China has experienced a 73 percent decrease in reported malaria cases between 2000 and 2010, and is implementing a national malaria elimination strategy to achieve elimination by 2020.

Overview
In 2010, 46 percent of confirmed cases in China were due to *Plasmodium vivax* and 16 percent were due to *P. falciparum*, the incidence of which was reported only in the Yunnan and Hainan provinces. 1 There were 19 malaria-related deaths in 2010, a 65 percent reduction from the 52 deaths in 2003, although a majority of these deaths were attributed to imported *P. falciparum*. 1,2 Approximately half of the population in China live in areas with no risk of malaria transmission, one percent live in high-transmission areas, and the remainder live in areas of low risk. 1

Due to China’s vast size and varying climate, malaria transmission occurs throughout the country. The primary vectors are *Anopheles anthropophagus* and *A. sinensis*, found mainly in the central and northern regions. 2,3 Secondary vectors include *A. minimus* and *A. dirus*, found mainly in the southern regions. 2,3 *P. falciparum* is endemic in southern China and has a year-round transmission period. *P. vivax*, which thrives in more temperate climates, is distributed throughout southern and central China with some transmission evidence in northern China between May and July. 4

Malaria is endemic to only two provinces: Yunnan Province, which lies along China’s southern border with Myanmar and is comprised of 129 counties, and Hainan Province, an island in the South China Sea comprised of 20 counties. 2 With support from Global Fund grants, China is targeting these remaining endemic counties and has benchmarks for elimination: there are 75 counties with high malaria incidence, 687 counties with low malaria incidence, 1,432 counties with potential for very low malaria incidence, and 664 malaria-free counties. 5 The national malaria program in China began implementing a malaria elimination strategy in 2010, with the goal of no indigenous cases outside of Yunnan Province by 2015, and national elimination by 2020. 5 China is a country partner in the Asia Pacific Malaria Elimination Network (APMEN), a network composed of 12 Asia Pacific countries and other stakeholders working to eliminate malaria in the region. 6,7

At a Glance*

- **7,855** Reported cases of malaria (46% *P. vivax*)
- **19** Deaths from malaria
- **51 %** of population at risk (total population: 1.3 billion)
- **0.006** Annual parasite incidence (cases/1,000 total population/year)
- **0.1 %** Slide positivity rate

*2010 statistics

Progress Toward Elimination
In the 1940s, there were at least 30 million malaria cases nationally with a mortality rate of about one percent annually. 13 Prior to launching a national malaria control program in 1955, it was estimated that malaria was endemic to between 70 and 80 percent of the total counties in China. 12 Data from 1954 showed that there were nearly seven million cases, though the situation was likely far more severe due to underreporting. Due to the devastating effects of malaria in rural areas, the following year a national malaria control program was established at national, regional, and district levels with substantial government funding. 13

Malaria incidence in 1955 was 10 cases per 1,000 population with more than 5,500 malaria-related deaths. 12 Due to increased testing and reporting capacity, malaria incidence increased to 15 cases per 1,000 population by 1960; however, malaria-related deaths decreased by more than 90 percent to fewer than 400 deaths. By 1965, incidence reduced slightly to only nine cases per 1,000 population while deaths continued to decrease to 179, a 56 percent reduction. 13
Malaria Transmission Limits

*Plasmodium falciparum*

*Plasmodium vivax*

*P. falciparum/P. vivax* malaria risk is classified into no risk, unstable risk of <0.1 case per 1,000 population (API) and stable risk of ≥0.1 case per 1,000 population (API). Risk was defined using health management information system data and the transmission limits were further refined using temperature and aridity data. Data from international travel and health guidelines (ITHG) were used to identify zero risk in certain cities, islands and other administrative areas.

By 1970, the Cultural Revolution interrupted control operations and malaria incidence more than tripled to nearly 30 cases per 1,000 population with 239 malaria-related deaths. In 1973, an outbreak occurred, of which 87 percent (or 13 million cases) of the total cases were reported from five provinces: Anhui, Henan, Hubei, Jiangsu, and Shandong. Because these areas were densely populated and there was rapid transmission, under the guidance of the ministry of health, intersectoral collaboration between these provinces was emphasized for all malaria control activities. Intersectoral collaborations have been expanded significantly since, and by 1998, nearly 500 million people live in areas where systems for malaria control have been established. Between 1980 and 1990, the number of total malaria cases dropped significantly from more than three million cases to fewer than 120,000 cases, in large part due to the government’s efforts to control malaria.

Since the beginning of the malaria control program in the mid-1950s, there has been an emphasis on strengthening the primary health care networks and increasing community participation. From 1979 to 1998, more than 700,000 health workers were trained in epidemiology, entomology, parasitology, and malaria control for the task of covering half a billion people with malaria surveillance. Between 1991 and 1998, 15 million people were treated for malaria, 34 million received prophylactic drugs during transmission seasons, and more than 110 million residents benefited from indoor residual spraying (IRS) and insecticide-treated bed nets.
Reported Malaria Cases

Cases of malaria decreased by more than 80 percent during the 1990s due to intensive malaria control activities. However, outbreaks possibly linked to cross-border importation, poor surveillance, and reemerging *P. vivax* resulted in a significant increase in cases starting in the early 2000s.


**GOALS:**

1. No indigenous cases except in Yunnan Province along the China-Myanmar border by 2015

2. National malaria elimination by 2020

(1) In 1998, about 1.2 billion people lived in areas where malaria incidence was less than 0.1 per 1,000 population, 30 million people lived in areas with an incidence of 0.1 to 1 per 1,000 population, and six million people lived in areas with an incidence of 1.1 to 10 per 1,000 population.

From 2000 to 2006, there was a substantial increase in malaria cases due to reemerging *P. vivax* in central China in the provinces of Henan, Hubei, Jiangxi, and Anhui. Malaria incidence there tripled from 0.03 per 1,000 population in 2002 to 0.09 per 1,000 population in 2006. Total cases increased from nearly 30,000 in 2000 to more than 115,000 cases by 2006 after reaching a peak of 172,000 in 2002. Cross-border migration between Myanmar and Yunnan Province, a weak surveillance and reporting system, and drug resistance, among other factors, contributed significantly to the epidemic.

In 2002, China received a Global Fund Round 1 grant to control malaria in the high-transmission regions of the country, namely Yunnan Province—which borders the Lao People’s Democratic Republic, Myanmar, and Vietnam—and the island of Hainan. By improving access to diagnosis and treatment for mobile populations through the establishment of mobile clinics, the malaria program activities focused on limiting the spread of drug-resistant *P. falciparum*. Through a Global Fund Round 5 grant, China was able to strengthen its work in these resource-poor areas by distributing long-lasting insecticide-treated bed nets (LLINs), providing microscopes, and training to health workers, and supplying artemisinin-based combination therapies (ACT) for confirmed cases. A Global Fund Round 6 grant continues to support the malaria control work in Yunnan and Hainan provinces by establishing new health posts and strengthening existing ones, and in Yunnan Province, providing comprehensive malaria trainings to health workers who work most closely with migrants crossing the China-Myanmar border. Through the work of a nongovernmental organization called Health Unlimited, malaria services are being provided to frequently mobile Chinese workers living in Myanmar, as well as to Myanmar residents in Yunnan Province.

Building on this success, the malaria program was awarded a National Strategy Application award by the Global Fund to move from control to elimination by: 1) providing access to early, accurate diagnosis and prompt, effective, and safe
Eliminating malaria in CHINA

treatment; 2) ensuring vector control measures for the population at risk; 3) strengthening malaria health education by mobilizing community participation; 4) distributing ITNs to vulnerable, poor, and marginalized populations; 5) strengthening the national malaria surveillance system; and 6) providing effective program management to implement malaria control and elimination strategies. The Chinese government has provided a high level of political and financial commitment, supporting 65 percent of the malaria program activities. With continued support from the government, Global Fund, and other stakeholders, China will be able to reach its goal of national elimination by 2020.2

**Eligibility for External Funding**

| The Global Fund to Fight AIDS, Tuberculosis and Malaria | No |
| U.S. Government's President's Malaria Initiative | No |
| World Bank International Development Association | No |

**Economic Indicators**

| GNI per capita (US$) | $4,270 |
| Country income classification | Upper middle |
| Total health expenditure per capita (US$) | $177 |
| Total expenditure on health as % of GDP | 4.6 |
| Private health expenditure as % total health expenditure | 50 |

**Challenges to Eliminating Malaria**

**Imported cases from Myanmar**

Although many of the countries that border China are malaria-endemic, the malaria situation in Myanmar is severe and China's border province, Yunnan, is its highest-risk region. The areas along China's border with Myanmar are the least developed and the population is comprised of ethnic and minority groups who are most at risk because they are often mobile due to their occupations. These groups often live in areas where health services are very difficult to access and they tend to sleep in informal shelters or forests where protection from mosquitoes is minimal.14 China’s Global Fund Round 6 grant is supporting Health Unlimited and other stakeholders as they strengthen the surveillance and reporting systems along the China-Myanmar border and focus on the mobile Chinese workers and residents to improve access to health care and timely treatment.16

**Conclusion**

China is pursuing a phased elimination strategy with its own substantial financial resources and additional assistance from the Global Fund. With a national strategic plan for elimination in place, China is focusing on increased cross-border collaboration with Myanmar, and is working to achieve malaria elimination by 2020 by providing prompt and effective treatment through increased surveillance activities.

**Sources**


**Transmission Limits Maps Sources**


World Health Organization/Regional Office for the Western Pacific (2009), Manila, Republic of the Philippines, URL: http://www.wpro.who.int/sites/mrp/epidemiology/malaria (Data years 2004–2007)

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**About This Briefing**

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The Malaria Elimination Initiative at the Global Health Group of the University of California, San Francisco (www.globalehealthsciences.ucsf.edu/global-health-group) convenes the Malaria Elimination Group (www.malariaeliminationgroup.org), and supports countries actively pursuing elimination at the endemic margins of the disease. Funding for the Malaria Elimination Initiative is provided by the Bill & Melinda Gates Foundation and Exxon Mobil Corporation.

The Malaria Atlas Project (MAP) provided the malaria transmission maps. MAP is committed to disseminating information on malaria risk, in partnership with malaria endemic countries, to guide malaria control and elimination globally. Find MAP online at: www.map.ox.ac.uk.

Additional support was provided by the Asia Pacific Malaria Elimination Network (APMEN). Find APMEN online at: www.apmen.org.