

**Dr Nick BEECHING**

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**50 year old woman with fever, rash and chest pain from Mauritius in March 2006**

**2 week holiday in Mauritius returned 4 days ago**

**Injured leg and admitted to hospital on day 9 for antibiotics**

**Many patients on ward with fever**

**No mosquito bites remembered**

**4 days later fever and headache for 3 days**

**Improved as flew back to UK**

**Full immunisations, no malaria chemoprophylaxis**



# Now has 2 days of

Fever to 39° C

Migratory joint pains

Headache

Photophobia

Rash

Pleuritic chest pain

Temp 38.9° C P100

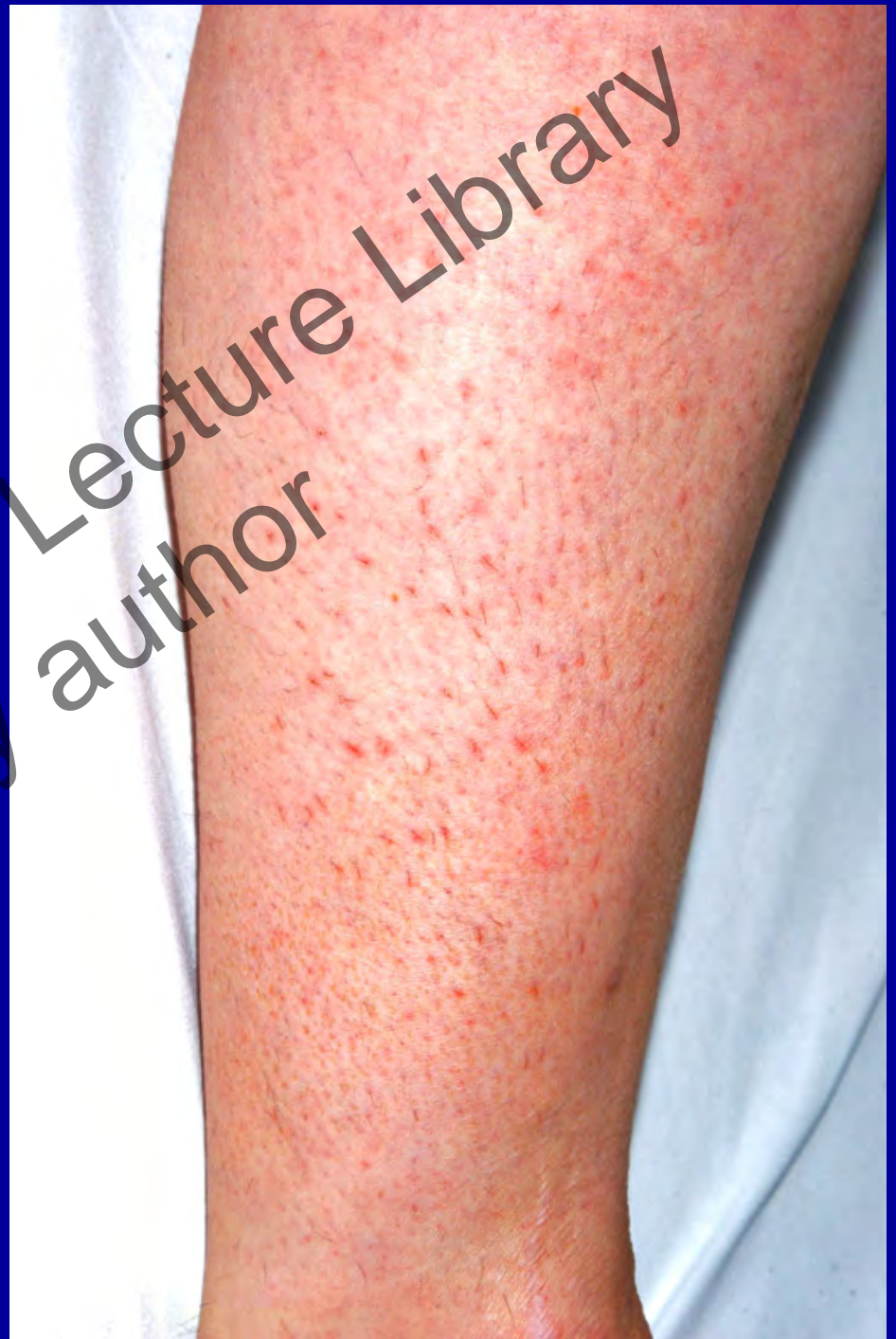
BP 120/85 RR 12

Discrete rash on legs

Chest clear

No neck stiffness

Joints normal



# Investigations

Hb 11.0 g/dL (>11.5)

WBC 6.1 x 10<sup>9</sup>/L

Lymph 0.6 (1.5-4)

Mono 0.2 (0.2-0.8)

Neut 5.2 (2-7.5)

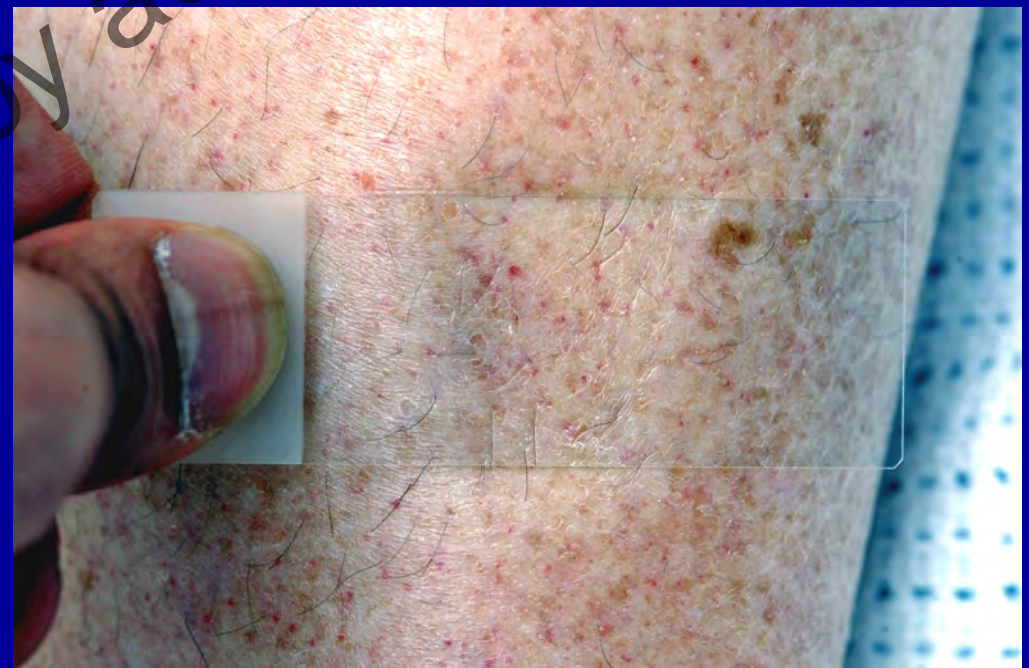
Plt 270 x 10<sup>9</sup>/L (>150)

ESR 12 mm/hr

Malaria smears neg

Liver function  
normal

CXR normal



# What is your diagnosis? (choose one)

1. Dengue
2. Malaria
3. Meningococcal meningitis
4. O'nyong-nyong
5. Something else

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# Initial diagnosis & progress

- **Concern about meningococcal disease**
  - CT of head normal
  - Given ceftriaxone
  - No lumbar puncture
  - Transferred to Liverpool
- **Diagnosis presumed chikungunya**
  - Pulmonary embolus excluded by VQ scan

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

# Clinical features

	Malaysia 1998 (%)	Réunion 2005-Feb 2006 (%)
Skin rash	50	39
Myalgia	50	60
Headache, spinal pain	50, 50	70, NR
Arthralgia (all types)	78	100
Large joints	18	NR
Fever	100	100
Number of reported cases	51	504

NR=not reported. Data for Malaysia from Lam and colleagues (2001)<sup>19</sup> and data for Réunion from <http://www.invs.sante.fr>.

**Table: Frequency of clinical manifestations during the 1998 Malaysian epidemic and the 2005 Réunion epidemic**

# Fever & exanthems: differences

Clinical manifestations of chikungunya and dengue infections in returned travelers

Clinical finding	Chikungunya (22 cases) N (%)	Dengue (16 cases) N (%)	Significance (P)*
Cephalagia	9 (41)	11 (69)	0.087
Asthenia	15 (68)	13 (81)	NS
Myalgia	7 (32)	8 (50)	NS
Arthralgia	22 (100)	0	< 0.001
Pruritus	10 (48)	5 (31)	NS
Lymphadenopathy	14 (64)	7 (44)	NS
Macular exanthema	16 (73)	13 (81)	NS

\* NS, nonsignificant.



# Fever & exanthems: differences

## Biological features of chikungunya and dengue infections in returned travelers

Biological finding	Chikungunya (22 cases) N (%)	Dengue (16 cases) N (%)	Significance (P)
Leucopenia	8 (40)	12 (75)	0.033
Neutropenia	2 (10)	13 (81)	< 0.001
Lymphopenia	18 (90)	9 (56)	0.049
Circulating lymphocytosis	6 (30)	5 (31)	NS
Anemia	3 (15)	0	NS
Thrombopenia	7 (35)	14 (88)	0.002
Increased ALAT*	13 (65)	14 (88)	NS
Increased CRP†	9 (64)	10 (77)	NS

\* ALAT, alanine aminotransferase.

† CRP, C-reactive protein.

# Which of these is not a vector for chikungunya? (choose one)

1. *Aedes aegypti*
2. *Aedes albopictus*
3. *Aedes vittatus*
4. *Anopheles gambiense*
5. *Culex annulorostris*

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# 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**

# How would you treat her?

(choose one)

1. Symptomatic treatment
2. Chloroquine
3. Interferon
4. Ribavirin
5. Aciclovir

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# Progress

## 6 weeks later

Severe fatigue

Mild joint pain

Sore leg wound – osteomyelitis excluded

## 3 months later

Improving

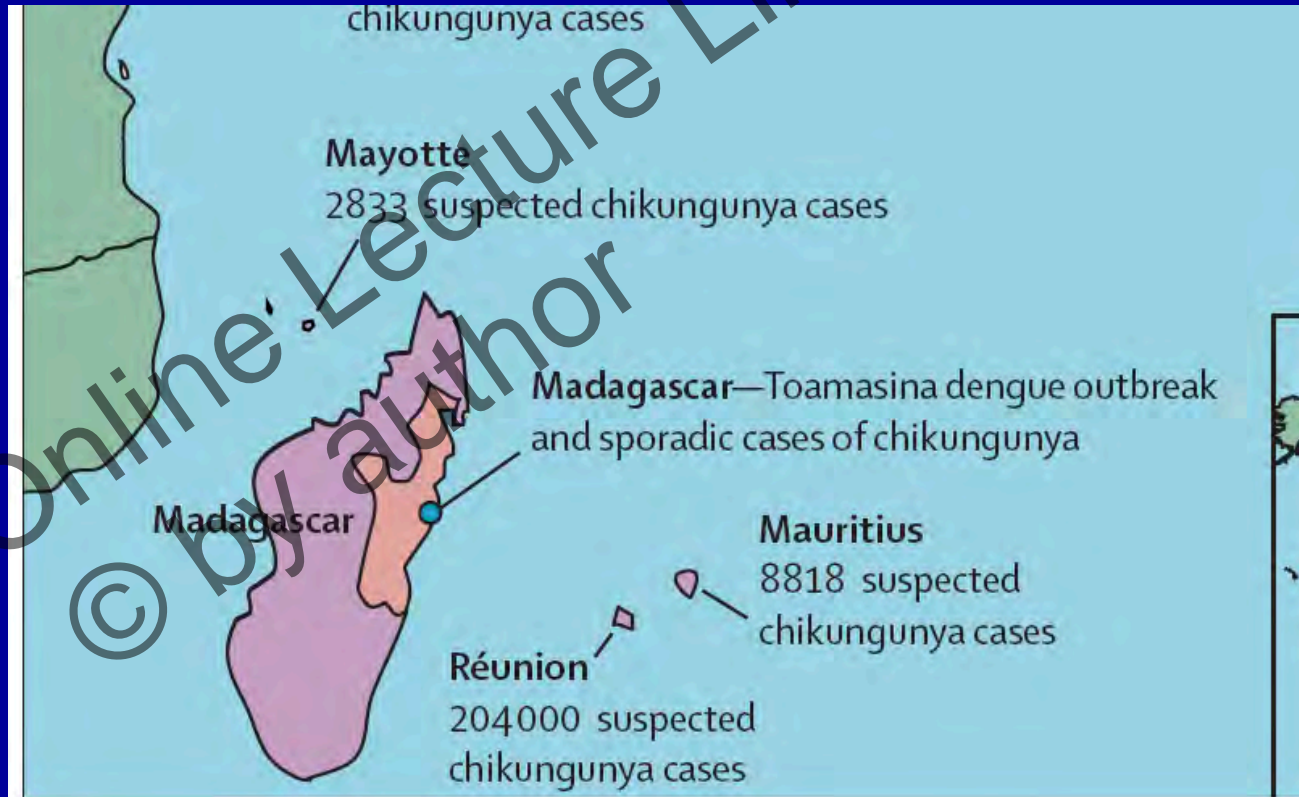
Compensated by travel health insurance

## Serology

Positive IgM & IgG for Chikungunya

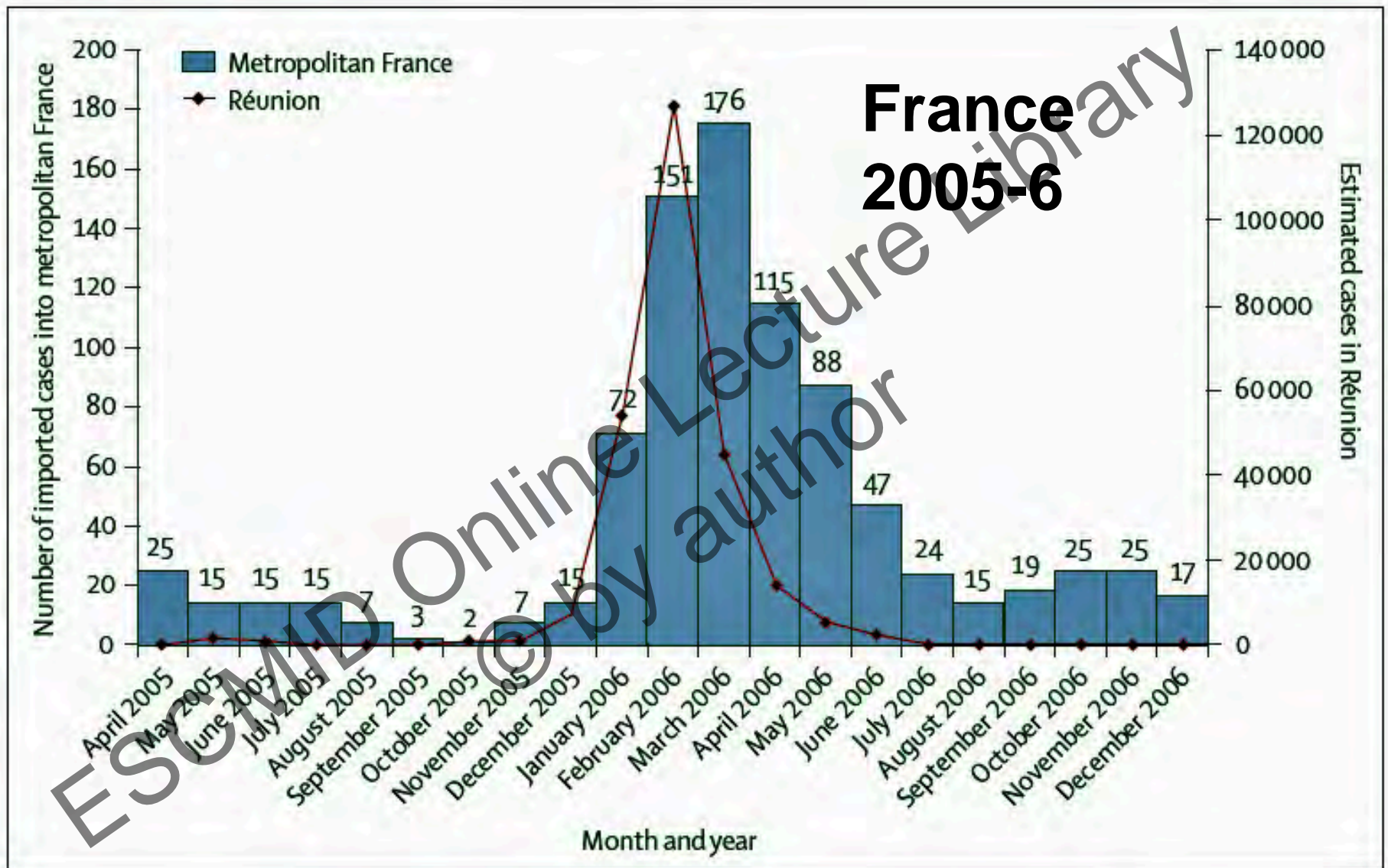
# Epidemiology

- **Tanzania 1953**
- **Asia**
- **West Africa**
  
- **Réunion, Mauritius etc from 2000**
- **1.5M visitors in 2004**
- **UK importations >130 in 2006**



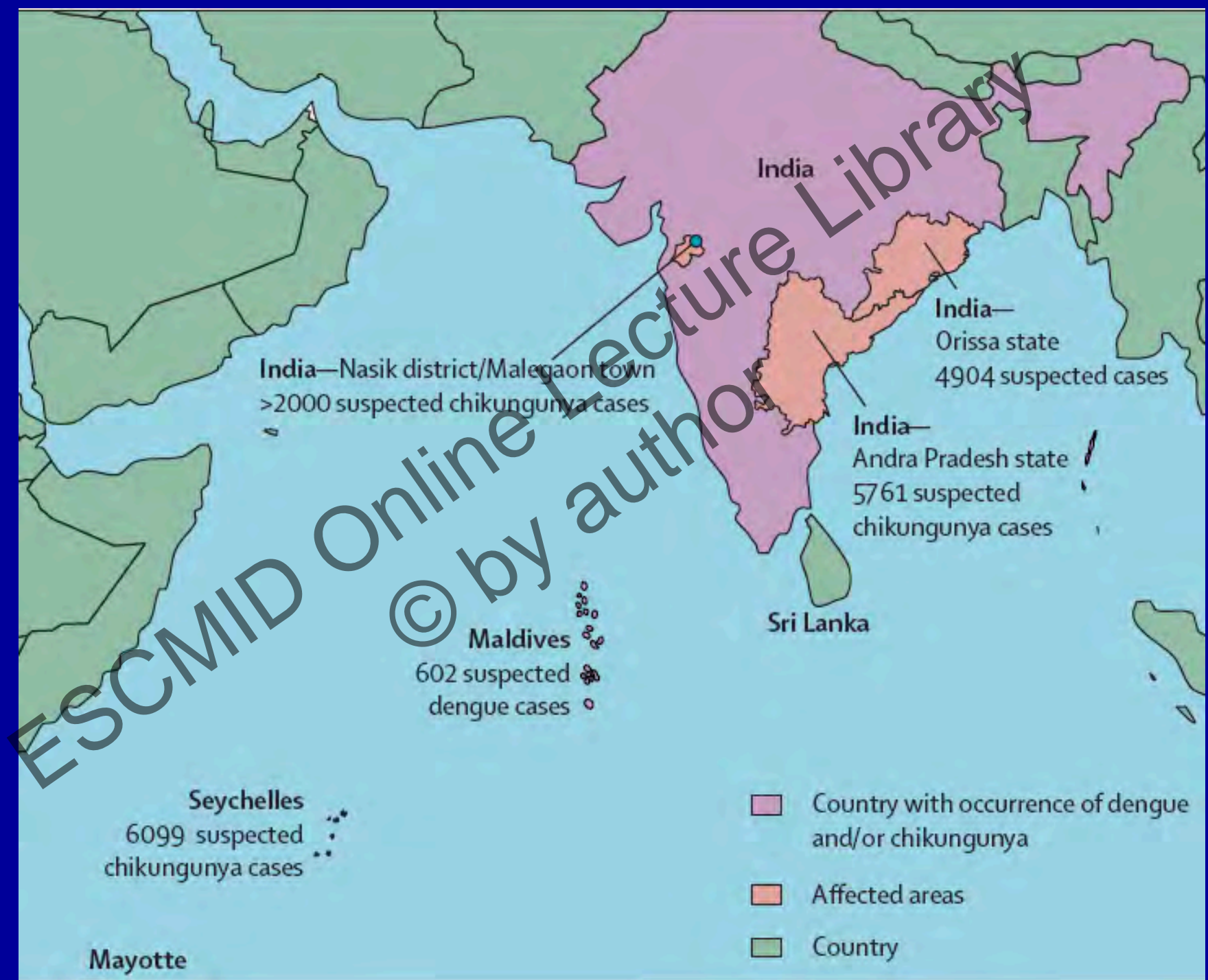
*Figure 2 : Chikungunya and dengue incidence in India and Indian Ocean Status as of March 17, 2006. Data from WHO, <http://www.who.int>.*





**Figure 3: Chikungunya cases in Réunion and imported cases into metropolitan France, April 2005–December 2006**

Weekly notifications based on an estimated mathematical extrapolation (<http://www.invs.sante.fr> and reference 52) and imported cases in France.



## 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.



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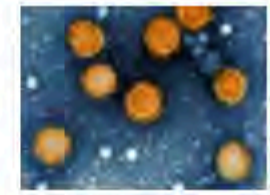
Ti trovi in: Prevenzione e controlli > In primo piano

## 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 focolari epidemici in Asia ed Africa.

La Chikungunya è una malattia virale acuta, caratterizzata da sintomi simili-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 (arbovirus) 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?

# 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**

## Points

- Differential diagnosis of fever and rash from tropics is wide
- Case of probable nosocomial chikungunya infection
- As part of current large epidemic
- More severe and prolonged sequelae than dengue, especially joint disease
- *Aedes* vectors spreading and climate change may exacerbate this

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