

Ebola:

What you need to know



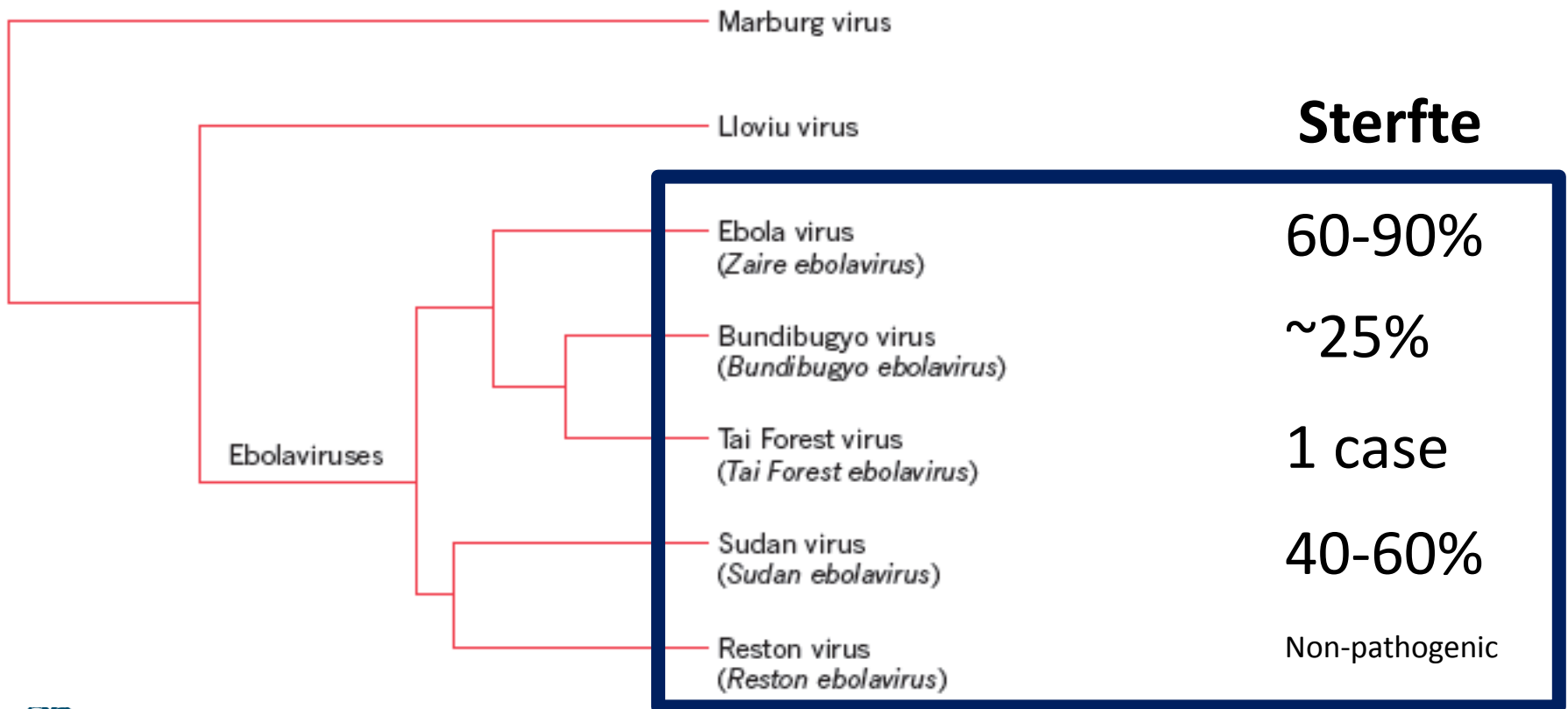
Nationale dagen voor arbeidsgeneeskunde
12-13 november 2015

Dr Ula Maniewski, internist
Instituut voor Tropische geneeskunde, Antwerpen
Reisgeneeskunde
Lid werkgroep werknemers in het buitenland VWVA



What is ebola?

- Filovirus, which is found in subsaharian Africa



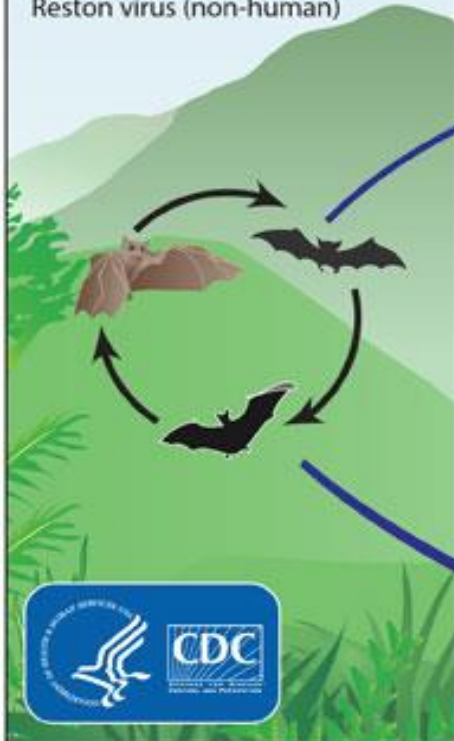
Ebolavirus Ecology

Enzootic Cycle

New evidence strongly implicates bats as the reservoir hosts for ebolaviruses, though the means of local enzootic maintenance and transmission of the virus within bat populations remain unknown.

Ebolaviruses:

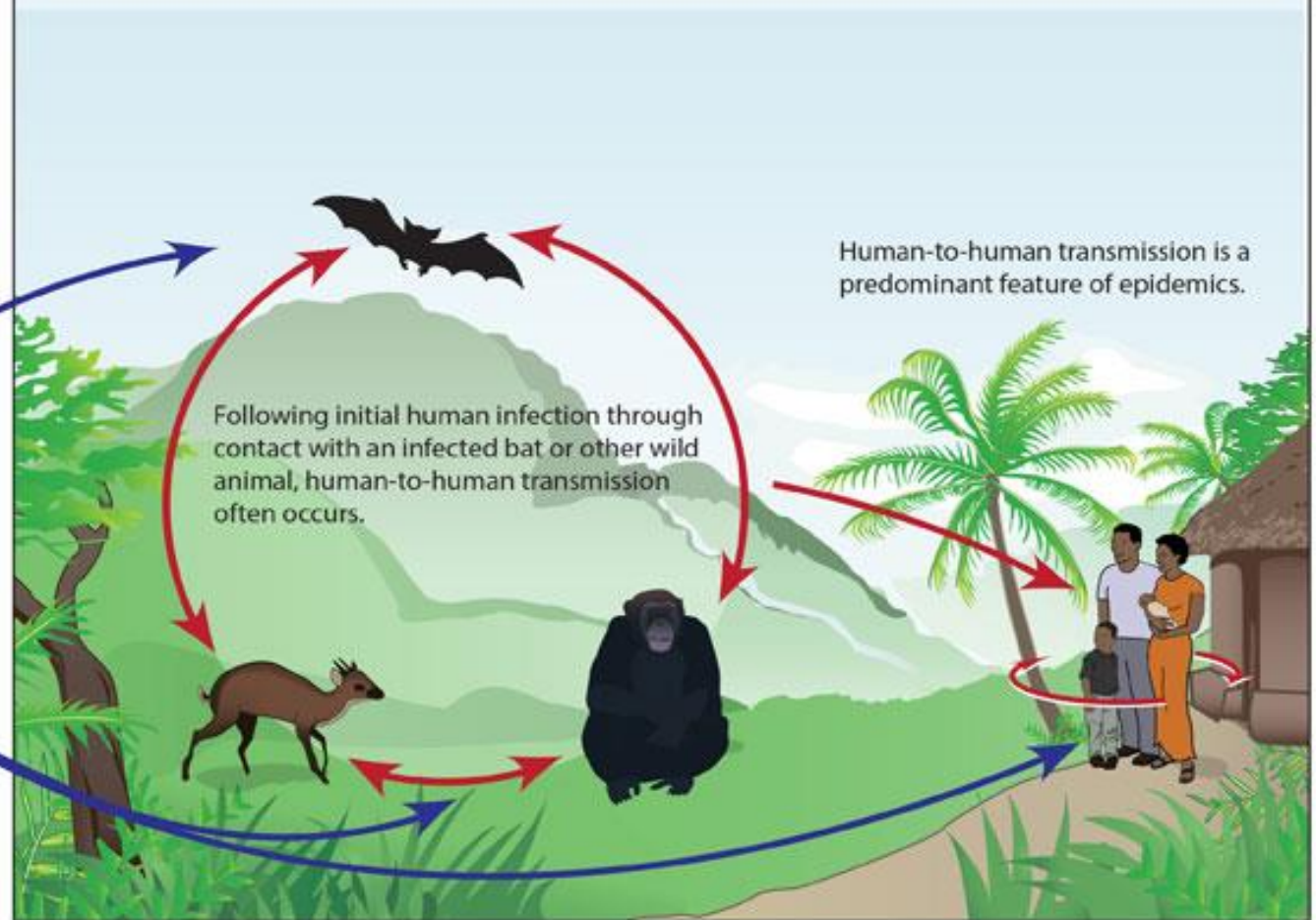
- Ebola virus (formerly Zaire virus)
- Sudan virus
- Tai Forest virus
- Bundibugyo virus
- Reston virus (non-human)



Epizootic Cycle

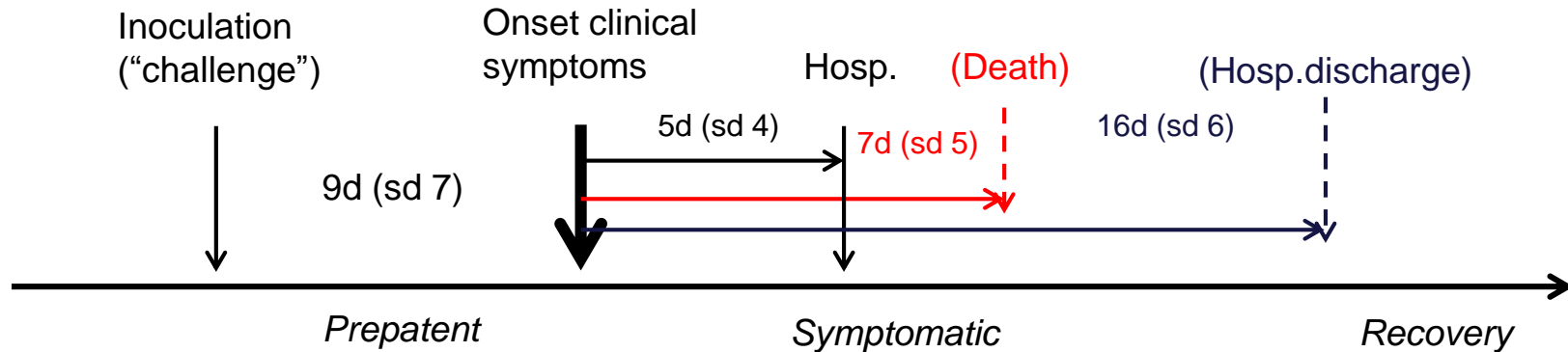
Epizootics caused by ebolaviruses appear sporadically, producing high mortality among non-human primates and duikers and may precede human outbreaks. Epidemics caused by ebolaviruses produce acute disease among

humans, with the exception of Reston virus which does not produce detectable disease in humans. Little is known about how the virus first passes to humans, triggering waves of human-to-human transmission, and an epidemic.



EVD: Event Timeline

Diagnose vereist RT-PCR op bloed

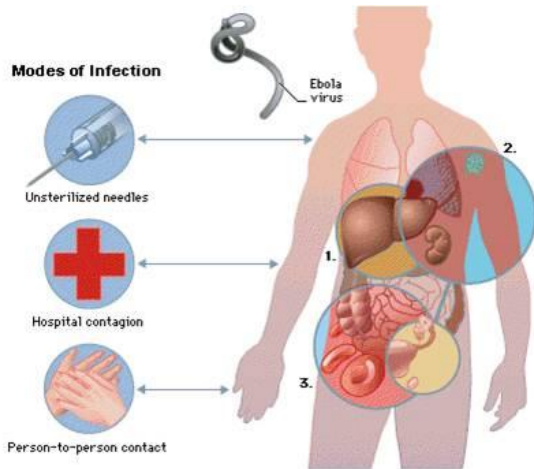


Early Symptoms		Late Symptoms	
	%		%
Fever	87	Cough	30
Headache	53	Dyspnea	23
Diarrhea	66	Dysphagia	33
Vomiting	68	Sore throat	22
Muscle ache	39	Bleeding	18
Conjunct.	21	Confusion	13
		Jaundice	10
		Rashes	6

Source: Ebola Virus Disease in West Africa —The First 9 Months of the Epidemic and Forward Projections
WHO Ebola Response Team. NEJM, Sept 23rd, 2014




EVD Multi-organ Involvement



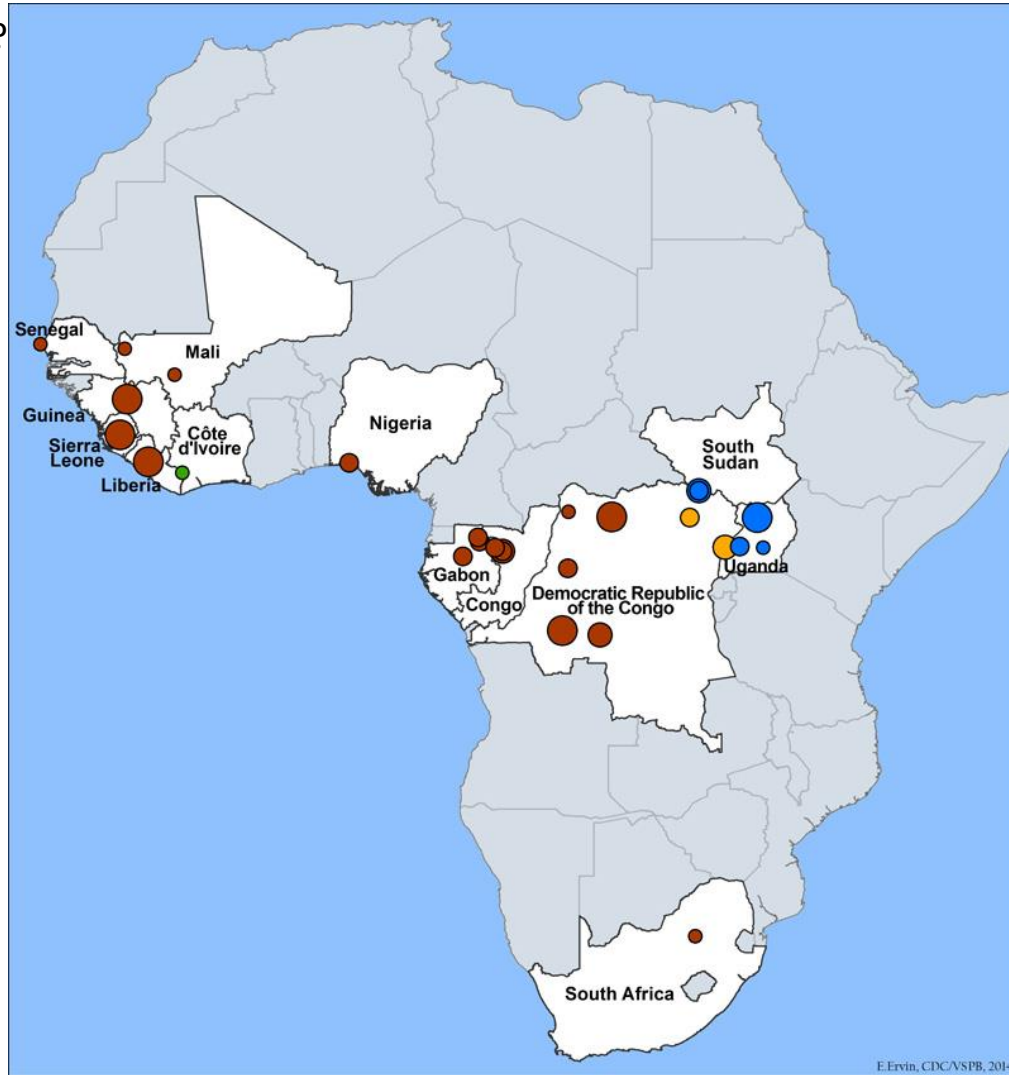
EVD evolves towards a systemic disease with multi-organ involvement and ultimately failure, from 3 days till 12 days after symptom onset.



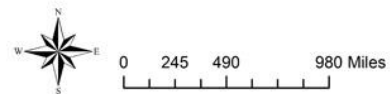
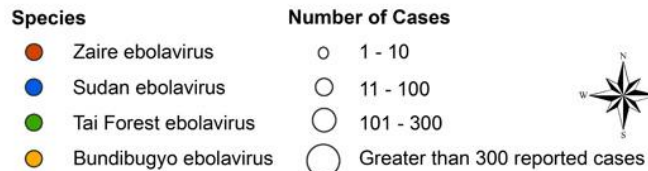
- 
- **Fever**
 - **Diarrhea and vomiting, fluid loss**
 - **Hypotension**
 - **Vascular permeability increased**
 - **Renal failure, hepatitis**
 - **Cerebral dysfunction**
 - **Bleeding**
 - **Circulatory collapse (shock)**



Where has ebola occurred?



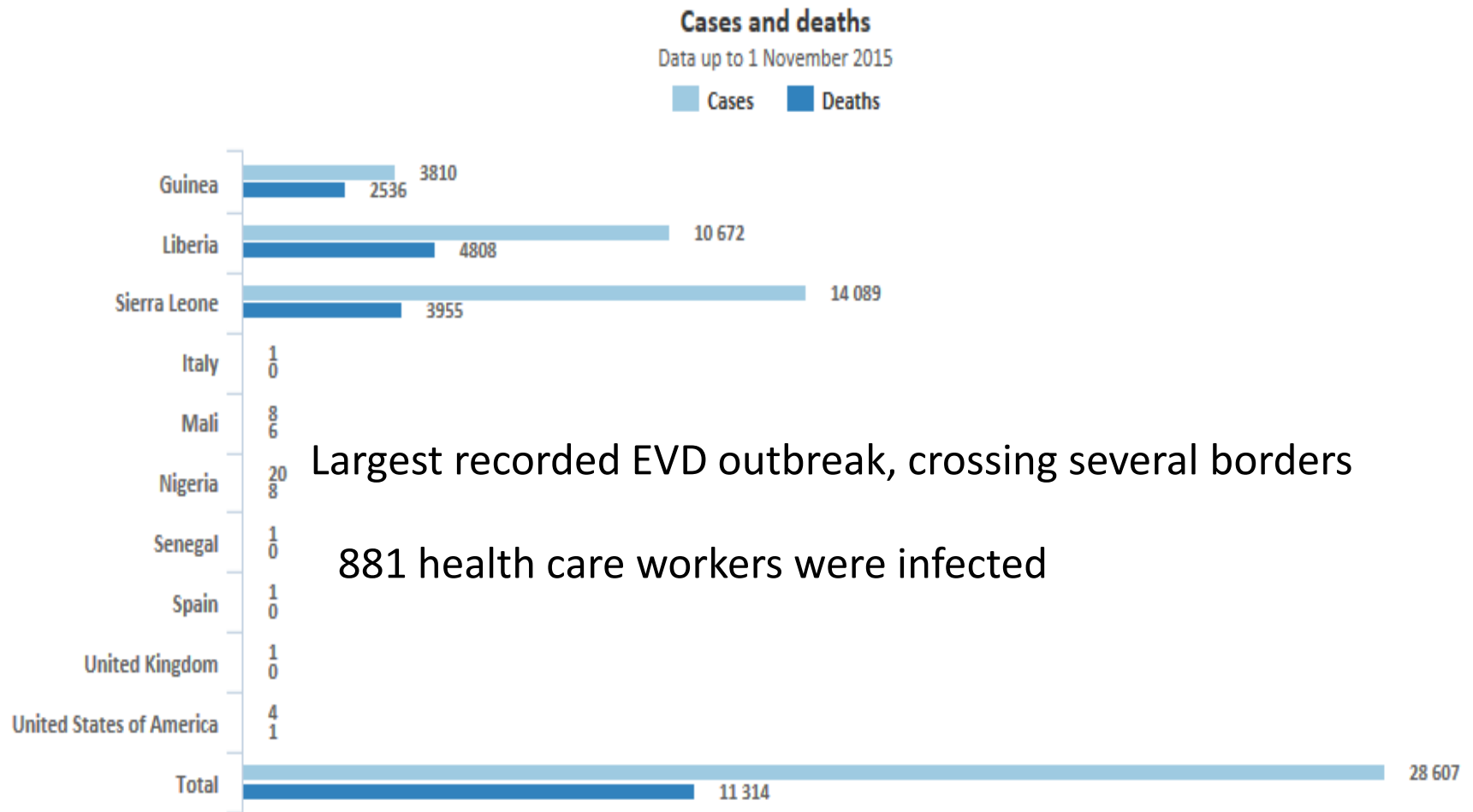
EBOLAVIRUS OUTBREAKS BY SPECIES AND SIZE, 1976 - 2014





Ebola epidemic 2014-2015

Figure 1: Confirmed, probable, and suspected EVD cases worldwide



Largest recorded EVD outbreak, crossing several borders

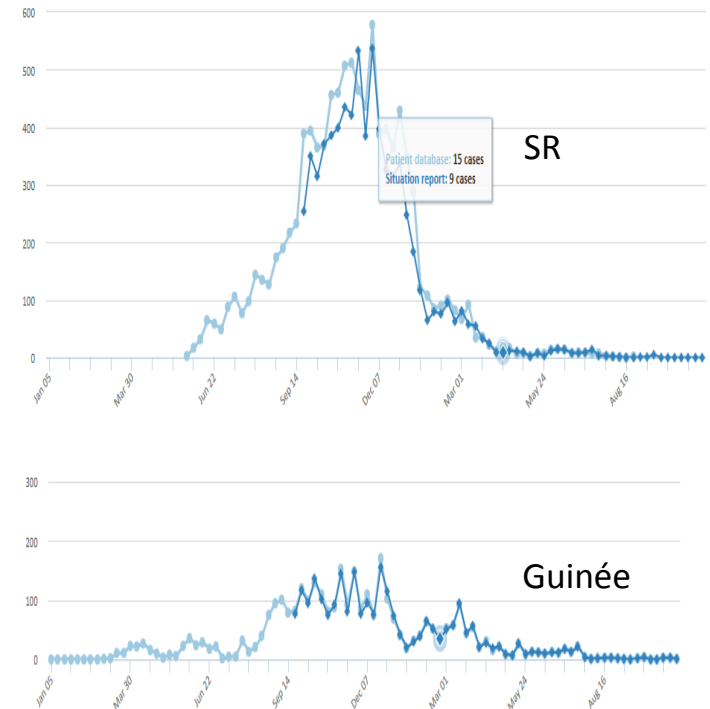
881 health care workers were infected

Ebola situation report, WHO, 9 nov 2015



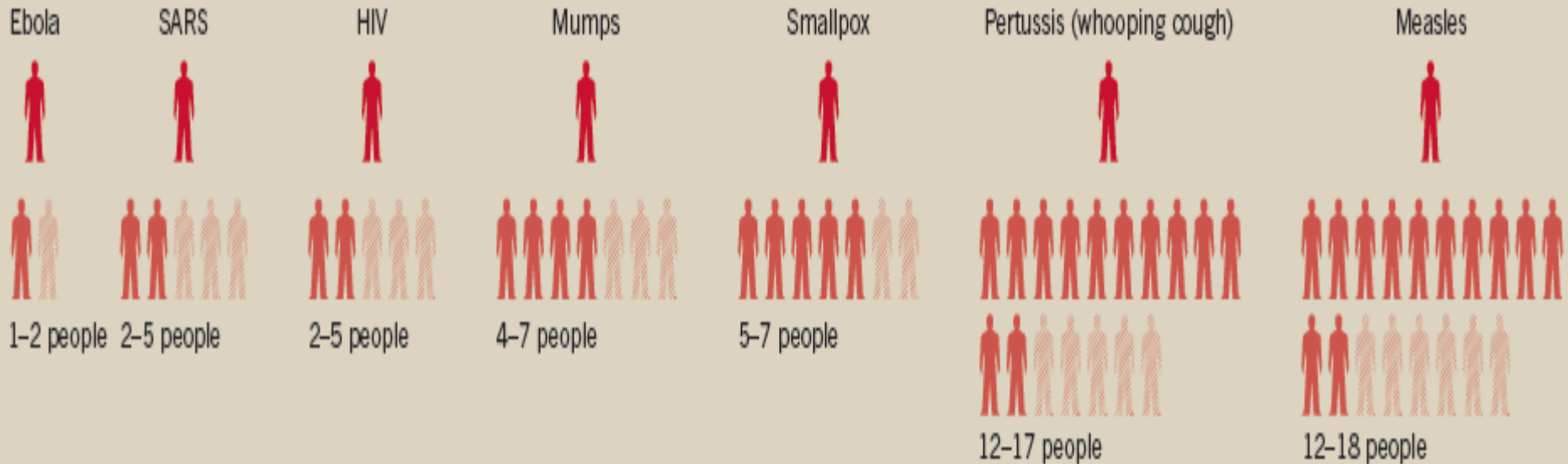
How is the situation now? (9/11/2015)

- Liberia : free of ebola since 2/9/2015
- Sierra Leone: free of ebola since 9/11/2015
- Guinée: 1 new case: newborn



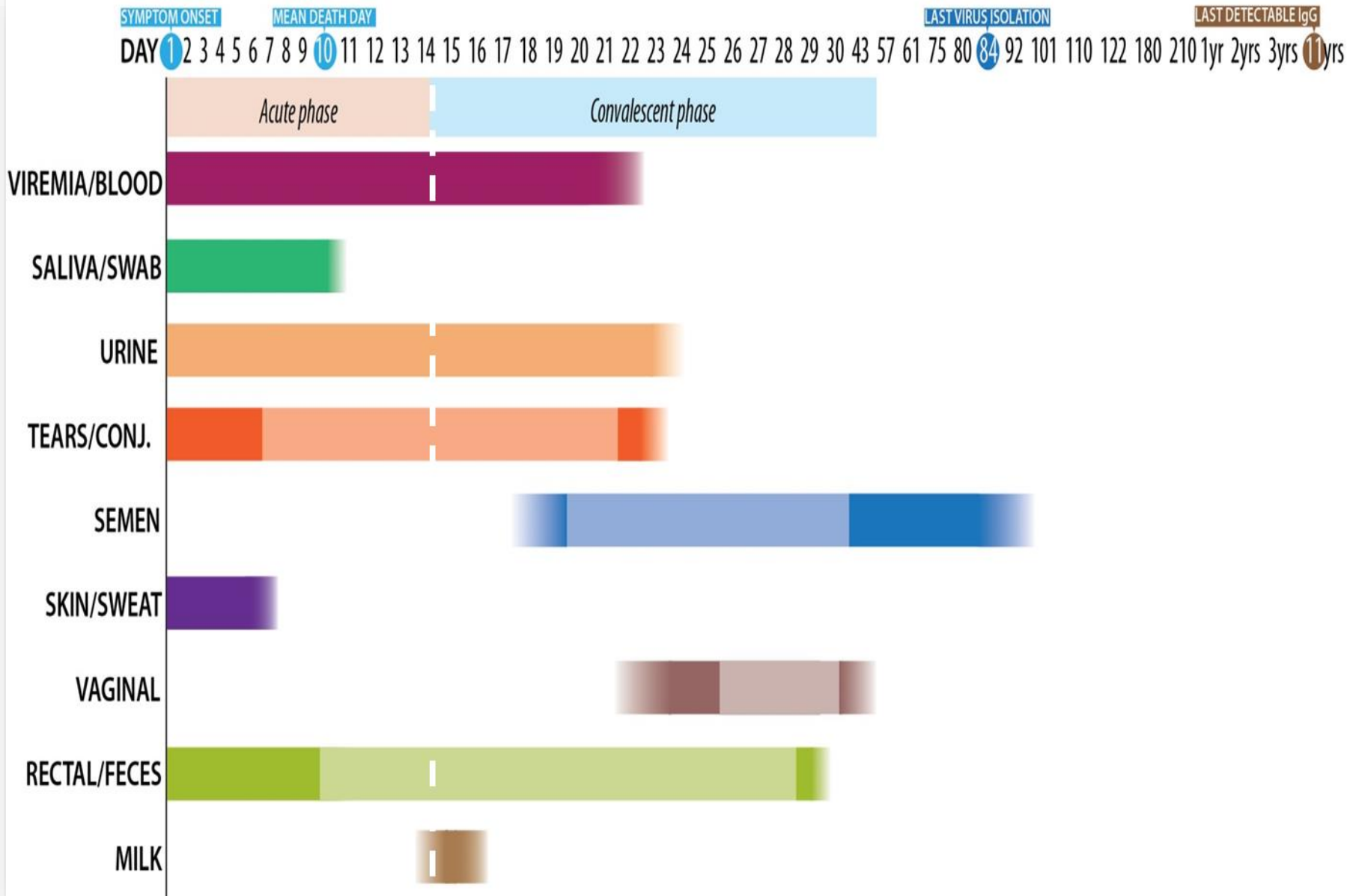
TRANSMITTING DISEASE

Ebola is spread by contact with an infected person's bodily fluids, but is less contagious than many common diseases, such as mumps and measles. In the current outbreak, each person with Ebola will infect 1-2 other people.



- Relatief besmettelijk...
- Maar makkelijk te doden!
 - Water en zeep
 - Klassieke ontsmettingsmiddelen (bv. chlooroplossing)
 - UV-licht
 - Uitdroging (van de omgeving)
 - Verhitting (60' aan 60°C, of 5' aan 100°C)
- Overleeft langer in donkere en vochtige plekken
- Afkoelen of invriezen doodt het virus niet







ORIGINAL ARTICLE

Ebola RNA Persistence in Semen of Ebola Virus Disease Survivors — Preliminary Report

“In March 2015, a woman in Liberia received a diagnosis of EVD and her only potential exposure that could be ascertained was sexual contact with a male survivor of EVD. Further investigation found Ebola virus RNA in **the survivor’s semen 199 days after** the onset of his symptoms, with a genetic sequence that matched the sequence from the case patient”

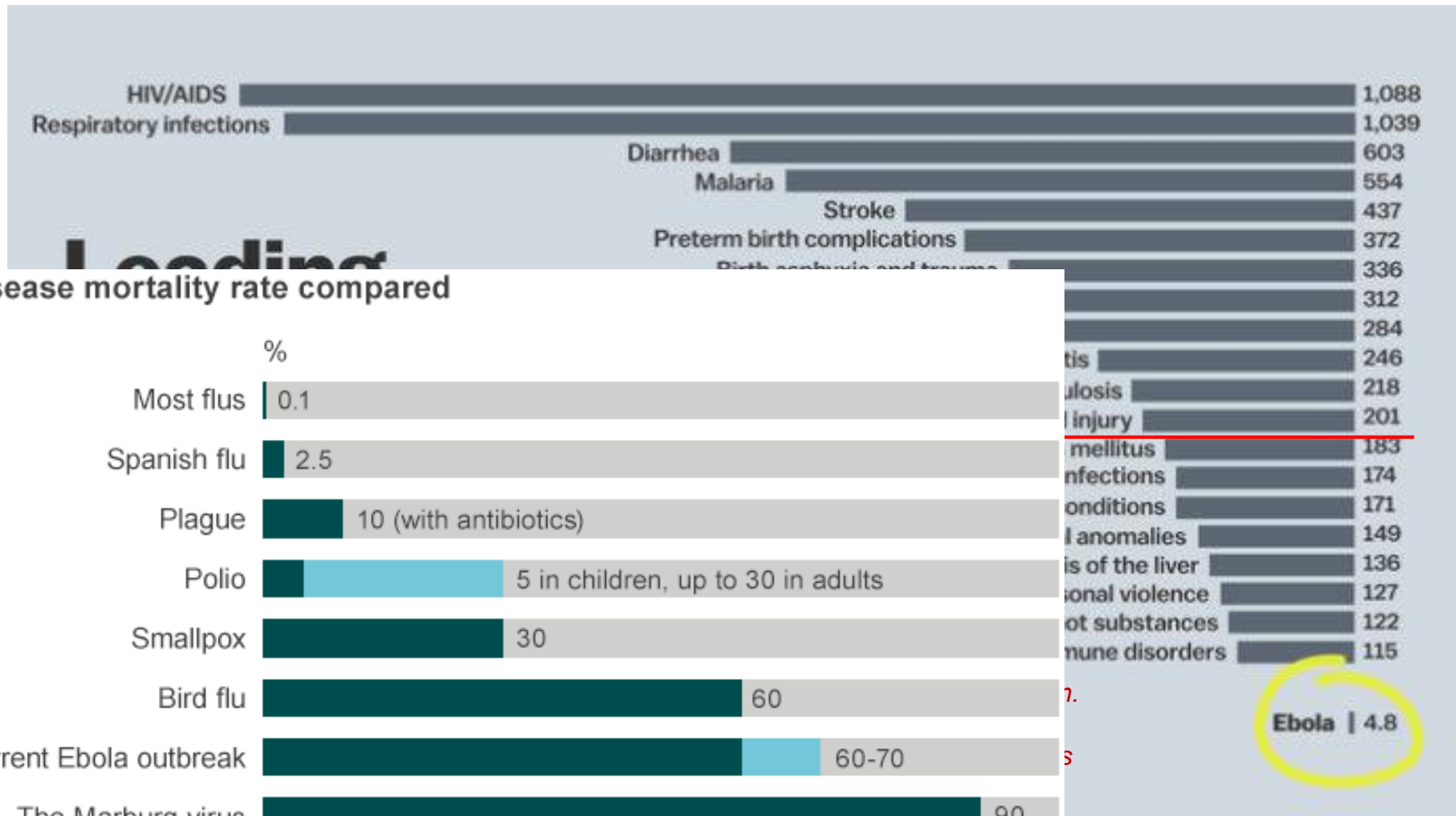
N Engl J Med. 2015 Jun 18;372(25):2423-7. doi: 10.1056/NEJMoa1500306. Epub 2015 May 7.

Persistence of Ebola Virus in Ocular Fluid during Convalescence.

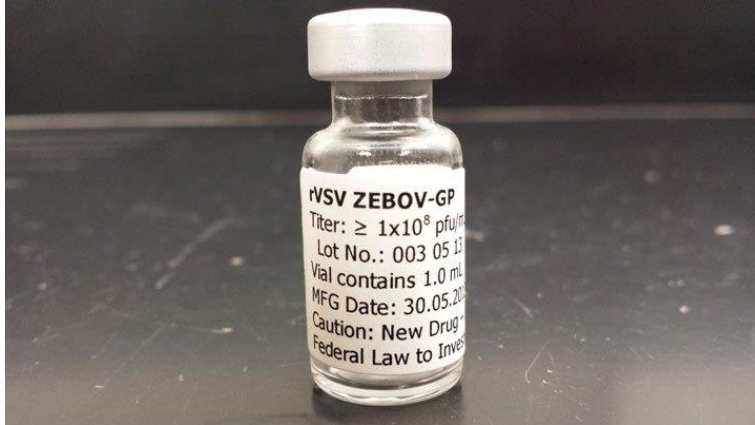
Varkey JB¹, Shantha JG, Crozier I, Kraft CS, Lyon GM, Mehta AK, Kumar G, Smith JR, Kainulainen MH, Whitmer S, Ströher U, Uyeki TM, Ribner BS, Ye



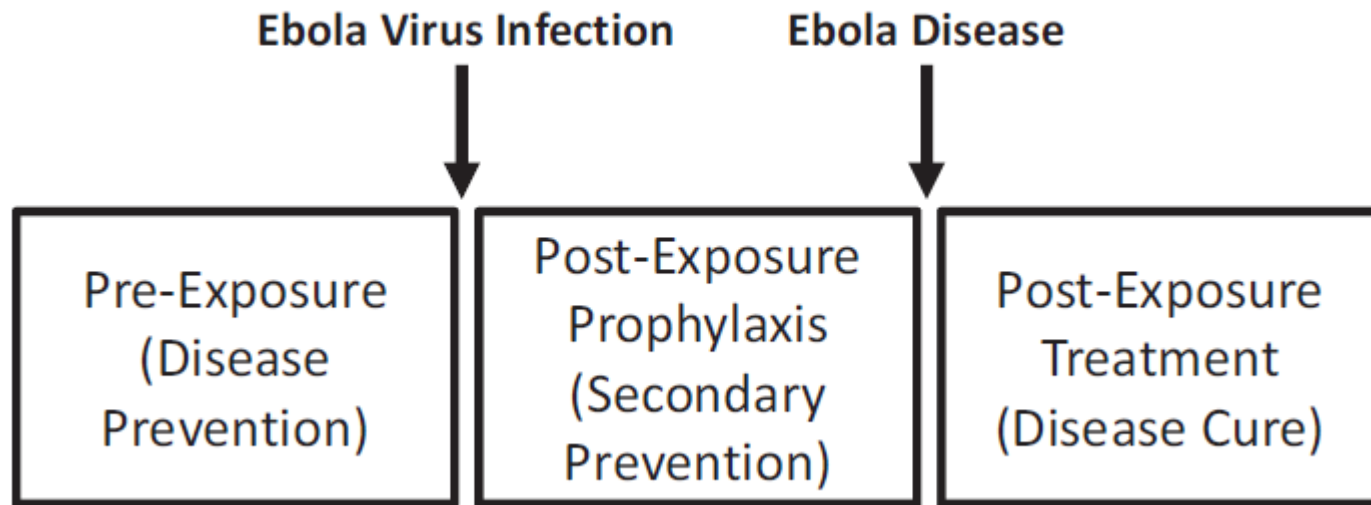
EVD vs. Leading Causes of Death, Africa



Treatment options



EVD prophylaxis and treatment



- Mechanical barriers
- *Vaccines*

- *Vaccines*
- *Immunotherapy*
- *Antivirals*
 - *Nucleoside analogues*
 - *RNA silencing molecules*
 - *Antisense oligomers*

Supportive treatment !!!





Efficacy and effectiveness of an rVSV-vectored vaccine expressing Ebola surface glycoprotein: interim results from the Guinea ring vaccination cluster-randomised trial

Ana Maria Henao-Restrepo, Ira M Longini, Matthias Egger, Natalie E Dean, W John Edmunds, Anton Camacho, Miles W Carroll, Moussa Doumbia, Bertrand Draguez, Sophie Duraffour, Godwin Enwere, Rebecca Grais, Stephan Gunther, Stefanie Hossmann, Mandy Kader Kondé, Souleymane Kone, Eeva Kuisma, Myron M Levine, Sema Mandal, Gunnstein Norheim, Ximena Riveros, Aboubacar Soumah, Sven Trelle, Andrea S Vicari, Conall H Watson, Sakoba Kéïta, Marie Paule Kieny, John-Arne Røttingen**

Summary

Background A recombinant, replication-competent vesicular stomatitis virus-based vaccine expressing a surface glycoprotein of Zaire Ebolavirus (rVSV-ZEBOV) is a promising Ebola vaccine candidate. We report the results of an interim analysis of a trial of rVSV-ZEBOV in Guinea, west Africa.

Published Online
July 31, 2015
<http://dx.doi.org/10.1016/>



EVD experimental treatments

Immunotherapy

Convalescent plasma

Monoclonal antibodies
• *Zmapp (Leafbio Inc.)*

Horse hyperimmune globulins

Antivirals

Nucleos(t)ide analogues

- *T-705, favipiravir (Toyama)*
- *CMX001, brincidofovir (Chimerix)*
- *BCX4430 (BioCryst)*

Small interfering RNA molecules

- *TKM-100802, TKM-Ebola (Tekmira)*

Antisense phosphorodiamidate morpholino oligomers (PMOs)

- *AVI-7537 (Sarepta)*

Vaccines

Recombinant vesicular stomatitis virus vectored EBOV-GP vaccine
(*rVSV-EBOV*)

Chimpanzee adenovirus 3 vectored EBOV-GP vaccine
(*cAd3 EBOV*)

Heterologous prime-boost Ad26-modified vaccinia Ankara vectored EBOV-GP



Er is meer dan ebola!!!

Case 28-2015 — A 32-Year-Old Man with Fever, Headache, and Myalgias after Traveling from Liberia

Paul D. Biddinger, M.D., David C. Hooper, M.D., Erica S. Shenoy, M.D., Ph.D., Ednan K. Bajwa, M.D., M.P.H., Gregory K. Robbins, M.D., M.P.H., and John A. Branda, M.D.

N Engl J Med 2015; 373:1060-1067 | September 10, 2015 | DOI: 10.1056/NEJMcpc1503828

Malaria

Original Research | 2 June 2015

Differential Diagnosis of Illness in Travelers Arriving From Sierra Leone, Liberia, or Guinea: A Cross-sectional Study From the GeoSentinel Surveillance Network



Leptospirosis?
DOXY



H7N9? H5N1? HxNz??
ISOLATE



melioidosis?
CEFTAZIDIME



Peni R S.
Pneumoniae?
CA-Klebsiella pn.?
?CARBAPENEM

MERS-CoV?
ISOLATE



Rickettsiosis/scrub typhus?
DOXY

慎防叢林斑疹傷寒
Beware of Scrub Typhus



Fever and rash after travel



- **Dengue**
- **Rickettsiae**
- **Leptospirosis**
- **Acute HIV**

- **(sec. syphilis)**
- **(CMV)**
- **...**

Welke raad kan ik geven aan de werknemers?

- Voorkom dat uw werknemer koorts ontwikkelt en hierdoor verwarring ontstaat met EVD
- DUS:
 - Malariapreventie!!!!
 - medicamenteus en
 - niet medicamenteus
 - Basis handhygiëne



Prevention



Do NOT touch blood and body fluids of others (pee, poop, spit, vomit, sweat, semen).



Do NOT touch items that could have a sick person's blood or body fluids on them (bedding, needles, medical tools).



Do NOT touch the body of someone who has died of Ebola.

Prevent

Healthcare infection control, safe burial practices, avoiding bushmeat



INFECTION CONTROL



SAFE BURIAL PRACTICES



Wat als de werknemer ziek wordt?

Stel de 3 vragen:

1. In epidemisch gebied verbleven in de afgelopen 21 dagen?
2. Koorts +/- andere klachten (braken, diarree, bloedingsneiging,...)?
3. Blootstelling in risicogebied aan zieken, lichaamsvochten?

Zorgvuldige en gedetailleerde anamnese

Stel patiënt gerust dat goede zorgen altijd gegeven worden

Overleg met arts infectieziektenbestrijding



A SERIOUS OUTBREAK OF STUPID...

QUARANTINE
HER!!


"I JUST CAME
FROM THE
LIBRARY,
NOT
LIBERIA!"


"KID,
YOU CAN
NEVER BE
TOO
CAREFUL!"





Want to know more? www.ebola.be


NL FR EN DE


Home 


Huidige situatie 

Reisadvies 

Veelgestelde vragen 

Informatie voor professionals 

Wat doet het Instituut voor Tropische Geneeskunde? 

Wat doen de gezondheidsautoriteiten? 



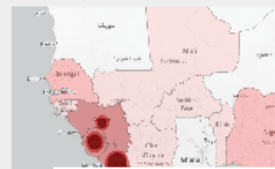
Ebola

Informatie voor burgers en gezondheidsprofessionals in België

Huidige situatie – Ebola in West-Afrika

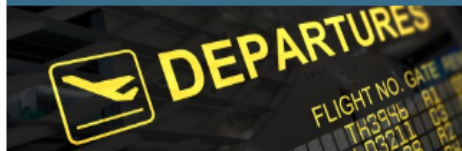
🕒 2 October 2015 12:38 Actuele informatie over de gebieden in Afrika met ebola-gevallen: Guinée Conakry, Sierra Leone en Liberia.

[Lees verder >](#)

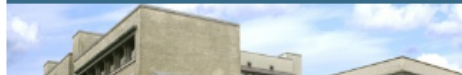


[Bekijk kaart op who.int >](#)

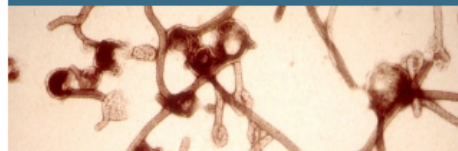
Reisadvies



Wat doet het Instituut voor Tropische Geneeskunde?



Veelgestelde vragen



Wat doen de gezondheidsautoriteiten?



Nieuws

Seminarie 'Ebola: lessons learned and how to be better prepared'

🕒 2 Oct 2015 door ITG

Ebola-coördinator blijft 6 maand langer en krijgt nieuwe opdracht

🕒 7 Apr 2015 door ITG

Betere bescherming noodzakelijk voor gezondheidswerkers in Guinee – brief in The Lancet

🕒 19 Feb 2015 door ITG

ITG-alumni bezinnen zich over de ebola-epidemie in Guinea

🕒 30 Jan 2015 door ITG

"Ebola, the epidemic that should never have happened" – artikel in Global Affairs

🕒 29 Jan 2015 door ITG





Dank voor uw aandacht!