



衛生防護中心
Centre for Health Protection

Scientific Committee on Vector-borne Diseases

Epidemiology of Malaria in Hong Kong

Purpose

This paper provides information on the epidemiological trends of malaria in Hong Kong and serves as a background paper for Members' information.

The disease

2. Malaria is a vector borne disease transmitted by several species of female anopheline mosquitoes. It is a disease caused by a group of protozoan parasites belonging to the genus *Plasmodium*, and includes *Plasmodium vivax*, *Plasmodium falciparum*, *Plasmodium ovale*, and *Plasmodium malariae*.

3. Common symptoms include intermittent fever, chills and sweating. Malaria may cause anaemia and jaundice, and in severe case, renal failure, seizure, mental confusion, coma and death. Severe infection is usually related to *Plasmodium falciparum*.

4. Incubation period ranges from 7 days to up to 1 year. *Plasmodium vivax* and *Plasmodium ovale* have dormant liver stages and may cause relapse months or years later. *Plasmodium malariae* has been known to persist in the blood of some persons for several decades.

5. The impact of malaria varies greatly in different parts of the world. After World War II (WWII), strenuous efforts to eradicate malaria were successful in large geographical areas, excepting sub-Saharan Africa and certain parts of Asia and South America. Around 30 million clinical cases and between 1-2 million deaths occur annually. 90% of the burden of disease falls in sub-Saharan Africa, where most deaths occur. The great majority of death occurs in children aged less than 5 years in Africa. *P. vivax* ranks second in terms of global disease burden, causing up to 80 million cases of malaria per year, with most cases (85%) occurring outside Africa, including Southeast Asia, Latin America, and China.



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6. It is anticipated that the situation might worsen if effective action is not taken. Reasons for deterioration and challenges to malaria control include war and civil unrest, climate instability and flooding, increased international travel, spread of drug resistant *P. falciparum*, insecticide resistance, and HIV infection which increases the susceptibility to malaria.

Local situation

7. Malaria has been well under control in the past four decades. The highest number of cases was recorded in 1946 with more than 2000 cases that year (an estimated incidence of 1.6 per 1,000 population and a case-fatality of 31.6%). There has been a shift of epidemiology to imported cases since the 70's. An upsurge recorded in 1989 related to Vietnamese migrants. The overall numbers have remained low since then. These change are attributed to changes in vector ecology brought about by urbanization, enhanced surveillance and better vector control measures implemented throughout Hong Kong. (Figure 1)

Number of notifications

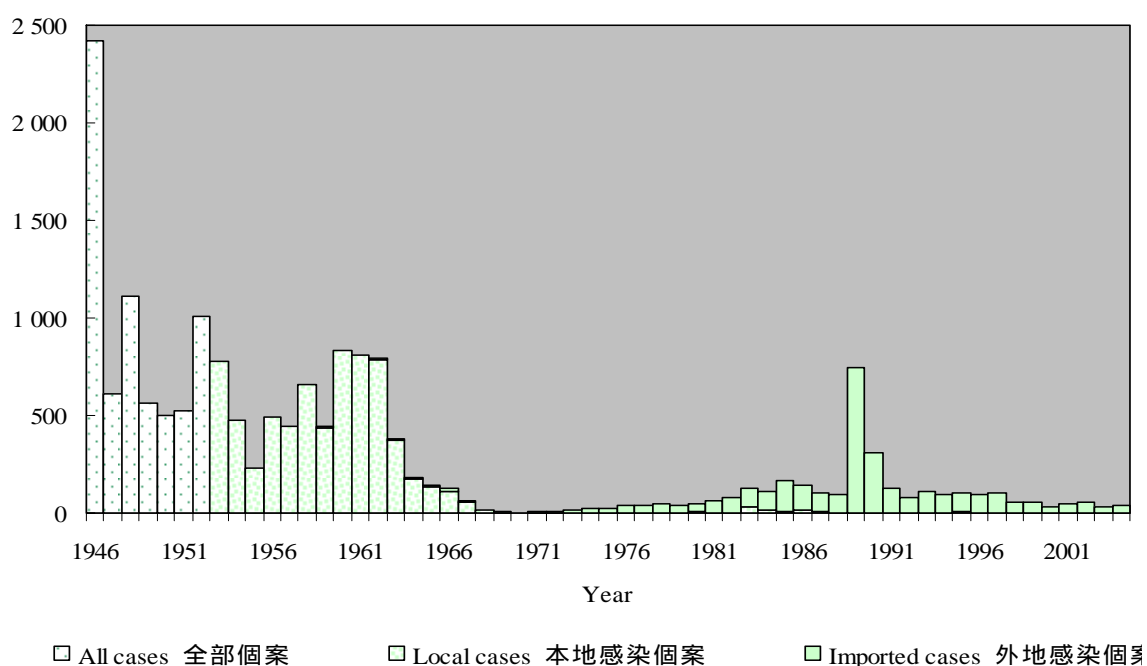


Figure 1 Malaria in Hong Kong (1946-2004)

Recent epidemiology

8. A review of malaria cases notified between January 1996 and June 2005 was conducted to delineate the recent epidemiological trends. The annual number of cases ranged between 28 and 101 (Figure 2).

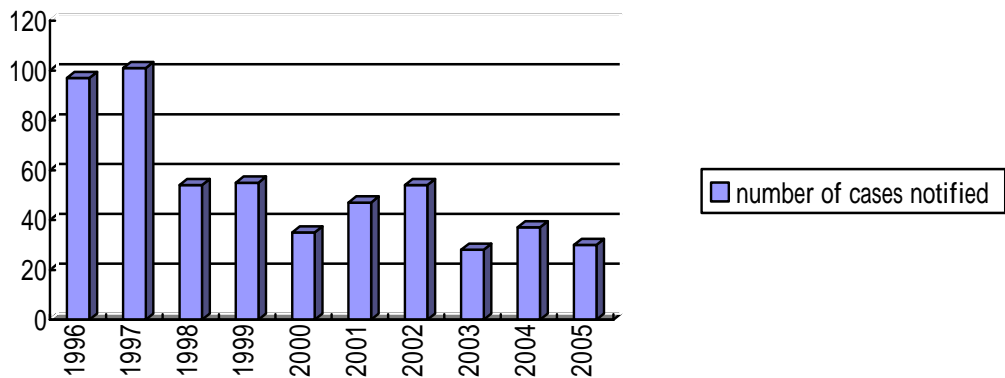


Figure 2 Number of malaria cases notified (1996-2005 June)

9. A total of 521 cases were recorded, of which 514 (98.7%) were imported cases. 67% of the cases were male. The age range of the cases was 11 months to 81 years, with a median of 31 years. Most of the affected persons were Hong Kong residents (65.2%) or tourists/ transients (26.9%), with the rest being migrant workers and illegal immigrants. The majority of cases were imported from India, Pakistan and Nepal (48.2%). (Figure 3).

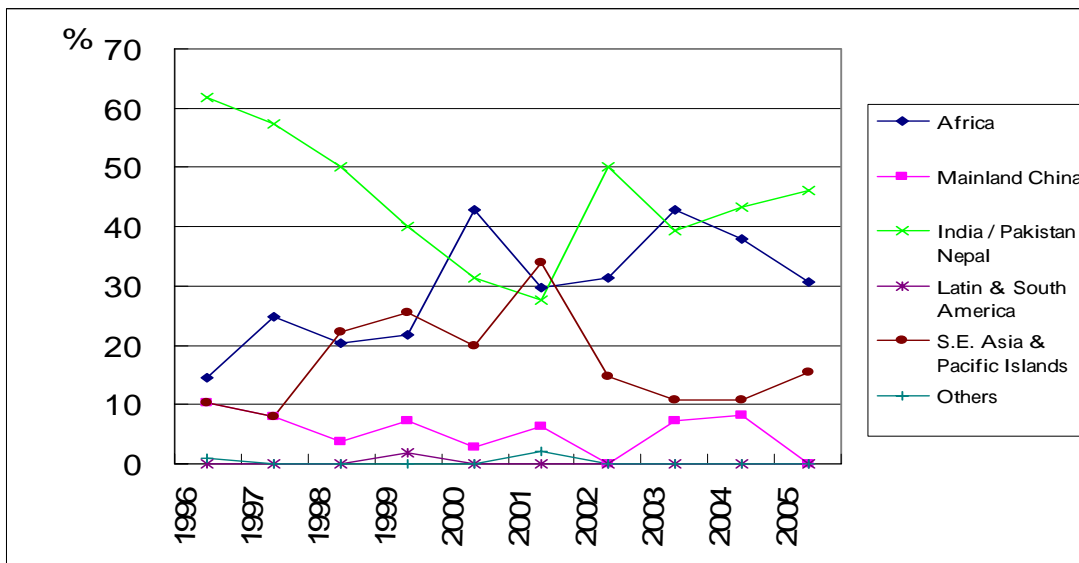


Figure 3 Imported cases by country of import (1996-2005 June)

10. *P. vivax* was the most commonly identified parasite (63%), followed by *P. falciparum* (28.4%), *P. malariae* (4.2%), and *P. ovale* (0.8%). Another 2.7% (14 cases) had mixed infections of two or more parasites. *P. vivax* has slowly decreased in proportion from 80% of all cases in 1996 to around 50% in 2004 and the first half of 2005. (Figure 4)

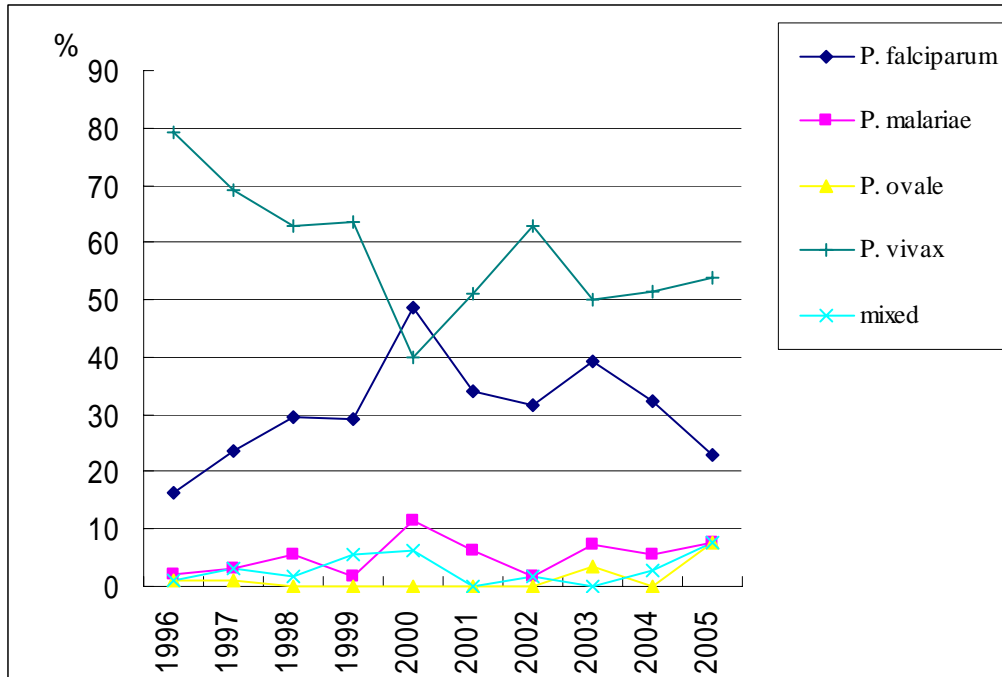


Figure 4 Type of parasites identified (1996-2005 June)

11. Over the past 10 years, the annual fatality rate was low and ranged from 0 to 0.03 per 100,000 population. There were 7 fatal cases, affecting 4 males and 3 females. Five were Hong Kong residents and two were visitors. *P. falciparum* was identified as the infective agent in 6 of these cases, out of which 4 were imported from Africa. The case fatality rate was higher being 4% (6 of 148) of those with *P. falciparum* and 1.3% (7 of 521) overall.

12. Of the 340 Hong Kong residents affected by malaria since 1996, 334 contracted malaria during travel. A history of taking chemoprophylaxis was present in 37 cases (11.1%), 281 cases (84.1%) did not take any chemoprophylaxis, whilst a history of chemoprophylaxis in the remaining 16 cases (4.8%) could not be ascertained. (Figure 5).

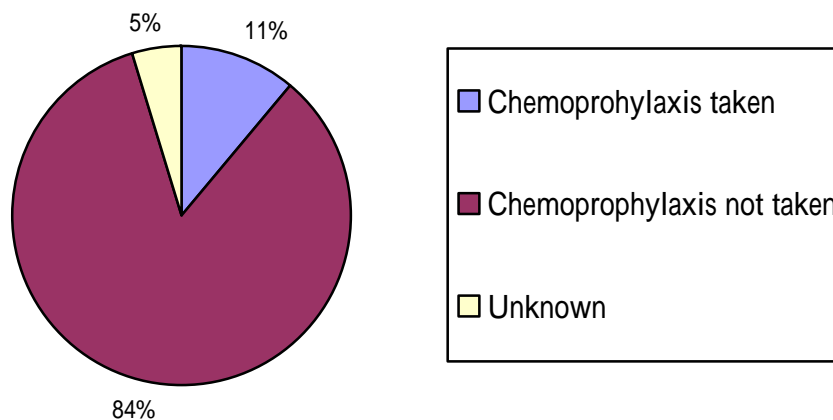


Figure 5. History of taking chemoprophylaxis among imported cases affecting local residents

Vector situation

13. The two principal local malaria vectors, namely *Anopheles minimus* and *Anopheles jeyporiensis*, breed in clear sunlit hilly streams and slow-flowing fresh water flooded fields with vegetation respectively. Urbanisation would eliminate the breeding sites of *Anopheles jeyporiensis* whilst new towns would bring people closer to natural unpolluted streams which are the habitats of *Anopheles minimus*. They used to be quite common in rural areas such as the northern and eastern parts of the New Territories and Lantau Island. The latest collection of the two species was in Luk Keng in 2002.

14. According to the annual vector survey conducted by Pest Control Advisory Section, Food & Environmental Hygiene Department in recent years, *Anopheles maculatus*, *Anopheles sinensis*, *Anopheles bengalensis* were found to be widely distributed throughout the territory. They are now the predominant anopheline species in Hong Kong. *Anopheles bengalensis* is, however, not considered to be of primary importance in malaria transmission. The other two are important vectors in Malaysia and in Mainland China.

Control measures

15. Malaria surveillance and control has been in place for years. Apart from prompt investigation and control targeted at malaria patients and their contacts, laboratory support, vector control, and health education are the three main pillars.

Laboratory support

16. The Central Malaria Reference Laboratory (CMRL) was established in 1984 in accordance to the recommendation of World Health Organisation. It provides laboratory reference service for screening and confirmation of malaria infections, quality assurance for private and public laboratories, and opportunities for training of laboratory personnel.

Vector surveillance and control

17. The Anti-malaria Vector program has been conducted in Hong Kong for over fifty years. The program aims at eliminating the potential breeding habitats of the local malaria vectors so as to prevent the local transmission of malaria. The program covers most streams in urban areas, including Hong Kong Island and the Kowloon peninsula. In addition, selected streams in new towns such as Shatin, Tai Po, Tsuen Wan and Tuen Mun are also covered.

Health education

18. In view of the importance of imported malaria cases in Hong Kong, we published an article in our biweekly bulletin Communicable Diseases Watch in September 2004 advising the medical community to prescribe chemoprophylaxis to potential travelers to endemic areas. The Travel Health Service also provides information on malaria endemic areas at their website.

Conclusion

19. Malaria in Hong Kong has been well controlled over the past decades. Since the majority of cases are imported, vigilance needs to be maintained among the medical community and the public at large. Precautions against malaria, comprising personal anti-mosquito protective measures and chemoprophylaxis, need to be taken when traveling to endemic areas.

Centre for Health Protection

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