



## DENGUE FEVER

No. 17, 2008

Dengue fever is the most frequently occurring mosquito-transferred virus disease in humans. There are four types of dengue virus, Den1-4. Infection by one type does not protect against the others. It is therefore possible to contract dengue fever repeatedly.

### Occurrence

The occurrence of dengue fever has increased significantly over the last decades and is now endemic in more than 100 countries, [Figure 1](#). Dengue fever mainly occurs in tropical and subtropical areas. The WHO estimates an annual 50 million cases and assesses that 40% of the world's population is at risk of infection.

### Current outbreak in Brazil

Following a period of heavy rain, January 2008 recorded a considerable increase in the incidence of dengue fever in the federal state of Rio de Janeiro.

The state, which counts 15 million inhabitants, has so far reported more than 75,000 dengue fever cases, including 80 deaths, half of which were children below the age of 15 years. The present epidemic is dominated by type Den2 dengue virus. This type is associated with a higher mortality than Den3, which was dominant during the previous 6 years. You may follow the outbreak as it develops at [www.ssi.dk/rejser](http://www.ssi.dk/rejser) (Danish language).

### Mode of transmission

Dengue virus is transferred via female mosquito bites, primarily from the *Aedes aegypti*, but in later years also from *A. albopictus*. These mosquitoes are primarily found in urban areas. Human-to-human transmission does not occur.

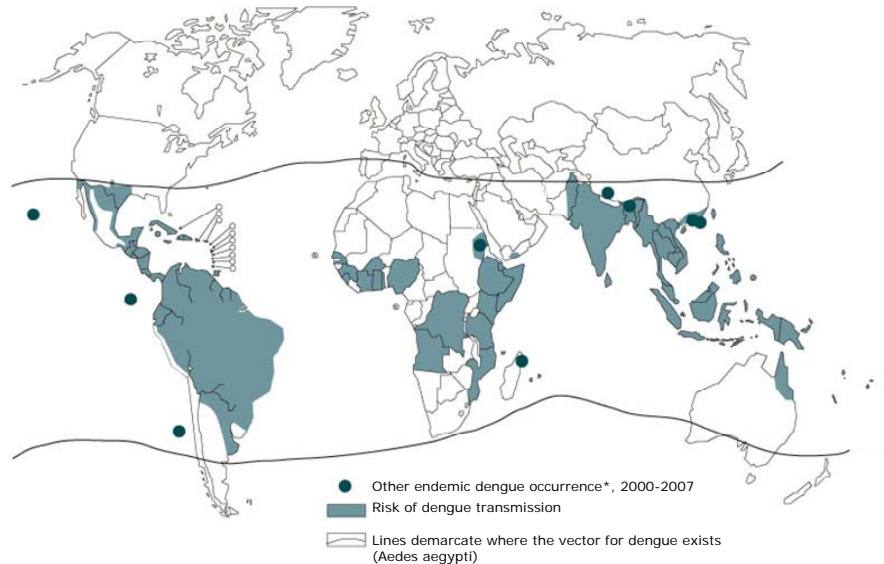
The risk of infection increases with an increase in number of mosquitoes, e.g. in connection with the wet season and flooding. *A. aegypti*, however, reproduces continually in stagnant water, e.g. in drinking water tanks, discarded car tires and empty cans.

### Symptoms

After an incubation period of 3-14 days, the typical symptoms are high fever, rash, headache and muscle pain, comparable to those of a serious influenza.

Haemorrhagic dengue fever, which is a serious and potentially lethal condition presenting as high fever, and haemorrhagic manifestations are less frequent.

**Figure 1. Countries and areas with dengue virus transmission risk, 2007 (Source: WHO, 2008)**



\*) Hawaii, Galapagos Islands, Easter Island, Madagascar/Reunion, Sudan, Nepal, Bhutan, Macao and Hong Kong

Haemorrhagic dengue fever occurs much more frequently in patients who have previously been infected than in primary infections.

### Diagnosis

The diagnosis is established by detection of IgM and IgG antibodies in a blood sample. Furthermore, diagnosis by PCR is possible in the first days after disease onset. The analysis is performed at Statens Serum Institut.

In 2007, 16 imported cases of dengue fever were diagnosed in Denmark.

### Treatment

No specific treatment is available for the treatment of dengue fever, which is treated symptomatically with e.g. paracetamol. Intensive liquid treatment may save lives in serious cases of haemorrhagic dengue fever.

### Prophylaxis

A vaccine covering all four types of dengue fever is currently being tested. But even if the vaccine proves successful, it will take years before it is available.

Precaution should be taken to avoid mosquito bites. Mosquito repellent, which should be used after sunrise, provides protection for a number of hours depending on the type used. Careful application to all skin areas is essential. Repellents may have a local irritant effect, particularly when used repeatedly. In children below 3 years repellents should be used with caution, and these agents should not

be used in infants. The risk of mosquito bites at home may be reduced by spraying insecticides indoors and by using a mosquito net. Mosquitoes as well as larvae may be controlled by using insecticides and by blocking the access of egg-laying mosquitoes to stagnant water, e.g. by covering drinking water containers.

### Comment

Travellers from non-endemic areas such as Denmark will rarely develop haemorrhagic dengue fever. It is essential that travellers receive guidance concerning personal protection equipment for the prevention of dengue fever.

The increased occurrence of dengue fever is attributed to an increase in urbanisation in connection with which many share a limited space in primitive and poor sanitary conditions. Such areas provide ideal reproduction conditions for *A. aegypti*. Furthermore, the increase in travels by air may assist the spread of dengue fever as infectees may transfer the infection to previously non-endemic areas and spread new types of virus in known endemic areas. The global increase in the occurrence of dengue fever and the increased travel activity may cause the number of diagnosed dengue cases in Denmark to rise in years to come. (P. Valentiner-Branth, Department of Epidemiology, L. Vinner, A. Fomsgaard, Department of Virology)

## Individually notifiable diseases

Number of notifications received in the Department of Epidemiology, SSI (2008 figures are preliminary)

Table 1	Week 16 2008	Cum. 2008 <sup>1)</sup>	Cum. 2007 <sup>1)</sup>
AIDS	0	11	16
Anthrax	0	0	0
Botulism	0	0	0
Cholera	0	0	0
Creutzfeldt-Jakob	0	4	2
Diphtheria	0	0	0
Food-borne diseases of these, infected abroad	2	80	152
Gonorrhoea	15	114	114
Haemorrhagic fever	0	0	0
Hepatitis A of these, infected abroad	1	16	10
Hepatitis B (acute)	0	4	7
Hepatitis B (chronic)	3	51	82
Hepatitis C (acute)	0	4	2
Hepatitis C (chronic)	8	116	91
HIV	0	59	88
Legionella pneumonia of these, infected abroad	1	32	29
Leprosy	0	0	0
Leptospirosis	0	2	4
Measles	1	6	1
Meningococcal disease of these, group B	2	22	25
of these, group C	2	10	12
of these, unspec. + other	0	4	7
Mumps	0	8	6
Neuroborreliosis	1	14	3
Ornithosis	0	19	26
Ornithosis	0	1	1
Pertussis (children < 2 years)	0	1	1
Plague	2	33	27
Plague	0	0	0
Polio	0	0	0
Purulent meningitis Haemophilus influenzae	0	0	1
Listeria monocytogenes	0	0	5
Streptococcus pneumoniae	2	35	42
Other aethiology	1	12	6
Unknown aethiology	1	8	8
Under registration	1	8	-
Rabies	0	0	0
Rubella (congenital)	0	0	0
Rubella (during pregnancy)	0	0	0
Shigellosis of these, infected abroad	2	20	15
Syphilis	2	18	8
Tetanus	3	34	30
Tuberculosis	0	0	0
Typhoid/paratyphoid fever of these, infected abroad	7	125	111
Typhoid/paratyphoid fever	1	10	4
Typhoid/paratyphoid fever of these, infected abroad	1	8	4
Typhus exanthematicus	0	0	1
VTEC/HUS of these, infected abroad	0	35	53
VTEC/HUS	0	12	17

<sup>1)</sup> Cumulative number 2008 and in corresponding period 2007

## Selected laboratory diagnosed infections

Number of specimens, isolates, and/or notifications received in SSI laboratories

Table 2	Week 16 2008	Cum. 2008 <sup>2)</sup>	Cum. 2007 <sup>2)</sup>
Bordetella pertussis (all ages)	3	40	45
Gonococci of these, females	1	116	105
of these, males	0	24	15
Listeria monocytogenes	1	92	90
Mycoplasma pneumoniae Resp. specimens <sup>3)</sup>	5	15	17
Serum specimens <sup>4)</sup>	2	40	219
Streptococci <sup>5)</sup> Group A streptococci	2	47	236
Group B streptococci	0	48	51
Group C streptococci	1	31	31
Group G streptococci	0	4	7
S. pneumoniae	0	36	40
Table 3	Week 14 2008	Cum. 2008 <sup>2)</sup>	Cum. 2007 <sup>2)</sup>
MRSA	8	150	-
Pathogenic int. bacteria <sup>6)</sup> Campylobacter	20	454	598
S. Enteritidis	1	72	71
S. Typhimurium	22	117	79
Other zoon. salmonella	19	196	141
Yersinia enterocolitica	7	65	77
Verocytotoxin- producing E. coli	3	34	51
Enteropathogenic E. coli	1	21	38
Enterotoxigenic E. coli	4	80	37

<sup>2)</sup> Cumulative number 2008 and in corresponding period 2007

<sup>3)</sup> Resp. specimens with positive PCR

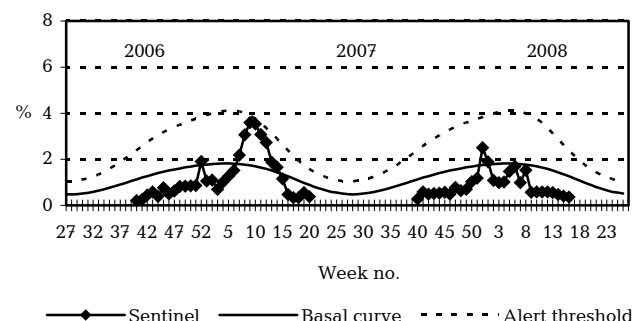
<sup>4)</sup> Serum specimens with pos. complement fixation test

<sup>5)</sup> Isolated in blood or spinal fluid

<sup>6)</sup> See also [www.germ.dk](http://www.germ.dk)

## Sentinel surveillance of the influenza activity

Weekly percentage of consultations, 2006/2007/2008



Sentinel: Influenza consultations (as percentage of total consultations)

Basal curve: Expected frequency of consultations under non-epidemic conditions

Alert threshold: Possible incipient epidemic