Ebola Virusu Hastalığı

Dr. Önder Ergönül
Koç Üniversitesi Tıp Fakültesi

20 Kasım, Denizli

TÜRK KLİNİK MİKROBİYOLOJİ VE İNFEKSİYON HASTALIKLARI DERNEĞİ

Ebola ve MERS-CoV için Öğrenme Hedefleri

- Konunun önemi
- Salgın verileri
  - Sıklık
  - Bulaş yolları
- Klinik seyir
- Korunma yolları
- Hastanemizde durum

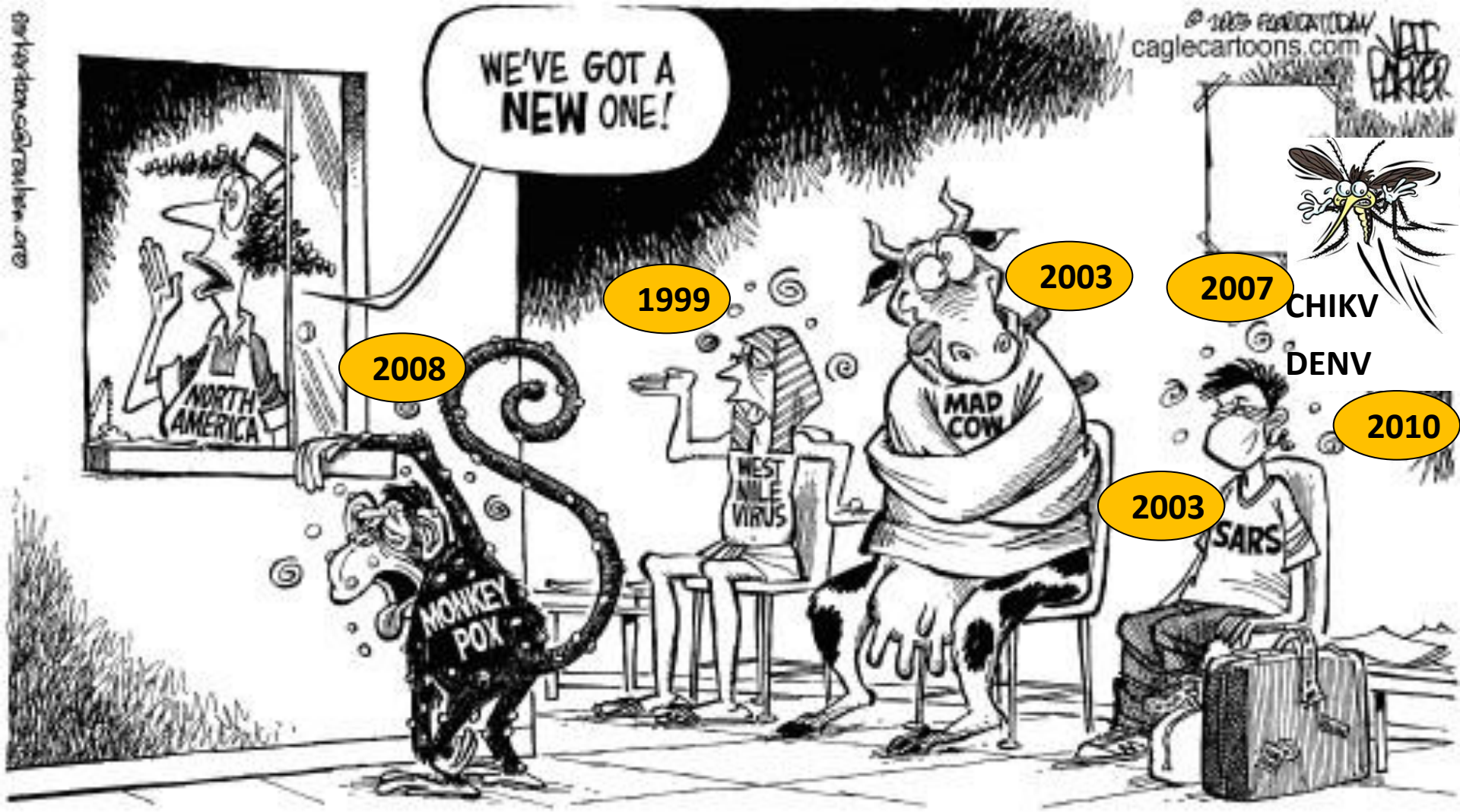
Yeni Enfeksiyonlar
Emerging and Re-emerging Infections

Son 20 yılda insidansları artan veya yakın gelecekte artış gösterebilecek olan; yeni, yeniden ortaya çıkan veya ilaçlara dirençli enfeksiyonlar

Institute of Medicine Report, 1992

Yeni (emerging) Enfeksiyon Nedir?

- Son 20 yıl (?)
- Yeni bir etken
- Yeni bir bölge
- Yeni direnç gelişimi
- Yeniden önem kazanan


WE'VE GOT A NEW ONE!
NORTH AMERICA
MONKEY POX
WEST NILE VIRUS
MAD COW
SARS
1999
2003
2007
CHIKV
DENV
2008
2010
2003
caglecartoons.com

1973’den itibaren Yeni Virüsler

1973	Rotavirus
1976	Ebola virus
1977	Hanta virus
1983	HIV
1988	Hepatit E
1989	Hepatit C
1990	Guanarito

1993	Sin Nombre
1994	Sabia
1994	Hendra
1995	Hepatit G
1995	Herpes 8
1997	H5N1
1999	Nipah

2000'den itibaren Yeni Virüsler

2001	Metapnömovirus
2003	Maymun çiçeği
2003	SARS
2004	Bocavirus
2008	Merkelcell polyoma virus
2009	İnfluenza H1N1
2012	MERS-CoV

Developments in Emerging and Existing Infectious Diseases 1
Series Editors: Önder Ergönül and Füsun Can

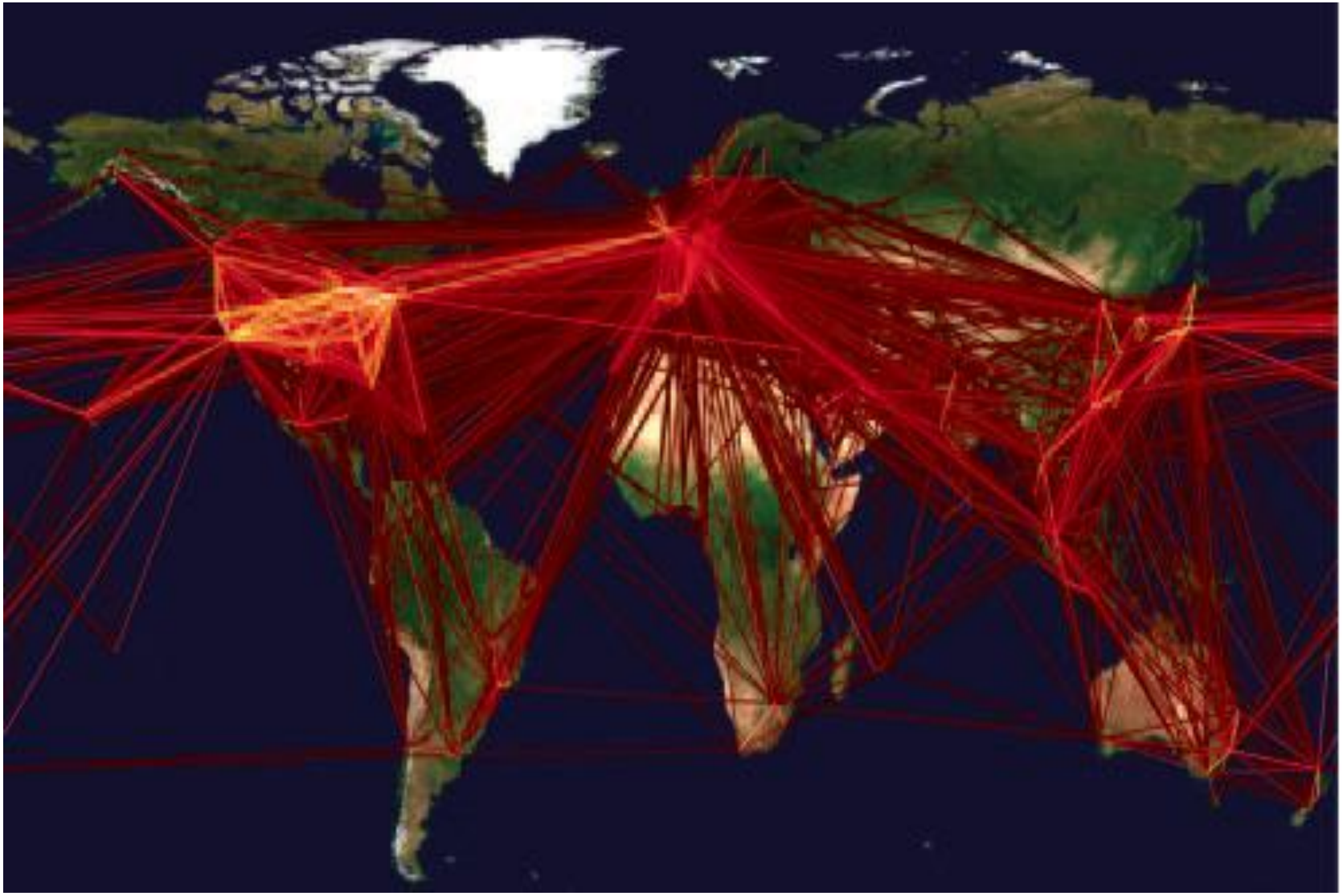
EMERGING INFECTIOUS DISEASES

Clinical Case Studies

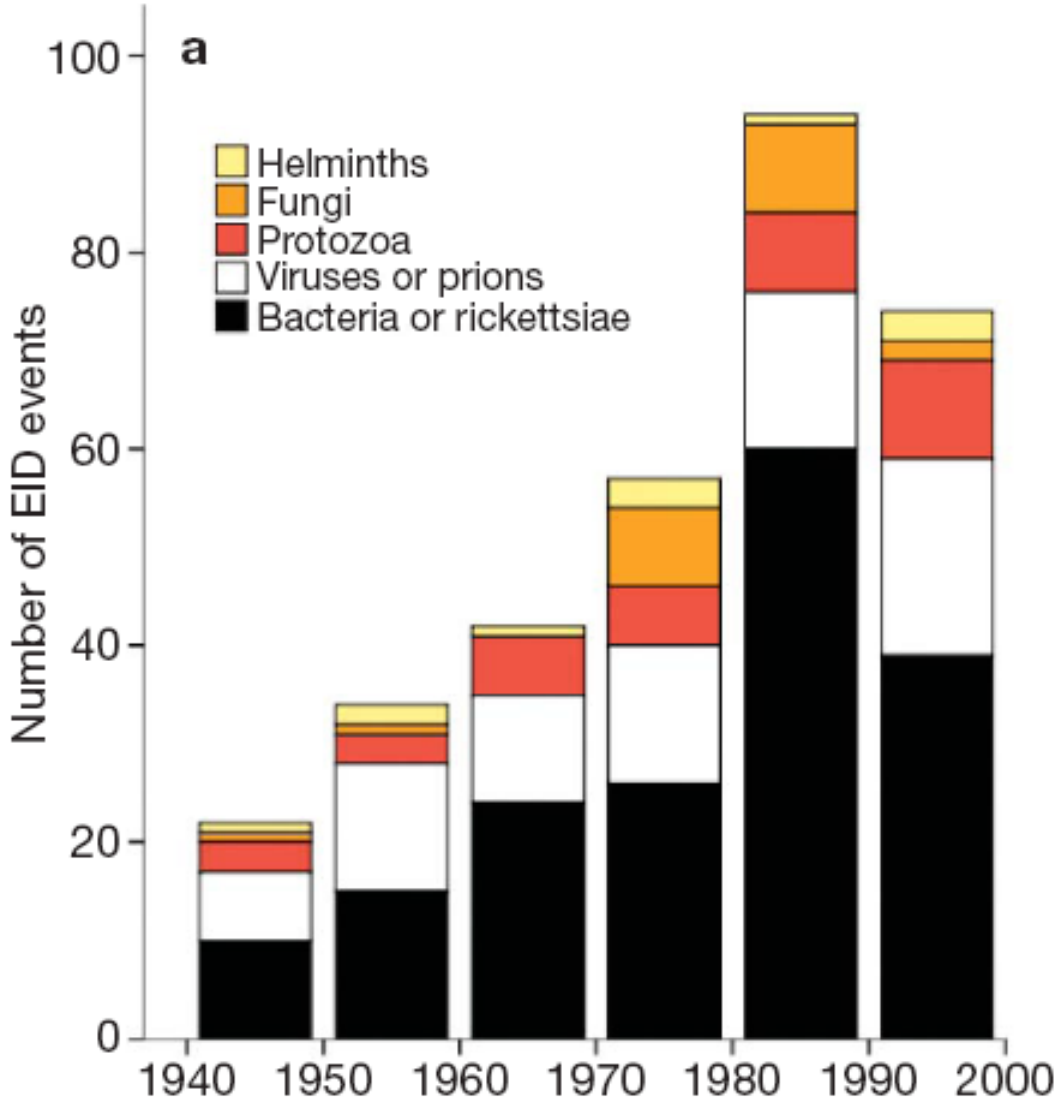
Edited by

**Önder Ergönül, Füsun Can,
Lawrence Madoff, and Murat Akova**

World Wide Air Traffic

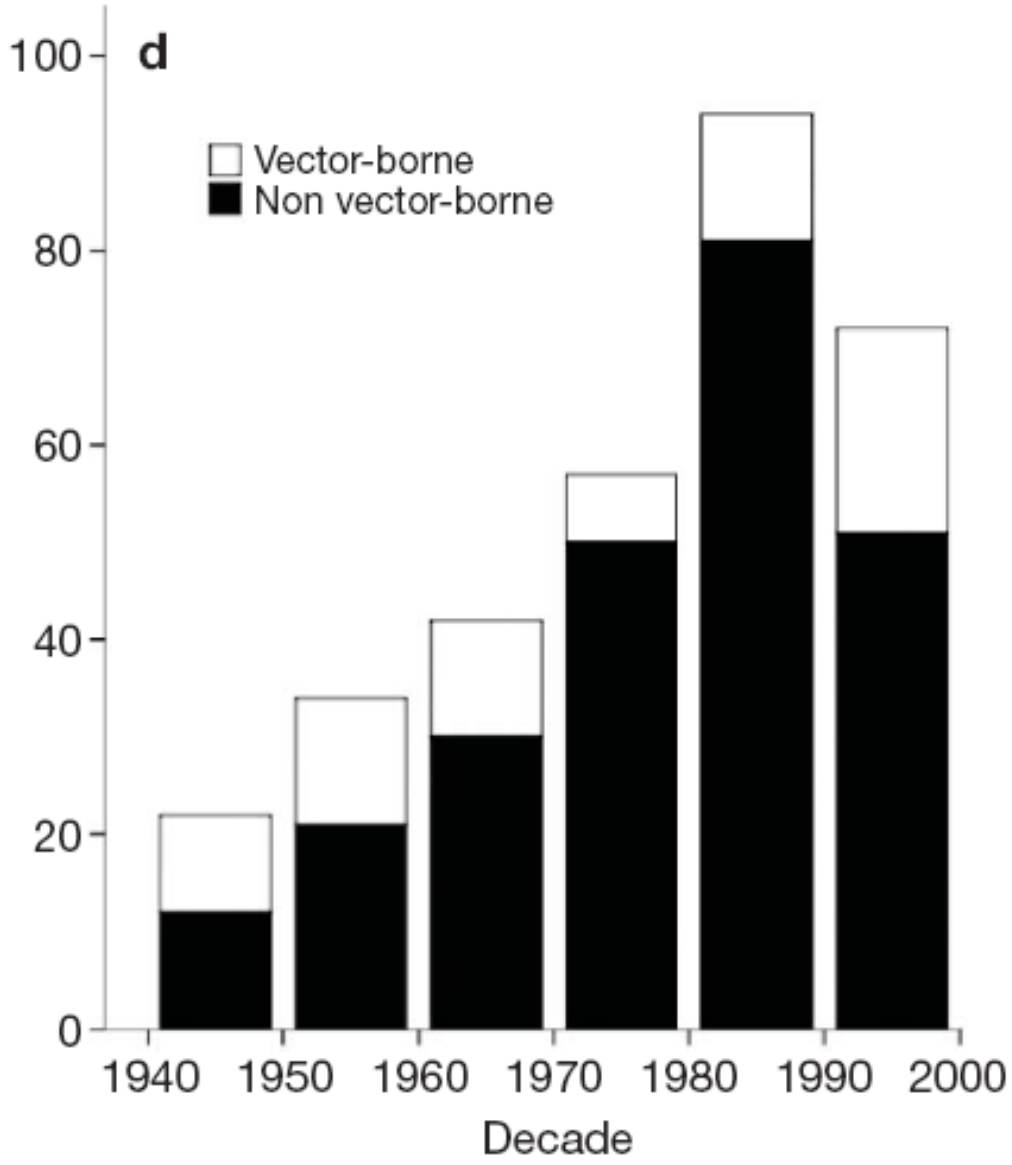


Hufnagel et al., 2004. PNAS. 101: 15124



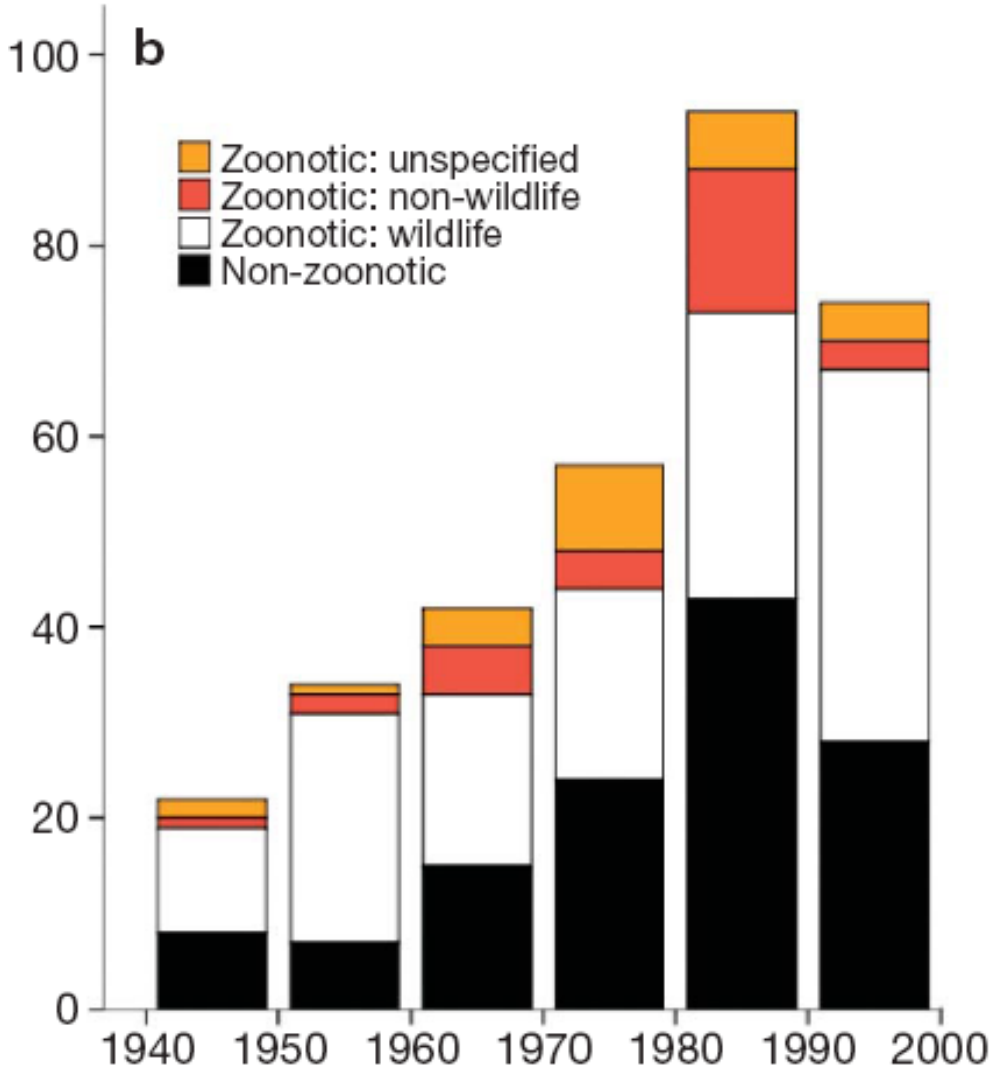
The proportion of viral infections increases

Jones KE, Nature 2008



The proportion of vector-borne infections increases

Jones KE, Nature 2008



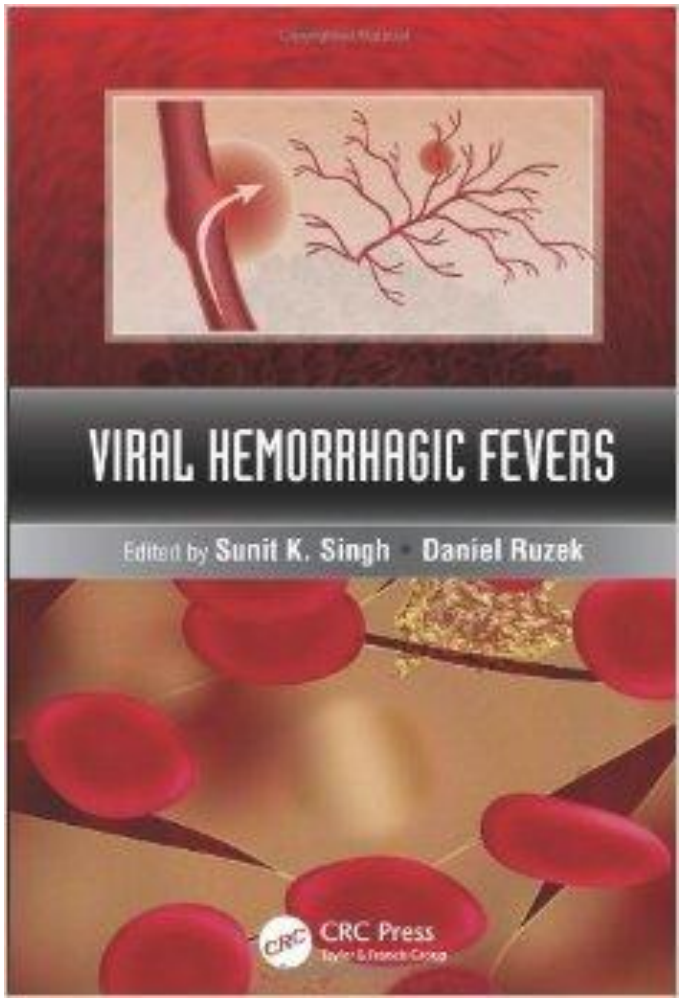
The proportion of Wild life zoonoses increase

Jones KE, Nature 2008

Viral Kanamalı Ateşler
4 Genus, 12 Viruses

Filoviridae	Arenaviridae	Bunyaviridae	Flaviviridae
Ebola	Lassa	Hanta	Yellow F.
Marburg	S.America	Rift Valley	Dengue
		CCHF	Omsk
			Kyasanur
			Alkhumra

Viral Kanamalı Ateşler
Ortak Özellikler



- Tek iplikli RNA viruslarıdır
- Acil infeksiyonlardır
- Küresel tehdit oluştururlar
- Yerel isimler alırlar
- Patogenezleri yakındır
- Aşıları yoktur
- Tedavileri zayıftır
- Kontrolü güçtür

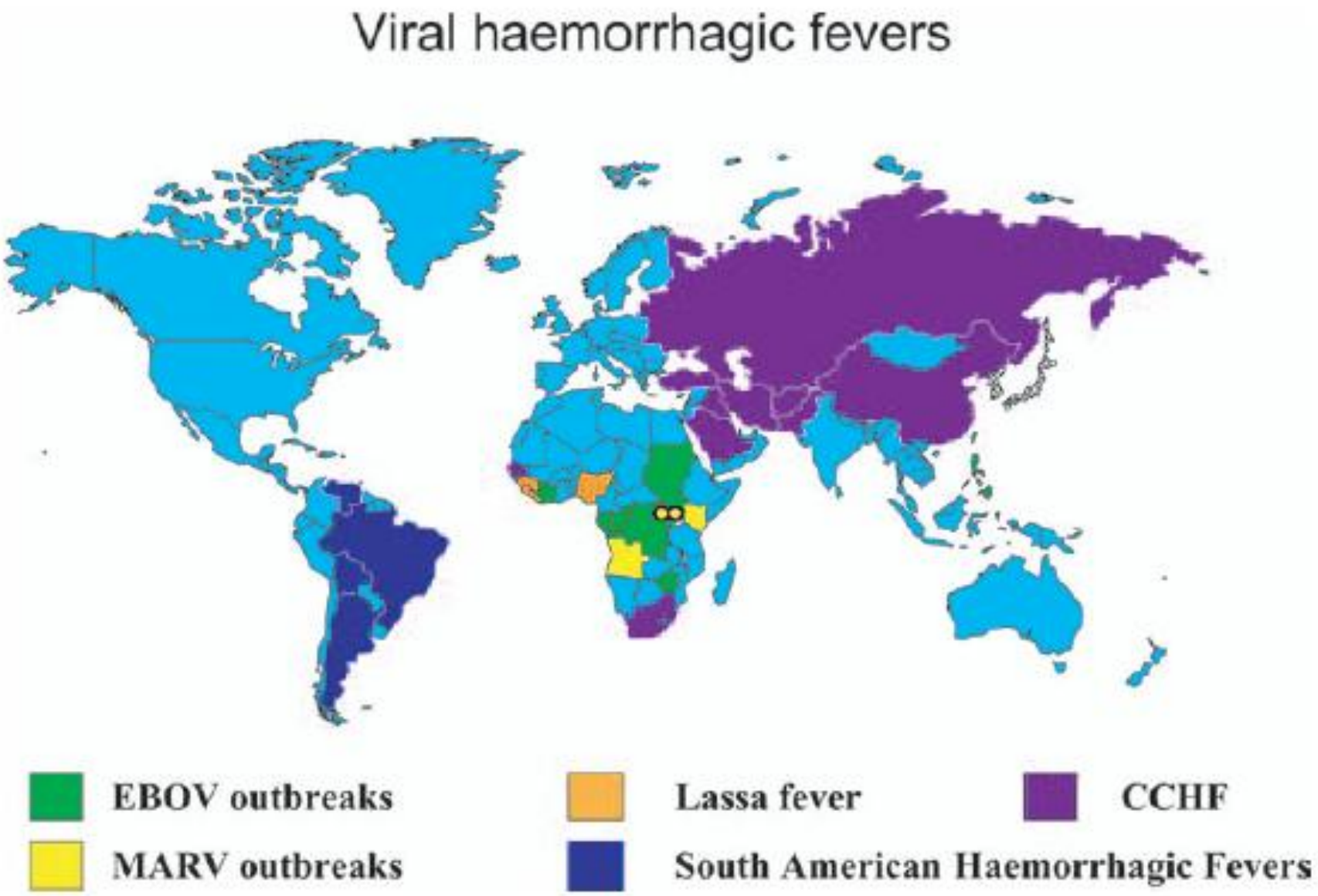


Fig. 1 Map of the world showing those countries known in 2005 to be affected by viral haemorrhagic fever (VHF) viruses. All those marked produce nosocomial outbreaks, with the exception of the South American haemorrhagic fever viruses. CCHF, Crimean–Congo haemorrhagic fever; EBOV, Ebola virus; MARV, Marburg virus.

Chapter 9

Ebola Virus Disease

Pierre Formenty
Emerging and Epidemic Zoonotic Diseases Team (CED/EZD), World Health Organization

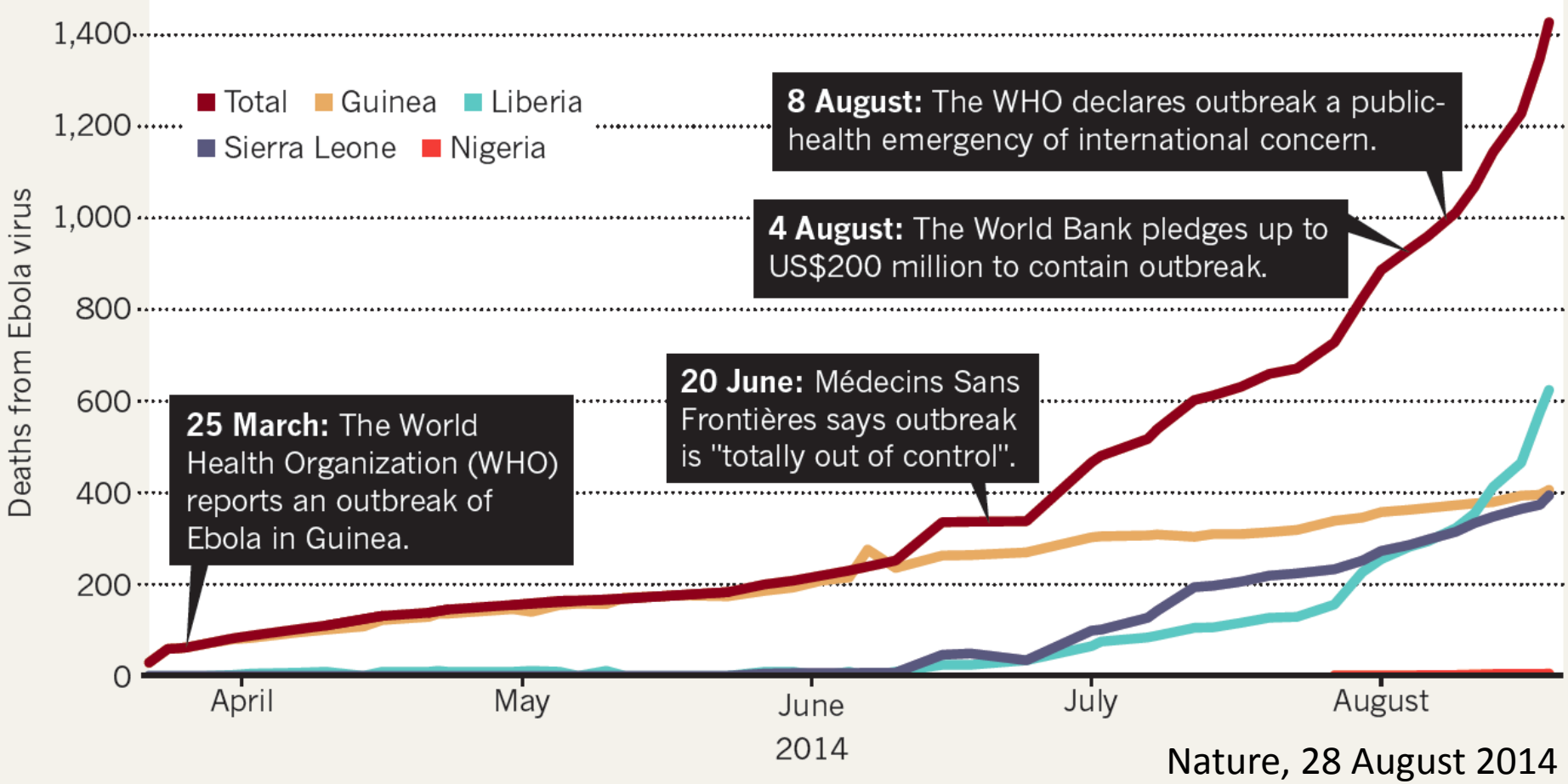
CASE PRESENTATION

9 Kasım 2014

Toplam Olgu sayısı : 14098
Lab onaylı : 8715
Ölüm : 5160

OUT OF CONTROL

The death toll from Ebola virus in West Africa continues to rise. Infectious-disease experts say that more health-care workers are needed to contain the outbreak.

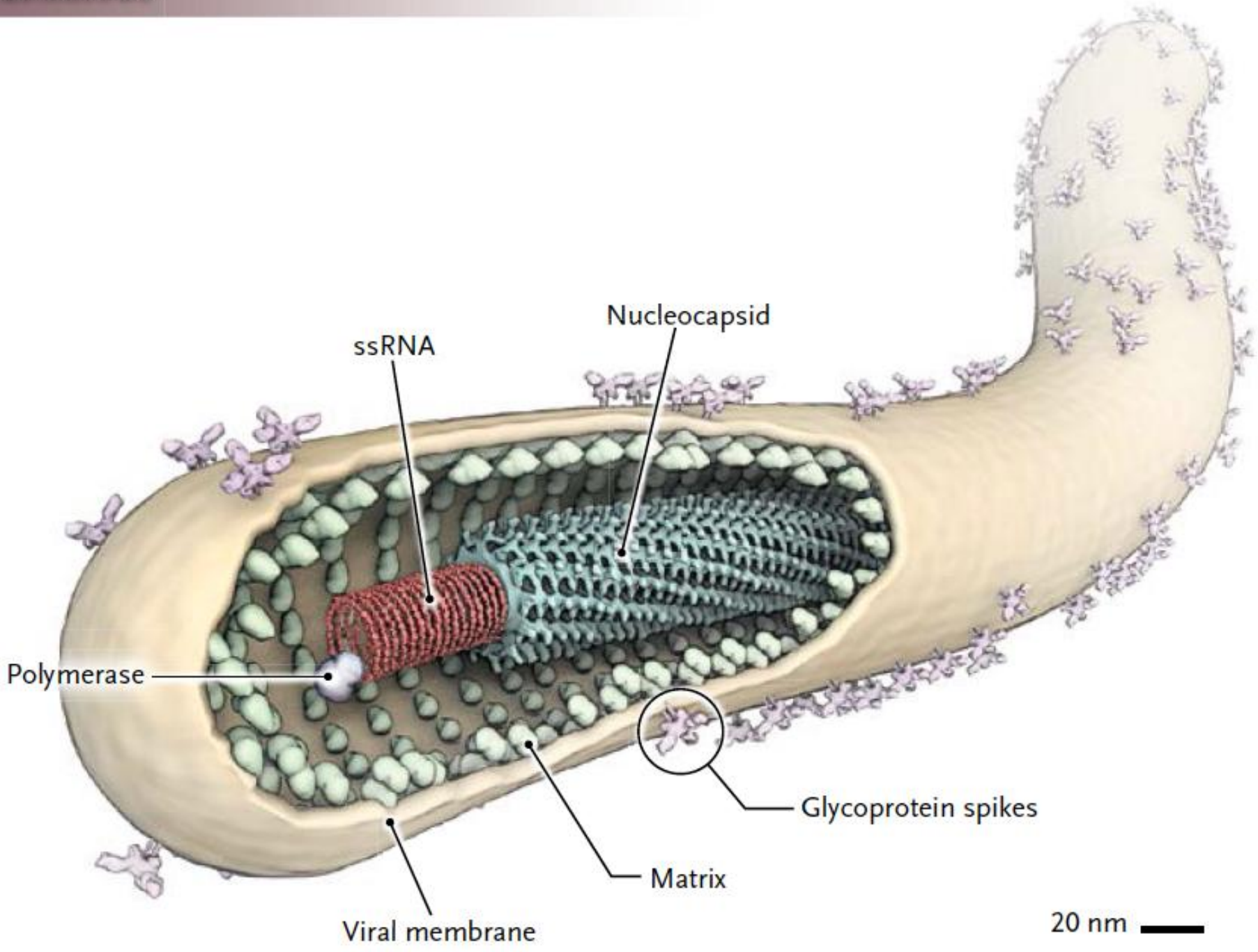


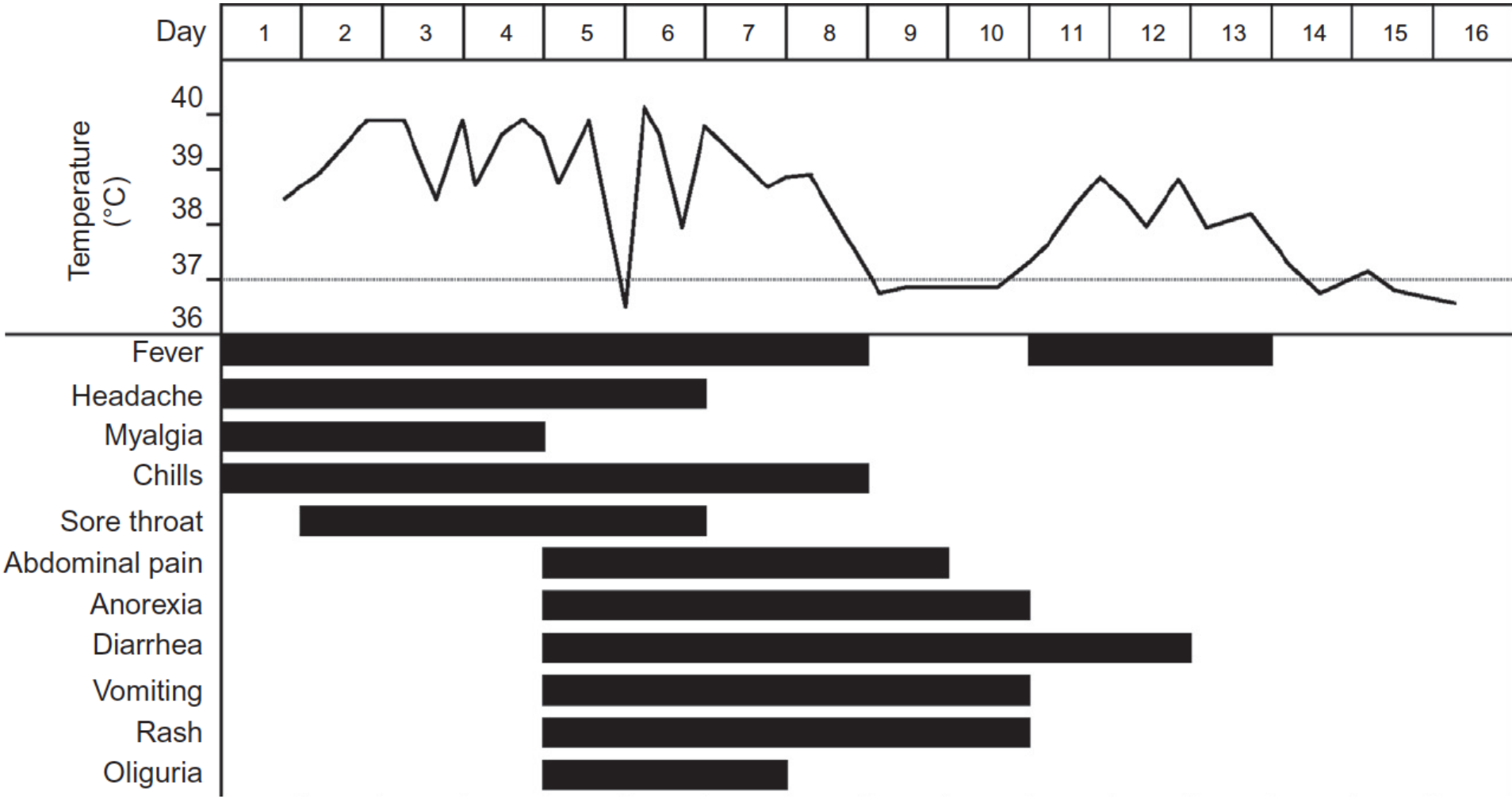
Nature, 28 August 2014

'In 1976 I discovered Ebola, now I fear an unimaginable tragedy'

Peter Piot was a researcher at a lab in Antwerp when a pilot brought him a blood sample from a Belgian nun who had fallen mysteriously ill in Zaire

Ebolavirus


Nucleocapsid
ssRNA
Polymerase
Glycoprotein spikes
Matrix
Viral membrane
20 nm



Formenty P. Ebola. In: Ergonul, Can, Akova, Madoff, 2014, Elsevier

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Ebola Virus Disease in West Africa — The First 9 Months of the Epidemic and Forward Projections

WHO Ebola Response Team*

NEJM, 7 Ekim 2014

Table 1. Demographic Characteristics and Signs and Symptoms in Confirmed and Probable Ebola Case Patients with a Definitive Clinical Outcome in Guinea, Liberia, Nigeria, and Sierra Leone.*

Variable	All Patients	Patients Who Died	Patients Who Recovered	Odds Ratio (95% CI)†
		no./total no. (%)		
Demographic characteristics				
Male sex	685/1415 (48.4)	515/1056 (48.8)	170/359 (47.4)	0.93 (0.73–1.19)
Age group				
<15 yr	190/1378 (13.8)	145/1021 (14.2)	45/357 (12.6)	1.18 (0.83–1.71)
15–44 yr	838/1378 (60.8)	577/1021 (56.5)	261/357 (73.1)	0.48 (0.36–0.62)
≥45 yr	350/1378 (25.4)	299/1021 (29.3)	51/357 (14.3)	2.47 (1.79–3.46)
Health care worker	158/1429 (11.1)	112/1067 (10.5)	46/362 (12.7)	0.86 (0.60–1.27)
Signs and symptoms				
General symptoms				
Fever‡	1002/1151 (87.1)	746/846 (88.2)	256/305 (83.9)	1.34 (0.92–1.95)
Fatigue	866/1133 (76.4)	633/829 (76.4)	233/304 (76.6)	0.94 (0.68–1.28)
Loss of appetite	681/1055 (64.5)	498/778 (64.0)	183/277 (66.1)	0.92 (0.69–1.23)
Vomiting	753/1114 (67.6)	566/816 (69.4)	187/298 (62.8)	1.19 (0.89–1.59)
Diarrhea	721/1099 (65.6)	555/813 (68.3)	166/286 (58.0)	1.42 (1.06–1.89)
Headache	553/1035 (53.4)	407/757 (53.8)	146/278 (52.5)	1.03 (0.78–1.36)
Abdominal pain	439/992 (44.3)	311/715 (43.5)	128/277 (46.2)	0.85 (0.64–1.13)
Muscle pain	385/990 (38.9)	293/728 (40.2)	92/262 (35.1)	1.24 (0.92–1.67)
Joint pain	374/950 (39.4)	283/695 (40.7)	91/255 (35.7)	1.32 (0.98–1.80)
Chest pain	254/686 (37.0)	196/488 (40.2)	58/198 (29.3)	1.53 (1.07–2.20)
Cough	194/655 (29.6)	150/462 (32.5)	44/193 (22.8)	1.74 (1.18–2.61)
Difficulty breathing	155/665 (23.3)	123/472 (26.1)	32/193 (16.6)	1.68 (1.10–2.63)
Difficulty swallowing	169/514 (32.9)	138/375 (36.8)	31/139 (22.3)	2.22 (1.41–3.59)
Conjunctivitis	137/658 (20.8)	109/465 (23.4)	28/193 (14.5)	2.03 (1.29–3.29)
Sore throat	102/467 (21.8)	82/339 (24.2)	20/128 (15.6)	1.94 (1.13–3.46)
Confusion	84/631 (13.3)	68/446 (15.2)	16/185 (8.6)	2.00 (1.14–3.71)
Hiccups	108/947 (11.4)	91/699 (13.0)	17/248 (6.9)	2.15 (1.27–3.82)
Jaundice	65/627 (10.4)	52/443 (11.7)	13/184 (7.1)	1.83 (0.99–3.63)
Eye pain	48/622 (7.7)	39/438 (8.9)	9/184 (4.9)	1.95 (0.95–4.40)
Rash	37/642 (5.8)	30/453 (6.6)	7/189 (3.7)	1.90 (0.86–4.83)
Coma or unconsciousness	37/627 (5.9)	34/445 (7.6)	3/182 (1.6)	4.59 (1.61–19.34)

Kanamalar

Variable	All Patients	Patients Who Died	Patients Who Recovered	Odds Ratio (95% CI)†
		no./total no. (%)		
Unexplained bleeding	168/932 (18.0)	140/693 (20.2)	28/239 (11.7)	1.83 (1.20–2.90)
Hematemesis	26/670 (3.9)	20/503 (4.0)	6/167 (3.6)	1.07 (0.44–3.01)
Blood in stool	48/843 (5.7)	35/614 (5.7)	13/229 (5.7)	0.98 (0.52–1.96)
Bleeding gums	19/837 (2.3)	18/608 (3.0)	1/229 (0.4)	6.69 (1.35–121.32)
Bloody nose	16/836 (1.9)	15/610 (2.5)	1/226 (0.4)	8.02 (1.54–148.62)
Bloody cough	20/831 (2.4)	16/605 (2.6)	4/226 (1.8)	1.63 (0.58–5.82)
Other bleeding	8/657 (1.2)	5/493 (1.0)	3/164 (1.8)	0.45 (0.11–2.23)
Bleeding at injection site	20/833 (2.4)	19/605 (3.1)	1/228 (0.4)	6.51 (1.32–118.04)
Blood from vagina§	14/431 (3.2)	13/290 (4.5)	1/126 (0.8)	6.0 (1.11–112.4)
Blood in urine	10/827 (1.2)	9/601 (1.5)	1/226 (0.4)	5.14 (0.90–98.73)
Bleeding under skin	5/827 (0.6)	5/604 (0.8)	0/223	NA

BRIEF REPORT

Clinical Care of Two Patients with Ebola Virus Disease in the United States

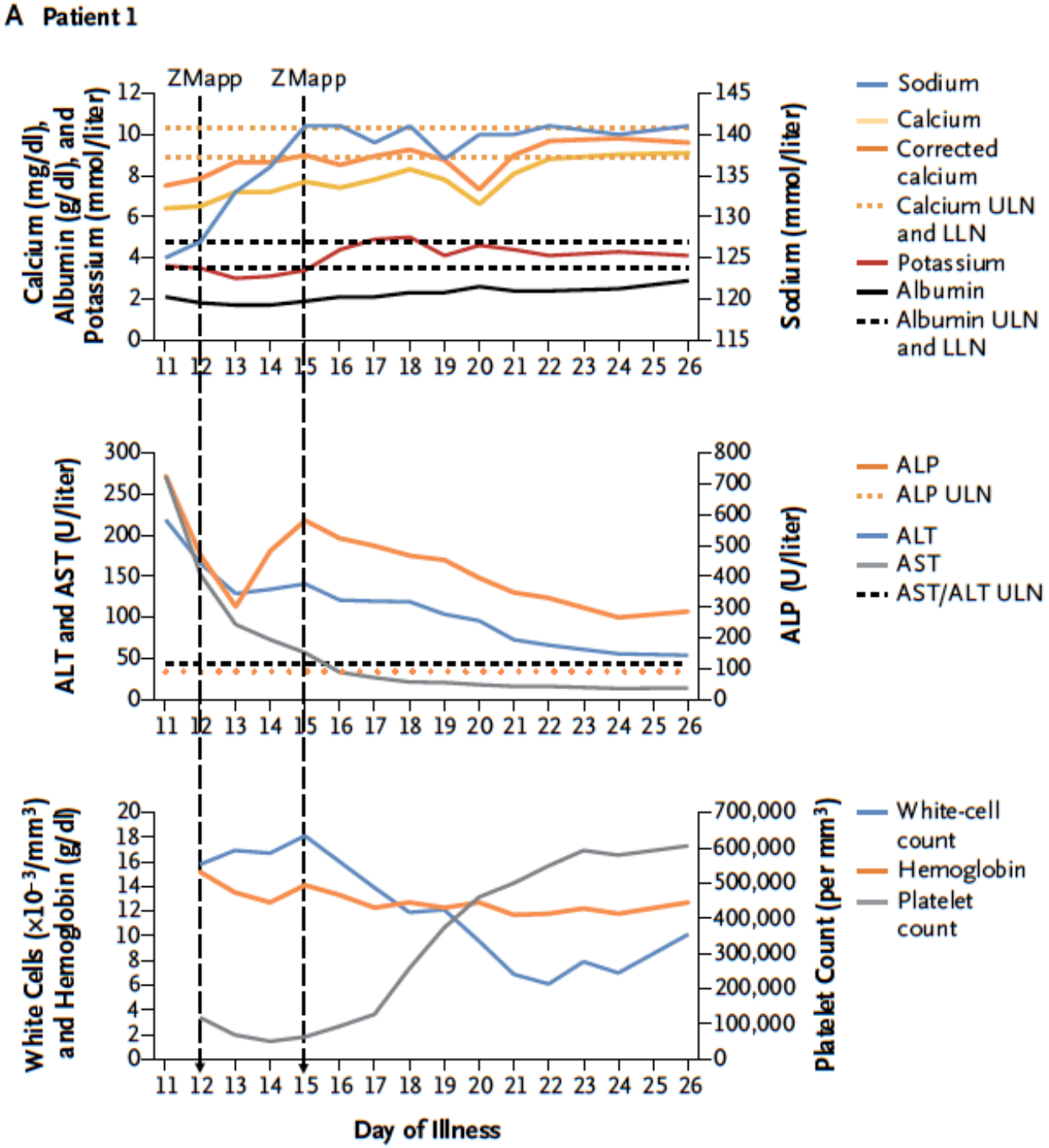
G. Marshall Lyon, M.D., M.M.Sc., Aneesh K. Mehta, M.D., Jay B. Varkey, M.D., Kent Brantly, M.D., Lance Plyler, M.D., Anita K. McElroy, M.D., Ph.D., Colleen S. Kraft, M.D., Jonathan S. Towner, Ph.D., Christina Spiropoulou, Ph.D., Ute Ströher, Ph.D., Timothy M. Uyeki, M.D., M.P.H., M.P.P., and Bruce S. Ribner, M.D., M.P.H., for the Emory Serious Communicable Diseases Unit*

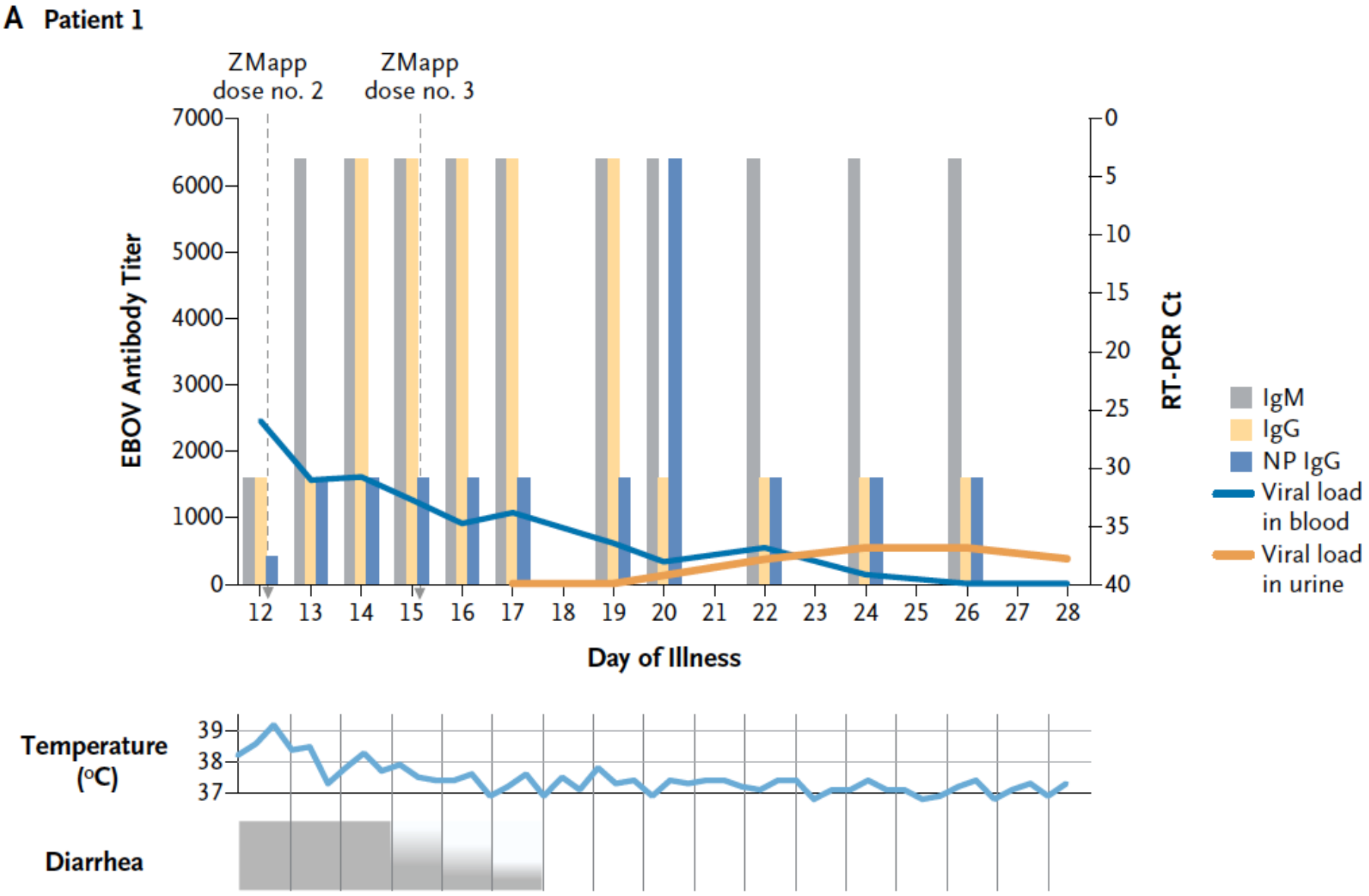
Lyon GM, et al, N Engl Med, 13 Kasım 2014

1. OLGU

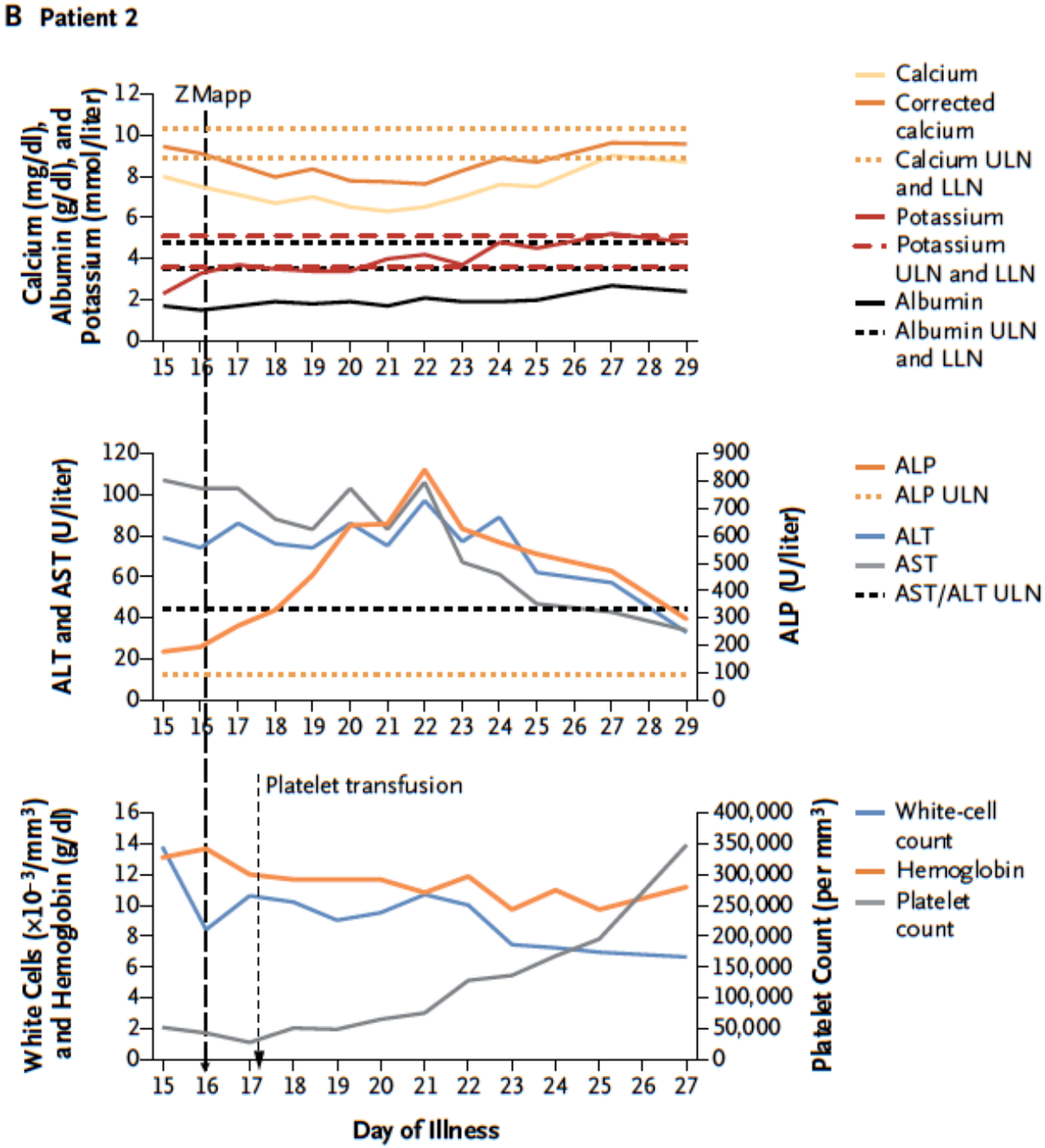
33 yaşında, hekim, 2013 den itibaren Liberya'da çalışıyor.
Sıtma profilaksisi altında.
23 Temmuz 2014; ateş, yorgunluk, A: 37.8° C.
Semptomlarını arkadaşlarına bildiriyor, evinde dinleniyor.
Sıtma, Lassa, Ebola araştırılıyor, sonuç negatif.
Ringer laktat, empirik antibiyotik

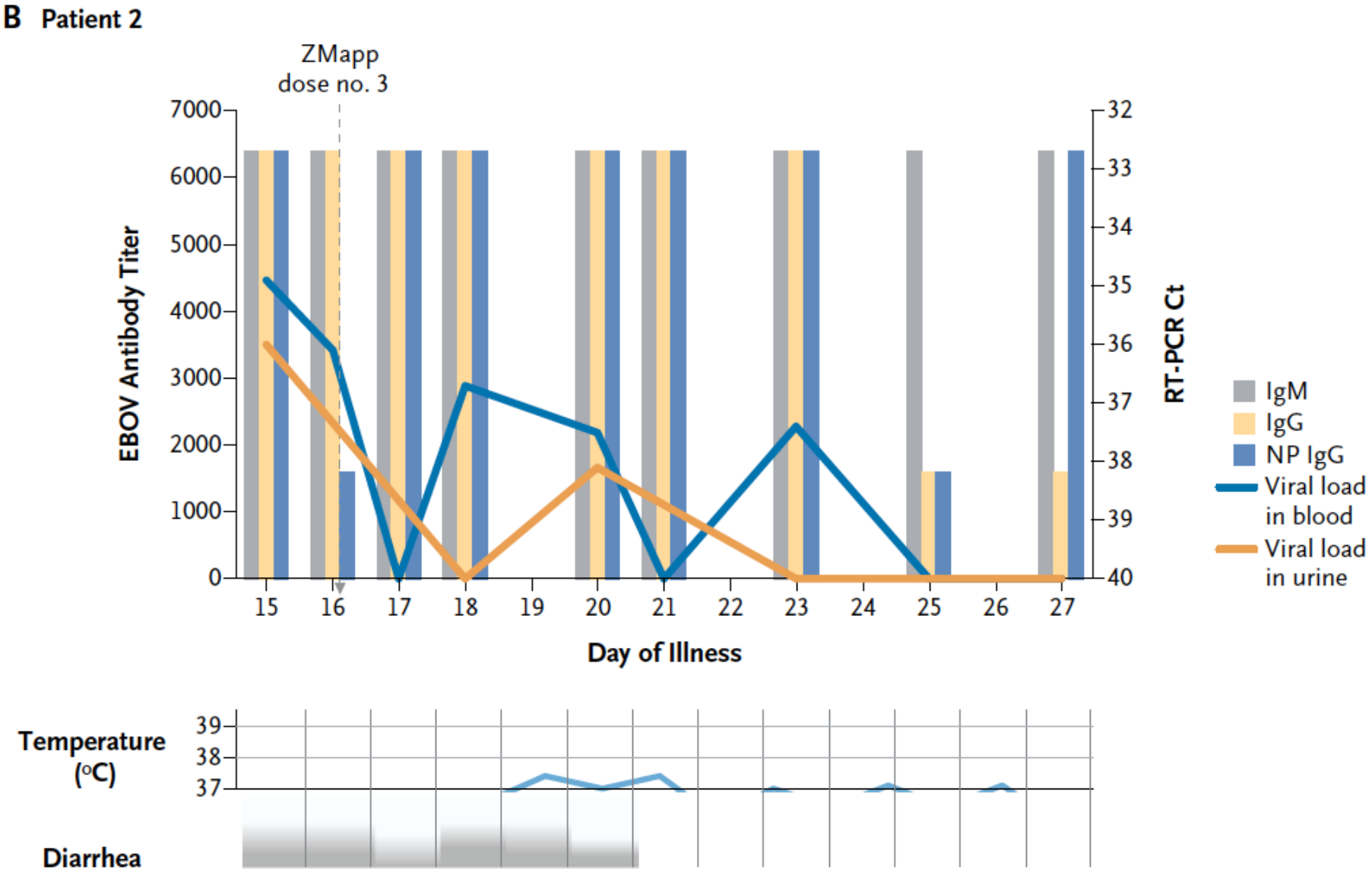
4. gün: Ateş halen yüksek, sıtma, sarı humma, Lassa, Ebola yeniden çalışılıyor, Ebola saptanıyor.
6. gün: peteşiyal döküntü, A: 40 C, karın ağrısı, ishal. Melena, makulopapuler dokuntu
7. gün: hematemez, 1 U kan, 1 U konvalesan serum. Kötüleşme. Acetaminofen, Hidrasyon
9. gün: iv of Zmapp: deneysel EBOV glycoprotein-specific monoclonal antibodies
(Mapp Biopharmaceutical and LeafBio).
8 saat sonra iyileşme: döküntü azaldı. 10. gün transfer


A Patient 1
ZMapp
ZMapp
Calcium (mg/dl), Albumin (g/dl), and Potassium (mmol/liter)
Sodium (mmol/liter)
Sodium
Calcium
Corrected calcium
Calcium ULN and LLN
Potassium
Albumin
Albumin ULN and LLN
ALT and AST (U/liter)
ALP (U/liter)
ALP
ALP ULN
ALT
AST
AST/ALT ULN
White Cells (×10⁻³/mm³) and Hemoglobin (g/dl)
Platelet Count (per mm³)
White-cell count
Hemoglobin
Platelet count
Day of Illness



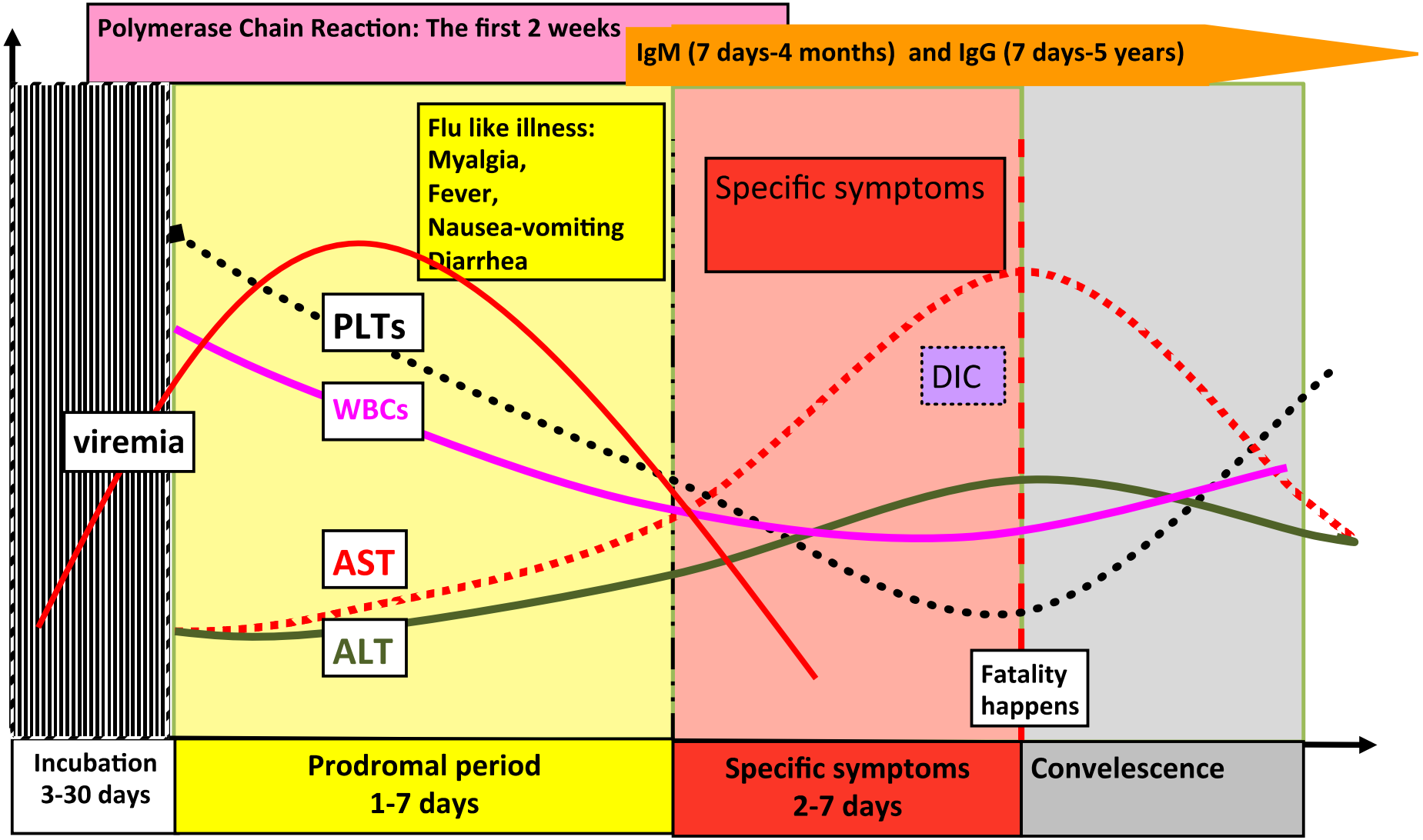
Lyon GM, et al, N Engl Med, 13 Kasım 2014


B Patient 2
ZMapp
Calcium (mg/dl), Albumin (g/dl), and Potassium (mmol/liter)
Calcium
Corrected calcium
Calcium ULN and LLN
Potassium
Potassium ULN and LLN
Albumin
Albumin ULN and LLN
ALT and AST (U/liter)
ALP (U/liter)
ALP
ALP ULN
ALT
AST
AST/ALT ULN
Platelet transfusion
White Cells (×10⁻³/mm³) and Hemoglobin (g/dl)
Platelet Count (per mm³)
White-cell count
Hemoglobin
Platelet count
Day of Illness



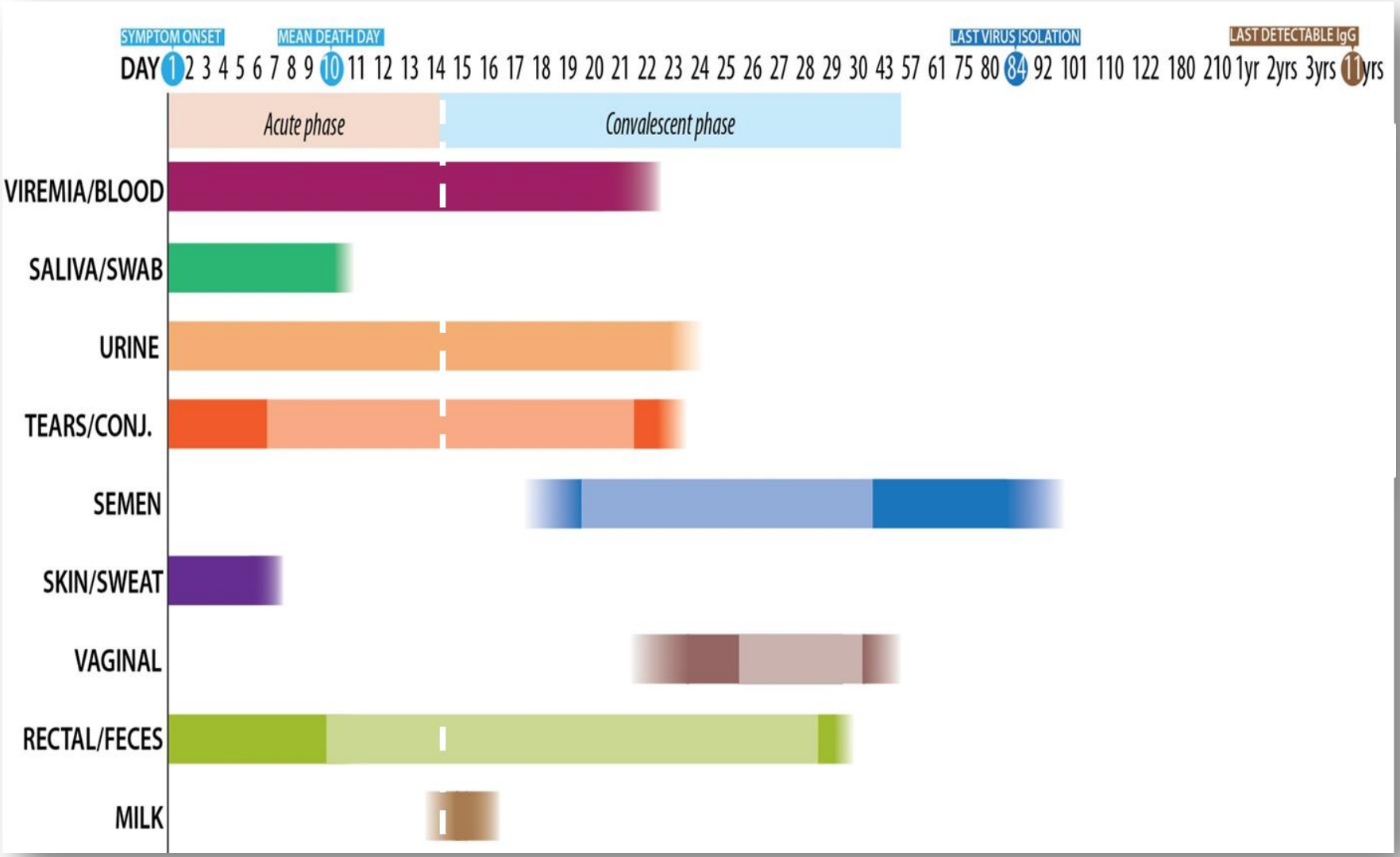
Lyon GM, et al, N Engl Med, 13 Kasım 2014

Clinical and Laboratory Course



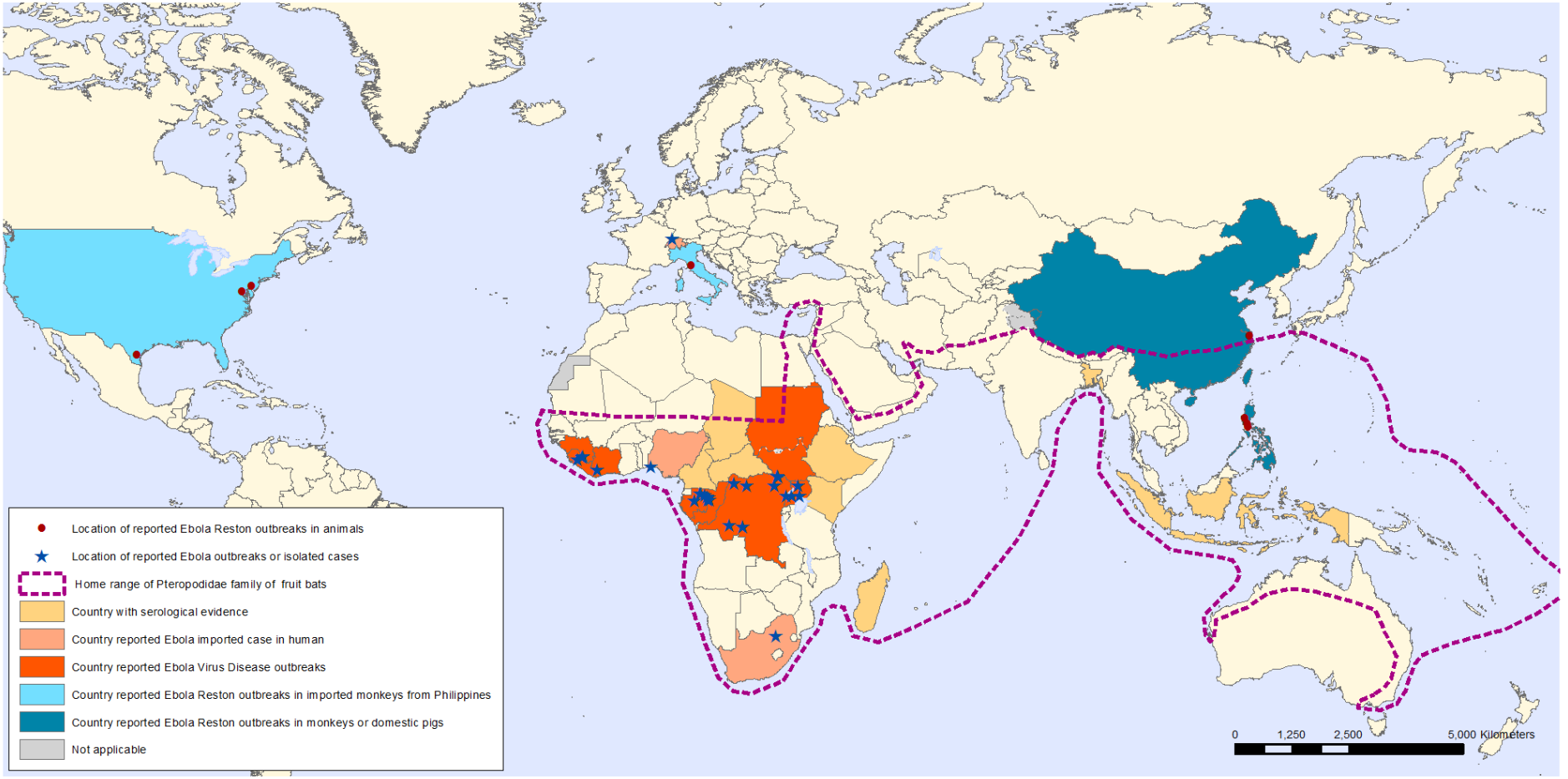
Ergonul O. *Lancet ID* 2006; 6: 203-214

Detection of Ebola Virus in Different Human Body Fluids over Time



MSF Staff Members Lead a Young Patient with Suspected Ebola into the Case-Management Center.

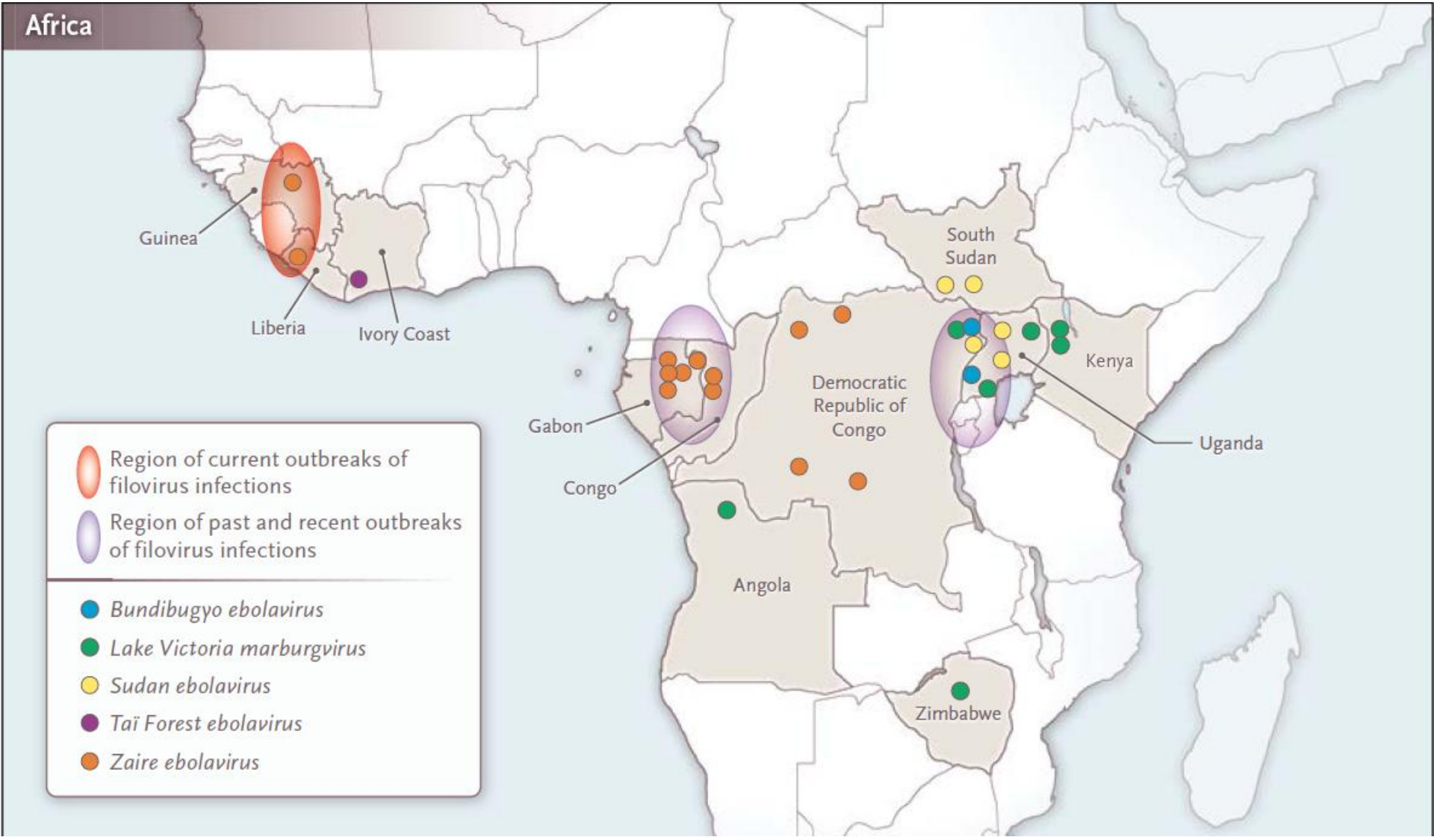
Geographic distribution of Ebola virus disease outbreaks in humans and animals



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

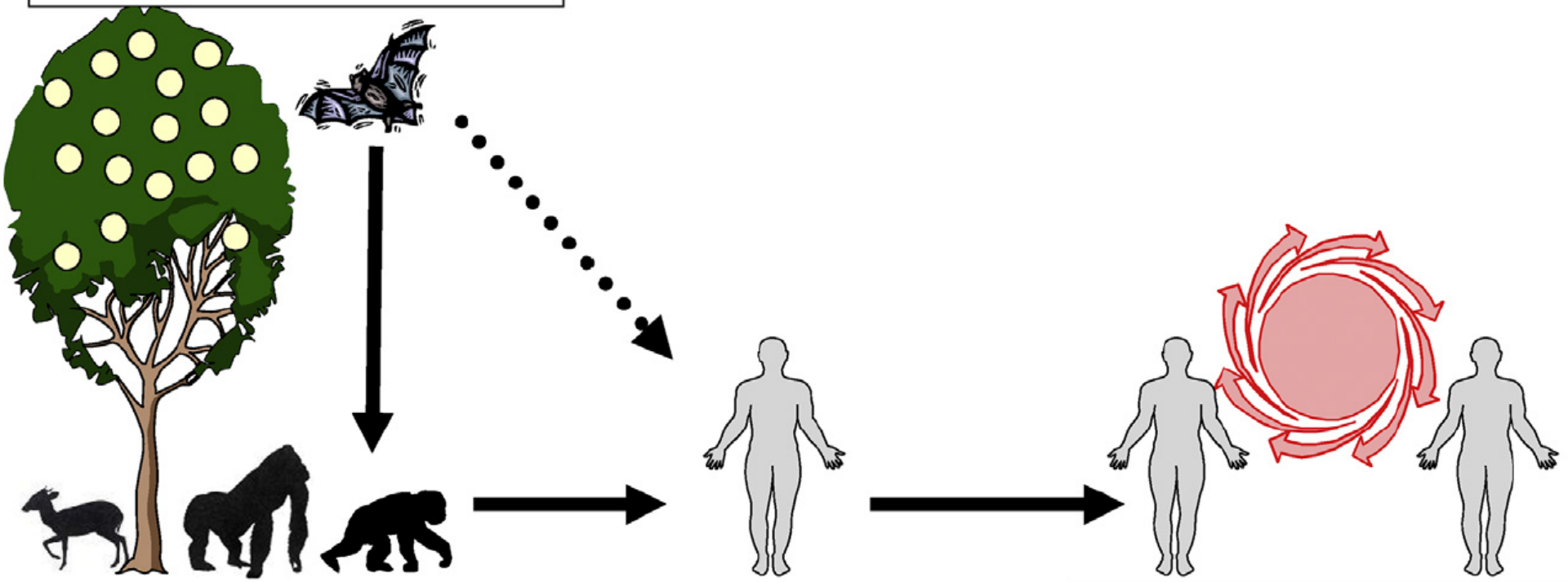
Data Source: World Health Organization
Map Production: Health Statistics and Information Systems (HSI)
World Health Organization

World Health Organization


Africa
Guinea
Liberia
Ivory Coast
Gabon
Congo
South Sudan
Democratic Republic of Congo
Kenya
Uganda
Angola
Zimbabwe
Region of current outbreaks of filovirus infections
Region of past and recent outbreaks of filovirus infections
Bundibugyo ebolavirus
Lake Victoria marburgvirus
Sudan ebolavirus
Taï Forest ebolavirus
Zaire ebolavirus

1. Virus reservoir : Fruit bats

The virus maintains itself in fruit bats. The bats spread the virus during migration.



2. Epizootic in primates

Infected fruit bats enter in direct or indirect contact with other animals and pass on the infection, sometimes causing large-scale epidemics in gorillas, chimpanzees and other monkeys or mammals (e.g. forest antelopes).

3. Primary human infection

Humans are infected either through direct contact with infected bats (rare event), or through handling infected dead or sick animals found in the forest (more frequent)

4. Secondary transmission

Secondary human-to-human transmission occurs through direct contact with the blood, secretions, organs or other body fluids of infected persons. High transmission risk when providing direct patient care or handling dead bodies (funerals).

Formenty P. Ebola. In: Ergonul, Can, Akova, Madoff, 2014, Elsevier

Bushmeat: yabani hayvan eti

The term **bushmeat**, also called **wildmeat** and **game meat**, refers to meat from non-domesticated mammals, reptiles, amphibians and birds hunted for food in tropical forests

Basic reproduction number, *R*o (Çoğalma sayısı)

- 1.71 (95% CI, 1.44 to 2.01), Guinea
- 1.83 (95% CI, 1.72 to 1.94), Liberia
- 1.20 (95% CI, 0.67 to 1.96), Nigeria
- 2.02 (95% CI, 1.79 to 2.26), Sierra Leone

- Ro <1 : sönümlenme
- Ro=1 : endemik
- Ro>1 : salgın

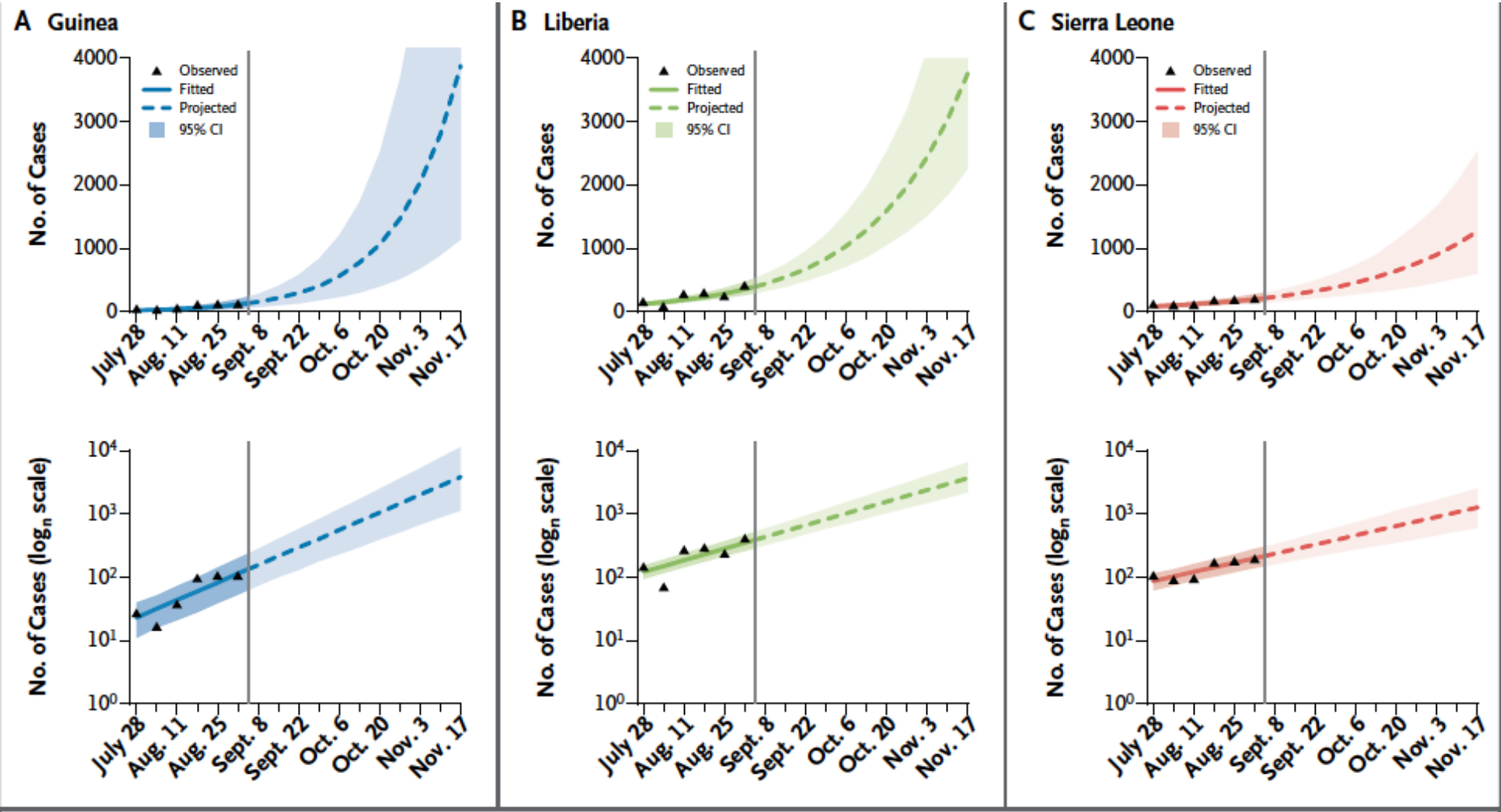
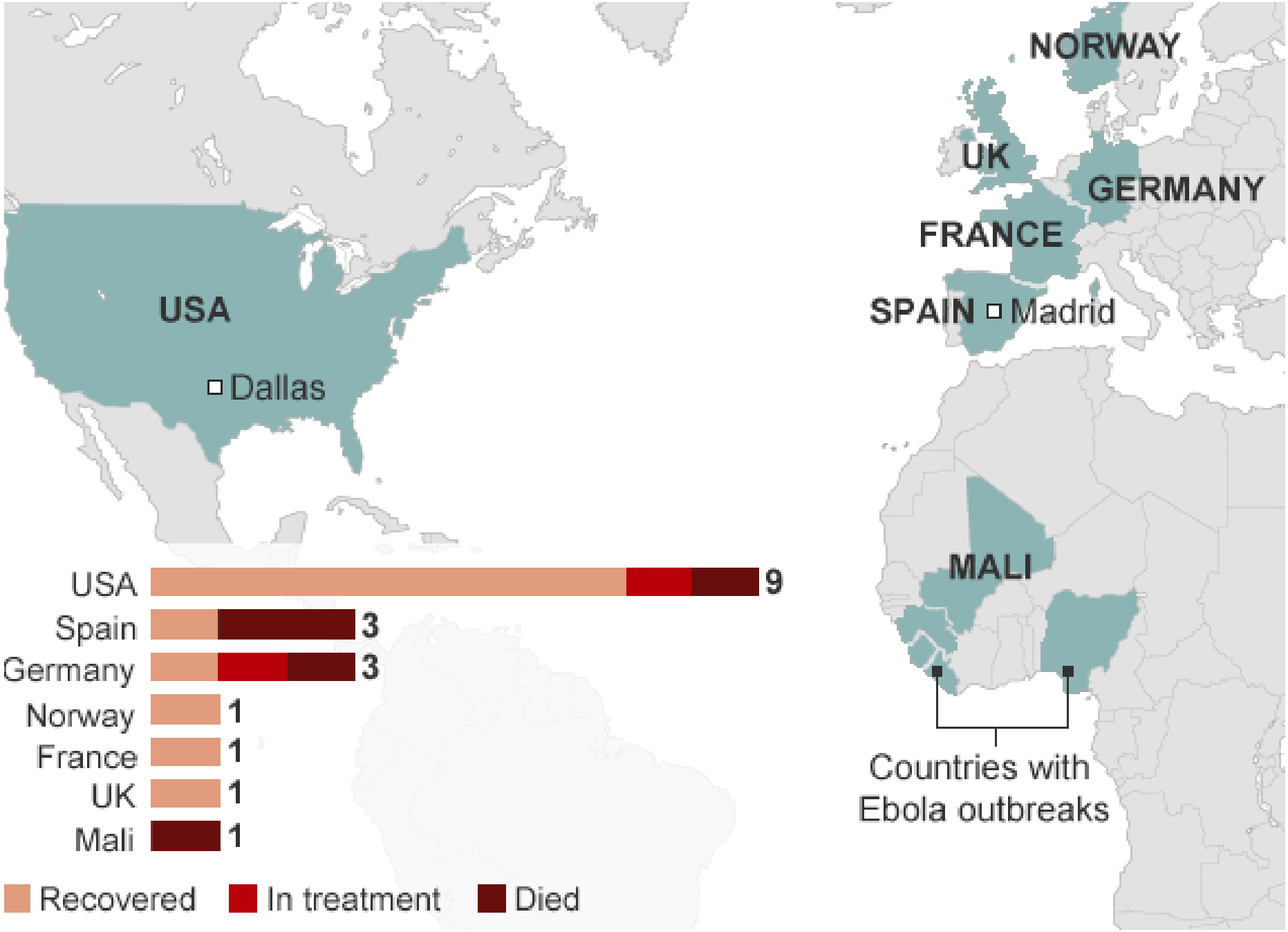


Figure 4. Observed and Projected Case Incidence.

NEJM, 23 Eylül 2014


NORWAY
UK
GERMANY
FRANCE
SPAIN
Madrid
USA
Dallas
MALI
USA 9
Spain 3
Germany 3
Norway 1
France 1
UK 1
Mali 1
Recovered
In treatment
Died
Countries with Ebola outbreaks

31 Ekim 2014

Ebola outbreak: Nurse infected in Spain

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Media Statement

For Immediate Release: Sunday, October 12, 2014
Contact: Media Relations
(404) 639-3286

CDC Confirms Healthcare Worker Who Provided Care for First Patient Positive for Ebola

Patient isolated and public health investigation ongoing

Today, the Centers for Disease Control and Prevention (CDC) confirmed test results reported late last night by the Texas Department of State Health Services' public health laboratory showing that a healthcare worker at Texas Presbyterian Hospital is positive for Ebola. The healthcare worker, who provided care for the Dallas index patient, was isolated soon after symptoms started and remains so now.

On Friday, October 10, the healthcare worker reported a low-grade fever overnight and was referred for testing. The healthcare worker had been self-monitoring for fever and symptoms. As a precaution, after identification of fever, the healthcare worker was isolated and CDC staff interviewed the patient to determine additional contacts or potential exposures. At this time, one close contact has been identified and is being monitored.

İspanyol Hemşirenin Köpeği Öldürüldü

Ebola Virus Antibody Prevalence in Dogs and Human Risk

Loïs Allela,*[1] Olivier Bourry,*[1] Ré… …ilippe Yaba,* Brice Kumulungui,*
Pierre Rouqu… …ric M. Leroy*‡

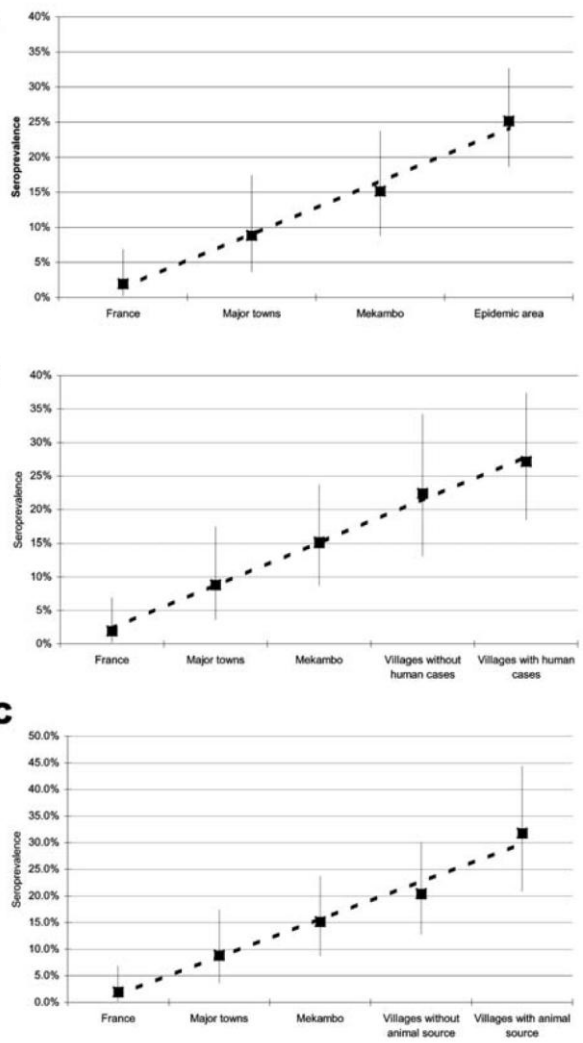
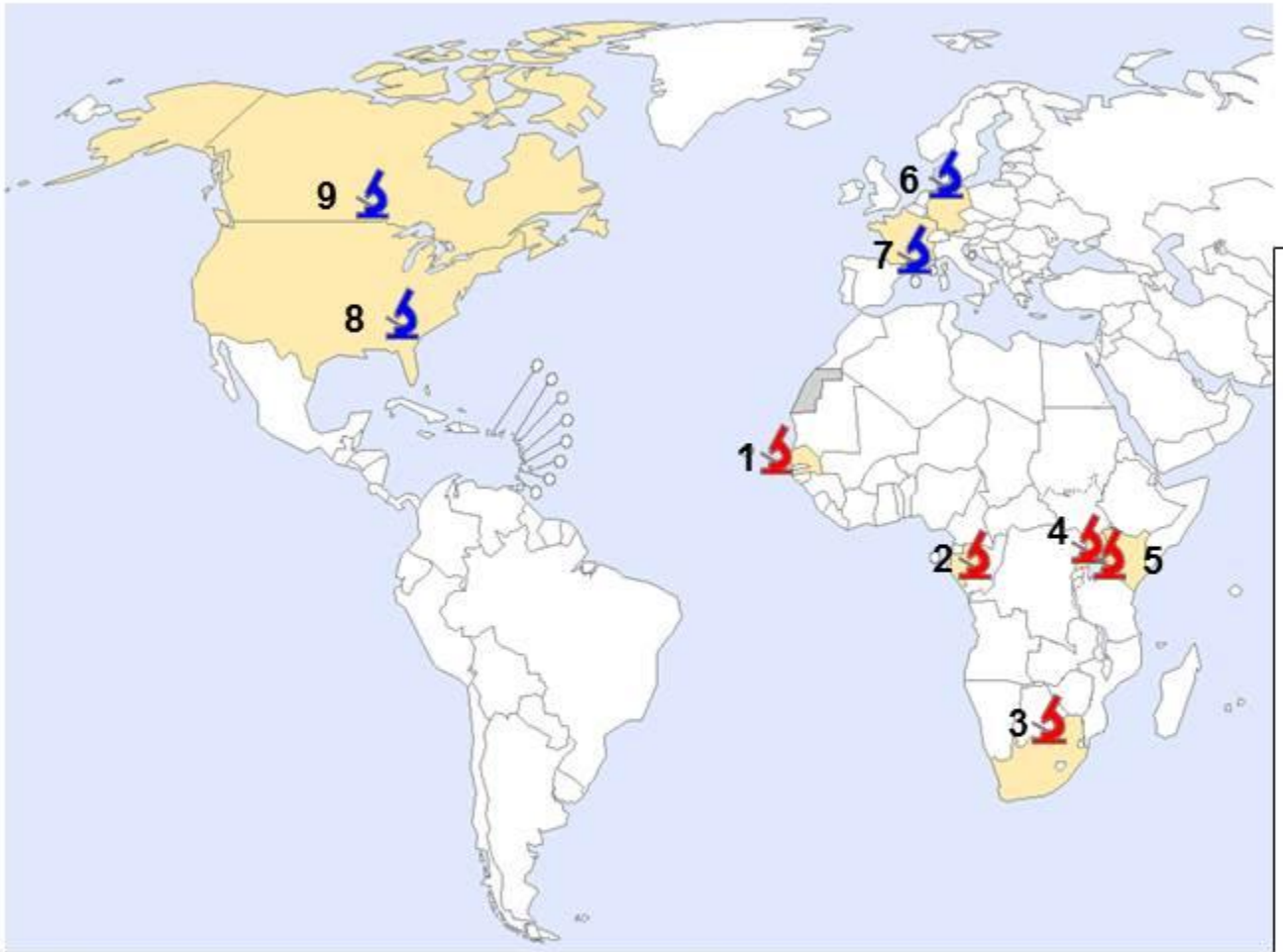


Table 2. Prevalence rates of Ebola-specific i… …n different areas and villages

Area/village characteristic	…evalence* (%)	95% confidence interval (%)
France	2	0.2–6.9
Major towns (Libreville and Port Gentil)	8.9	3.6–17.4
Mekambo	15.2	8.7–23.8
Ebola virus–epidemic area (villages)	25.2	18.6–32.6
Villages with human cases	27.2	18.4–37.4
Villages without human cases	22.4	13.1–34.2
Villages with human cases and animal sourc…	31.8	20.9–44.4
Villages with human cases, without animal s…	15.4	4.4–34.9

EID, 2005

Ebola Virus Disease in West Africa
EDPLN laboratories for Ebola or Marburg virus diagnostic



EDPLN : Emerging and Dangerous pathogens Laboratory Network

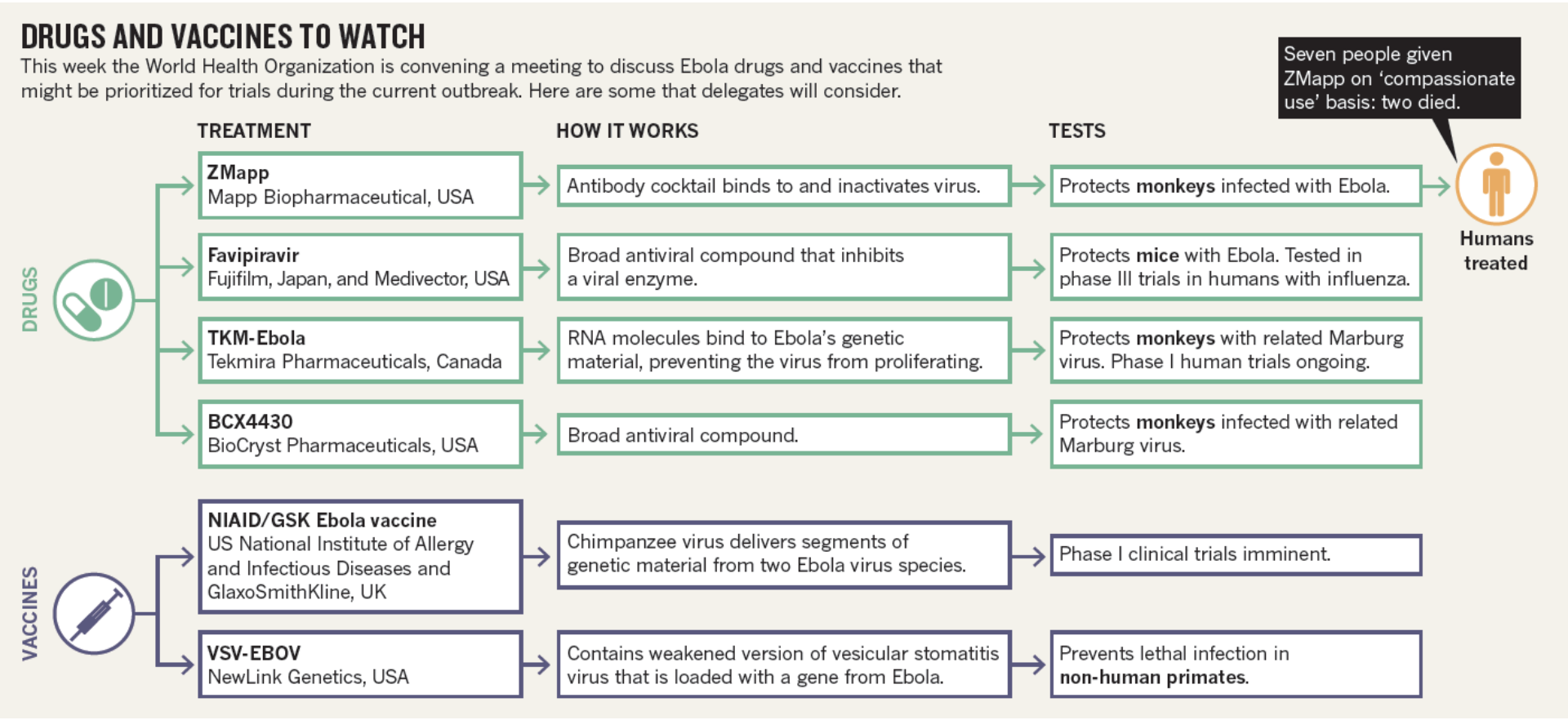
1. **Senegal**
   Institut Pasteur de Dakar
2. **Gabon**
   Centre International de Recherches Médicales de Franceville
3. **South Africa**
   National Institute for Communicable Diseases
4. **Uganda**
   Uganda Virology Research Institute
5. **Kenya**
   Kenya Medical Research Institute (KEMRI)
6. **Germany**
   Bernhard-Nocht-Institut für Tropenmedizin (BNI)
7. **France**
   Institut Pasteur Lyon et Paris
8. **United States of America**
   Centers for Disease Control and Infection
9. **Canada**
   National Microbiology Laboratory
   Public Health Agency of Canada

AFR-EDPLN laboratories with capacity for Ebola or Marburg virus diagnostic

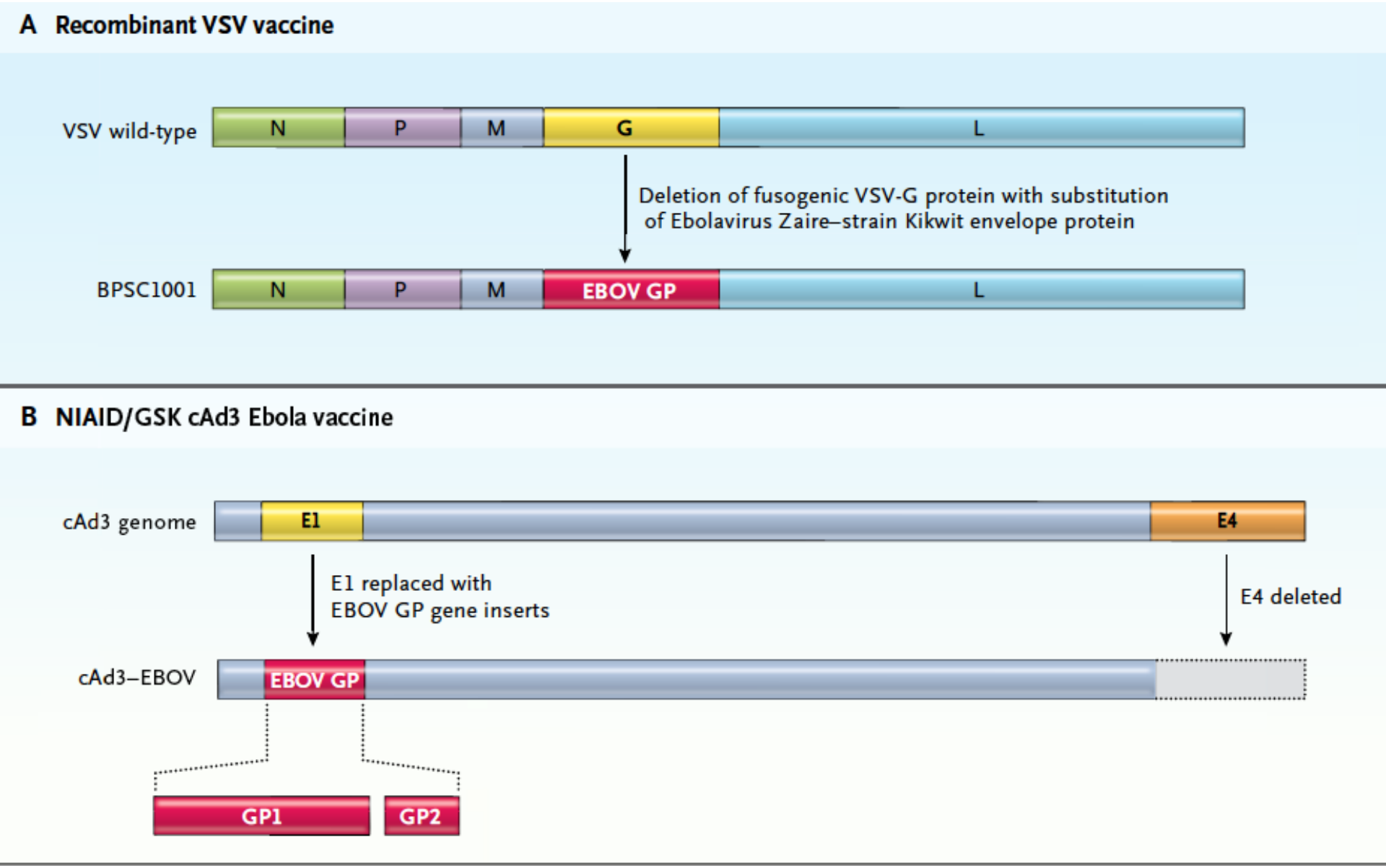
Global EDPLN laboratories supporting the Guinea Ebola outbreak response

Source: WHO, 10 April 2014

İlaçlar ve Aşılar



Ebola Aşı Adayları



NEJM, 7 Ekim 2014

HEALTH EBOLA

Ebola Healthcare Workers Are Dying Faster Than Their Patients

Jack Linshi @jacklinshi | Oct. 3, 2014

The bulk of healthcare workers are locals who don't have enough resources or training to treat not only their patients, but also each other

HABERLER »

EBOLA'NIN AVRUPA'DA YAYILMA OLASILIĞI DÜŞÜK / ANCAK YENİ OLGULARLA KARŞILAŞILMASI "KAÇINILMAZ"

Risk of Ebola spreading in Europe is very low: statement by Zsuzsanna Jakab, WHO Regional Director for Europe

WEST AFRICA
Ebola Outbreak

The 2014 Ebola epidemic is the largest in history and is affecting multiple countries.

Likely host = bats

1 in 2

people who get Ebola in this outbreak have died.

How do you get the Ebola virus?

Direct contact with

1. **Body fluids of a person who is sick with or has died from Ebola.** (blood, vomit, pee, poop, sweat, semen, spit, other fluids)
2. **Objects contaminated with the virus** (needles, medical equipment)
3. **Infected fruit bats or primates** (apes and monkeys)

Early Symptoms

Ebola can only be spread to others after symptoms begin. Symptoms can appear from 2 to 21 days after exposure.

- **Fever**
- **Headache**
- **Diarrhea**
- **Vomiting**
- **Stomach pain**
- **Unexplained bleeding or bruising**
- **Muscle pain**

When is someone able to spread the disease to others?

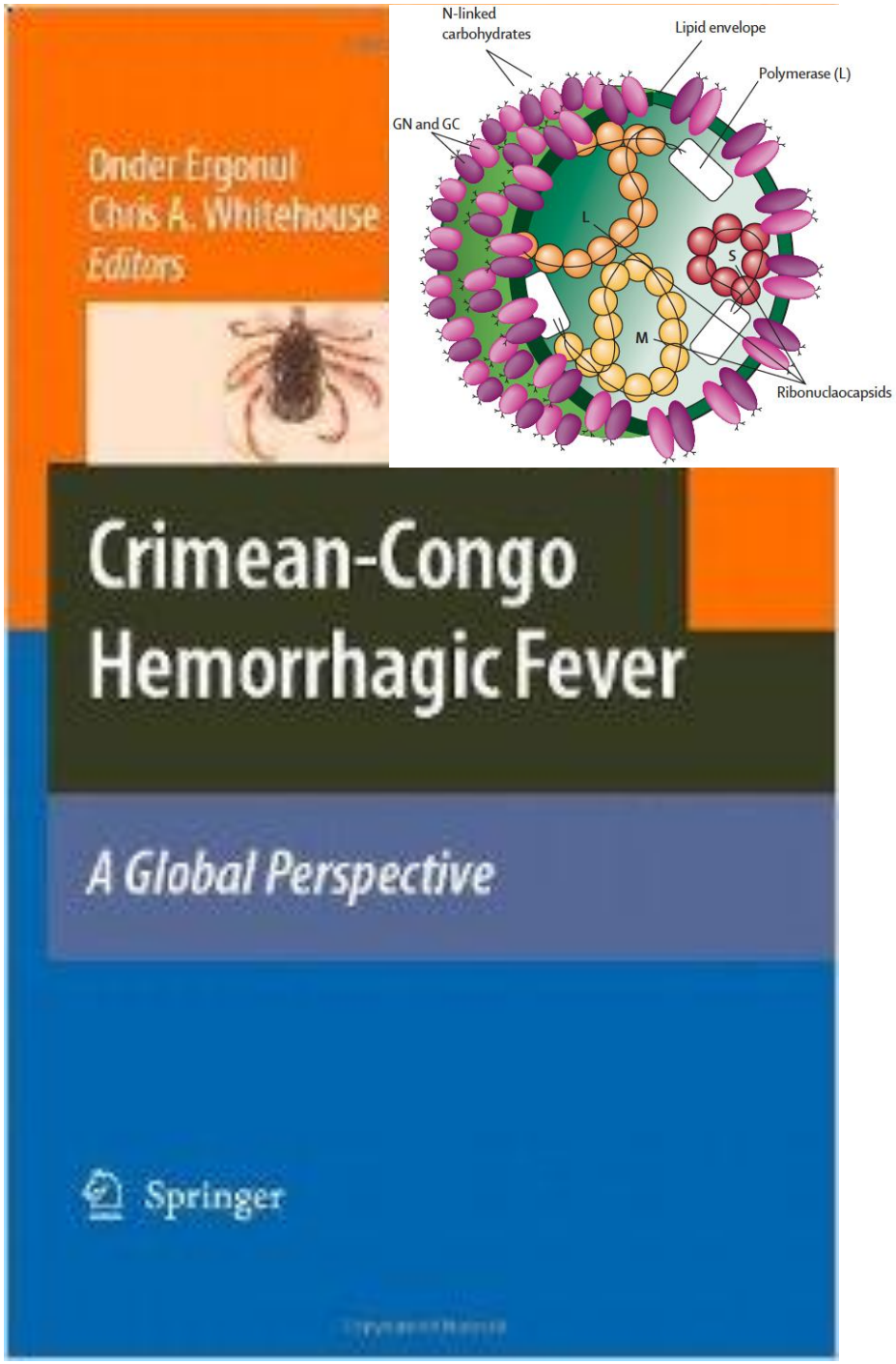
Ebola only spreads when people are sick.
A patient must have symptoms to spread the disease to others.

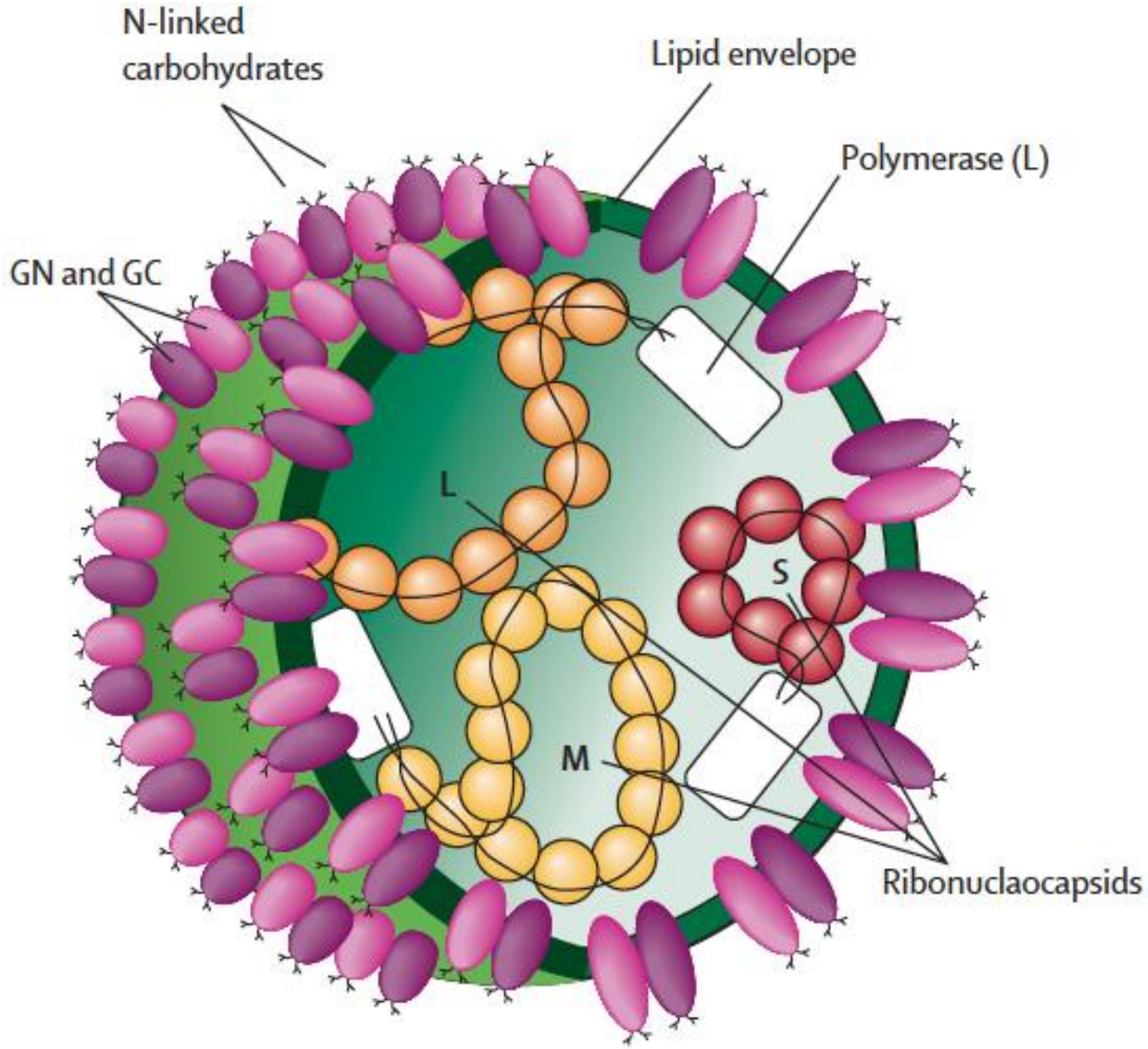
MONTH						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

After 21 days, if an exposed person does not develop symptoms, they will not become sick with Ebola.

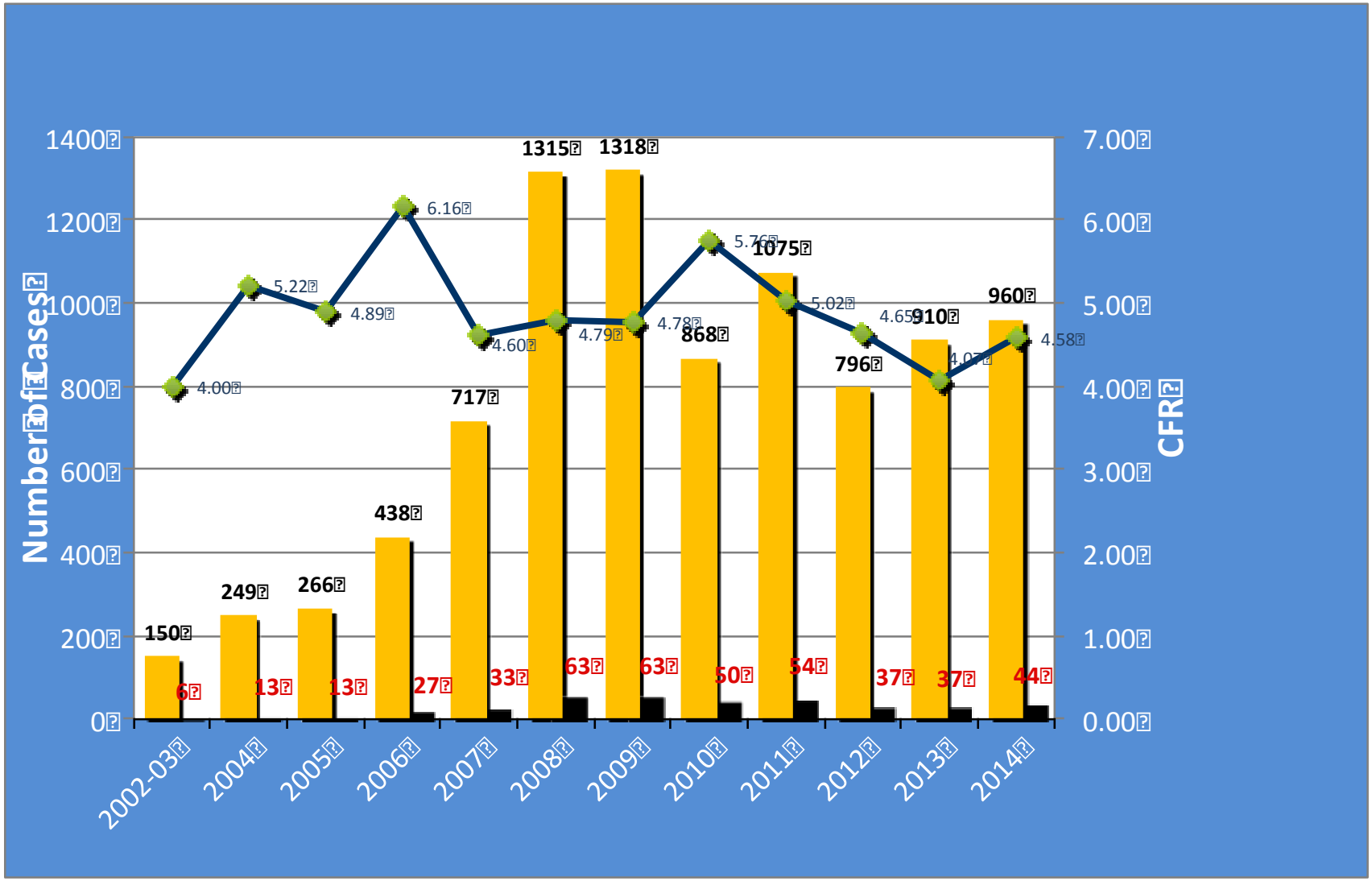
U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

CS250531


Onder Ergonul
Chris A. Whitehouse
Editors
N-linked carbohydrates
Lipid envelope
Polymerase (L)
GN and GC
L
S
M
Ribonuclaocapsids
Crimean-Congo Hemorrhagic Fever
A Global Perspective
Springer

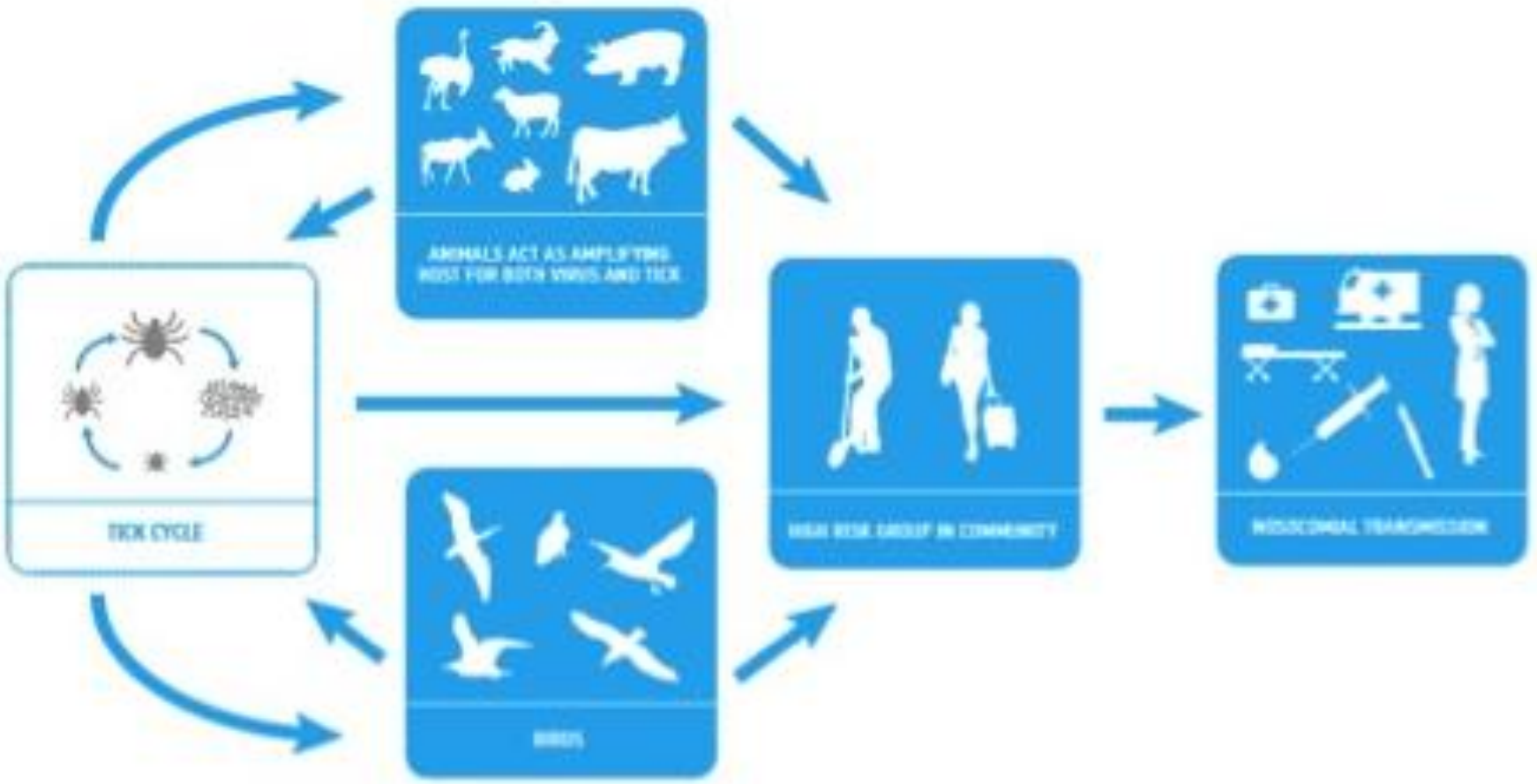

N-linked
carbohydrates
Lipid envelope
Polymerase (L)
GN and GC
L
S
M
Ribonuclaocapsids

Cases and Case Fatality Rate: 2002-2014



MoH, Public Health Institute, Turkey

Crimean-Congo Hemorrhagic Fever



Ergonul O, In Emerging Infections, 2014, Elsevier

İğneyi yanlışlıkla kendine batıran doktor öldü

Ondokuz Mayıs Üniversitesi (OMÜ) Sağlık Araştırma ve Uygulama Merkezi acil servisine başvuran Kırım Kongo Kanamalı Ateşi (KKKA) hastasında kullanılan iğneyi yanlışlıkla kendine batıran doktor Mustafa Bilgiç, tedavi gördüğü yoğun bakım servisinde müdahalelere rağmen kurtarılamadı.

AA | 22 EYLÜL 2012, 11:42

GÜNDEM

GÜNDEM

Sarayda Hanedan'ın muhteşem düğünü

Crimean-Congo Hemorrhagic Fever among Health Care Workers, Turkey

Aysel Kocagul Celikbas, Başak Dokuzoğuz, Nurcam Baykam, Sebnem Eren Gok, Mustafa Necati Eroğlu, Kenan Midilli, Herve Zeller, and Onder Ergonul

Table 1. Clinical and laboratory findings of HCWs in whom Crimean-Congo hemorrhagic fever developed after occupational exposure, Turkey, 2004–2011*†

HCW, outcome	Body temperature, °C	Bleeding	Leukocytes/ mm^3	Platelets/ mm^3	AST	ALT	APTT	Fibrinogen	SSI
1, survived	38.5	No	800	42,000	425	346	44	225	Moderate
2, survived	37.2	No	1100	53,000	145	81	43	270	Mild
3, died	40.5	Ecchymosis, hematemesis, melena, hematuria	11,100	40,000	251	277	90	171	Severe
4, survived	40.5	No	2,900	78,000	150	110	37.4	250	Mild
5, survived	39	Epistaxis	1,800	58,000	167	129	64	218	Moderate
6, survived	40.5	No	1,800	44,000	123	216	40.5	165	Moderate
7, survived	39.1	No	3,100	13,000	418	132	40.9	170	Moderate

*HCW, health care worker; AST, aspartate aminotransferase; ALT, alanine aminotransferase; APTT, activated partial thromboplastin time ; SSI, severity score index.
†Reference values: leukocytes, 4,000–11,000/mm^3; platelets, 150,000–450,000/mm^3; AST, <50 IU/L; ALT, <50 IU/L; APTT, 24–36 sec; fibrinogen, 200–400 mg/dL.

Emerg Infect Dis 2014

Table 2. Demographic features of HCWs with occupational exposure to Crimean-Conger hemorrhagic fever virus, Turkey, 2004–2011*

Episode, outcome†	HCW age, y/sex/profession	Procedure	Transmission route	Ribavirin for postexposure prophylaxis	Ribavirin for therapy (no. d after symptom onset)	Fatal
Episode 1; survived, her baby died	36/M/nurse	Wound care	Contact with surgical wound without protective equipment	No	Yes (0)	No
	31/F/nurse	Intubation, aspiration	Aerosol and droplet and contact without protective equipment	No	No	No
Episode 2; died	28/F/nurse	Phlebotomy	Needlestick	No	Yes (3)	Yes
Episode 3; died	41/M/physician	Resuscitation	Aerosol and droplet	–	Yes (0)	No
	26/M/physician	Nasal tamponade	Indirect contact	–	Yes (0)	No
	29/M/physician	Nasal tamponade	Indirect contact	–	Yes (0)	No
Episode 4; survived	30/M/nurse	Phlebotomy	Needlestick	No	Yes (1)	No
Episode 5; survived	30/F/nurse	Phlebotomy	Needlestick	Yes	–	No
Episode 6; survived	24/F/physician	Phlebotomy	Needlestick	Yes	–	No

*HCW, health care worker; –, ribavirin not necessary.
†Outcome for the index case-patient in each episode.

Emerg Infect Dis 2014


Мудири шўъба
дуктури ихтисоси олй
Умаров Аскарали
Камбарович
(1959-2009)

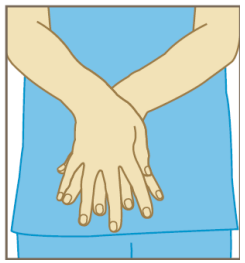

STAR TRIBUNE
SACK
Biri aksırdığı anda
ipi kes

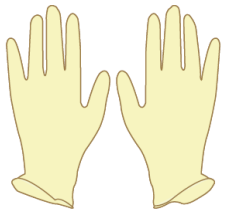
Sağlık Çalışanları Nasıl Giyinmeli?

http://www.mkk.de/cms/media/bilder/presse/2002/50/Lassa.jpg

Hand hygiene and use of PPE based on risk assessment

- Always before and after patient contact, and after contact with contaminated environmental surfaces or equipment
- If direct contact with patient's blood and body fluids, secretions, excretions, mucous membranes or non-intact skin
- If there is a risk of spills onto the health-care worker's face





Airborne transmission of VHF?

- Suspected in Lassa Fever outbreak in 1969

  (Carey, D. et al. Trans.R.Soc.Trop.Med Hyg., 1972; 66 (3): 402-408).

- No documented case of airborne transmission.
- Suspected airborne transmission of Ebola Reston in monkeys (Jaax, N. et al. Lancet, 1995; 346 : 1669-1671).

2007 CDC recommendations

- Person-to-person transmission is associated primarily with direct BBF contact
- Percutaneous exposure carries a particularly high risk for transmission and increased mortality
- In less developed countries, outbreaks of HFVs have been controlled with basic hygiene, barrier precautions, safe injection practices, and safe burial practices
- Use of a respirator (N95 or FFP2 - EN 149) is recommended during aerosol-generating procedures when the aerosol is likely to contain [airborne pathogens] *M. tuberculosis*, SARS-CoV, or avian or pandemic influenza viruses

http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Isolation2007.pdf

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

Korunmak için Özet

- Temas ve damlacık önlemlerinin sıkı takibi
- Standart önlemler; kan ve vücut sıvılarının sıkı takibi
  - Entegre strateji
  - El hijyeni
  - Kişisel koruyucu malzeme
  - Kesici ve delici alet kutularının kullanımı
  - Emniyetli enjektör ve benzeri aletler
  - Maruziyet sonrası takip
  - Yönetsel önlemler: protokoller, planlamalar

AMERİKAN HASTANESİ

ACİL POLİKLİNİK EBOLA KLİNİK YOLU

≥ 38.5°C ATEŞİLE BİRLİKTE

Aşağıdaki klinik bulgulardan en az birisinin varlığı;

- Ciddi başağrısı,
- Kas ağrısı,
- Aşırı halsizlik,
- Bulantı,
- Kusma,
- İshal,
- Karın ağrısı

(Değerlendirme için Triyaj Odası tercih edilir.)

EVET → Mutlaka Cerrahi Maske takılmalı, Standart Önlemler'e uyulmalı!

Semptomlar ortaya çıkmadan önceki 21 gün içinde;

- Doğrulanmış veya şüpheli Ebola Virüs Hastalığı vakasının kan veya diğer vücut sıvıları ile temas veya
- Ebola Virüs Hastalığının aktif olarak yayılımının olduğu bölgede yaşıyor olmak veya
- Bulaşın aktif olduğu bölgeye seyahat etmek veya
- Endemik bölgede yarasa, kemirgen veya maymun, şempanze gibi primatlar ile doğrudan temas (dokunma, ısırılma, etini yemek vb).

EVET

Hastanın Alınacağı Oda

(15 no'lu Negatif Basınçlı Muayene Odası tercih edilir.)

Havalandırması iyi olan bir odada takip önerilmektedir. Negatif basınçlı oda şart değildir. Uygun olması durumunda negatif basınçlı oda tercih edilir.

* Bakım Onarım Bölümü ile görüşülerek ve oda girişinde bulunan Barometreden odanın havalandırması kontrol edilir.

Alınması Gereken Önlemler

Uygun el hijyeni sağlanır.

Önerilen Koruyucu Malzemeler: Eldiven, N95 Maske, Koruyucu Gözlük, İzolasyon Önlüğü (her kullanım sonrası kirli kovasına atılacak)

Odada Bulunması Gerekenler: Kesici-Delici Alet Atık Kutusu, Tıbbi Atık Kutusu, Sarı Renkli Enfekte Çamaşır Poşeti, Alkol Bazlı El Dezenfektanı

Öneriler:

İnvaziv işlemler en aza indirgenmeli.

Tek kullanımlık alet ve malzemeler tercih edilmeli.

Kullanılacak malzemeler hastaya özel olmalı odadan dışarı çıkarılmamalı.

***Universal Önlemler Paketi kullanılabilir.**

(Göz koruyuculu maske, sıvı geçirmez koruyucu önlük, iğne batmaz eldiven)

HAYIR

Kliniği açıklayacak başka bir tanı yönünden değerlendirilir.

Örneğin: Sıtma, Mers-Cov, Kırım Kongo Kanamalı Ateşi gibi

ARANACAK KİŞİLER

- BAŞHEKİM
- ENFEKSİYON HASTALIKLARI UZMANI
- ENFEKSİYON KONTROL HEMŞİRESİ
- SÜPERVİZÖR
- LABORATUVAR ŞEFİ

Hastadan Alınması Gereken Örnek

EDTA veya SİTRATLI tüpe (Mor Kapaklı) (4,5ml) alınan örnek kilitli poşete, ardından örnek taşıma çantasına koyulur. Laboratuvara EBOLA şüphesi bilgisi verilerek teslim edilir.

Laboratuvar tarafından en az 1ml olacak şekilde ayrıştırılan serum örneği Referans Laboratuvarı'na soğuk zincir ile gönderilir.

TABURCU ETME ÖNERİLERİ

Uygun bir şekilde referans hastaneye transfer edilir ve / veya laboratuvar ve klinik bulguları iyileşen hastalar taburcu edilip ayaktan izlenebilir.

HASTA TABURCU EDİLİNCE

ENFEKSİYONLU HASTA ODASI TEMİZLEME talimatı doğrultusunda oda temizliği yapılır.

Hastaya kullanılan malzemelerin temizlik ve dezenfeksiyonu oda içerisinde yapılır.

Nakil Süreci

- **Hasta nakli için Ambulans: 112** "EBOLA" bulguları olduğu mutlaka belirtilir.
- Transfer edilecek hastaneye bilgi verilir.

Bakanlığın önerdiği koruyucu ekipmanlar ile hastanın transferini sağlamak ambulansın sorumluluğundadır.


TEMİZ
ELLER