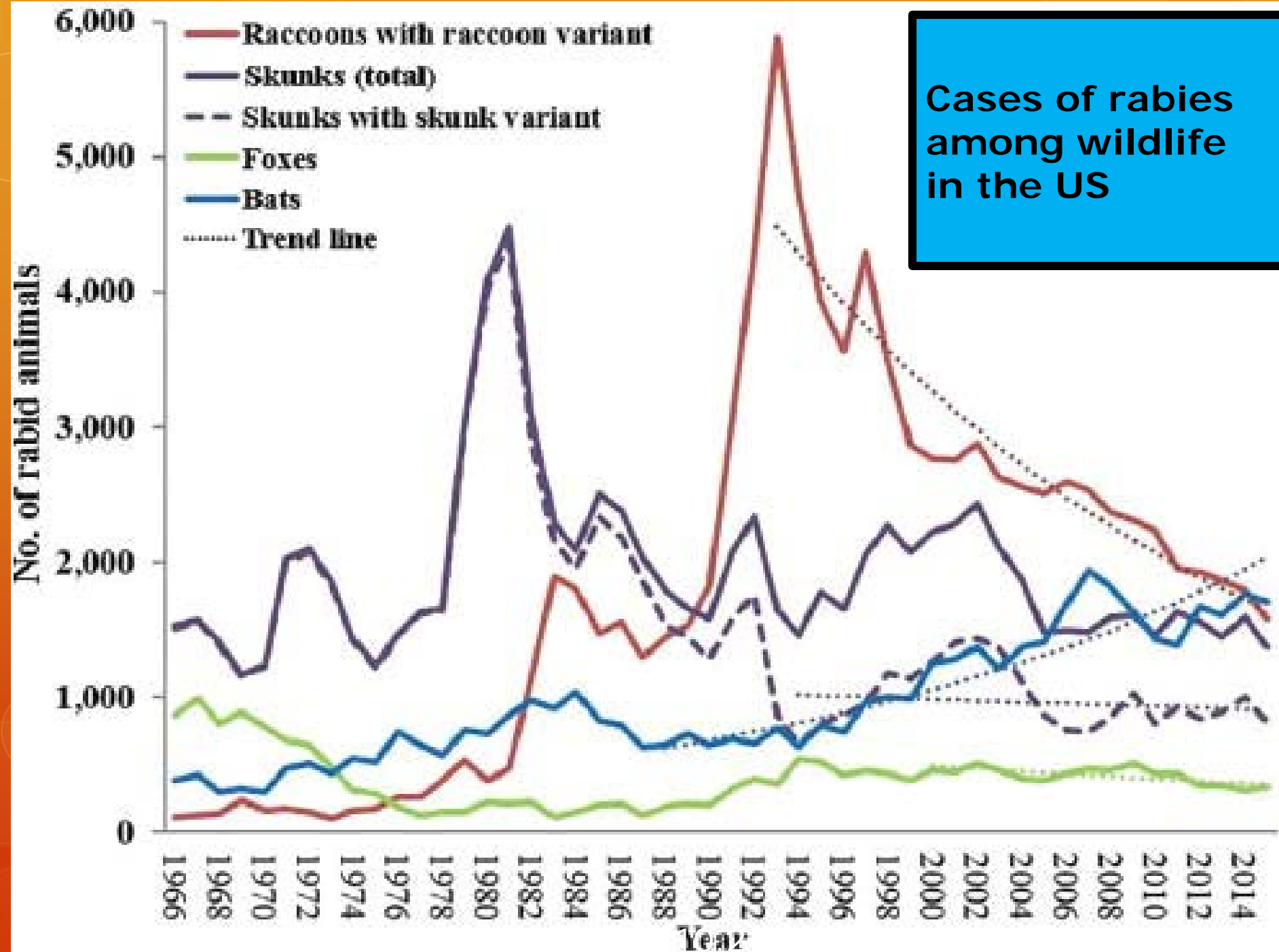


CDC: Man died of rabies from kidney transplant

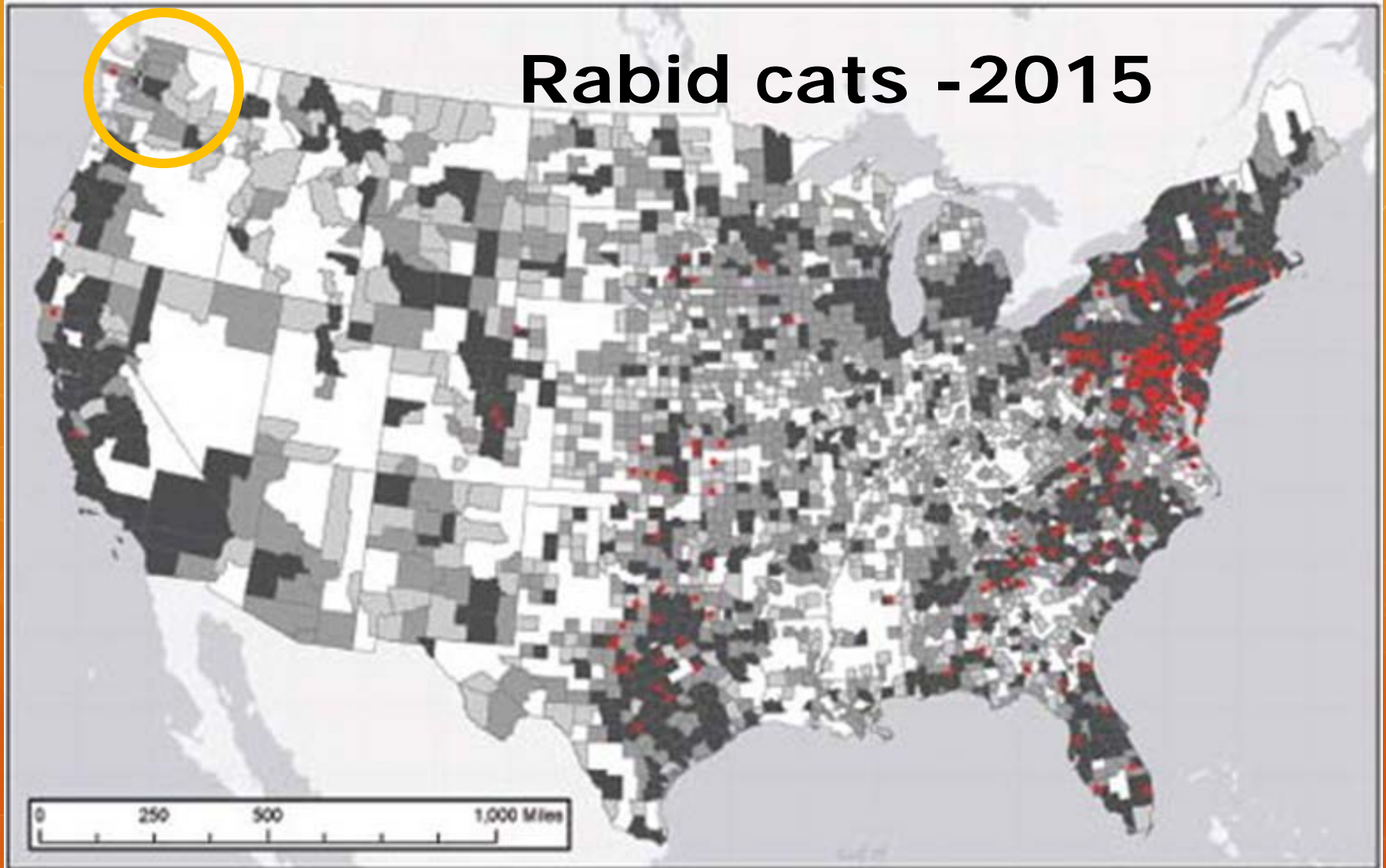
- MD man died of raccoon rabies that he contracted from a donated kidney 1.5 years ago
- 3 other people -- in Florida, Georgia and Illinois -- received organs are receiving treatment
- Donor had encephalitis, an inflammation of the brain, when they harvested the organs (kidneys, heart and liver)
- In the only other U.S. outbreak of rabies among organ recipients, the four patients died within a month of transplant in 2004.
- Human rabies: 1 to 3 cases per year



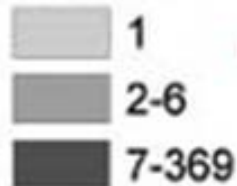
**Cases of rabies
among wildlife
in the US**



Rabid cats -2015



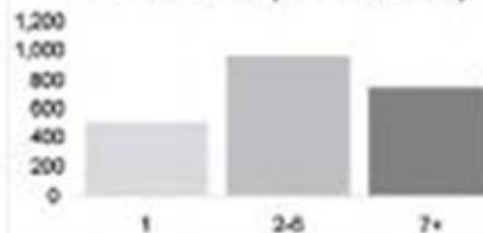
Tested



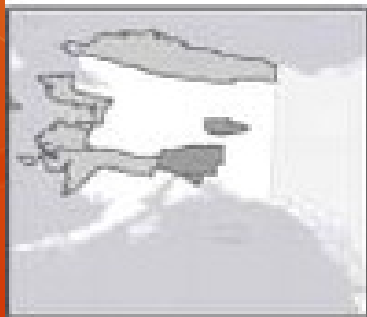
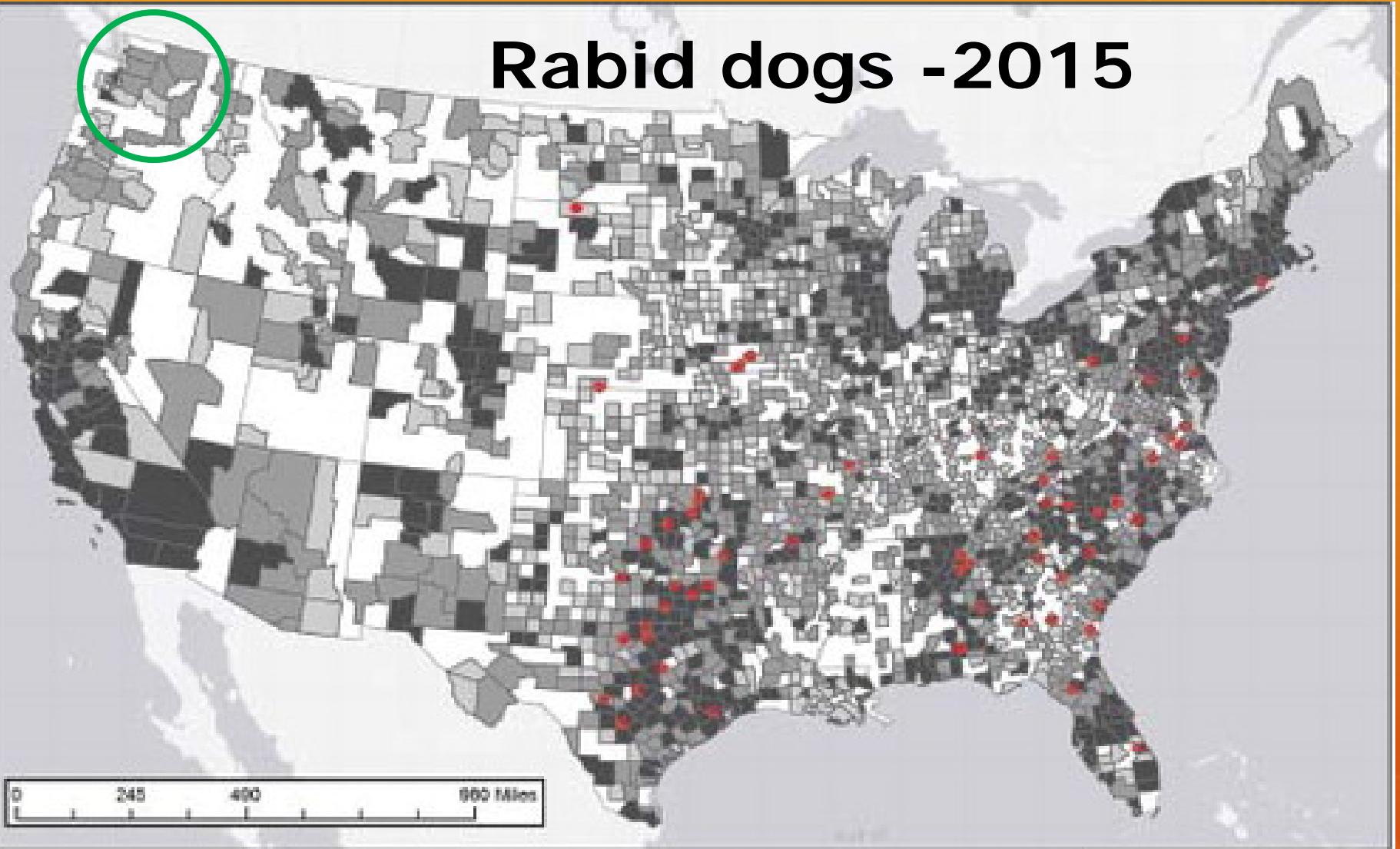
Rabid cats

• 1 dot = 1

Counties (n = 2,223)



Rabid dogs -2015



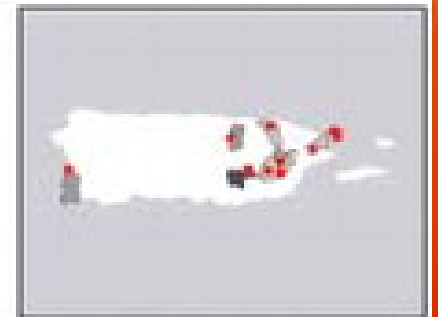
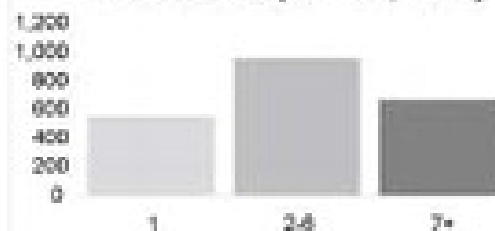
Tested



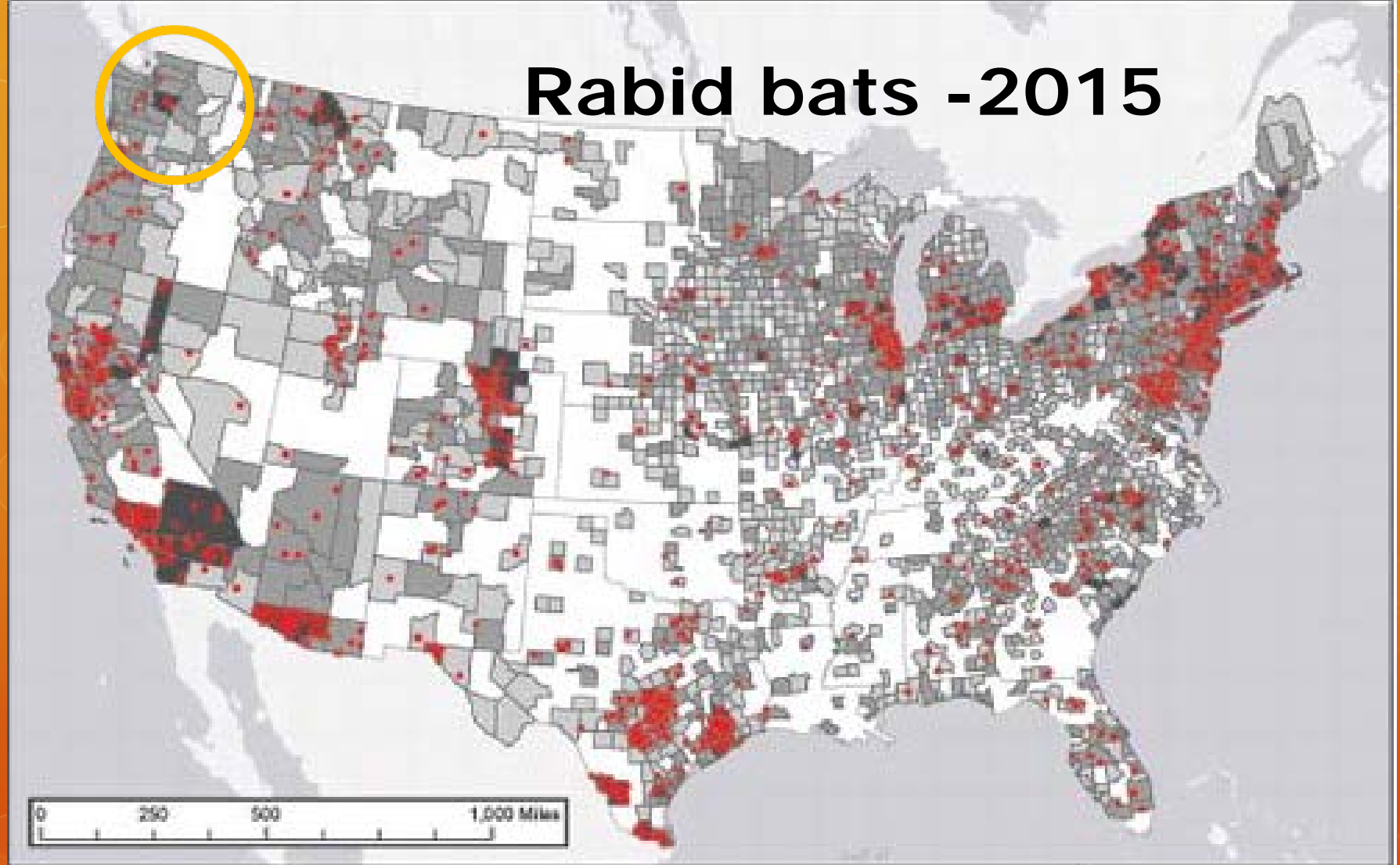
Rabid dogs

● 1 dot = 1

Counties (n = 2,171)

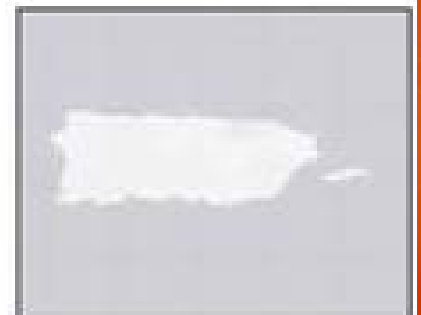
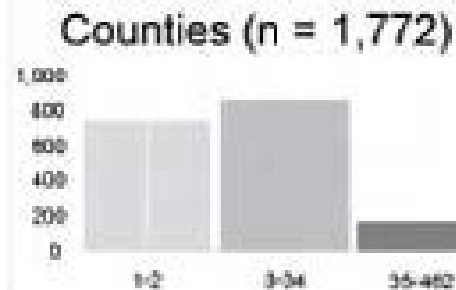


Rabid bats -2015



Tested
1-2
3-34
35-462

Rabid bats
• 1 dot = 1



Washington State Animals Tested for Rabies, 1988-2017



Year	Bat		Cat		Dog		Ferret		Raccoon		Skunk		Rodent		Lagomorph		Other Wild		Other Domestic		Total	
	Total	Positive	Total	Positive	Total	Positive	Total	Positive	Total	Positive	Total	Positive	Total	Positive	Total	Positive	Total	Positive	Total	Positive	Total	Positive
1988	69	4	165		110		15		16		3		12		2		5		3		400	4
1989	102	9	124		91		20		9		4		8		1		9		4		372	9
1990	63	4	104		82		5		7		5		5		1		14		4		290	4
1991	90	9	105		96		13		8		3		13		0		19		2		349	9
1992	73	6	132		90		16		14		2		12		0		14		6	1*	359	7
1993	68	1	122		95		8		4		8		16		2		10		13		346	1
1994	58	14	105		90		7		4		3		15		0		16		14	1^	312	15
1995	263	15	140		114		12		8		1		23		3		15		18		597	15
1996	257	13	104		101		8		9		2		14		3		20		12		530	13
1997	780	51	155		118		7		17		4		15		2		18		11		1,127	51
1998	447	27	126		109		8		11		1		6		0		19		16		743	27
1999	334	25	103		71		3		11		3		8		1		14		13		561	25
2000	330	23	105		60		1		2		4		6		1		9		4		522	23
2001	263	22	111		93		2		3		1		8		0		4		5		490	22
2002	186	12	99	1	53		7		2		2		9		1		8		9		376	13
2003	229	23	137		72		0		11		1		4		1		9		10		474	23
2004	311	20	141		70		3		13		6		11		0		6		10		571	20
2005	245	15	132		66		3		12		2		5		1		10		4		480	15
2006	273	15	105		70		4		13		1		2		1		8		5		482	15
2007	315	22	132		97		1		16		3		5		0		9		3		581	22
2008	337	17	143		76		1		10		2		5		1		9		11		595	17
2009	311	14	133		90		1		12		5		4		1		7		9		573	14
2010	200	14	103		63		0		14		1		6		1		9		10		407	14
2011	204	11	87		51		1		9		1		2		0		8		5		368	11
2012	221	9	98		54		2		7		0		4		0		7		9		402	9
2013	284	12	80		65		0		13		0		3		0		5		9		459	12
2014	276	15	75		53		0		12		0		1		1		6		11		435	15
2015	305	9	95	1	49		0		8		2		8		0		11		7		485	10
2016	298	20	108		44		0		5		0		4		1		3		3		466	20
2017	376	22	81		48		0		8		1		4		0		2		5		525	22
Total	7,568	473	3,450	2	2,341	0	148	0	288	0	71	0	238	0	25	0	303	0	245	0	14,152	455

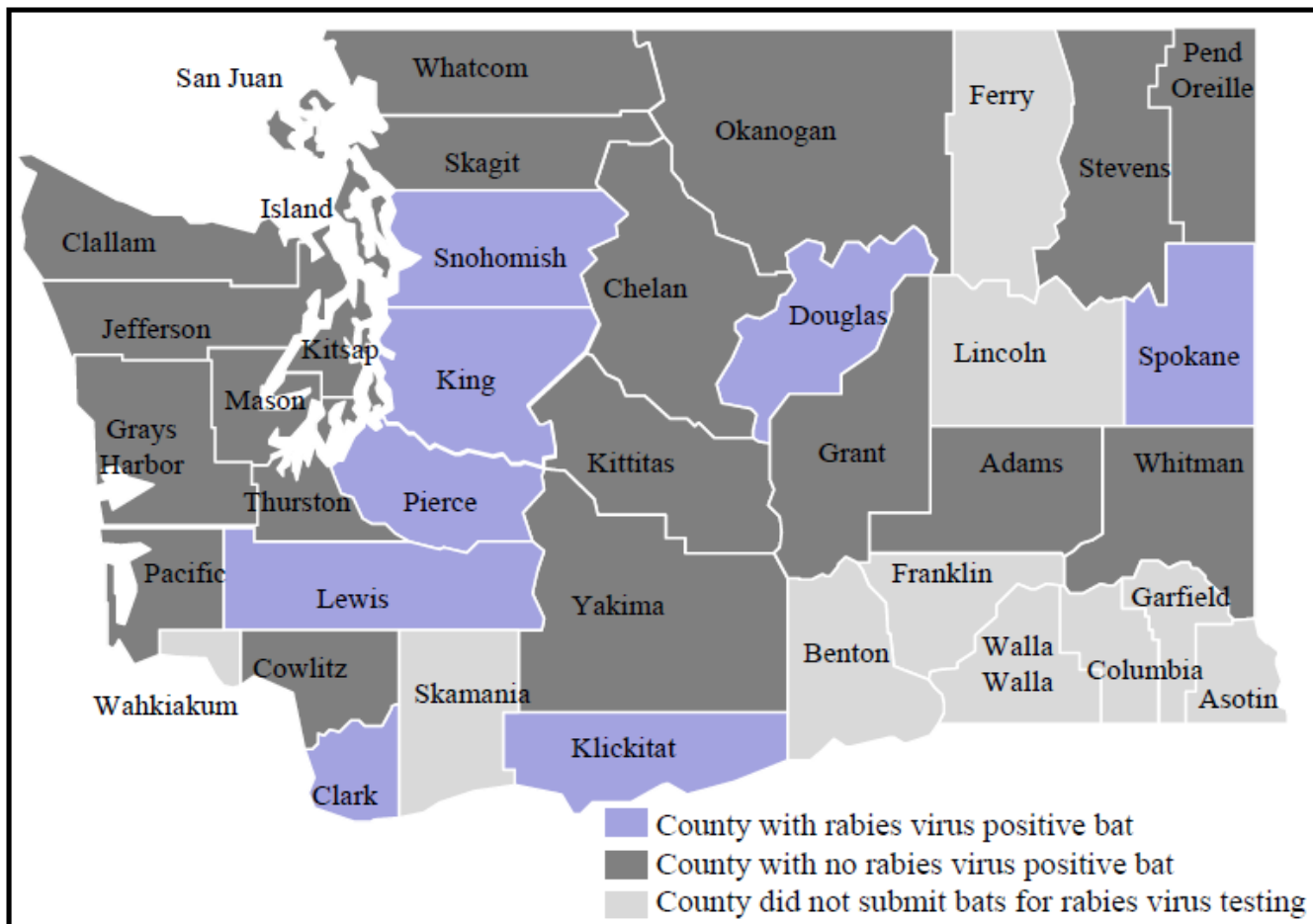
6.25% ↑ 0.06% ↑

Rodents include: beaver, chipmunk, chinchilla, chipmunk, degu, gerbil, gopher, hamster, marmot, mouse, muskrat, nutria, porcupine, prairie dog, rat, squirrel, vole, and woodchuck.
Skunks include: all species of the Mephitidae family and are not identified to species level.
Other domestic include: burro, cattle, goat, horse, llama, mule, pig, sheep, and (captive) zebra.
Other wild include: badger, bear, bison, bobcat, cougar, coyote, deer, fox, kinkajou, lynx, marten, mink, mole, nonhuman primate, ocelot, opossum, otter, seal, shrew, sugar glider, weasel, wolf, wolf-hybrid, zorilla (striped polecat).
Species identification: bats are identified to species level using morphological identification keys; all other species are not formally identified unless rabies virus positive.
 Numbers reported through 2007 were inclusive of positive and negative test results: beginning in 2008 all specimens submitted (i.e., including unsatisfactory results) are included in counts.

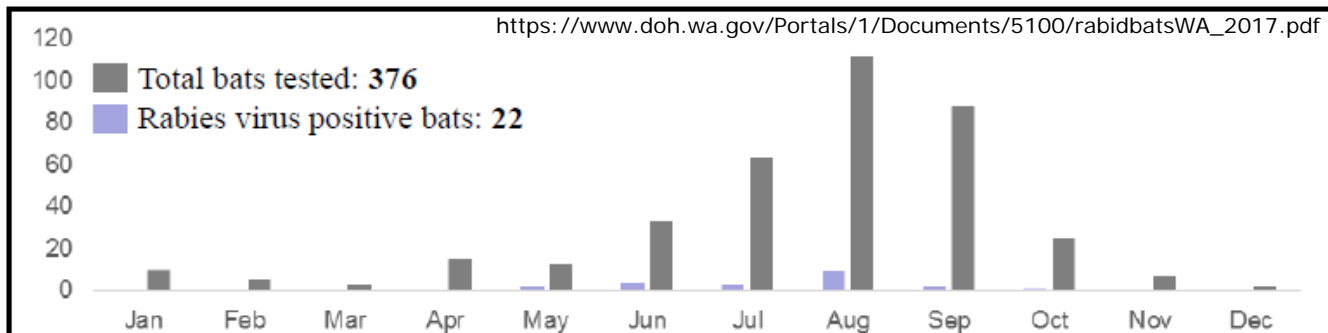




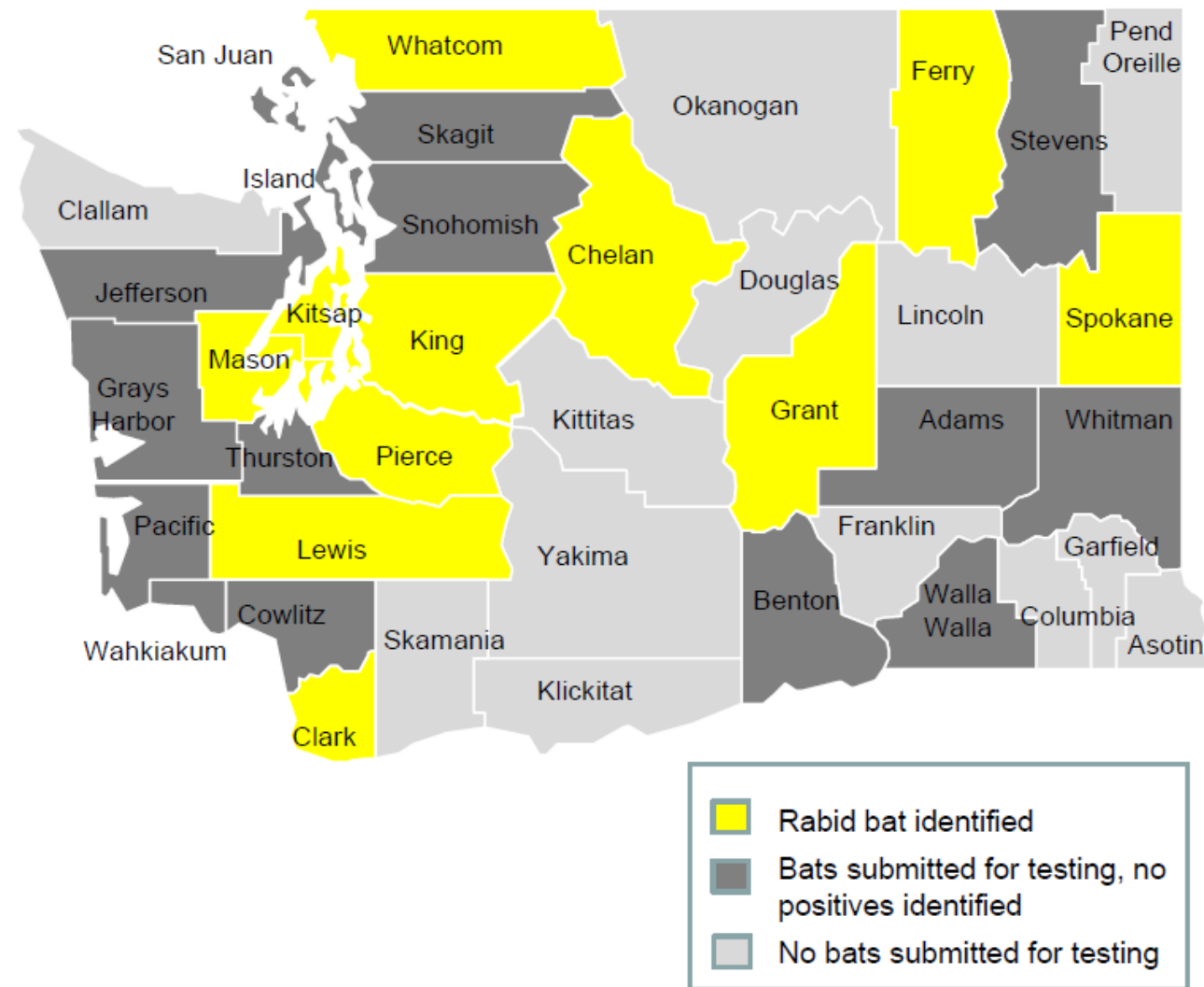
Bats Tested for Rabies Virus by County of Submission — Washington State, 2017



Month	County	No. Positive Bats
May	Snohomish	1
	Spokane	1
Jun	Snohomish	1
	Pierce	1
	Spokane	2
Jul	Spokane	1
	King	1
	Snohomish	1
Aug	Chelan	1
	King	5
	Klickitat	1
	Pierce	1
	Clark	1
	Lewis	1
Sept	King	1
	Spokane	1
Oct	King	1



**Bats Tested for Rabies, Washington State,
January 1 – December 31, 2016 (N = 298 Tested Bats)**




Month	County	# Positive Bats
May	King	1 bat
May	Clark	1 bat
June	Kitsap	1 bat
June	Whatcom	1 bat
June	Ferry	1 bat
July	Spokane	2 bats
July	Mason	1 bat
July	Lewis	1 bat
August	Chelan	2 bats
August	Grant	1 bat
August	Spokane	1 bat
August	Whatcom	1 bat
August	Lewis	1 bat
September	Chelan	1 bat
September	King	1 bat
September	Pierce	1 bat
September	Thurston	1 bat
November	King	1 bat

20 rabid bats were identified during 2016.

Seven rabid bats in WA- 2018

Rabid Bats - Positive Cases in Washington, 2018

County of Collection		Month	Count of Positive Bats (cumulative)
Thurston		June	1
Snohomish		May	1
King		May	2
Chelan		May	1
Total Positive Cases for 2018 (cumulative)		5	

**2 more rabid bats in Chelan County
June 2018 (total =7)**

Washington State Bats Tested for Rabies, 2013-2017

	2013		2014		2015		2016		2017		County Total	
County	Positive	Total	Positive	Total	Positive	Total	Positive	Total	Positive	Total	Positive	Tested
Adams	0	0	0	1	0	0	0	6	0	1	0	8
Asotin	0	3	0	0	0	0	0	0	0	0	0	3
Benton	0	2	0	1	0	2	0	3	0	0	0	9
Chelan	0	2	0	6	0	8	3	17	1	11	5	57
Clallam	1	6	1	5	0	4	0	0	0	7	2	23
Clark	0	18	0	16	1	16	1	15	1	10	3	84
Columbia	0	0	0	0	0	0	0	0	0	0	0	0
Cowlitz	0	14	0	13	0	7	0	16	0	10	1	63
Douglas	0	0	0	0	0	0	0	0	0	1	0	2
Ferry	0	0	0	1	0	0	1	1	0	0	1	4
Franklin	1	1	0	0	0	1	0	0	0	0	1	3
Garfield	0	0	0	0	0	0	0	0	0	0	0	0
Grant	0	1	0	3	0	2	1	4	0	2	1	15
Grays Harbor	0	1	0	0	0	5	0	3	0	3	1	15
Island	0	10	1	10	0	12	0	5	0	18	2	64
Jefferson	1	4	0	6	0	8	0	6	0	7	1	36
King	4	64	4	64	2	65	3	52	8	78	22	370
Kitsap	1	27	3	19	0	20	1	23	0	27	5	126
Kittitas	1	3	0	4	0	3	0	0	0	3	1	15
Klickitat	0	0	2	3	0	3	0	0	1	5	3	14
Lewis	0	11	0	13	0	7	2	16	1	18	3	74
Lincoln	0	1	0	1	0	0	0	0	0	0	0	2
Mason	0	4	0	11	2	8	1	8	0	5	3	45
Okanogan	0	2	0	3	0	1	0	0	0	1	0	8
Pacific	0	4	0	4	1	4	0	4	0	7	1	30
Pend Oreille	0	0	0	0	0	0	0	0	0	0	0	1
Pierce	0	13	0	8	0	8	1	16	2	25	3	80
San Juan	0	1	0	1	0	3	0	2	0	1	0	10
Skagit	0	5	1	8	0	7	0	5	0	9	2	42
Skamania	0	0	0	2	0	2	0	0	0	0	0	4
Snohomish	0	22	1	21	1	25	0	15	3	37	6	136
Spokane	0	19	0	12	1	34	3	44	5	31	9	149
Stevens	0	6	0	3	0	7	0	4	0	3	0	25
Thurston	0	11	0	13	1	17	1	16	0	33	2	108
Wahkiakum	0	2	0	1	0	2	0	0	0	0	1	6
Walla Walla	0	1	0	0	0	1	0	1	0	0	0	4
Whatcom	3	22	2	19	0	15	2	14	0	21	8	103
Whitman	0	2	0	0	0	5	0	2	0	1	0	10
Yakima	0	2	0	4	0	3	0	0	0	1	0	12
Total	12	284	15	276	9	305	20	298	22	376	87	1,760

Rabies Symptoms in Humans

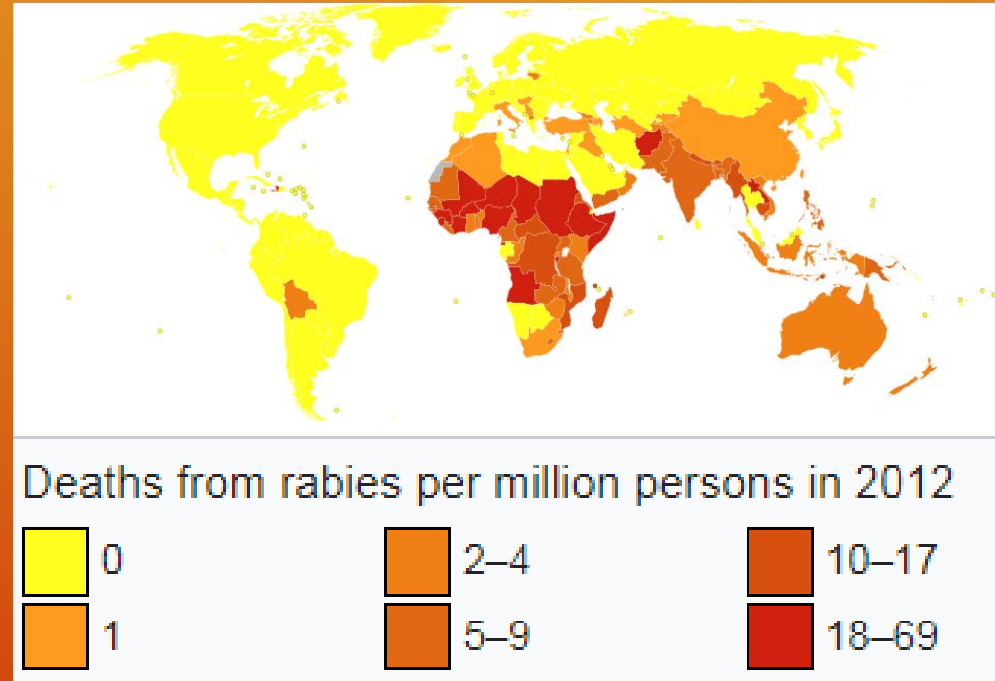
- Once a person begins showing signs and symptoms of rabies, the disease is nearly always fatal. For this reason, anyone who may have a risk of contracting rabies should receive rabies post-exposure prophylaxis.
- The first symptoms of rabies may be very similar to the flu and may last for days. Later signs and symptoms may include:
 - Fever
 - Headache
 - Nausea
 - Vomiting
 - Agitation
 - Anxiety
 - Confusion
 - Hyperactivity
 - Difficulty swallowing
 - Excessive salivation
 - Fear of water (hydrophobia) because of the difficulty in swallowing
 - Hallucinations
 - Insomnia
 - Partial paralysis

In humans, symptoms usually develop after 3 - 8 weeks (range= 9 days to 7 years)



Rabies: Survival stories

- California Girl Only Third in U.S. to Survive Rabies Without Vaccine (stray cat near school).
- Doctors treated her with a regimen called the Milwaukee Protocol. It includes antiviral medications and a medically-induced coma to let the brain rest.
- Same regimen used to successfully treat a 15-year-old Wisconsin girl who had rabies in 2004.



Bat posters



Okanagan County Public Health

1234 South 2nd Ave, Okanogan WA 98840
PHONE: (509) 422-7140 • FAX: (509) 422-7142

Local Public Health is where it happens!



Chelan-Douglas Health District

200 Valley Mall Parkway, East Wenatchee, WA 98802

PHONE: (509) 886-6400 • FAX: (509) 886-6478

Always working for a safer and healthier community

Bat Exposure

Anyone who encounters a bat should be evaluated by a medical professional for risk of rabies.

Encounters with a bat include:

- Direct contact with a bat = bat bite or bat saliva in your eyes, nose, mouth or fresh wound.
- Finding a bat in the same room of a person who might be unaware that a bite or direct contact had occurred.
 - * a deeply sleeping person awakens to find a bat in the room
 - * or an adult witnesses a bat in the room with a previously unattended child, mentally disabled person, or intoxicated person

If you discover a bat in your home or cabin:

- **DO NOT TOUCH THE BAT**
- Call Animal Control if available in your area, (509) 662-9577
- Call the Chelan-Douglas Health District to determine if the bat needs to be tested for rabies
Monday-Thursday, (509) 886-6400.
- After hours and weekends, (509) 886-6499.
- If the bat does not need to be tested follow "How can I safely capture a bat in my home". See instructions to the right.

If you are bitten by a bat:

- Wash the wound with soap and water
- Get medical attention within 24 hours
- The medical provider should immediately report the bat bite to the Chelan-Douglas Health District

To avoid possible exposure to rabies:

- Do not touch live or dead bats
- Teach children not to touch live or dead wild animals
- Make sure your home's open windows have screens
- Vaccinate pet dogs, cats, and ferrets against rabies as required by Washington State law (WAC 246-100-197)

Related Links:
[Rabies Information](#)
(Centers for Disease Control and Prevention)
[Rabies Activity in Washington State](#)
(Washington State Department of Health)

How can I safely capture a bat in my home?

If a bat is present in your home and you cannot rule out the possibility of exposure, leave the bat alone and contact an animal-control or public health agency for assistance. If professional help is unavailable, use precautions to capture the bat safely, as described below.

What you will need:

- leather work gloves (put them on)
- small box or coffee can
- piece of cardboard
- tape

When the bat lands, approach it slowly, while wearing the gloves, and place the box or coffee can over it. Slide the cardboard under the container to trap the bat inside. Tape the cardboard to the container securely, and punch small holes in the cardboard, allowing the bat to breathe. Contact your health department or animal-control authority to make arrangements for rabies testing.

If you see a bat in your home and you are sure no human or pet exposure has occurred, confine the bat to a room by closing all doors and windows leading out of the room except those to the outside. The bat will probably leave soon. If not, it can be caught, as described, and released outdoors away from people and pets.



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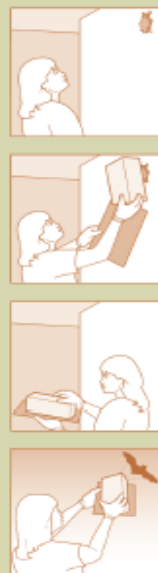
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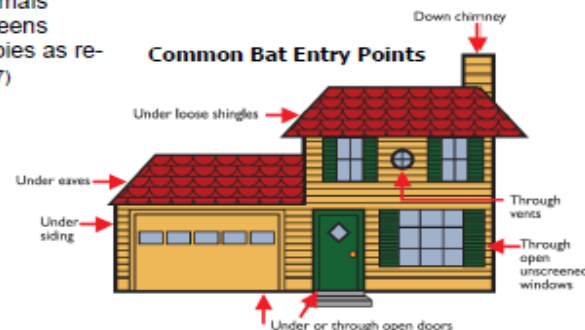
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Common Bat Entry Points



La E: a los

Cualquier con un mu medio pr

Los encu

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- Encon persor contac

Si descul

- **NO TOQUE EL MURCIÉLAGO**
- Llame a la agencia de control de animales si está disponible en su área, (509) 662-9577
- Llame al Distrito de Salud de los condados de Chelan y Douglas para determinar si el murciélago debe ser examinado para la rabia.
(509) 886-6400, de lunes a jueves
(509) 886-6499, los fines de semana y después de horas negocios
- Si el murciélago no necesita prueba de rabia, siga las instrucciones de "¿Cómo puedo capturar de forma segura a un murciélago en mi casa?" Vea las instrucciones a la derecha.

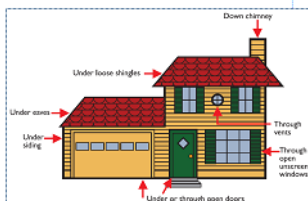
Si le muerde un murciélago:

- Lave la herida con agua y jabón
- Busque atención médica dentro de las siguientes 24 horas
- El proveedor médico debe informar al Distrito de Salud de los condados Chelan y Douglas Distrito inmediatamente acerca de la mordedura de murciélago

Para evitar una exposición posible a la rabia:

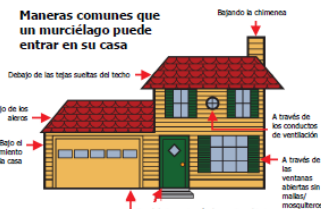
- No toque los murciélagos vivos o muertos
- Enseñe a los niños a no tocar los animales silvestres vivos o muertos
- Asegúrese de que las ventanillas abiertas en su hogar tengan mallas/mosquiteros
- Vacune a los perros, gatos y hurones contra la rabia según los reglamentos del estado de Washington (WAC 246-100-197)

Enlaces para más información:
Información acerca de la Rabia (Centros para el Control y la Prevención de Enfermedades)
[Rabies Activity in Washington State](#) (Washington State Department of Health) (inglés)



adhesiva para pegar bien el cartón al contenedor y haga agujeros pequeños en el cartón para que pueda respirar el murciélago en una habitación y cierre todas las puertas y ventanillas de la habitación, menos las que van hacia el exterior del edificio. El murciélago probablemente se irá pronto. Si no, lo puedo capturar según las instrucciones anteriores y libarlo afuera, lejos de las personas y mascotas.

Maneras comunes que un murciélago puede entrar en su casa



Ebola Virus Ecology and Transmission

Ebola virus disease is a zoonotic disease. Zoonotic diseases involve animals and humans.

Animal-to-Animal Transmission

Evidence suggests that bats are the reservoir hosts for the Ebola virus. Bats carrying the virus can transmit it to other animals, like apes, monkeys, and duikers (antelopes), as well as to humans.

Spillover Event

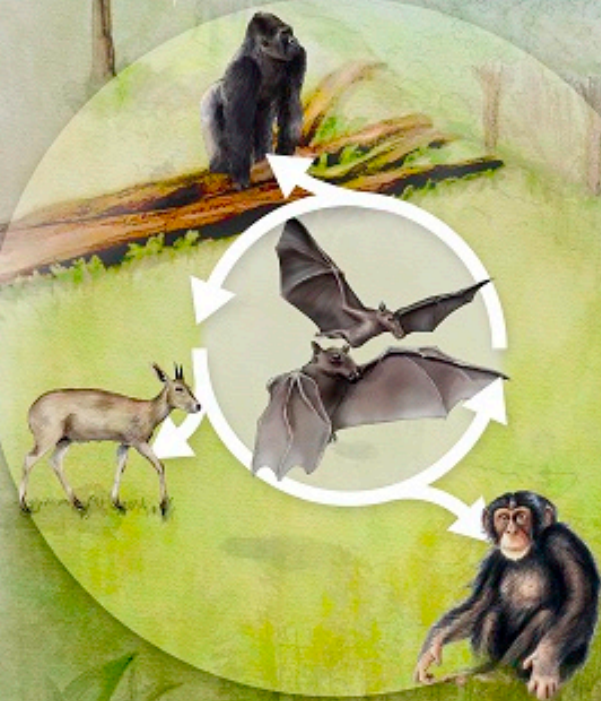
A "spillover event" occurs when an animal (bat, ape, monkey, duiker) or human becomes infected with Ebola virus through contact with the reservoir host. This contact could occur through hunting or preparing the animal's meat for eating.

Human-to-Human Transmission

Once the Ebola virus has infected the first human, transmission of the virus from one human to another can occur through contact with the blood and body fluids of sick people or with the bodies of those who have died of Ebola.

Survivor

Ebola survivors face new challenges after recovery. Some survivors report effects such as tiredness and muscle aches, and can face stigma as they re-enter their communities.



Traditional funeral practice



Unprotected healthcare worker



Unprotected contact with blood and body fluids



Survivor



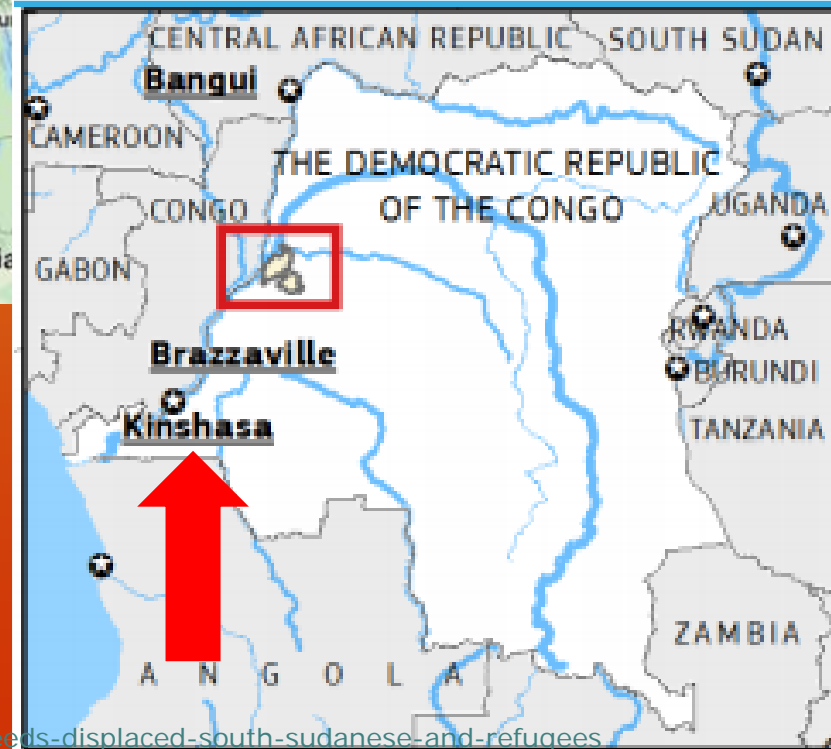


May & June
2018

Ebola

UNICEF Mobilizes to Fight Ebola in the Democratic Republic of Congo

Ebola -2018-Congo



<https://reliefweb.int/country/cong>

<https://reliefweb.int/report/south-sudan/south-sudan-situation-responding-needs-displaced-south-sudanese-and-refugees>

Flow of People

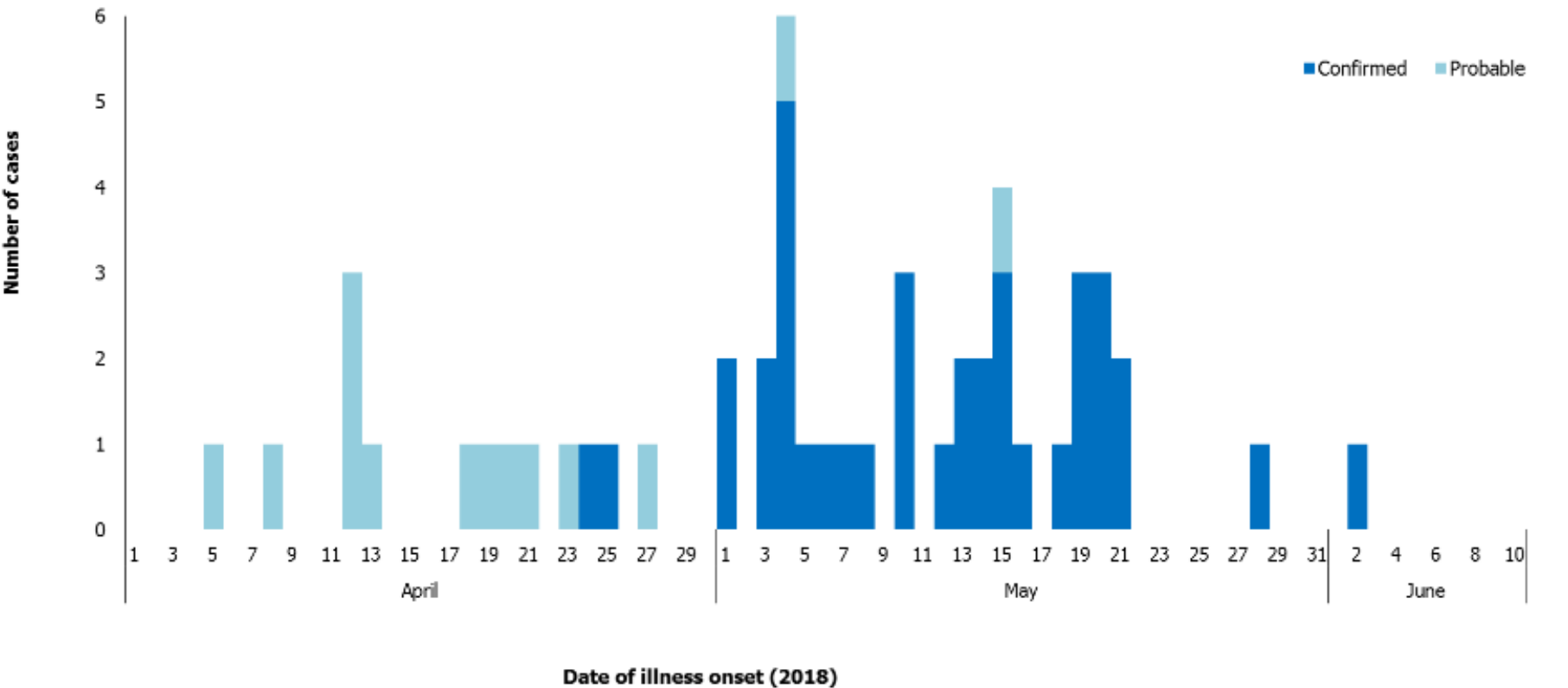


**South Sudan Situation -
Responding to the needs of
displaced South Sudanese and
refugees, Supplementary
Appeal January - December
2018**

**2.4 million
South Sudanese refugees
hosted in neighboring countries**



Figure 1: Confirmed and probable Ebola virus disease cases by date of illness onset from 4 April through 10 June 2018 (n=52)



Ebola virus

- The Ebola virus can incubate in a human body for up to **21 days** before a person shows any symptoms.
- Once a virus has been identified, a country must have **2 successive incubation periods -- 42 days -- without a new case before being declared free of the Ebola virus.**



EBOLA

in Equateur Province, DRC



- **54 cases** of hemorrhagic fever (**25 deaths**)

- └ 35 confirmed ebola cases
- └ 13 probable
- └ 6 suspects

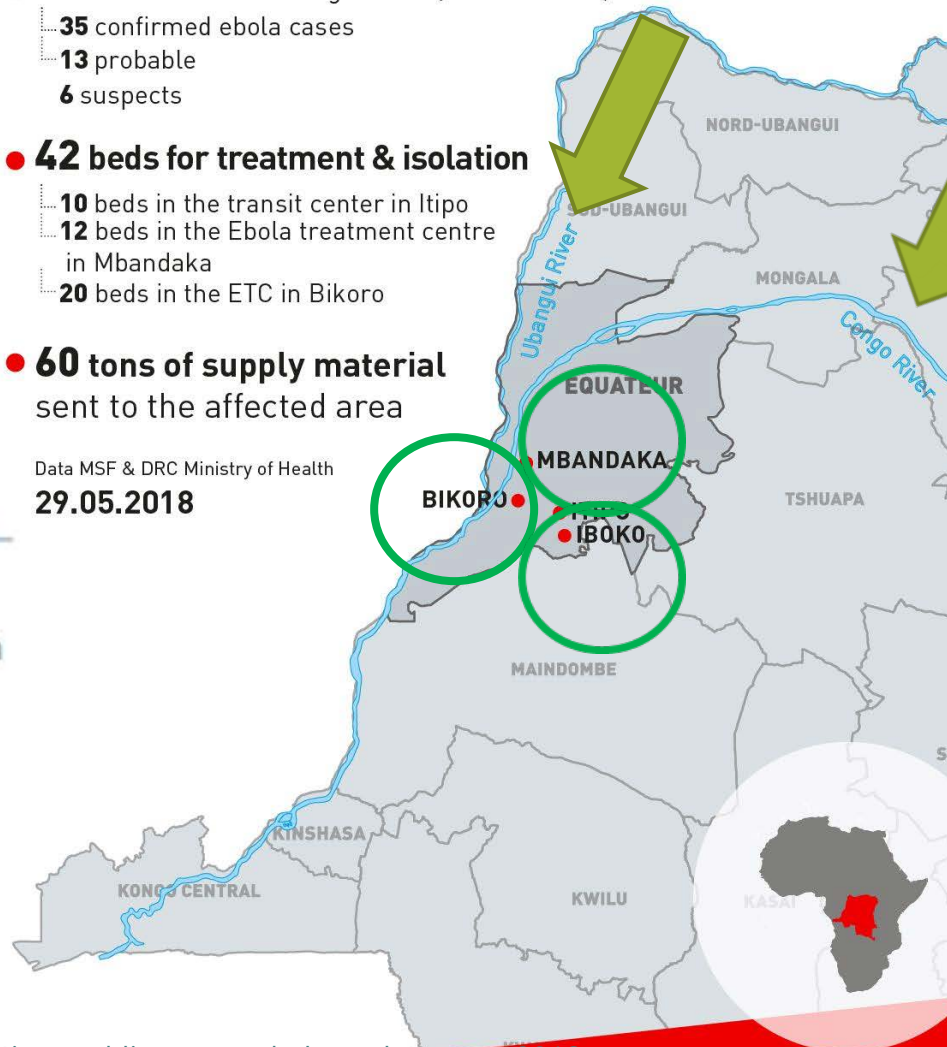
- **42 beds for treatment & isolation**

- └ 10 beds in the transit center in Itipo
- └ 12 beds in the Ebola treatment centre in Mbandaka
- └ 20 beds in the ETC in Bikoro

- **60 tons of supply material** sent to the affected area

Data MSF & DRC Ministry of Health

29.05.2018



Supply and Logistics

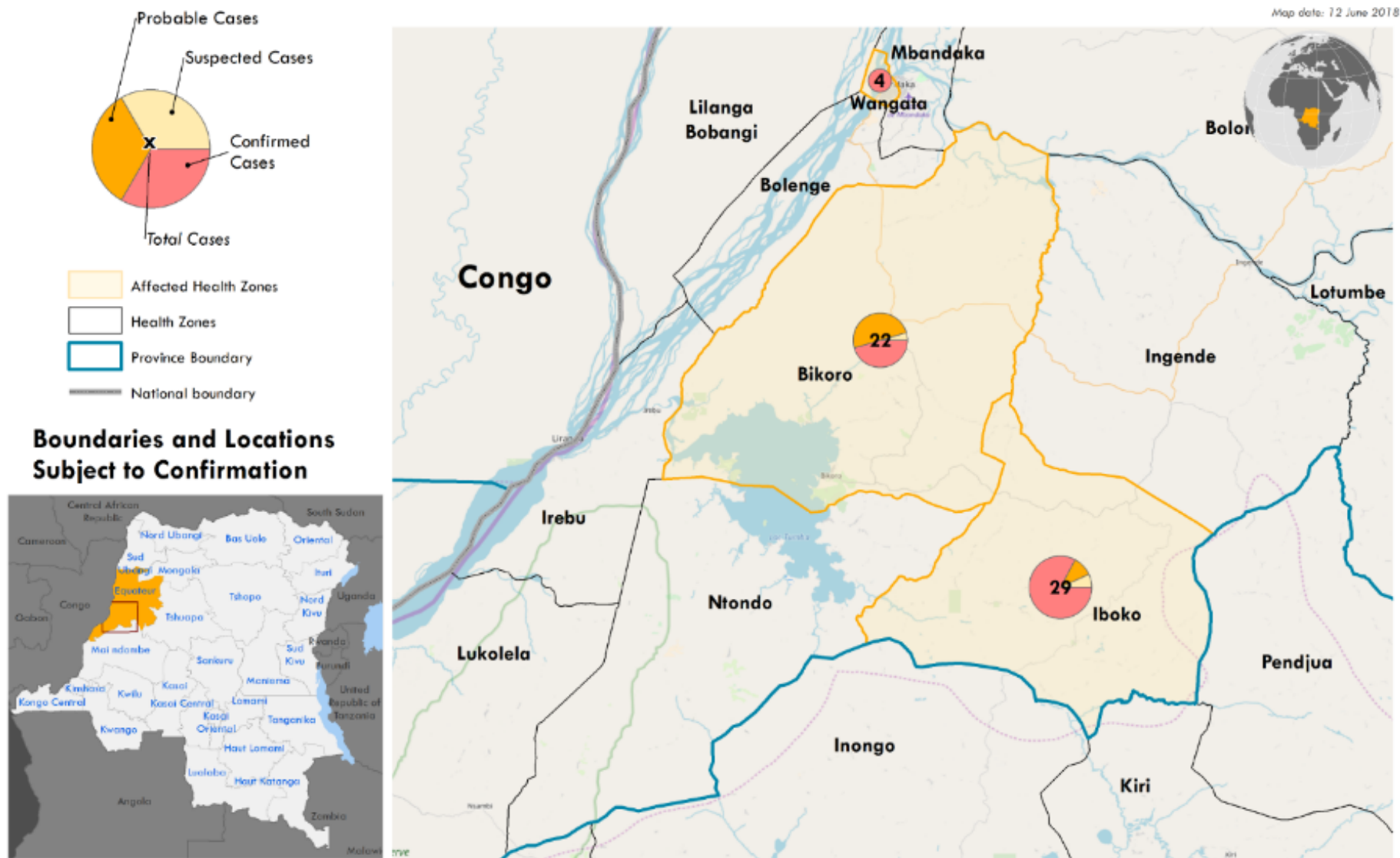


916,760 USD

worth of items have been deployed for the Ebola response



Figure 2: Democratic Republic of the Congo, Ebola cases per Health Zone in Equateur province from 4 April through 10 June 2018



Ebola DRC June 15, 2018

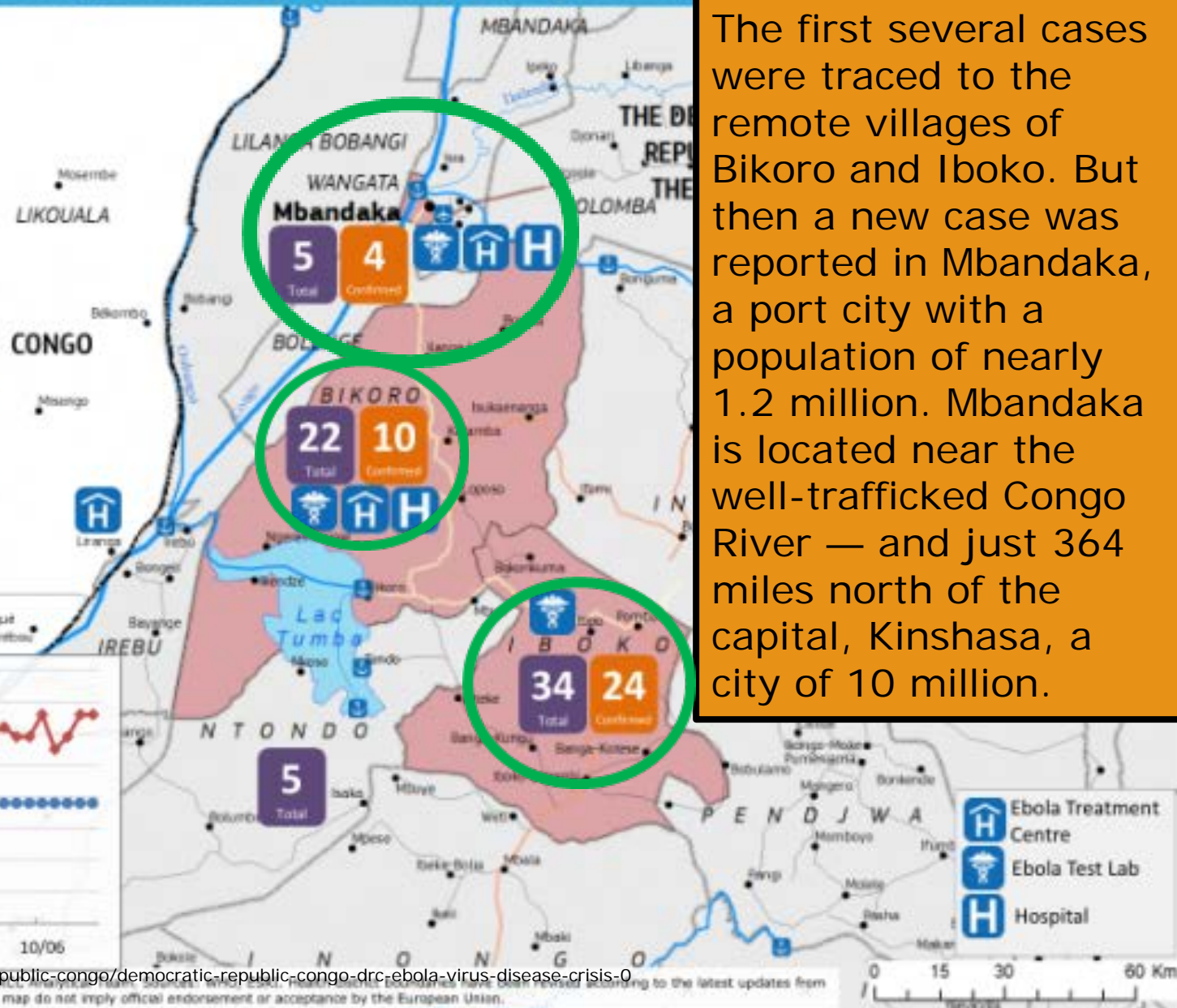
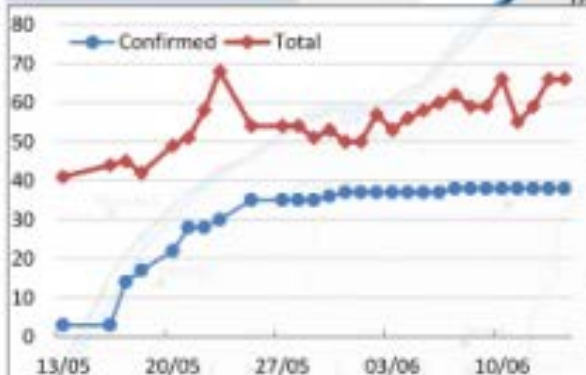
Emergency Response Coordination Centre (ERCC) – DG ECHO Daily Map | 15/06/2018

The Democratic Republic of the Congo: Ebola Virus Disease Crisis (DRC) – epidemiological situation



DRC Cases (as of 14 June)

Total Cases	66
Confirmed	38
Probable	14
Suspected	14
Deaths (out of total)	28
Contacts	541



The first several cases were traced to the remote villages of Bikoro and Iboko. But then a new case was reported in Mbandaka, a port city with a population of nearly 1.2 million. Mbandaka is located near the well-trafficked Congo River — and just 364 miles north of the capital, Kinshasa, a city of 10 million.

<https://reliefweb.int/map/democratic-republic-congo/democratic-republic-congo-drc-ebola-virus-disease-crisis-0>

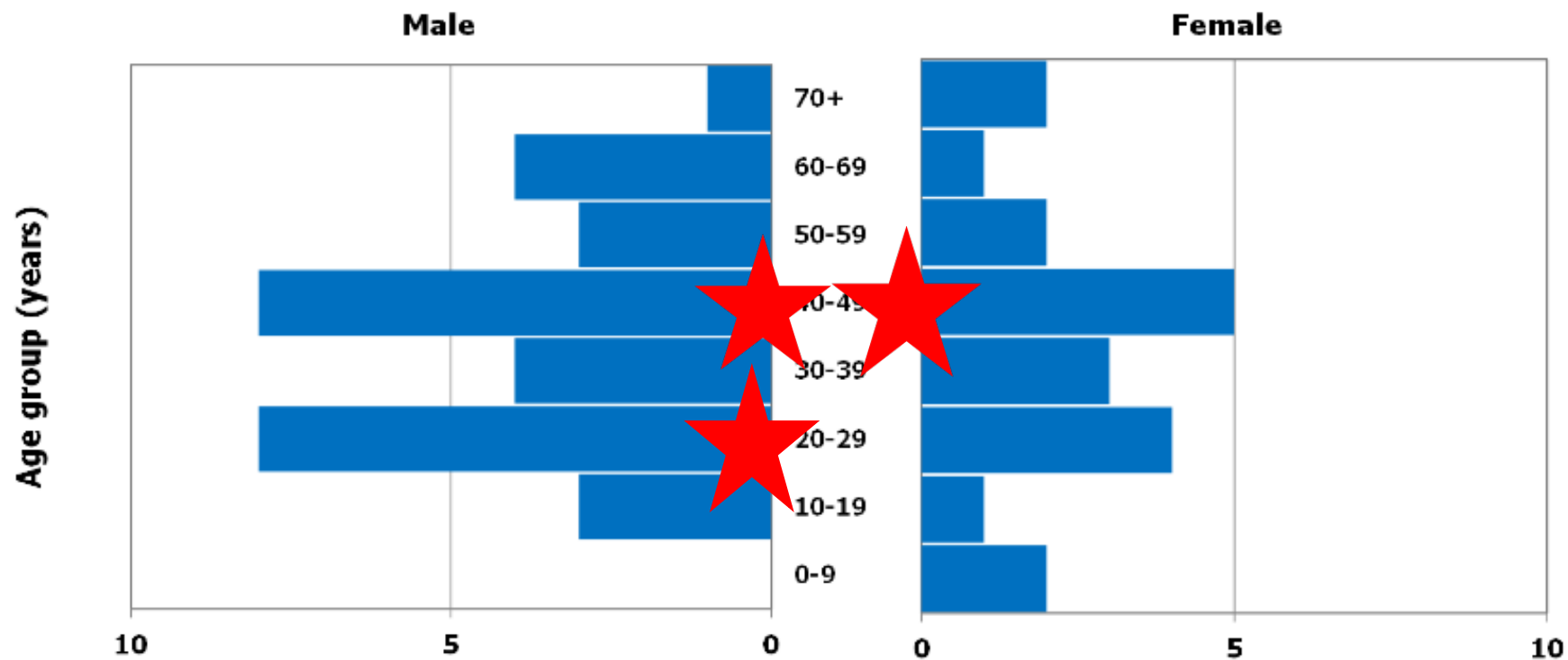
Copyright, European Union, 2018. Map created by ERCC. All rights reserved. The state boundaries and names shown on this map do not imply official endorsement or acceptance by the European Union.

Ebola Outbreak 2018

- Dr. Peter Salama, the Deputy Director-General for Emergency Preparedness and Response for the World Health Organization (WHO), said in remarks before the WHO Assembly in Geneva. **"We're on the epidemiological knife edge of this response."**
- 73.7 % of cases died



Figure 3: Confirmed and probable Ebola virus disease cases by age and sex from 4 April through 10 June 2018 (n=51)



The Pillars of an Ebola Intervention must continue in order to stem the spread:

- Providing medical and psychological care, isolation of people who are sick
- Traditional doctors or healers are an important target for awareness because they are the first resort of the inhabitants when they are sick
- Outreach activities including tracing and following up contacts
- Informing people about the disease, how to prevent it and where to seek care
- Supporting existing healthcare
- Temporarily adapting cultural behavior, such as funeral rites



World Day of the African Child

- On the occasion of the World Day of the African Child on 16 Jun 2018, UNICEF invited 32 children reporters of Bikoro to animate radio programs on the dignified and safe burial.

DR Congo - 2018 Ebola Outbreak in Equateur Province

June 13, 2018

People in Affected Areas



0.8M ~People in affected area

0.3M ~Children in affected area

Situation - Key Numbers

MoH, 12-Jun-18



66 Total cases
• 48% in Iboko HZ
• 28 (42%) deaths



390 contacts under surveillance

WASH

53 health facilities in affected health zones provided with essential WASH services
(90% of target)

284 schools in high risk areas provided with handwashing facilities
(69% of target)

285 community sites (port, market places, office etc) provided with hand washing facilities in the affected areas
(85% of target)

70,117 people with access to safe water source in the affected areas
(52% of target)

C4D

1,417 members of specific-groups reached through community engagement and interpersonal communication activities *

460,031 at-risk people reached through community engagement and interpersonal communication approaches **

2,633 eligible people for ring vaccination informed of the benefits of the vaccine and convinced to receive the vaccine within required protocols.

72 of households for which personalized house visits was undertaken to address misperception about Ebola or resistance to vaccination

Psychosocial Support & Protection

37 affected families, including children that receive protection and psycho social support kit
(97% of target)

89 contacts, including children that receive protection and psycho social support kit
(12% of target)

Response Coordination

4 affected localities with functioning partner coordination mechanism
(100% of target)

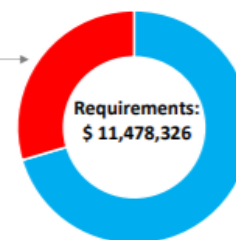
Education

93,228 school children reached with Ebola prevention information
(78% of target)

4,231 teachers briefed on Ebola prevention information
(95% of target)

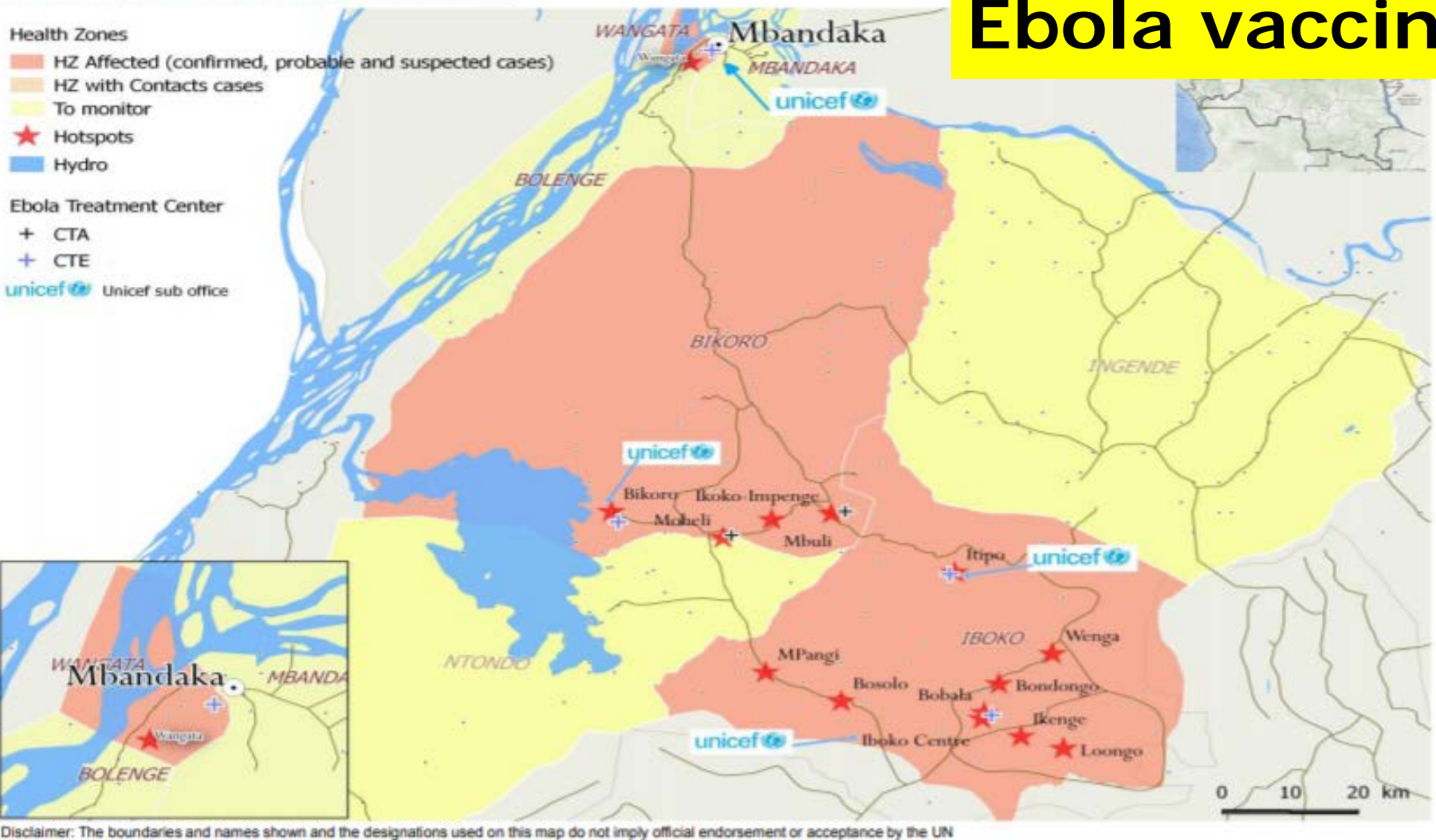
Funding

Funding Gap: 30%



Funding Available [†]: 70%

Ebola vaccine



- Since the launch of the vaccination intervention on 21 May, a total of **3017 people** have been vaccinated in Mbandaka (829), Iboko (1374), Bikoro (726), Ingende (77) and Kinshasa (11).

'Ring' vaccination

Who receives the vaccine?

- Newly diagnosed and laboratory-confirmed **Ebola patients** and the **people they have been in contact with**— often family members, neighbors, colleagues and friends of the patient — will constitute the 'ring'.
- **Ebola health workers**
- Ring vaccination ensures that the vaccination of people who are in the 'ring' create a buffer zone — or protective ring — to prevent the spread of infection.
- Vaccine needs to be stored at -76 to -112 deg F (-60 to -80 deg C)



Questions?

- Please contact me Jacqueline.Dawson@cdhd.wa.gov if you would like a copy of my presentation.

Some bat species can capture up to 1,000 mosquitoes an hour

Bats and Mosquito Control

