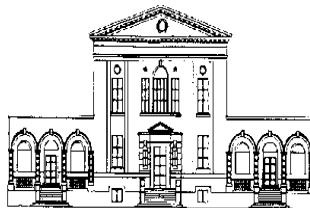


Le Malattie Infettive Emergenti



Giuseppe Ippolito, Francesco Maria Fusco
Istituto Nazionale per le Malattie Infettive "L. Spallanzani", Roma, Italia
Francescomaria.fusco@inmi.it



World Health Organization

**WHO Collaborating Center for clinical care, diagnosis, response and
training on Highly Infectious Diseases**

1983: “Infectious diseases are more easily prevented and more easily cured than any other major group of disorders”.

Harrison's Principles of Internal Medicine. 10th edition 1983.

Invece...



Some recent breaking events - 1

- September 2010: a child in Central Anatolia, Turkey, was diagnosed with encephalitis of unknown origin;
- Then, serological surveillance showed 47 human cases of the same infection in 2010, from 15 regions of Turkey. Forty of the total 47 cases showed neuroinvasive manifestation. 10 of the patients died.

Which is the diagnosis?



Tapisiz et al. Turk J Pediatr. 2011 May-Jun;53(3):317-9.

Kalaycioglu et al. Eurosurveillance, Volume 17, Issue 21, 24 May 2012

Some recent breaking events - 2

- 2010 in Tajikistan: a cluster of acute flaccid paralysis among children;
- A WHO outbreak investigation and control team promptly arrived. When the outbreak was controlled, more than 700 cases were detected, with about 600 paralyzed children and about 50 deaths.

Which is the diagnosis?



No authors listed. Wkly Epidemiol Rec. 2010 May 7;85(19):165-6.

Some recent breaking events - 3

- Dicembre 2013 in Guinea: a 2-year-old child suddenly die after a severe fever after consuming “bushmeat”;
- In few weeks 5 members of its family die, and HCWs caring for them developed similar symptoms.

Which is the diagnosis?

(Questa è facile...)



Blaize et al. NEJM 2014

Solutions?

Some recent breaking events - 1

- September 2010: a child in Central Anatolia, Turkey, was diagnosed with encephalitis of unknown origin;
- Then, serological surveillance showed 47 human cases of the same infection in 2010, from 15 regions of Turkey. Forty of the total 47 cases showed neuroinvasive manifestation. 10 of the patients died.

Which is the diagnosis?



West Nile Virus
introduction in Turkey

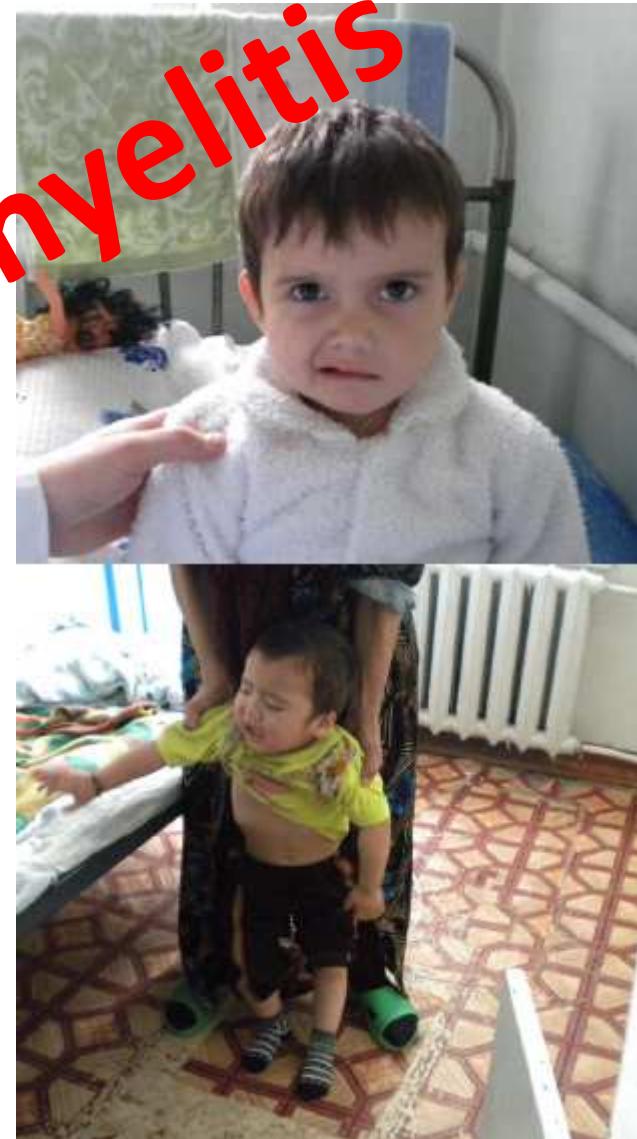
Tapisiz et al. Turk J Pediatr. 2011 May-Jun;53(3):317-9.

Kalaycioglu et al. Eurosurveillance, Volume 17, Issue 21, 24 May 2012

Some recent breaking events - 2

- 2010 in Tajikistan: a cluster of acute flaccid paralysis among children;
- A WHO outbreak investigation and control team promptly arrived. When the outbreak was controlled, more than 700 cases were detected, with about 600 paralysed children and about 50 deaths.

**Resurgence of Poliomyelitis
in Tajikistan**
which is the
diagnosis?



No authors listed. Wkly Epidemiol Rec. 2010 May 7;85(19):165-6.

Some recent breaking events - 3

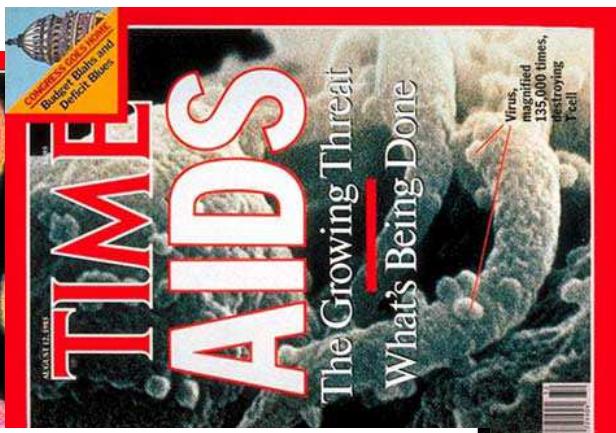
- 2014 in Guinea: a 2-year-old child suddenly die after a severe fever after consuming “bushmeat”;
- In few weeks 5 members of its family die, and HCWs caring for them developed similar symptoms

Which is the diagnosis?
(Questa è facile...)



Current Ebola outbreak
in West Africa

Blaize et al. NEJM 2014



TIME

SPORTS FINAL
F-Actions, 8/27, Tuesday, August 5, 2014

\$1.25 nydailynews.com

DAILY NEWS
NEW YORK'S HOMETOWN NEWSPAPER

EBOLA SCARE IN CITY

Man tested for deadly virus at Mt. Sinai
Disease 'unlikely' but docs 'don't know'
Test result looms as NYers wait in fear

PAGES 4-5

Never before have so many Americans been facing such a threat to their health and safety. And it's not just Ebola. Other diseases are also threatening our health. From the Zika virus to the West Nile virus, we're facing a new threat every day. That's why it's important to stay informed. That's why the Daily News is here to help. We'll keep you updated on all the latest news and developments. So you can stay safe and healthy. Because that's what matters most.

It's turning up everywhere: in your water, your food, the pool. How to protect yourself from E. coli

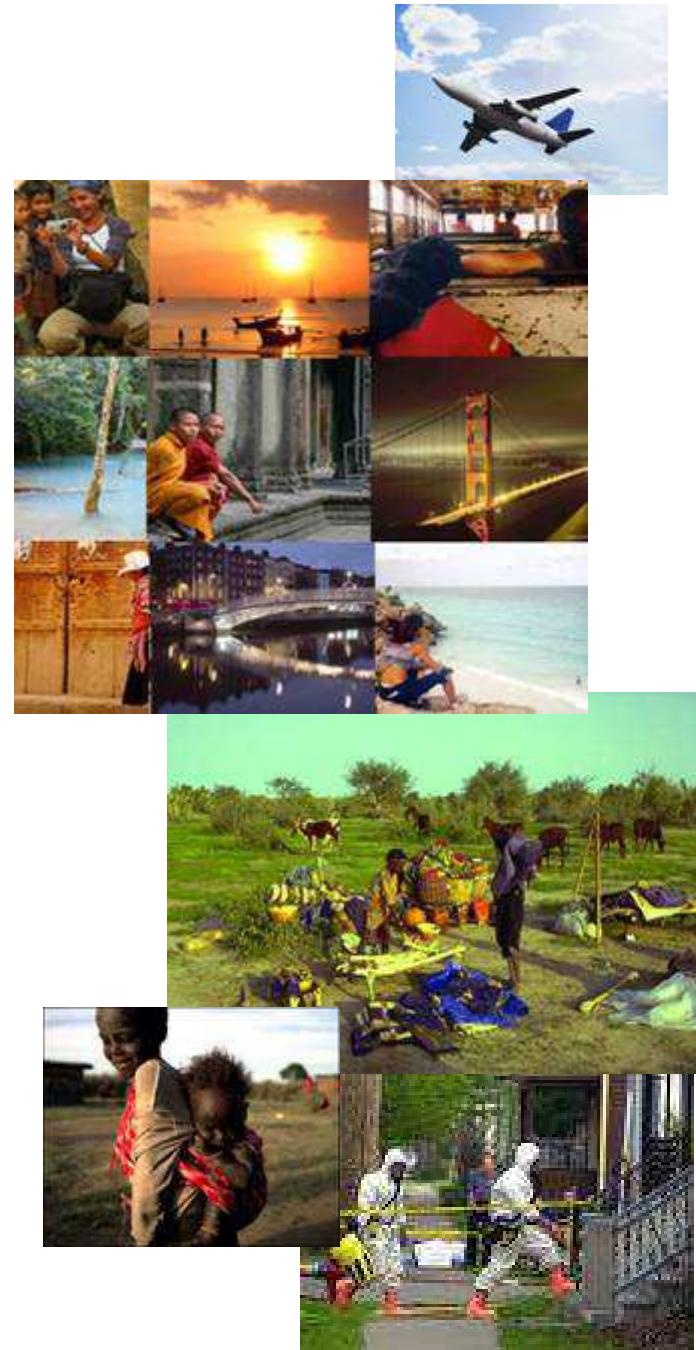
THE KILLER GERM

Should you be?

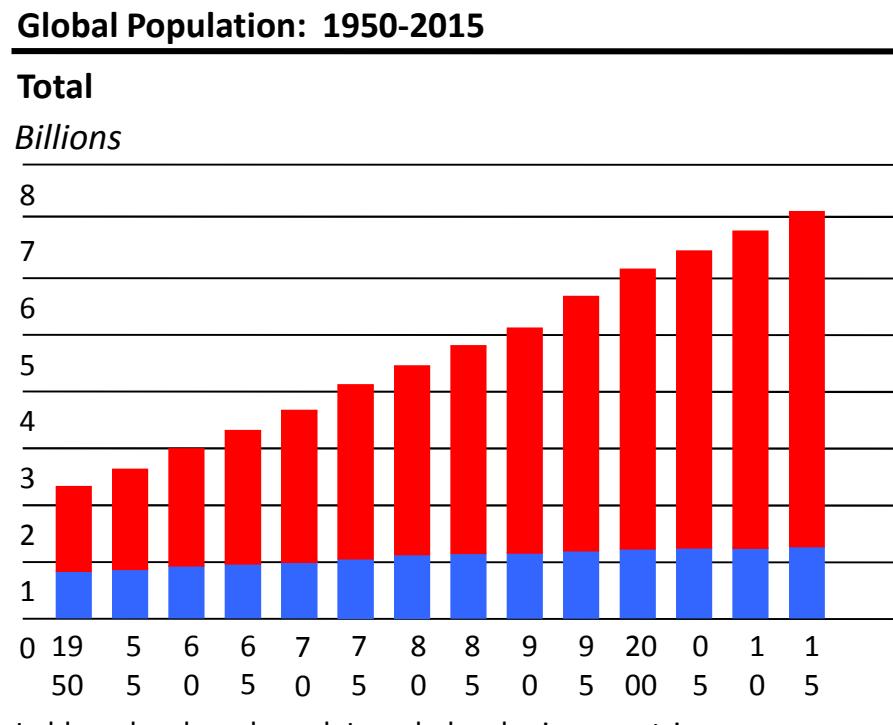
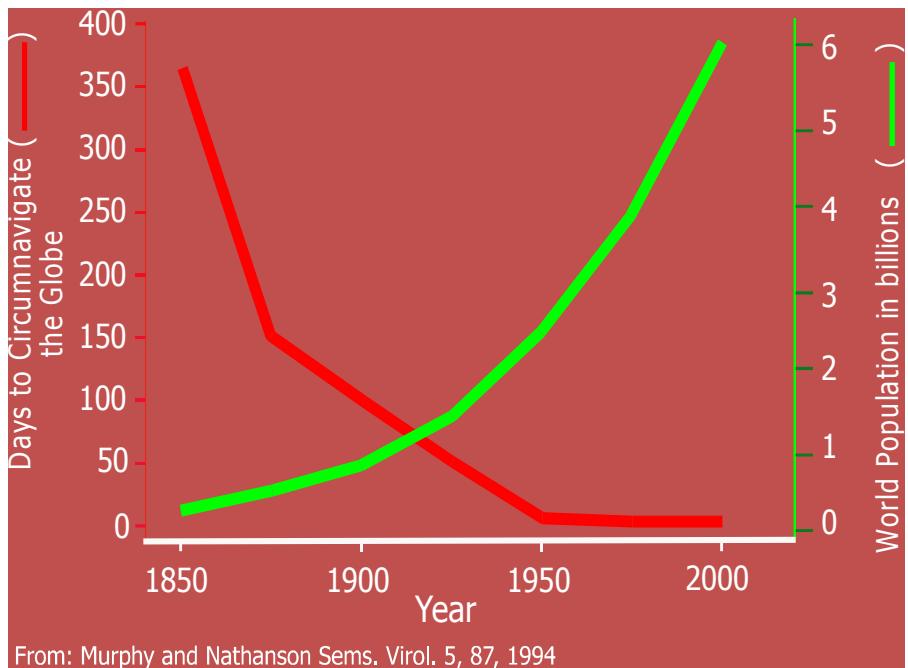


Factors in Emergence

- Microbial adaptation and change
- Host susceptibility to infection
- Climate and weather
- Changing ecosystems
- Human demographics and behavior
- Technology and industry
- International travel and commerce
- Breakdown of public health measures
- Poverty and social inequality
- War and famine
- Lack of political will
- Intent to harm



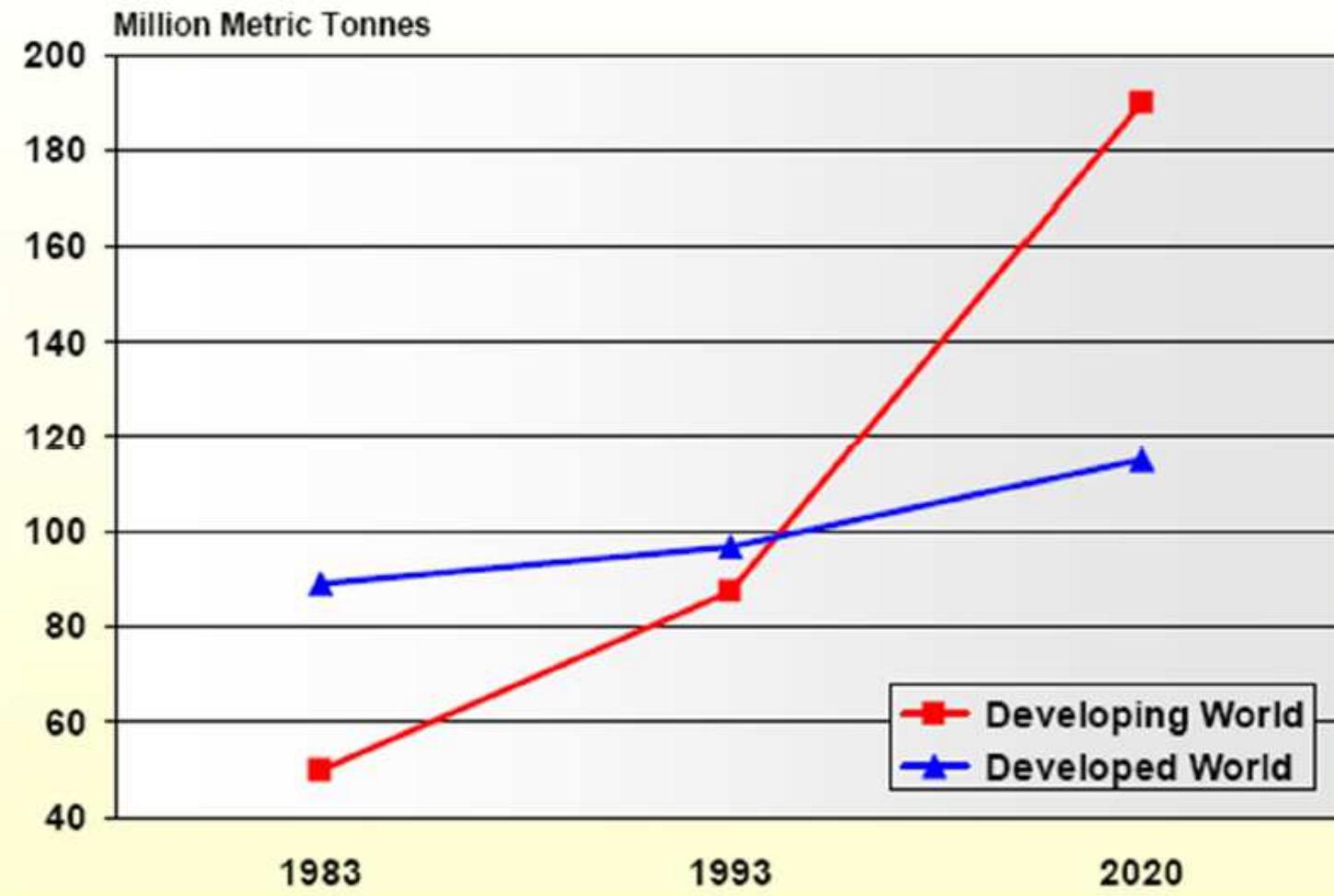
The main fuel for EID: Globalization



Source: US Bureau of the Census

Un altro fattore chiave: l'aumentata richiesta di carne per usi alimentari

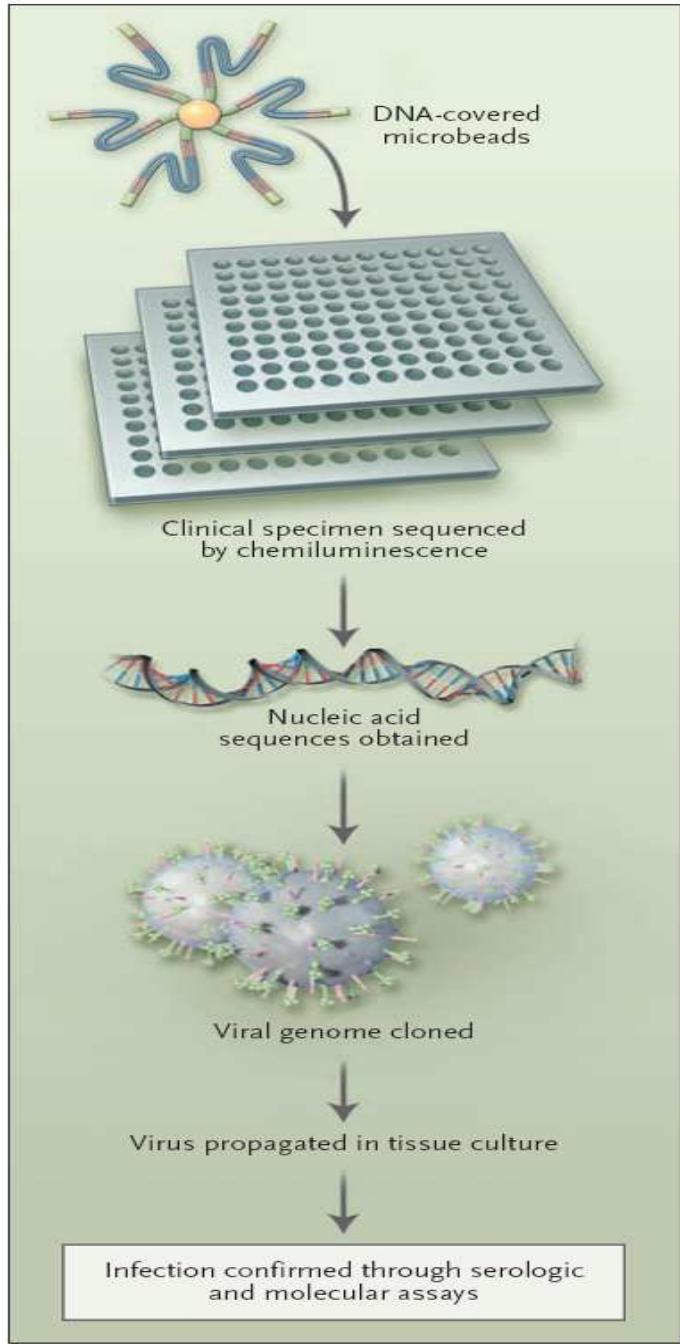
Forecast of meat consumption 1983-2020





edit: Fabio Frisca (FAO Vietnam)





Another determining factor: the new role of molecular diagnosis in the discovery and control of new pathogens

Some "classical" examples:

- Herpes virus associated to Kaposi Sarcoma;
- West Nile virus;
- SARS.

FOCUS ON RESEARCH

The New Age of Molecular Diagnostics for Microbial Agents

Richard Whitley, M.D.

Globalizzazione e malattie emergenti: l'epidemia di Chikungunya in Italia come esempio perfetto

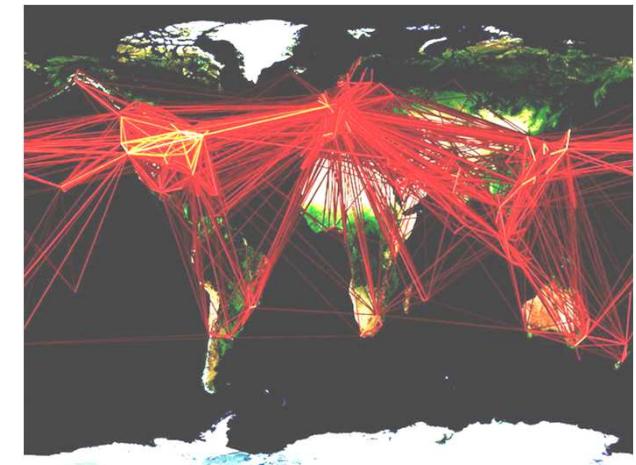
Una zanzara dall'**ASIA** introdotta in **EUROPA** attraverso
pneumatici usati dall' **AMERICA DEL NORD**

+

Un virus dall'**AFRICA** introdotto in **ITALIA** da un immigrato
dall'**INDIA**

=

247 casi di Chikungunya Fever in **EMILIA- ROMAGNA**



Looking at the past for reading the future

- 87 new EID since 1980
- Expect 2-4 new EID annually; 10-30 by 2015
- EID are the “New normal”

Emerging Outbreaks

- Often these outbreaks are disruptive, because of their medical and psychological impact;
- For this reason, CDC started, as exercise, a “Zombie Preparedness”.

The screenshot shows a Windows Internet Explorer window with the following details:

- Title Bar:** CDC - Office of Public Health Preparedness and Response: Zombies - Windows Internet Explorer
- Address Bar:** http://www.cdc.gov/phpr/zombies.htm
- Toolbar:** Includes standard IE buttons like Back, Forward, Stop, Refresh, and Live Search.
- Menu Bar:** File, Modifica, Visualizza, Preferiti, Strumenti, ?
- Toolbar Buttons:** Preferiti, WorldClient, Siti suggeriti, HotMail gratuita, Intranet - Istituto Nazionale..., Personalizzazione collegamenti, WindowsMedia, Raccolta Web Slice.
- Page Content:**
 - CDC Home:** Centers for Disease Control and Prevention, CDC 24/7: Saving Lives. Protecting People.™
 - A-Z Index:** A B C D E F G H I J K L M N O P Q R S T U V W X Y Z *
 - Office of Public Health Preparedness and Response:** A green header with a sidebar containing links to About Our Organization, Are We Prepared, Healthcare Preparedness, and **Zombie Preparedness**.
 - Zombie Preparedness:** A large image of a zombie's face with hands covering its eyes. Below the image:
 - Text: Wonder why Zombies, Zombie A
 - Text: La Fine
Tiziano Ferro
El Amor Es Una Cosa Simple
 - Text: Preparedness continue to live or walk
- Right Sidebar:** Contains icons for Print, Email, RSS, and other links.
- Bottom Status Bar:** Shows system information including the date (18.54), battery level (125%), and network status (Internet).

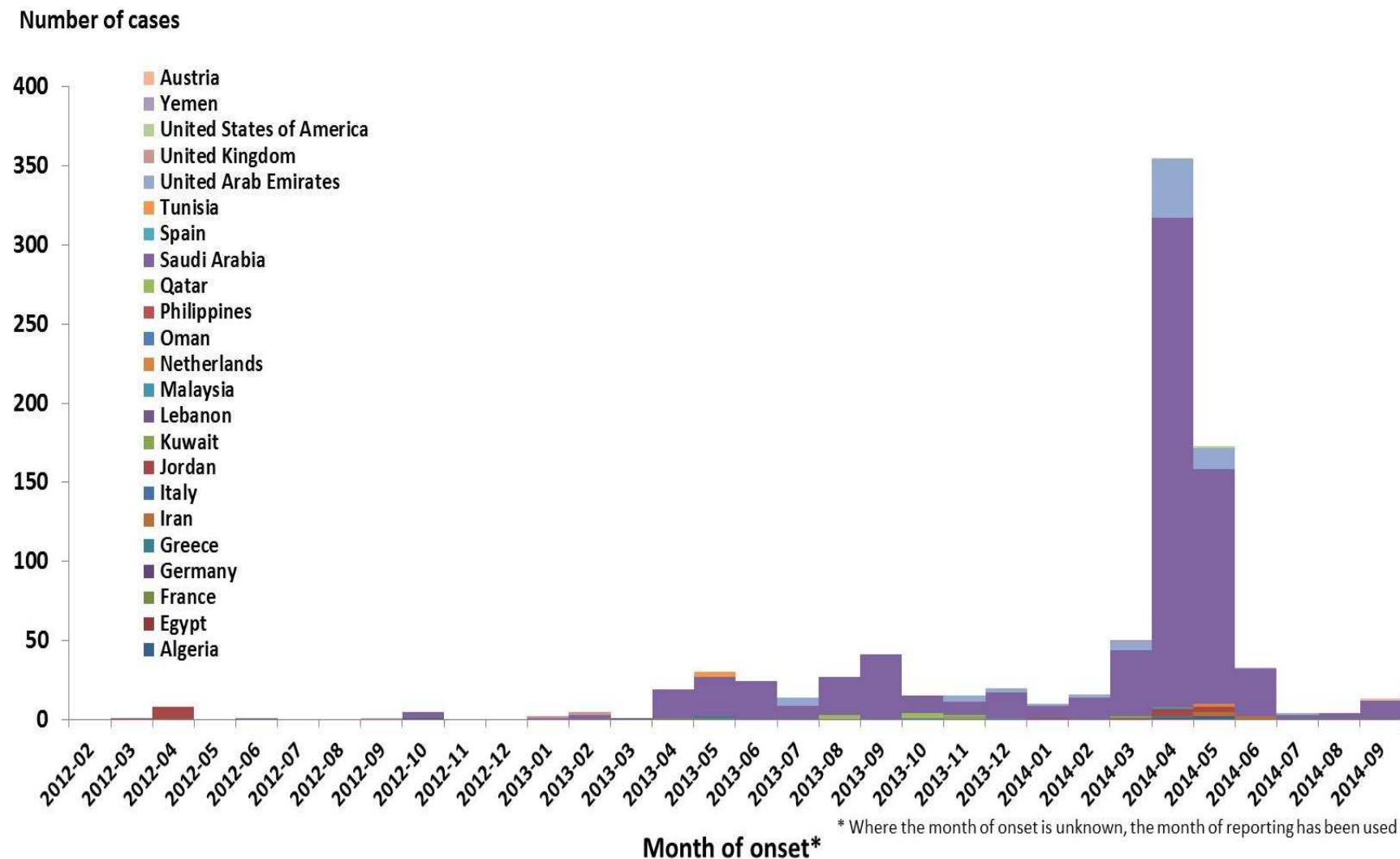
Main determinants in Emerging Diseases

- **New pathogens and expansion of viruses to new geographic regions.** Examples: MERS, WNV, [Ebola](#);
- **Spread of viruses into humans from animal reservoirs.** Examples: Nipah, [Ebola](#);
- **Breakdown of public health systems.** Example: Polio, [Ebola](#).

Main determinants in Emerging Diseases

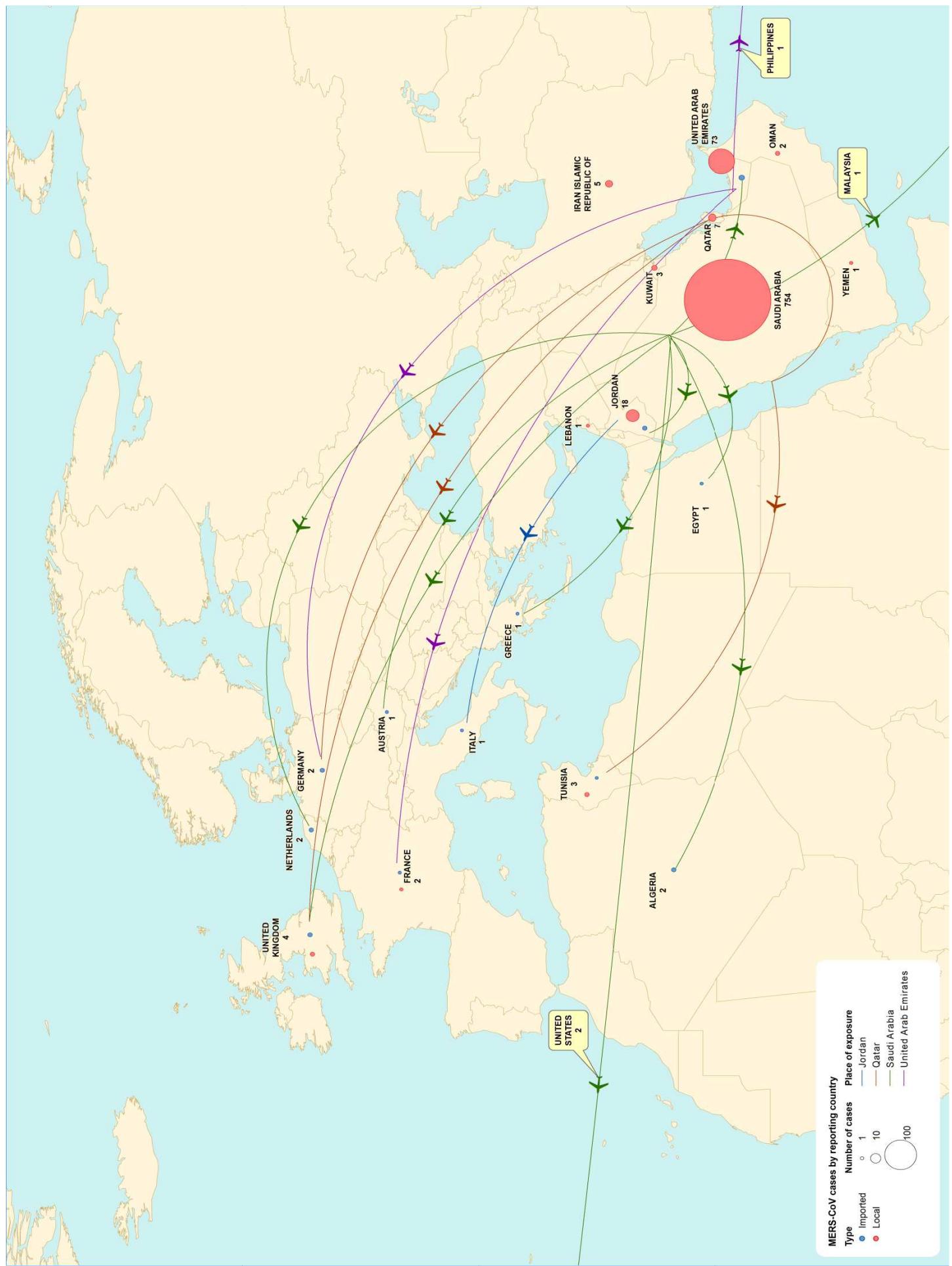
- **New pathogens and expansion of viruses to new geographic regions.** Examples: MERS, WNV, **Ebola**;
- **Spread of viruses into humans from animal reservoirs.** Examples: Hendra and Nipah, Ebola;
- **Breakdown of public health systems.** Example: Polio, Ebola.

Middle East Respiratory Syndrome



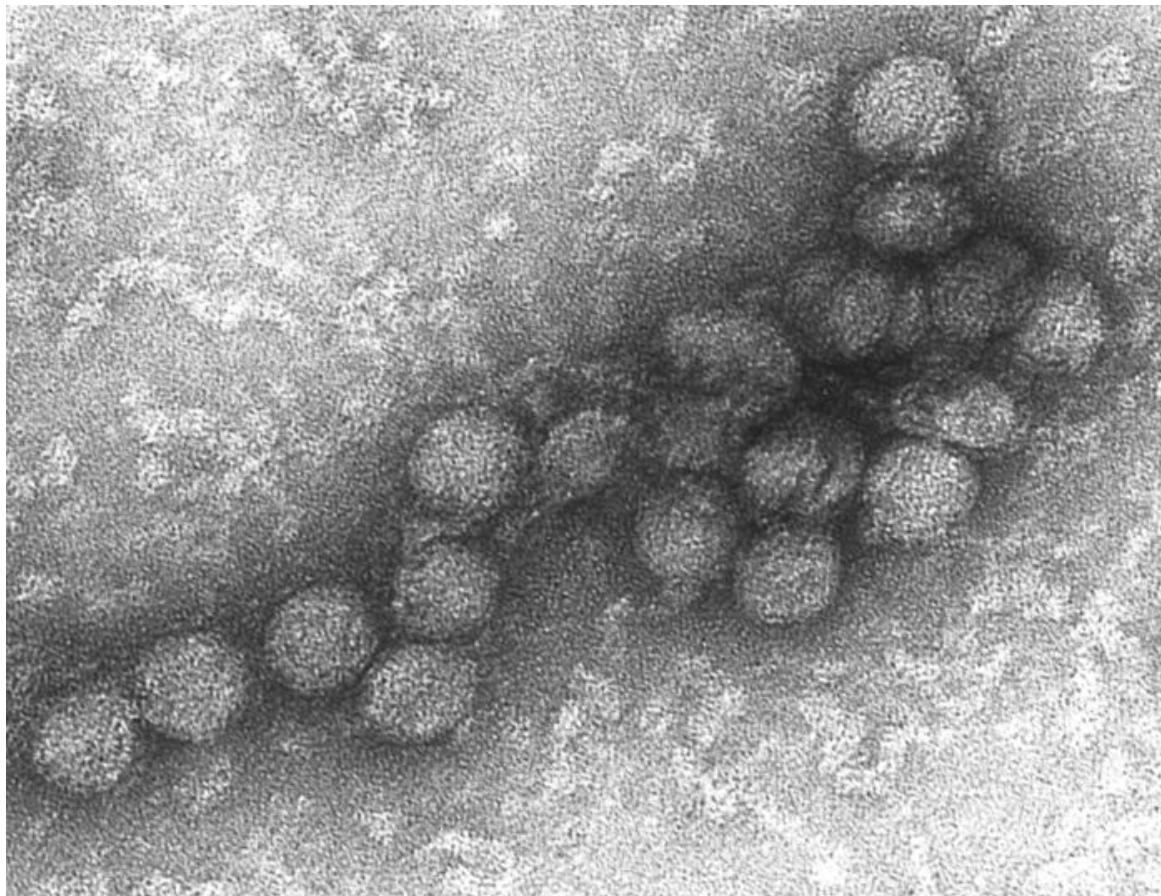
Middle East Respiratory Syndrome

- Causata da un Coronavirus (come la SARS);
- Malattia ad alta letalità (circa il 40%);
- Sembra difficilmente trasmissibile da uomo ad uomo;
- Come la SARS, ama viaggiare in aereo...



“Fastidiosamente imprevedibile e difficile da controllare... **West Nile virus!**”

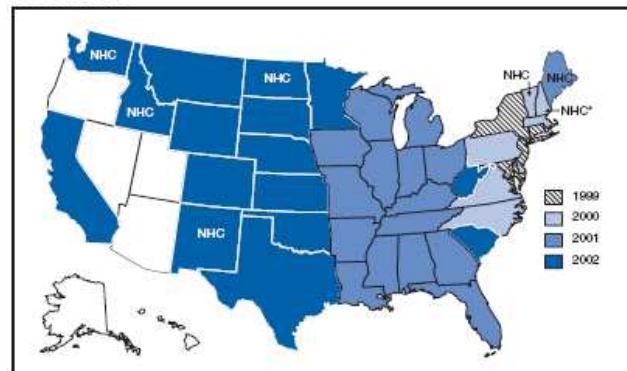
Lyle R. Petersen and Marc Fischer, N Engl J Med; 367:1281-1284, October 4, 2012



Nuove epidemie nei paesi occidentali

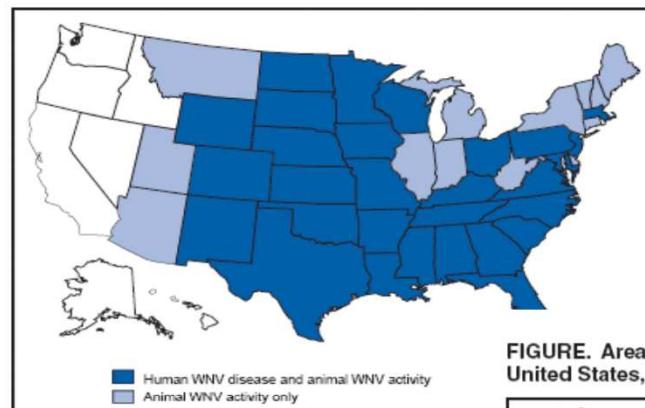
Il caso WNV negli USA

FIGURE 1. West Nile virus activity, by state — United States, 1999–2002



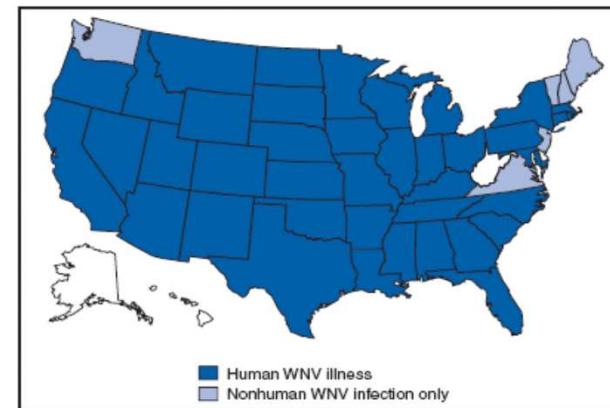
1999 - 2002

FIGURE. Areas reporting West Nile virus (WNV) activity — United States, 2003*



2003 - 2004

FIGURE. Areas reporting West Nile virus (WNV) activity — United States, 2005*

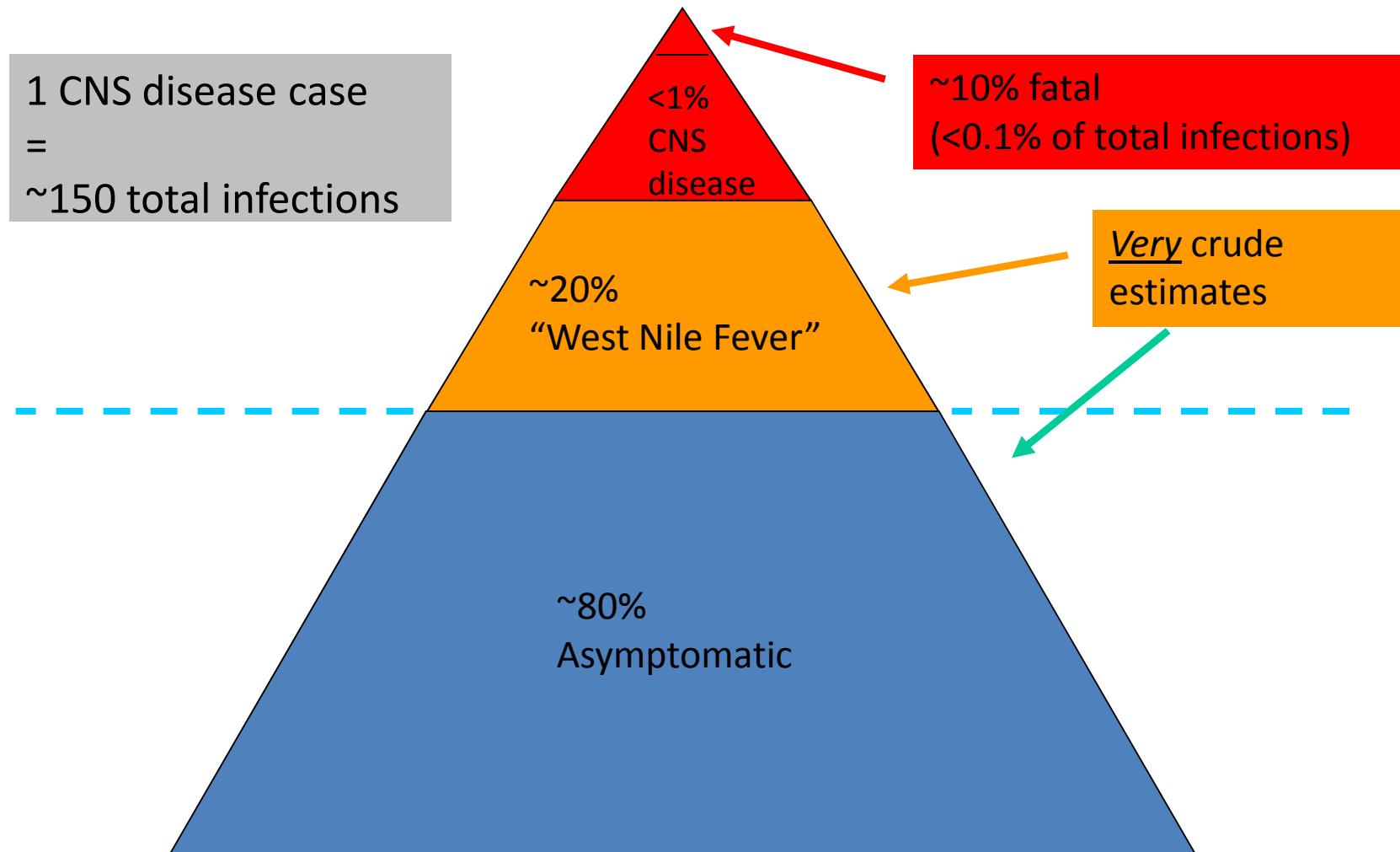


2005

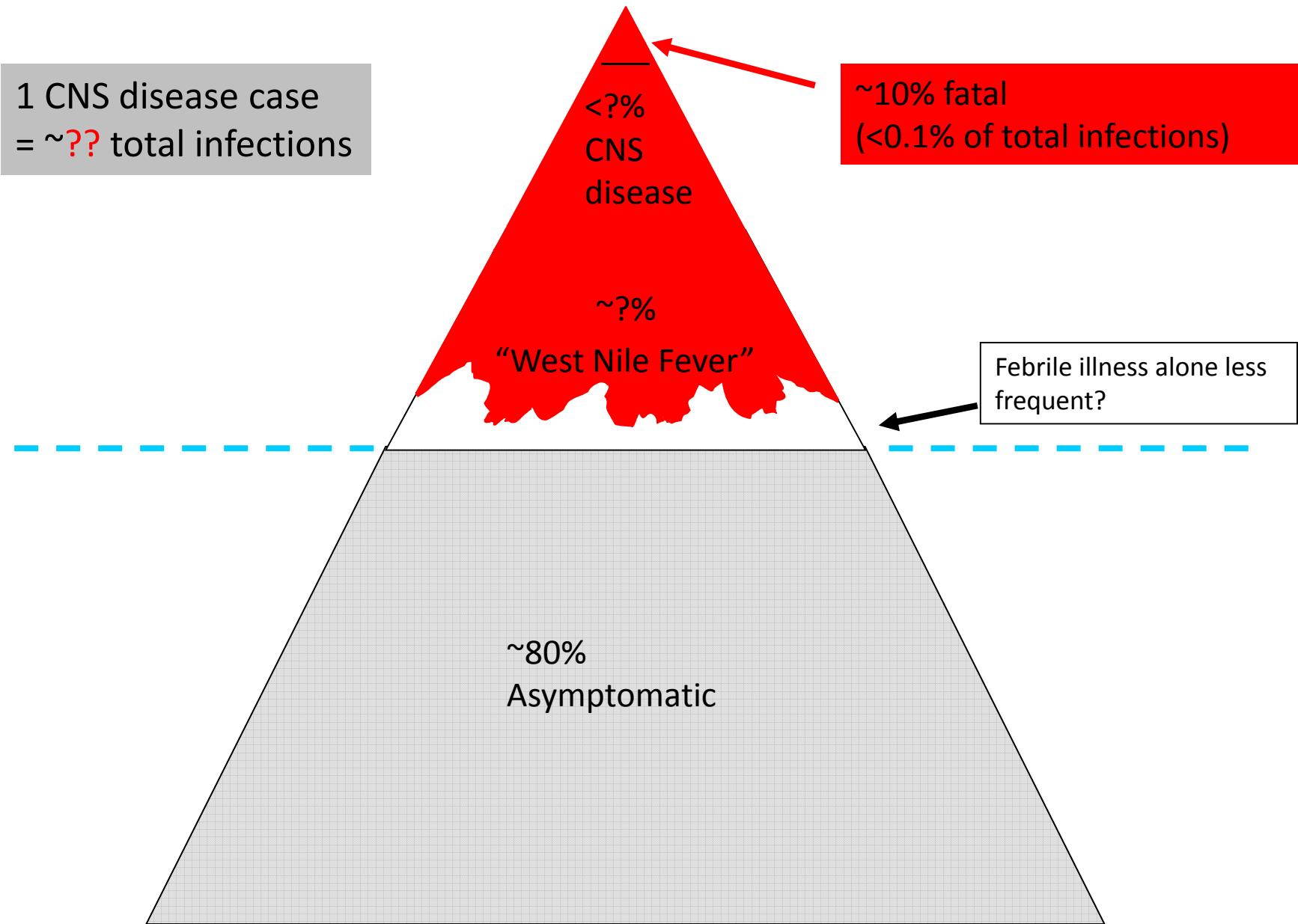
* As of September 27, 2005.

Emerging issues in WNV epidemiology – revisiting the pyramid

Classic distribution of symptoms in WNV diseases

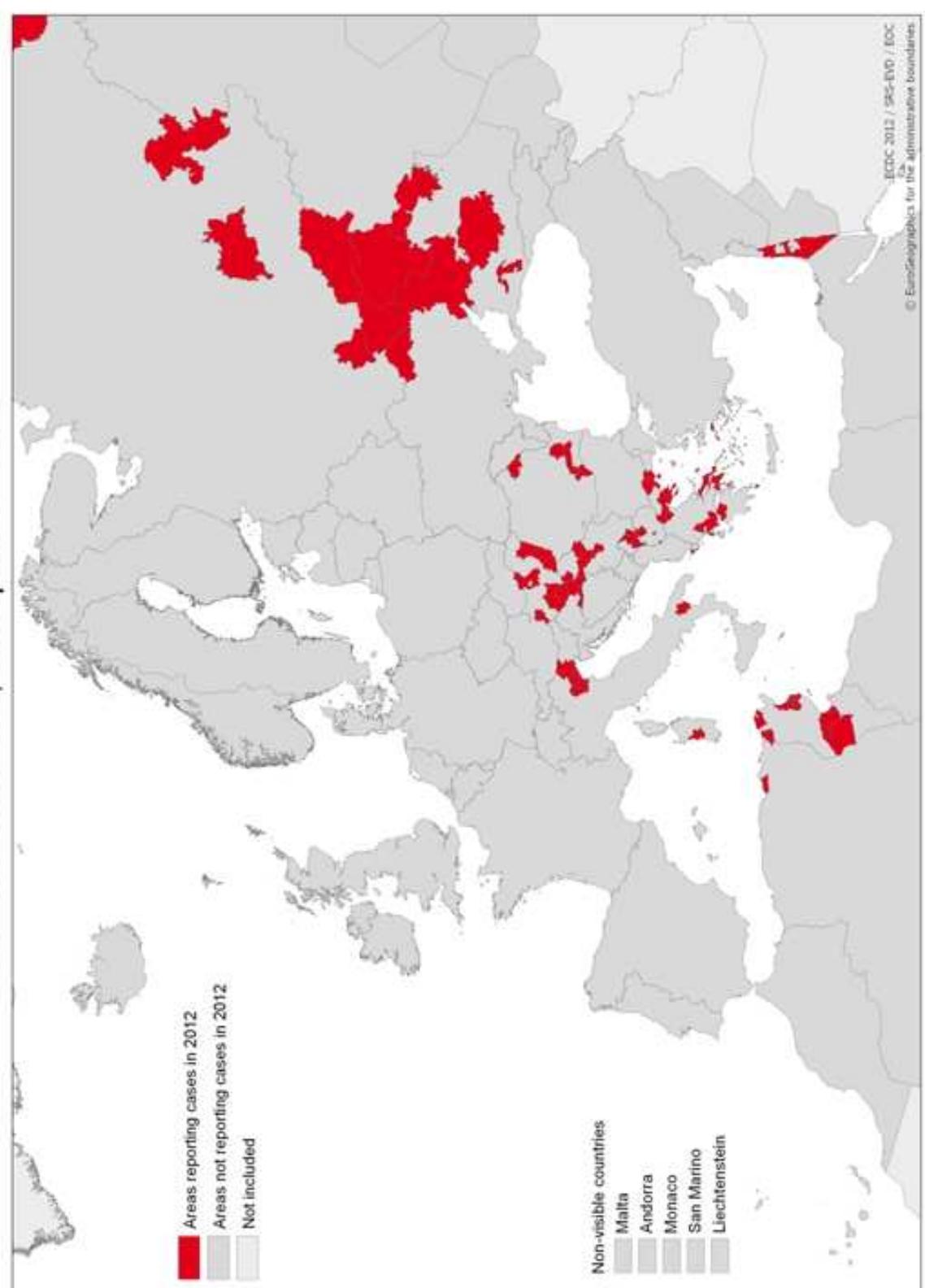


WNV Human Infection “Iceberg” Revisited



Reported cases of West Nile fever for the EU and neighbouring countries

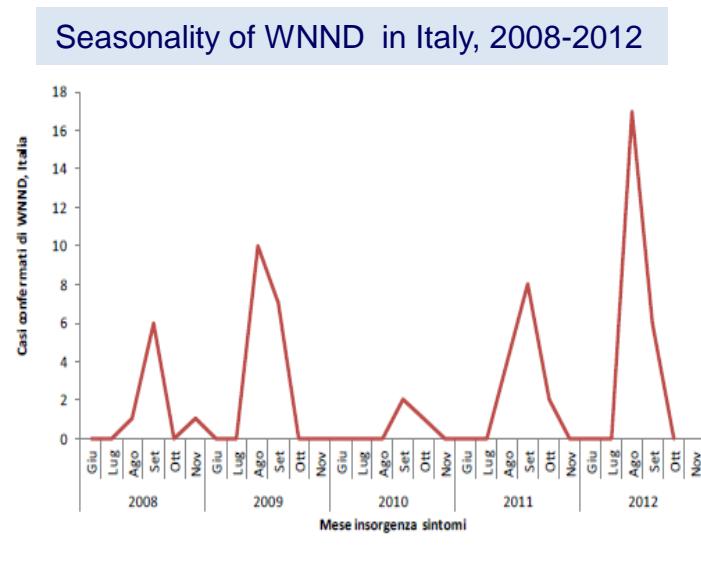
Transmission season 2012; latest update: 31/10/2012



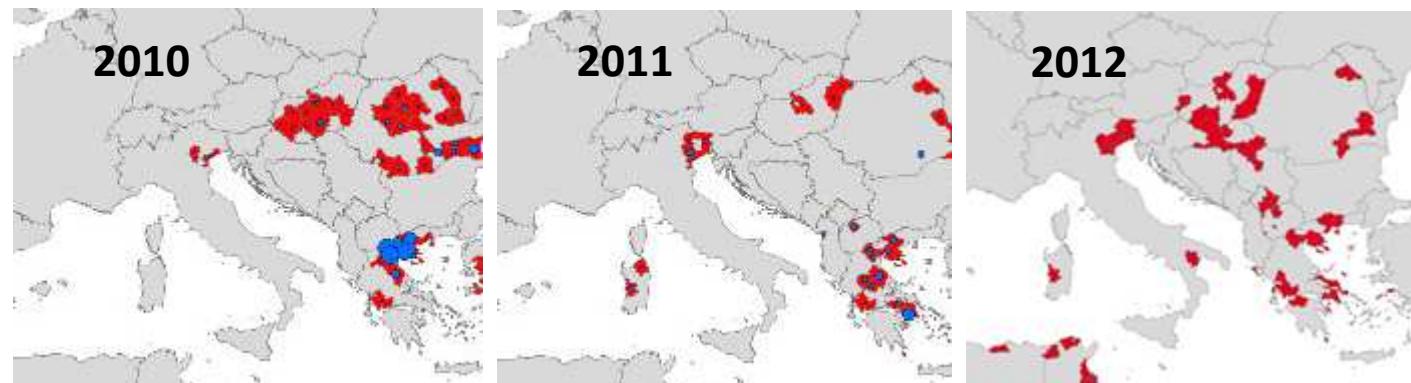
Italia: aumento dell'incidenza fin dal 2008

- WNV riappare in Italia nel 2008 dopo una lunga assenza (dal 1998).

Region	Autochthonous WNND cases per year				
	2008	2009	2010	2011	2012
Emilia Romagna	3	9	0	0	0
Veneto	5	7	3	8	21
Lumbardy	0	2	0	0	0
Friuli-VG	0	0	0	2	4
Sardinia	0	0	0	4	2
Basilicata	0	0	0	0	1
Total	8	18	3	14	28



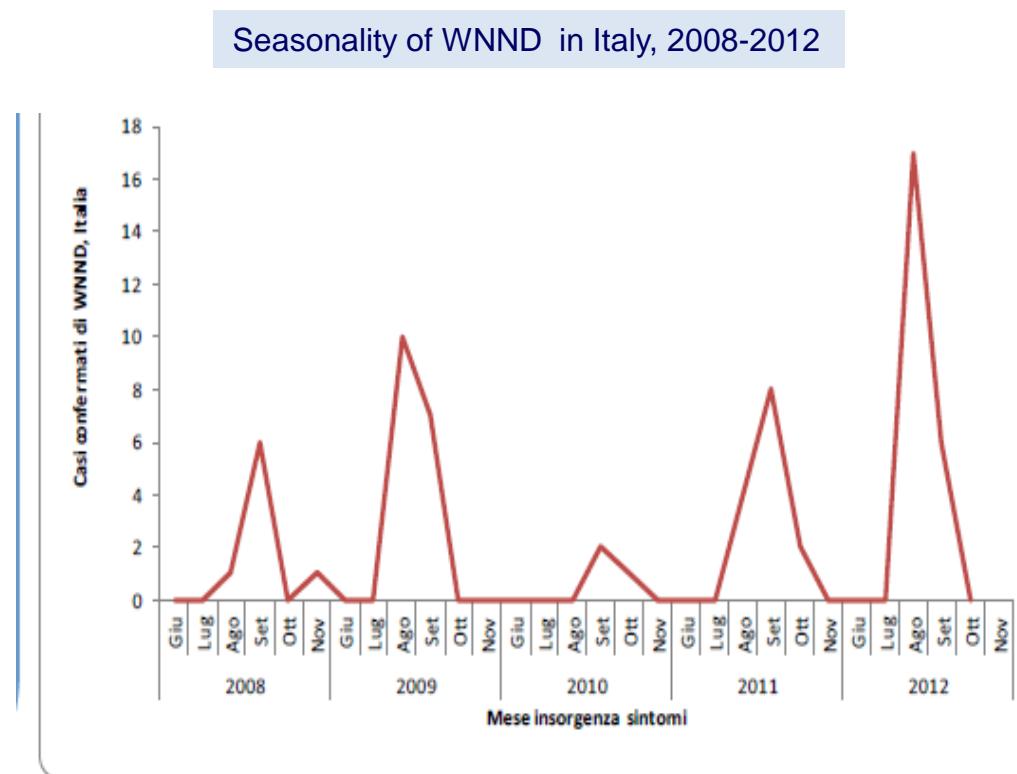
Source: Epicentro, ISS, last updated: October 31, 2012



Source: ECDC http://ecdc.europa.eu/en/healthtopics/west_nile_fever

WNV in Italia. Epidemiologia differente dagli USA.

- In Italia, il numero di casi umani è rimasto sostanzialmente costante dopo la sua introduzione.



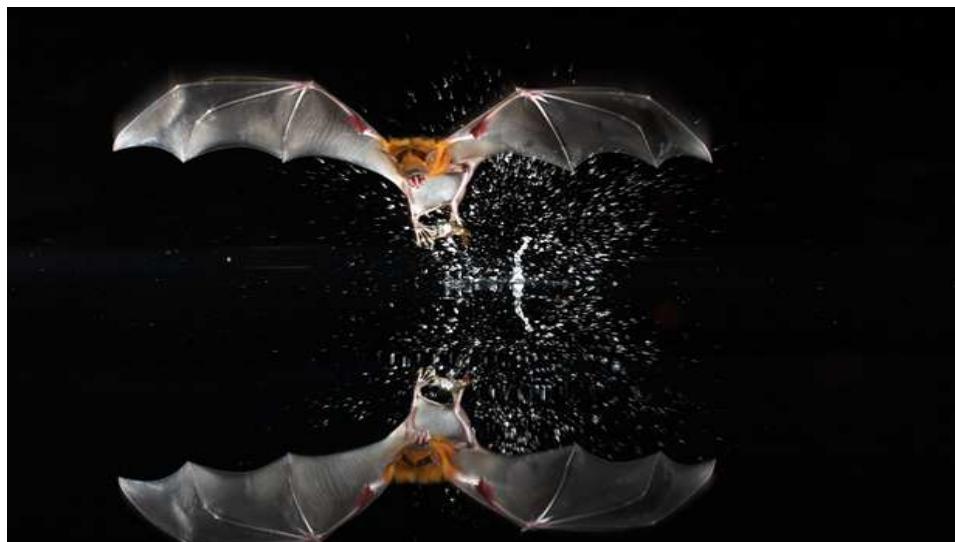
Perchè l'epidemiologia è diversa?

- Differenti fattori ecologici (diverso ospite intermedio)?
- Diversi fattori virologici?
- Mancanza di sorveglianza?
- O stiamo assistendo ad un pattern pre-epidemico, e la vera epidemia scoppierà da un anno all'altro?

Main determinants in Emerging Diseases

- New pathogens and expansion of viruses to new geographic regions. Examples: MERS, WNV, Ebola;
- **Spread of viruses into humans from animal reservoirs.** Examples: Hendra and Nipah, **Ebola**;
- Breakdown of public health systems. Example: Polio, Ebola.

The emerging role of bats as reservoir: rabies, Hendra, Nipah, Lyssaviruses, Ebola, Marburg, SARS-CoV...



Why bats are special?

- Extreme biodiversity contributes to the biodiversity of their pathogens;
- Unique mammals able to fly;
- Different immunological characteristics: they have no bone-marrow;
- Social animals, living in large colonies;
- Wide variety of ecological niches, with different ecological specialization;
- Some of them are hematophagous.

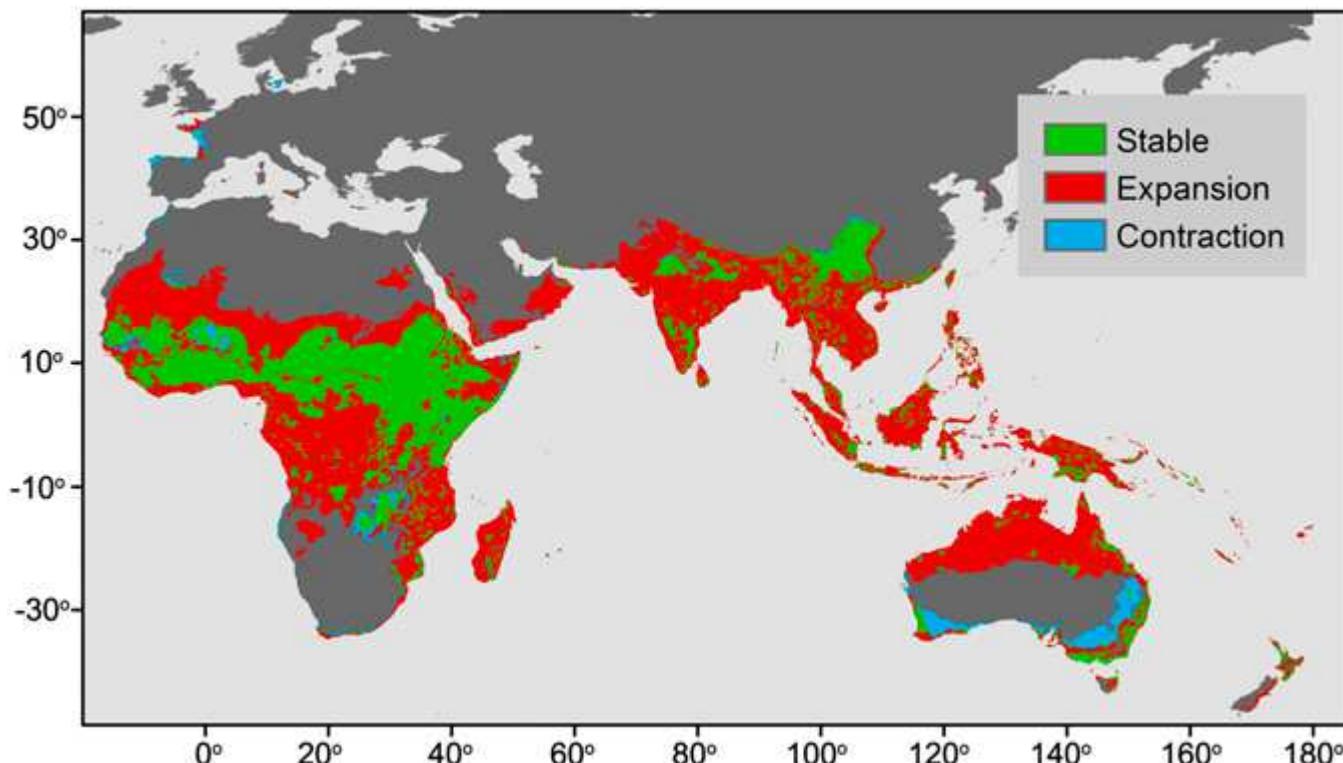


Nipah virus: the Asian “Ebola”?

- Several outbreaks among pigs and humans since first epidemic in Malaysia in 1999, all in South Asia (mainly India and Bangladesh);
- Some hundreds of human cases, and thousands of swine pulled down;
- Main symptom: severe Encephalopathy, 60% lethality;
- Rarely transmitted by humans to humans;
- Main reservoir are the fruit bats.

Nipah virus – Future expansion?

- Coverage area of fruit bats is enlarging, due to climate change. **Are new Nipah outbreaks expected in virgin territories, such as Africa?**
- In the figure, the current areal of fruit bats and **potential for expansion** due to climate change



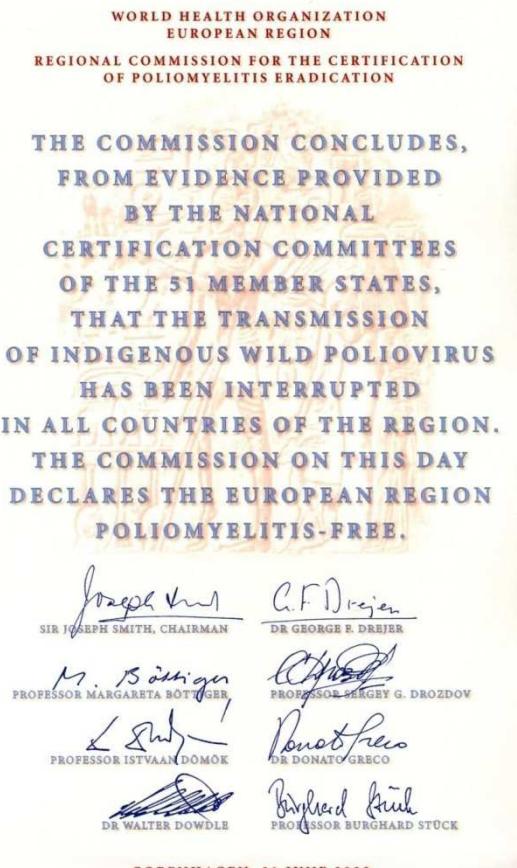
Main determinants in Emerging Diseases

- New pathogens and expansion of viruses to new geographic regions. Examples: MERS, WNV, Ebola;
- Spread of viruses into humans from animal reservoirs. Examples: Hendra and Nipah, Ebola;
- **Breakdown of public health systems.** Example: Polio, Ebola.

Resurgence of Poliomyelitis

- European WHO Region has been declared **polio-free** in 2002.

CERTIFICATE



Declaration of polio-free
region, 2002

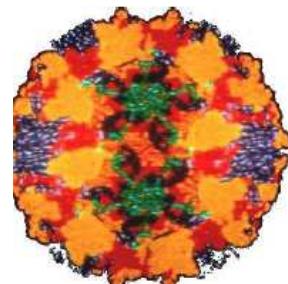


Last Polio case in Europe: Turkey, 1998

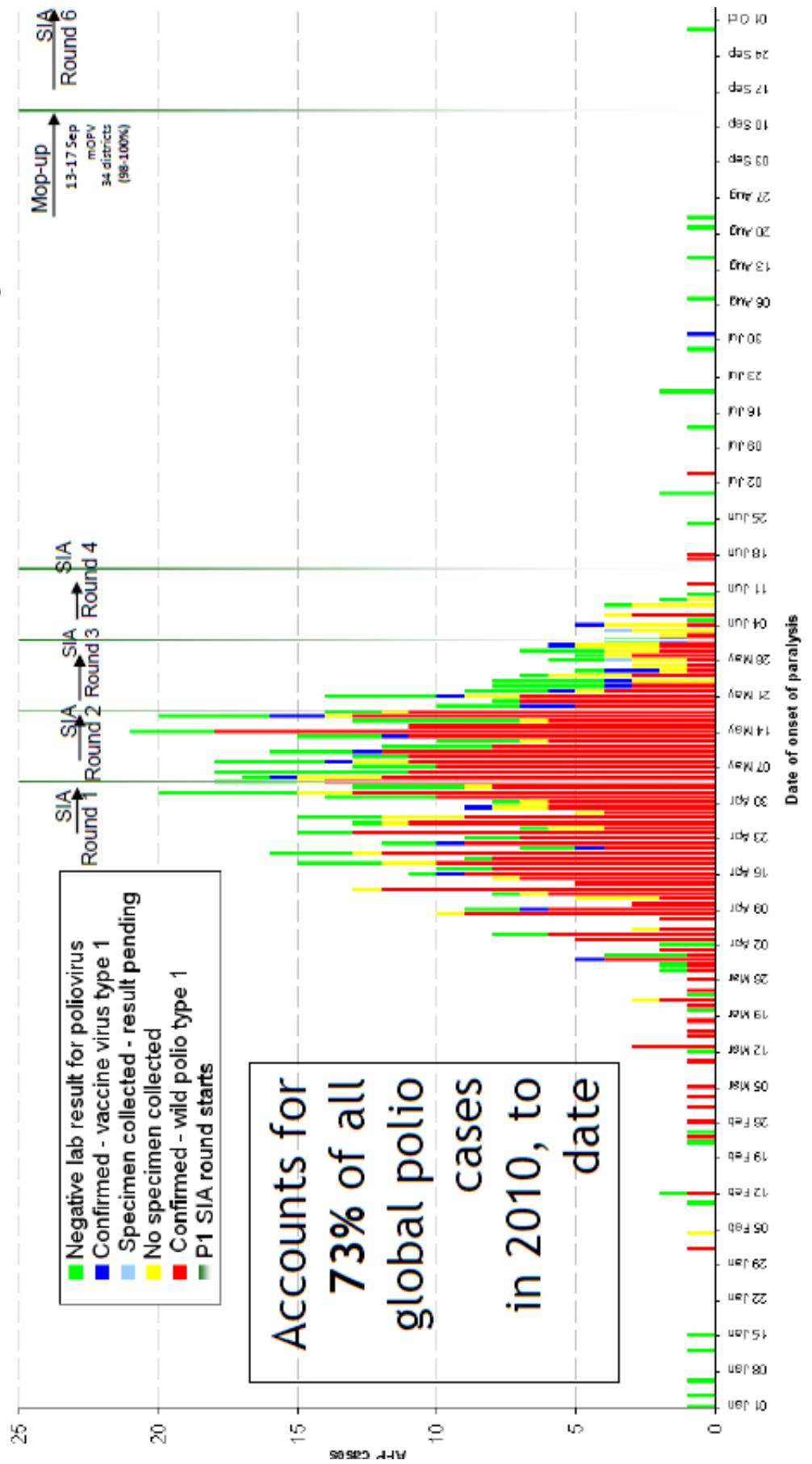
It is still true?

Poliovirus outbreak, Tajikistan 2010

- A wild poliovirus has been introduced in Tajikistan, probably by an Indian immigrant;
- It started the first polio outbreak in European Region after the 2002 Declaration



Laboratory confirmed polio cases, AFP cases negative for poliovirus, and AFP cases pending results by date of paralysis onset, Tajikistan, 2010

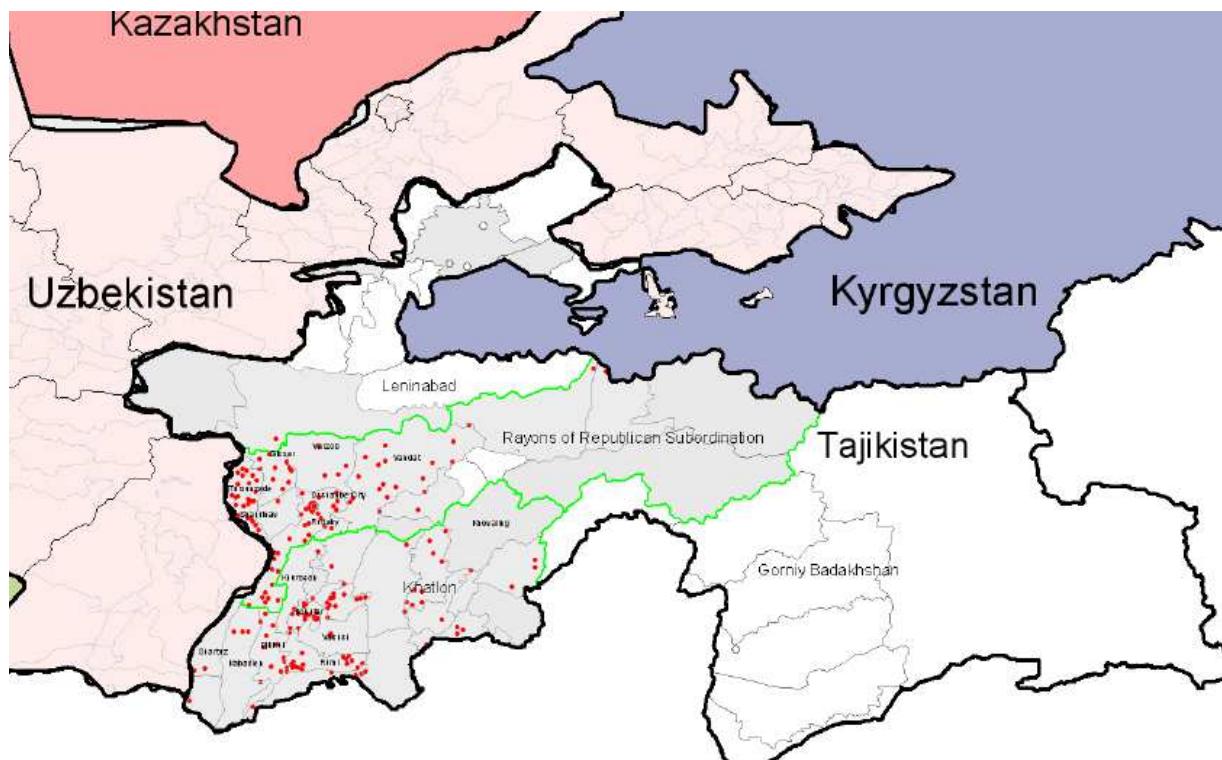


Something strange in Tajiki outbreak...

- It is estimated that, for each symptomatic case, polio virus cause about 200 cases;
- We can assume that about 150.000 cases occurred in Tajikistan;
- It means that:
 - 1 child over 3 under 1 year was not protected!!!
 - 1 child over 5 under 6 year was not protected!!!
 - 1 adolescent over 10 was not protected!!!
- And the vaccination campaign?

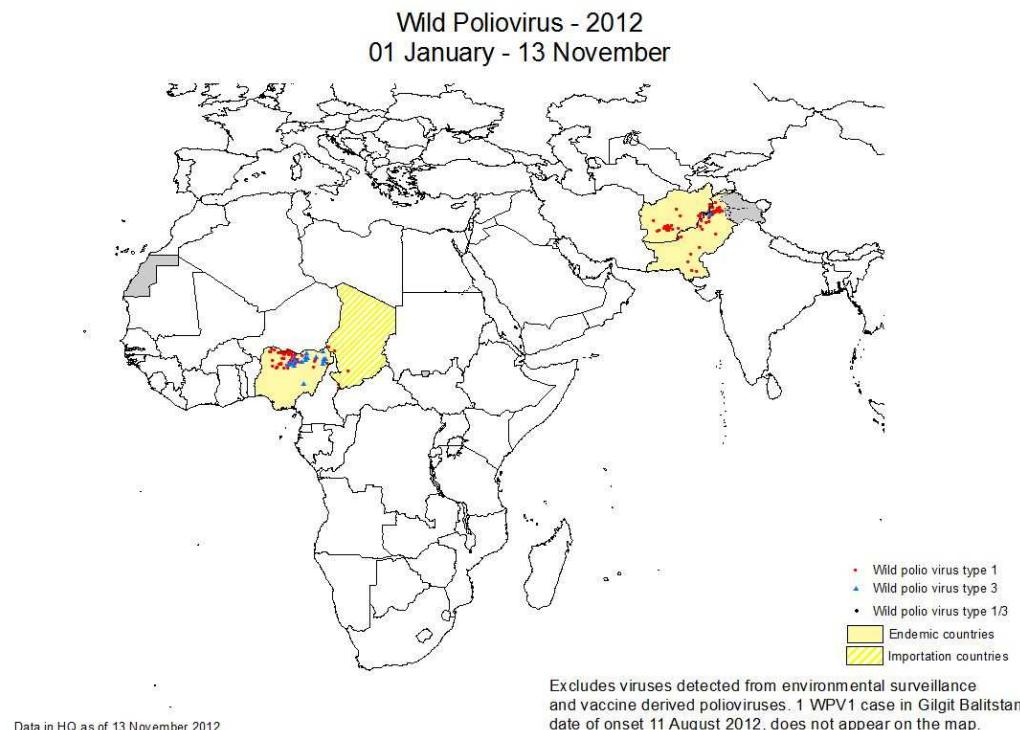
False vaccination coverage declaration?

- It is probably that declarations of vaccination coverage in Tajikistan were **systematically false** since many years;
- Probably the breakdown of Public Health System, after URSS deflagration, lead to this situation;
- Which about **other countries with similar situation?**



Polio in the world - 2012

- After the control of outbreak in Tajikistan, the European Region is returned “free”;
- In the areas where transmission is currently ongoing, **cultural and religious barriers by Islamic fundamentalists limit the vaccination** in Nigeria, Afghanistan and Pakistan.



Warrach HJ. Religious opposition to polio vaccination. Emerg Infect Dis. 2009

Epidemia da virus Ebola nell'Africa occidentale 2014

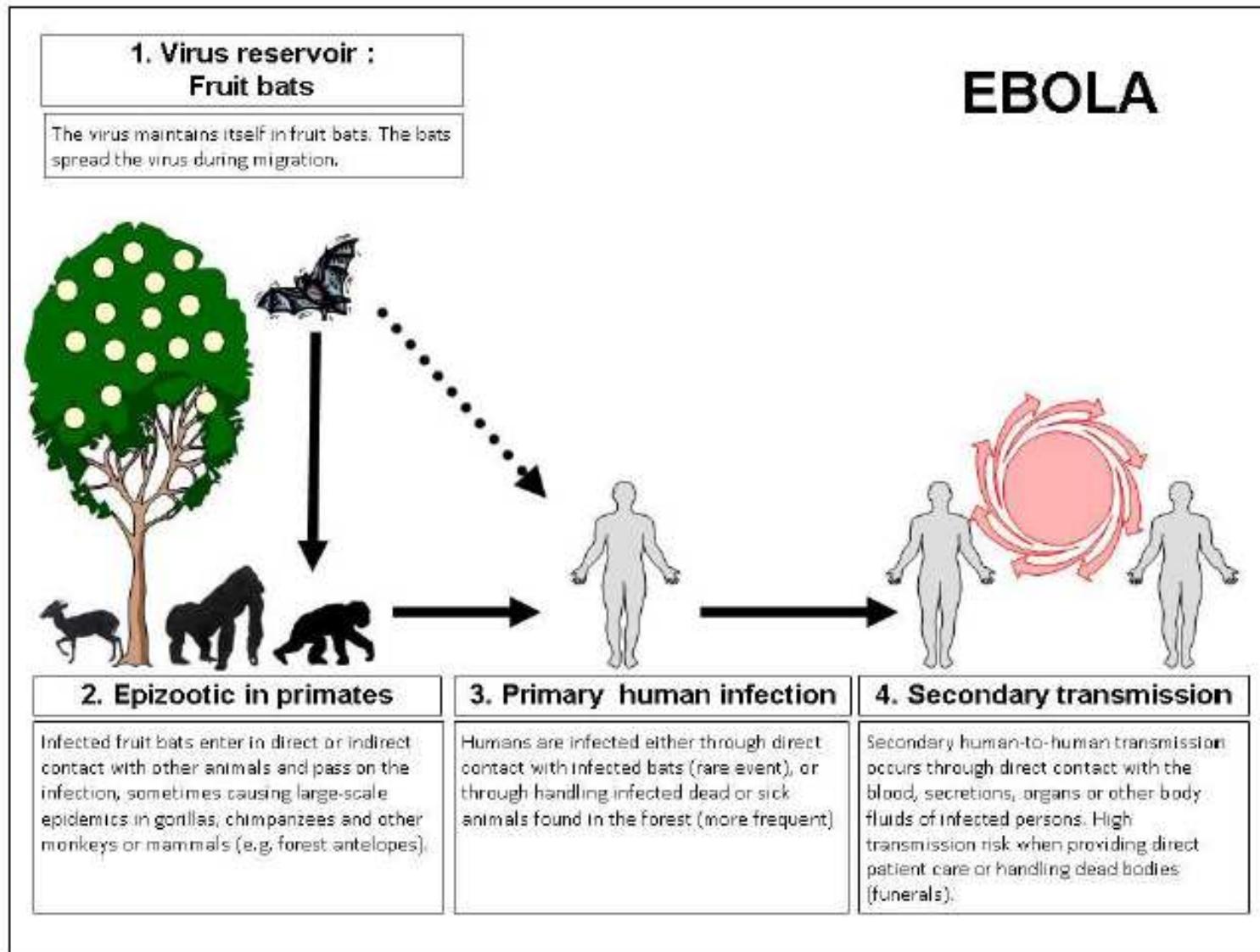
- Una malattia introdotta in nuovi territori;
- Derivante dal reservoir animale;
- Amplificata dal malfunzionamento dei sistemi di sanità pubblica...

Malattia da Virus Ebola (Ebola Virus Disease, EVD)

- Già conosciuta come Febbre Emorragica Ebola;
- Malattia virale, causata da un Filovirus come la Febbre Marburg;
- Se ne conoscono 5 specie, di cui 4 patogene per l'uomo;
- Malattia ad alta letalità, direttamente trasmissibile da uomo ad uomo;
- E' la malattia che, nell'immaginario collettivo, evoca più di ogni altra una "idea di drammaticità".



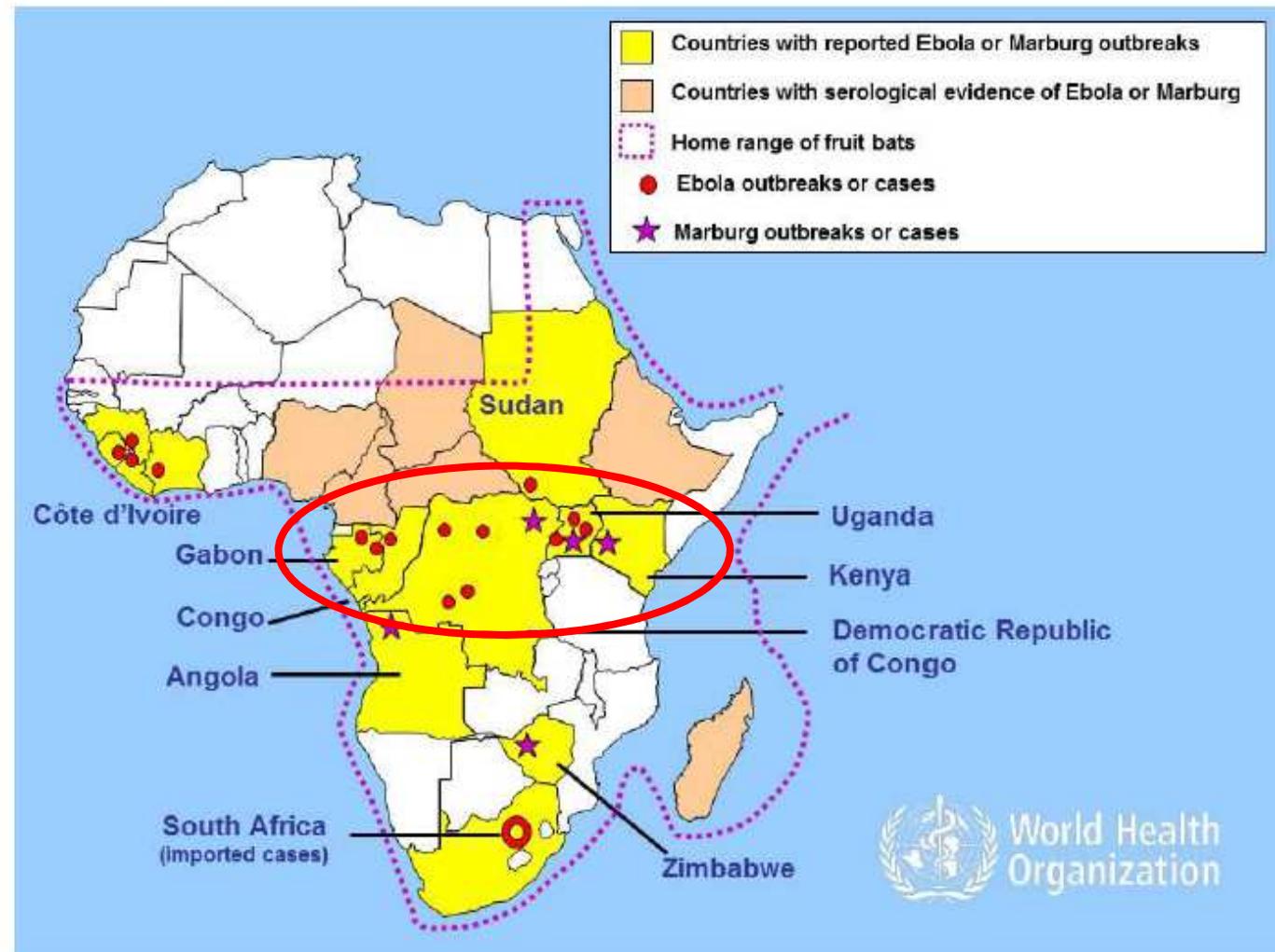
La dinamica delle epidemie da EVD



Le precedenti epidemie da Virus Ebola

Figure 1. Geographical distribution of Ebola and Marburg outbreaks in Africa (1967-2014)

- Tutte avvenute in Africa Centrale;
- Sono avvenute sempre più frequentemente negli ultimi anni;
- Sempre in contesti di villaggi o piccole cittadine



I numeri della epidemia in corso, rispetto alle epidemie precedenti, sono incredibilmente più alti



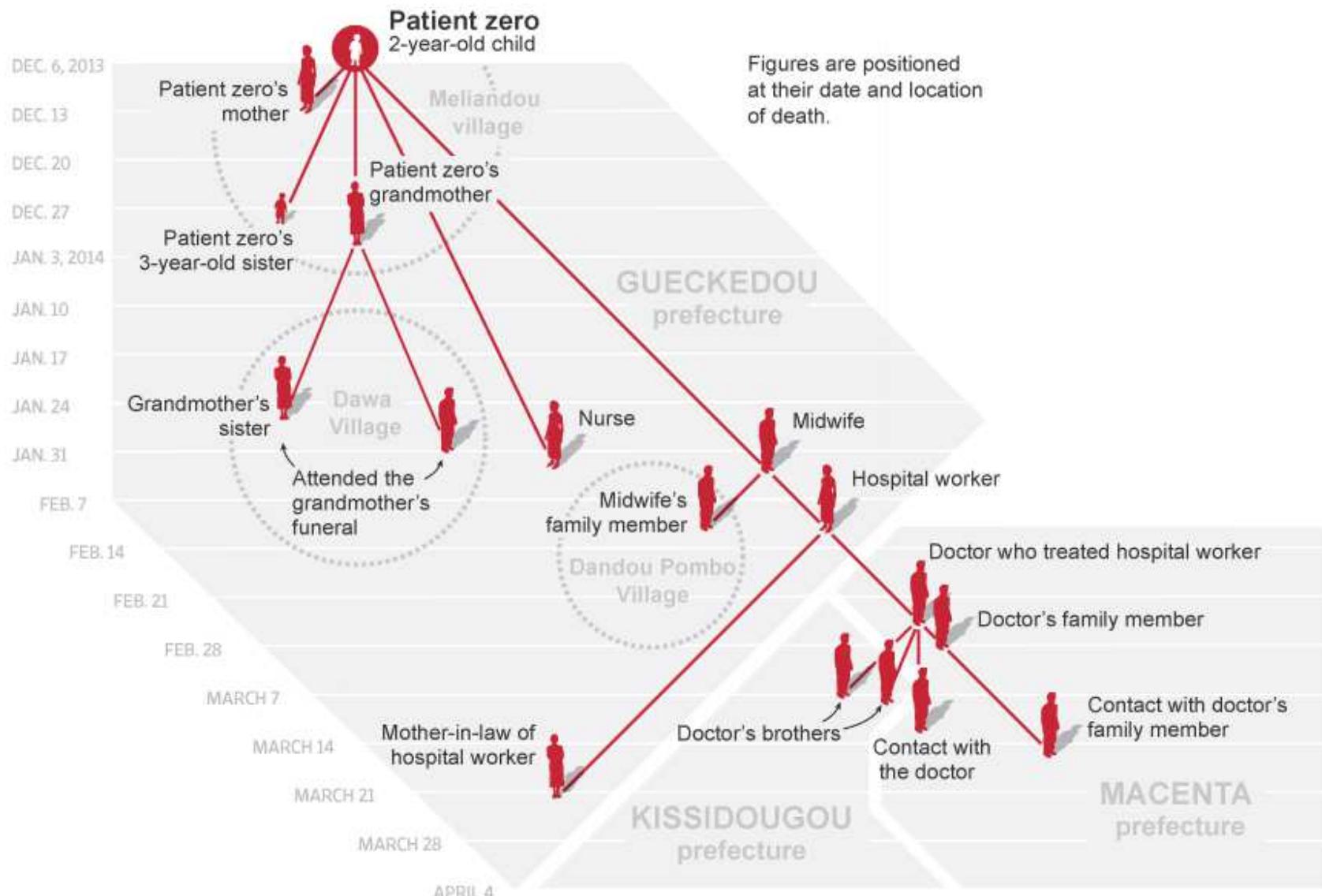
Total number

Table 2. Total number of cases and deaths in West African EVD-affected countries, as of 23 September 2014 [29]

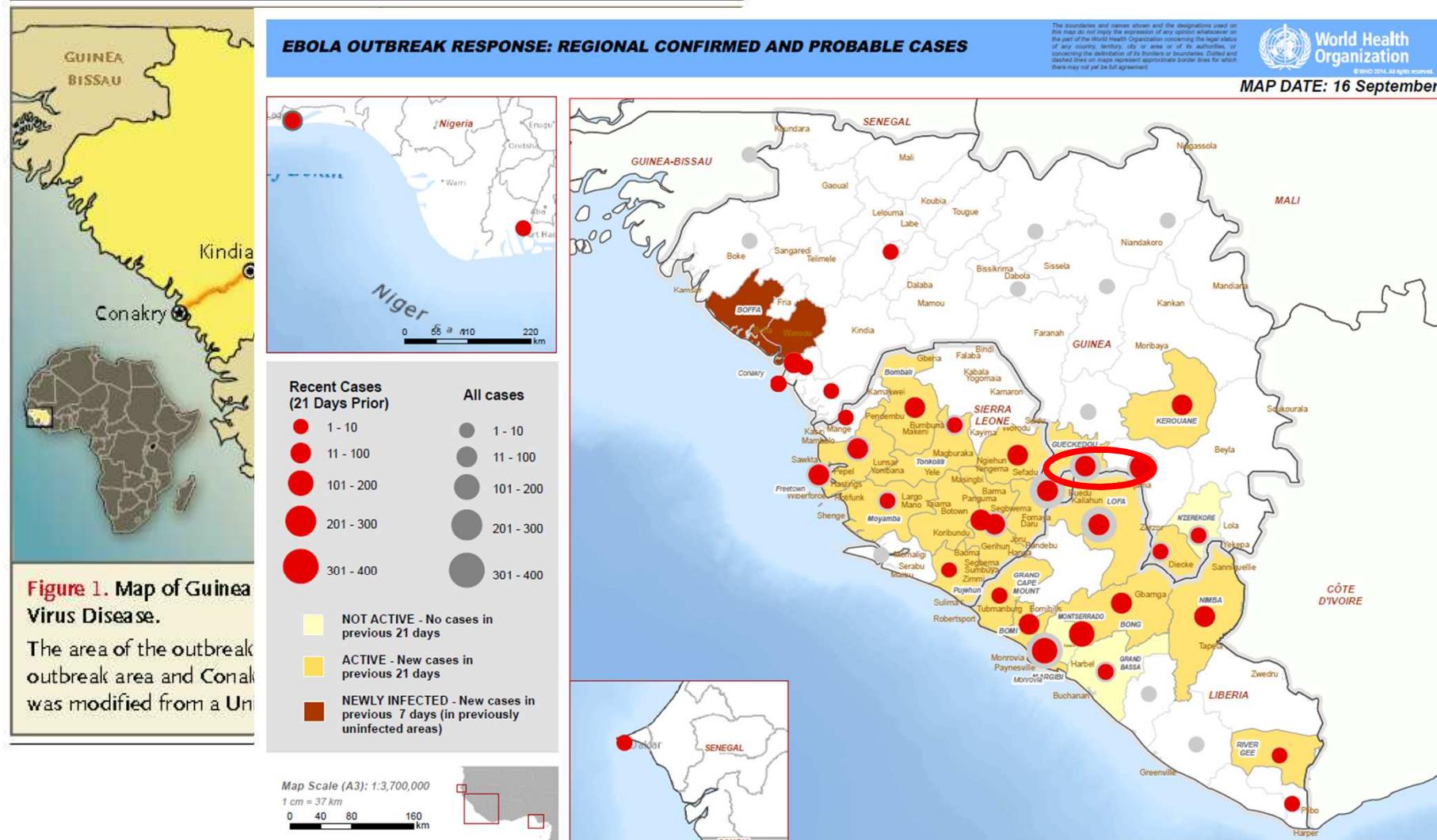
Country	Total number of cases	Total number of deaths
Guinea	1 074	648
Sierra Leone	2 021	605
Liberia	3 458	1 830
Nigeria	20	8
Total	6 573	3 091

Note: Above numbers are subject to change due to ongoing reclassification, retrospective investigation, and availability of laboratory results.

Origine della Epidemia in Africa Occidentale



Distribuzione geografica all'inizio dell'epidemia ed attualmente

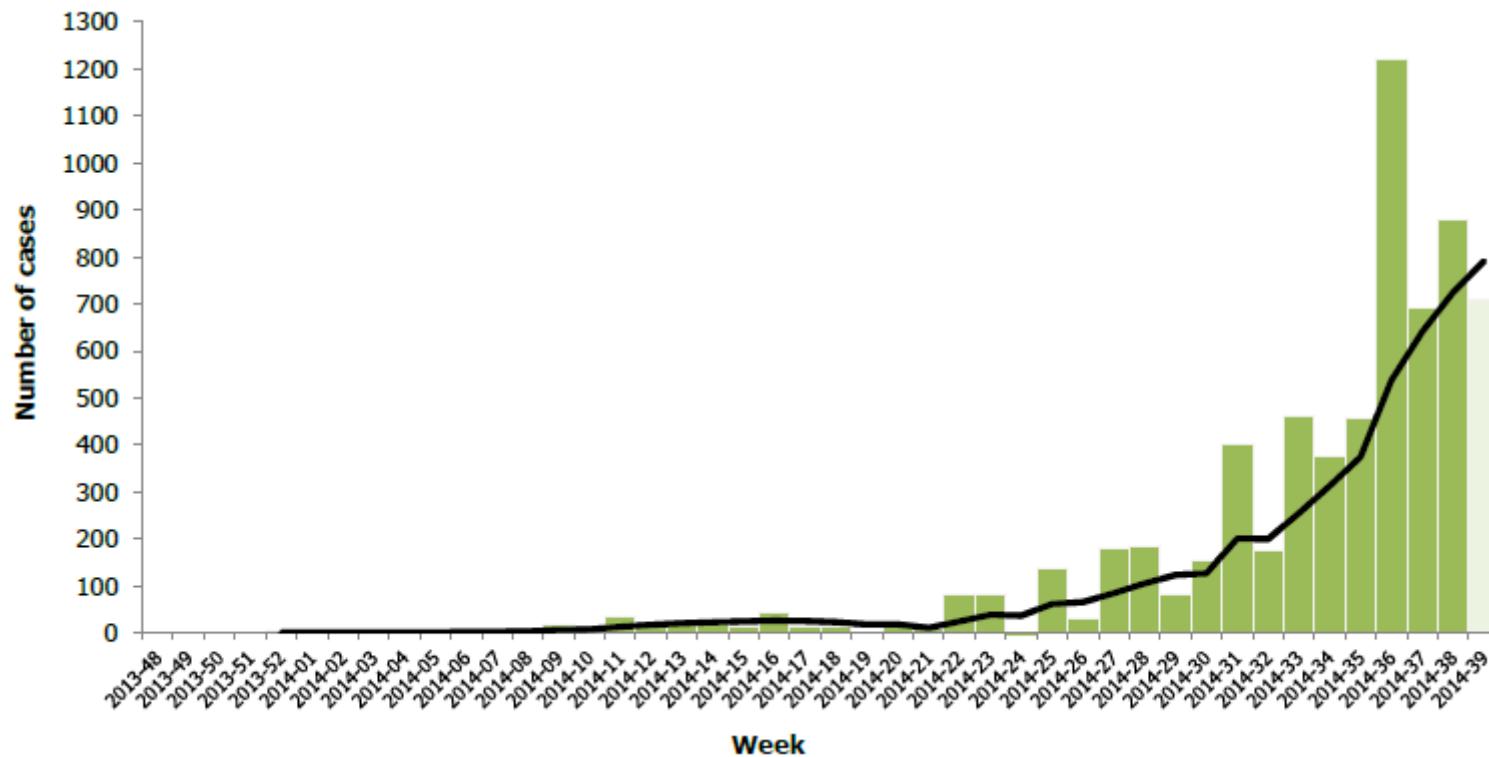


L'epidemia in Nigeria – Dalla importazione al contenimento?

- Il 23 Luglio un passeggero benestante proveniente dalla Liberia raggiunge Lagos in aereo. All'arrivo appaiono i sintomi. Viene prontamente ricoverato e posta diagnosi. Il 26 Luglio il paziente muore;
- Il 5 Agosto viene posta diagnosi di Ebola in un medico nigeriano che aveva trattato il primo paziente;
- Il medico, nonostante la comparsa dei primi sintomi, ha continuato a prestare servizio (eludendo volontariamente l'isolamento?), avviando una catena di trasmissione che ha causato 21 casi (tra cui 8 decessi);
- Dopo un intenso lavoro di ricerca dei contatti e di isolamento dei casi, l'epidemia pare essere contenuta (mancanza di nuovi casi da circa 21 giorni).

Numeri della epidemia in Africa occidentale - 1

Incidenza di nuovi casi



Parametri epidemiologici di riferimento

Tabella 1 – Parametri epidemiologici della epidemia di EVD in corso in Africa Occidentale (da WHO Ebola Response Team, NEJM, Sept 2014)

Periodo di incubazione (in giorni)	$9,4 \pm 7,4$
R_0	1,2-2,0
Intervallo dalla comparsa dei sintomi (in giorni)	
Alla ospedalizzazione	$5,0 \pm 4,7$
Alla dimissione	$16,4 \pm 6,5$
Alla morte	$7,5 \pm 6,8$
Tasso di mortalità (%)	
Basato sugli outcome definitivi	70,8
Prima del 18 Agosto	71,3
Dopo il 18 Agosto	59,9
Solo i casi ospedalizzati	64,3
Solo negli operatori sanitari	69,4

Ebola: protection of health workers on the front line



Although fears were raised about the possible spread of Ebola virus to the UK and USA last week, the real concern remains in west Africa. Unlike previous outbreaks in east Africa that were brought under control fairly swiftly, the west African outbreak has become the worst in history. 1603 people have had suspected or confirmed Ebola virus disease in the four affected countries (Guinea, Sierra Leone, Liberia, and Nigeria) and 887 died between March, 2014, and Aug 1, 2014.

On Aug 1, WHO Director-General Margaret Chan and the presidents of the affected countries launched a new joint US\$100 million plan to bring the outbreak under control. The intensified response is much needed. The plan rightly recognises the need for several hundred more personnel, including clinical doctors and nurses, epidemiologists, and social mobilisation experts, to be deployed to the affected countries. Domestic and foreign health workers on the ground dealing with the outbreak have been overstretched. On June 24, Médecins Sans Frontières warned that its teams had reached the limits

of what they could do. More than 60 health workers have already died from Ebola while helping others, including doctor Sheik Umar Khan who is credited with treating more than 100 patients with the disease in Sierra Leone. Health workers on the front line are at increased risk of contracting Ebola by coming into contact with the bodily fluids of infected patients. Use of adequate personal protective clothing and equipment when caring for patients or the deceased, thorough cleaning, and effective waste disposal, can substantially reduce the risk of infection. Worryingly, last week the World Medical Association reported that many of its junior doctor members dealing with the outbreak had not been provided with essential protective equipment. The situation is disturbing and unacceptable. Governments, WHO, and the international community have a collective responsibility not only to fully staff the effort to bring Ebola under control, but also to provide adequate protective clothing, training, and support for anyone coming into contact with patients. ■ *The Lancet*

See World Report page 481

For more on the Ebola outbreak see <http://www.who.int/csr/diseases/ebola/en/>

Table 4. Number of Ebola cases and deaths in healthcare workers as of 21 September 2014

Country	Cases (% of total reported cases)	Deaths (% of total reported deaths)
Guinea	67 (6.2)	35 (54)
Sierra Leone	113 (5.6)	82 (13.6)
Liberia	184 (5.3)	89 (4.9)
Nigeria	11 (55.0)	5 (62.5)
Total	375 (5.7)	211 (6.8)

Source: WHO [29]

Perché una così grande epidemia?

Una epidemia da virus Ebola sarebbe, in teoria, relativamente facile da contenere:

- Il periodo di incubazione è abbastanza lungo (circa 7 giorni in media) e quindi consente una ricerca dei contatti;
- La patologia non sembra essere trasmissibile in assenza di sintomi, e quindi basterebbe isolare i malati in fase sintomatica;
- Le precauzioni standard e da contatto si sono dimostrate efficaci nel prevenire la maggioranza delle trasmissioni

Perché una così grande epidemia?

- **Povertà, povertà, povertà** (Secondo l'Indice di Sviluppo Umano 2014, su 187 paesi i tre paesi colpiti in posizione 175, 179, 183);
- Situazione drammatica dei sistemi sanitari assistenziali;
- Inesistenza/inefficienza di strutture di sanità pubblica;
- Frontiere molto facili da attraversare;
- Scarsa collaborazione (ed evidente ostilità delle popolazioni locali);
- Paura, credenze locali, stigma;
- **Sottostima del problema e lentezza degli interventi di aiuto internazionale.**

Perché una così grande epidemia? Ostilità delle popolazioni locali

The screenshot shows a web browser window with the TIME magazine website loaded. The main headline is "8 Ebola Workers Killed by Panicked Mob in Guinea". Below the headline, a sub-headline reads "Officials and journalists on a delegation to raise awareness in a remote village were found dead". The article discusses how eight members of a delegation were killed by an angry mob in a remote village in Guinea. The browser interface includes a navigation bar with tabs for TIME, PEOPLE, FORTUNE, SPORTS ILLUSTRATED, ENTERTAINMENT WEEKLY, MONEY, GOLF, and MORE. There are also social media sharing buttons for email, Facebook, Twitter, Google+, and LinkedIn.

8 Ebola Workers Killed by P... time.com/3403202/guinea-ebola-mob/

TIME INC. NETWORK : TIME PEOPLE FORTUNE SPORTS ILLUSTRATED ENTERTAINMENT WEEKLY MONEY GOLF MORE

TIME Subscribe MENU LATEST MAGAZINE VIDEOS

8 Ebola Workers Killed by Panicked Mob in Guinea

Dozens of Turkish ISIS Hostages Freed in 'Rescue Effort'

AP Interview: El-Sissi Ready to Back Anti-IS Fight

Hillary Clinton's Decision Time

Sarkozy Eyes Return to Frontline French Politics as Hollande Stumbles

ABA ENGLISH

Impara l'inglese con i film!

Trasferimento dati da images.taboola.com...

Tina Fey's Family Drama War to Peace

FREE TIME Up to 6 months free when you subscribe now!

WORLD EBOLA

8 Ebola Workers Killed by Panicked Mob in Guinea

Denver Nicks @DenverNicks | Sept. 19, 2014

✉️ 📱 🌐 🗃

Officials and journalists on a delegation to raise awareness in a remote village were found dead

Eight members of a delegation on a mission to raise awareness in a remote village in Guinea about the Ebola outbreak ravaging West Africa were killed this week by an angry mob who thought they came to spread the disease, a government spokesperson said Thursday.

The delegation of government officials, health workers, journalists and a pastor left for the remote village on Tuesday, the New York

19.39 20/09/2014

Una forte polemica si è innescata tra Medicins Sans Frontieres (MSF) e l'Organizzazione Mondiale della Sanità (WHO);

MSF, che ha lavorato sul campo fin dalle fasi iniziali dell'epidemia, sostiene di aver **più volte allertato le autorità internazionali circa gli sviluppi drammatici dell'epidemia**;

Il WHO sostiene di aver fatto quanto poteva, **nel rispetto del proprio ruolo ed in relazione alle proprie risorse**;

Da pochi giorni, il controllo delle operazioni per il contenimento della epidemia sono passate **sotto la gestione diretta dell'ONU** (per la prima volta impegnato in una crisi sanitaria)

Ebola: a failure of international collective action

The Lancet Editorial (Aug 23, p 637)¹ sums up the collective failure to respond in a manner that might have

trend to treat humanitarian assistance as a branch of development aid might contribute to the current hands-off approach, leading to a paralysis of effective and direct humanitarian action on the ground.

The plight of health staff and populations in west Africa, faced

collapsing health services running and, more importantly, to show that global solidarity still exists.

We declare no competing interests.

*Mit Phillips, Aine Markham
mit.phillips@brussels.msf.org

Médecins Sans Frontières, Analysis and Advocacy Unit, Brussels 1090, Belgium



Published Online
September 9, 2014
[http://dx.doi.org/10.1016/S0140-6736\(14\)61606-8](http://dx.doi.org/10.1016/S0140-6736(14)61606-8)

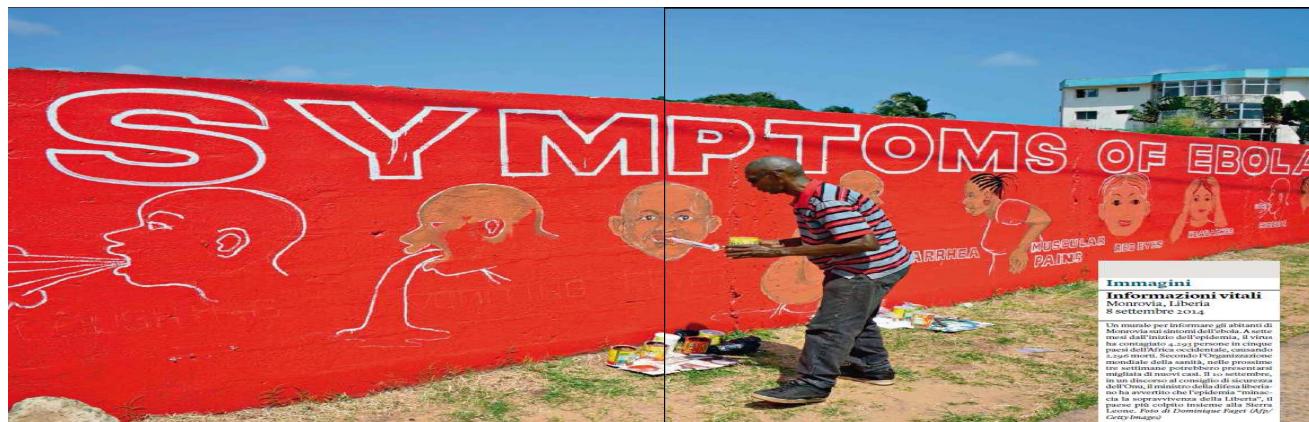
Sicuramente:

- Le autorità locali hanno tardato a riconoscere l'insorgenza della epidemia;
- Le autorità internazionali hanno tardato a riconoscere la gravità della situazione;
- Le stime della necessità di letti e personale fatte all'inizio dell'epidemia si sono rivelate drammaticamente inadeguate.



- Staff medico e sanitario per:
 - Gestione clinica dei pazienti,
 - Gestione dell'infection control;
- Staff logistico ed epidemiologico per:
 - Gestione delle supplies,
 - Contact tracing;
- Letti di isolamento, ospedali da campo, Dispositivi di Protezione Individuale;
- Supporto diagnostico;
- Training agli operatori locali;
- Campagne di informazione alla popolazione generale
- Beni di prima necessità: cibo, acqua, altri farmaci...

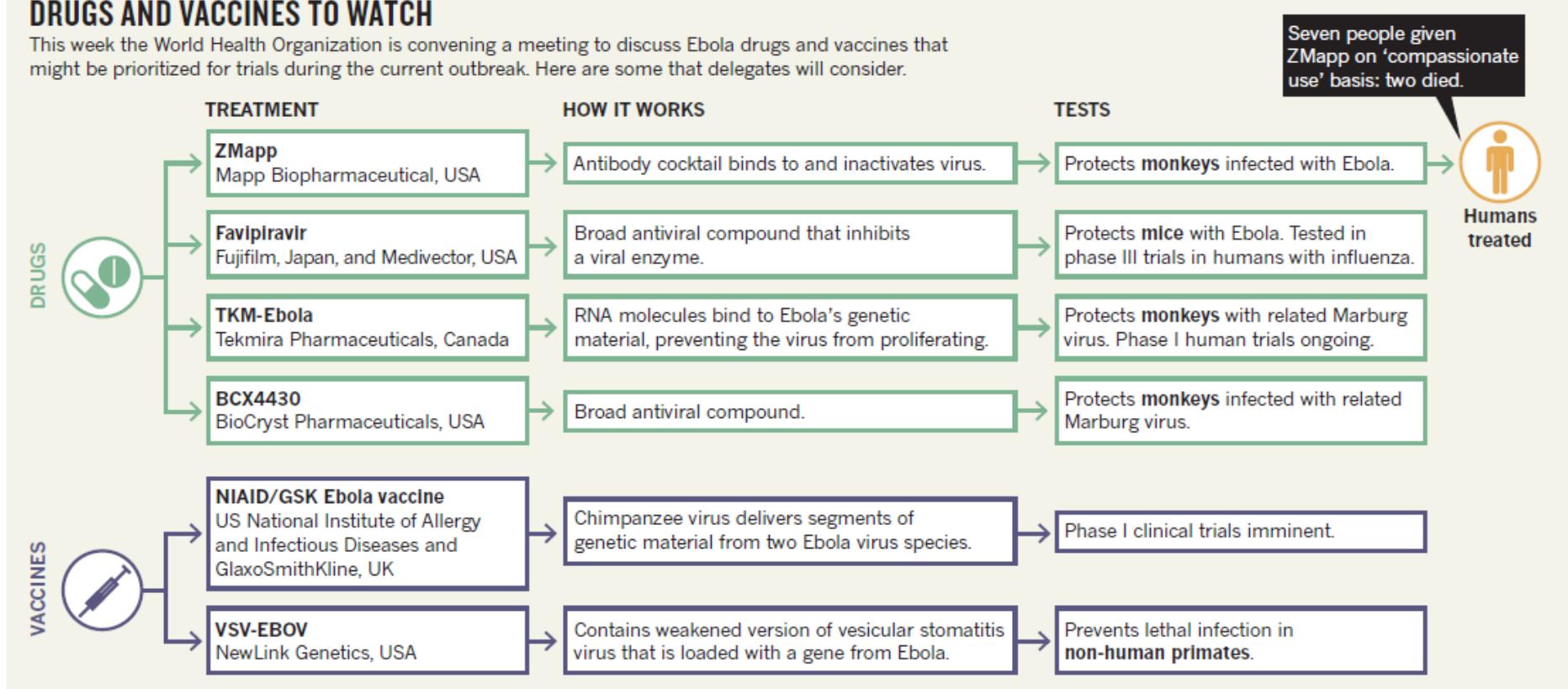
Attuali necessità per il controllo dell'epidemia



Interventi terapeutici e vaccinali

DRUGS AND VACCINES TO WATCH

This week the World Health Organization is convening a meeting to discuss Ebola drugs and vaccines that might be prioritized for trials during the current outbreak. Here are some that delegates will consider.



Vaccini-1

- ChAd3 monovalente/bivalente NIH/GSK
- 100% di protezione sulle scimmie
- Fase I in USA e UK

Farmaci-1

ZMapp™

- Tripli anticorpi monoclonali in piante di tabacco (plantibodies)
- 100% di protezione sulle scimmie
- Circa 10 trattamenti in uso compassionevole

Farmaci-2

- **Siero Umano di Convalescente**
- Già usato nel 1995 nell'epidemia di Kikwit
- Unico raccomandato WHO

Casi nei paesi occidentali

- A oggi, solo pochi casi sono avvenuti nei paesi occidentali;
- In (quasi) tutti i casi si trattava di pazienti che erano stati diagnosticati nei paesi colpiti, ed **appositamente rimpatriati**;
- In Europa, casi sono stati gestiti in Inghilterra, Spagna, Germania ed attualmente in Francia;
- Da due giorni è giunta notizia del primo caso importato in USA non rimpatriato.



Table 5. Medical evacuation from EVD-affected countries up to 25 September 2014

Date of evacuation	Evacuated from	City (country) of evacuation	Profession	Outcome	Confirmed	Citizenship
2 August	Liberia	Atlanta (USA)	Healthcare worker	Discharged	Yes	US
5 August	Liberia	Atlanta (USA)	Healthcare worker	Discharged	Yes	US
6 August	Monrovia, Liberia	Madrid (Spain)	Healthcare worker	Death	Yes	Spanish
24 August	Sierra Leone	London (United Kingdom)	Healthcare worker	Discharged	Yes	British
27 August	Sierra Leone	Hamburg (Germany)	Epidemiologist	Unknown	Yes	Senegalese
4 September	Liberia	Omaha (USA)	Healthcare worker	Discharged (?)	Yes (?)	US
9 September	Liberia	Atlanta (USA)	Healthcare worker	Discharged (?)	Yes (?)	US
14 September	Sierra Leone	Leiden (Netherlands)	Healthcare worker	Discharged	No	Dutch
14 September	Sierra Leone	Leiden (Netherlands)	Healthcare worker	Discharged	No	Dutch
19 September	Liberia	Paris (France)	Healthcare worker	Stable	Yes	French
22 September	Sierra Leone (Lunsar)	Madrid (Spain)	Healthcare worker	Death	Yes	Spanish
22 September	Sierra Leone	Geneva (Switzerland)	Healthcare worker	Stable	Suspect	Non-Swiss
28 September	Sierra Leone	Washington, DC (USA)	Healthcare worker	Stable	Suspected	US

Il caso importato in USA

- Cittadino liberiano, viene a trovare i parenti in USA, Texas;
- Asintomatico alla partenza, in aereo, all'arrivo (il 20 Settembre);
- Dopo 4 giorni febbre, si presenta ad un ospedale il 26 Settembre. Nonostante dica di essere liberiano, **non viene identificato come caso sospetto!**
- Torna dopo due giorni, in condizioni più gravi. Identificato come sospetto, isolato, attualmente in cura;
- Aveva accompagnato una conoscente in un centro di isolamento per Ebola in Liberia, ma non riferisce esposizioni ad alto rischio;
- Attualmente circa 20 persone sono state identificate come contatti, e sono sotto sorveglianza.

Futuri casi in Italia?

- Improbabili, ma **non impossibili**;
- Una cosa (quasi) certa: **se arriva, arriva in aereo!**
- Scenario più probabile: **un operatore sanitario o umanitario appositamente rimpatriato**;
- Altri possibili scenari:
 - Un operatore sanitario che sviluppa la malattia dopo il rientro;
 - Un operatore non sanitario (personale ENI, cooperante internazionale, prete) che sviluppa la malattia al rientro in Italia;
 - Un immigrato regolare di ritorno in Italia dopo la visita ai parenti (improbabile per la scarsa presenza in Italia di comunità dai paesi colpiti, tranne la Nigeria dove l'epidemia pare estinta);
 - Un immigrato clandestino (altamente improbabile visto la durata e la durezza del percorso migratorio clandestino).

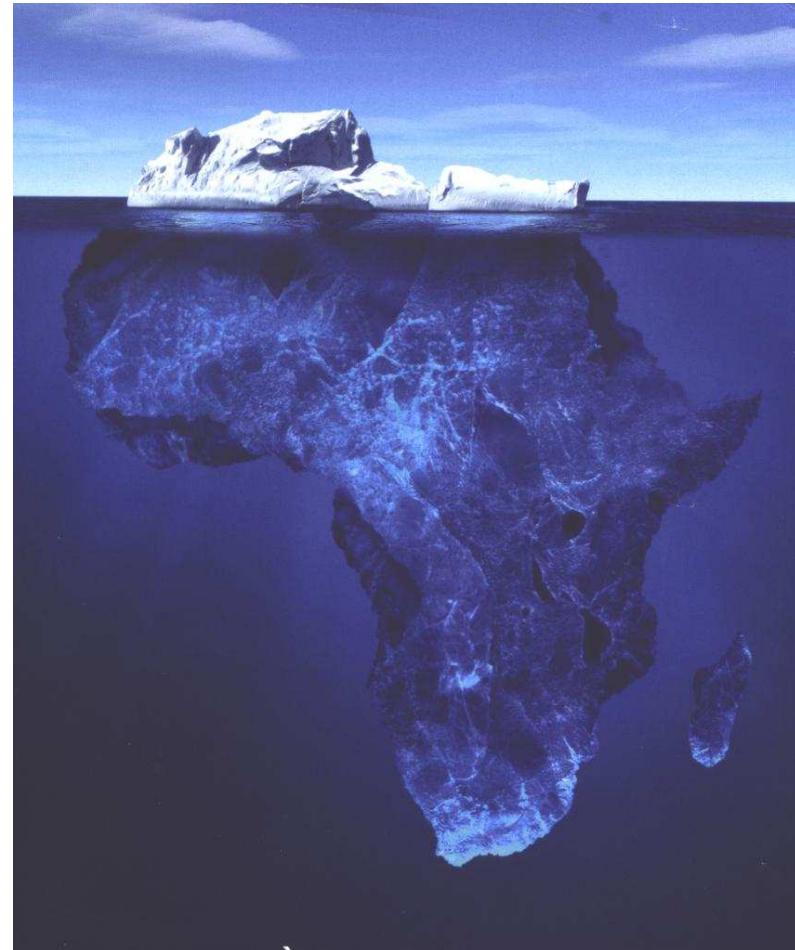
Public Health Strategies

- EIDs usually hit unprepared population/Public Health systems;
- Diagnostics, drugs and pharmaceuticals are often not existing or not widely available;
- Thus, preparedness plans and adequate Public Health strategies are strongly needed.



Main preparedness points

- Early detection (screening, syndromic surveillance, clinical awareness);
- Laboratory capabilities;
- Isolation and Infection control capabilities;
- Innovative research on drugs and vaccines;
- Training of HCWs;
- A bit of luck!



Hospital preparedness during SARS: imaginative solutions...



Figure 1. Due to limited space within the facility, temporary tents used for staff screening were set up at the entrance of the Toronto Western hospital.



Main points to be addressed to face EID Infrastructures



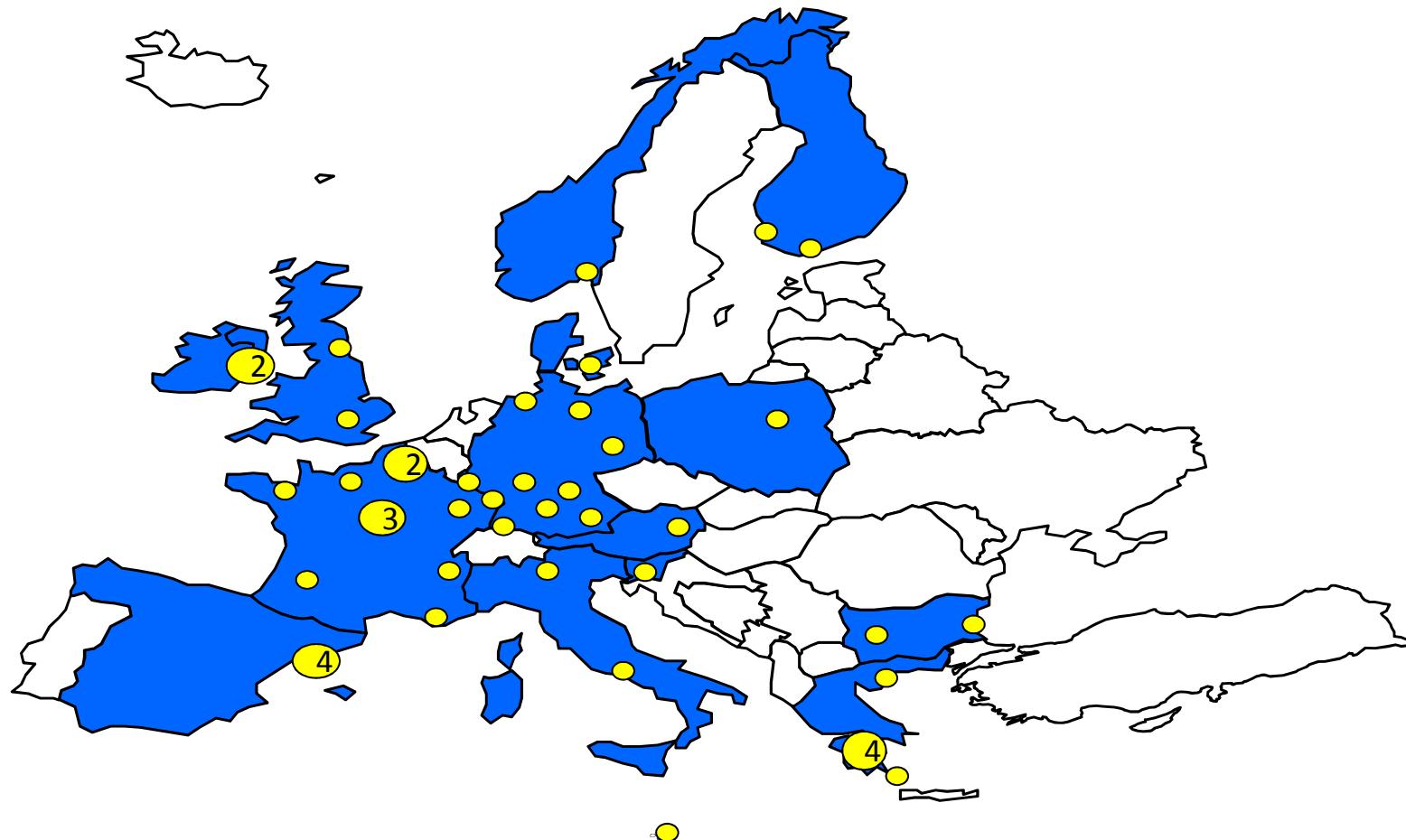
The “Trexler” isolator available at Royal Free Hospital, London



The high-level isolation unit and the BSL-4 cabinet available at INMI, Rome

Main points to be addressed to face EID Infrastructures – Isolation units

The situation in Europe - 2009



Fusco FM et al. Journal of Hospital Infections,

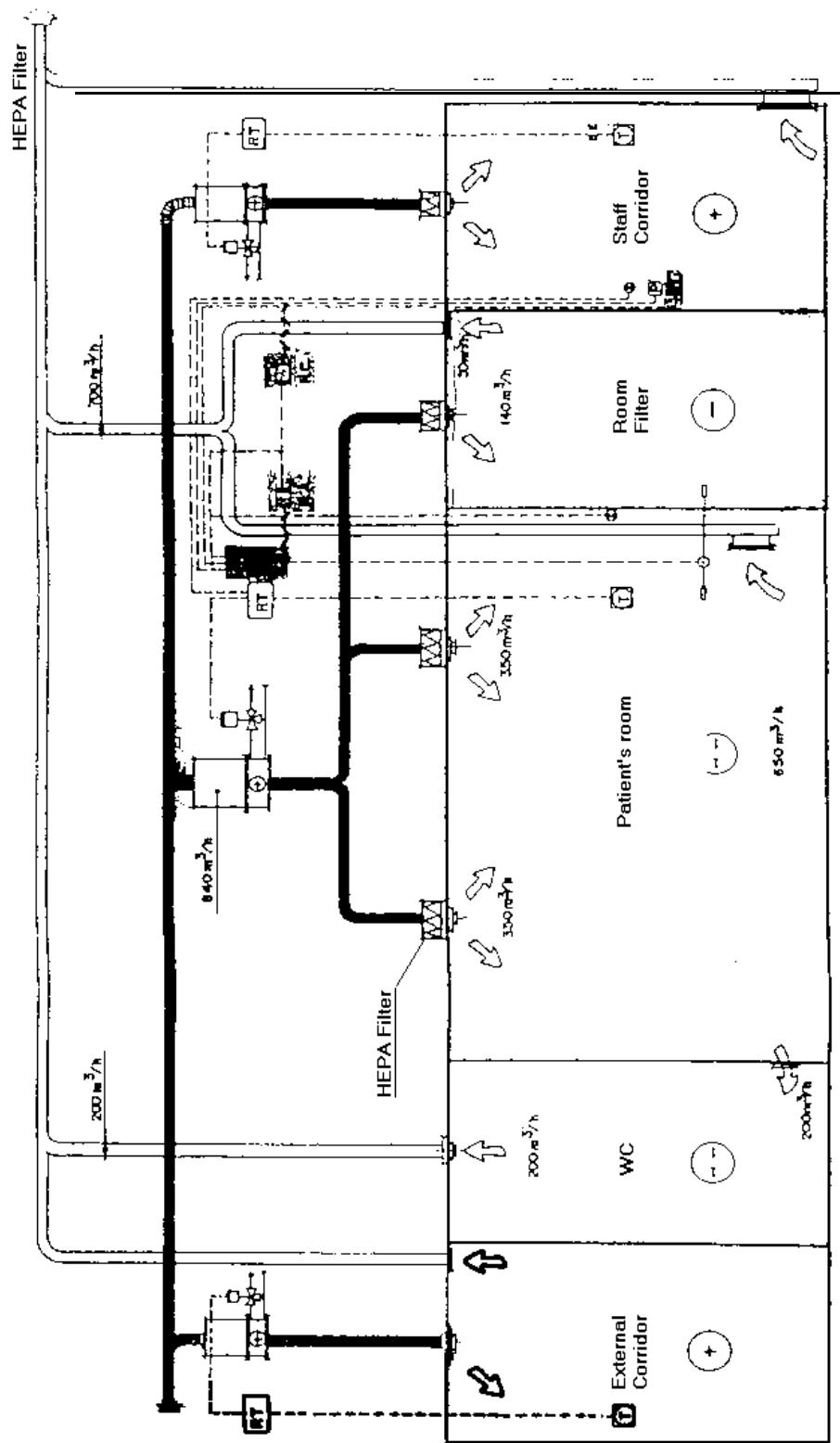
The National Institute for Infectious Diseases “Lazzaro Spallanzani”





INMI: currently available facilities for Highly Infectious Diseases

- One high-level containment unit always available;
- Other 8 beds in a dedicated ward able to be activated in 4 hours;
- Infection control specific expertise;
- 5 biosafety Level (BSL)-3 containment laboratories, one of which equipped for performing autopsies;
- 1 BSL-4 laboratory (Class III cabinet) for maximum containment.





Transport capabilities





Spallanzani Hospital Team and Air Force Team working together



**High Containment Ambulance
of Spallanzani Team**



Procedure!!!

**Istituto Nazionale per le Malattie Infettive
Lazzaro Spallanzani-Roma**

**Piano per la gestione dell’assistenza sanitaria di
casi sospetti o accertati con patologie
riconducibili ad agenti biologici utilizzati
utilizzati a fini bioterroristici**



[**http://www.inmi.it/bioresponce/piano.pdf**](http://www.inmi.it/bioresponce/piano.pdf)

European Networks

- **Laboratory diagnosis and research**
 - The European Network of P4 Laboratories ([Euronet-P4](#) and [ENP4-Lab](#), 2005-2010), [QUANDHIP](#) (2011-14)
- **Clinical and infection control management**
 - The European Network for Infectious Diseases ([EUNID](#), 2004-2007)
 - European Network for highly infectious diseases ([EURONHID](#), 2007-2010)
 - EuroNHID Consolidation, in 2014
- **Training**
 - European Training in Infectious Disease Emergencies ([ETIDE](#), 2006-2009)

Capacità diagnostiche per Ebola allo Spallanzani

- Ricerca diretta del virus mediante metodi molecolari basata su un test iniziale di screening e vari test successivi di conferma
- Caratterizzazione molecolare mediante sequenziamento ed analisi filogenetica
- Ricerca diretta del virus mediante metodi culturali
- Ricerca diretta del virus mediante microscopia elettronica
- Ricerca degli anticorpi mediante Immunofluorescenza indiretta (IgM e IgG)
- Ricerca di anticorpi mediante test di neutralizzazione
- Diagnosi differenziale verso le principali eziologie alternative, nonché verso altre cause di sindromi emorragiche, incluse Lassa, Dengue, Alkhurma, febbre gialla, ecc.



**Corso di formazione per formatori sulla malattia da virus Ebola
per i medici dei servizi di Pronto Soccorso del Lazio**

Istituto Nazionale per le Malattie Infettive (INMI) "Lazzaro Spallanzani", Roma
22, 23, 24, 25 e 26 settembre 2014

Grazie a tutti!