Emerging infections

Nick Beeching
Senior Lecturer in Infectious Diseases

Tropical & Infectious Disease Unit
Royal Liverpool University Hospital
Liverpool School of Tropical Medicine

The message

Act, before disease becomes persistent through long delays

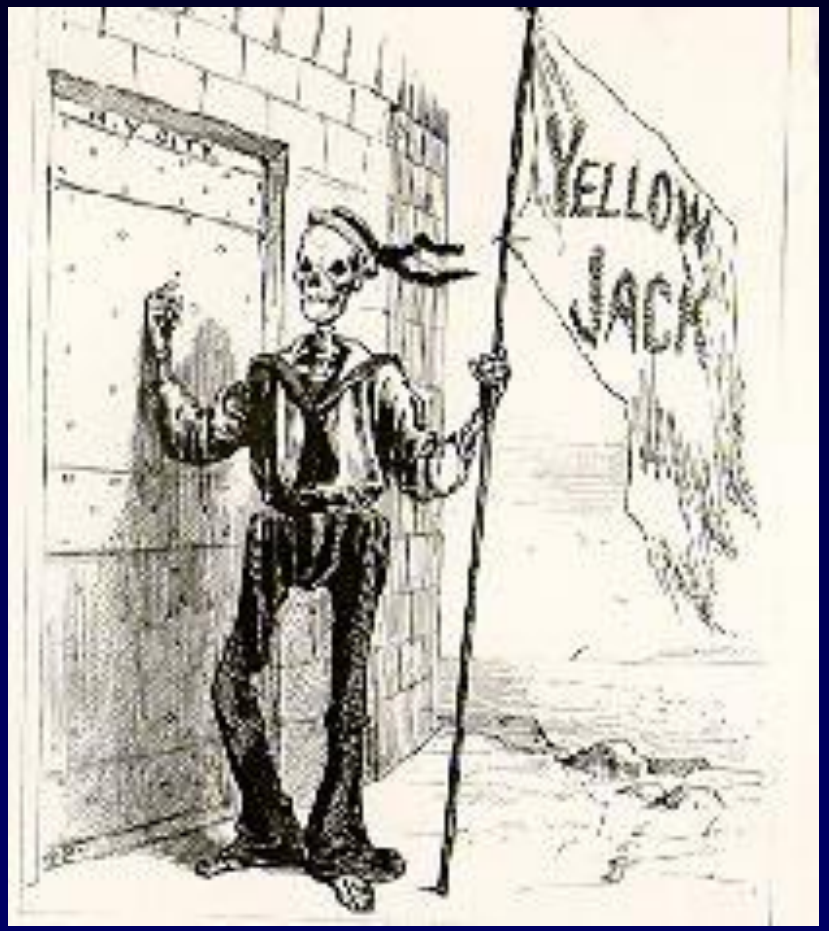
Ovid, 43 BC to AD 17

Plan

- Background
- Definitions
- Causes
- Selected regional infections
- Implications for public health

Yellow fever 19th Century

Beware, beware
The Bight of Benin
For few come out
Though many go in



www.hsl.virginia.edu/.../new_strategies.cfm

20th century infection

- 1900-1960s
  - fevers, rashes, meningitis
  - polio, diphtheria, TB
  - gastroenteritis, children

- 1960s-1980s
  - decline in above
  - new problems eg Lassa, HIV
  - new patients eg IV drug misusers
  - immunocompromised hosts cancer, chemotherapy, ITU
  - nosocomial infections

Definitions

Diseases of infectious origin whose incidence in humans has increased within the past two decades or threatens to increase in the near future

Centers for Disease Control and Prevention (1994)

An infectious disease whose incidence is increasing following its first introduction into a defined host population, or an infectious disease whose incidence is increasing in a defined host population as a result of long term changes in its underlying epidemiology

Woolhouse & Dye (2001)

Examples

- Viruses: HIV, West Nile Virus, Nipah, Rift Valley Fever, Chikungunya
- Bacteria: Leptospirosis, MRSA, VRSA
- Protozoa: Drug resistant malaria, new species of Cryptosporidium
- Fungi: Aspergillus in immunocompromised
- Insects: Bedbugs in Australia

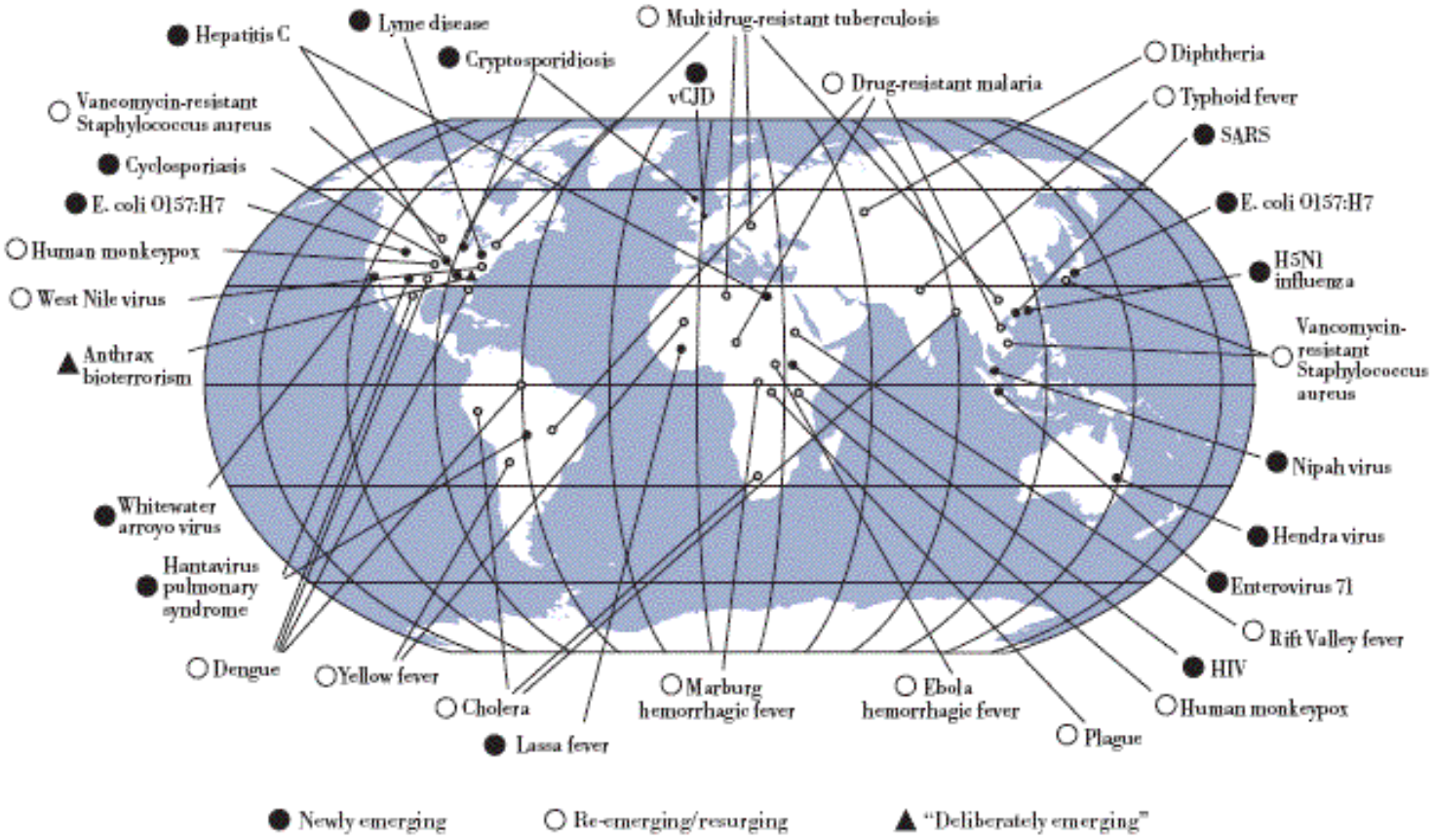
Table 1

Examples of recently emerging pathogens

Microbe	Disease	Year
Rotavirus	Infantile gastroenteritis	1973
Legionella pneumophila	Legionnaires disease	1977
Ebola virus	Ebola hemorrhagic fever	1977
Borrelia burgdorferi	Lyme disease	1982
HIV	AIDS	1983
Hepatitis C virus	Hepatitis	1989
Vibrio cholerae O139	Cholera	1992
Sin Nombre virus	Hantavirus pulmonary syndrome	1993
Human herpesvirus 8	Kaposi sarcoma in AIDS patients	1995
Influenza virus A H5N1	Influenza	1997[A]
SARS coronavirus	Severe acute respiratory syndrome	2002

[A]First human cases; virus previously known to infect birds.

FIGURE 1 EXAMPLES OF EMERGING AND RE-EMERGING INFECTIOUS DISEASES THROUGHOUT THE WORLD.

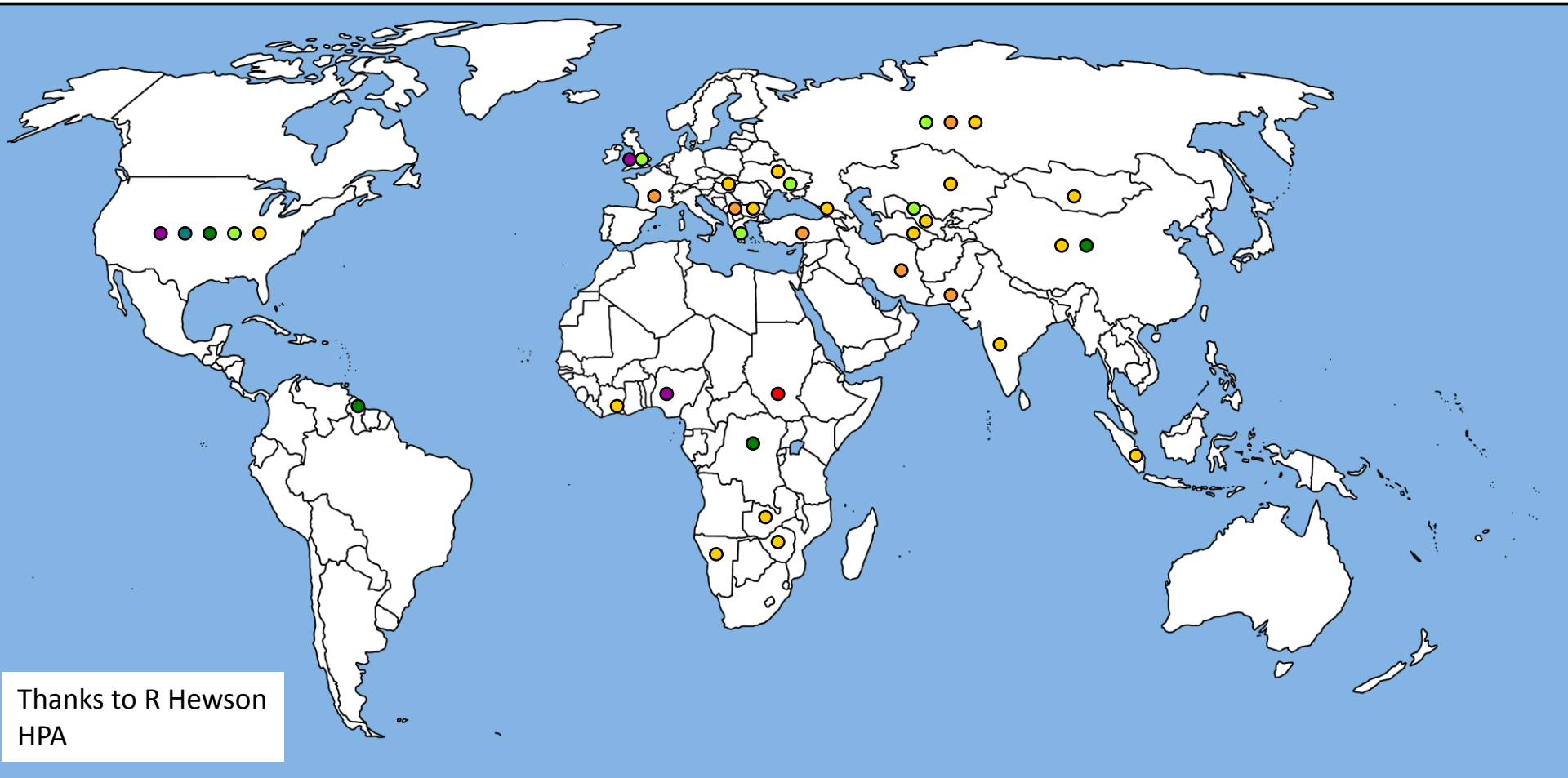


Adapted from Morens, D.M., et al. 2004. The Challenge of Emerging and Re-emerging Infectious Diseases. *Nature* 430:242–49.

Recent confirmed human cases of high consequence pathogen infection

2005

- CCHF / Arbo-V
- Ebola/Marburg
- Lassa Fever (ArenaV)
- Anthrax
- Botulism
- Plague
- Tularaemia

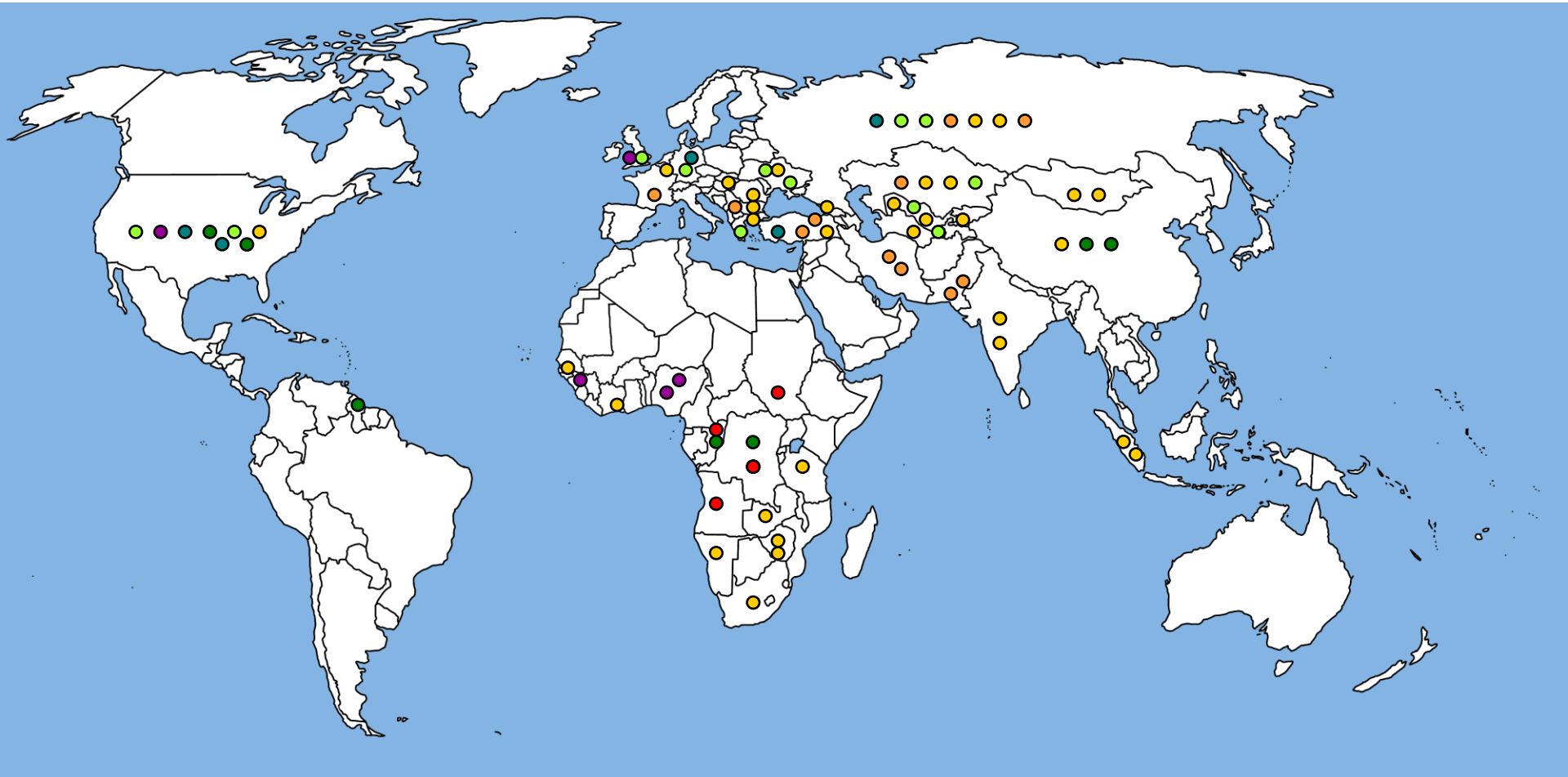


Thanks to R Hewson
HPA

Recent confirmed human cases of high consequence pathogen infection

2005 → 2006

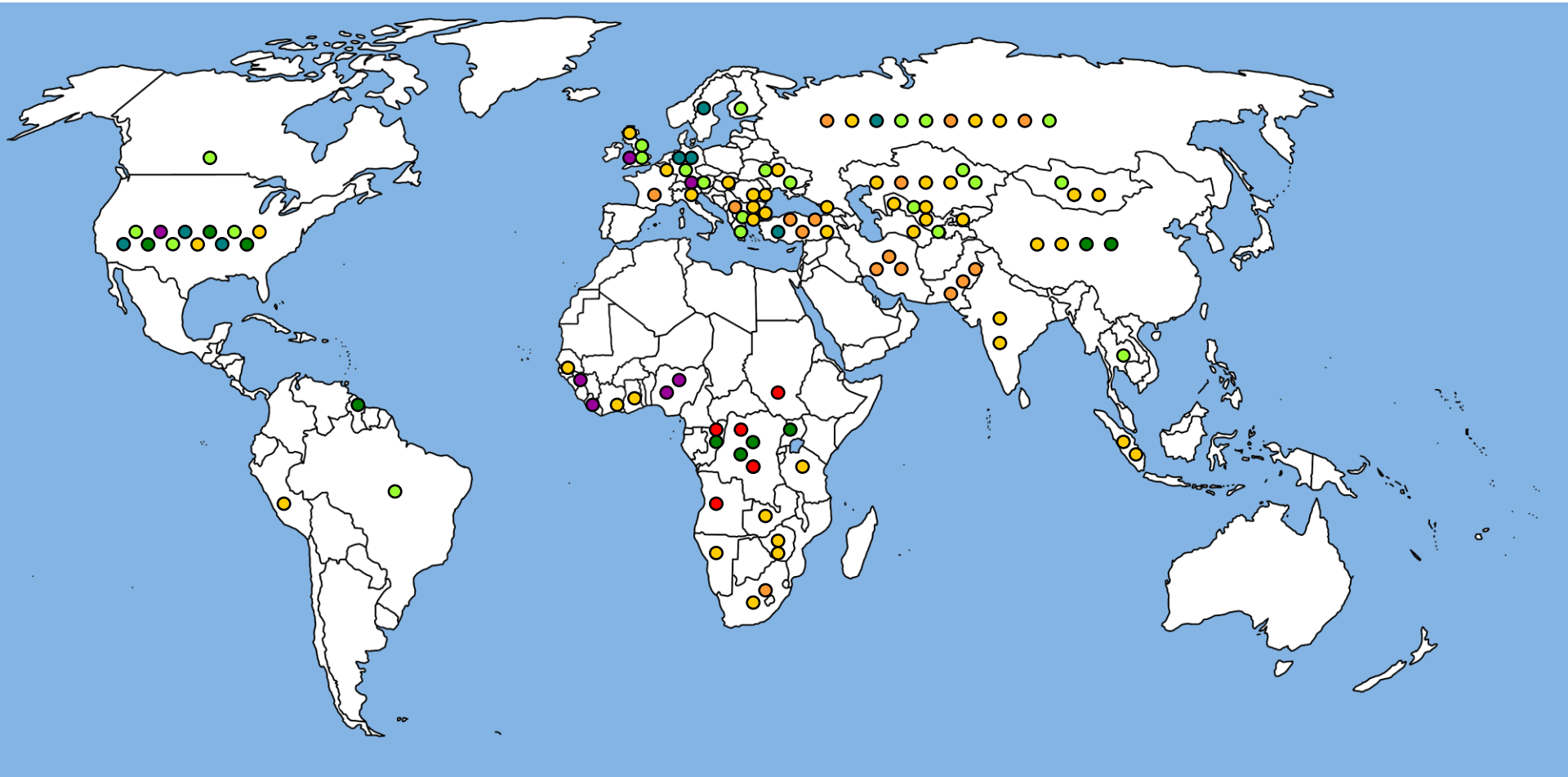
- CCHF / Arbo-V
- Ebola/Marburg
- Lassa Fever (ArenaV)
- Anthrax
- Botulism
- Plague
- Tularaemia



Recent confirmed human cases of high consequence pathogen infection

2005 → 2007

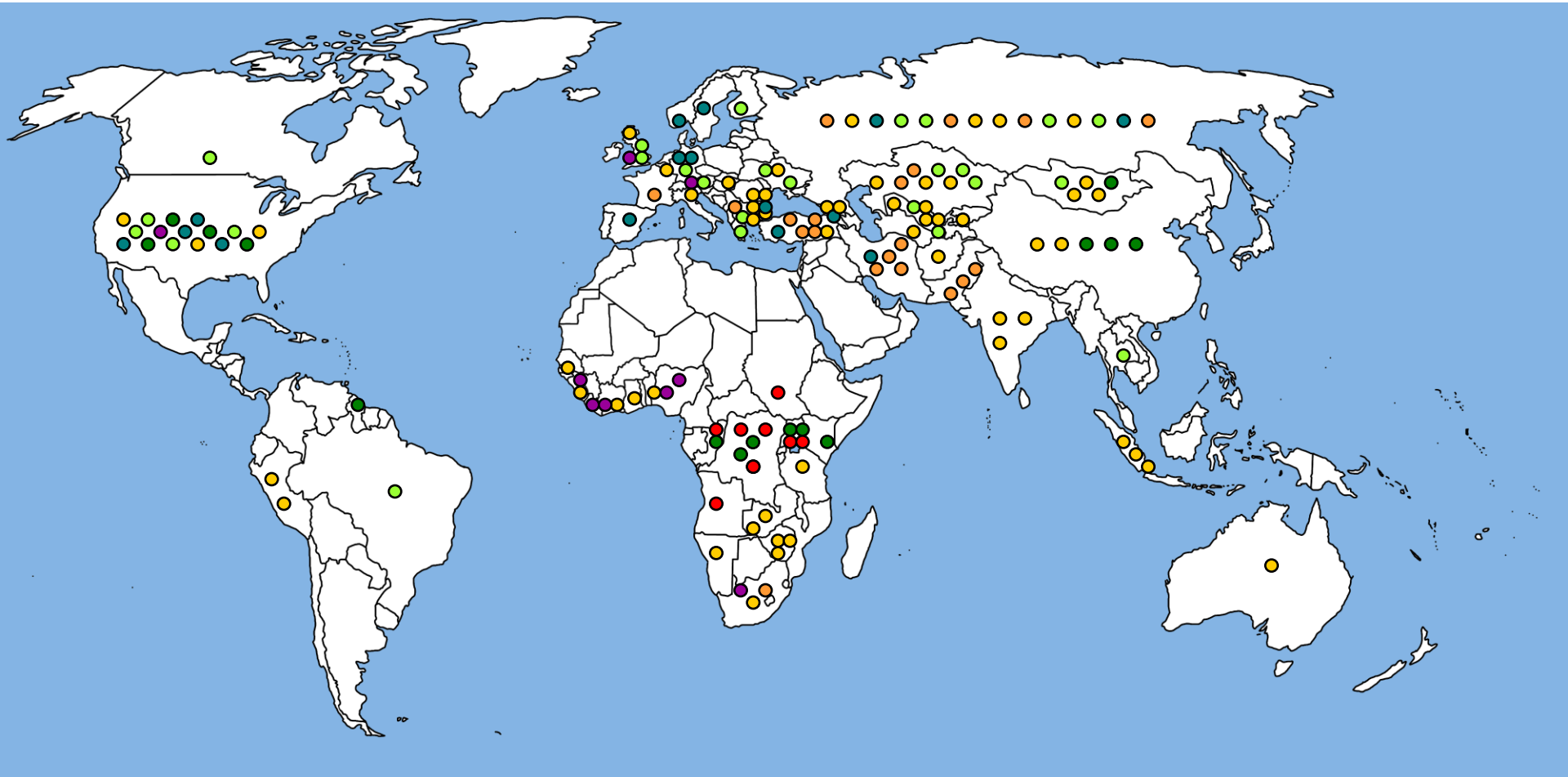
- CCHF / Arbo-V
- Ebola/Marburg
- Lassa Fever (ArenaV)
- Anthrax
- Botulism
- Plague
- Tularaemia



Recent confirmed human cases of high consequence pathogen infection

2005 → 2008

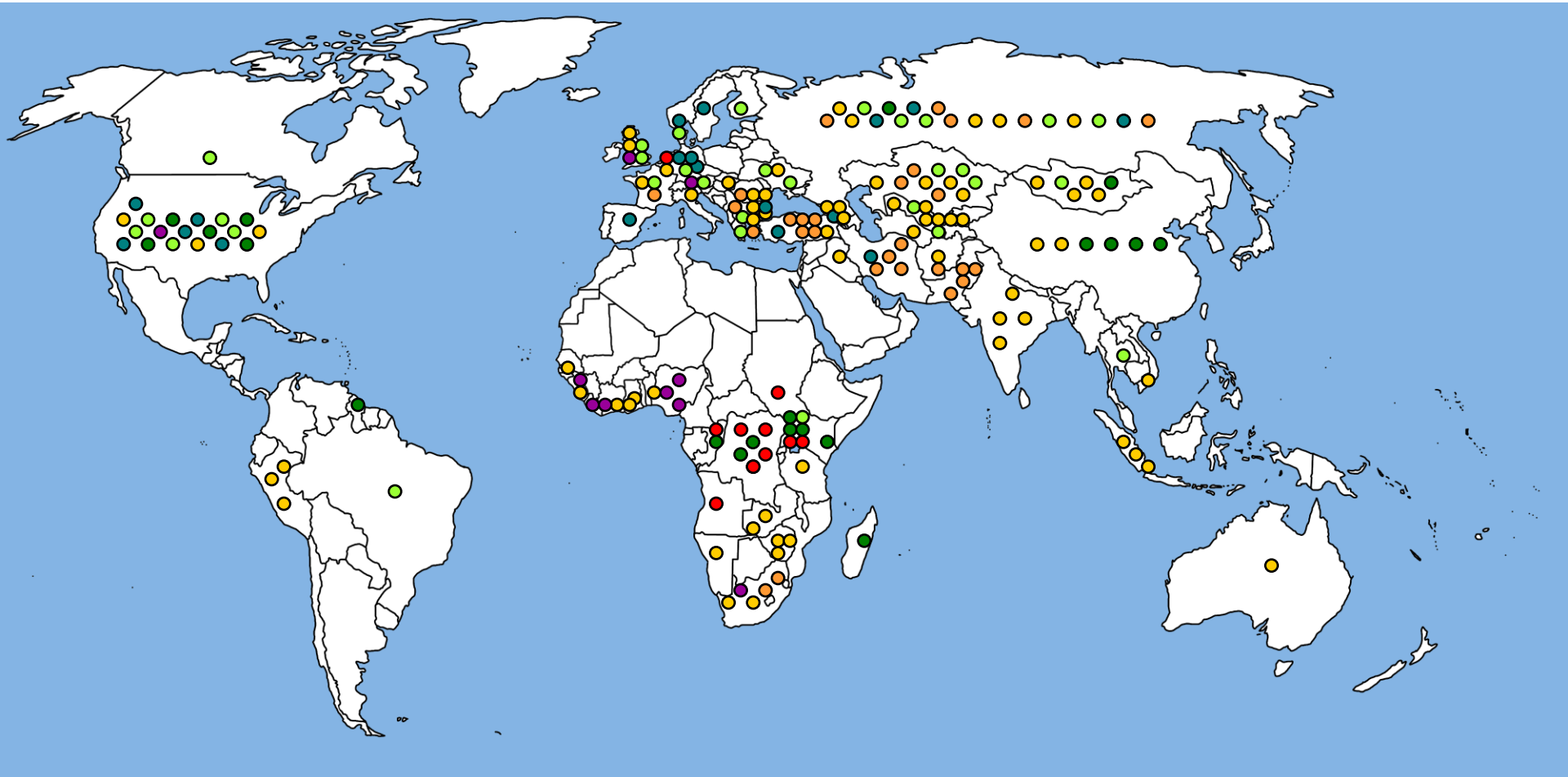
- CCHF / Arbo-V
- Ebola/Marburg
- Lassa Fever (ArenaV)
- Anthrax
- Botulism
- Plague
- Tularaemia



Recent confirmed human cases of high consequence pathogen infection

2005 → 2009

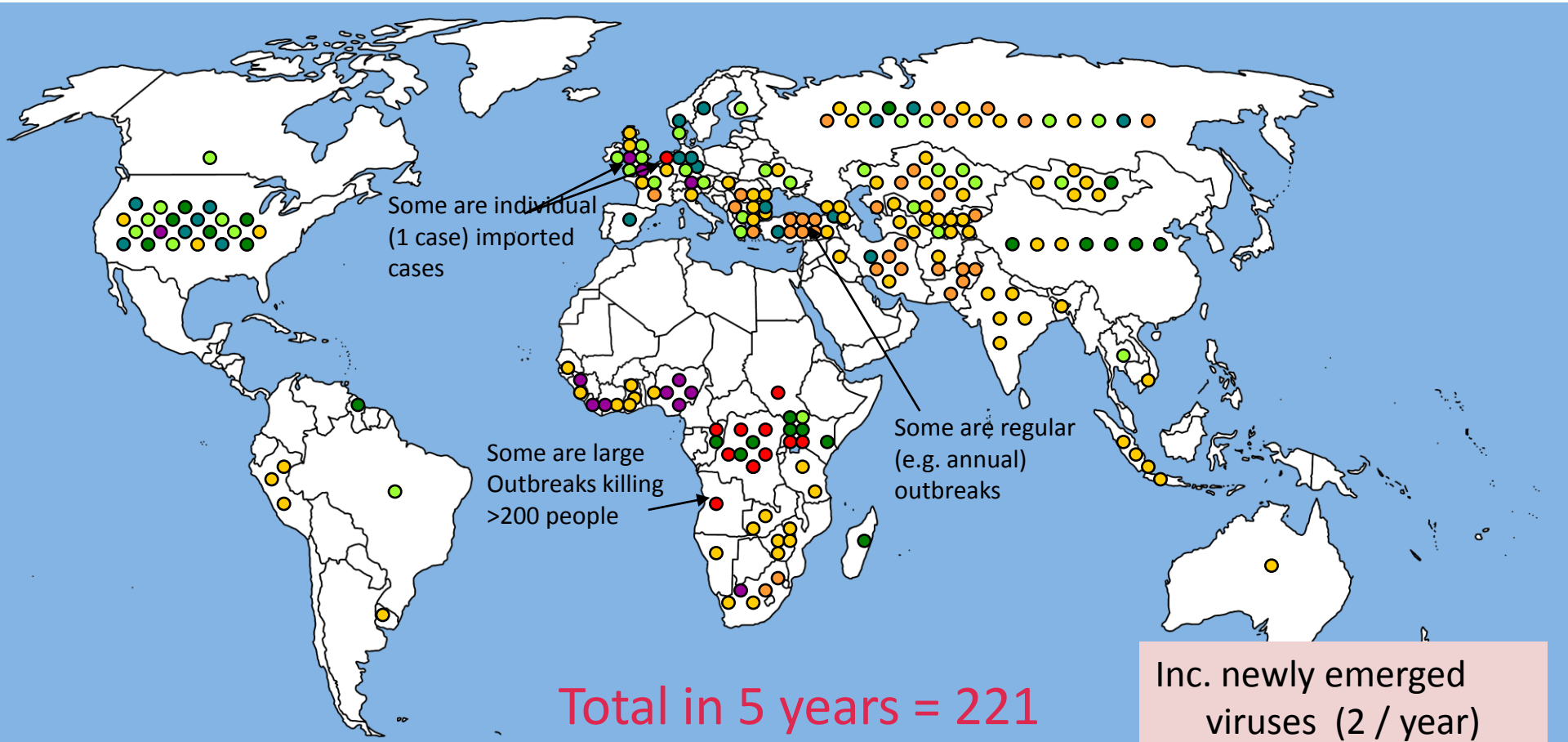
- CCHF / Arbo-V
- Ebola/Marburg
- Lassa Fever (ArenaV)
- Anthrax
- Botulism
- Plague
- Tularaemia



Recent confirmed human cases of high consequence pathogen infection

2005 → 2010

- CCHF / Arbo-V
- Ebola/Marburg
- Lassa Fever (ArenaV)
- Anthrax
- Botulism
- Plague
- Tularaemia



Total in 5 years = 221

Inc. newly emerged viruses (2 / year)

Emergence of a new disease

Can viral threats of the future be predicted?

Two general patterns

I. Almost all have RNA rather than DNA genomes

RNA viruses have mutation edge over DNA viruses

Genetic - adaptability

II. Almost all have an animal reservoir

Zoonosis - Cross species transmission

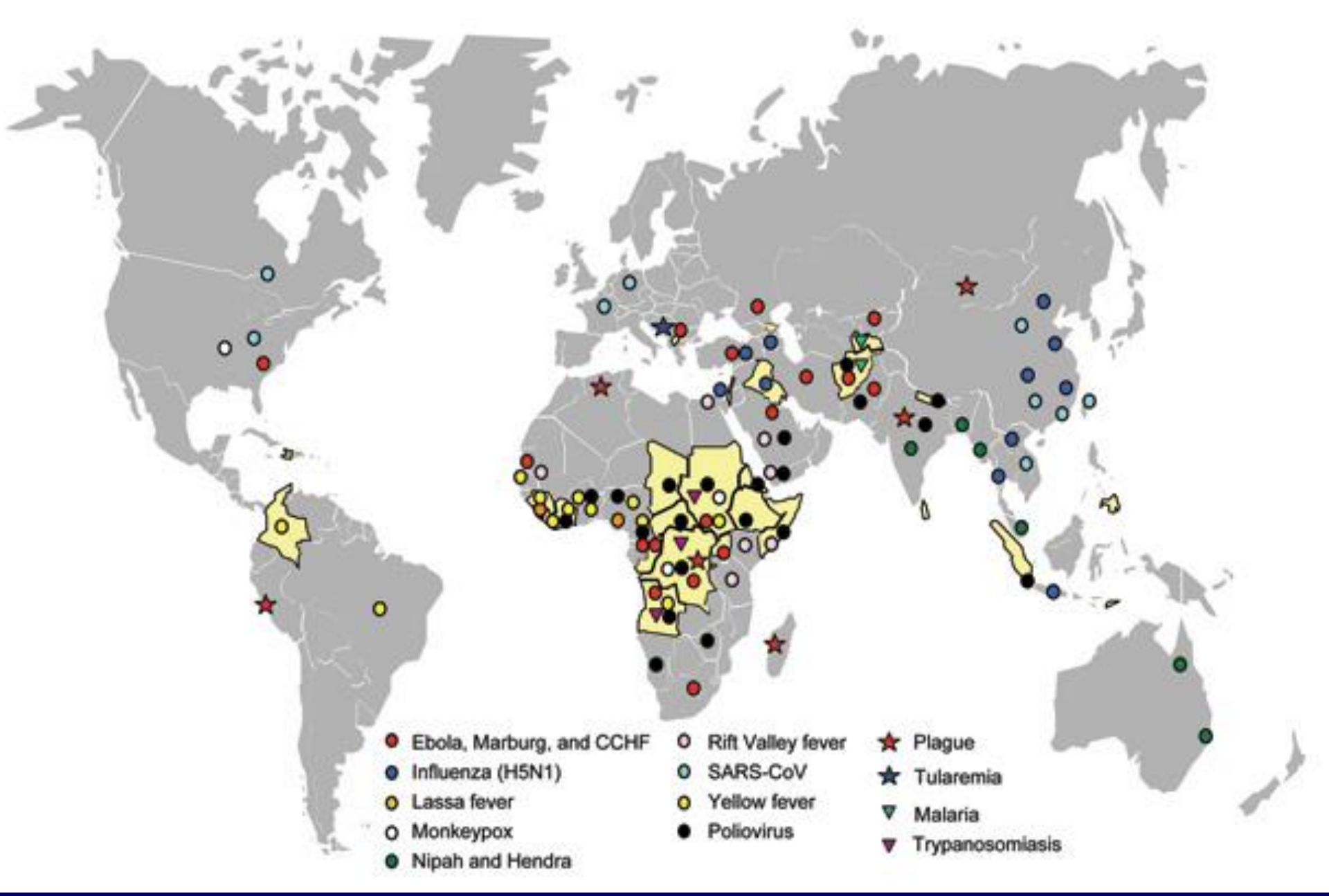
- Influenza
- SARS CoV
- Ebola / Marburg
- Lassa
- CCHF

Emerging infections

- Civil disturbance, war
- Movement of people, travel, urbanisation & agriculture
- Pressure of vaccines, antimicrobials, pesticides
- New resistance eg MRSA, ESBL, malaria, TB
- New vectors eg tyres for mosquitoes
- New health practices eg hospitals, ITU
- New social practices eg IV drug use, piercings
- New organism eg SARS, HIV
- Travel, deliberate release

Emerging infections

- Civil disturbance, war
- Movement of people, travel, urbanisation & agriculture
- Pressure of vaccines, antimicrobials, pesticides
- New resistance eg MRSA, ESBL, malaria, TB
- New vectors eg tyres for mosquitoes
- New health practices eg hospitals, ITU
- New social practices eg IV drug use, piercings
- New organism eg SARS, HIV
- Travel, deliberate release



Gayer M *et al.* Emerging infections and conflict. *EID* 2007; 13: 1625-31

News Front Page
World
Africa
Americas
Asia-Pacific
Europe
Middle East
South Asia
From Our Own Correspondent
UK
England
Northern Ireland
Scotland
Wales
Business
Politics
Health
Education
Science/Nature
Technology
Entertainment
Have Your Say
Magazine
In Pictures
Week at a Glance

Last Updated: Thursday, 12 August, 2004, 03:35 GMT 04:35 UK

E-mail this to a friend | Printable version

Disease outbreak at Darfur camp

UN medical experts in the western Sudanese region of Darfur have expressed concern over an outbreak of Hepatitis E which has killed 22 people.

The UN fears a lack of security will prevent refugees returning home

A doctor working for the UN Population Fund, Henia Dakkak, told the BBC the disease was spreading quickly because of poor sanitation in the camps.

Ms Dakkak said pregnant women were most at risk of infection.

About a million black Africans have been driven from their homes in Darfur, mostly by pro-government Arab militias.

The Sudanese government denies any involvement in atrocities, saying it is trying to improve security in the region.

But on Wednesday UN special envoy to Sudan Jan Pronk urged the government to do more to end the 18-month conflict.

WATCH AND LISTEN
The BBC's Paul Wood
"The camp is taking on an air of permanence"
VIDEO

A NATION DIVIDED SUDAN
In Depth

DARFUR CONFLICT
- Amnesty calls for arms ban
- A nurse's story
- Complex roots of misery
- Cruel and slow starvation
- Q&A: Darfur conflict

No stereotypes
The complexities of inter-ethnic conflicts in Darfur

PEACE IN THE SOUTH?
OPEN Peace hopes
- Rebuilding lives
- Q&A: Peace in Sudan
- Peace balancing act

PROFILES
Janjaweed leader | Go

Opinion

Trends Parasitol 2008; 24: 406-10

Knowlesi malaria: newly emergent and of public health importance?

Janet Cox-Singh and Balbir Singh

Malaria Research Centre, Faculty of Medicine and Health Sciences, University Malaysia Sarawak, 93150 Kuching, Sarawak, Malaysia

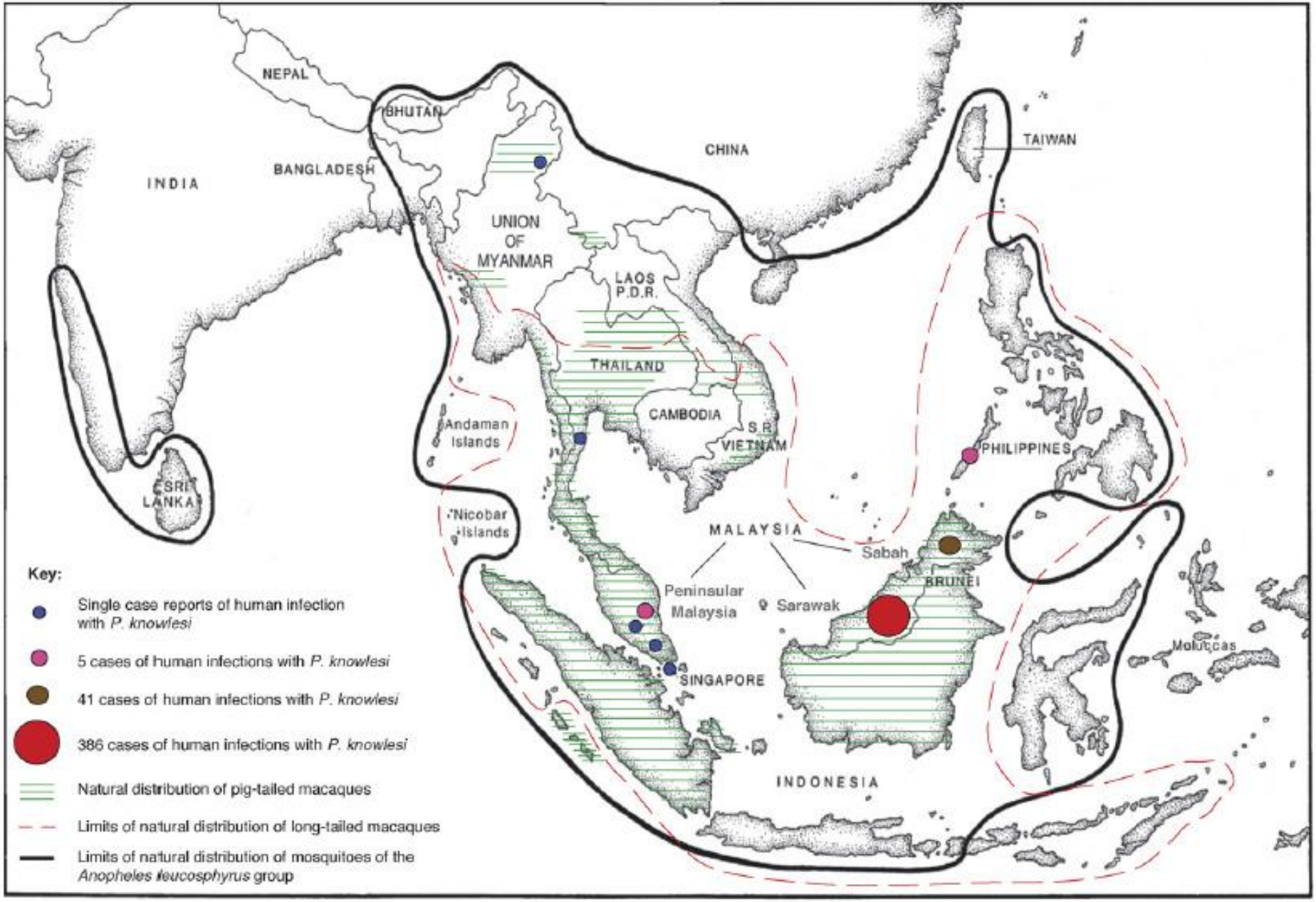
Anthony Sebastian

Figure 5: **Long tailed macaque (*Macaca fascicularis*)**

- Macaque monkeys
- *An. luecosphyrus*
- Malariotherapy for syphilis
- 1965 first natural human infection

Trends in Parasitology Vol.24 No.9

Cox-Singh J , Singh B. *Trends Parasitol* 2008; 24: 406-10



CDC Home | Search | Health Topics A-Z

March 2009

MMWR Weekly

March 13, 2009 / 58(09);229-232

Philippines

Simian Malaria in a U.S. Traveler --- New York, 2008

DISPATCHES

Monkey Malaria in a European Traveler Returning from Malaysia

Anu Kantele, Hanspeter Marti, Ingrid Felger, Dania Müller, and T. Sakari Jokiranta

In 2007, a Finnish traveler was infected in Peninsular Malaysia with *Plasmodium knowlesi*, a parasite that usually causes malaria in monkeys. *P. knowlesi* has established itself as the fifth *Plasmodium* species that can cause human malaria. The disease is potentially life-threatening in humans; clinicians and laboratory personnel should become more aware of this pathogen in travelers.

EID 2008;14(9):1434-6

Plasmodium knowlesi in Human, Indonesian Borneo

Melanie Figtree, Rogan Lee, Lisa Bain, Tom Kennedy, Sonia Mackertich, Merrill Urban, Qin Cheng, and Bernard J. Hudson

Plasmodium knowlesi is now established as the fifth *Plasmodium* species to cause malaria in humans. We describe a case of *P. knowlesi* infection acquired in Indonesian Borneo that was imported into Australia. Clinicians need to consider this diagnosis in a patient who has acquired malaria in forest areas of Southeast Asia.

EID 2010;16(4):672-4

Percentage increase in international arrivals, 1993-1997

Source: Joshua Lederberg, In *Emerging infectious diseases from the global to the local perspective.* Washington: D.C. National Academy Press 2001.

http://www.youtube.com/watch?v=yx7_yzypm5w&feature=related

Like Share

477,929

Uploaded by Squigs515 on 16 Dec 2010

This is a 24 hour observation of all of the large aircraft flights in the world, condensed down to 1:11. From space we look like a bee hive of activity. What

1,386 likes, 20 dislikes

As Seen On:


saudia

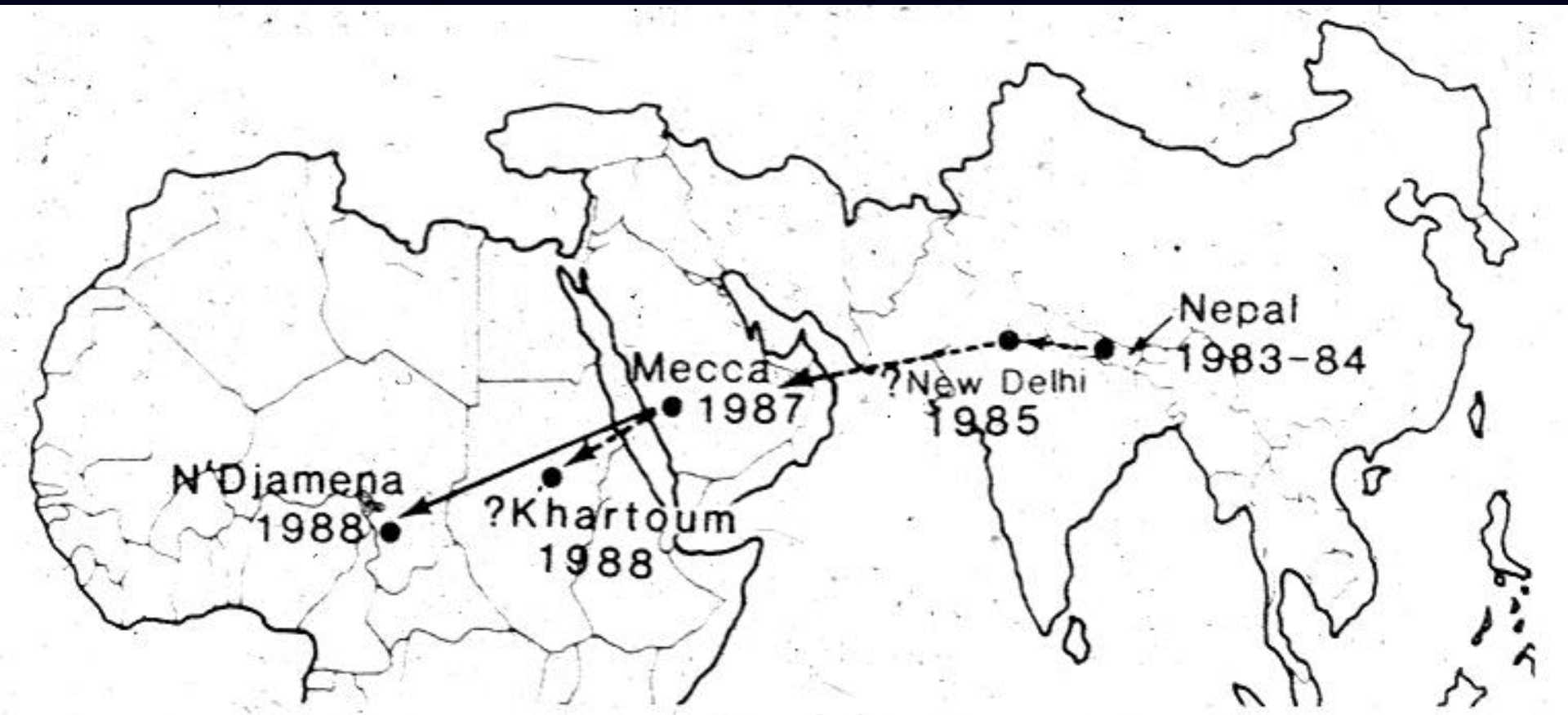
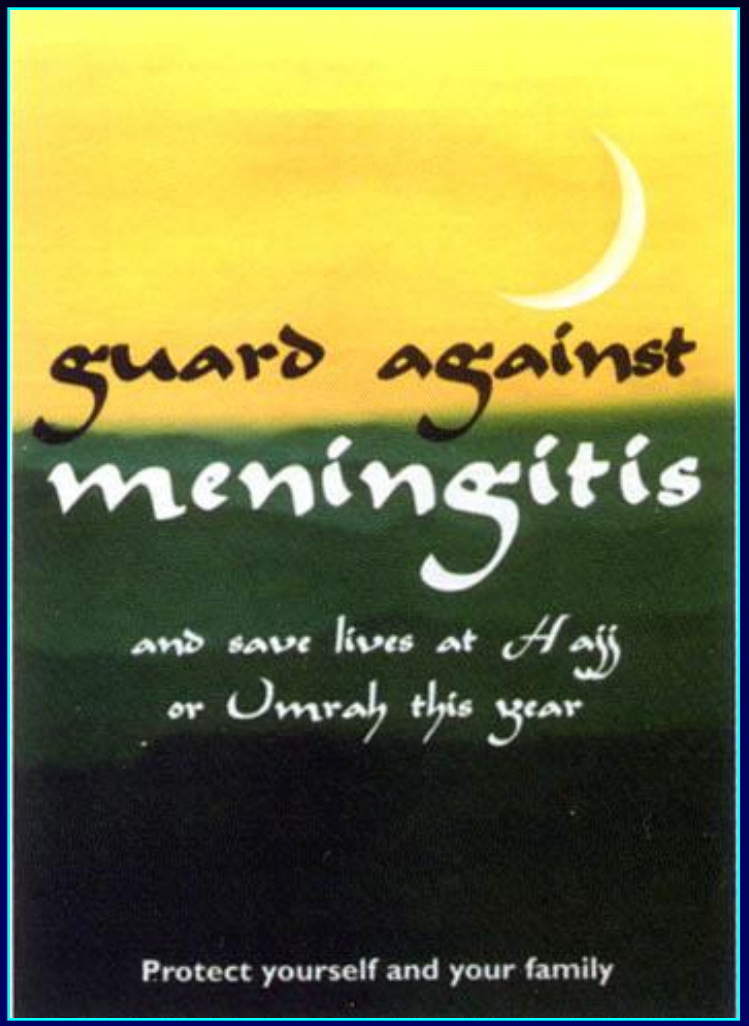


Fig 2—Proposed migration pattern of the III-1 clonal complex based on genetic relatedness of strains from epidemics in Nepal, Saudi Arabia, and Chad.

N. meningitidis W135 & Hajj - UK

- 2000
  - **45 cases**
  - **8 (18%) deaths**
- 2001
  - **34 cases**
  - **10 (29%) deaths**



Eco-Challenge 2000
Multisport event

Sejvar J *et al. EID* 2003; 9: 702-7

Leptospirosis
reports from
GeoSentinel & Idaho
& LA Depts Health

L. weilii

189/304 (62%) athletes contacted

80/189 (42%) met case definition

Unde venis?

THE LANCET
Volume 281, Issue 7278, 23 February 1963, Pages 401-404

doi:10.1016/S0140-6736(63)92299-2 | How to Cite or Link Using DOI
Permissions & Reprints

UNDE VENIS ?[*1]

Brian Maegraith M.A. Oxon., M.B. Adelaide, D.Phil., F.R.C.P., F.R.C.P.E., PROFESSOR OF TROPICAL MEDICINE IN THE UNIVERSITY OF LIVERPOOL

Available online 17 October 2003.

Article Outline

*1 * Annual oration delivered before the Reading Pathological Society on Oct. 25, 1962.

Unde venis?
Where have you come from ?

THE LANCET
Volume 281, Issue 7278, 23 February 1963, Pages 401-404

doi:10.1016/S0140-6736(63)92299-2 | How to Cite or Link Using DOI
Permissions & Reprints

UNDE VENIS ?[*1]

Brian Maegraith M.A. Oxon., M.B. Adelaide, D.Phil., F.R.C.P., F.R.C.P.E., PROFESSOR OF TROPICAL MEDICINE IN THE UNIVERSITY OF LIVERPOOL

Available online 17 October 2003.

Article Outline

*1 * Annual oration delivered before the Reading Pathological Society on Oct. 25, 1962.

Travel histories

A&E setting

- 2% of >900 attendances in 1 week
- 5.3% of 310 with non trauma

Smith RM. *Eur J Emerg Med* 2005;12:230-3

British ER physicians

- 5 case scenarios
- Travel history requested in 24/145 (16%)

Smith RM. *J Trav Med* 2006;13:73-7

Journal of
TRAVEL MEDICINE 2011; 18: 271-4

General Physicians Do Not Take Adequate Travel Histories

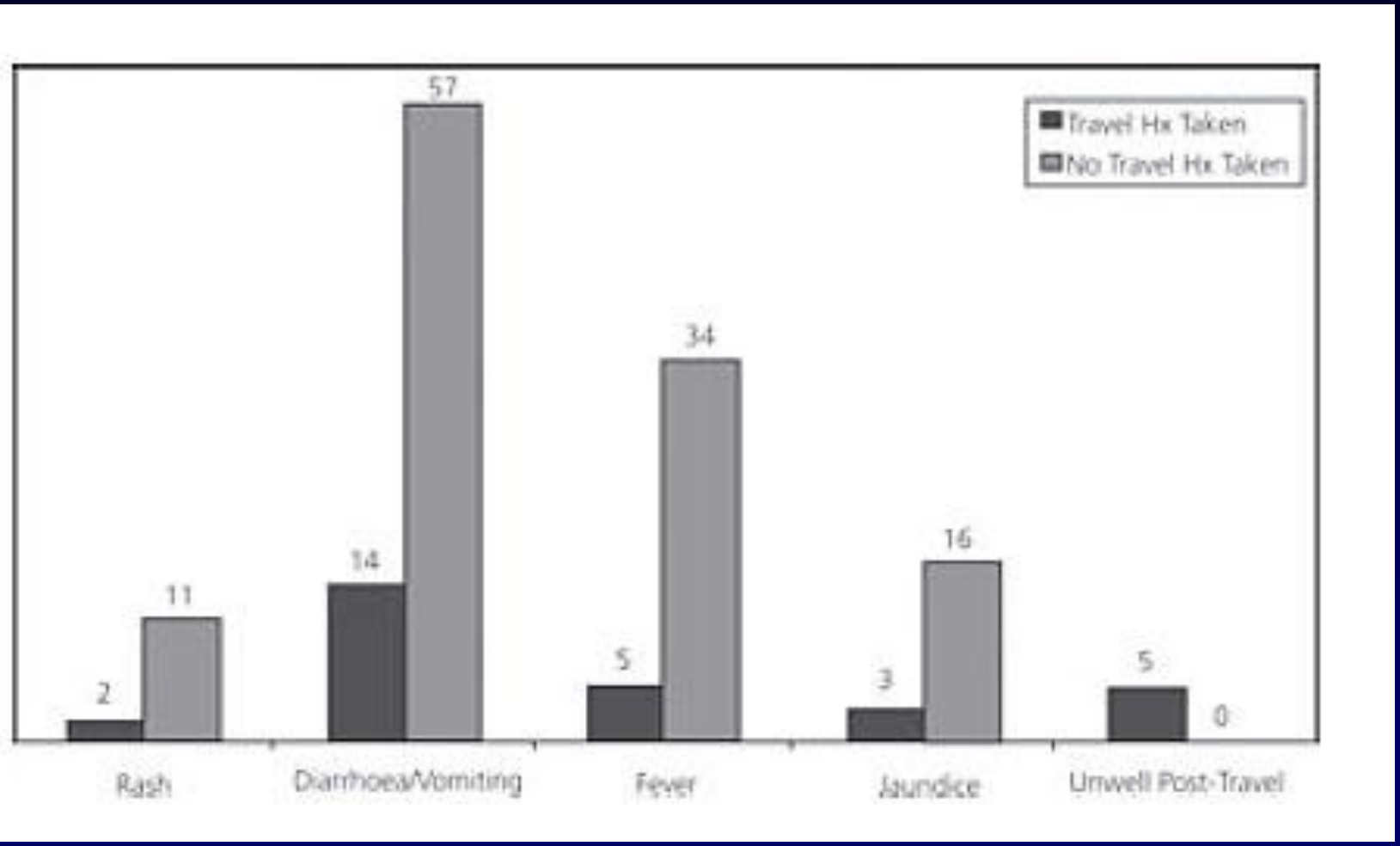
Victoria A. Price, MRCP,* Rachel A.S. Smith, MBChB,* Sam Douthwaite, MRCP,† Sherine Thomas, MRCP,‡ D. Solomon Almond, FRCP,* Alastair R.O. Miller, FRCP,‡ Nicholas J. Beeching, FRCP,‡ Gail Thompson, FRCP,‡§ Andrew Ustianowski, FRCP, PhD,† and Mike B.J. Beadsworth, FRCP, MD, DTMH‡

*Acute Medical Unit, Royal Liverpool University Hospital, Liverpool, UK; †Department of Infectious Diseases and Tropical Medicine, Monsall Unit, North Manchester General Hospital, Manchester, UK; ‡Tropical and Infectious Disease Unit, Royal Liverpool University Hospital, Liverpool, UK; §Health Protection Agency, Centre of Emergency Preparedness and Response, Porton Down, Salisbury, Wiltshire, UK

DOI: 10.1111/j.1708-8305.2011.00521.x

Background. Our aim was to document how often travel histories were taken and the quality of their content.
Methods. Patients admitted over 2 months to acute medical units of two hospitals in the Northwest of England with a history of fever, rash, diarrhea, vomiting, jaundice, or presenting as "unwell post-travel" were identified. The initial medical clerking was assessed.
Results. A total of 132 relevant admissions were identified. A travel history was documented in only 26 patients (19.7%). Of the 16 patients who had traveled, there was no documentation of pretravel advice or of sexual/other activities abroad in 15 (93.8%) and 12 (75.0%) patients, respectively.
Conclusions. There needs to be better awareness and education about travel-related illness and the importance of taking an adequate travel history.

Travel history in 26/132 (19.7%)



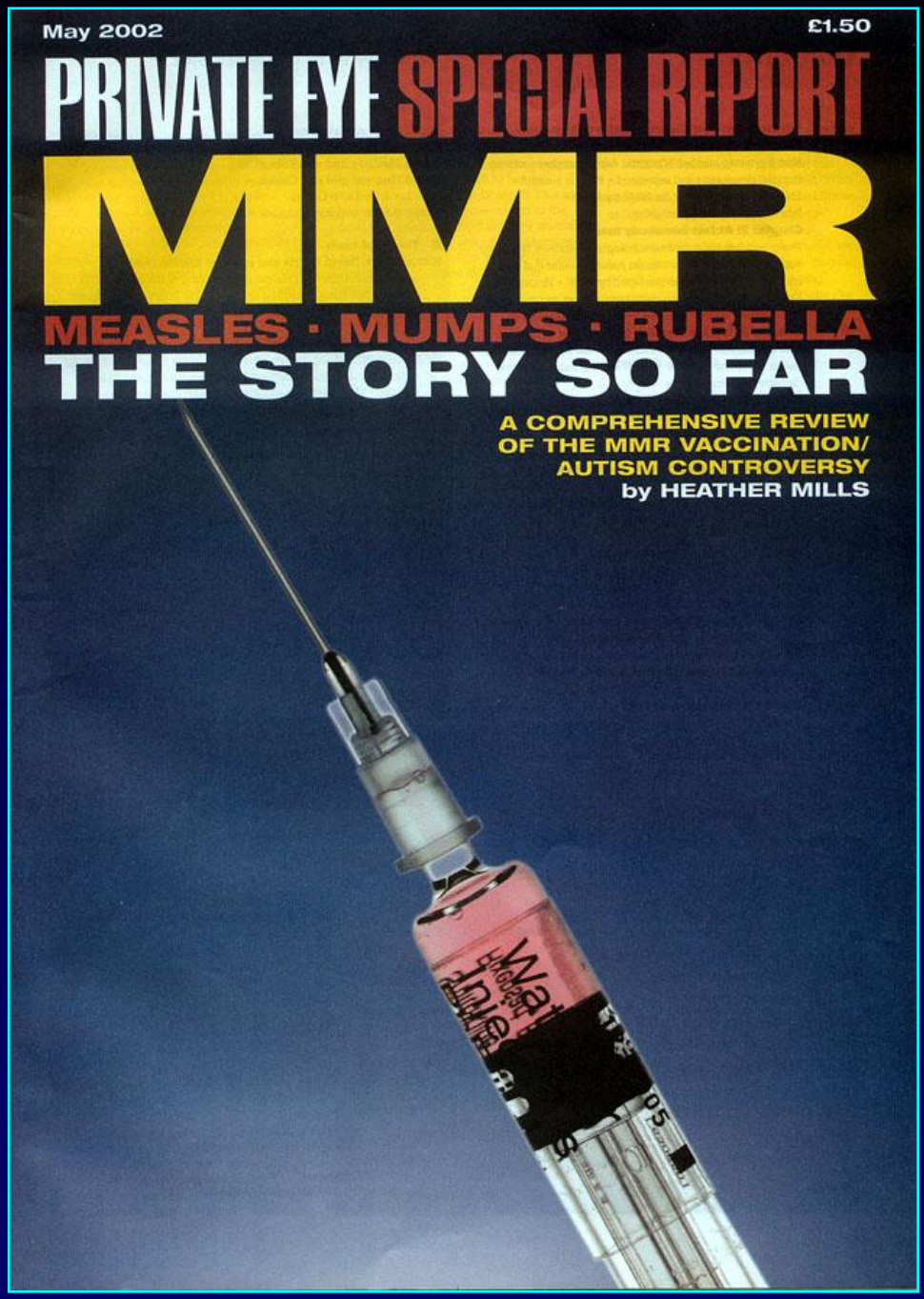
Quality of history taken 16/26 (62.5%) had travelled)

- Destination 14 (87.5%)
- Location within country 3 (18.8%)
- Reason for travel 12 (75%)
- Interval since travel 12 (75%)
- Duration of travel 8 (50%)
- Sexual history 4 (25%)
- VHF risk in 5 fever patients 0

Emerging infections

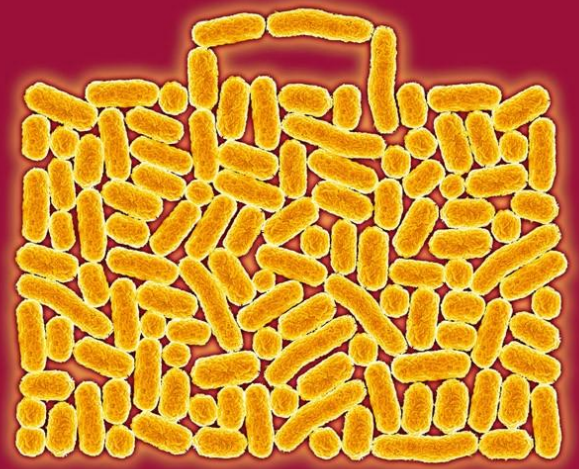
- Civil disturbance, war
- Movement of people, travel, urbanisation & agriculture
- Pressure of vaccines, antimicrobials, pesticides
- New resistance eg MRSA, ESBL, malaria, TB
- New vectors eg tyres for mosquitoes
- New health practices eg hospitals, ITU
- New social practices eg IV drug use, piercings
- New organism eg SARS, HIV
- Travel, deliberate release

Vaccines – are they used ?



NHS

National Patient Safety Agency



germs travel

Stop them in their tracks.

Clean your hands.

cleanyourhands© campaign

NHS

National Patient Safety Agency

a whole world in your hands

Germs cover territory fast. There could be up to 4.6 million of the little blighters colonising your hands right now.

Wipe them out.

Clean your hands.

cleanyourhands© campaign

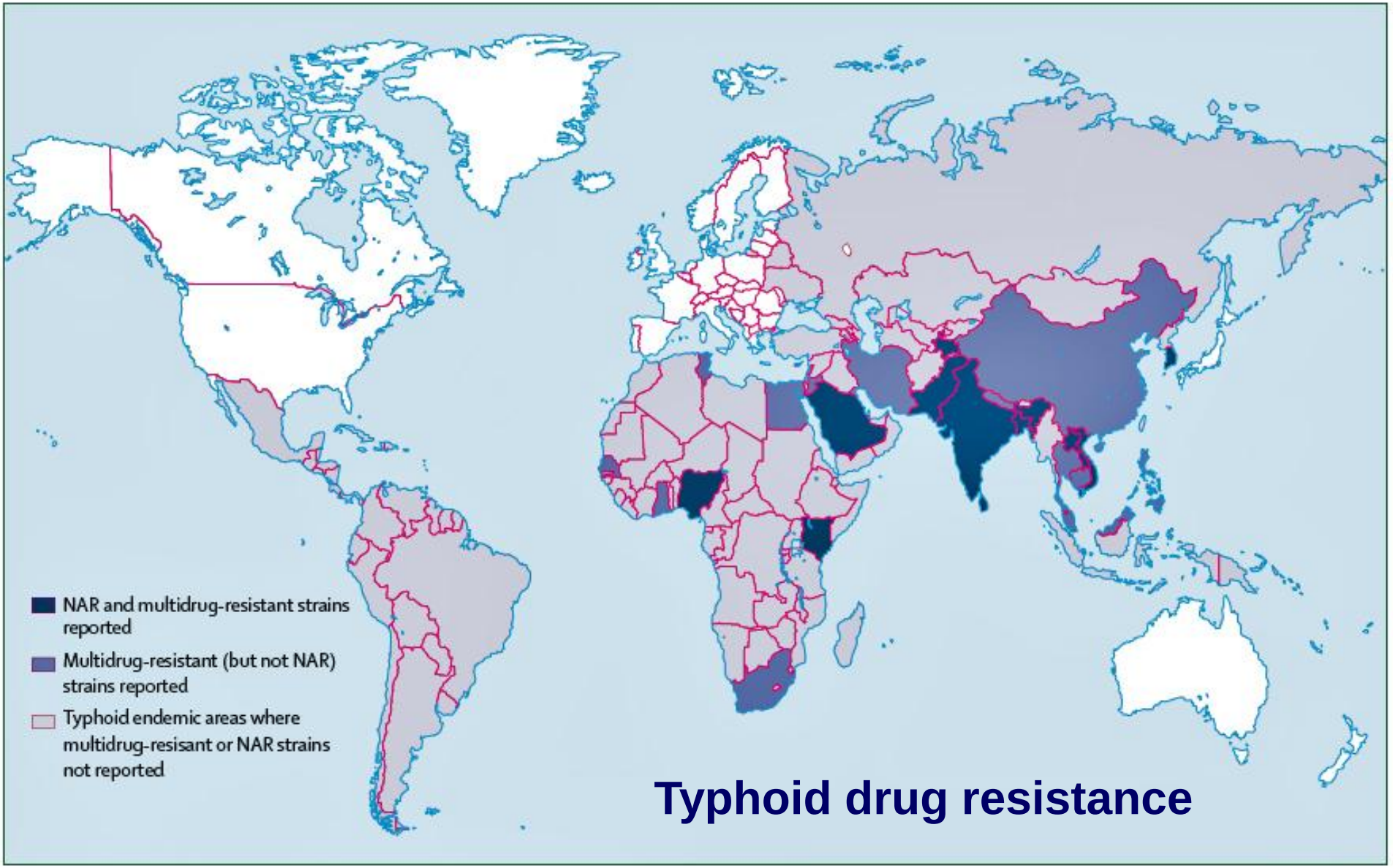


Figure: **Global distribution of antimicrobial resistance in *Styphi* (1990–2004)**
Adapted from Parry and colleagues[96] and updated on basis of data from past 3 years.

Bahn MK *et al. Lancet* 2005; 366: 749-62 after Parry CM *et al. NEJM* 2002; 347:1770

Most typhoid in USA is imported

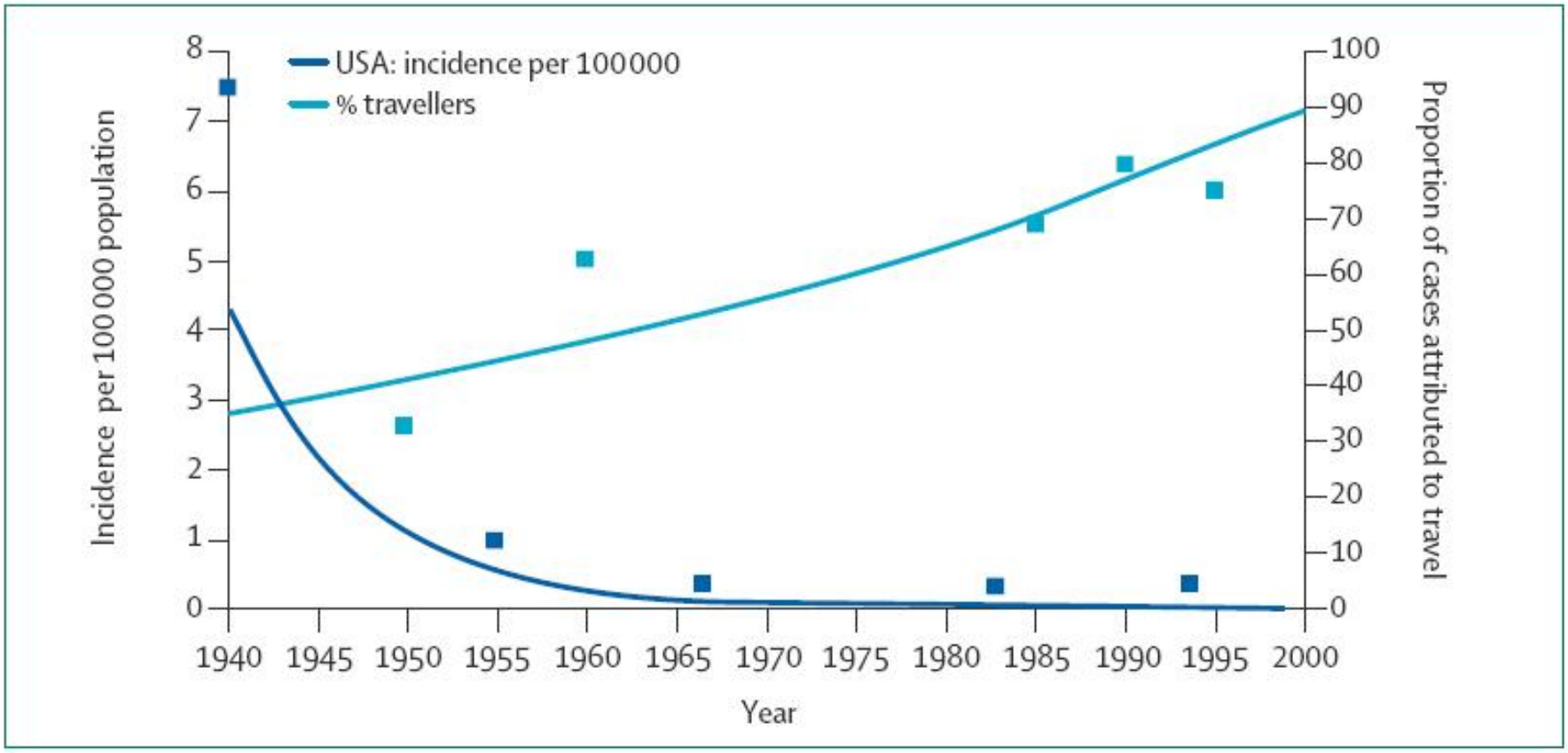


Figure 2: Trends in incidence of typhoid fever in the USA and the proportion of cases of typhoid fever attributed to travel

Connor BA, Schwartz E. *Lancet ID* 2005; 5: 623-8

Resistant organisms

110/492 (22.4%) had travelled

Decreased cipro sensitivity

Travel 31.8%

No travel 17.8%

OR 2.15 P<0.001

EID 2011; 17:123-5

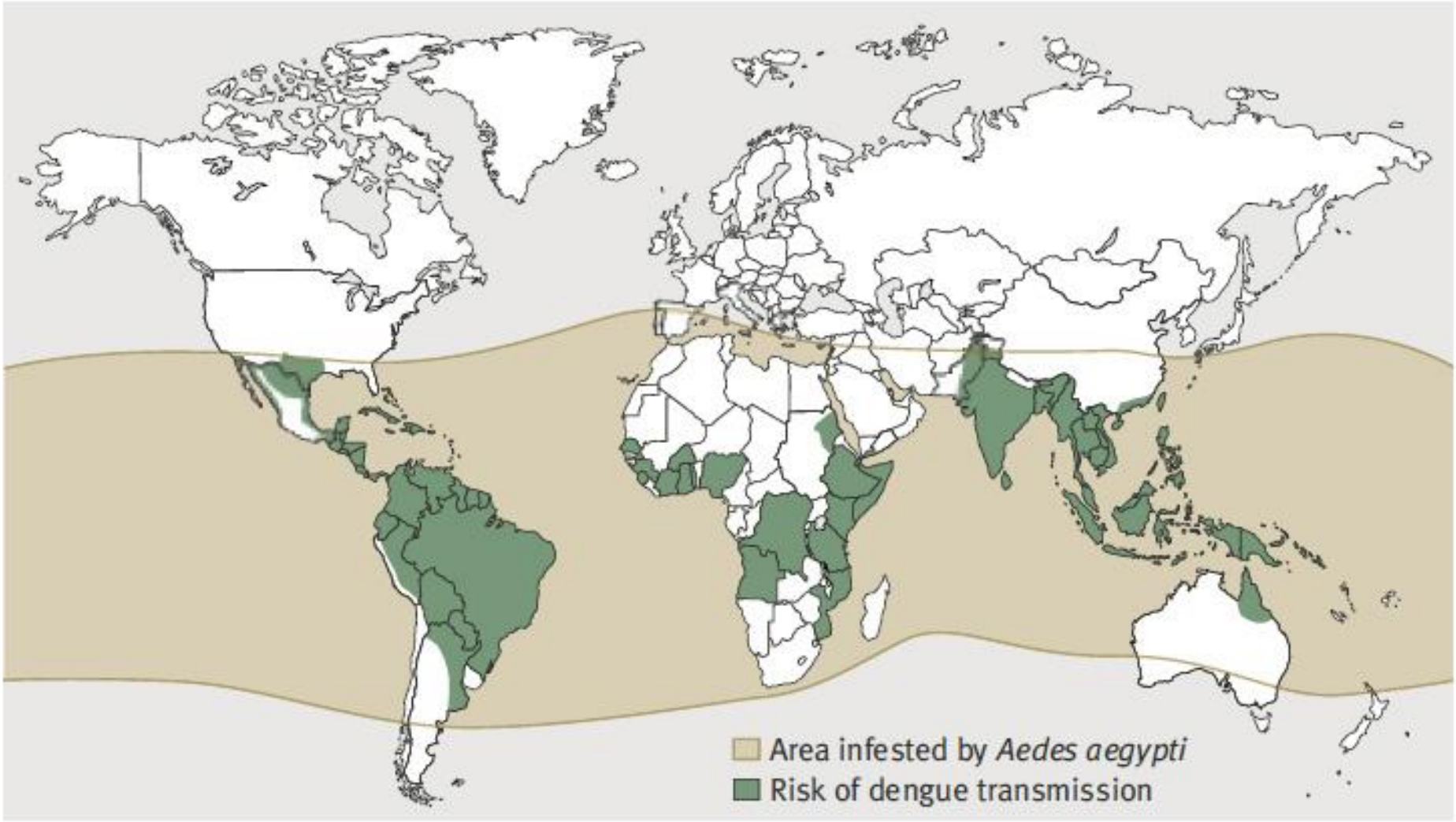
Foreign Travel and Decreased Ciprofloxacin Susceptibility in *Salmonella enterica* Infections

Manar Al-Mashhadani, Robert Hewson, Roberto Vivancos, Alex Keenan, Nick J. Beeching, John Wain, and Christopher M. Parry

To determine antimicrobial drug resistance patterns, we characterized nontyphoidal *Salmonella enterica* strains isolated in Liverpool, UK, January 2003 through December 2009. Decreased susceptibility to ciprofloxacin was found in 103 (20.9%) of 492 isolates. The lower susceptibility was associated with ciprofloxacin treatment failures and with particular serovars and phage types often acquired during foreign travel.

Emerging infections

- Civil disturbance, war
- Movement of people, travel, urbanisation & agriculture
- Pressure of vaccines, antimicrobials, pesticides
- New resistance eg MRSA, ESBL, malaria, TB
- New vectors eg tyres for mosquitoes
- New health practices eg hospitals, ITU
- New social practices eg IV drug use, piercings
- New organism eg SARS, HIV
- Travel, deliberate release



Presence of dengue worldwide and areas infested by the main vector, *Aedes aegypti*

Teixera M. *BMJ* 2009;339:b4338 doi: 10.1136/bmj.b4338

Nature Reviews Microbiology | AOP, published online 7 April 2010; doi:10.1038/nrmicro2336

Randolph SE, Rogers DJ. *Nat Rev Microbiol* 7 Apr 2010

The arrival, establishment and spread of exotic diseases: patterns and predictions

Sarah E. Randolph and David J. Rogers‡*

Abstract | The impact of human activities on the principles and processes governing the arrival, establishment and spread of exotic pathogens is illustrated by vector-borne diseases such as malaria, dengue, chikungunya, West Nile, bluetongue and Crimean–Congo haemorrhagic fevers. Competent vectors, which are commonly already present in the areas, provide opportunities for infection by exotic pathogens that are introduced by travel and trade. At the same time, the correct combination of environmental conditions (both abiotic and biotic) makes many far-flung parts of the world latently and predictably, but differentially, permissive to persistent transmission cycles. Socioeconomic factors and nutritional status determine human exposure to disease and resistance to infection, respectively, so that disease incidence can vary independently of biological cycles.

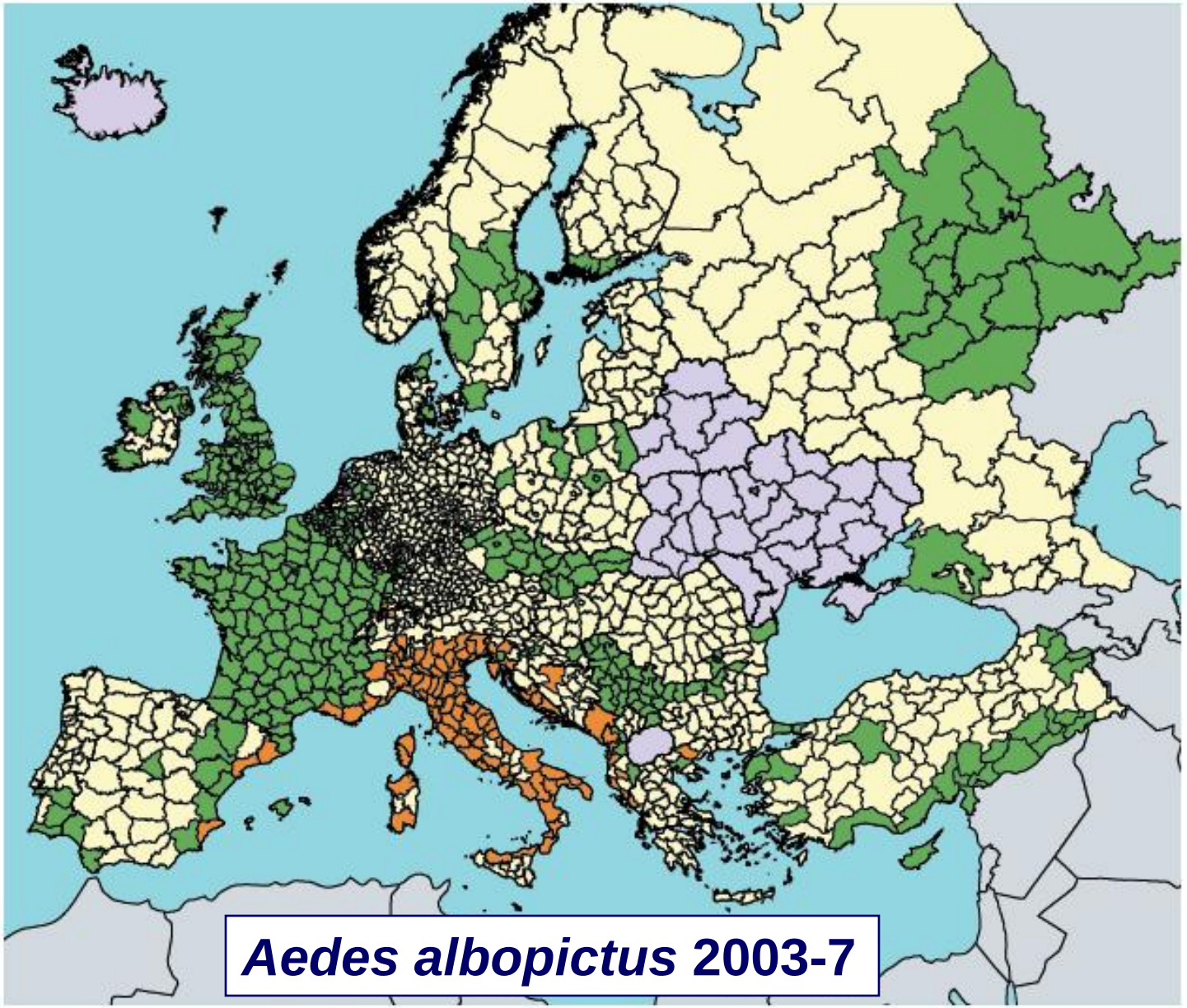


Figure 1 | **Distribution of *Aedes albopictus* at regional administrative levels in Europe and neighbouring countries up until January 2008.** Orange indicates the presence of *Aedes albopictus* in at least one municipality; purple indicates the presence of the mosquito only in greenhouses; green indicates no presence according to surveys in 2003–2007; yellow indicates the absence of data on mosquito fauna in 2003–2007; grey indicates no information on mosquito presence. Data from REF. 19.

Vectors

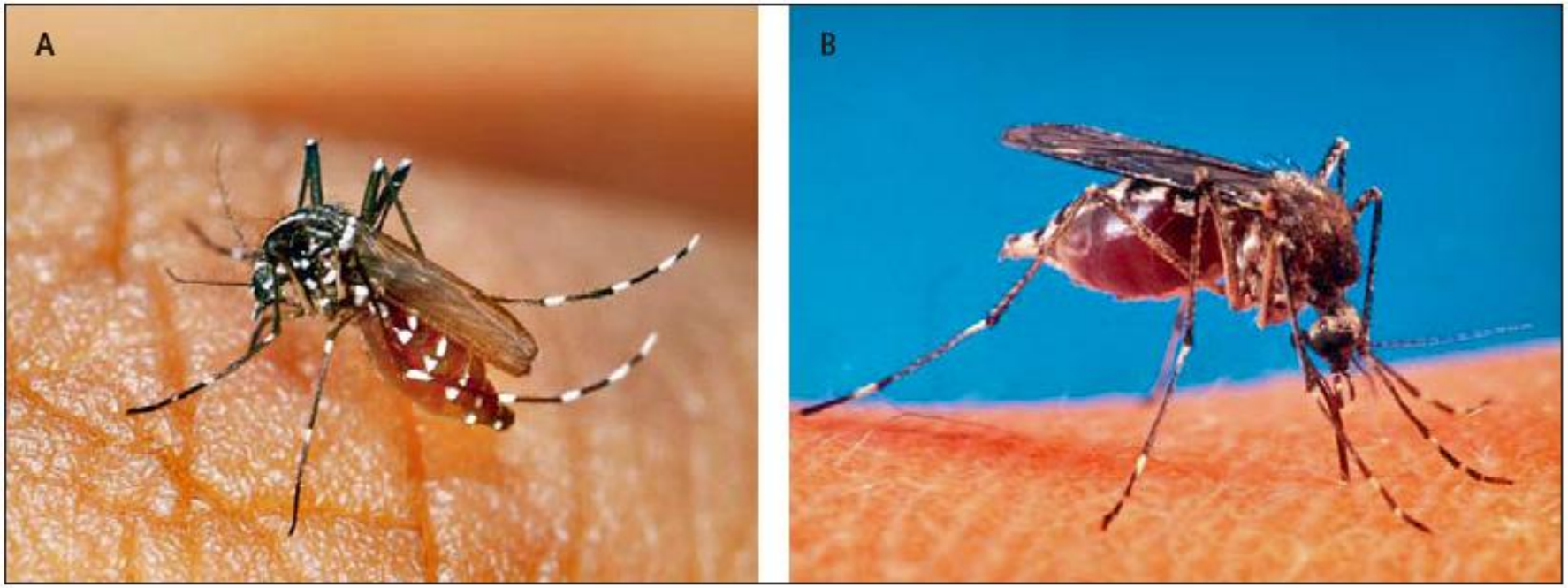


***Figure 1*: Mosquito vectors of chikungunya virus**
(A) Blood-gorged *A albopictus* female feeding on a human host. *A albopictus* is the primary chikungunya virus vector in the current Indian Ocean outbreak. (B) *A aegypti* mosquito. *A aegypti* is the primary chikungunya virus vector in Asian chikungunya outbreaks. Images from United States Department of Agriculture.

Pialoux G *et al. Lancet Inf Dis* May 2007; 7: 319-27

http://www.ministerosalute.it/dettaglio/pdFocus.jsp?area=promozione&colore=3&id=440

Go

Ministero della Salute

11 Sep 2007

Martedì, 11 settembre 2007

Cerca | Guida | Mappa

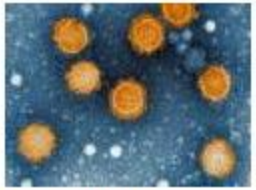
La Repubblica tutela la salute come fondamentale diritto dell'individuo e interesse della collettività, e garantisce cure gratuite agli indigenti.

Home | Cittadini | Operatori | Sala Stampa

Ti trovi in: Prevenzione e controlli > In primo piano

In primo piano

Le domande più frequenti sulla Chikungunya



Cos'è la chikungunya?

La febbre Chikungunya è una malattia nota per eventi epidemici, il primo dei quali è stato registrato in Tanzania nel 1952. Da allora, sono stati descritti focolai epidemici in Asia ed Africa.

La Chikungunya è una malattia virale acuta, caratterizzata da sintomi simil-influenzali quali: febbre elevata, cefalea, debolezza, dolori articolari diffusi, che talora costringono il paziente ad assumere una posizione piegata nel tentativo di alleviare il dolore causato dall'infiammazione delle articolazioni,(in swahili, "Chikungunya" significa "che contorce"); tale quadro è accompagnato, in un'elevata percentuale di casi, da manifestazioni cutanee maculopapulari pruriginose, che talora possono assumere caratteristiche di tipo emorragico benigno (petecchie, ecchimosi, epistassi, gengivorragie).

I sintomi durano tre-cinque giorni e si risolvono spontaneamente, ma i dolori articolari, accompagnati da astenia, possono persistere anche per mesi. Le complicanze più gravi sono rappresentate dalla meningoencefalite e dallo shock settico da coagulazione vasale disseminata.

La Chikungunya è generalmente a decorso benigno, ma può essere fatale, particolarmente in soggetti anziani con sottostanti patologie di base (pazienti oncologici, trapiantati, pazienti affetti da malattie croniche quali broncopneumopatia cronica ostruttiva, cardiopatie, diabete).

Come si trasmette?

Il virus responsabile della Chikungunya è un togavirus (arborvirus) che viene trasmesso dalle zanzare del genere Aedes, come Aedes aegypti e Aedes albopictus, comunemente chiamata zanzara tigre. Queste zanzare possono trasmettere l'infezione pungendo una persona malata, nella fase acuta. La zanzara si infetta e successivamente pungendo un'altra persona può trasmettere il virus. Il virus non si trasmette invece da persona a persona con i normali contatti di vita quotidiana.

Dopo quanto compaiono i sintomi?

Internet

Chikungunya - Italy September 2007

- 197 cases reported (Ravenna Province)
- 1-95 yr old; 52% female;
- 36 laboratory confirmed
- 31 being investigated
- 11 cases required hospital admission (incl. 83yr old man – multiple morbid chronic disease who died)

Index case

- Foreigner arrived Italy June 21 2007
- Travel history - Indian sub Continent
- Developed symptoms 2-3 days later
- Castiglione di Cervia, Ravenna Province

C/o Graham Lloyd
HPA Porton

Eurosurveillance 15 years 1996–2011
Europe's journal on infectious disease epidemiology, prevention and control

Eurosurveillance, Volume 16, Issue 42, 20 October 2011

Rapid communications

AUTOCHTHONOUS PLASMODIUM VIVAX MALARIA IN GREECE, 2011

K Danis (daniscostas@yahoo.com)[1], A Baka[1], A Lenglet[2], W Van Bortel[2], I Terzaki[1], M Tseroni[1], M Detsis[1], E Papanikolaou[1], A Balaska[1], S Gewehr[3], G Dougas[1], T Sideroglou[1], A Economopoulou[1], N Vakalis[4], S Tsiodras[1], S Bonovas[1], J Kremastinou[1]

1. Hellenic Centre for Disease Control and Prevention, Athens, Greece
2. European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden
3. Ecodevelopment S.A., Thessaloniki, Greece
4. National School of Public Health, Athens, Greece

Citation style for this article: Danis K, Baka A, Lenglet A, Van Bortel W, Terzaki I, Tseroni M, Detsis M, Papanikolaou E, Balaska A, Gewehr S, Dougas G, Sideroglou T, Economopoulou A, Vakalis N, Tsiodras S, Bonovas S, Kremastinou J. Autochthonous Plasmodium vivax malaria in Greece, 2011. Euro Surveill. 2011;16(42):pii=19993. Available online: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19993

Date of submission: 11 October 2011

Between May and September 2011, twenty cases of *Plasmodium vivax* infection were reported in Greek citizens without reported travel history. The vast majority of those cases were confined to a delimited agricultural area of Evrotas, Lakonia. Conditions favouring locally acquired transmission of malaria, including the presence of

FIGURE 1

Place of residence of reported malaria cases, Greece, May–September 2011 (n=36)

6 Greek

Lakonia

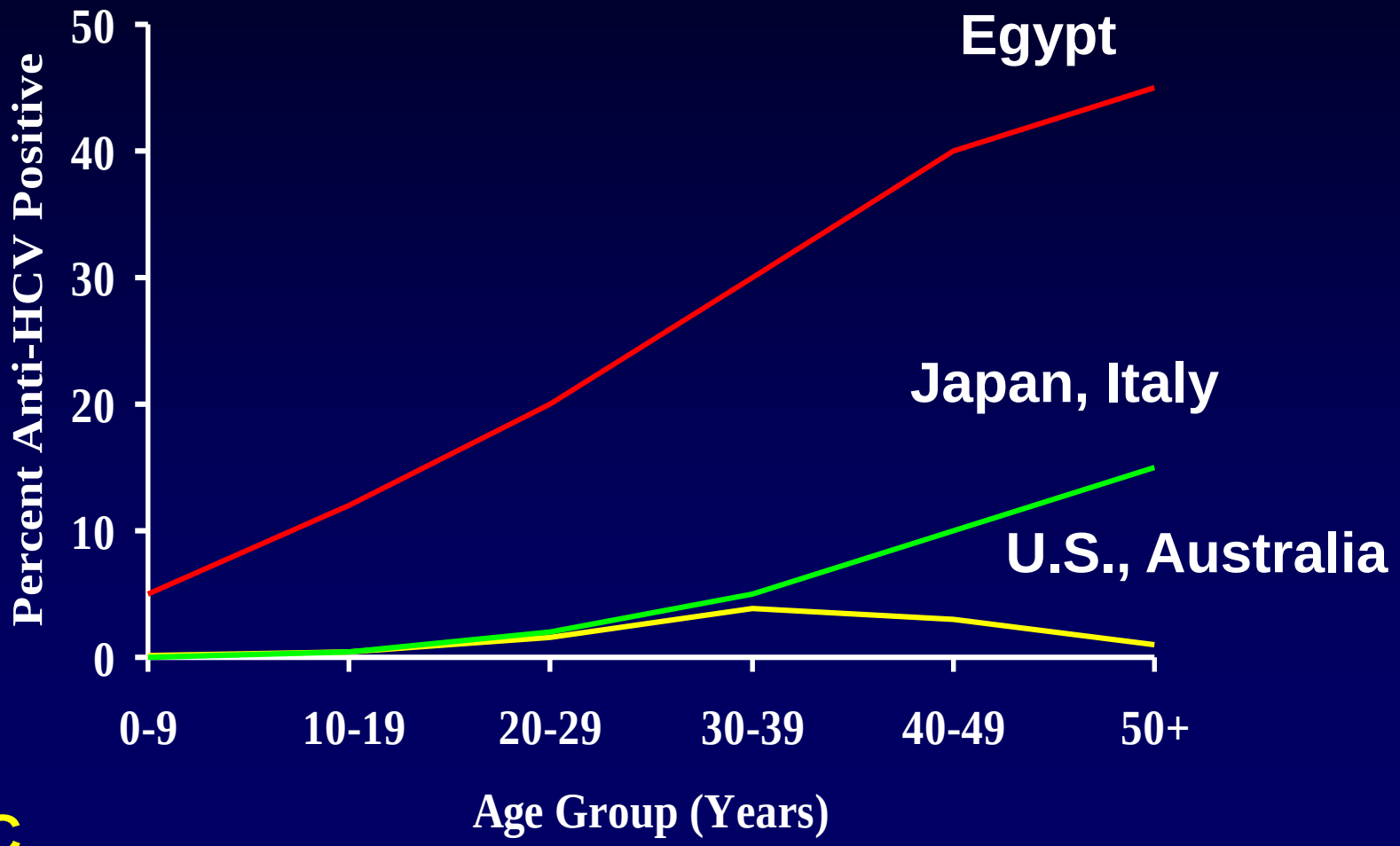
16 migrant

14 Greek

Emerging infections

- Civil disturbance, war
- Movement of people, travel, urbanisation & agriculture
- Pressure of vaccines, antimicrobials, pesticides
- New resistance eg MRSA, ESBL, malaria, TB
- New vectors eg tyres for mosquitoes
- New health practices eg hospitals, ITU
- New social practices eg IV drug use, piercings
- New organism eg SARS, HIV
- Travel, deliberate release

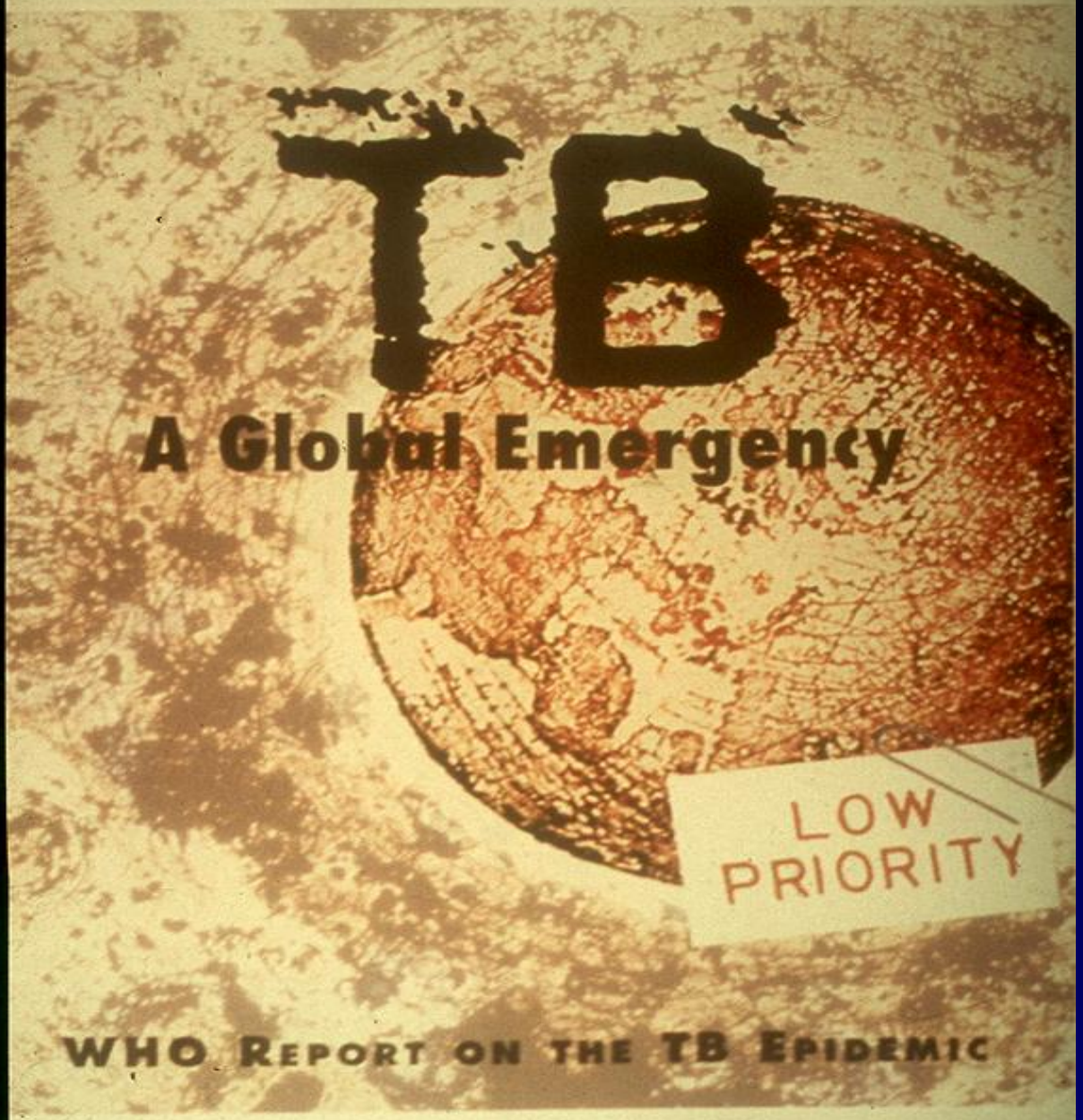
Hepatitis C – healthcare acquired specific prevalence



CDC

Tropical IVDU related infections

- Malaria
- Melioidosis
- American trypanosomiasis (Chagas disease)
- Leishmaniasis (Spanish IVDU)
- Syphilis
- Hepatitis B & C
- HIV


TB
A Global Emergency
LOW PRIORITY
WHO Report on the TB Epidemic

Some regional infections

- Mutiresistant bacteria
- Legionella etc
- Anything travel related
  - **People**
  - **Animals**
- MERS CoV
- VHFs

www.promedmail.org/

About ProMED-mail»

Latest | Search | Plants | Hot Topics | Errata

Latest Posts on ProMED-mail

02 Dec 2013 Chikunguya (50) – India (MH)

02 Dec 2013 Avian influenza, human (147): China (Hong Kong) H7N9, first case

02 Dec 2013 Sapovirus - New Zealand: (GI) hospital outbreak

02 Dec 2013 Avian influenza (97): Netherlands (GR) poultry, LPAI, H5N3, OIE

02 Dec 2013 Dengue/DHF update (98): Asia

02 Dec 2013 Dengue/DHF update (97): Americas

02 Dec 2013 Foot & mouth disease - Saudi Arabia: st O, genotyping, RFI

01 Dec 2013 Measles update (48)

01 Dec 2013 HIV - Japan: blood donation risk

01 Dec 2013 Avian influenza, human (146): mathematical risk model

01 Dec 2013 Brucellosis, canine - USA: (MI)

01 Dec 2013 Bovine tuberculosis - USA (05): (NE) bovine

01 Dec 2013 **MERS-CoV - Eastern Mediterranean (96): UAE (Abu Dhabi), RFI**

01 Dec 2013 Poliomyelitis - update (30): comment, vaccination

30 Nov 2013 E. coli EHEC - USA (35): (AZ) restaurant, O157, lettuce

View printable version Share this post:

Published Date: 2013-12-01 09:58:48
Subject: PRO/AH/EDR> MERS-CoV - Eastern Mediterranean (96): UAE (Abu Dhabi), RFI
Archive Number: 20131201.2083935

MERS-COV - EASTERN MEDITERRANEAN (96): UNIED ARAB EMIRATES (ABU DHABI), REQUEST FOR INFORMATION
****

A ProMED-mail post
http://www.promedmail.org
ProMED-mail is a program of the
International Society for Infectious Diseases
http://www.isid.org

Date: Sat 30 Nov 2013
Source: Alrai newspaper [in Arabic, trans. by ProMED DDD Proj.Man. ZH, edited]
http://www.alrai.com/article/619503.html

MERS-CoV
3 Dec 2013

163 cases
68 deaths

The Jordanian MoH issued a press release that had a much more thorough report on MERS-CoV and which indicates there is a 3rd person infected -- the 9-year-old son of the infected husband and pregnant wife (reported in ProMED-mail MERS-CoV - Eastern Mediterranean (94): UAE (Abu Dhabi), Qatar 20131129.2082330).

In the press release, Dr Hijjawi also mentioned that the male patient has 3 brothers and their wives, constituting about 20 family members, who were all ordered by Abu Dhabi not to travel or return to Jordan for 12 days, and undergo intensive tests to ensure they have not contracted the virus. After 12

TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE (1997) 91, 275–278

Crimean–Congo haemorrhagic fever virus infection in the Western Province of Saudi Arabia

O. M. E. El-Azazy[1] and E. M. Scrimgeour[2] *[1]Veterinary Laboratory, Ministry of Agriculture and Water, Jeddah, Kingdom of Saudi Arabia; [2]Department of Medicine, National Guard King Khalid Hospital, P.O. Box 9515, Jeddah, 21423, Kingdom of Saudi Arabia*

Abstract

In 1990, an outbreak of suspected viral haemorrhagic fever involving 7 individuals occurred in Mecca in the Western Province of Saudi Arabia. Congo–Crimean haemorrhagic fever (CCHF), not previously known to be present in Saudi Arabia, was incriminated. A study of the epidemiology of this virus was therefore carried out in Mecca, and in nearby Jeddah and Taif in 1991–1993; 13 species of ixodid ticks (5 *Hyalomma* spp., 5 *Rhipicephalus* spp., 2 *Amblyomma* spp., 1 *Boophilus* sp.) were collected from livestock (camels, cattle, sheep, goats), and of these 10 were capable of transmitting CCHF. Camels had the highest rate of tick infestation (97%), and *H. dromedarii* was the commonest tick (70%). Attempts to isolate virus from pools of *H. dromedarii* and *H. anatolicum anatolicum* were unsuccessful. The source of infection in 3 confirmed cases of CCHF was contact with fresh mutton and, in a suspected case, slaughtering sheep. An investigation in Mecca, which included a serological survey of abattoir workers, identified 40 human cases of confirmed or suspected CCHF between 1989 and 1990, with 12 fatalities. Significant risk factors included exposure to animal blood or tissue in abattoirs, but not tick bites. It is suspected that the CCHF virus may have been introduced to Saudi Arabia by infected ticks on imported sheep arriving at Jeddah seaport, and that it is now endemic in the Western Province.

Keywords: Crimean–Congo haemorrhagic fever, epidemiology, Ixodidae, *Hyalomma*, Saudi Arabia

1989-90 40 human cases, 12 fatal

Journal of Infection (2005) 51, 91-97

www.elsevierhealth.com/journals/jinf

Flavivirus similar to Kayasanur Forest Disease: butchers with ?CCHF

Alkhumra virus infection, a new viral hemorrhagic fever in Saudi Arabia

Tariq A. Madani[a,b,*]

[a]*Department of Medicine, Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia*
[b]*Ministry of Health, Riyadh 11176, Saudi Arabia*

Accepted 29 November 2004
Available online 11 January 2005

KEYWORDS
Alkhumra;

Abstract *Objectives.* Four patients with typical acute viral hemorrhagic fever were identified in the holy city of Makkah, Saudi Arabia, between 8 and 23 February 2001,

Madani T. *J Infect* 2005; 51: 91-7

Alkhurma Hemorrhagic Fever in Humans, Najran, Saudi Arabia

Abdullah G. Alzahrani, Hassan M. Al Shaiban, Mohammad A. Al Mazroa, Osama Al-Hayani, Adam MacNeil, Pierre E. Rollin, and Ziad A. Memish

28 cases 2006-9

- **Active case finding, serological & PCR confirmation**
- **Mostly Dec-March**
- **11 hospitalised**
- **Bleeding, fever, jaundice, seizures**
- **Fever in 54%**

65 Controls from household or neighbouring house

- **Seronegative**

AlZahrani AG *et al. EID* 2010; 16: 1882-8

Table 4. Multivariate logistic regression results of risk factors for Alkhurma hemorrhagic, Najran, Saudi Arabia, 2006–2009*

Risk factor	Crude OR (95% CI)	Model aOR† (95% CI)
Contact with domestic animals	5.39 (1.74–17.3)	3.17 (0.96–10.43)
Tick bites	11.48 (2.51–59.73)	6.20 (1.34–28.70)
Adjacent farm distance	4.00 (1.40–11.75)	3.63 (1.25–10.49)

*OR, odds ratio; CI, confidence interval; aOR, adjusted OR.
†aOR for risk factors (contact with domestic animals, tick bites, adjacent farm distance) after elimination of nonsignificant variables (drinking unpasteurized milk and owning or raising domestic animals) calculated by using backward stepwise strategy.

AlZahrani AG *et al. EID* 2010; 16: 1882-8

OPEN ACCESS Freely available online

PLOS | NEGLECTED TROPICAL DISEASES

Policy Platform

Alkhurma Viral Hemorrhagic Fever Virus: Proposed Guidelines for Detection, Prevention, and Control in Saudi Arabia

Ziad A. Memish[1,6*], Shamsudeen F. Fagbo[1], Abdullah M. Assiri[1], Pierre Rollin[2], Ali M. Zaki[3], Remi Charrel[4], Chris Mores[5], Adam MacNeil[2]

1 Public Health Directorate, Ministry of Health, Riyadh, Kingdom of Saudi Arabia, **2** Viral Special Pathogens Branch, Centers for Disease Control and Prevention, Atlanta, Georgia, United States of America, **3** Microbiology Laboratory, Doctor Soliman Fakeeh Hospital, Jeddah, Kingdom of Saudi Arabia, **4** Unite des Virus Emergents UMR190 "Emergence des Pathologies Virales", Faculté de Médecine, Marseille, France, **5** Department of Pathobiological Sciences, School of Veterinary Medicine, Louisiana State University, Baton Rouge, Louisiana, United States of America, **6** College of Medicine, Alfaisal University, Riyadh, Kingdom of Saudi Arabia

Introduction

Alkhurma viral hemorrhagic fever virus (AHFV) is a tick-borne flavivirus described in Saudi Arabia and recently implicated in outbreaks of febrile illness associated with hemorrhagic and neurological manifestations. To facilitate an evidence-based

Clinical Manifestations

Analysis of the first set of confirmed Alkhurma hemorrhagic fever (AHF) cases suggested a pattern characterized by severe to fatal clinical outcome with a case fatality rate approaching 30% [2]. Clinical and laboratory characteristics of the earliest

index of suspicion that persists amongst clinicians in some parts of the country.

Vector(s) and Reservoir(s)

There is strong virological, entomological, epidemiological, and phylogenetic evidence that the AHFV is a tick-borne

Memish ZA *et al. PLoS Negl Trop Dis* 6(7): e1604. doi:10.1371/journal.pntd.0001604

OPEN ACCESS Freely available online

PLOS | NEGLECTED TROPICAL DISEASES

Policy Platform

Alkhurma Viral Hemorrhagic Fever Virus: Proposed Guidelines for Detection, Prevention, and Control in Saudi Arabia

Ziad A. Memish[1,6*], Shar
Remi Charrel[4], Chris Mor

1 Public Health Directorate, Ministry of
Georgia, United States of America, 3 Mic
"Emergence des Pathologies Virales", Fa
University, Baton Rouge, Louisiana, Unit

Introduction

Alkhurma viral hemorrhagic f
(AHFV) is a tick-borne flavivirus
in Saudi Arabia and recently imp
outbreaks of febrile illness associ
hemorrhagic and neurological
tions. To facilitate an evide

Box 1. Focus Groups for AHF Workshop

- Case definition/epidemiologic studies
- Vector/reservoir identification
- Health education and awareness
- Laboratory diagnosis
- Infection control

Alkhurma Hemorrhagic Fever in Travelers Returning from Egypt, 2010

Fabrizio Carletti, Concetta Castilletti, Antonino Di Caro, Maria R. Capobianchi, Carla Nisii, Fredy Suter, Marco Rizzi, Alessandra Tebaldi, Antonio Goglio, Cristiana Passerini Tosi, and Giuseppe Ippolito

Two travelers returning to Italy from southern Egypt were hospitalized with a fever of unknown origin. Test results showed infection with Alkhurma virus. The geographic distribution of this virus could be broader than previously thought.

Alkhurma virus (ALKV) is a recently described member of the tick-borne hemorrhagic fever group of the genus *Flavivirus*. It was initially isolated in the late 1990s (1,2) and is today considered a variant of the Kyasanur

Evidence suggests that ALKV infects humans either transcutaneously (by contamination of a skin wound with the blood of an infected vertebrate or through the bite of an infected tick) or orally through consumption of unpasteurized contaminated milk. Transmission to humans has been associated with butchering of sheep and camels. No human-to-human transmission has been reported. ALKV is classified in different countries as a BioSafety Level 3 or 4 agent.

ALKV has been detected only in Saudi Arabia, but the closely related Kyasanur Forest disease virus has spread as far as India and the People's Republic of China (4). We describe 2 cases of Alkhurma hemorrhagic fever in 2 travelers who returned to Italy from Egypt in 2010.

The Cases

The first patient, a 64-year-old man from Italy, spent 1 week (April 25–May 1, 2010) in a touristic village in southern Egypt, near the Sudan border. While visiting a camel and dromedary market in Shalatin on April 29, he was bitten on the foot by an unidentified arthropod (although not formally identified, was described as tick shaped). Soon after, a small, papular lesion developed. During his return flight to Italy, ≈48 hours after the bite, the patient experienced high fever, shaking chills, anorexia, malaise, nausea

Carletti F *et al. EID* 2010; 16: 1979-82

ELSEVIER

International Journal of Antimicrobial Agents 21 (2003) 153–157

INTERNATIONAL JOURNAL OF Antimicrobial Agents

www.isochem.org

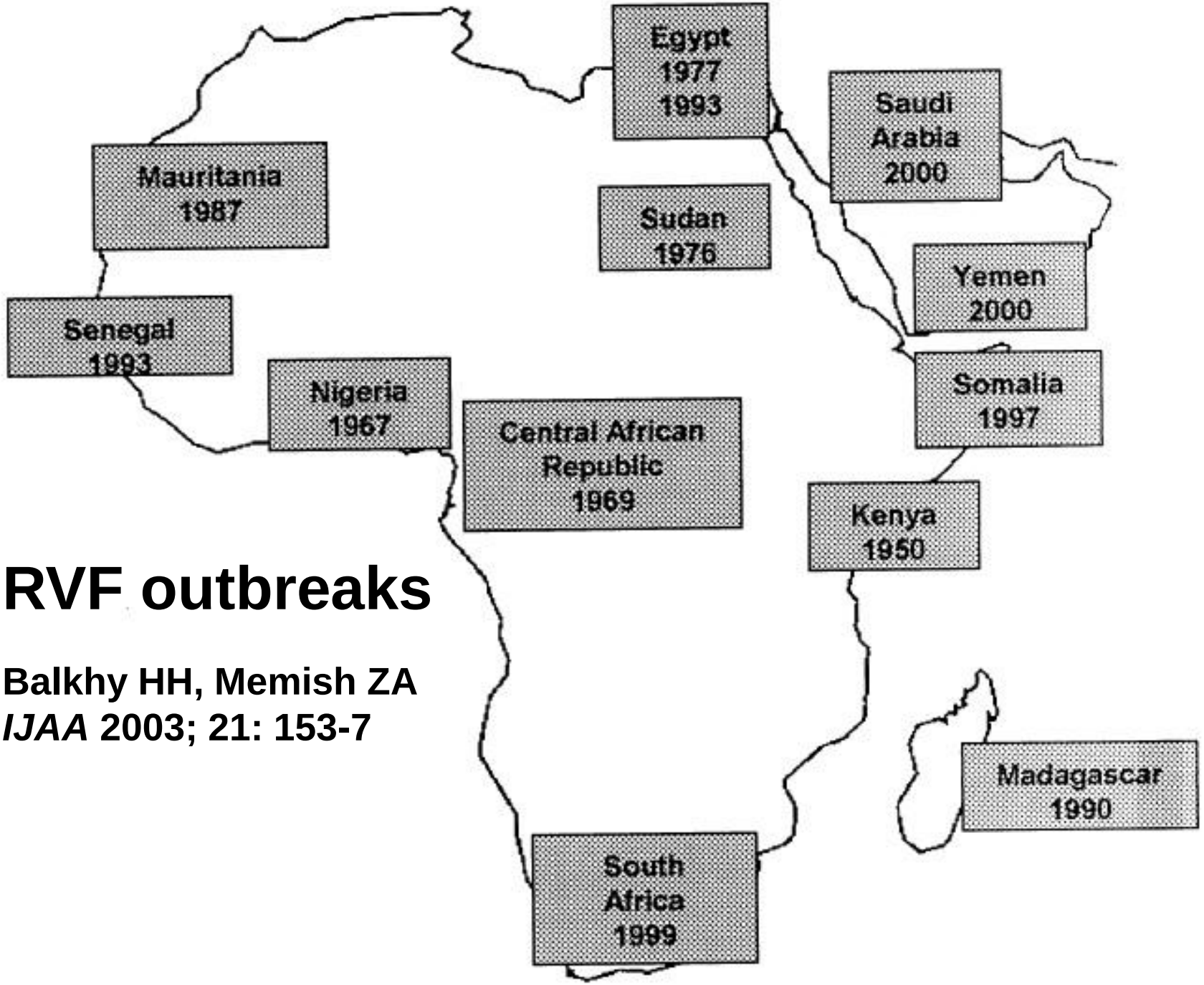
Rift Valley fever: an uninvited zoonosis in the Arabian peninsula

Hanan H. Balkhy [a,c], Ziad A. Memish [b,c,*]

[a] *Department of Pediatrics, King Fahad National Guard Hospital, Riyadh, Saudi Arabia*
[b] *Department of Medicine, King Fahad National Guard Hospital, Riyadh, Saudi Arabia*
[c] *Department of Infection Prevention and Control, King Fahad National Guard Hospital, P.O. Box 22490, Riyadh 11426, Saudi Arabia*

Abstract

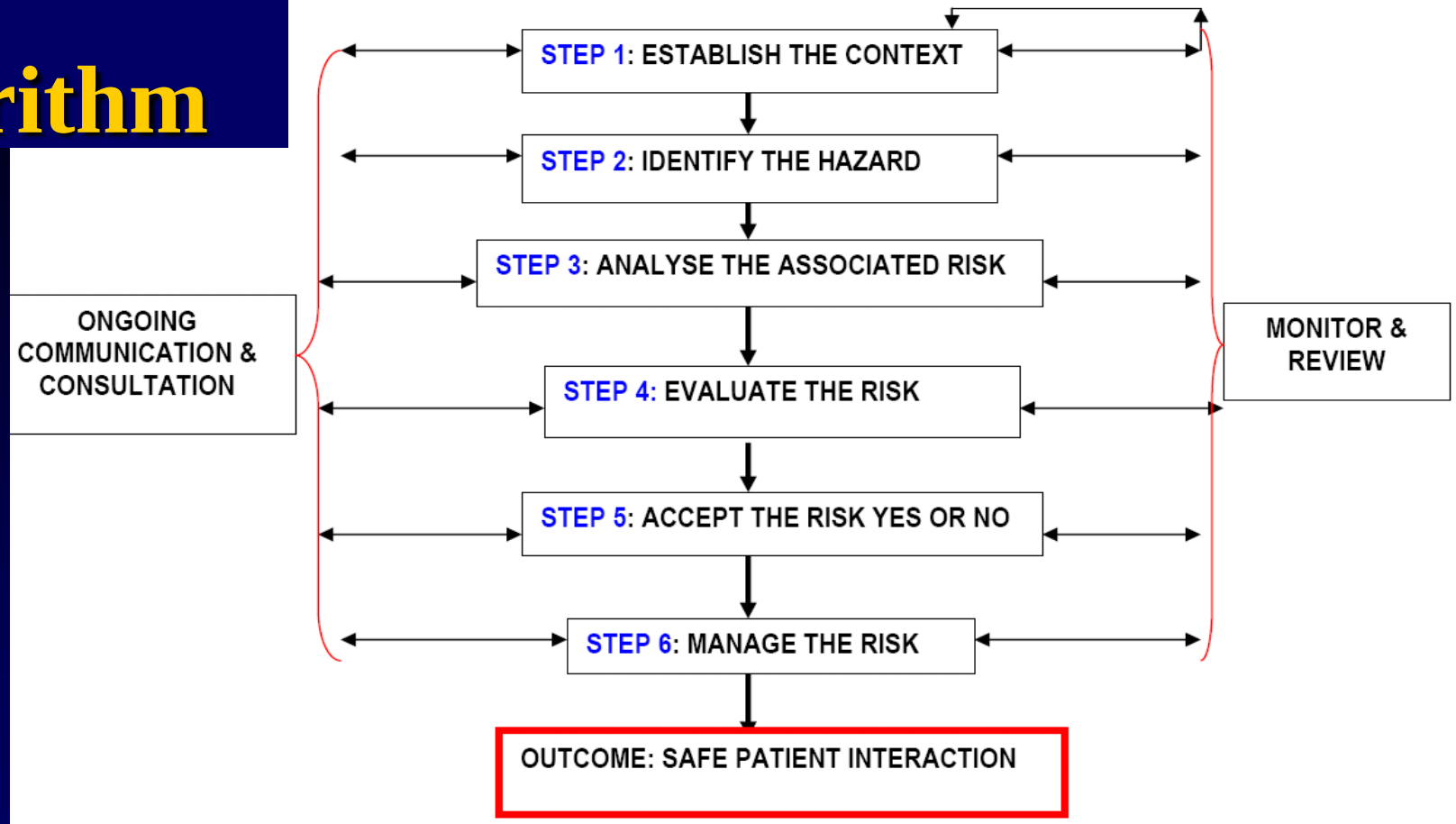
Rift Valley fever (RVF) is an acute viral disease, affecting mainly livestock but also humans. The virus is transmitted to humans through mosquito bites or by exposure to blood and bodily fluids. Drinking raw, unpasteurized milk from infected animals can also transmit RVF. Routine vaccination of livestock in Africa has been prohibitively expensive, leading to endemicity of RVF in most African countries. Reports in September 2000 first documented RVF occurring outside of Africa in the Kingdom of Saudi Arabia and Yemen. Prior to this outbreak, the potential for RVF spread into the Arabian Peninsula had already been exemplified by a 1977 Egyptian epidemic. This appearance of RVF outside the African Continent might be related to importation of infected animals from Africa. In the most recent outbreak patients presented with a febrile haemorrhagic syndrome accompanied by liver and renal dysfunction. By the end of the outbreak, April 2001 statistics from the Saudi Ministry of Health documented a total of 882 confirmed cases with 124 deaths. Both the severity of disease and the relatively high 14% death rate might be a consequence of underreporting of less severe disease. Travellers to endemic areas may be at risk of acquiring the disease if exposed to animals or their body fluids directly or through mosquito bites. Special education regarding both modes of transmission and the geographical distribution of this disease needs to be given to travellers at risk.



RVF outbreaks

Balkhy HH, Memish ZA
***IJAA* 2003; 21: 153-7**

Risk algorithm



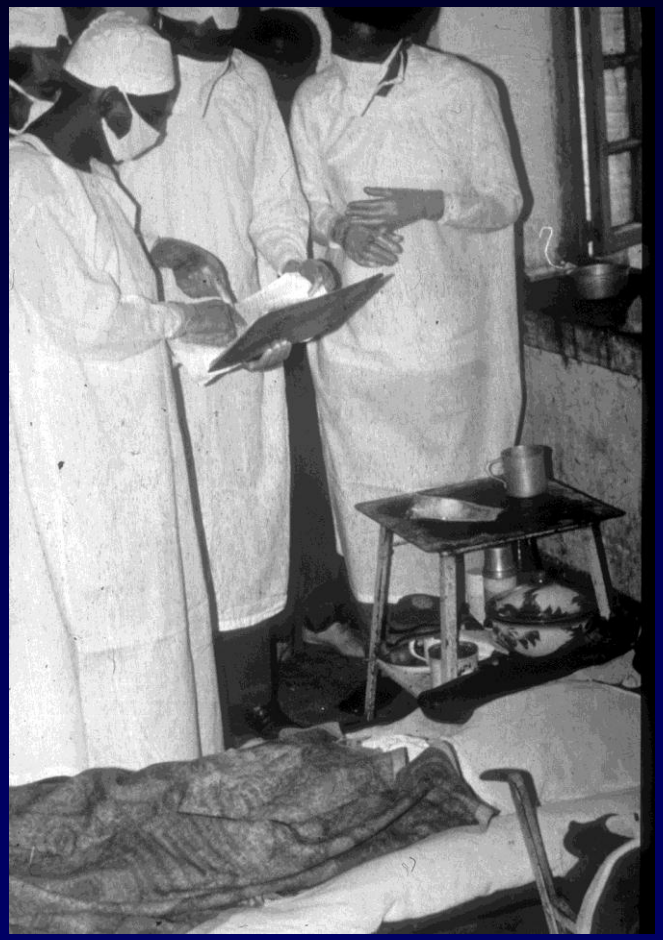
References

- Emergency Management in Australia. Concepts and Principles. Emergency Management Australia, 2004.
- Community Emergency Planning Guide. Australian Emergency Manual. Second Edition. 1992.
- Public health response to biological and chemical weapons. WHO

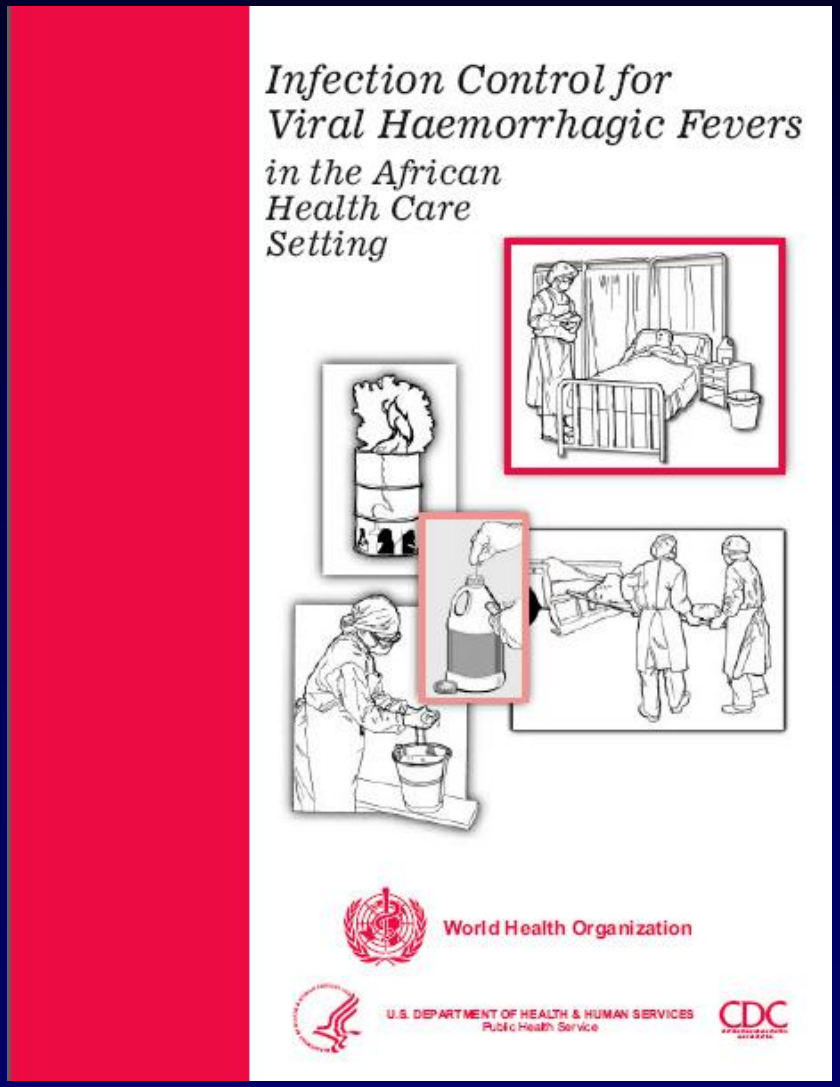
Containment of imported VHF

- Risk assessment – epi & clinical
- Possible case – negative pressure room
- Staff precautions - blood & secretion/air
- Liaise with lab
  - **Exclude malaria**
  - **Specialist tests**
- Liaise with public health
  - **Identify contacts**
  - **Transfer as appropriate**
- Prepare for media onslaught

Infection control



Maridi Hospital, Sudan



VHF ward Liverpool c1980

Journal of Infection (2007) 54, 6–11

ELSEVIER

www.elsevierhealth.com/journals/jinf

Early risk assessment for viral haemorrhagic fever: Experience at the Hospital for tropical diseases, London, UK

Charles J. Woodrow [a], Alice C. Eziefula [a], Dan Agranoff [a], Geoffrey M. Scott [b], Julie Watson [a], Peter L. Chiodini [a,c], Diana N.J. Lockwood [a,c], Alison D. Grant [a,c,*]

[a] *The Hospital for Tropical Diseases, Directorate of Infection, University College London Hospitals, Mortimer Market, Capper Street off Tottenham Court Road, London WC1E 6AU, UK*
[b] *Department of Clinical Microbiology, University College London Hospitals, UK*
[c] *London School of Hygiene & Tropical Medicine, London WC1E 7HT, UK*

The message

Act, before disease becomes persistent through long delays

Ovid, 43 BC to AD 17

Summary

- Infection will continue to emerge and re-emerge, especially
  - **Airborne**
  - **Zoonoses**
  - **Travel related**
- Clinicians must take travel and contact histories
- Early recognition is needed to protect healthcare workers and contacts
- National and international public health response needs to identify, cintain and prevent causes

Acknowledgments

- Dr Gail Carson Oxford
- Dr Roger Hewson PHE Porton

شكرا لكم على إهتمامكم

Thank you for your attention