



CIDRAP

Center for Infectious Disease Research and Policy
University of Minnesota

**CIDRAP Leadership Forum
September Intelligence Briefing**

April 13, 2016

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1. Vectorborne diseases

- Zika
- Yellow Fever, Chikungunya

2. Ebola

- Update

3. MERS-CoV

- Update

4. Influenza

5. Other

- Avian Influenza
- Mumps
- *Elizabethkingia*

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'Scarier than we initially thought': CDC sounds warning on Zika virus



Gregory Korte, USA TODAY 5:19 p.m. EDT April 11, 2016

WASHINGTON — Public health officials said Monday they've learned a lot more about Zika since the White House asked Congress for \$1.9 billion to combat the mosquito-borne virus and are increasingly concerned about its potential impact on the United States.

"Most of what we've learned is not reassuring," said Dr. [Anne Schuchat](#), the principal deputy director of the Centers for Disease Control and Prevention. "Everything we look at with this virus seems to be a bit scarier than we initially thought."

She said the virus has been linked to a broader array of birth defects throughout a longer period of pregnancy, including premature birth and blindness in addition to the smaller brain size caused by microcephaly. The potential geographic range of the mosquitoes transmitting the virus also reaches farther northward, with the *Aedes aegypti* species present in all or part of 30 states, not just 12. And it can be spread sexually, causing the CDC to update its guidance to couples.

And researchers still don't know how many babies of women infected with Zika will end up with birth defects, or what drugs and vaccines may be effective.

Figura 3 - Países e territórios com transmissão autóctone do vírus Zika nas Américas, até a SE 14/2016.

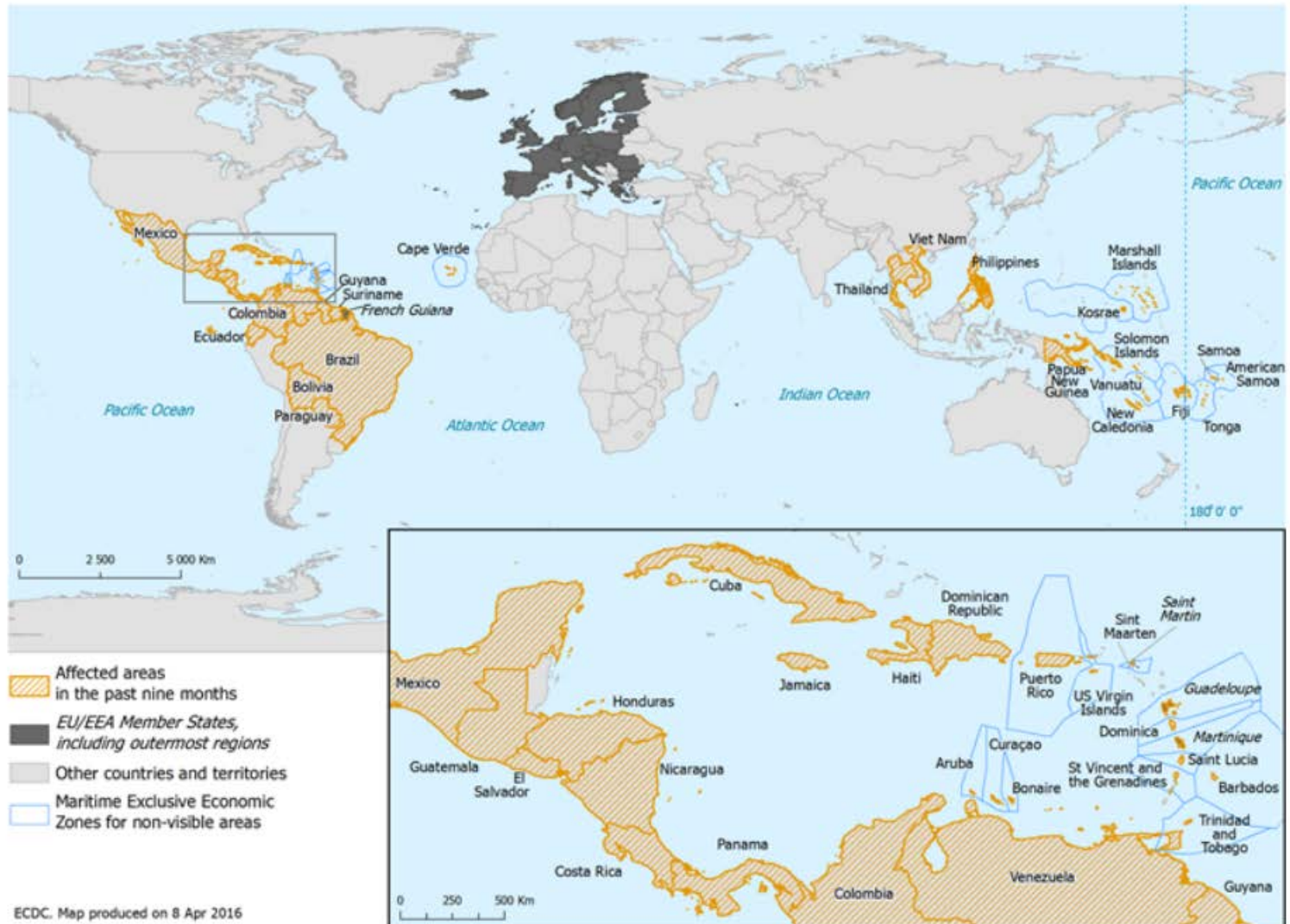


Fonte: Organização Pan-Americana da Saúde/Organização Mundial da Saúde. Dados atualizados em 07/04/2016.
http://www.paho.org/hq/index.php?option=com_content&view=article&id=11585&Itemid=41688&lang=en

Países:

- | | | |
|-----------------|------------------------------|--------------------------------------|
| 1. Aruba | 13. Guadalupe | 25. Paraguai |
| 2. Barbados | 14. Guatemala | 26. Porto Rico |
| 3. Bolívia | 15. Guiana | 27. República Dominicana |
| 4. Bonaire | 16. Guiana Francesa | 28. Saint Lucia |
| 5. Brasil | 17. Haiti | 29. Saint Martin |
| 6. Colômbia | 18. Honduras | 30. Saint Maarten |
| 7. Costa Rica | 19. Ilhas Virgens Americanas | 31. Saint Vincent and the Grenadines |
| 8. Cuba | 20. Jamaica | 32. Suriname |
| 9. Curaçao | 21. Martinica | 33. Trinidad e Tobago |
| 10. Dominica | 22. México | 34. Venezuela |
| 11. El Salvador | 23. Nicarágua | |
| 12. Equador | 24. Panamá | |

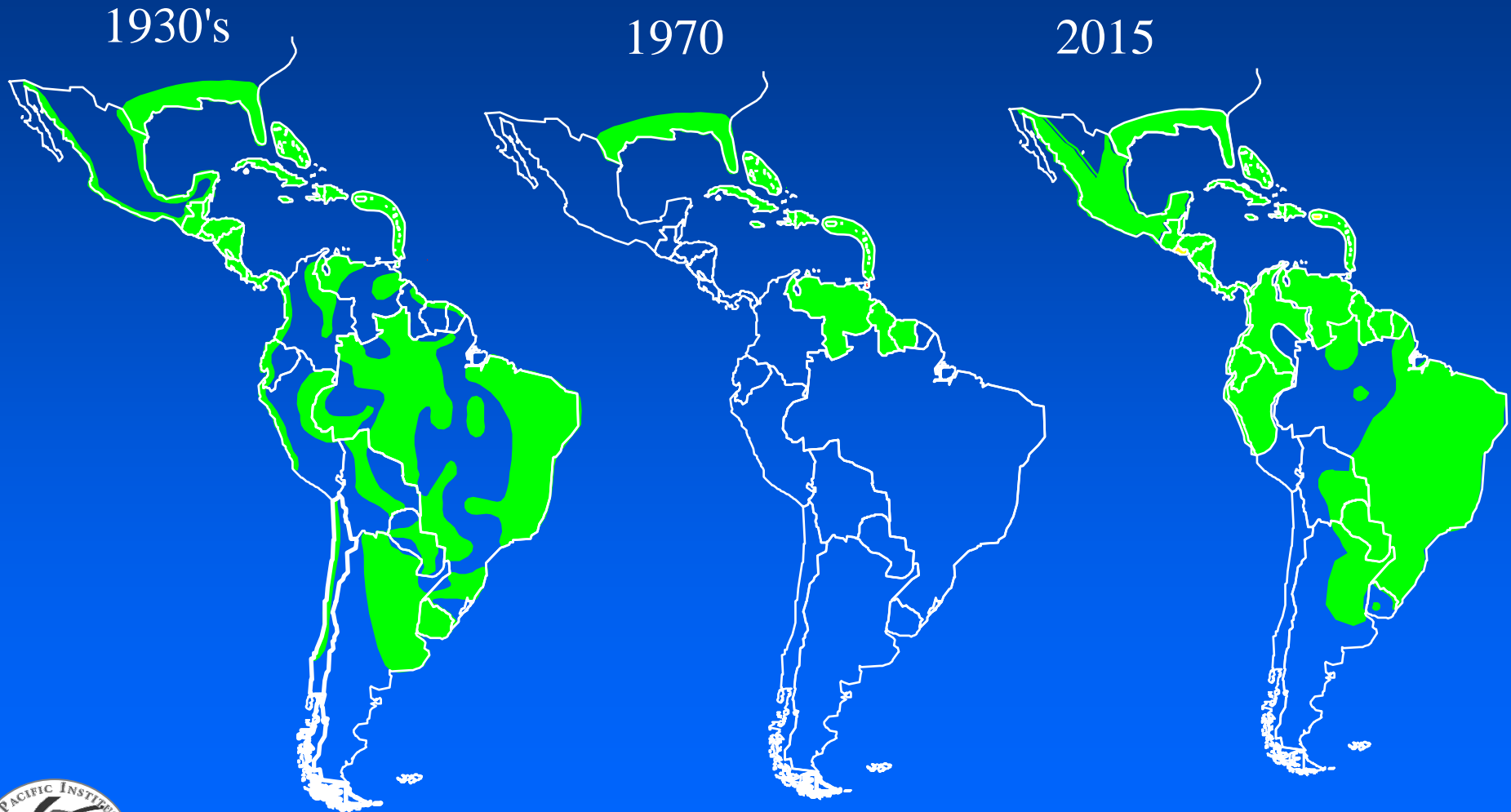
Countries or territories with reported confirmed autochthonous cases of Zika virus infection in the past nine months, as of 8 April 2016



Aedes aegypti



Aedes aegypti Distribution in the Americas



Adapted from Gubler, 1998



RAPID RISK ASSESSMENT

Zika virus disease epidemic: potential association with microcephaly and Guillain–Barré syndrome

Fifth update, 11 April 2016

Main conclusions and options for response

Considering the continued spread of Zika virus in the Americas and Caribbean, the strong evidence of an association between Zika virus infection during pregnancy and congenital central nervous system malformations, the association between Zika virus infection and Guillain–Barré syndrome, and the risk of establishment of local vector-borne transmission in Europe during the 2016 summer season, EU/EEA Member States are recommended to consider a range of mitigation measures.

The following uncertainties have been taken into consideration in developing the proposed options for response:

- At the present time, there is a lack of evidence on which stage of the pregnancy the foetus is most vulnerable to Zika virus infection. Therefore the entire duration of pregnancy should be considered at risk.
- The presence of infectious Zika virus in semen has been detected up to three weeks after onset of disease; the longest interval reported between the onset of symptoms in a male and the subsequent onset of the disease thought to be due to sexual transmission in a female partner is 19 days.
- The role of asymptomatic males in the sexual transmission to women is unknown.
- The roles of different mosquito species as potential vectors of Zika virus should be clarified. If current assumptions prove inaccurate or incorrect, vector control strategies have to be adapted and revised.

Information to travellers and EU residents in affected areas

Over the past two months, as of 4 April 2016, autochthonous cases of Zika virus infection have been reported from 45 countries or territories worldwide. In the past nine months, 47 countries or territories have reported autochthonous cases of Zika virus infection.

A list of countries and territories with documented autochthonous transmission during the past two months is available on the [ECDC website](#).

Information for travellers and EU citizens residing in areas with active transmission

- Travellers visiting countries where there is active transmission of Zika virus should be made aware of the ongoing outbreak of Zika virus infection. A list of countries and territories with documented autochthonous transmission during the past two months is available on the [ECDC website](#).

- Travellers visiting these countries, and EU citizens residing in these countries, should take measures to prevent mosquito bites indoors and outdoors, especially from sunrise to sunset when *Aedes* mosquito vectors are most active in biting. These measures include:
 - The use of mosquito repellent in accordance with the instructions indicated on the product label.
 - Wearing long-sleeved shirts and long trousers, especially during the hours when the type of mosquito that is known to transmit the Zika virus (*Aedes*) is most active.
 - Sleeping or resting in screened or air-conditioned rooms, otherwise use mosquito nets, even during the day.
- Pregnant women and women who are planning to become pregnant should consider postponing non-essential travel to affected areas until after delivery.
- Pregnant women who plan to travel to affected areas and pregnant women residing in affected areas should consult their healthcare providers for advice and follow strict measures to prevent mosquito bites.
- Travellers with immune disorders or severe chronic illnesses should consult their doctor or seek advice from a travel clinic before travelling, particularly on effective prevention measures.
- Travellers to Zika-affected areas and EU citizens residing in affected areas should be advised that using condoms could reduce the risk of sexual transmission through semen.

Information for travellers returning from areas with transmission of Zika virus

- Pregnant women who have travelled or resided in areas with Zika virus transmission should mention their travel during antenatal visits in order to be assessed and monitored appropriately.
- In order to protect the foetus, male travellers returning from affected areas should consider using a condom with a pregnant partner until the end of pregnancy.
- Travellers showing symptoms compatible with Zika virus disease within two weeks of return from an affected area are advised to contact their healthcare provider and mention their recent travel.
- On 11 April, WHO published an update of its travel health advice on Zika virus in which they advise travellers returning from areas with ongoing Zika virus transmission to practise safer sex for at least one month after returning, in order to reduce the potential risk of onward sexual transmission. This WHO guidance will be reviewed and the recommendations updated as new evidence emerges.

Information to healthcare providers in EU Member States

Ensure that Zika virus-infected patients in areas with *Aedes* mosquito vectors avoid getting bitten during the first week of illness (bed nets, screened doors and windows as recommended by PAHO/WHO).

Increase awareness among health professionals who provide prenatal care of the possible association between Zika virus and microcephaly and adapt prenatal monitoring in accordance with the exposure to the vector.

In addition, due to the unprecedented size of the Zika virus epidemic, health services and practitioners should be alerted to the possible occurrence of neurological syndromes (Guillain-Barré syndrome and other neurological syndromes such as meningitis, meningoencephalitis and myelitis according to WHO/PAHO) and potential disease complications not yet described in the scientific literature, and atypical clinical presentation among specific populations (i.e. children, the elderly, immunocompromised individuals and those with sickle cell disease).

INFORME EPIDEMIOLÓGICO Nº 21 – SEMANA EPIDEMIOLÓGICA (SE) 14/2016 (03/04 A 09/04/2016)
MONITORAMENTO DOS CASOS DE MICROCEFALIA NO BRASIL

Neste documento constam as informações epidemiológicas referentes à microcefalia e/ou alterações do SNC, previstas nas definições vigentes no “Protocolo de Vigilância e Resposta à Ocorrência de Microcefalia e/ou alterações do Sistema Nervoso Central (SNC) – Versão 2.1/2016”, disponível no site www.saude.gov.br/svs. O objetivo geral desta vigilância é descrever o padrão epidemiológico de ocorrência de microcefalias relacionadas às infecções congênitas no território nacional.

I - Vigilância de microcefalias e/ou alterações do sistema nervoso central (SNC)

1. Informações gerais

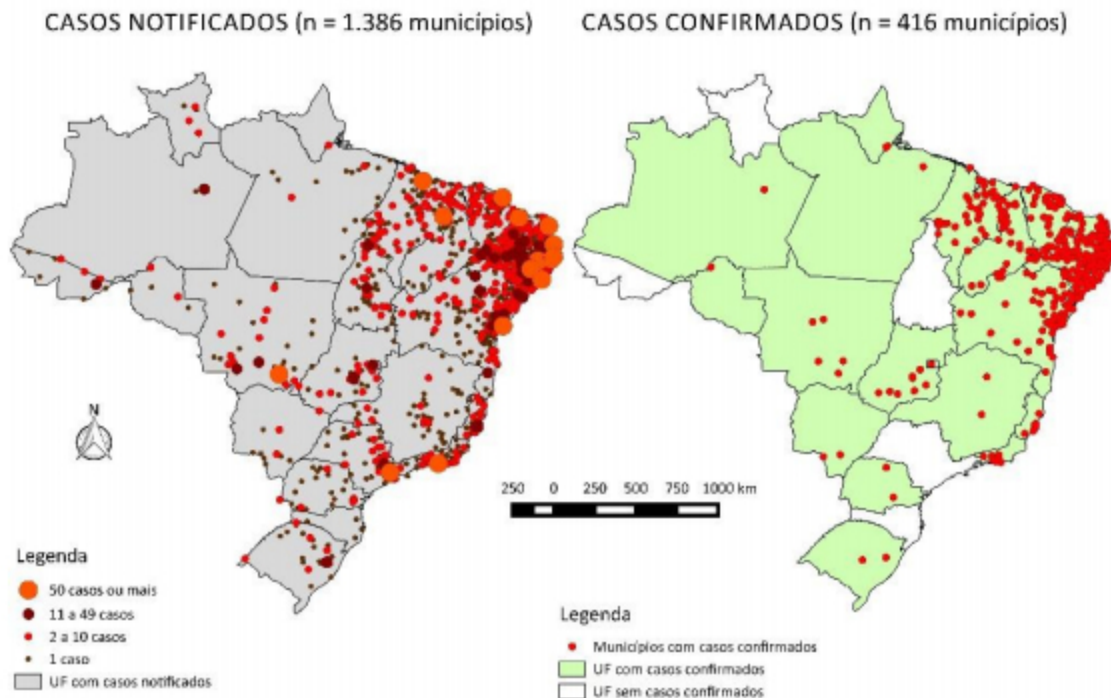
Até 09 de abril de 2016 (SE 14), 7.015 casos foram notificados, segundo as definições do Protocolo de vigilância (recém-nascido, natimorto, abortamento ou feto). Desses, 3.836 (54,7%) casos permanecem em investigação e 3.179 casos foram investigados e classificados, sendo 1.113 confirmados para microcefalia e/ou alteração do SNC sugestivos de infecção congênita e 2.066 descartados (Tabela 1).

Tabela 1 – Distribuição acumulada¹ dos casos notificados de microcefalia e/ou alterações do SNC, segundo definições do Protocolo de Vigilância. Brasil, de 08 de novembro de 2015 a 09 de abril de 2016 (SE 45/2015 - SE 14/2016).

Nº	REGIÕES E UNIDADES FEDERADAS	Total acumulado ¹ de casos notificados de 2015 a 2016		Casos notificados de Microcefalia e/ou Alterações do SNC ² , sugestivos de infecção congênita, em fetos, abortamentos, natimortos ou recém-nascidos.		
		N	%	Permanecem em investigação	Investigados e confirmados ^{2,3}	Investigados e descartados ⁴
	Brasil	7.015	100,0	3.836	1.113	2.066
1	Alagoas	265	3,8	74	55	136
2	Bahia	1014	14,5	667	203	144
3	Ceará	451	6,4	254	80	117
4	Maranhão	238	3,4	112	84	42
5	Paraíba	857	12,2	388	105	364
6	Pernambuco	1849	26,4	873	312	664
7	Piauí	154	2,2	25	72	57
8	Rio Grande do Norte	414	5,9	295	85	34*
9	Sergipe	207	3,0	159	31	17
	REGIÃO NORDESTE	5449	77,7	2847	1027	1575
10	Espírito Santo	121	1,7	96	6	19
11	Minas Gerais	79	1,1	31	2	46
12	Rio de Janeiro	394	5,6	281	35	78
13	São Paulo	259	3,7	163*	0	96
	REGIÃO SUDESTE	853	12,2	571	43	239
14	Acre	35	0,5	23	0 ^c	12
15	Amapá	5 ^c	0,1	2 ^c	3 ^c	0 ^c
16	Amazonas	13	0,2	9	2	2
17	Pará	24	0,3	23	1	0
18	Rondônia	12	0,2	4	3	5
19	Roraima	16 ^c	0,2	16 ^c	0 ^c	0 ^c
20	Tocantins	134	1,9	117	0	17
	REGIÃO NORTE	239	3,4	194	9	36
21	Distrito Federal	37	0,5	2	4	31
22	Goiás	121	1,7	75	9	37
23	Mato Grosso	202	2,9	116	15	71
24	Mato Grosso do Sul	18	0,3	3	2	13
	REGIÃO CENTRO-OESTE	378	5,4	196	30	152
25	Paraná	33	0,5	6	2	25
26	Santa Catarina	4	0,1	1	0	3
27	Rio Grande do Sul	59	0,8	21	2	36
	REGIÃO SUL	96	1,4	28	4	64

Fonte: Secretarias de Saúde dos Estados e Distrito Federal (dados atualizados até 09/04/2016).

Figura 1 – Distribuição espacial com casos notificados e confirmados de microcefalia e/ou alteração do SNC, Brasil, até a SE 14/2016.



Fonte: Secretarias de Saúde dos Estados e Distrito Federal (dados atualizados até 09/04/2016).



Report outlines patterns in rare fatal Zika infections

Filed Under: [Zika](#)

[Lisa Schnirring](#) | News Editor | [CIDRAP News](#) | Apr 08, 2016



Though reports of fatal Zika virus infections are very rare, researchers from Colombia today profiled four of them, including one patient who suffered brain hemorrhage and two others with ischemic brain lesions detected on autopsy.

In other Zika developments, a new survey suggested Americans still have knowledge gaps about the threat, and US officials announced that they would keep the comment period open for another month on a proposed pilot project in Florida that would involve genetically modified mosquitoes.

Cases spotlight disease spectrum

Several clinical questions remain about Zika virus, which causes a typically mild disease and is thought to be asymptomatic in nearly 80% of patients. Very little is known about deaths from the virus, and so far, Colombia had recorded only one other, in a girl who had sickle cell disease. Brazil is the only other country to report fatalities—three known ones.



sudok1 / iStock



Studies show Zika brain damage; feds express deep concern

Filed Under: [Zika](#)

Lisa Schnirring | News Editor | CIDRAP News | Apr 11, 2016

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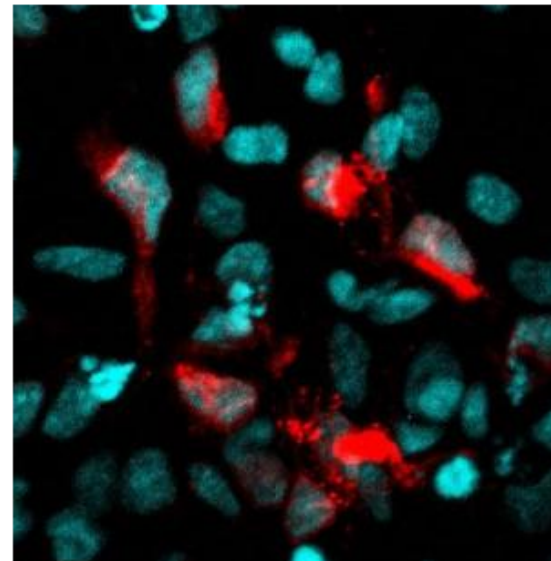
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The scientific case against the damaging effect of Zika virus on nerve cells grew stronger over the past few days, with one Brazilian research team linking infection to yet another neurologic condition and another finding more evidence of the virus's potential to damage developing fetal brain cells.

In other developments, federal health officials at a White House press briefing today detailed the efforts that require emergency funding in the wake of a recent administration announcement that it would transfer existing Ebola money until Congress approves President Obama's \$1.9 billion Zika funding request.

Zika linked to brain autoimmune disorder

In the first study, Brazilian clinicians followed 151 patients hospitalized in Recife with arbovirus and neurologic symptoms from December 2014 to December 2015, a span that included Brazil's Zika virus outbreak. They suspected autoimmune disorders in 6 of the patients, describing their findings today in a press release in advance of the American Academy of Neurology (AAN) annual meeting in Vancouver.



© D'Or Institute for Research and Education (IDOR)

Neural progenitor cells are infected with Zika virus (red); cell nuclei appear in blue.

Brazilian scientists find new Zika-linked brain disorder in adults

CHICAGO | BY JULIE STEENHUYSEN

Scientists in Brazil have uncovered a new brain disorder associated with Zika infections in adults: an autoimmune syndrome called acute disseminated encephalomyelitis, or ADEM, that attacks the brain and spinal cord.

Zika has already been linked with the autoimmune disorder Guillain-Barre syndrome, which attacks peripheral nerves outside the brain and spinal cord, causing temporary paralysis that can in some cases require patients to rely on respirators for breathing.

RECOMMENDED: [Amid clinic closures, young doctors seek abortion training](#)

The new discovery now shows Zika may provoke an immune attack on the central nervous system as well.

The findings add to the growing list of neurological damage associated with Zika.

According to the World Health Organization, there is a strong scientific consensus that, in addition to Guillain-Barre, Zika can cause the birth defect microcephaly, though conclusive proof may take months or years. Microcephaly is defined by unusually small heads that can result in developmental problems.

Brazil said it has confirmed more than 940 cases to be related to Zika infections in the mothers. Brazil is investigating nearly 4,300 additional suspected cases of microcephaly.





Microcephaly CT scans add to Zika evidence

Filed Under: [Zika](#)

[Lisa Schnirring](#) | News Editor | [CIDRAP News](#) | Apr 07, 2016



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Brazil-based clinicians yesterday described severe abnormalities they saw on computed tomography (CT) scans of 23 babies born with Zika-related microcephaly, while the World Health Organization (WHO) reiterated today its assertion of a scientific consensus that the virus causes microcephaly and Guillain-Barre syndrome (GBS).

CT scans show similar patterns

The CT scans were collected from September to December 2015 during the investigations of potentially Zika-linked microcephaly cases in Brazil's Pernambuco state.

Researchers, including doctors from Johns Hopkins University, published their findings in a letter to the *New England Journal of Medicine*. They said their goal was to more clearly describe imaging findings in such cases, since only limited data have been available.

Cerebrospinal fluid samples were available for 7 of the 23 infants, and serologic tests were positive for all of the samples. The tests were negative on all the babies for several other pathogens linked to microcephaly.



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Zika study lists itchy rash among unusual features

Filed Under: [Zika](#)

Lisa Schnirring | News Editor | CIDRAP News | Apr 12, 2016

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The first full description of the Rio de Janeiro's Zika virus outbreak revealed that itching is a common feature of the disease and should be added to the case definition, and that cases were detected as early as January 2015, earlier than thought.

Researchers from Brazil's Fiocruz Institute already had a syndromic surveillance study under way, including blood draws, to detect unusual presentations of dengue infection. Shifting their focus to Zika virus, they described cases and patterns detected from the first half of 2015 outbreak today in the latest edition of *Public Library of Science (PLOS) Neglected Tropical Diseases*.

Unusual itchy rash raised suspicions

The investigators wrote that they first noticed an increase in rashlike illness with or without brief fever, distinct from dengue infection, in January 2015. They looked more closely at illnesses matching the pattern after the first local Zika virus case was confirmed in Rio de Janeiro in May 2015.



thodonal / iStock



White House to shift Ebola funds for Zika response

Filed Under: [Ebola](#); [VHF](#); [Zika](#)

Lisa Schnirring | News Editor | CIDRAP News | Apr 06, 2016

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The Obama administration announced today that because the president's request for \$1.9 billion in emergency funding has stalled in Congress, it will shift \$589 million, most of it from Ebola resources, toward critical activities such as controlling mosquitoes, building lab capacity, and developing vaccines and diagnostic tests.

President Obama first asked for the emergency funding on Feb 8, and members of Congress have balked at the \$1.9 billion request, demanding that the administration tap unused Ebola money. The president's formal request for funds to help with the international and domestic responses on Feb 22 said there was flexibility on the use of remaining Ebola money.

On the sidelines of an Apr 1 Zika summit to help state and local public health officials build or fine-tune their Zika action plans, health officials pleaded with Congress to approve the funds, warning that the funding gap and a raid of Ebola funds would undermine the response to both threats.



Sean Pavone / iStock



CDC Zika summit draws attention to preparedness, need for emergency funds

Filed Under: [Zika](#)

Lisa Schnirring | News Editor | CIDRAP News | Apr 01, 2016

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A 1-day summit to help state and local health officials fine-tune their Zika response plans drew more than 300 people to Centers for Disease Control and Prevention (CDC) headquarters in Atlanta and came with strong pleas for Congress to approve emergency funding to support the efforts.

Puerto Rico is already battling an outbreak, and with local spread in Cuba and Mexico, the virus is right on the nation's main doorstep ahead of warmer weather and an uptick in mosquito activity. On the mainland, the disease has sickened 312 travelers, including 27 pregnant women.



President Obama's February 8 emergency funding request of \$1.9 billion support the domestic and international response is stalled in Congress, with some Republican members demanding that funds be shifted from already approved Ebola money. Federal health officials for months now have warned that they expect limited illness clusters in some parts of the country.

The CDC said the goal of the Zika Action Plan (ZAP) summit is to arm public health officials with the latest information and help them identify any preparedness gaps. It also released several tools for health departments, including Zika preparedness and response guidance and action plan template forms, which are available on the summit Web site.



CDC updates *Aedes* mosquito maps, gears up for Zika summit

Filed Under: [Zika](#)

Lisa Schnirring | News Editor | CIDRAP News | Mar 31, 2016

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The US Centers for Disease Control and Prevention (CDC) yesterday updated its maps of the range of *Aedes* mosquitoes that can spread Zika and other diseases, showing a wider area than before, as the number of Zika infections in the United States continue to climb—travel-linked ones on the mainland and locally acquired illnesses in the territories.

In other US developments, CDC officials and other experts will meet in Atlanta with state and local public health officials tomorrow for a Zika summit.

Maps show best estimates, but not disease risk

The new maps—the first update in over a decade—are the CDC's best estimates for *Aedes aegypti* and *Aedes albopictus* ranges, based on a variety of sources. The agency emphasized that the maps aren't intended to show exact locators or portray the risk for the spread of Zika virus.



 *Aedes aegypti*

CDC

Zika Update: Two new cases in South Florida



By **Naseem S. Miller**
Contact Reporter

APRIL 8, 2016, 2:22 PM

Palm Beach and Broward counties reported additional cases of travel-related Zika on Friday, bringing the state's total to 84.

Zika has been confirmed in five pregnant women in Florida, all of whom had traveled to areas where Zika is transmitted locally.

Miami-Dade and Broward counties are reporting the highest numbers of Zika cases, accounting for more than half of all cases in the state.

Meanwhile, Florida continues to lead the nation in the number of Zika cases, accounting for 23 percent of all cases. Officials are concerned that, with Summer around the corner, Florida could experience local outbreaks of Zika.

Although there's much unknown about the virus, researchers are finding that it is strongly associated with birth abnormalities.



Zika



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[Zika virus](#) (CDC landing page)

[Zika situation report](#) (WHO, Mar 17, 2016)

[Zika virus](#) (WHO fact sheet, January 2016)

[Zika virus infections and complications called Public Health Emergency of International Concern](#) (WHO, Feb 1, 2016)

[Zika virus disease, frequently asked questions about Zika virus](#) (WHO Emergencies Preparedness, Response)

[Zika virus infection](#) (PAHO/WHO landing page)



Maps

[2016 Zika outbreak timeline map](#) (HealthMap)

[Pregnant? The CDC says these are the Zika-affected areas to avoid](#) (STAT map, Feb 2, 2016)

Here are all the known cases of Zika virus in the world ([Popular Science map](#))



World Health
Organization

YELLOW FEVER OUTBREAK IN ANGOLA

Vol: 4-05

SITUATION REPORT 10 APRIL 2016

I. Key Highlights

- ◆ The UN Resident Coordinator and the WHO Country Representative will be visiting Huambo Province on Thursday
- ◆ The overall administrative coverage of the vaccination campaign in Luanda province is 90% of the targeted population (5,900,775 of 6,583,216)
- ◆ The total stock of Yellow fever vaccines as of 10 April: 670,700 doses at central store
- ◆ Huambo will be launching the Yellow fever response vaccination campaign on 12 April targeting 930,751 individuals aged 6 months and above
- ◆ Benguela province is yet to commence, the preparation process is ongoing with the technical support of the central level team deployed to the province.

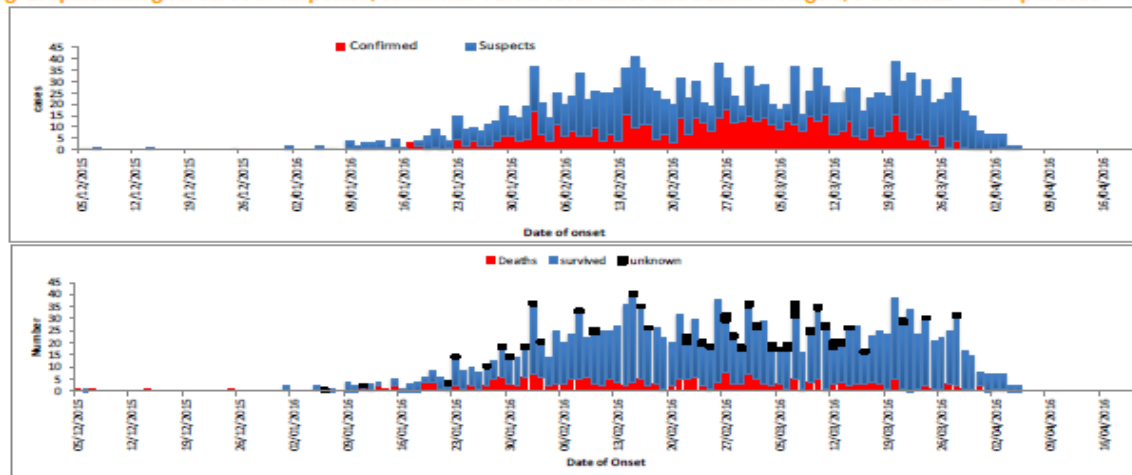
II. Epidemiological Situation as of 10 April 2016

- ◆ A total of **1,751** suspected cases with **242** deaths were reported, of which **582** were laboratory confirmed cases
- ◆ Of the **582** laboratory confirmed cases, **406** were from Luanda province, **85** from Huambo, **22** from Benguela and the remaining **69** were from the other affected provinces
- ◆ Fifty nine (**59**) districts have laboratory confirmed cases in **12** out of the **18** provinces in the country
- ◆ Local transmission in **10** districts with **18** confirmed cases in **5** provinces see in Fig. 3
- ◆ New samples tested were **69** samples with one confirmed from Cazenga in Luanda province with date of onset on 3 April 2016
- ◆ No new districts with confirmed cases reported

Table 1: National summary of Yellow fever outbreak from 5 Dec 2015— 10 April 2016

Indicator	Number
New sample tested	69
New confirmed cases	1
New deaths	2
New districts with confirmed cases	0
New provinces with confirmed cases	0
New districts with local transmission out of Luanda	0
Total suspected cases	1751
Total confirmed cases	582
Total deaths	242
Total districts with suspected cases	89
Total districts with confirmed cases	59
Total provinces with suspected cases	17
Total provinces with confirmed cases	12
Total districts with local transmission out of Luanda	10
Total provinces with local transmission out of Luanda	5
Total number of districts in Angola	166
Total number of provinces in Angola	18
Target population for Luanda	6 583 216
Total population vaccinated in Luanda	5 896 007
SIAs administrative coverage (Luanda)	90%

Fig. 1: Epidemiological Curve of suspected, confirmed Yellow fever cases and deaths in Angola, 5 Dec 2015— 10 April 2016





Yellow fever in DRC linked to Angola's growing outbreak

Filed Under: [Yellow Fever](#)

Robert Roos | News Writer | CIDRAP News | Apr 12, 2016

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The Democratic Republic of the Congo (DRC) has had 151 suspected yellow fever cases with 21 deaths since January, with at least some of them linked to the big outbreak in neighboring Angola, the World Health Organization (WHO) said yesterday, citing DRC government sources.

The Angolan outbreak, meanwhile, has expanded to 1,751 cases and 242 deaths, with 582 confirmed cases, the WHO's Regional Office for Africa reported yesterday. On Apr 4 the WHO had put the count of confirmed cases at 490.

Imported cases

In the DRC, the national surveillance system picked up the 151 suspected cases between early January and Mar 22, the WHO said. Nine cases were confirmed by serology in a government lab in Kinshasa. Because possible cross-reactions with other arboviruses can confuse test results, officials sent the positive samples to the Pasteur Institute lab in Dakar, Senegal, for confirmation.



UNAMID / Flickr cc

Yellow eyes and skin indicate the toxic phase of yellow fever.



News Scan for Apr 08, 2016

Travel alert for Angola upgraded as yellow fever outbreak grows

The US Centers for Disease Control and Prevention (CDC) yesterday upgraded its travel alert for individuals going to Angola to level 2 out of 3 ("practice enhanced precautions"), recommending that all travelers to the country who are 9 months of age or older be vaccinated for yellow fever, and Angola's ministry of health now requires that anyone of this age entering the country have proof of vaccination, according to the CDC.

Furthermore, the World Health Organization (WHO) in its new *Weekly Epidemiologic Record* today states that the continuing outbreak of yellow fever in urban Angola should serve as a warning for the need to strengthen prevention and control activities and warned about limited global supply of vaccine.

West Africa, after years of mass vaccination campaigns, saw no yellow fever outbreaks in 2015, says the report. However, similar programs have not been implemented in other parts of Africa.

The total burden of the Angola outbreak, which began last December and has been largely confined to the urban Luanda area, stands as of Apr 4 at 501 lab-confirmed and 1,562 suspected cases, with 225 deaths, the WHO says.

The WHO gave the outbreak a level 2 out of 3 emergency grading earlier this year and, because of the urban concentration of cases and the high risk of outbreak extension, worked with the ministry of health in Angola and other partners to conduct a reactive vaccination campaign targeting 6.4 million individuals in Luanda province.



News Scan for Apr 06, 2016

WHO details imported yellow fever cases in China and Kenya

In developments reflecting the continuing global impact of Angola's yellow fever outbreak, the WHO today reported eight more imported cases in China and the first two imported cases in Kenya.

At the end of March China reported its first imported case from Angola, and today's WHO report notes eight more from three provinces: Fujian, Jiangsu, and Sichuan. Ages range from 36 to 53, and five of the patients are men. Of five people with known immunization status, none had been vaccinated against yellow fever before traveling to Angola. One was vaccinated while in Angola but was probably infected before developing protection, the agency said.

In a separate report, the WHO said Kenya notified it of two imported cases between Mar 15 and Mar 18. Both involve men in their 30s who had been working in Luanda, Angola. Both traveled back to Kenya while they were sick, and neither had been vaccinated against yellow fever before arriving in Angola.

One of the patients died from multi-organ failure, and the other has recovered and has been discharged from the hospital, the WHO said.

Apr 6 WHO report on yellow fever in China

Apr 6 WHO report on yellow fever in Kenya



News Scan for Apr 05, 2016

Yellow fever vaccine shortage a 'ticking timebomb'

In what Director-General Margaret Chan, MD, MPH, of the World Health Organization (WHO) says is the most serious outbreak of yellow fever in Angola in 30 years, a serious global shortage of vaccine makes what is already a bad situation potentially catastrophic, sources are reporting. Dr. Chan recently visited Angola to observe the situation first-hand.

Outbreak cases, which began in December of last year, have been concentrated in urban Luanda, the country's capital, but have now spread to 6 of the country's 18 provinces, said a WHO feature story yesterday. The official outbreak total now stands at 490 cases with 198 deaths, according to the WHO, but could be far higher.

Vaccination campaigns launched in February by the WHO and partners have reached 5.7 million people in Luanda as of late March. However, the global emergency stockpile is empty, the WHO says. Only four sources of the vaccine exist worldwide, and the egg-based process of making the vaccine is slow and outdated, as explained in an Apr 4 *Science* news story.

Imported cases have been identified in China and three other African countries, including the Democratic Republic of Congo. Experts are particularly concerned that yellow fever, which is endemic in much of Latin America but brings the heaviest disease burden in Africa, could begin spreading in urban areas elsewhere in Africa as well as in southern China, where *Aedes aegypti* mosquitoes are plentiful, and other parts of Asia.

Angolan yellow fever outbreak highlights dangerous vaccine shortage

By Kai Kupferschmidt | Apr. 4, 2016, 3:30 PM



The three people dressed in baby blue plastic suits and goggles form a human conveyor belt for chicken embryos. The first takes a tray of eggs that were injected with a yellow fever vaccine virus, then left to incubate for 4 days, and cuts the top off each egg. The second tweezes the embryos out of the eggs and deposits them in a large bottle. The last person adds some liquid, then blends the embryos into a rich, red broth that contains millions of weakened virus particles.

The end result of this procedure, repeated dozens of times every week at the **Pasteur Institute of Dakar**, is a highly effective vaccine that offers lifelong protection against yellow fever. But the 80-year-old process is decidedly low-tech and hard to scale up—and that's become a problem, because a big yellow fever outbreak that started in December 2015 in Luanda, Angola's capital, has emptied the world's strategic reserves of the vaccine.



Fears rise over yellow fever's next move

Scientists warn vaccine stocks would be overwhelmed in the event of large urban outbreaks.

Declan Butler

13 April 2016

As the [largest outbreak of yellow fever in almost 30 years](#) continues to spread in Angola, scientists are warning that the world is ill-prepared for what would be a public-health calamity: the re-emergence of urban epidemics of the deadly infection, which could overwhelm vaccine stockpiles.

Yellow fever virus caused devastating outbreaks in cities in the past, but by the 1970s its mosquito carrier in urban areas — *Aedes aegypti* — had been wiped from large swathes of the globe; vaccination programmes also helped to confine the virus to the jungle. But now, as a result of the scaling-back of control efforts, *Aedes* mosquitoes have re-emerged in [densely populated tropical and subtropical cities where many people are unvaccinated](#) — and the Angolan situation has renewed fears that the virus might be poised to break out from the jungle.

Worst of all would be if yellow fever gains a foothold in Asia — where, mysteriously, it has never become established despite apparently ideal ecological conditions. “We don’t know if this will happen, but if it does it would be a public-health disaster,” says Duane Gubler, a researcher in mosquito-borne diseases at Duke-NUS Medical School in Singapore.

Related stories

- [Viral complacency](#)
- [Zika and birth defects: what we know and what we don't](#)

HEALTH

‘Sitting on a time bomb’: Outbreak of yellow fever setting off alarms

By HELEN BRANSWELL [@HelenBranswell](#)

APRIL 7, 2016

A fast-spreading outbreak of yellow fever has taken hold in central Africa, alarming infectious disease experts and threatening to spread far wider if not brought under control quickly.

Even as the spread of another virus, [Zika](#), commands the attention of global health officials, yellow fever could prove far more worrisome. The disease, which like Zika is transmitted by mosquitoes, kills an estimated 60,000 people a year.

“I think we’re sitting on a time bomb,” [Duane Gubler](#), one of the world’s leading experts on mosquito-spread viruses, told STAT.

“You think SARS was bad? This would make it pale by comparison.”



News Scan for Apr 05, 2016

PAHO reports almost 4,000 new chikungunya cases in the Americas

The Pan American Health Organization (PAHO) last week reported 3,994 new cases of chikungunya in the Americas, bringing the 2016 outbreak total to 36,529 confirmed and suspected cases. The agency, however, has now fallen a week behind in its reporting.

The agency has not reported any new 2015 cases since Mar 4, leaving that number at 731,920 cases. Therefore, the outbreak total since its 2012 onset has now reached 1,916,075 cases.

According to the latest report, which is dated Mar 25 but was not posted till late last week, a major portion of the new cases were in Brazil, which reported for the first time in 2016. Brazil noted 2,766 new cases in the first 7 weeks of the year.

Colombia, the hardest-hit nation so far in 2016, chalked up the next largest gain, with 747 new cases and 9,488 for the year. Honduras was next, with 408 new cases and 6,602 total. Many countries, however, have not reported new numbers for many weeks.

PAHO did report did not report any new chikungunya-related deaths, leaving that number at two. The outbreak was first reported in December 2013 on St. Martin in the Caribbean with the first recorded cases of the disease in the Americas.

Mar 25 PAHO update

Latest PAHO 2015 cumulative case numbers

News Scan for Apr 11, 2016

PAHO reports 4,500 new chikungunya cases

The Pan American Health Organization (PAHO) last week reported 4,587 new cases of chikungunya in the Americas over a 2-week span, bringing the 2016 outbreak total to 41,116 confirmed and suspected cases.

The agency has not reported any new 2015 cases since Mar 4, leaving that number at 731,920 cases. Therefore, the outbreak total since its 2012 onset has now reached 1,920,662 cases.

According to the latest report, Bolivia reported the largest case increase, with 1,725 new infections, for a total of 6,900, to become the second most affected nation this year. Colombia, the hardest-hit nation so far in 2016, had the next largest gain, with 967 new cases and 10,415 for the year.

Brazil and Guatemala were next, with 799 and 584 new cases, respectively. Brazil has now logged 3,565 cases this year, and Guatemala has 1,321. Many countries, however, have not reported new numbers for many weeks.

PAHO did report did not report any new chikungunya-related deaths, leaving that number at two. The outbreak was first reported in December 2013 on St. Martin in the Caribbean with the first recorded cases of the disease in the Americas.

Apr 8 PAHO update

Latest PAHO 2015 cumulative case numbers

News Scan for Mar 23, 2016

Twelve sepsis deaths noted in Guadeloupe chikungunya outbreak

Scientists from the Guadeloupe island group, writing in *Emerging Infectious Diseases* yesterday, reported 25 cases of severe sepsis and 12 associated deaths likely attributable to chikungunya infection during a 2014 outbreak.

Of 110 non-pregnant adults hospitalized with chikungunya in 2014, 42 had infections resulting in failure of one or more organs or intensive care unit admission. More than half of patients with severe illness (25, or 59.5%) progressed to sepsis or septic shock, and 12 died.

Patients with severe infections were more likely to have acute cardiac failure and organ dysfunction, in addition to higher white blood cell counts and higher enzyme levels indicating tissue damage compared with patients who had less severe illnesses.

No cause other than chikungunya infection was identified in the 25 patients who progressed to severe sepsis or septic shock. Septic patients were more likely to have presented with cardiac, respiratory, and renal signs and symptoms upon admission, the researchers said. The mortality rate was much higher among septic patients (48%) than in patients with less severe illness (3%).

The researchers noted the rarity of septic shock triggered by a viral illness, saying that sepsis could be a significant complication of severe chikungunya infection. Guadeloupe experienced a chikungunya outbreak from February to November 2014, during which approximately 40% of the islands' population were infected, or 160,000 people.

Mar 22 *Emerg Infect Dis* study

1. Vectorborne diseases

- Zika
- Yellow Fever, Chikungunya

2. Ebola

- Update

3. MERS-CoV

- Update

4. Influenza


5. Other


- Avian Influenza
- Mumps
- *Elizabethkingia*

WHO declares end to Ebola public health emergency

Filed Under: [Ebola](#); [VHF](#)

[Lisa Schnirring](#) | News Editor | [CIDRAP News](#) | Mar 29, 2016

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The World Health Organization (WHO) today announced the end of the Ebola public health emergency of international concern (PHEIC), noting that West Africa's outbreak nations have stamped out original transmission chains and have shown they can quickly extinguish occasional clusters as virus levels die out in survivors.

The WHO made the announcement after its Ebola emergency committee met today for the ninth time. After hearing updates from all three countries and responders, the panel noted that all three countries have passed observation and extended surveillance periods since the last case in the original transmission chains were reported.

As expected, new clusters continue to be reported, such as a recent one in Guinea, but they are becoming less frequent and the countries have quickly responded and limited the cases to no more than two generations of infection.



UK DFID / Flickr cc

Ebola: A new flare-up in Liberia, vaccines given out in Guinea



By **Greg Botelho**, CNN
Updated 9:51 AM ET, Fri April 1, 2016



Story highlights

NEW: Nearly 800 in Guinea who'd been in contact with Ebola sufferers get experimental vaccine

NEW: A 30-year-old woman who died in a hospital in Monrovia, Liberia, had the virus, the WHO says

Liberia has twice before been declared Ebola-free -- in May 2015 and in September

concern.

This is still true, even given the new Liberia case. But that doesn't mean Ebola is gone entirely, nor that it won't rear its ugly head again.

(CNN) — Two steps forward, one step back.

That's the reality Friday in the fight against Ebola, with the World Health Organization announcing first that hundreds would get experimental vaccines in Guinea, then a short time later that the deadly disease has reemerged in Liberia.

All this comes days after the same international health body declared that [the Ebola outbreak in West Africa was no longer a public health emergency](#) of international



Liberia confirms 2nd Ebola case as cross-border link probed

Filed Under: [Ebola](#); [VHF](#)

Lisa Schnirring | News Editor | CIDRAP News | Apr 04, 2016

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Health officials in West Africa are investigating a possible Guinea connection to a new flare-up in Liberia, where a second recent confirmed case has been reported. It involves the young son of a woman who recently died from her infection while en route to a Monrovia hospital, the World Health Organization (WHO) said today.

Liberia recently reported its third Ebola recurrence, and Guinea is battling a nine-person cluster, with seven of the illnesses fatal. The outbreak is centered in the Nzerekore district city of Koropara, located in southern Guinea.

The WHO on Mar 29 declared the end of the Ebola public health emergency of international concern, but it warned that sporadic clusters would likely continued to be reported as lingering virus levels decline in the survivor population.



suprunvitaly / iStock



News Scan for Apr 06, 2016

Guinea Ebola cluster death toll rises to 8

A woman infected in Guinea's recent Ebola cluster died from her illness at a treatment center in Nzerekore, lifting the death total to eight, Agence France-Presse (AFP) reported yesterday.

Ibrahima Sylla, spokesman for Guinea's Ebola response team, told AFP that the woman died on Apr 3 and that one more confirmed case-patient is still being treated at the center. The case total in the cluster remains at nine.

Earlier this week the World Health Organization (WHO) said it and its partners were investigating a possible cross-border connection in a two-person Ebola cluster that emerged more recently in Liberia than the one in Guinea.

Apr 5 AFP story

In other Ebola developments, scientists at the National Institutes of Health Rocky Mountain Laboratories in Hamilton, Mont., in an effort to help guide policies for decontaminating and removing specimens from high-containment labs, recently tested the effectiveness of different chemical inactivation methods. They reported their findings today in an early edition of *Emerging Infectious Diseases*.

The researchers used the Ebola Zaire strain as model for a range of similar pathogens, using in vitro and in vivo approaches for their comparisons. They said their results spelled out the inactivation procedures that can be used for specific specimen types and research purposes, which could help streamline inactivation procedures without safety testing each individual sample.



News Scan for Apr 07, 2016

Liberia's Ebola cluster grows to 3, linked to fatal case in Guinea

Two Ebola case-patients, both children, and one fatality in Liberia have been linked to a fatal Ebola infection in Guinea's ongoing flare-up, the World Health Organization (WHO) announced today, increasing the number of recent cases in Liberia to three.

The Liberian fatal case involves the wife of a deceased Ebola patient in Guinea's Macenta prefecture. She and her three children traveled to Monrovia, Liberia, following the man's death, where she developed symptoms of Ebola and died on Mar 31.

Two of her sons have tested positive for Ebola and are receiving treatment in a Monrovia hospital, the WHO said. More than 100 of the family's Liberian contacts are being monitored for signs of infection.

Blood tests have confirmed that the Ebola recurrence in Guinea and Liberia can be traced to one known survivor, and small flare-ups or clusters are likely to continue due to viral persistence in people who have recovered, the WHO said.

Liberia has instituted infection control measures and is preparing to vaccinate contacts of the deceased woman and her children, the WHO said. Guinea, where nine Ebola cases have been confirmed since late February, has already vaccinated 1,400 identified contacts to halt transmission.

Apr 7 WHO update

Apr 4 CIDRAP News story on Liberian cases



WHO issues Ebola survivor guidance as cases show virus persistence

Filed Under: [Ebola](#); [VHF](#)

[Jim Wappes](#) | Editorial Director | [CIDRAP News](#) | Jan 22, 2016

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The World Health Organization (WHO) today issued guidance on caring for Ebola survivors, emphasizing integrated care for their diverse needs, while two case reports yesterday demonstrated the persistence of Ebola virus in the breast milk and semen of survivors.

The WHO guidance comes after flare-ups of Ebola virus disease (EVD) in West Africa, some tied to sexual transmission of the virus, and after a high-profile relapse in a nurse survivor in the United Kingdom. Issues with survivors include the ability of the Ebola virus to survive for long periods in some parts of the body like the eyes, breasts, and testicles, as well as emotional trauma and long-lasting physical symptoms.



UNMEER / Martine Perret / Flickr cc

The WHO said there are more than 10,000 Ebola survivors today, the vast majority of them in West Africa.



Expert panel urges no letup on Ebola vaccine progress

Filed Under: [Ebola](#); [VHF](#)

[Jim Wappes](#) | Editorial Director | [CIDRAP News](#) | Mar 31, 2016



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Although the World Health Organization (WHO) this week ended the global health emergency over Ebola, the world cannot ease up on efforts to maximize development of Ebola vaccines and prepare for the next outbreak, according to an expert panel.

A report today by the Ebola Vaccine Team B comes a little over a year after its first report, which detailed desirable qualities to seek in as-yet undeveloped vaccines and included a host of recommendations for quickly responding to the then-accelerating crisis.

Since that time a vaccine produced by Merck has demonstrated impressive efficacy in clinical trials, and other vaccines have advanced well along the clinical trial pathway. But no vaccine has yet been approved by the US Food and Drug Administration or other regulatory body, the experts point out in their report, and public health officials must not grow complacent until one or more vaccines are advanced enough to stockpile and respond to the next Ebola epidemic.



Sally Hodgson, US Embassy-Monrovia / NIAID

March 2016

Ebola Vaccine Team B

Plotting the Course of Ebola Vaccines

CHALLENGES AND
UNANSWERED QUESTIONS

wellcometrust

 **CIDRAP**
Center for Infectious Disease Research and Policy
University of Maryland

Team B Focus: Key Unresolved Issues

- Need for a **business model** to maintain industry involvement in Ebola vaccine R&D, licensure and deployment
- Lack of a comprehensive **regulatory strategy** for Ebola vaccine licensure
- Gaps in **safety/effectiveness data** for rVSV-ZEBOV
- Need for direct input from **African public health leaders** on how Ebola vaccines would be used in Africa to end current epidemic and prevent future epidemics

The Need for a Vaccine Development Paradigm Shift

- The current Ebola epidemic is not a “one-off” event.
- Future Ebola (other emerging diseases) epidemics are inevitable.
- The current vaccine R&D, financing and manufacturing model is not effective for meeting the needs to develop and deploy new vaccines for pathogens that cause outbreaks of regional critical importance.

Urbanization of African Countries of Potential Concern

- Kinshasa, DRC/Brazzaville, RC
 - 13.8 million (four other cities > 1 million)
- Lagos, Nigeria
 - 13.2 million (five other cities > 1 million)
- Nairobi, Kenya
 - 4.1 million
- Accra, Ghana
 - 2.8 million
- Monrovia/Freetown/Conakry
 - 4.2 million

What We're Afraid to Say About Ebola

By MICHAEL T. OSTERHOLM SEPT. 11, 2014



Jonathon Rosen

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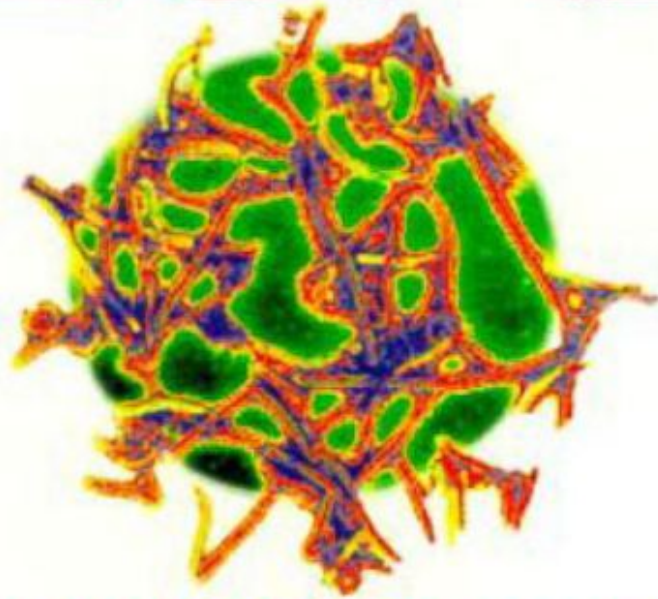
MINNEAPOLIS — THE [Ebola](#) epidemic in West Africa has the potential to alter history as much as any plague has ever done.

There have been more than 4,300 cases and 2,300 deaths over the past six months. Last week, the [World Health Organization](#) warned that, by early October, there may be thousands of new cases per week in Liberia, Sierra Leone, Guinea and Nigeria. What is not getting said publicly, despite briefings and discussions in the inner circles of the world's public health agencies, is that we are in totally uncharted waters and that Mother Nature is the only force in charge of the crisis at this time.

There are two possible future chapters to this story that should keep us up at night.

The first possibility is that the Ebola virus spreads from West Africa to megacities in other regions of the developing world. This outbreak is very different from the 19 that have occurred in Africa over the past 40 years. It is much easier to control Ebola infections in isolated villages. But there has been a 300 percent increase in Africa's population over the last four decades, much of it in large city slums. What happens when an infected person yet to become ill travels by plane to Lagos, Nairobi, Kinshasa or

THE HOT ZONE



A TERRIFYING TRUE STORY
RICHARD PRESTON

SCIENTIFIC REPORTS

**OPEN**

Conserved differences in protein sequence determine the human pathogenicity of Ebolaviruses

Morena Pappalardo*, Miguel Juliá*, Mark J. Howard, Jeremy S. Rossman, Martin Michaelis & Mark N. Wass

Received: 08 July 2015

Accepted: 14 March 2016

Published: 24 March 2016

Reston viruses are the only Ebolaviruses that are not pathogenic in humans. We analyzed 196 Ebolavirus genomes and identified specificity determining positions (SDPs) in all nine Ebolavirus proteins that distinguish Reston viruses from the four human pathogenic Ebolaviruses. A subset of these SDPs will explain the differences in human pathogenicity between Reston and the other four ebolavirus species. Structural analysis was performed to identify those SDPs that are likely to have a functional effect. This analysis revealed novel functional insights in particular for Ebolavirus proteins VP40 and VP24. The VP40 SDP P85T interferes with VP40 function by altering octamer formation. The VP40 SDP Q245P affects the structure and hydrophobic core of the protein and consequently protein function. Three VP24 SDPs (T131S, M136L, Q139R) are likely to impair VP24 binding to human karyopherin alpha5 (KPNA5) and therefore inhibition of interferon signaling. Since VP24 is critical for Ebolavirus adaptation to novel hosts, and only a few SDPs distinguish Reston virus VP24 from VP24 of other Ebolaviruses, human pathogenic Reston viruses may emerge. This is of concern since Reston viruses circulate in domestic pigs and can infect humans, possibly via airborne transmission.

1. Vectorborne diseases

- Zika
- Yellow Fever, Chikungunya

2. Ebola

- Update

3. MERS-CoV

- Update

4. Influenza

5. Other

- Avian Influenza
- Mumps
- *Elizabethkingia*



News Scan for Apr 06, 2016

Saudi officials report new MERS case, note common misconceptions

The Saudi Arabia Ministry of Health (MOH) today confirmed a new MERS-CoV case in Najran, and yesterday it noted that Saudis have high rates of misconceptions about the disease, according to an MOH survey.

The new case involves a 53-year-old Saudi man in Najran. He is hospitalized in critical condition, and his possible exposure to MERS-CoV (Middle East respiratory syndrome coronavirus) is under investigation, the MOH said today. He is not a healthcare worker.

His case brings the Saudi total since the outbreak began in 2012 to 1,368, including 584 deaths.

The MOH survey included 1,373 respondents who were interviewed in February and March. About 82% of them were from urban areas, 69% were women, and 45% were 20 to 29 years old. They expressed the following rates of belief in these *untruths* about MERS: infected camels are culled by authorities (82.7%), risk is higher in kids (79.8%), infected camel meat is not a MERS-CoV source (64.8%), and there is no such thing as asymptomatic cases (53.5%).

Participants listed the Internet as their top source of MERS-CoV information, followed by TV/radio and newspapers.

Apr 6 MOH update

Apr 5 MOH survey results



News Scan for Apr 07, 2016

Saudi Arabia reports fatal MERS case

Saudi Arabia's Ministry of Health (MOH) today confirmed a new MERS-CoV infection that led to the death of a man in Abha.

The fatal MERS-CoV (Middle East respiratory syndrome coronavirus) case involved a 70-year-old Saudi man in the southwestern city of Abha. He had no exposure to camels, and his infection is listed as "primary," meaning he did not contract the disease from another person. He was not a healthcare worker and had an underlying medical condition, the MOH said.

His infection and death bring the Saudi MERS total since the outbreak began in 2012 to 1,369 cases, including 585 deaths. Ten cases remain active, the MOH said.

Apr 7 MOH report



News Scan for Apr 11, 2016

Saudi Arabia reports 2 new MERS cases and 2 deaths

Saudi Arabia's Ministry of Health (MOH) reported two new MERS-CoV cases, one recovery, and the deaths of two previously reported patients over the past several days.

The first MERS-CoV (Middle East respiratory syndrome coronavirus) case involves a 59-year-old Saudi man from the eastern city of Dammam who is hospitalized in stable condition. He is not a healthcare worker, and the source of his exposure is listed as "contact with camels," the MOH said in an Apr 9 update.

The second patient is a 21-year-old Saudi man in Hofuf who is in stable condition, the MOH said today. He is not a healthcare worker and had recent contact with camels.

The MOH yesterday reported the deaths of two patients, one of whom was a 78-year-old Saudi woman from Buraydah, the site of an ongoing hospital MERS cluster. She was not a healthcare worker and had an underlying medical condition. The other fatality was in a 65-year-old man from Ar Rass, which is near Buraydah in Al-Qassim province. The man was not a healthcare worker and had preexisting disease.

A previously reported patient in Buraydah has also recovered from his infection, the MOH said yesterday. The recovery occurred in a 57-year-old Saudi man who is not a healthcare worker and had an underlying medical condition.



Bahrain, Saudi MERS detections tied to camel contact

Filed Under: **MERS-CoV**

Lisa Schnirring | News Editor | CIDRAP News | Apr 12, 2016



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In a sign of ongoing MERS-CoV transmission from camels to people in Saudi Arabia, two new illnesses were reported in people who had contact with the animals, one of them a man hospitalized in Bahrain, as Saudi officials reported three more outbreaks in camels.

Also, Saudi Arabia released information on factors that seem to be fueling MERS-CoV (Middle East respiratory syndrome coronavirus) outbreaks in hospitals, such as a lack of recognition among healthcare providers.



Simon Chapman / Flickr cc

Camel sources for 2 new illnesses

The MERS-CoV illnesses detected in Bahrain, which appears to be the first detected in the country, involves a 61-year-old Saudi man who was referred for a coronary artery bypass procedure.

Accepted Manuscript

Title: MIDDLE EAST RESPIRATORY SYNDROME
VACCINES.

Author: Stanley Perlman Rahul Vijay

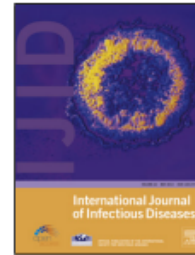
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Coronavirus Scan for Mar 15, 2016

SARS-like virus in bats; More Saudi MERS cases

Filed Under: [MERS-CoV](#); [SARS](#)



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Study: SARS-like virus in Chinese bats could jump to humans

Researchers at the University of North Carolina at Chapel Hill (UNC) say their research shows that viruses much like the SARS (severe acute respiratory syndrome) coronavirus (CoV) are still lurking in horseshoe bats in China and could jump to humans.

The scientists described their research in a Mar 13 article in the *Proceedings of the National Academy of Sciences (PNAS)*.

Previous studies suggest that SARS-CoV originated in horseshoe bats, and recent metagenomics studies of horseshoe bat viruses identified several SARS-like DNA sequences that are at least 90% identical to the SARS virus, the report says. Further, scientists recently isolated a virus called WIV1-CoV that uses human angiotensin-converting enzyme and could replicate at low levels in human cells.

The authors said they took DNA sequences from SARS-like viruses isolated from horseshoe bats and used them to reconstruct the viruses. They then tested the viruses' ability to infect human cells and mice. The results showed that WIV1-CoV could bind to the same receptors as SARS-CoV and readily replicated in cultured human airway cells, according to a UNC press release.

SARS-like WIV1-CoV poised for human emergence

Vineet D. Menachery^a, Boyd L. Yount Jr.^a, Amy C. Sims^a, Kari Debbink^{a,b}, Sudhakar S. Agnihothram^c, Lisa E. Gralinski^a, Rachel L. Graham^a, Trevor Scobey^a, Jessica A. Plante^a, Scott R. Royal^a, Jesica Swanstrom^a, Timothy P. Sheahan^a, Raymond J. Pickles^{c,d}, Davide Corti^{e,f,g}, Scott H. Randell^d, Antonio Lanzavecchia^{e,f}, Wayne A. Marasco^h, and Ralph S. Baric^{a,c,1}

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Edited by Peter Palese, Icahn School of Medicine at Mount Sinai, New York, NY, and approved January 6, 2016 (received for review September 4, 2015)

Outbreaks from zoonotic sources represent a threat to both human disease as well as the global economy. Despite a wealth of metagenomics studies, methods to leverage these datasets to identify future threats are underdeveloped. In this study, we describe an approach that combines existing metagenomics data with reverse genetics to engineer reagents to evaluate emergence and pathogenic potential of circulating zoonotic viruses. Focusing on the severe acute respiratory syndrome (SARS)-like viruses, the results indicate that the WIV1-coronavirus (CoV) cluster has the ability to directly infect and may undergo limited transmission in human populations. However, *in vivo* attenuation suggests additional adaptation is required for epidemic disease. Importantly, available SARS monoclonal antibodies offered success in limiting viral infection absent from available vaccine approaches. Together, the data highlight the utility of a platform to identify and prioritize prepandemic strains harbored in animal reservoirs and document the threat posed by WIV1-CoV for emergence in human populations.

strategies against SARS were effective against WIV1-CoV spike unlike available vaccine approaches. Together, the results highlight the utility of developing platforms to evaluate circulating zoonotic viruses as threats for future emergence and epidemic potential.

Results

The discovery of SARS-like virus clusters that bridge the gap between the epidemic strains and related precursor CoV strain HKU3 virus provided the best evidence for emergence of SARS-CoV from Chinese horseshoe bats (5). Comparing the receptor binding domain (RBD), SARS-CoV Urbani and WIV1 share homology at 11 of the 14 contact residues with human ACE2 (Fig. 1A); importantly, the three amino acid changes represent relatively conservative substitution not predicted to ablate binding (Fig. 1B). Therefore, exploring WIV1 strains allows examination of emergence, pathogenesis potential, and adaptation requirements. Using the SARS-CoV infectious clone as a

1. Vectorborne diseases

- Zika
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- *Elizabethkingia*

The Americas

Brazil: Swine flu has killed twice as many people as in 2015

By Associated Press April 5

SAO PAULO — The H1N1 swine flu virus has killed almost twice as many people in Latin America's biggest country over the past three months as it did in all of 2015, Brazil's Health Ministry said Tuesday.

The ministry said the illness caused 71 deaths in January, February and March, compared to 36 in 2015.

Of the 71 deaths, 55 were in the state of Sao Paulo, which accounted for 372 of the 444 cases registered in the first three months of the year.

The swine flu outbreak comes as Brazil prepares to host the Olympics in August and struggles with the worst recession in decades and a sprawling corruption investigation at state-owned oil company Petrobras. Nationwide outbreaks of Zika, dengue and chikungunya have also hit Brazil.

Vaccine effectiveness in preventing laboratory-confirmed influenza in primary care patients in a season of co-circulation of influenza A(H1N1)pdm09, B and drifted A(H3N2), I-MOVE Multicentre Case-Control Study, Europe 2014/15

M Valenciano ^{1,2}, E Kissling ^{1,2}, A Reuss ³, C Rizzo ⁴, A Gherasim ⁵, JK Horváth ⁶, L Domegan ⁷, D Pitigoi ⁸, A Machado ⁹, IA Paradowska-Stankiewicz ¹⁰, A Bella ¹¹, A Larrauri ¹², A Ferenczi ¹³, Joan O'Donnell ¹⁴, M Lazar ¹⁵, P Pechirra ¹⁶, MR Korczyńska ¹⁶, F Pozo ¹⁶, A Moren ¹⁷, on behalf of the I-MOVE multicentre case-control team ¹⁷

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Influenza A(H3N2), A(H1N1)pdm09 and B viruses co-circulated in Europe in 2014/15. We undertook a multi-centre case-control study in eight European countries to measure 2014/15 influenza vaccine effectiveness (VE) against medically-attended influenza-like illness (ILI) laboratory-confirmed as influenza. General practitioners swabbed all or a systematic sample of ILI patients. We compared the odds of vaccination of ILI influenza positive patients to negative patients. We calculated adjusted VE by influenza type/subtype, and age group. Among 6,579 ILI patients included, 1,828 were A(H3N2), 539 A(H1N1)pdm09 and 1,038 B. VE against A(H3N2) was 14.4% (95% confidence interval (CI): -6.3 to 31.0) overall, 20.7% (95%CI: -22.3 to 48.5), 10.9% (95%CI -30.8 to 39.3) and 15.8% (95% CI: -20.2 to 41.0) among those aged 0-14, 15-59 and ≥60 years, respectively. VE against A(H1N1)pdm09 was 54.2% (95%CI: 31.2 to 69.6) overall, 73.1% (95%CI: 39.6 to 88.1), 59.7% (95%CI: 10.9 to 81.8), and 22.4% (95%CI: -44.4 to 58.4) among those aged 0-14,

15-59 and ≥60 years respectively. VE against B was 48.0% (95%CI: 28.9 to 61.9) overall, 62.1% (95%CI: 14.9 to 83.1), 41.4% (95%CI: 6.2 to 63.4) and 50.4% (95%CI: 14.6 to 71.2) among those aged 0-14, 15-59 and ≥60 years respectively. VE against A(H1N1)pdm09 and B was moderate. The low VE against A(H3N2) is consistent with the reported mismatch between circulating and vaccine strains.

Introduction

In February 2014 each year, the World Health Organization (WHO) provides recommendations for the composition of the northern hemisphere vaccines, based on information from the WHO Global Influenza Surveillance and Response System. In 2014, the WHO vaccine strain selection committee recommended that the 2014/15 northern hemisphere influenza vaccine should include the same components as in 2013/14: an A/California/7/2009 (H1N1)pdm09-like



Study: Prior-year vaccination cut flu vaccine effects in 2014-15

Filed Under: [Influenza Vaccines](#)

Robert Roos | News Writer | CIDRAP News | Apr 05, 2016

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In the 2014-15 influenza season, when seasonal flu vaccines performed unusually poorly overall, people who had not been vaccinated the previous year were the ones most likely to benefit from the vaccine, whereas those who were vaccinated 2 years in a row did not, a new study from Canada's influenza surveillance network suggests.

In an even more unusual finding, people who were vaccinated 3 years in a row—in the 2012-13, 2013-14, and 2014-15 seasons—appeared to have a *higher* risk of being infected with the dominant flu strain in the latter season, according to the report, published last week in *Clinical Infectious Diseases*.

That surprising result echoed controversial findings reported by the Canadian flu surveillance network in the wake of the 2009 H1N1 flu pandemic. In studies published in 2010, researchers said they found that Canadians who had received a seasonal flu shot in the fall of 2008 were 1.4 to 2.5 times more likely to get an H1N1 infection requiring medical attention, compared with those who didn't get the seasonal shot.



Queen's University / Flickr cc



Review shows persistently low flu vaccine protection against H3N2

Filed Under: [Influenza Vaccines](#)

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A meta-analysis published yesterday of 56 studies showed flu vaccine effectiveness (VE) for the H3N2 strain over multiple seasons to be only 33%, compared with 54% for B strains and 61% for 2009 H1N1.

It also found, surprisingly, that VE for 2009 H1N1 and influenza B did not differ much for older people, despite their typically weaker immune systems.

The study, in *The Lancet Infectious Diseases*, covered more than 11 flu seasons, from Jan 1, 2004, to Mar 31, 2015. The H3N2 strain has been associated with more severe influenza seasons independent of vaccine effect, according to senior author Edward Belongia, MD, of the Marshfield Clinic Research Foundation (MCRF) in Wisconsin. Among the explanations he and his coauthors offered for the lower strain-specific protection were manufacturing-related factors.



sudoks / iStock

Variable influenza vaccine effectiveness by subtype: a systematic review and meta-analysis of test-negative design studies



Edward A Belongia, Melissa D Simpson, Jennifer P King, Maria E Sundaram, Nicholas S Kelley, Michael T Osterholm, Huong Q McLean

Summary

Background Influenza vaccine effectiveness (VE) can vary by type and subtype. Over the past decade, the test-negative design has emerged as a valid method for estimation of VE. In this design, VE is calculated as $100\% \times (1 - \text{odds ratio})$ for vaccine receipt in influenza cases versus test-negative controls. We did a systematic review and meta-analysis to estimate VE by type and subtype.

Methods In this systematic review and meta-analysis, we searched PubMed and Embase from Jan 1, 2004, to March 31, 2015. Test-negative design studies of influenza VE were eligible if they enrolled outpatients on the basis of predefined illness criteria, reported subtype-level VE by season, used PCR to confirm influenza, and adjusted for age. We excluded studies restricted to hospitalised patients or special populations, duplicate reports, interim reports superseded by a final report, studies of live-attenuated vaccine, and studies of pre-pandemic seasonal vaccine against H1N1pdm09. Two reviewers independently assessed titles and abstracts to identify articles for full review. Discrepancies in inclusion and exclusion criteria and VE estimates were adjudicated by consensus. Outcomes were VE against H3N2, H1N1pdm09, H1N1 (pre-2009), and type B. We calculated pooled VE using a random-effects model.

Findings We identified 3368 unduplicated publications, selected 142 for full review, and included 56 in the meta-analysis. Pooled VE was 33% (95% CI 26–39; $P=44.4$) for H3N2, 54% (46–61; $P=61.3$) for type B, 61% (57–65; $P=0.0$) for H1N1pdm09, and 67% (29–85; $P=57.6$) for H1N1; VE was 73% (61–81; $P=31.4$) for monovalent vaccine against H1N1pdm09. VE against H3N2 for antigenically matched viruses was 33% (22–43; $P=56.1$) and for variant viruses was 23% (2–40; $P=55.6$). Among older adults (aged >60 years), pooled VE was 24% (–6 to 45; $P=17.6$) for H3N2, 63% (33–79; $P=0.0$) for type B, and 62% (36–78; $P=0.0$) for H1N1pdm09.

Interpretation Influenza vaccines provided substantial protection against H1N1pdm09, H1N1 (pre-2009), and type B, and reduced protection against H3N2. Vaccine improvements are needed to generate greater protection against H3N2 than with current vaccines.

Funding None.

Introduction

Influenza vaccines are licensed on the basis of findings from immunogenicity studies or randomised clinical trials (RCTs) showing efficacy and safety. In a previous meta-analysis¹ of RCTs in healthy adults, we found that pooled vaccine efficacy was 59% against all strains. Although the RCT is the optimal design to minimise bias and confounding, it has important limitations. RCTs are often limited to one or two seasons, enrol healthy individuals, have low power to measure efficacy by subtype, and are not feasible to do annually. Placebo-controlled trials are not ethical in populations for whom vaccination is routinely recommended, and results from a single season might not predict efficacy in subsequent seasons.

Over the past decade, the test-negative design (TND) has emerged as a valid approach for estimation of influenza vaccine effectiveness (VE). In this design, VE is calculated as $100\% \times (1 - \text{odds ratio [OR]})$ for vaccine

receipt in influenza cases versus test-negative controls. The first TND study² was published in 2005 by Canadian investigators who reported VE in British Columbia during the 2004–05 season. Since then, multiple TND studies have been done to estimate VE in both the northern and southern hemisphere. The TND is similar to a case-control study, but cases and controls are not identified at the time of enrolment. Instead, patients seeking medical care for an acute respiratory illness are enrolled and respiratory tract samples tested for influenza with RT-PCR. Findings from TND simulation studies^{3,4} suggest that this method yields a valid estimate of VE in the source population under most scenarios.

Investigators of an increasing number of TND studies are reporting VE estimates separately by type and subtype. We did a systematic review and meta-analysis of published TND studies to estimate seasonal VE against illness caused by H3N2, H1N1pdm09, H1N1 (pre-2009), and type B.

Lancet Infect Dis 2016

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- *Elizabethkingia*



The Looming Threat of Avian Flu

Last year's outbreak showed just how difficult it is to protect America's agricultural system from devastating diseases. Next time it could be even worse.

By MARYN MCKENNA
APRIL 13, 2016

Distribution of confirmed cases of A(H7N9) by four periods of reporting (weeks 07/2013 to 14/2016)





Avian Flu Scan for Apr 11, 2016

China confirms 6 new H7N9 cases

Chinese health officials today released the country's monthly infectious disease report, which lists 17 H7N9 cases and 7 deaths that occurred during February.

Six of the 17 cases and six deaths listed in China's National Health and Family Planning Commission update had not been previously reported, according to FluTrackers, an infectious disease news message board. No demographic information about the new cases was provided.

The update lifts the overall global total from the disease to 776, according to a case list maintained by FluTrackers.

Apr 10 FluTrackers post
FluTrackers H7N9 case list



Avian Flu Scan for Apr 11, 2016

Vietnam reports H5N1 avian flu outbreak

Vietnamese officials yesterday reported a new outbreak of highly pathogenic H5N1 avian flu to the World Organization for Animal Health (OIE).

The outbreak began on Apr 1 in a village in Nghe An province's rural district of Quynh Luu in the northern part of the country. Of 200 birds in the village flock, 100 were sickened by the virus and 50 died. The remaining 150 birds were culled to prevent the spread of infection.

The report lists the source of the outbreak as "unknown or inconclusive." Health officials have implemented control measures, such as surveillance, vaccination, and disinfection of affected properties.

Apr 10 OIE report



Early reports show mumps on the rise in 2016, including on campuses

Filed Under: **Mumps**

Lianna Matt | Intern | CIDRAP News | Apr 08, 2016

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Recent headlines about US college mumps outbreaks appear to herald the start to a busy year for the disease and underscore the ongoing challenges that campuses face.

While mumps hit a low point of 229 cases in 2011, in the past 2 years, the Centers of Disease Control and Prevention (CDC) has recorded more than 1,000 cases annually. In updating its numbers yesterday, the CDC said that, as of Apr 1, public health departments have reported 467 mumps cases already this year.

Although mumps cases have seen a sharp decline since the CDC began recommending a two-dose vaccine prevention plan in 1988, outbreaks are still prevalent, particularly in high-contact social settings like college campuses. Mumps is transmittable through the air or by touching unwashed, contaminated surfaces, and the rising cases bring into question vaccination practices, waning immunity, and college healthcare.



UBC Library Communications / Flickr cc

The Boston Globe

Three cases of mumps confirmed at BU

By **Felice J. Freyer** | GLOBE STAFF MARCH 16, 2016

Three Boston University students have confirmed cases of mumps, as the viral illness continues to spread among college students in the Boston area.

BU officials reported Wednesday that three undergraduates who attend the university's Charles River campus had come down with mumps, one of them just before last week's spring break and the others last week. Two live off campus, but university spokesman Colin Riley did not have information on where the third lives.

The sick students were asked to isolate themselves for five days after symptoms started, and students and faculty members who may have come in contact with them were urged in an e-mail to watch for symptoms. Riley said the three students are doing well.

Meanwhile, a second case of mumps has been confirmed at the University of Massachusetts Boston, and lab results are pending on two other students, said spokesman DeWayne Lehman.



Number of Harvard Mumps Cases Rises to 22

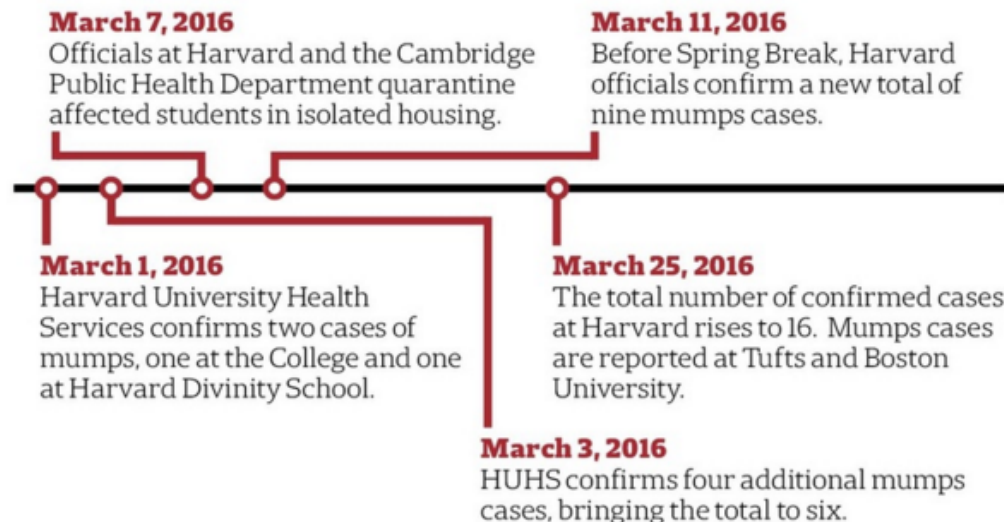
By MENAKA V. NARAYANAN, CRIMSON STAFF WRITER 13 hours ago

Six weeks after Harvard University Health Services Director Paul J. Barreira first alerted Harvard affiliates of two cases of mumps, the total number of confirmed cases at Harvard has risen to 22, according to the Cambridge Public Health Department.

The new number is an increase of six from the **most recent figure** announced in late March, according to HUHS Spokesperson Lindsey Baker. The virus has affected students across campus, including members of multiple athletic teams who are currently in self-isolation for “presumed cases of mumps,” Barreira said in March.

The virus has also **spread** to nearby schools, including Boston University and Tufts University.

Ninety-nine percent of undergraduates have been vaccinated against the virus, according to Barreira. However, the vaccine is only effective 88 percent of the time, Anita M. Barry, the director of the Infectious Disease Bureau in the Boston Public Health Commission, said.



Elizabethkingia outbreak spreads; source still a mystery

By Debra Goldschmidt, CNN

🕒 Updated 7:32 PM ET, Tue April 12, 2016

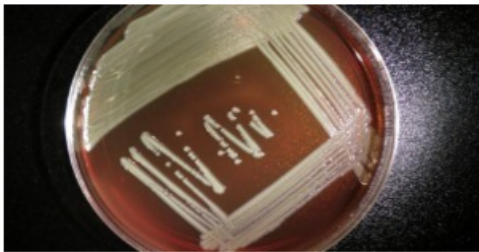
Story highlights

Illinois health officials report a fatal case of Elizabethkingia

Source of the outbreak remains unknown

November. Eighteen of those individuals have died. All of those infected had "at least one serious underlying illness" and most are older than 65, according to the Wisconsin of Health Services.

It's unknown whether the deaths were caused by the infection, the existing health conditions or the combination of both.



Related Article: Rarely seen blood infection outbreak continues; source remains mystery

(CNN) — The Illinois Department of Public Health confirmed one case of Elizabethkingia in a resident who died earlier this year.

The individual had the same strain of Elizabethkingia that has been confirmed in 57 patients in Wisconsin since

The number of cases in Wisconsin may continue to rise as the state health department continues to investigate possible cases.

Last month, the Michigan Department of Health and Human Services reported a case of the infection in their state. At the time, CDC spokesman Tom Skinner told CNN the Michigan case was not a complete surprise, given that health departments across the country were asked to be on the lookout for Elizabethkingia infections after the outbreak in Wisconsin was identified.



News Scan for Mar 25, 2016

Wisconsin *Elizabethkingia* cases rise to 59

The number of bloodstream infections caused by *Elizabethkingia anophelis* in Wisconsin rose by 5 this week, to 59, bringing the number of US cases to 60.

In a Mar 23 update, the Wisconsin Department of Health Services (WDHS) reported 52 confirmed, 4 possible, and 3 "under investigation" cases. Last week's *Elizabethkingia* total in the state was 54 cases.

Regarding possible cases, the WDHS said, "These are cases that tested positive for *Elizabethkingia*, but will never be confirmed as the same strain of *Elizabethkingia anophelis* because the outbreak specimens are no longer available to test."

The WDHS said in its update, "At this time, the source of these infections is unknown and the Department is working diligently to contain this outbreak." It said it is working with the US Centers for Disease Control and Prevention to visit sites and collect environmental samples from homes and healthcare facilities.

Last week Michigan reported a fatal case with a strain matching the Wisconsin outbreak strain.

E. anophelis, which can be present in the soil and other environmental sources, is multidrug-resistant, but the Wisconsin strain is susceptible to fluoroquinolones, rifampin, trimethoprim/sufamethoxazole, and minocycline. The organism typically affects people who are immunocompromised or have other health conditions.

Mar 23 WDHS update

Mar 17 CIDRAP News scan on Michigan case



Wisconsin 2016 *Elizabethkingia anophelis* outbreak

The Wisconsin Department of Health Services (DHS), Division of Public Health (DPH) is currently investigating an outbreak of bacterial infections caused by *Elizabethkingia anophelis*.

The majority of patients acquiring these infections are over 65 years old, and all patients have a history of at least one underlying serious illness.

The Department has alerted health care providers, infection preventionists and laboratories statewide and has been providing updates of outbreak-related information that includes laboratory testing, infection control and treatment guidance. Since the initial guidance was sent on January 15, there has been a rapid identification of cases and healthcare providers have been able to treat and improve outcomes for patients.

**Wisconsin 2016 *Elizabethkingia anophelis* Outbreak:
Elizabethkingia infections believed to be associated with this
outbreak reported to DPH*
Case counts between November 1, 2015 and April 8, 2016**

Type of Cases	Number of Cases
Confirmed	57
Under investigation	2
Possible cases**	4
Total cases reported to Wisconsin DPH	63



News Scan for Mar 17, 2016

Michigan reports fatal *Elizabethkingia* case

Michigan health officials today announced a fatal *Elizabethkingia anopheles* bloodstream infection matching an ongoing outbreak in Wisconsin, according to a statement. The patient was an older adult with underlying health conditions from western Michigan, the Michigan Department of Health and Human Services (MDHHS) said.

Eden Wells, MD, MPH, said the test results were confirmed by the Centers for Disease Control and Prevention on Mar 11 and added that the MDHHS has notified state health providers about the importance of early recognition.

Wisconsin health officials first announced the outbreak in early March, and so far they have detected 54 cases. Seventeen of the patients died, but it's not clear if the deaths were caused by the bacterial infection.

So far the source of the bacteria in the sick patients isn't known. *E. anopheles*, which can be present in the soil and other environmental sources, is multidrug-resistant, but the Wisconsin strain is susceptible to fluoroquinolones, rifampin, trimethoprim/sufamethoxazole, and minocycline. The opportunistic organism typically affects people who are immune-compromised or have other underlying health conditions.

Mar 17 MDHHS statement

Mar 16 Wisconsin update

Mar 11 CIDRAP News scan "*Wisconsin notes more bloodstream infections in Elizabethkingia outbreak*"



Illinois Resident Confirmed To Have Infection Matching Wisconsin Outbreak

12th Apr, 2016



Elizabethkingia cases found in Wisconsin, Michigan, Illinois

SPRINGFIELD – The Illinois Department of Public Health (IDPH) is reporting that tests from an Illinois resident match those from a Wisconsin outbreak of *Elizabethkingia anophelis*. The [Centers for Disease Control and Prevention \(CDC\)](#), the [Wisconsin Department of Health Services](#), and the [Michigan Department of Health and Human Services](#) have been investigating an outbreak of infections caused by a bacteria called *Elizabethkingia anophelis*, which is usually found in the environment.

“Illinois is working closely with the CDC and Wisconsin and Michigan health officials to investigate this outbreak and develop ways to prevent additional infections,” said IDPH Director Nirav D. Shah, M.D., J.D. “IDPH will continue to coordinate with hospitals and health care providers to quickly identify and report cases of *Elizabethkingia*.”

In early February, and again in March, IDPH sent alerts to hospitals requesting they report all cases of *Elizabethkingia* and save any specimens for possible testing at public health laboratories.

To date, Wisconsin is reporting 57 confirmed cases, including 18 deaths; Michigan is reporting one confirmed case, including one death; and Illinois is reporting one confirmed case, including one death.

Questions, Comments and Discussion



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