HID Dispatch

A quarterly newsletter to share tips, trends and best practices across the state.

2018 Annual Review of the Blueprint list of Priority Diseases

WHO has developed a special tool that seeks to identify which diseases pose a public health risk because of their epidemic potential and for which there are no, or insufficient, countermeasures. They release an annual blueprint based on this tool that prioritizes the diseases as needing research, development, and surveillance. In the 2018 annual review, experts listed the following diseases (not in any specific order) as the most important ones to watch:

- Middle East respiratory syndrome coronavirus (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS)
- Lassa fever
- Rift Valley fever (RVF)
- Ebola virus disease and Marburg virus disease
- Crimean-Congo hemorrhagic fever (CCHF)
- Nipah and henipaviral diseases
- Zika
- Disease X

https://www.who.int/blueprint/priority-diseases/en/

Believe it or not, the top four disease on this list, have already had outbreaks occur in 2019, some being the largest we have seen in years! Throughout this newsletter, I am going to discuss the history of the four we have seen thus far, as well as describe what their 2019 outbreak looked like.

Carle

Middle East Respiratory Syndrome

UNDERSTANDING THE VIRUS

Middle East Respiratory Syndrome (MERS) is a viral respiratory illness that is new to humans. Saudi Arabia first reported this in 2012. Since then, there have been 2428 cases and 838 deaths (Table 1). The virus that causes MERS is Middle East Respiratory Syndrome Coronavirus (MERS-CoV). Coronaviruses are common viruses that most people get at some time in their life. Human coronaviruses usually cause mild to moderate cold-like illnesses. However, MERS-CoV is different from any other coronavirus previously found in people. Symptoms can include fever, cough, and shortness of breath. Other symptoms can include diarrhea, nausea/vomiting, pneumonia, and kidney failure. MERS can be deadly. About three or four out of every 10 patients reported with MERS have died (35% fatality rate).

Table 1: http://applications.emro.who.int/docs/EMROPub_2019_MERA_apr_EN_23513.pdf?ua=1

MERS-CoV likely came from an animal source in the Arabian Peninsula. Researchers have found MERS-CoV in camels from several countries. We don't know whether camels are the only source of the virus, but studies continue to provide evidence that camel infections play a role in human infection with MERS-CoV. We need more information to understand this virus.

https://www.cdc.gov/features/novelcoronavirus/index.html

CURRENT OUTBREAK STATUS

Since the huge outbreak in 2014, cases of MERS have slowly been tapering off each year (Table 2). Already there have been 134 cases in the first four months of 2019. At this rate, we are on track to reach 536 cases in 2019. The highest we have seen since 2014!

Characteristics of MERS cases reported from Kingdom of Saudi Arabia, June 2012-April 2019

Type of case	2012	2013	2014	2015	2016	2017	2018	2019	Grand Total
Primary	3	36	164	52	74	71	54	35	489
Secondary	2	93	264	222	60	90	35	69	835
Missing		1	15	102	103	68	52	30	371
Unknown		28	219	78	11	5	1		342
Total	5	158	662	454	248	234	142	134	2037

Table 2: http://applications.emro.who.int/docs/EMROPub_2019_MERA_apr_EN_23513.pdf

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Lassa fever

UNDERSTANDING THE VIRUS

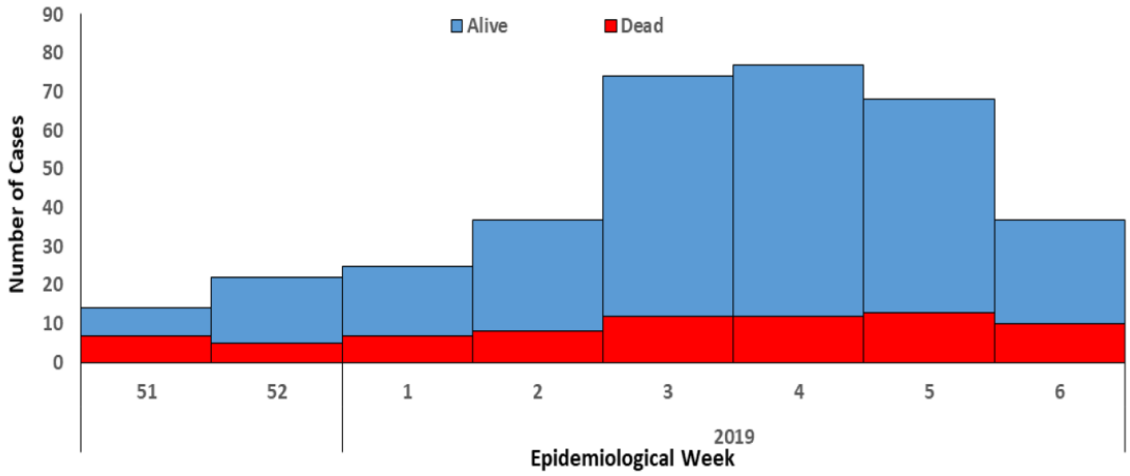
The reservoir, or host, of Lassa virus is a rodent known as the "multimammate rat" (Mastomys natalensis). Once infected, this rodent is able to excrete virus in urine for an extended time period, maybe for the rest of its life. Mastomys rodents breed frequently, produce large numbers of offspring, and are numerous in the savannas and forests of west, central, and east Africa. In addition, mastomys readily colonize human homes and areas where food is stored. All of these factors contribute to the relatively efficient spread of Lassa virus from infected rodents to humans. Signs and symptoms of Lassa fever typically occur 1-3 weeks after the patient encounters the virus. For the majority of Lassa fever virus infections (approximately 80%), symptoms are mild and are undiagnosed. In 20% of infected individuals, the disease may progress to more serious symptoms including hemorrhaging (in gums, eyes, or nose, as examples), respiratory distress, repeated vomiting, and facial swelling, pain in the chest, back, and abdomen, and shock. Patients also describe neurological problems, including hearing loss, tremors, and encephalitis. Death may occur within two weeks after symptom onset due to multi-organ failure.

https://www.cdc.gov/vhf/lassa/pdf/factsheet.pdf

CURRENT OUTBREAK STATUS

On 22 January 2019, the Nigeria Center for Disease Control declared the Lassa fever outbreak an emergency. From January 1 through February 10 2019 (40 days, there were 327 cases of Lassa fever with 72 deaths (case fatality ratio = 22%) reported (Table 3).

Table 3:



https://www.who.int/csr/don/14-february-2019-lassa-fever-nigeria/en/

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Rift Valley fever

UNDERSTANDING THE VIRUS

First identified in 1931, the virus presented in an epidemic among sheep on a farm in the Rift Valley of Kenya. Since then, sub-Saharan Africa reports outbreaks. In 1977, Egypt reported an explosive outbreak, causing the introduction of the RVF to infected livestock trade along the Nile irrigation system. In 1997–98, a major outbreak occurred in Kenya, Somalia and Tanzania following El Niño event and extensive flooding. Following infected livestock trade from the horn of Africa, RVF spread in September 2000 to Saudi Arabia and Yemen, marking the *first* reported occurrence of the disease *outside* the African continent and raising concerns that it could extend to other parts of Asia and Europe. Since then:

- *2000, Saudi Arabia and Yemen:* There were 516 cases with 87 deaths of RVF reported by the Ministry of Health of Saudi Arabia. In 2000, the Ministry of Public Health in Yemen reported 1087 suspected cases, including 121 deaths.
- *2003, Egypt:* In 2003, there were 148 cases including 27 deaths of RVF reported by the Ministry of Health of Egypt.
- *2006, Kenya, Somalia and Tanzania:* From 30 November 2006 to 12 March 2007, Kenya reported 684 cases including 234 deaths from RVF. From 19 December 2006 to 20 February 2007, Somalia reported a total of 114 cases including 51 deaths. From 13 January to 3 May 2007, Tanzania reported a total of 264 cases including 109 deaths.
- *2007, Sudan***:** The Federal Ministry of Health, Sudan, reported an outbreak of RVF on 28 October 2008. Sudan reported a total of 738 cases, including 230 deaths, between November 2007 and January 2008.
- *2008, Madagascar:* The Ministry of Health, Madagascar reported an outbreak of RVF on 17 April 2008. From January to June 2008, they reported a total of 476 suspected cases of RVF including 19 deaths from four provinces.
- *2008–2009, Madagascar:* From December 2008 to May 2009, the Ministry of Health, Madagascar reported 236 suspected cases including seven deaths.
- *2010, Republic of South Africa:* From February to July 2010, the Government of South Africa reported 237 confirmed cases of RVF in humans, including 26 deaths from nine provinces.
- *2012 Republic of Mauritania:* The Ministry of Health in Mauritania declared an outbreak of RVF on 4 October 2012. From 16 September 2012 (the date of onset of the index case) to 13 November 2012, they reported a total of 36 cases, including 18 deaths from six regions.
- *2016, Republic of Niger:* As of 11 October 2016, Ministry of Health reported 105 suspected cases including 28 deaths of RVF in humans in Tahoua region.

https://www.cdc.gov/vhf/lassa/pdf/factsheet.pdf

CURRENT OUTBREAK STATUS

- *2019, France:* From November 2018 to May 3, 2019 there have been 129 confirmed (RVF) cases in humans and 109 cases in animals.

https://www.who.int/csr/don/13-may-2019-rift-valley-fever-mayotte-france/en/

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Ebola

UNDERSTANDING THE VIRUS

The Ebola virus disease (EVD) causes an acute, serious illness, which is often fatal if untreated. EVD first appeared in 1976 in two simultaneous outbreaks, one in South Sudan, and the other in the Democratic Republic of Congo. The latter occurred in a village near the Ebola River, from which the disease takes its name. The virus family Filoviridae includes three genera: Cuevavirus, Marburgvirus, and Ebolavirus. Six species have been identified within the genus Ebolavirus: Zaire, Bundibugyo, Sudan, Taï Forest, Reston and Bombali.

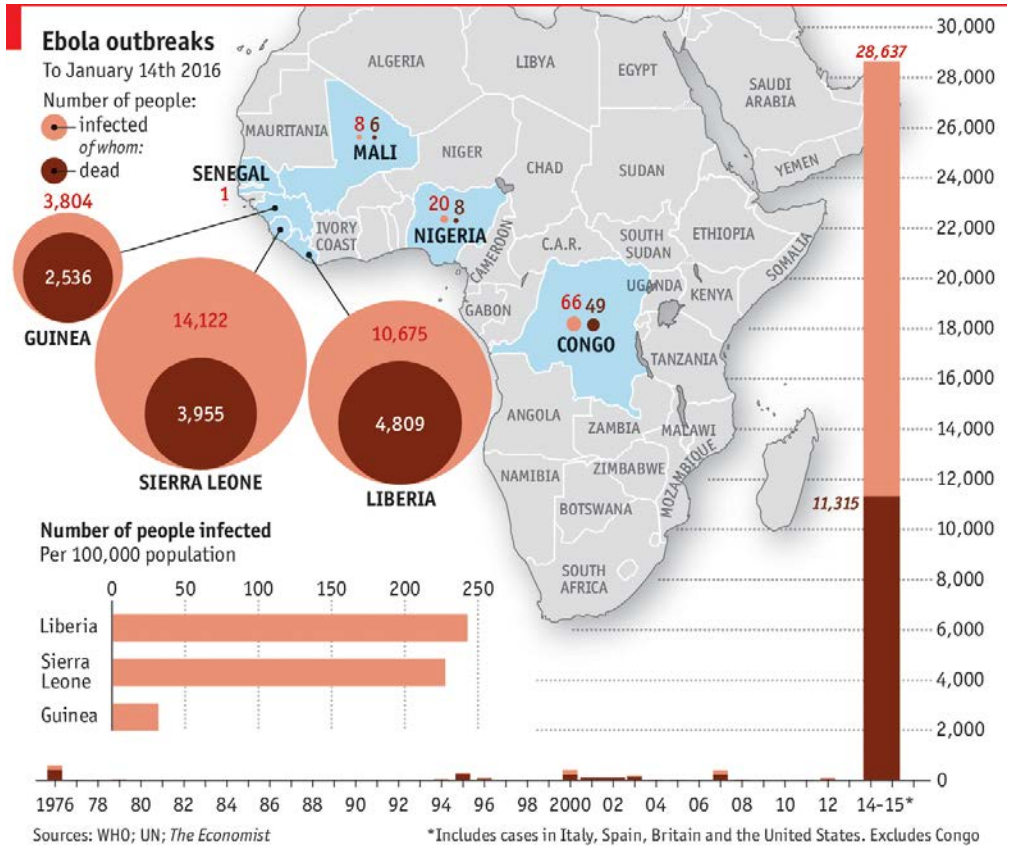

Figure 1: https://www.economist.com/graphic-detail/2016/01/14/ebola-in-africa-the-end-of-a-tragedy

The virus that caused the 2014–2016 West African outbreak (and that's causing the outbreak today in the DRC) belongs to the Zaire ebolavirus species. The 2014–2016 outbreak in West Africa was the largest Ebola outbreak since the virus was first discovered in 1976 (Figure 1). It was actually eleven times larger than all previous outbreaks combined!

https://www.who.int/news-room/fact-sheets/detail/ebola-virus-disease

CURRENT OUTBREAK STATUS

Table 4 shows the total number of cases in the current 2018-2019 outbreak in eastern DRC. The outbreak has been going on since August 2018. During these ten months (as of May 2019), there have been 1866 cases and 1241 deaths; giving this outbreak a fatality rate of 67%.

Province	Health Zone	During the last 21 days (01 – 21 May)		Cumulative to date				
		Confirmed Cases reported	Health areas: reporting at least 1 case / Total areas in zone	Confirmed cases	Probable cases	Total cases	Deaths among confirmed cases	Total deaths
North Kivu	Alimbongo	1	1/20	1	0	1	0	0
	Beni	42	11/18	303	9	312	168	177
	Biena	1	1/14	8	1	9	9	10
	Butembo	50	13/15	199	0	199	221	221
	Kalunguta	37	15/18	98	15	113	45	60
	Katwa	66	14/18	565	14	579	378	392
	Kayna	0	0/18	8	0	8	5	5
	Kyondo	2	2/22	19	2	21	13	15
	Lubero	7	5/18	11	2	13	2	4
	Mabalako	65	10/12	176	16	192	126	142
	Manguredjipa	6	1/9	11	0	11	5	5
	Masereka	4	4/16	37	3	40	14	17
	Musienene	32	6/20	55	1	56	24	25
	Mutwanga	0	0/19	5	0	5	3	3
	Oicha	1	1/25	41	0	41	20	20
	Vuhovi	3	2/12	81	12	93	29	41
Ituri	Bunia	0	0/20	1	0	1	1	1
	Komanda	0	0/15	28	9	37	10	19
	Mandima	32	5/15	127	4	131	76	80
	Nyakunde	0	0/12	1	0	1	1	1
	Rwampara	0	0/11	1	0	1	1	1
	Tchomia	0	0/12	2	0	2	2	2
Total		**349**	**91/359 (25%)**	**1778**	**88**	**1866**	**1153**	**1241**

Table 4: https://www.who.int/csr/don/30-may-2019-ebola-drc/en/

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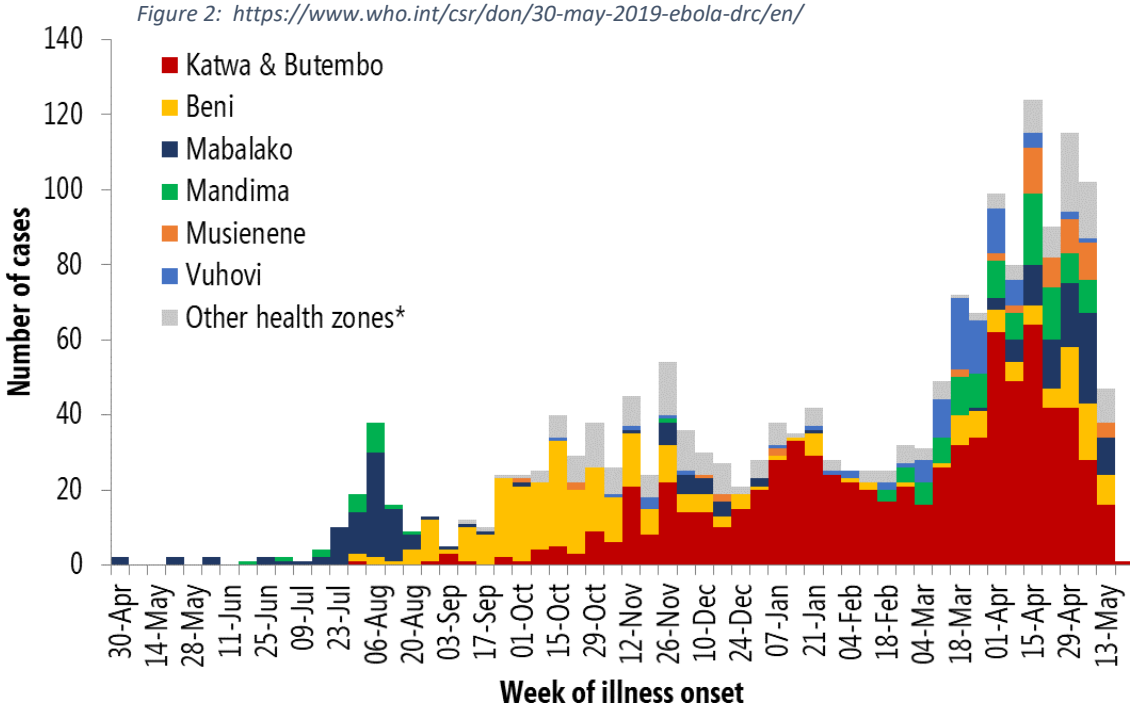
Note from the Editor:

Figure 2: https://www.who.int/csr/don/30-may-2019-ebola-drc/en/



The current 2018-2019 Ebola outbreak is highly complex, making it the *second* largest Ebola outbreak in *history!* There have been multiple militia attacks on treatment centers, which are adversely affecting the response efforts. Because of this, the Ebola cases are higher than they have been throughout the entire outbreak, (Figure 2) and instead of decreasing, the cases are actually *increasing!* A big part of this is the constant attacks (listed below) on the treatment centers, making them unsafe places to house patients and aid workers.

- 2/25 - Suspected militiamen attacked and burned down an Ebola treatment center. They evacuated ten patients in the center but one person died after falling into a ravine while fleeing the attack.
- 2/27 - Assailants set a health center on fire and engaged in a long gunfire with security forces. They reported no deaths.
- 3/9 - Unidentified militants assaulted Ebola treatment center just days after reopening the facility. At least one police officer was killed and several aid workers wounded.
- 4/19 - Suspected militiamen assaulted an Ebola treatment center, *killing a World Health Organization Epidemiologist.*
- 5/8 – Fighting between security forces and militiamen killed at least nine people, including one police office and eight militiamen.

Figure 3: Police guard a hospital in Congo https://www.npr.org/sections/goatsandsoda/2019/04/23/716121928/the-doctor-killed-in-fridays-ebola-attack-was-dedicated-but-also-afraid

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