

# Malaria among seafarers in Klaipeda in 1999–2008

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## ABSTRACT

*In the 10 years from 1999 to 2008, 33 imported malaria cases were recorded in Klaipeda, in 31 people from Lithuania and in 2 foreigners, from 1 to 8 cases per year. Among them, there were 28 infections of seafarers, who were probably infected in West Africa, Nigeria, Cameroon, or Angola. For all of them, malaria was a work-related health risk. Plasmodia of all species were detected in their blood, but in the majority of cases (24) it was Plasmodium falciparum. In all cases, the diagnosis was confirmed by blood examination – thick and thin films.*

*About 10% of patients had the severe form of the disease. Two seafarers died of falciparum malaria, one in Angola and one in Klaipeda. Preventive measures such as chemoprophylaxis and avoidance of mosquito bites were not always used by them. Therefore, the staff of the Klaipeda Public Health Centre focus their work on the health training of seafarers, explaining the risk of infection, advising how to avoid mosquito bites, and how to use antimalarial drugs for prophylaxis.*

**Key words:** malaria, risk, seafarers, *P. falciparum*

## INTRODUCTION

Klaipeda – the city with the only seaport in Lithuania, has about 190 000 inhabitants, and about 10 000 of them work at sea. Most Lithuanian seafarers work on ships operated under foreign flags. Each year, they return to Klaipeda. About 5000 seafarers were engaged on ships sailing to ports of tropical countries in Africa, Asia, and South America in which malaria was endemic and widespread. Many of them visited ports in West Africa where the risk of malaria is very high.

In 1973–1998 there were 113 cases of imported malaria registered in Klaipeda [1], and more than fifty percent of patients were seafarers. Malaria has been an important health problem for crews of ships in other countries [2–6]. The estimated number of malaria infections among international seafarers is between 500 and 1000 each year [2].

## METHODS AND RESULTS

In 1999–2008, 33 imported malaria cases were recorded in Klaipeda, in 31 Lithuanian citizens and in 2 foreigners, including 31 men and 2 women (Table 1–3).

Among the patients, 28 were seafarers, 2 were businessmen, and 3 were travellers.

The dominant parasite species among them was *Plasmodium falciparum* (in 24 out of 33 cases).

The seafarers may have been infected in ports in West Africa (Nigeria, Cameroon, Angola). All infected subjects knew about the preventive measures and their use, but 11 of them did not take antimalarials, and 12 of them took tablets irregularly. About one third of the patients took chloroquine.

The first symptoms of malaria occurred during the first month after the visit to the endemic area, usually after 7–

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**Table 1.** The number of imported malaria cases recorded each year in Klaipeda in the years 1999–2008, the species of Plasmodium diagnosed, the occupation of patients, and the number of fatalities

Year	Number of cases	Occupation of patients			Imported malaria types				Number of fatalities
		Seafarers	Businessmen	Travellers	Vivax malaria	Falciparum malaria	Ovale malaria	Malariae malaria	
1999	5	5				5			
2000	1	1				1			
2001	5	4	1		2	2	1		1
2002	8	8				8			
2003	5	4		1		3	1	1	
2004	4	2		2		3		1	
2005	1	1						1	
2006	0								
2007	2	2				2			1
2008	2	1	1		1			1	
Total	33	28	2	3	3	24	2	4	2

–10 days. Sixty percent of the patients asked for medical care during the 1<sup>st</sup> to 3<sup>rd</sup> day of illness, 24% of them on 4<sup>th</sup> to 7<sup>th</sup> day, 12% of them on the 8<sup>th</sup> to 14<sup>th</sup> day, and 3% of them on the 15<sup>th</sup> to 30<sup>th</sup> day. Some of the patients received treatment before coming to Klaipeda – in ports in Luanda, Angola and in Naudibu, Mauretania. In Klaipeda, patients were hospitalized in the University Hospital Infectious Diseases Department. The final diagnosis of malaria was made after laboratory examination – thin blood smear and thick drop. In Klaipeda and in foreign ports, malaria was treated with quinine products, tetracycline, or doxycycline.

### SEVERE MALARIA

Severe forms of the disease were diagnosed in about 10 percent of cases. There were two fatalities.

On 21 May 2001, a 63-year-old seafarer died in Luanda, Angola. He had the cerebral form of tropical malaria. We were not able to obtain detailed information about this case.

On 2 December 2007, a 20-year-old student of a marine school died in the University Hospital in Klaipeda. The cause of his death was the severe form of tropical malaria, multiple organ failure, and respiratory distress syndrome.

From 21 May to 13 November 2007 he worked on a ship sailing between ports in Nigeria, equatorial Guinea, and Cote d'Ivoire. On 16 November 2007 he travelled by plane from Abidjan, Cote d'Ivoire, to Klaipeda. He had a fever of up to 40°C, complained of severe weakness, headache, and muscle pain, and on 29 November 2007 he requested medical assistance. He was suspected of malaria and was hospitalized in Klaipeda University Hospital Department of Infectious Disease.

In his blood ring forms of Plasmodium falciparum were found, and parasitaemia was 23 percent. The severe form of tropical malaria was diagnosed. The patient was treated with dihydrochloride quinine (intravenous), and a blood transfusion was given.

Parasitaemia was reduced to 3%, but the patient had serious complications and died. In Africa the patient took antimalarials as a preventative measure, but irregularly, and took nothing upon his return to Klaipeda.

### DISCUSSION

Malaria is a work-related serious health risk for seafarers [2, 3, 5, 6]. Mortality among them is caused by insufficient awareness about the risk of infection, and a lack of information about the symptoms of the disease and on preventive measures, as well as failure to follow the rules of prevention.

Therefore, the staff of the Klaipeda Public Health Centre focus their work on the health training of seafarers. Training courses on first aid and primary medical care on ships are conducted there for masters and officers, and the problem of exotic infections is included in their curriculum, particularly – the epidemiology of malaria, symptoms of the disease, and its treatment and prevention. Refresher courses are conducted every five years.

In Lithuania, the care for the health of the crew is the responsibility of the shipmaster. At sea, they make use of the WHO publication „International Medical Guide for Ships”. Before a voyage to the tropics, they are reminded about the ways of avoiding mosquito bites, the use of insecticides and repellents, and the preventive use of anti-

**Table 2.** Age groups of patients, probable country of infection, and use of preventive measures

Age group	No of cases	Infection by country										Preventive measures				
		Eq. Guinea	India	Mozambique	Cote'd Ivoire	Angola	Cameroon	Congo DR	Nigeria	Madagascar	Brazil	Chemoprophylaxis			Protection against mosquitoes	
												Applied	Not regular	Not applied	applied	Not applied
20-30 y	5	1			2		1				1	1	1	3	4	1
31-40 y	4		1			1	1	1				1	2	1	2	2
41-50 y	11		1	1	1	3	4		1			3	6	2	7	4
51-60 y	11					2	2	1	5	1		5	3	3	8	3
61 > y	2					1					1			2		2
Total	33	1	2	1	3	7	8	2	6	1	2	10	12	11	21	12

**Table 3.** The initial and final diagnosis in patients

The primary diagnosis of the cases	The time of final diagnosis
In 61% of patients – malaria	During the first 3 days in 76% of patients
18% – influenza	During days 4–7 in 15% of patients
15% – acute upper respiratory tract infection	During days 8–14 in 9% of patients
3% – hepatitis	
3% – pneumonia	

malaria. The drugs recommended are mefloquine, chloroquine, and doxycycline; and for treatment: artemether/lumefantrine, and atovaquone/proguanil.

Experts show how to use the drugs according to the actual epidemiological situation in the visited ports/countries, and the resistance of the local *Anopheles* mosquito vectors to antimalarials.

Recruitment agencies in Lithuania are obliged by law to inform seafarers about the risk of malaria in endemic areas, about the epidemiology of the disease, and on preventive methods.

Malaria has been eradicated from Lithuania; still the possibility of reintroduction of the pathogen exists, with the exception of *P.falciparum* and *P.ovale*, which cannot be transmitted there due to the local climatic conditions. However, the transmission of *P.vivax* would be possible in the country. The prevalent local mosquito species are *Anopheles plumbeus*, *A.maculipennis*, and *A.bifurcatus*.

### CONCLUSIONS

Imported malaria cases among national seafarers, and a few foreigners, were recorded in Klaipeda during the recent decade, and there were two fatalities. Malaria has

continued to be an important health problem for Lithuanian seafarers.

Malaria is also a serious work-related health risk for seafarers in other countries.

There is a need for sustained efforts to inform seafarers on the risk of this infection during their voyages, and to motivate them to follow strictly the rules of prevention.

The Klaipeda Public Health Centre will further strengthen the health training of seafarers with the aim of reducing malaria morbidity among them and prevent mortality.

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