



COREB – ESR
Animation opérationnelle du réseau national
3^{ème} Rencontre – 29 juin 2017
Ministère des Affaires Sociales et de la Santé - Paris

An unexpected event in Spain: too much to learn



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Disclosure

- I belong to the High-Level Isolation Unit of La Paz-Carlos III Hospital
- I am not an expert on Viral Hemorrhagic Fevers

- But I have attended
 - 3 Ebola virus disease
 - 1 Crimean-Congo Haemorrhagic fever
 - More than 20 VHF suspected patients
 - More than 30 high risk contacts...
 -



By I. Columbina, ad vivum delineavit. Paulus Fürst Excud (i) t. - Internet Archive's copy of Eugen Holländer, Die Karikatur und Satire in der Medizin: Medico-Kunsthistorische Studie von Professor Dr. Eugen Holländer, 2nd edn (Stuttgart:Ferdinand Enke, 1921), fig. 79 (p. 171)., Public Domain, <https://commons.wikimedia.org/w/index.php?curid=15677032>

Microbiology by numbers

- ~ **1400** human pathogens
- **< 1%** of the total number of microbial species on the planet
- **177** emergent or reemergent

Newly emerging infectious diseases

Diseases that are recognized in the human host for the

first time

CENTERS FOR DISEASE CONTROL

MNWR[™]

MORBIDITY AND MORTALITY WEEKLY REPORT

June 5, 1981

***Pneumocystis Pneumonia –
Los Angeles***

July 4, 1981

***Kaposi's Sarcoma and
Pneumocystis Pneumonia Among
Homosexual Men –
New York City and California***

Individuals living with HIV in 2015



Total: 36.7 million [34.0 million–39.8 million]

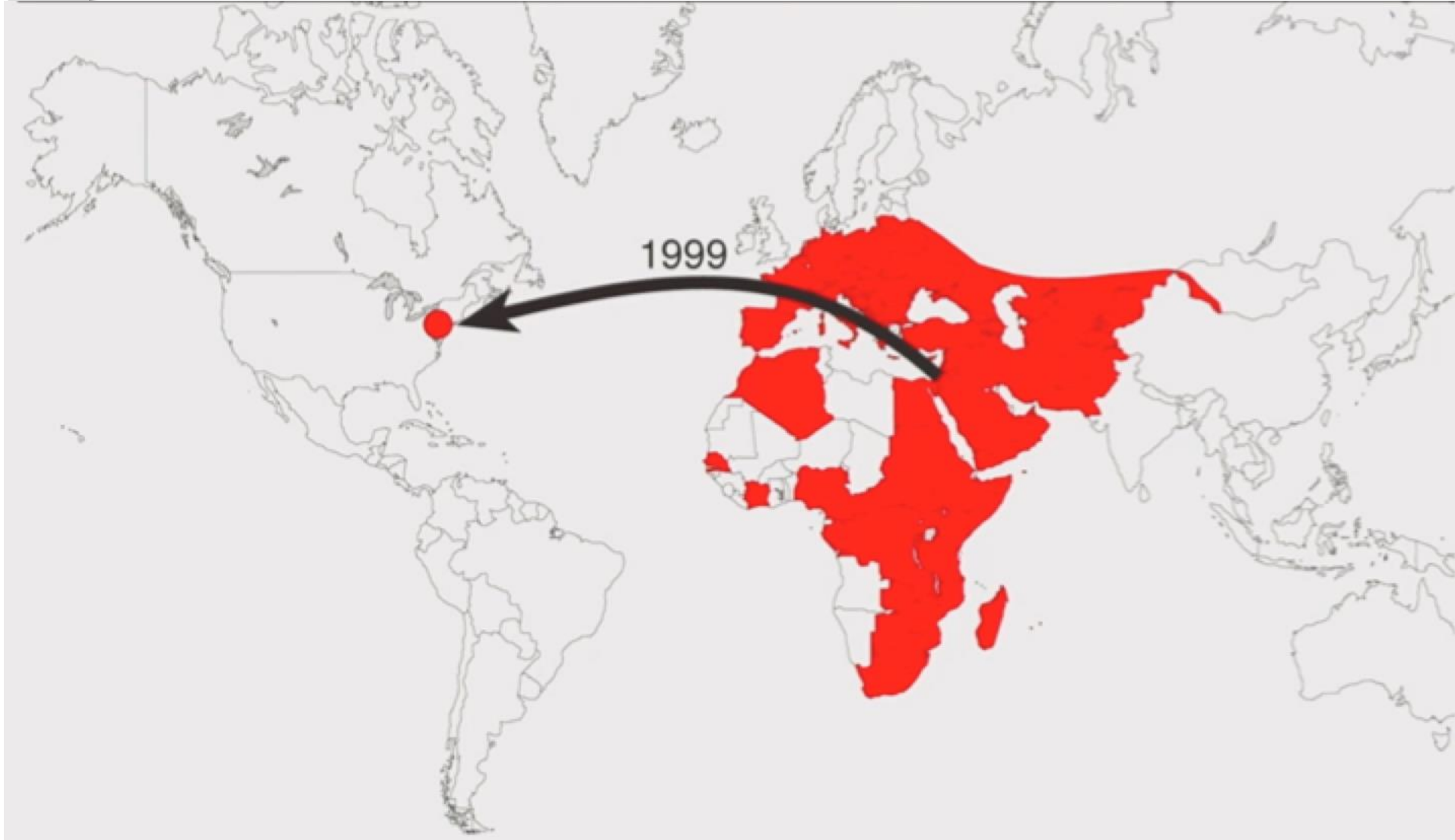
Newly emerging infectious diseases

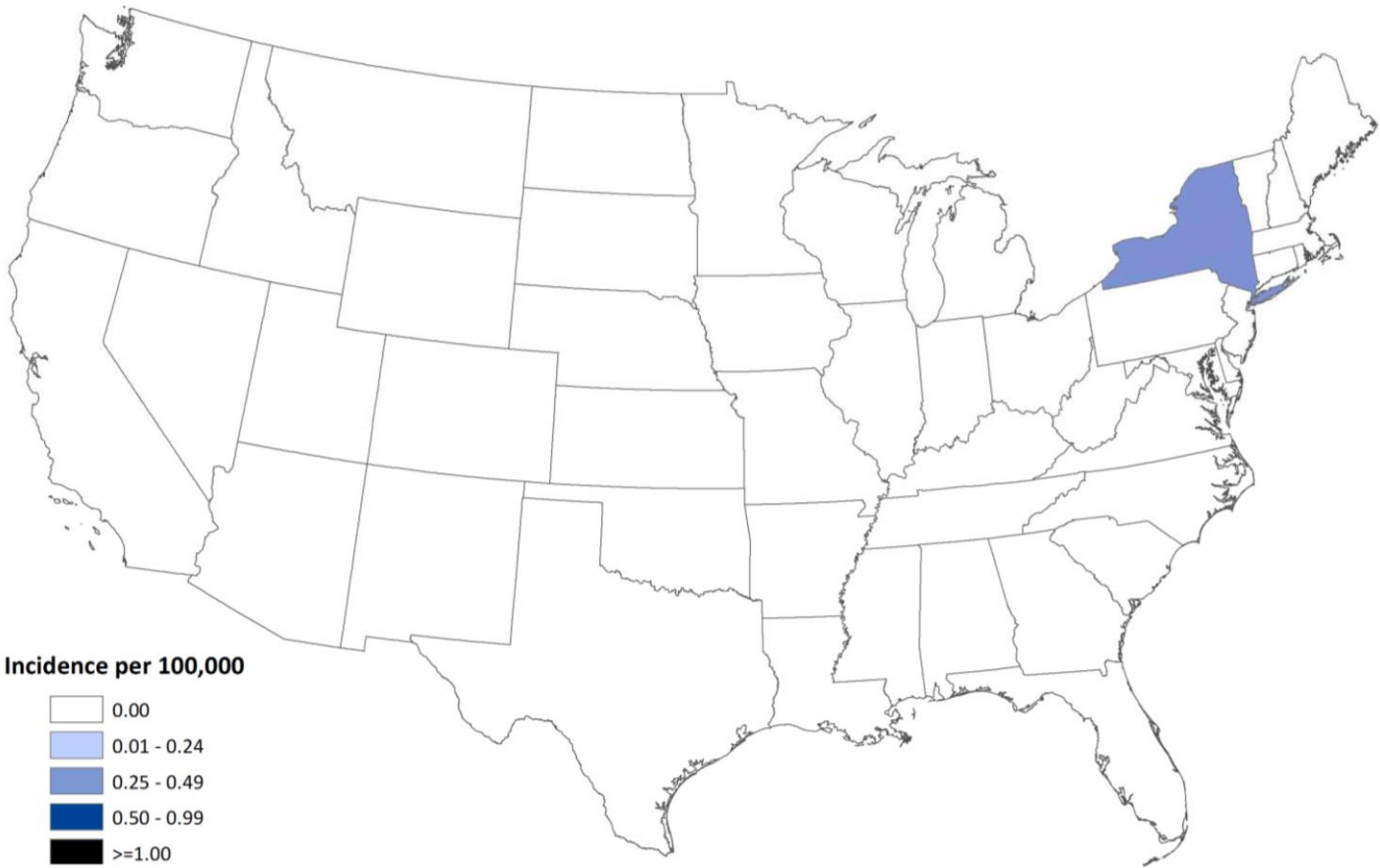
Diseases that are recognized in the human host for the

first time

Diseases that historically have infected humans but continue to reappear either in

new locations

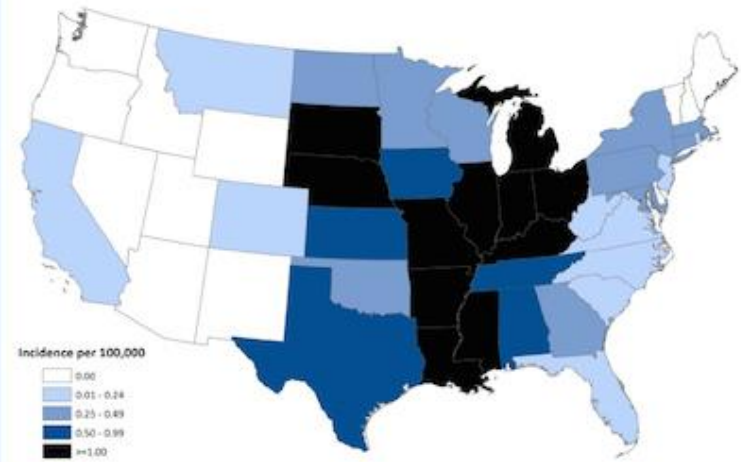




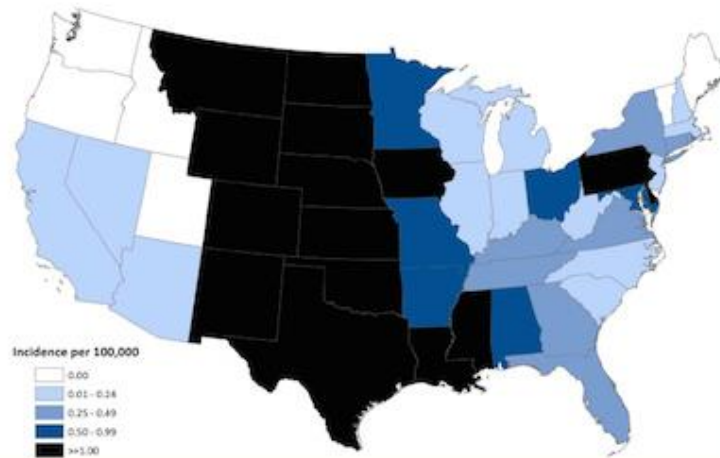
West Nile virus neuroinvasive disease incidence reported to ArboNET, by state, United States, 2001



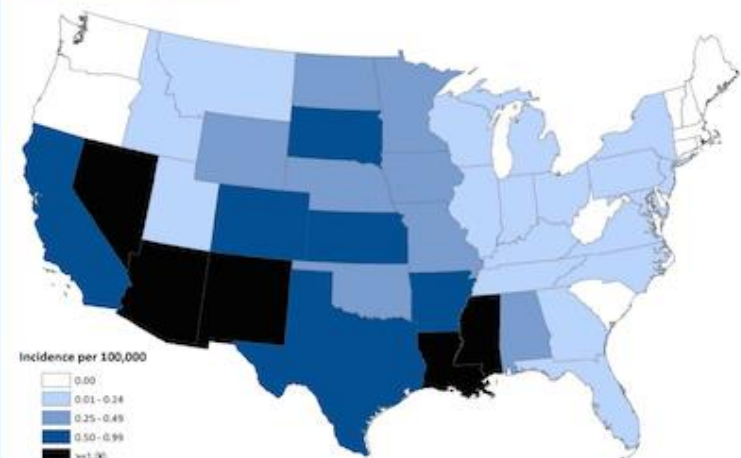
West Nile virus neuroinvasive disease incidence reported to ArboNET, by state, United States, 2002



West Nile virus neuroinvasive disease incidence reported to ArboNET, by state, United States, 2003



West Nile virus neuroinvasive disease incidence reported to ArboNET, by state, United States, 2004



Newly emerging infectious diseases

Diseases that are recognized in the human host for the

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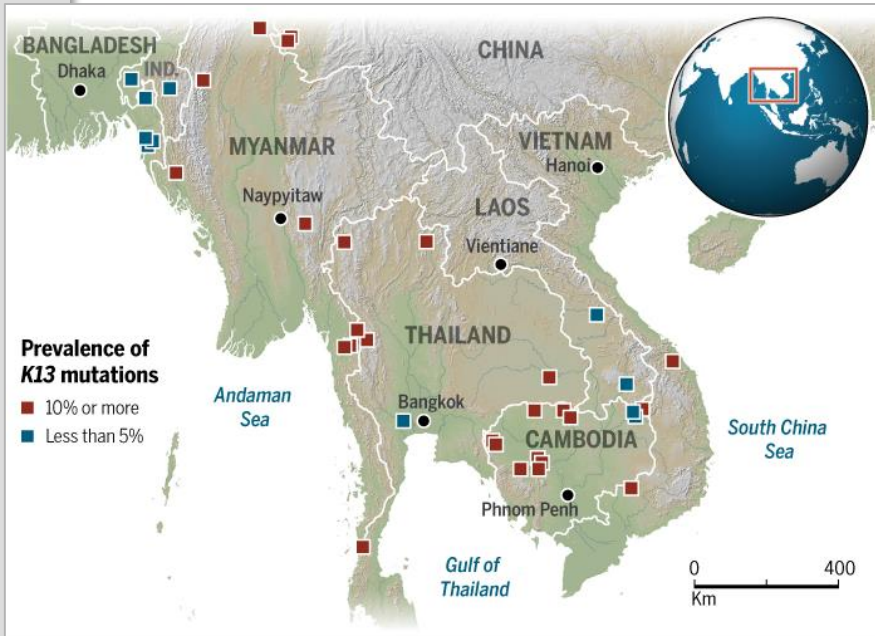
Diseases that historically have infected humans but continue to reappear either in

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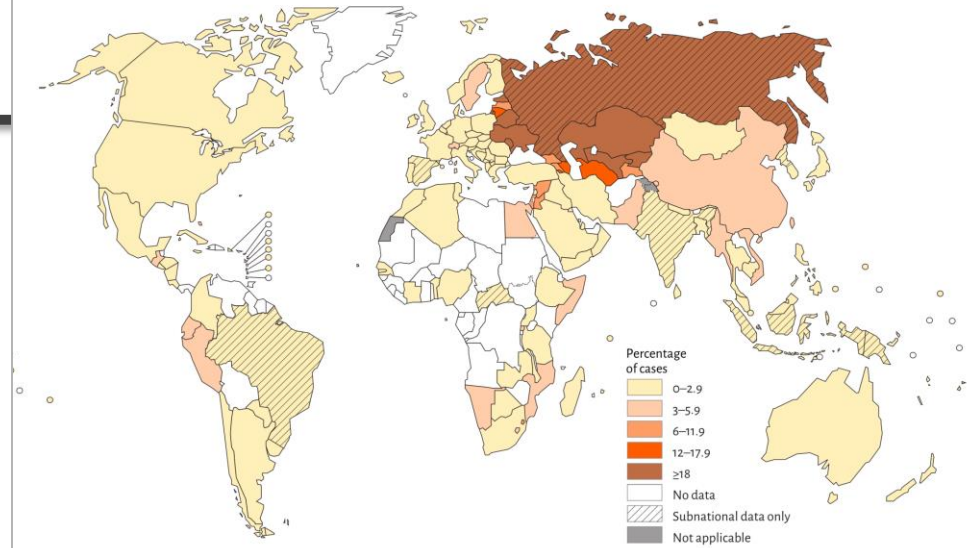
Diseases that historically have infected humans but continue to reappear either in **new locations** or in

resistant forms

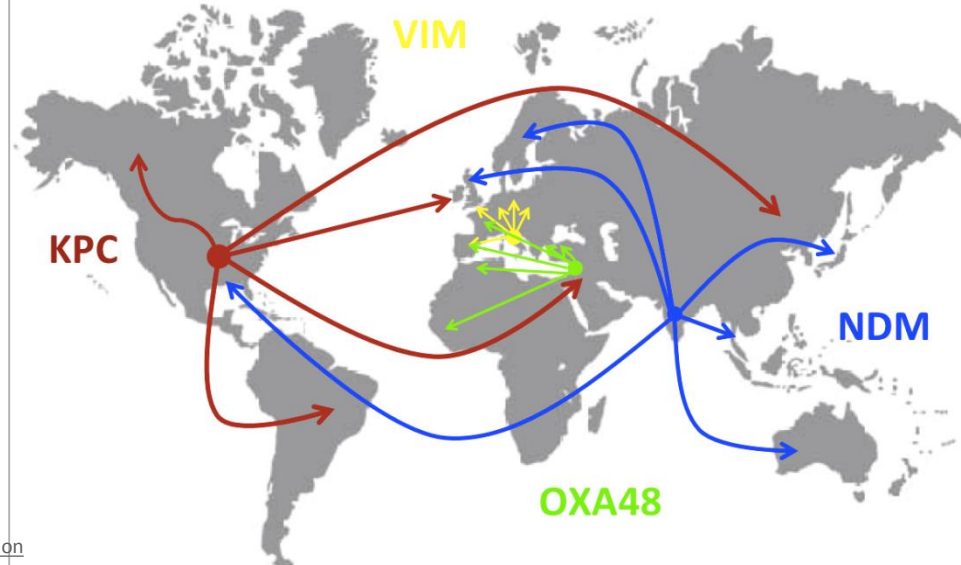
Artemisin-resistant Malaria



Percentage of new TB cases with MDR-TB



Carbapenemase-producer *Enterobacteriaceae* emergence



Newly emerging infectious diseases

Diseases that are recognized in the human host for the

first time

Diseases that historically have infected humans but continue to reappear either in

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Diseases that historically have infected humans but continue to reappear either in **new locations** or in

resistant forms

Diseases that historically have infected humans but continue to reappear either in **new locations** or in **resistant forms** or **reappear** after apparent control or elimination or under unusual circumstances

Meet The People Shaping The Future Of Energy: Reinventing Energy Summit - 25 November in London

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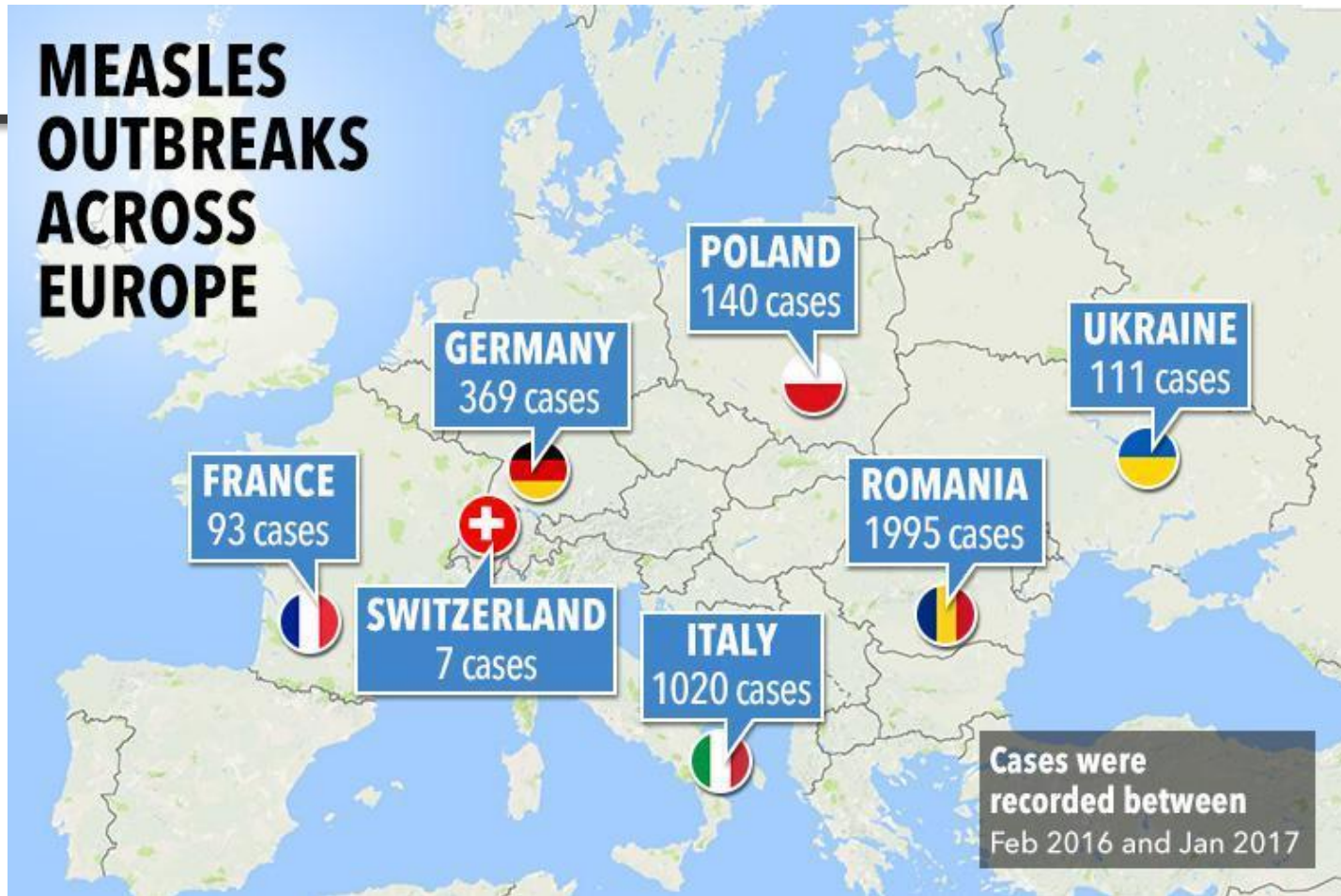
DAILY NEWS 5 May 2014

Global emergency declared as polio cases surge

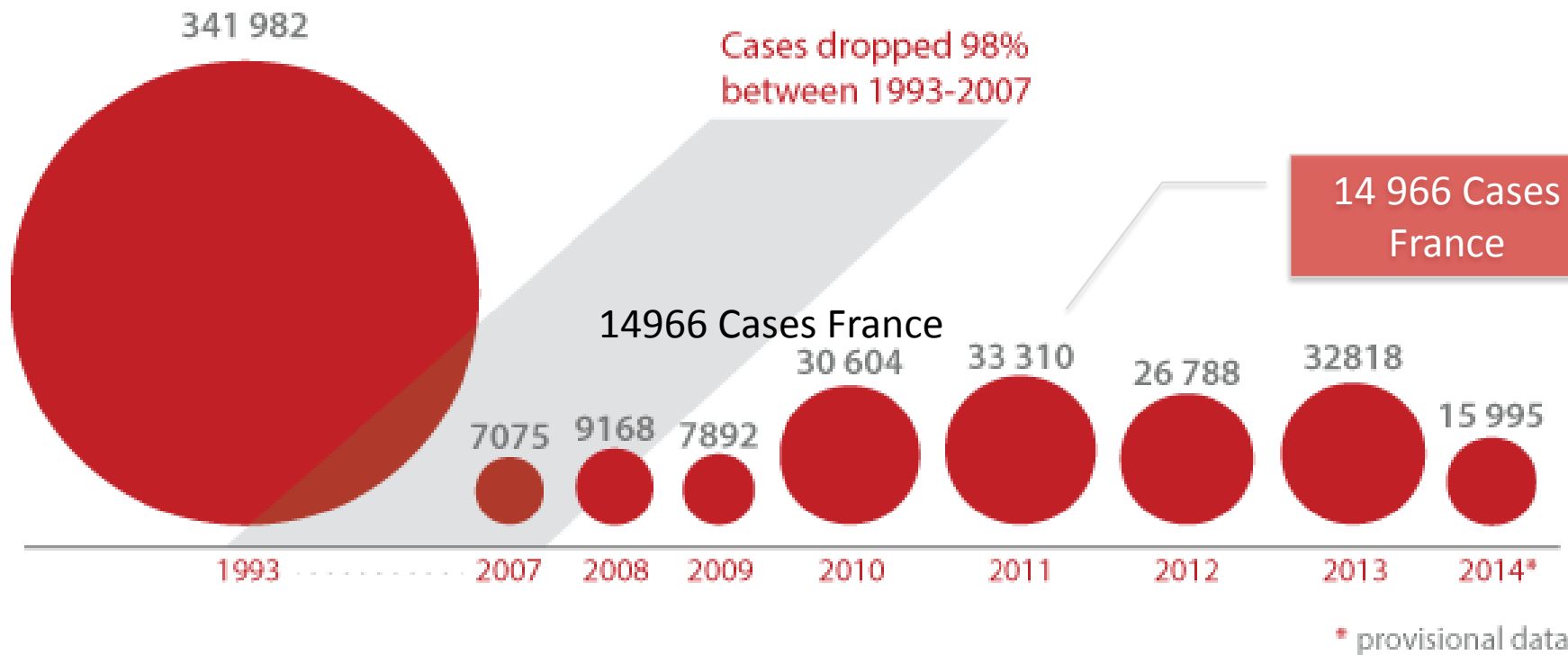
By Debora MacKenzie



MEASLES OUTBREAKS ACROSS EUROPE



Measles cases in the WHO European Region



Newly emerging infectious diseases

Diseases that are recognized in the human host for the **first time**

Diseases that historically have infected humans but continue to reappear either in **new locations**

Diseases that historically have infected humans but continue to reappear either in **new locations** or in **resistant forms**

Diseases that historically have infected humans but continue to reappear either in **new locations** or in **resistant forms** or **reappear** after apparent control or elimination or under unusual circumstances

BIOTERRORISM

2001 anthrax attacks



SPECIAL REWARD
Up to \$2.5 million



For information leading to the arrest and conviction of the individual(s) responsible for the mailing of letters containing anthrax to the New York Post, Tom Brokaw at NBC, Senator Tom Daschle and Senator Patrick Leahy:



**AS A RESULT OF EXPOSURE TO ANTHRAX,
FIVE (5) PEOPLE HAVE DIED.**

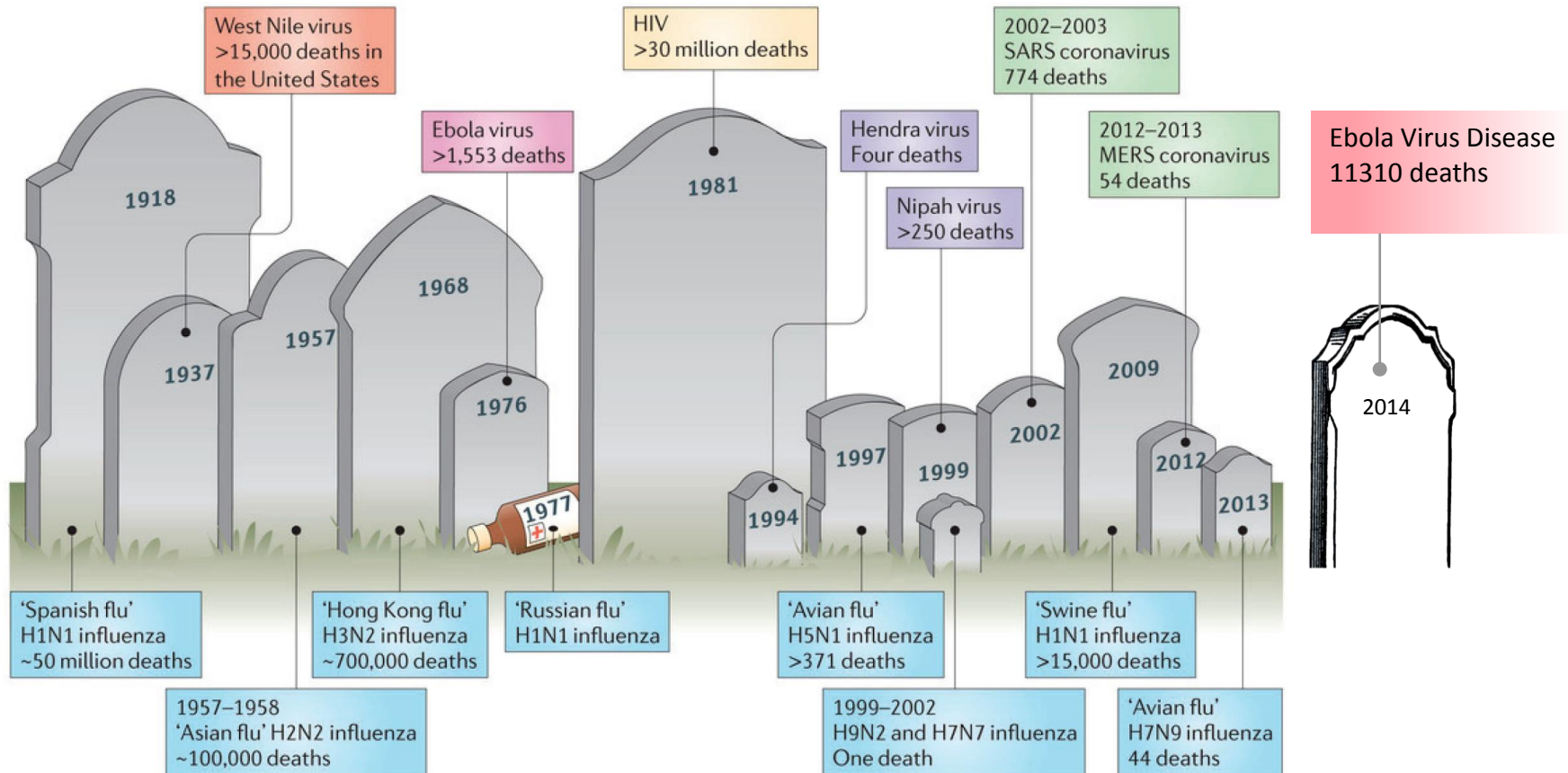
The person responsible for these deaths...

- Likely has a scientific background/work history which may include a specific familiarity with anthrax
- Has a level of comfort in and around the Trenton, NJ area due to present or prior association

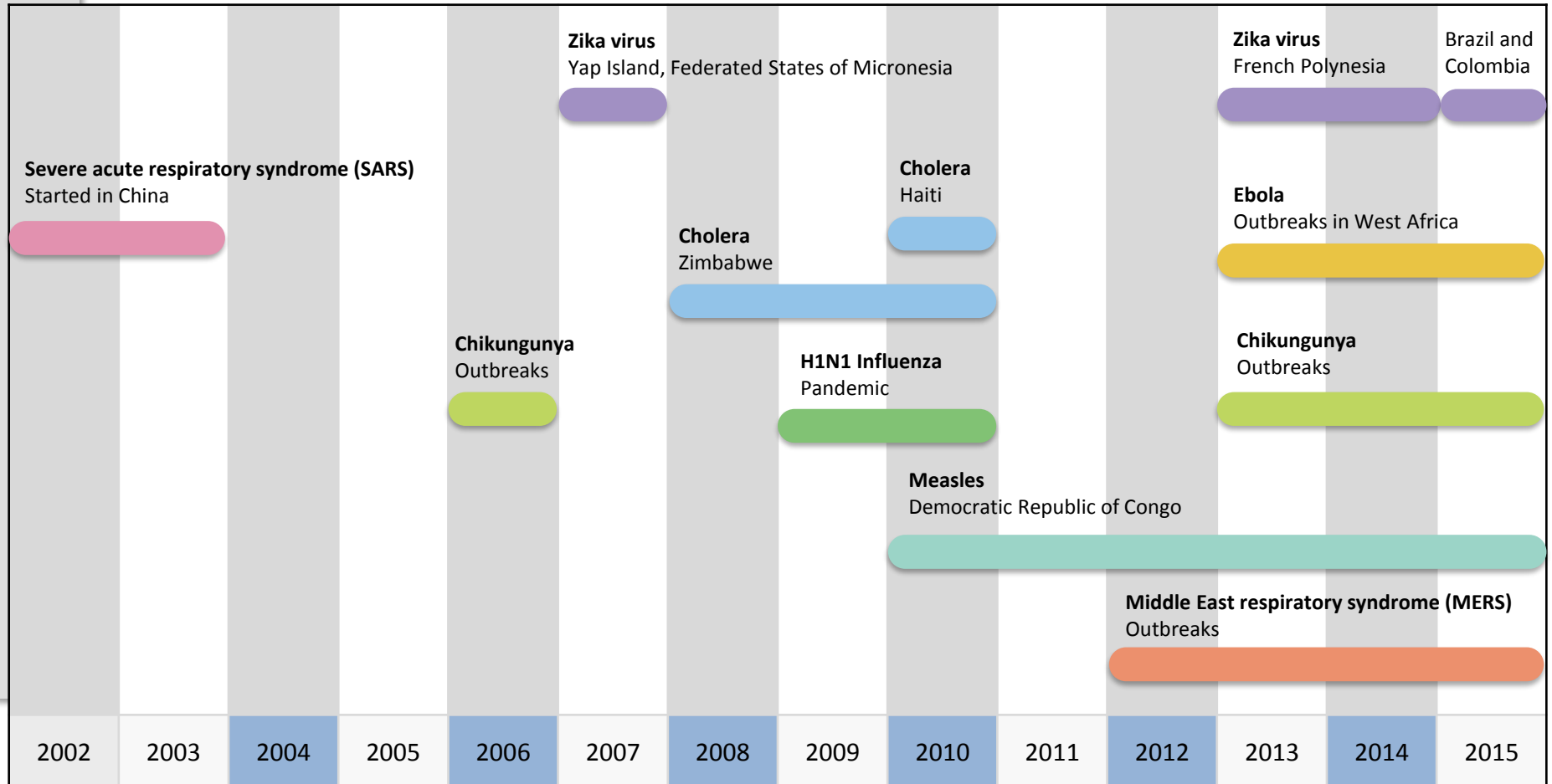
Anyone having information, contact **America's Most Wanted** at **1-800-CRIME TV** or the **FBI** via e-mail at **amerithrax@fbi.gov**

All information will be held in strict confidence. Reward payment will be made in accordance with the conditions of Postal Service Reward Poster 296, dated February 2000. Source of reward funds: U.S. Postal Service and FBI \$2,000,000; ADVO, Inc. \$500,000.

Emerging viral diseases. Mortality



Major Emerging and Reemerging Infectious-Disease Outbreaks, Epidemic, and Pandemics, 2005 through 2015



Top Emerging Pathogens Likely to Cause Severe Outbreaks in the Near Future

Diseases to be urgently addressed under the WHO Research and Development Blueprint

Crimean Congo hemorrhagic fever virus

Filovirus diseases (Ebola and Marburg)

Highly pathogenic emerging coronaviruses relevant to humans (Middle East respiratory syndrome coronavirus [MERS-CoV], severe acute respiratory syndrome coronavirus [SARS-CoV])

Lassa fever virus

Nipah virus

Rift Valley fever virus

Any new severe infectious disease

Serious diseases necessitating further action as soon as possible

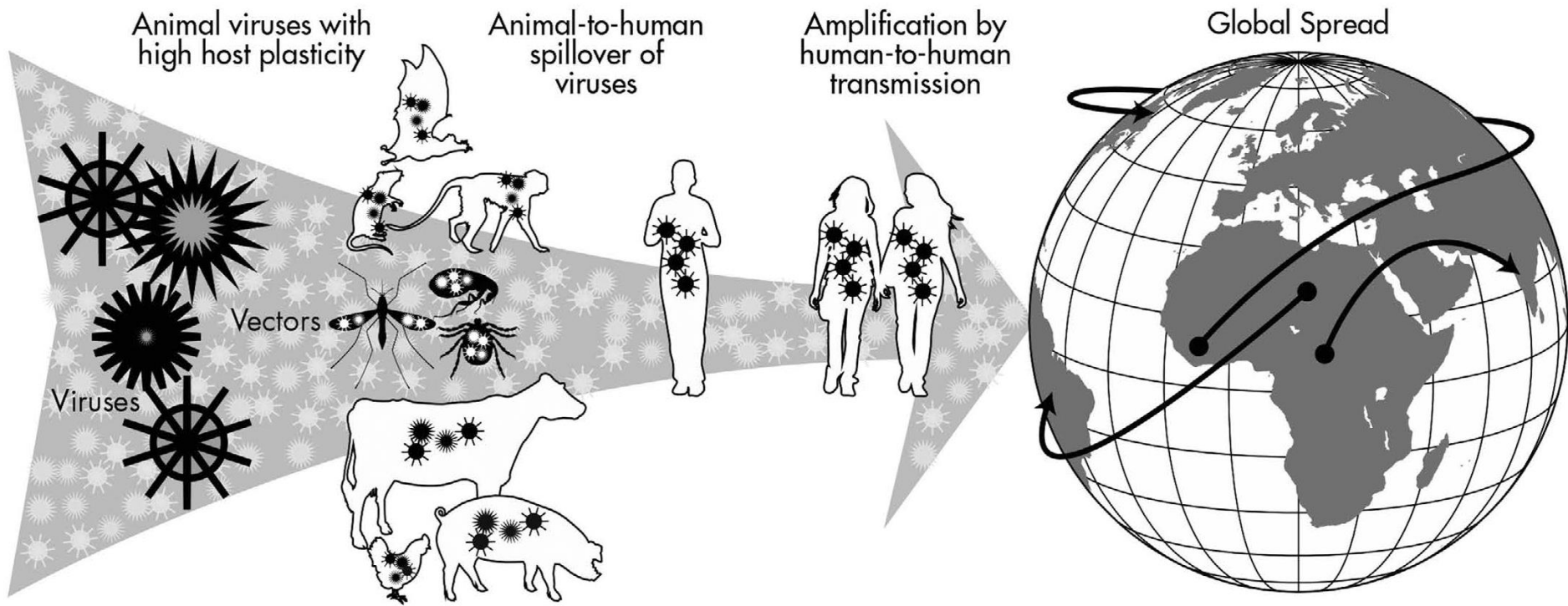
Chikungunya

Severe fever with thrombocytopenia syndrome

Congenital abnormalities and other neurologic complications associated with Zika virus

Microbiology by numbers

- ~ **1400** human pathogens
- **< 1%** of the total number of microbial species on the planet
- **177** emergent or reemergent
- **≈75%** of Emerging Pathogens are Zoonotic

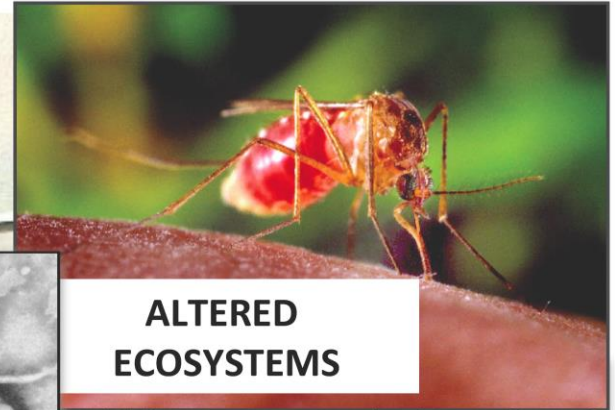


Factors Involved in Virus Emergence

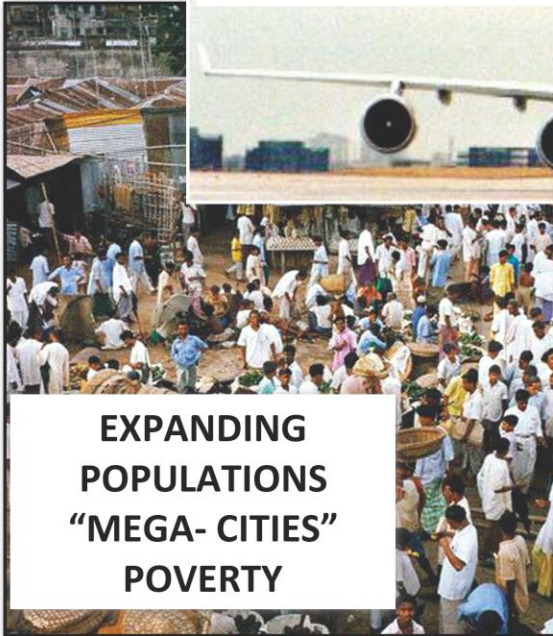
**GLOBALIZATION
RAPID AIR TRAVEL**



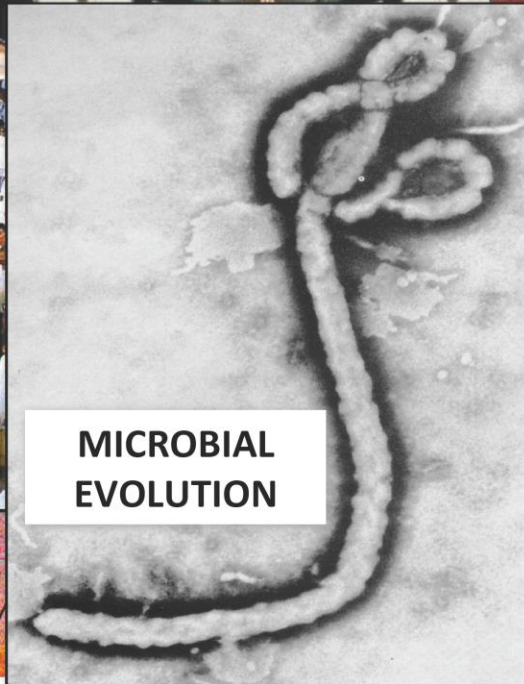
**ALTERED
ECOSYSTEMS**



**EXPANDING
POPULATIONS
"MEGA-CITIES"
POVERTY**



**MICROBIAL
EVOLUTION**



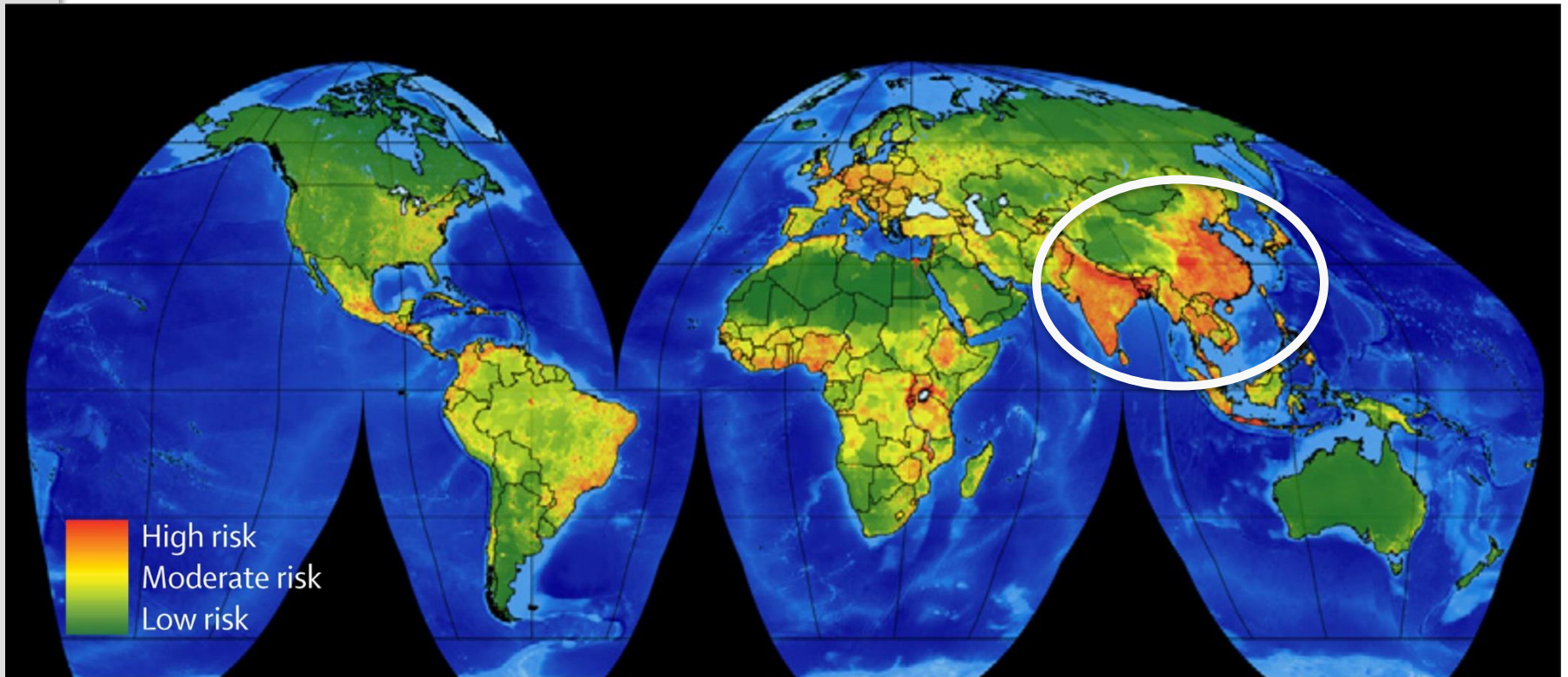
DEFORESTATION

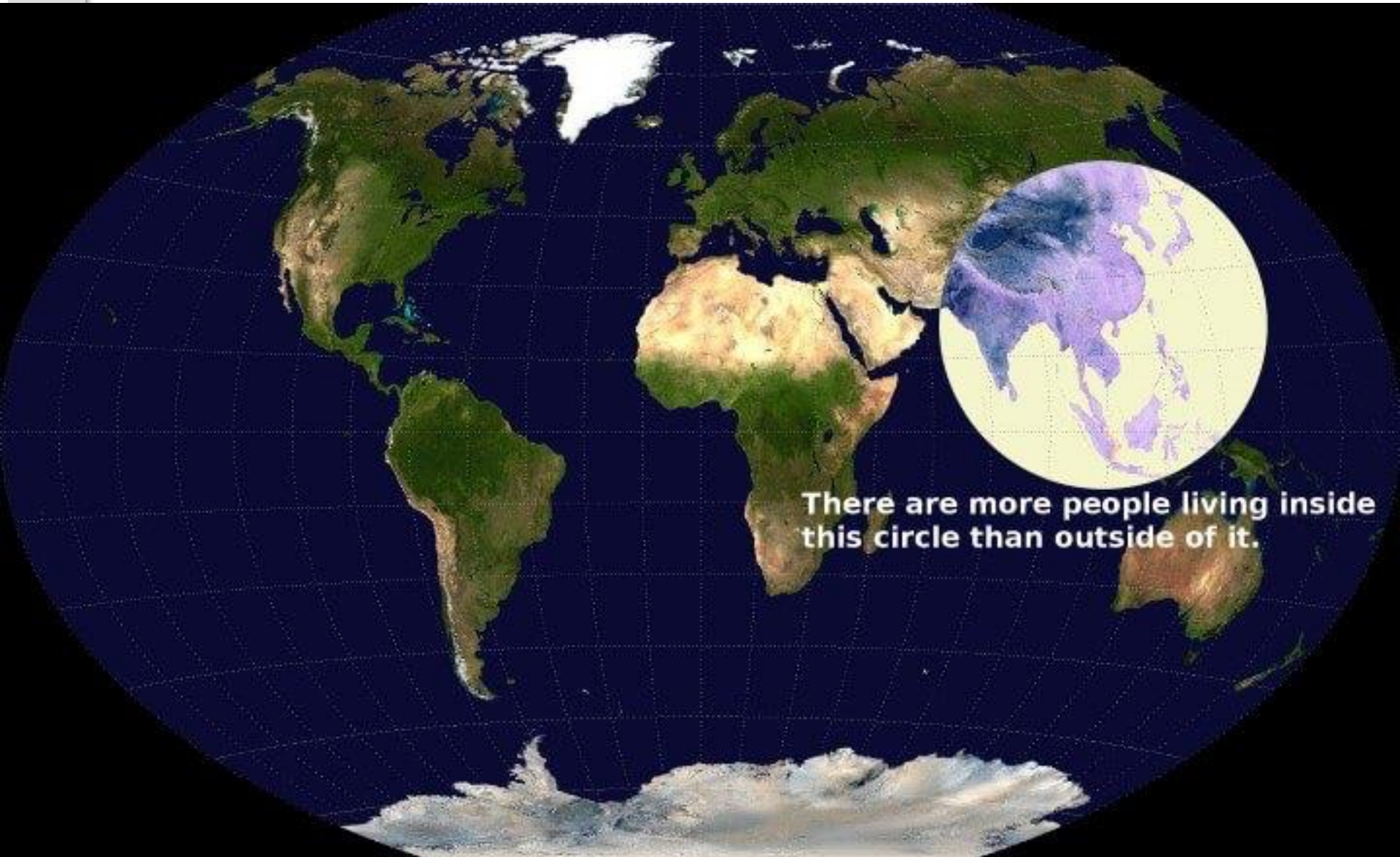


ENVIRONMENTAL CHANGES



Global Hotspots for Emerging Infectious Diseases that Originate in Wildlife





**There are more people living inside
this circle than outside of it.**



Bushmeat in Pointe Noire, Democratic Republic of Congo



FIGURE A12-2 Contact between humans and great apes is increasing due to ecotourism, and without preventive measures could result in cross-species pathogen exchange.

Deforestation



Southern Liberia large parts of the last great primary forest disappear to make way for palm oil in 2012.(Anne Chaon/AFP/Getty Images)

Human-Animal Interactions





Climate change: floods



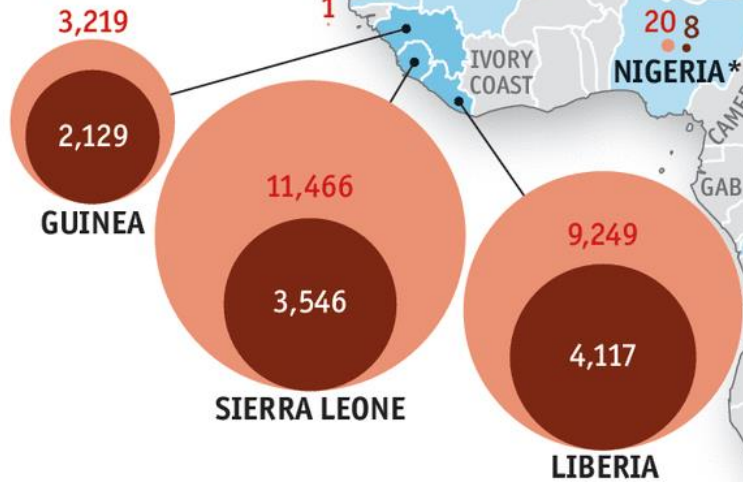


Ebola outbreaks

To March 1st 2015

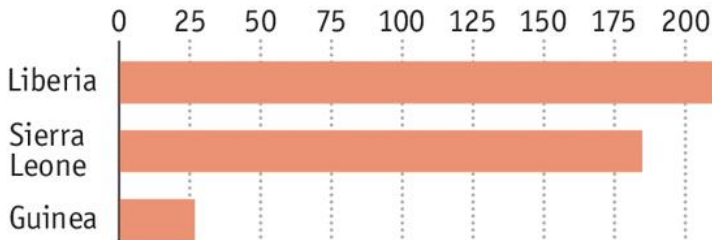
Number of people:

- infected
- of whom:*
- dead



Number of people infected

Per 100,000 population



1976

78

80

82

84

86

88

90

92

94

96

98

2000

02

04

06

08

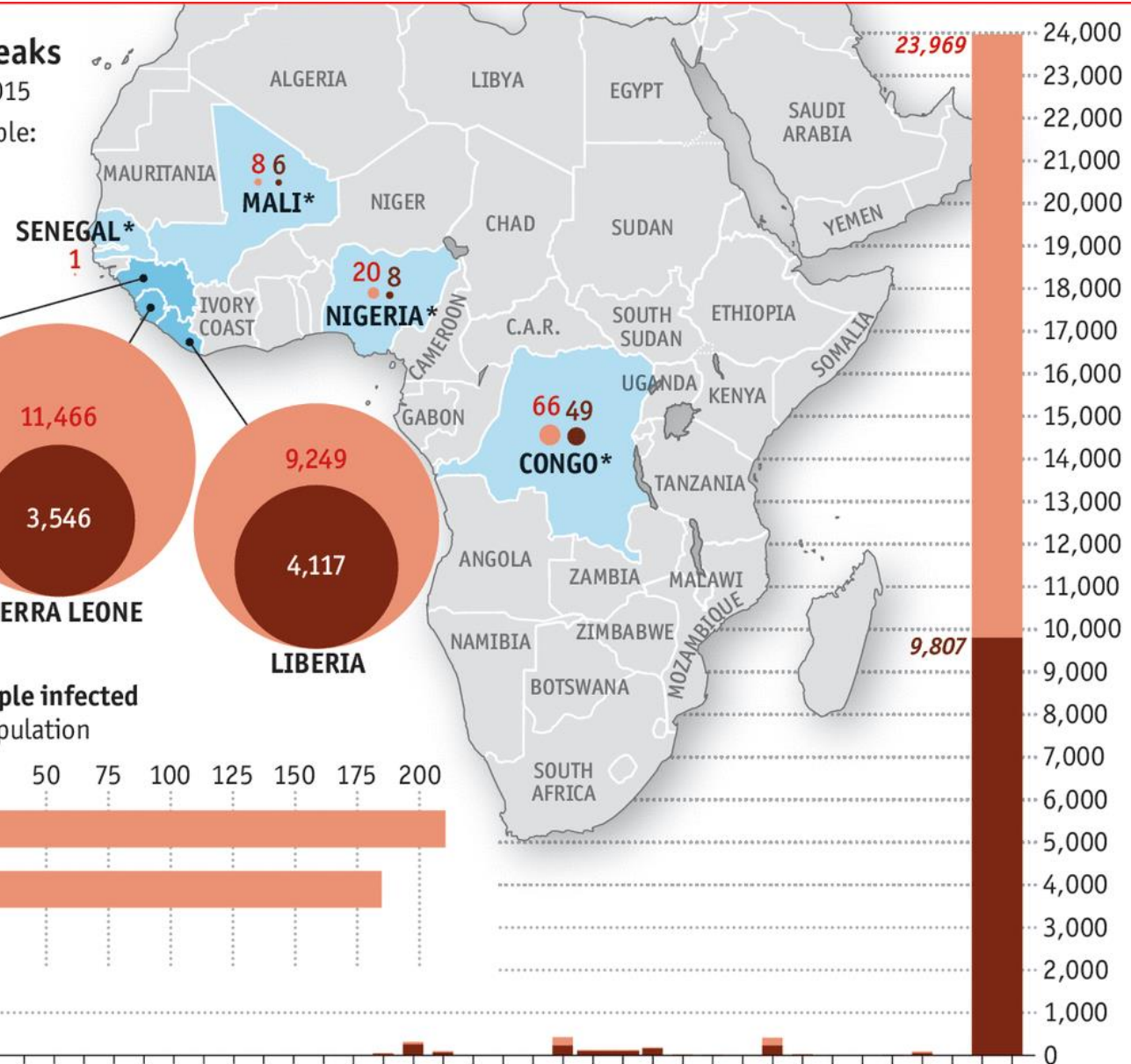
10

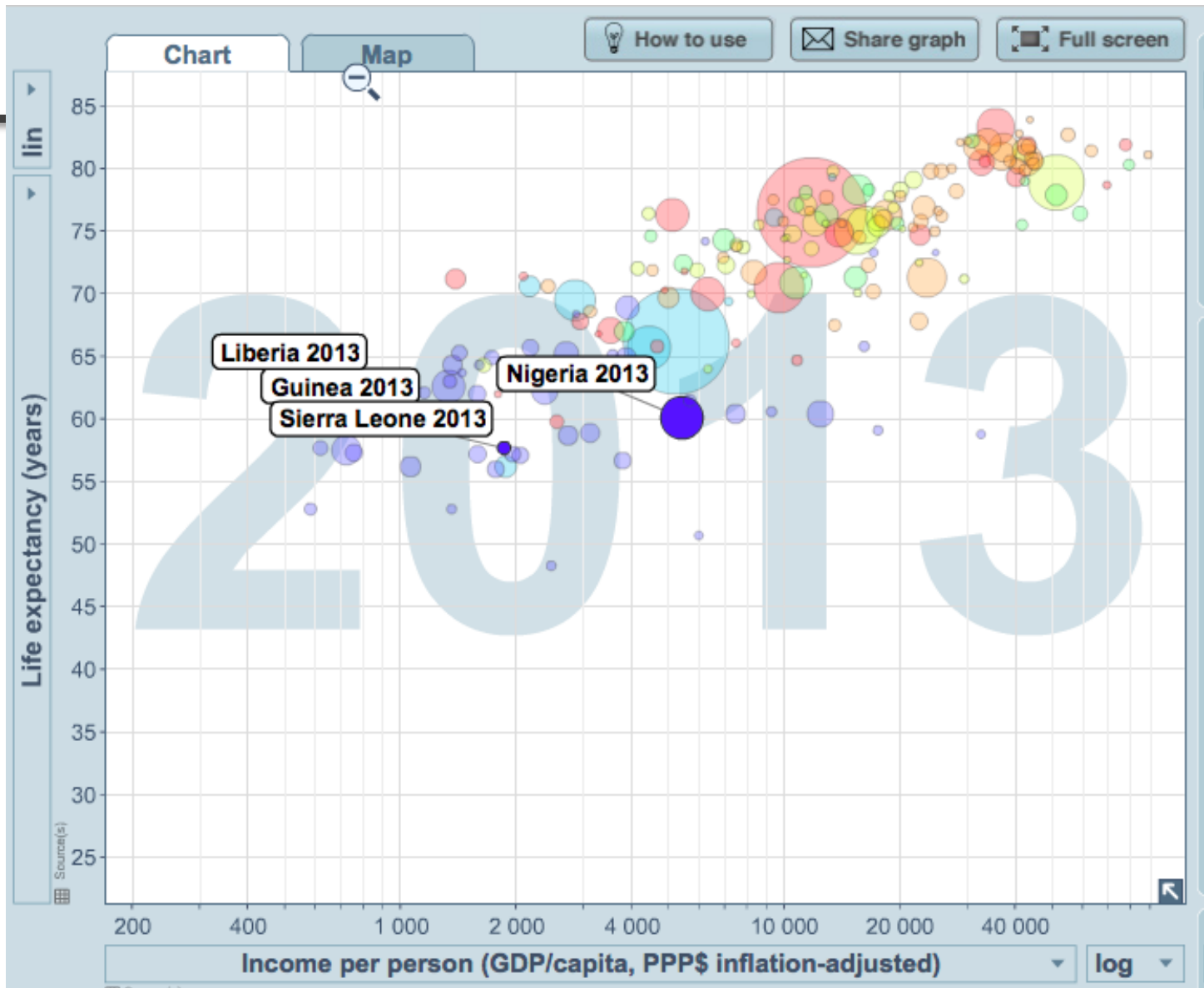
12

14-15†

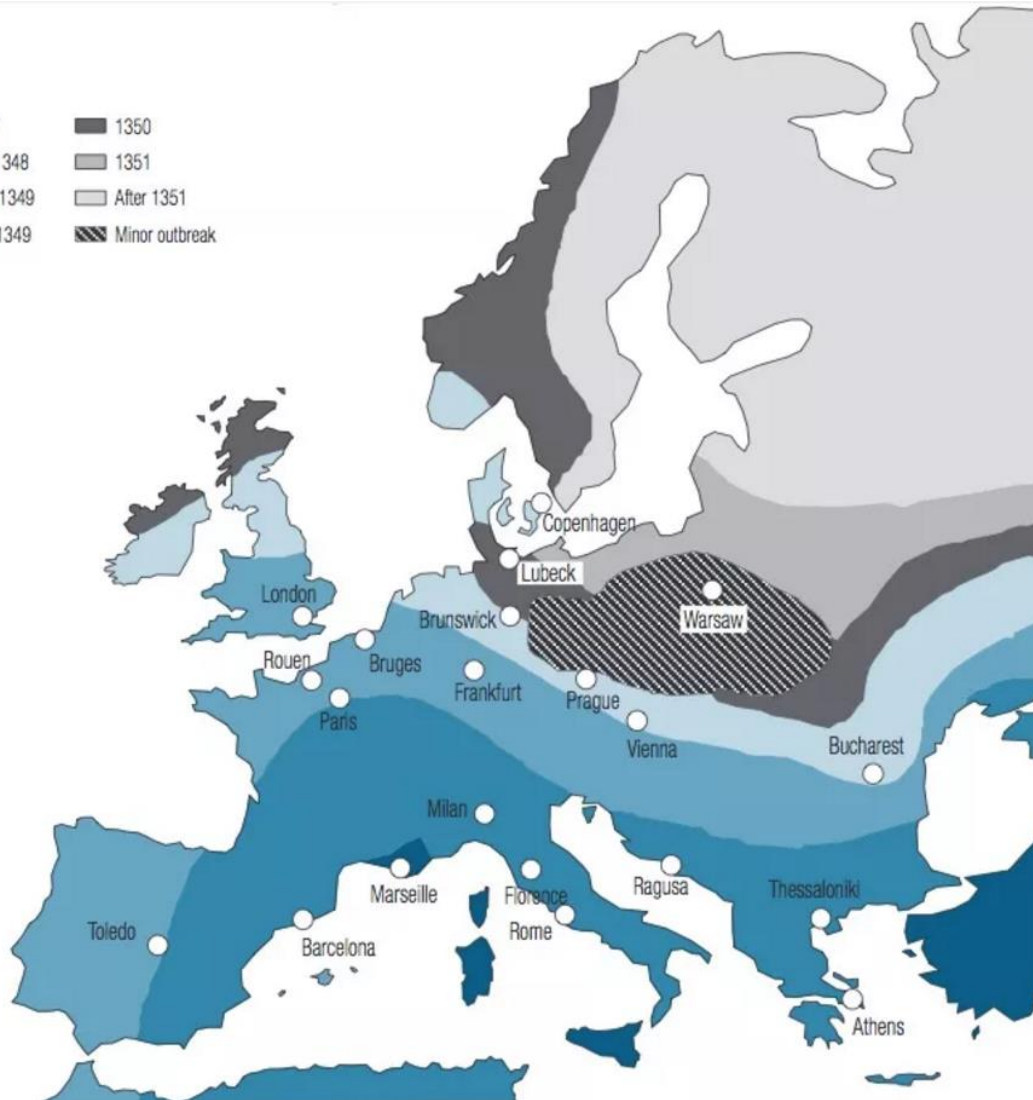
Sources: WHO; UN; *The Economist*

*Declared Ebola-free †Excluding Congo



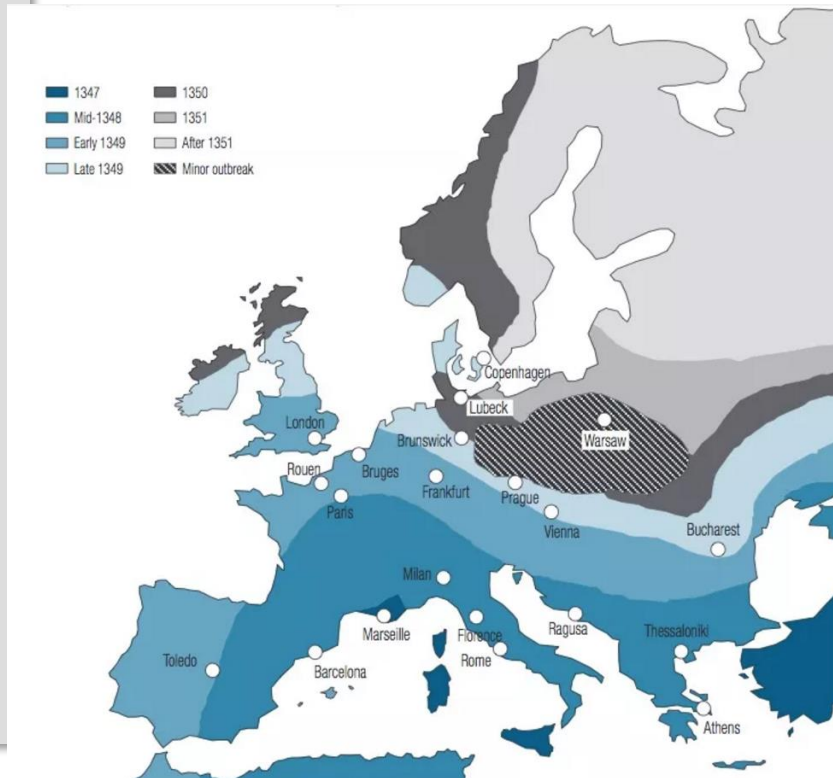


Spread by only local traffic

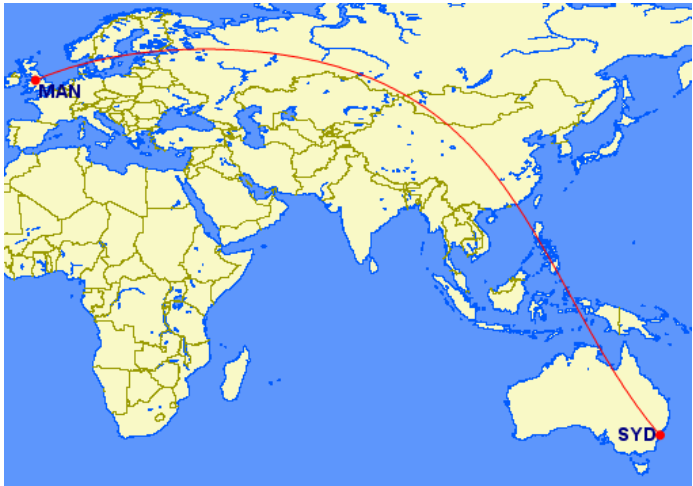
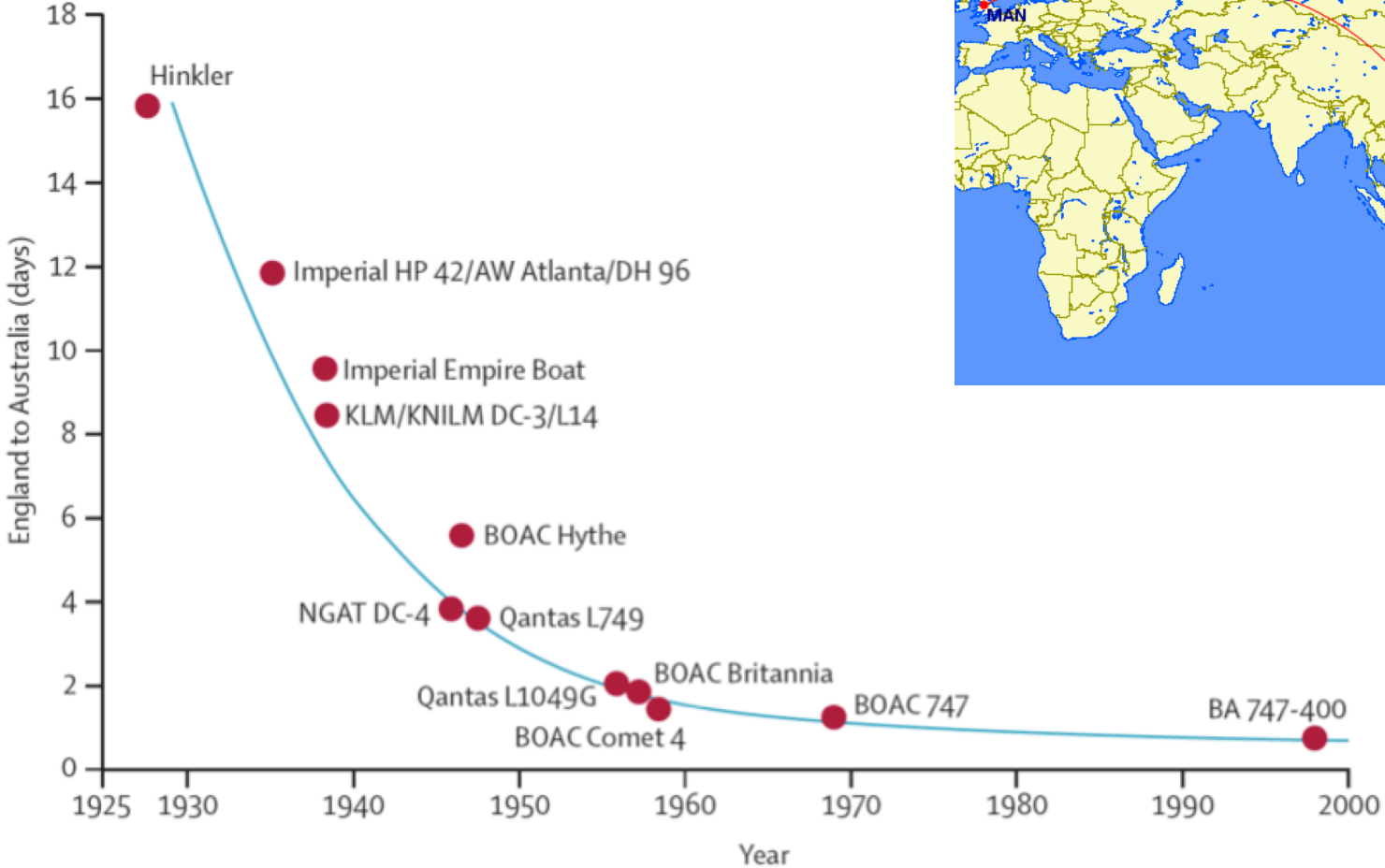


Spread of bubonic plague in Europe from the 1340s to the 1350s.

Spread by only local traffic

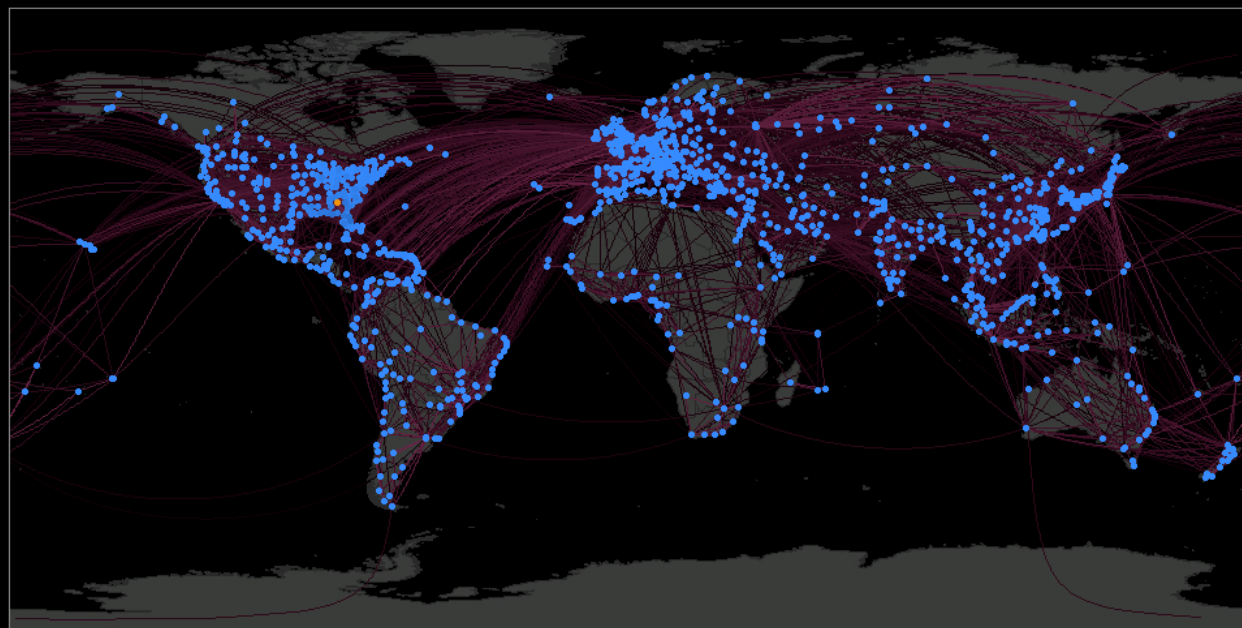
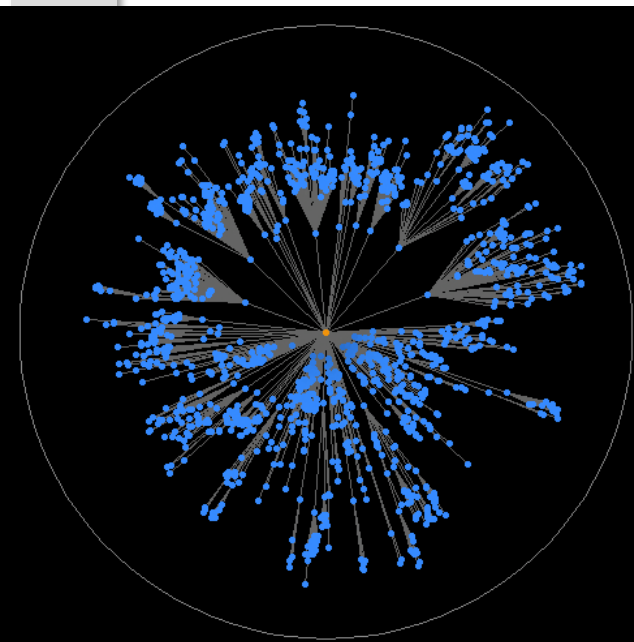


Spread by air traffic



Morens DM, Folkers GK, Fauci AS. Emerging infections: a perpetual challenge. The Lancet Infectious Diseases 2008; 8:710–719

<http://www.citylab.com/commute/2013/02/weve-been-looking-spread-global-pandemics-all-wrong/4782/>



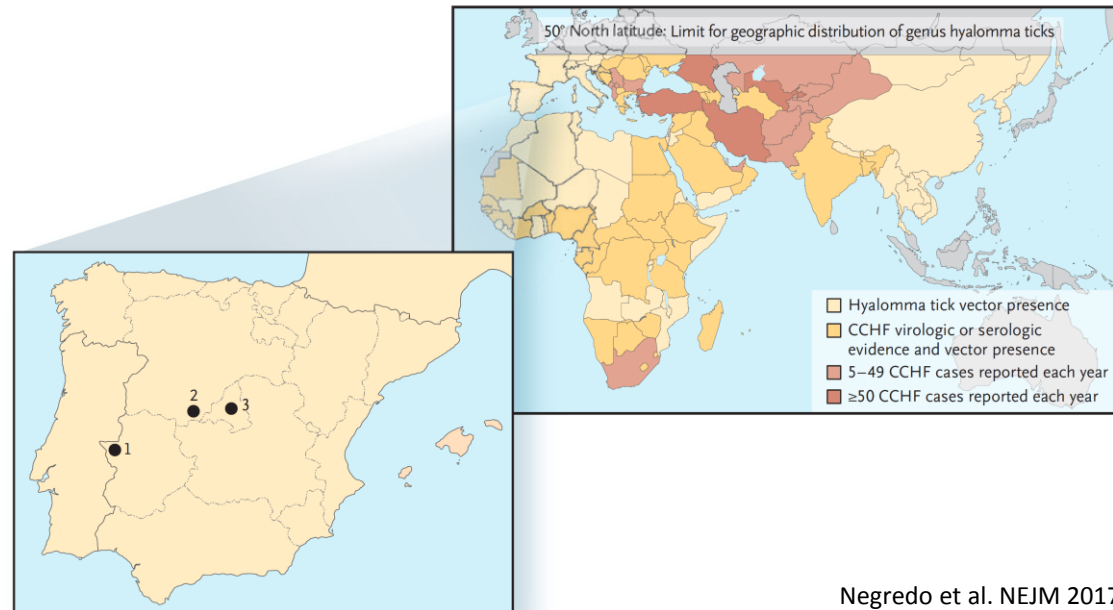
***"In the context of infectious diseases there is
no place remote,
no place disconnected"***

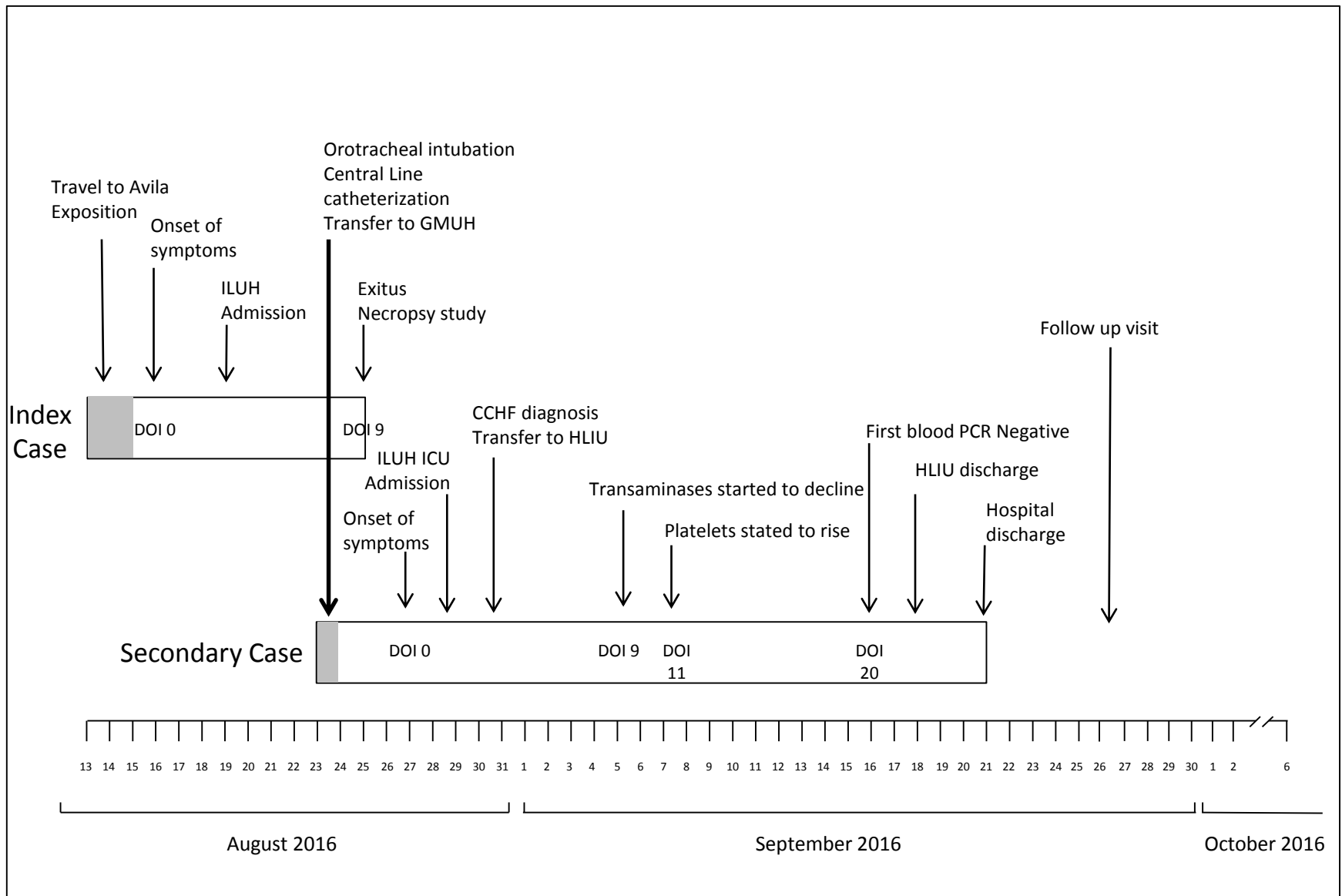
BRIEF REPORT

Autochthonous Crimean–Congo Hemorrhagic Fever in Spain

A. Negrodo, F. de la Calle-Prieto, E. Palencia-Herrejón, M. Mora-Rillo, J. Astray-Mochales, M. P. Sánchez-Seco, E. Bermejo Lopez, J. Menárguez, A. Fernández-Cruz, B. Sánchez-Artola, E. Keough-Delgado, E. Ramírez de Arellano, F. Lasala, J. Milla, J.L. Fraile, M. Ordobás Gavín, A. Martínez de la Gándara, L. López Perez, D. Diaz-Diaz, M.A. López-García, P. Delgado-Jimenez, A. Martín-Quirós, E. Trigo, J.C. Figueira, J. Manzanares, E. Rodríguez-Baena, L. Garcia-Comas, O. Rodríguez-Fraga, N. García-Arenzana, M.V. Fernández-Díaz, V.M. Cornejo, P. Emmerich, J. Schmidt-Chanasit, and J.R. Arribas, for the Crimean Congo Hemorrhagic Fe

B Locations of CCHF Worldwide

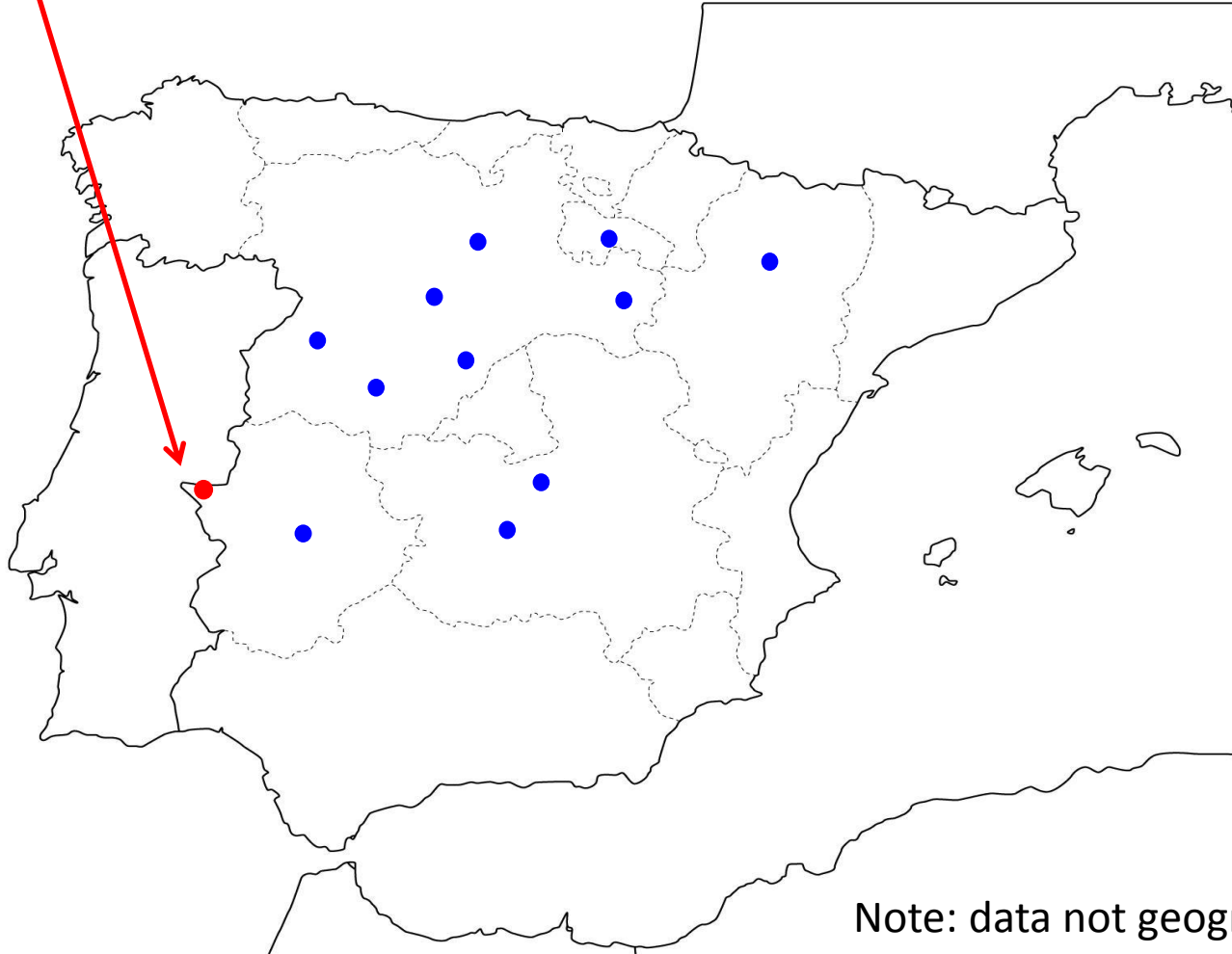




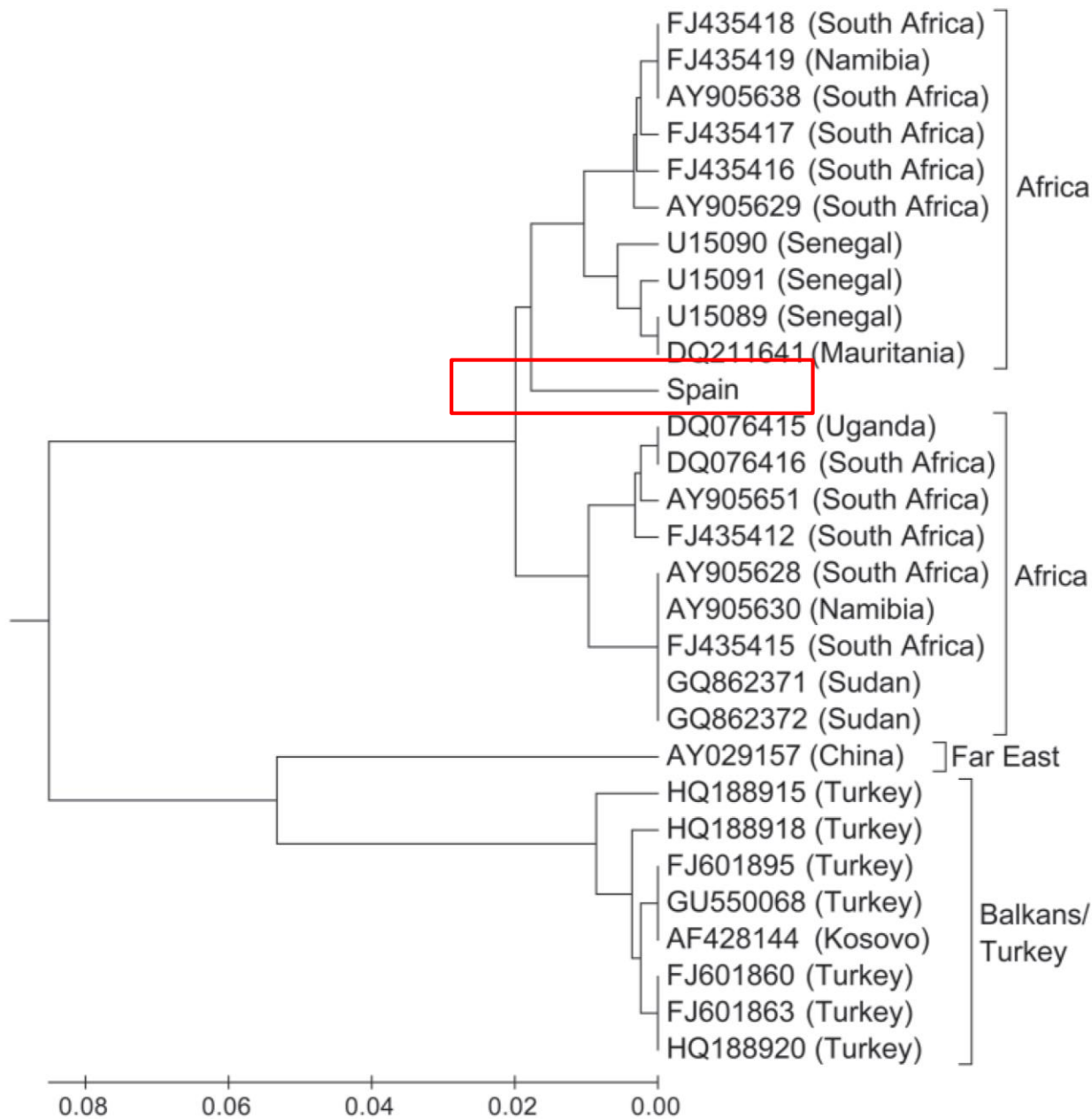
ILUH: Infanta Leonor University Hospital; **GMUH:** Gregorio Marañón University Hospital; **ICU:** Intensive Care Unit; **CCHF:** Crimean Congo Haemorrhagic Fever; **HLIU:** High Level Isolation Unit; **DOI:** day of illness

39.63°N, 7.33°W

November **2010**: 117 *Hyalomma lusitanicum* ticks were collected from 28 adult red deer (*Cervus elaphus*), and tested positive for CCHF by PCR



Note: data not geographically precise



Crimean-Congo Hemorrhagic Fever Virus in Ticks from Migratory Birds, Morocco¹

Ana M. Palomar, Aránzazu Portillo,
Paula Santibáñez, David Mazuelas, Juan Arizaga,
Ariñe Crespo, Óscar Gutiérrez,
Juan Francisco Cuadrado, and José A. Oteo

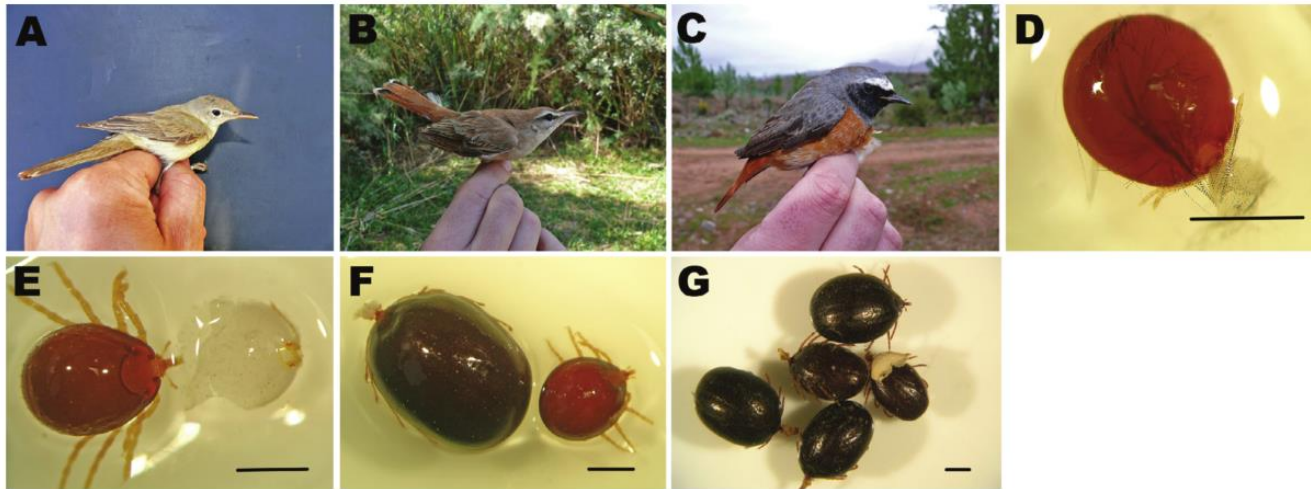
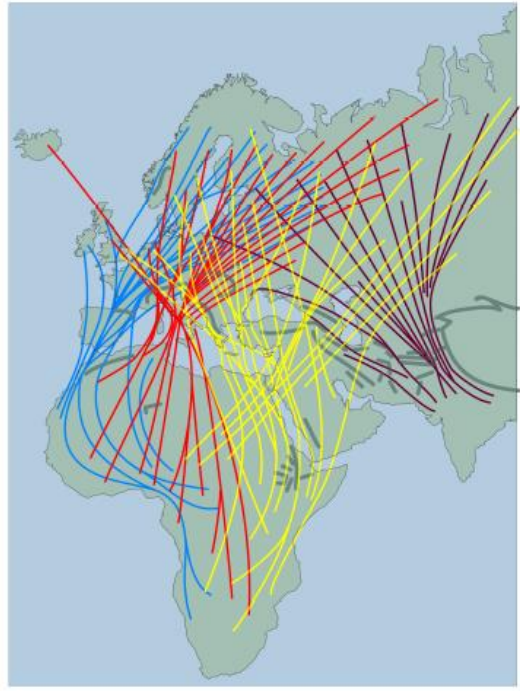
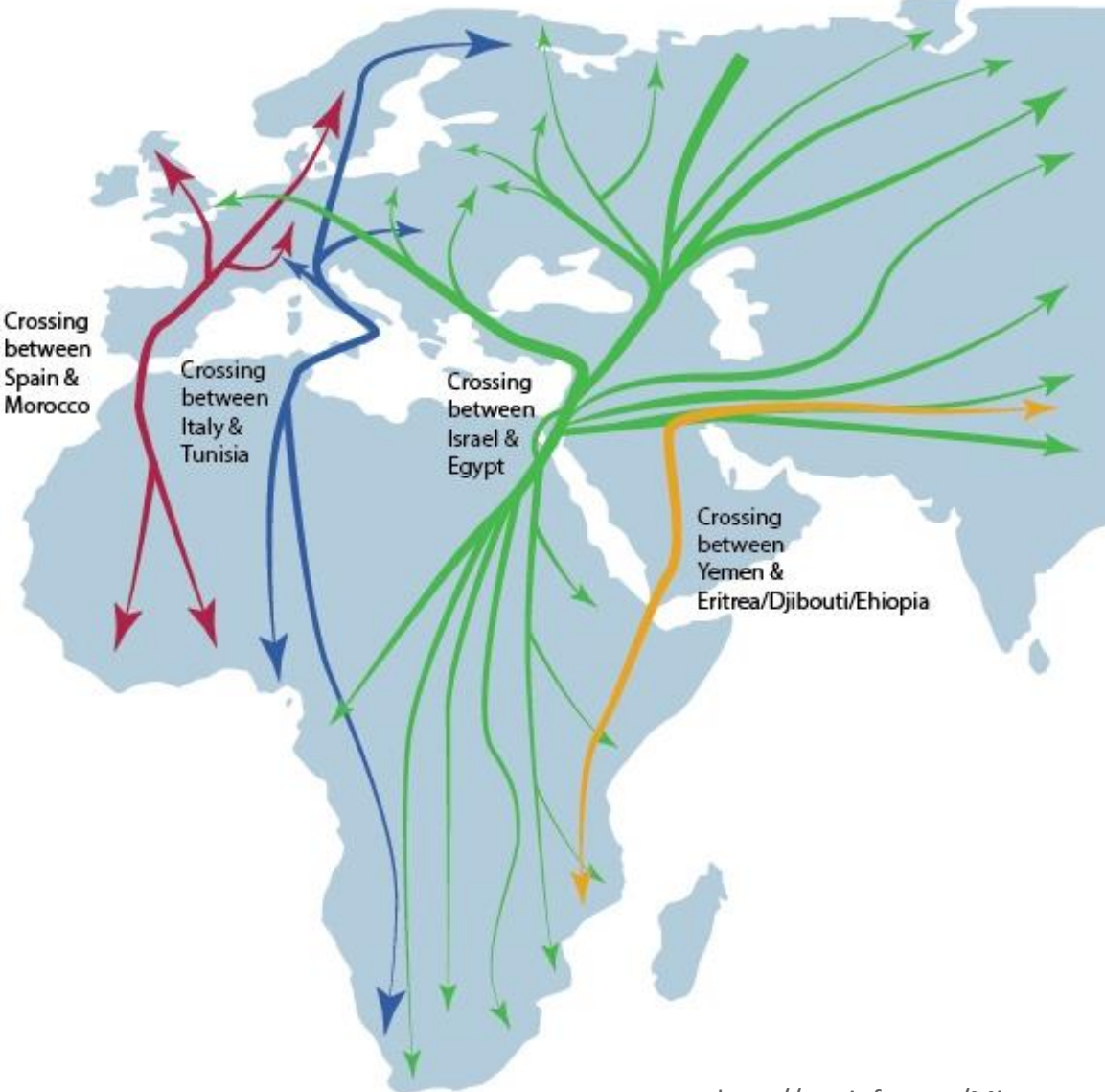


Figure 2. Bird species and tick specimens collected in Zouala, Morocco, April 2011. A) *Iduna opaca*, B) *Erythropygia galactotes*, and C) *Phoenicurus phoenicurus* birds. D–G) *Hyalomma marginatum* tick specimens removed from birds and preserved in alcohol: D) semi-engorged larva, E) semi-engorged nymph, F) semi-engorged and fully engorged nymphs, and G) fully engorged nymphs. Scale bars indicate 1 mm.

Migratory routes



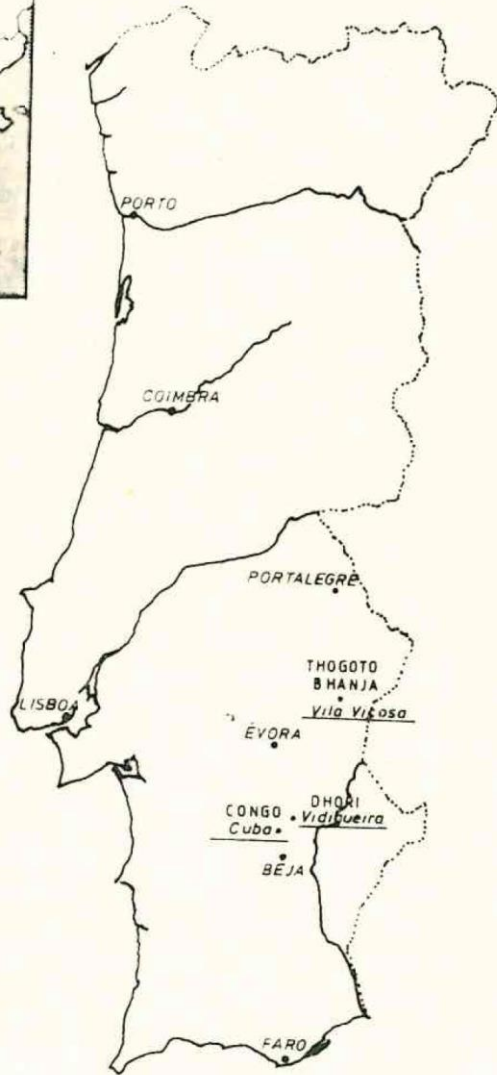
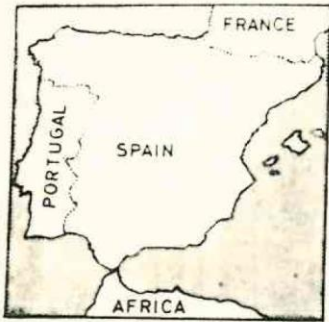
Phylogenetic tree



Sequences were aligned (ClustalW into MEGA 5.2 software) and a phylogenetic tree was generated using neighbour-joining algorithm with 1,000 replicates for bootstrap testing. Accession numbers are indicated in the tree.

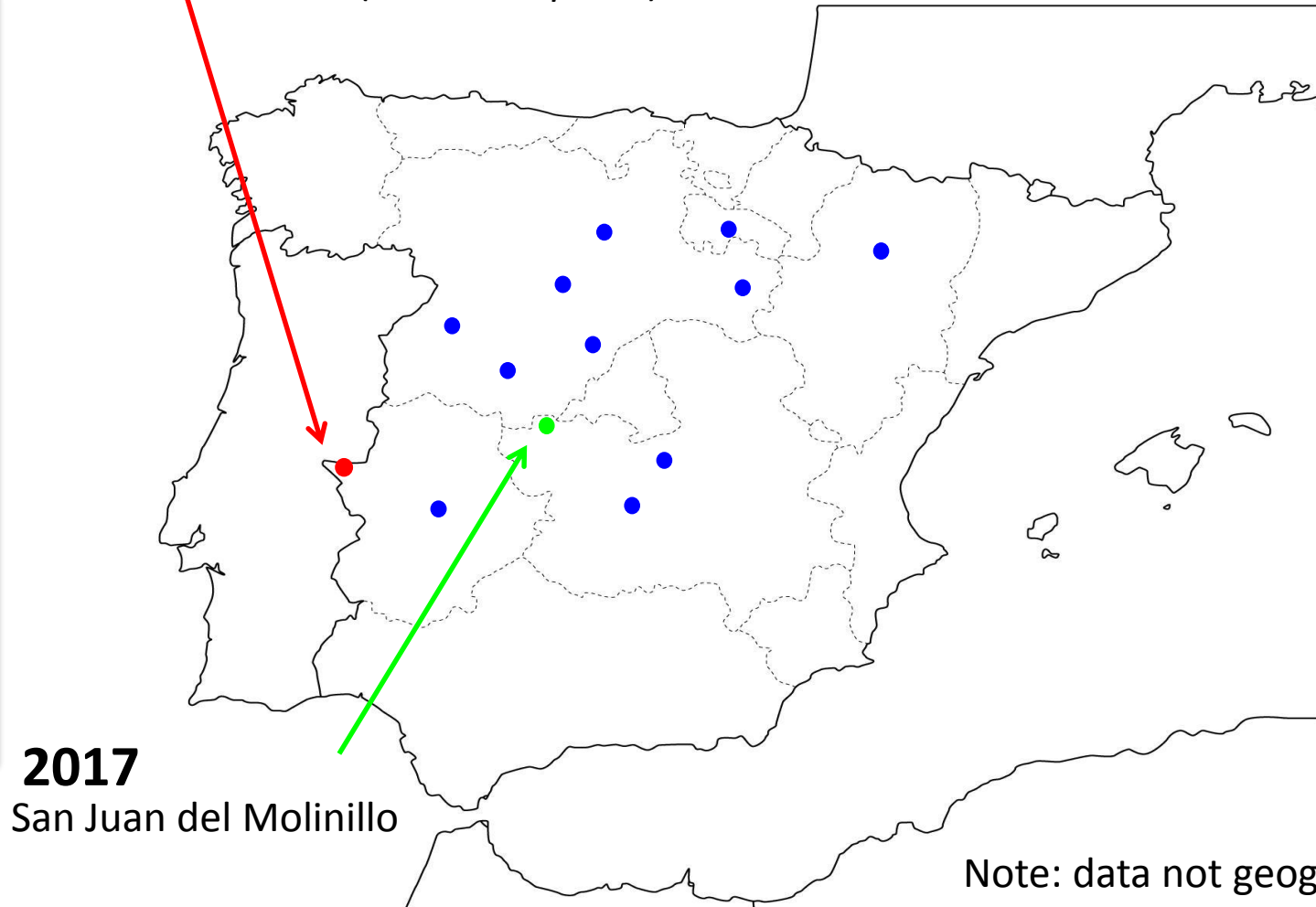
Seroprevalence studies (goats and humans) Portugal 1984.

- 2 out of 190 people had CCHF antibodies



39.63°N, 7.33°W

November **2010**: 117 semi-engorged adult
H. lusitanicum ticks were collected from 28 adult red deer
(*Cervus elaphus*)






Note: data not geographically precise

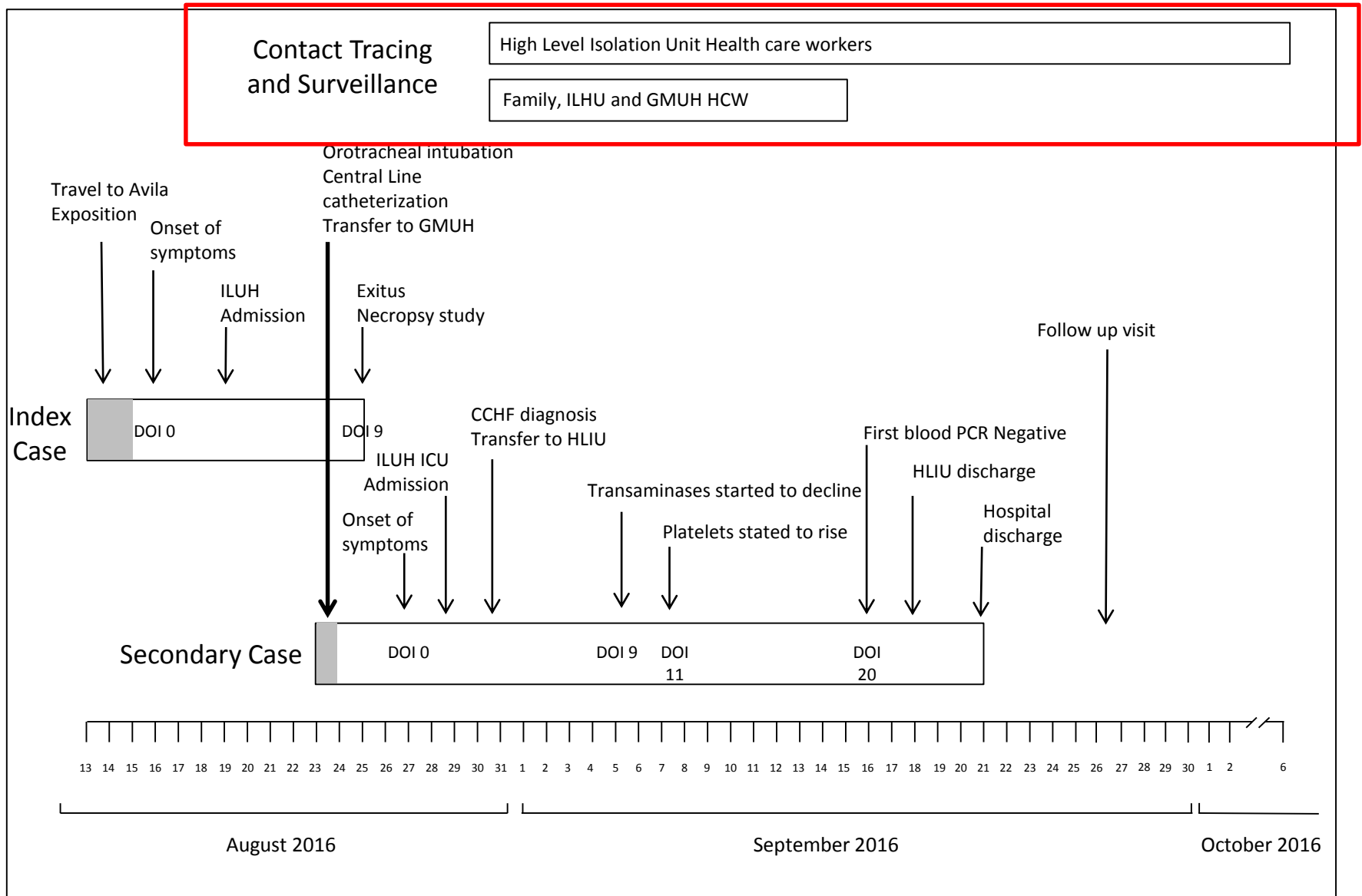
Setp 2016- March 2017



Comarcas ganaderas

-  Al menos un municipio positivo
-  Todas las muestras negativas
-  Muestras positivas en una sola finca en años previos ●

Elaborado por: Centro de Coordinación de Alertas y Emergencias Sanitarias



ILUH: Infanta Leonor University Hospital; **GMUH:** Gregorio Marañón University Hospital; **ICU:** Intensive Care Unit; **CCHF:** Crimean Congo Haemorrhagic Fever; **HLIU:** High Level Isolation Unit; **DOI:** day of illness

- 437 exposed subjects before CCHF diagnosis:
 - 386 high risk.
 - 51 low risk.
- In addition, 59 health care workers of the HLIU had protected exposures while caring for the secondary case.
- None contracted symptomatic CCHF.

Why were there so “few” secondary infections?

Appropriate Personal Protective Equipment

USE STANDARD PRECAUTIONS FOR THE CARE OF ALL PATIENTS

STANDARD PRECAUTIONS APPLY TO: BLOOD • NON-INTACT SKIN • MUCOUS MEMBRANES • ALL BODY FLUIDS, SECRETIONS AND EXCRETIONS EXCEPT SWEAT.



WASH HANDS

Wash hands properly and thoroughly between patient contact and other contact with body fluids or soiled equipment.



WEAR GLOVES

Wear gloves when handling blood, body fluids, nonintact skin or soiled items. Change gloves between patients. Wash hands after removing gloves.



WEAR MASK

Wear a mask and eye protection or face shield to protect mucous membranes of the eyes, nose, and mouth when likely to be splashed.



WEAR GOWN

Wear a gown to protect skin and prevent soiling of clothing when likely to be splashed or sprayed. Wash hands after removing gown.



SHARPS DISPOSAL

Dispose of syringes and other sharps into a designated closed container. **Do not** break or bend needles.

FOLLOW ESTABLISHED POLICIES AND PROCEDURES FOR PATIENT PLACEMENT, ENVIRONMENTAL CONTROLS, PATIENT-CARE EQUIPMENT, AND LINEN

Aproppiate Personal Protective Equipment (PPE)



M Mora, HLIU La Paz-Carlos III, Madrid



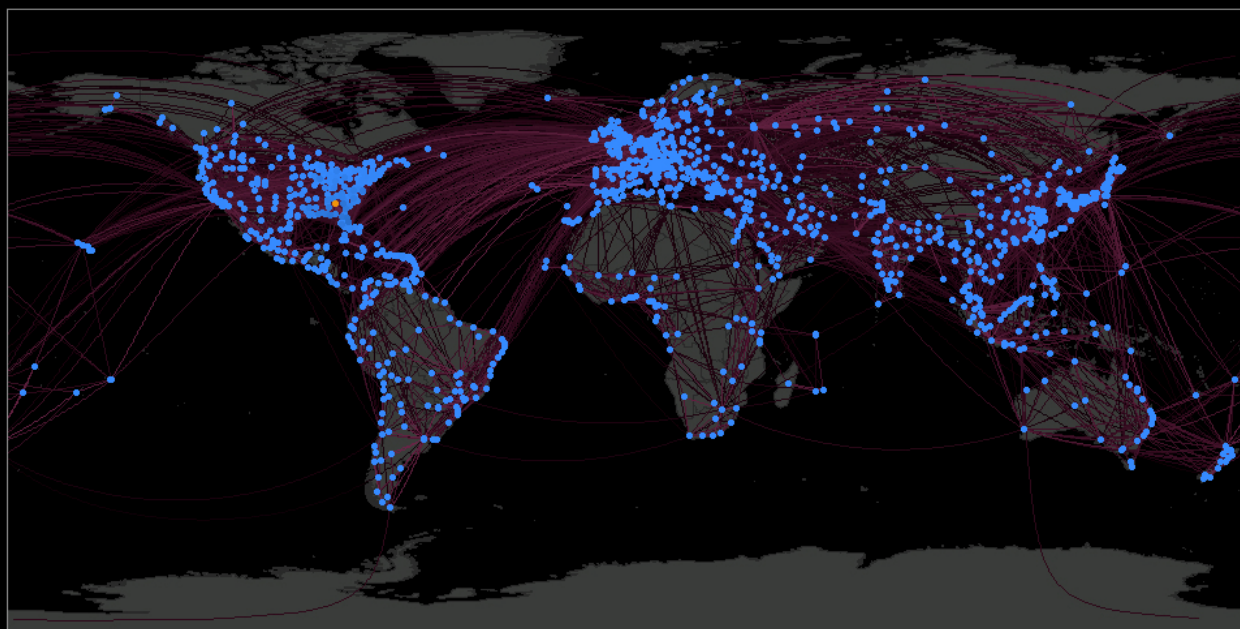
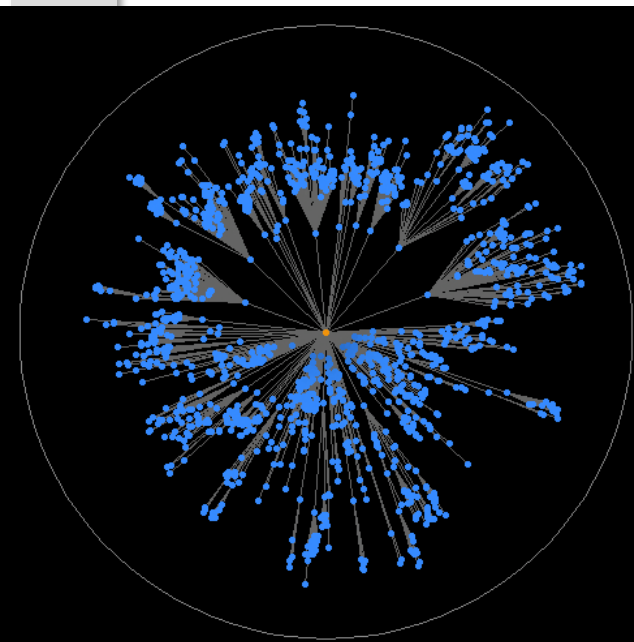
H Leblebicioglu, Ondokuz Mayiz University, Turkey

Preparedness

- One Health concept
- Think about it, we live in a globalized world for humans and animals!!!
- Autoprotective culture in medicine: standard precautions



“Of all the things that could kill more than 10 million people around the world, the most likely is an epidemic stemming from either natural causes or bioterrorism”



***"In the context of infectious diseases there is
no place remote,
no place disconnected"***

But don't forget to look what is happening at home as well

Merci beaucoup pour votre attention

marta.mora@salud.madrid.org

