

Case 2

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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 10⁹/L
 Lymph 0.6 (1.5-4)
 Mono 0.2 (0.2-0.8)
 Neut 5.2 (2-7.5)
 Plt 270 x 10⁹/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 chikungunya

	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)¹⁸ 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

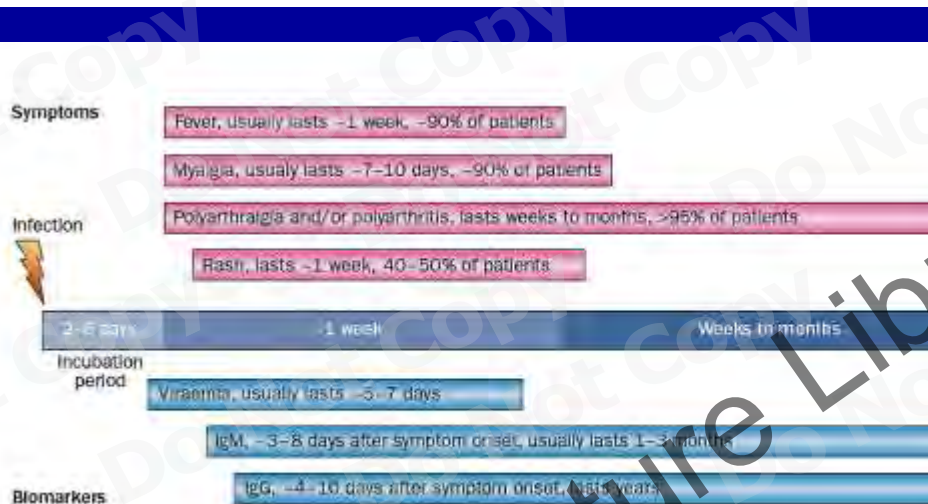


Figure 2 | Usual course of CHIKV disease in adults. The figure shows a schematic representation of CHIKV disease, showing typical symptoms and biomarkers (including usual durations) in boxes. The

**Suhrbier A et al. Arthritogenic alphaviruses--an overview
Nat Rev Rheumatol 2012; 8: 420-9**

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)*
Cephalalgia	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.

Hochedez P et al. Am J Trop Med Hyg 2008; 78(5): 710-3

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 (41)	10 (77)	NS

* ALAT, alanine aminotransferase.
† CRP, C-reactive protein.

Hochedez P *et al. Am J Trop Med Hyg* 2008; 78(5): 710–3

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

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

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

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3. *Aedes vittatus*
4. *Anopheles gambiae*
5. *Culex annulirostris*

Vectors



Figure 1: Mosquito vectors of chikungunya virus

(A) Blood-gorged *Aedes albopictus* female feeding on a human host. *Aedes albopictus* is the primary chikungunya virus vector in the current Indian Ocean outbreak. (B) *Aedes aegypti* mosquito. *Aedes 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



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

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

How would you treat her?

(choose one)

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

**How would you treat her?
(choose one)**

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

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>.

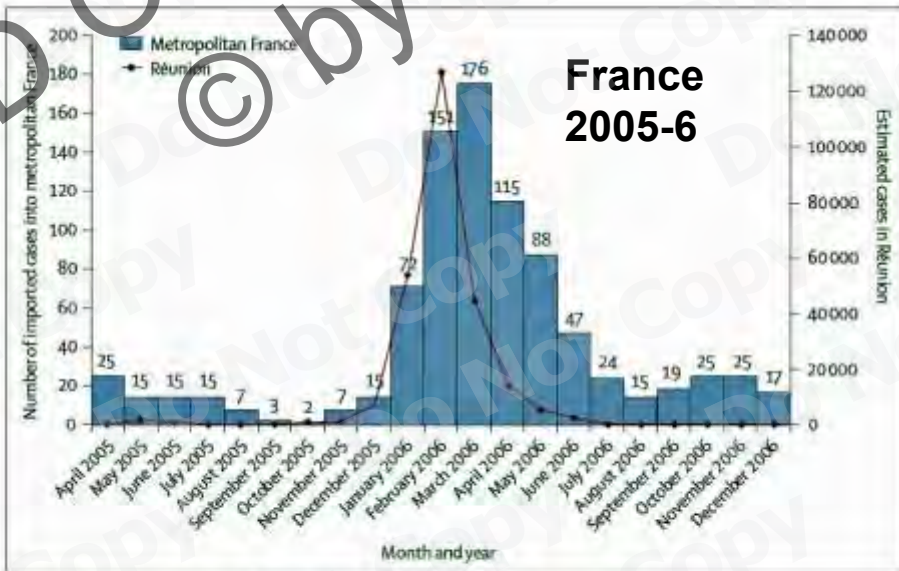
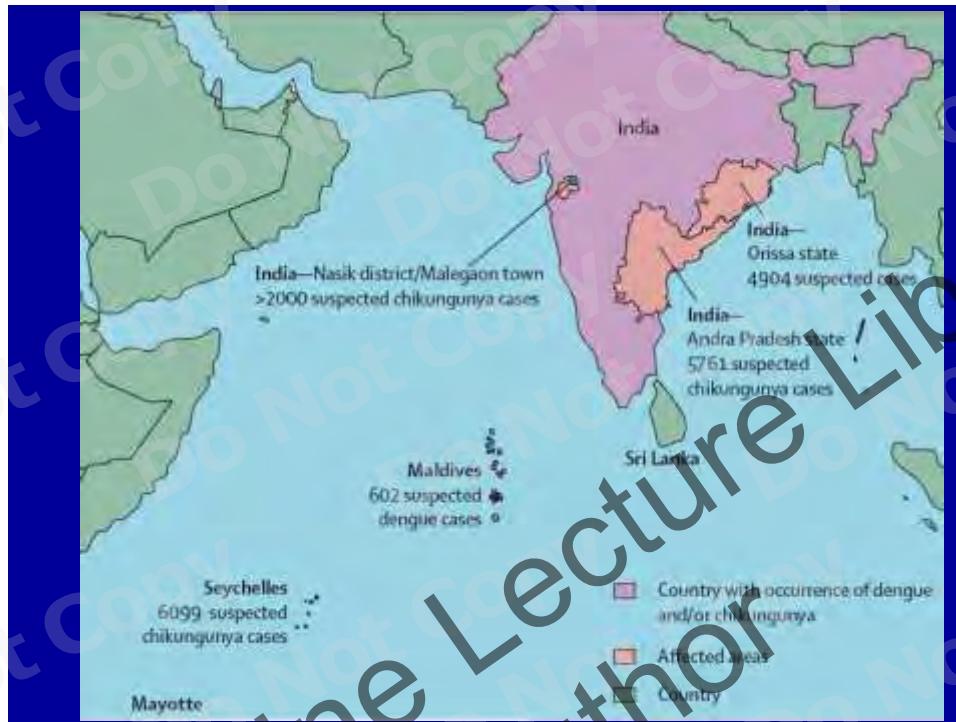


Figure 3: Chikungunya cases in Réunion and imported cases into metropolitan France, April 2005–December 2006. Weekly notifications based on an estimated mathematical extrapolation (<http://www.invs.sante.fr> and reference 52) and imported cases in France.



Online Review Article | *Nat Rev Microbiol* | April 2010 | doi:10.1038/nrmicro0735

REVIEWS

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 fever. 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.

http://www.ministerosalute.it/lettaggio/pdf/occa_ppt/area-promozione/colore/S2007-400

11 Sep 2007

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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 allergico (eritemi, petecchie, edematosi, orticaria, gengivorragie). I sintomi durano tre-cinque giorni e si risolvono spontaneamente, ma i dolori articolari, accompagnati da anemia, possono persistere anche per mesi. Le complicanze più gravi sono rappresentate dalla meningite e dalla mieloneurite 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 come broncopolmonopatia cronica ostruttiva, cardiopatia, diabete).

Come si trasmette?
 Il virus responsabile della Chikungunya è un bigavirus (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 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.

Come quanto contagio i chikung?



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**



INVS Point Sanitaire No. 14, 7-13 Apr 2014

http://www.invs.sante.fr/content/download/87064/319536/version/61/file/pe_chikungunya_antilles_170414.pdf

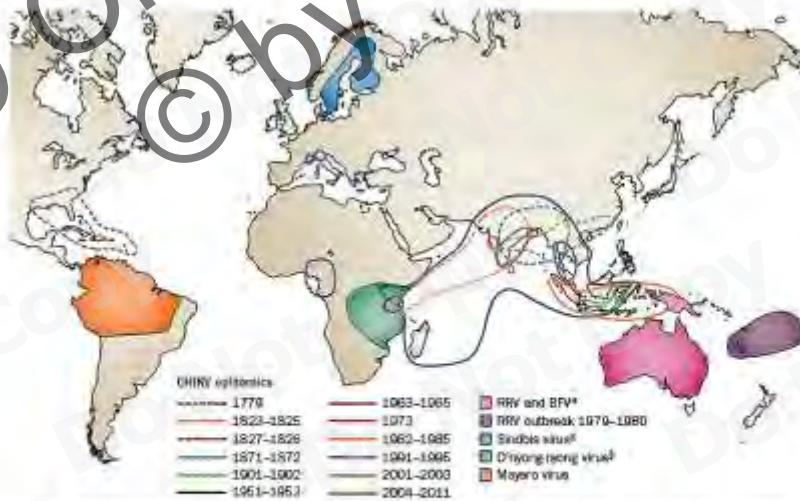


Figure 1 | Approximate geographical locations of diseases associated with arthropogenic alphaviruses. For CHIKV disease, locations of documented large outbreaks are shown. Epidemics prior to 1902 are shown in dashed lines and were initially classified as outbreaks of dengue, but were likely to have been due to CHIKV. *Geographical locations of RRV and BFV diseases overlap, with BFV restricted to the Australian mainland. †Main location of diseases caused by the Sindbis virus family. ‡D'nyong nyong virus disease outbreaks in 1959-1961 (East Africa), 1996-1997 (Uganda) and 2003 (West Africa). §Mayaro virus disease outbreak regions. Abbreviations: BFV, Barmah Forest virus; CHIKV, chikungunya virus; RRV, Ross River virus.

Suhrbier A et al. Nat Rev Rheumatol 2012; 8: 420-9

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* 2007; 7: 319-27

Suhrbier A et al. *Nat Rev Rheumatol* 2012; 8: 420-9

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