

# Study finds evidence of fake malaria drugs being manufactured in China

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A unique collaborative study between scientists, public health workers and police has led to the arrest of alleged traders of fake anti-malarial drugs in China. The epidemiological investigation, involving teams from across the globe and published in this week's PLoS Medicine, highlights the growing threat posed by fake pharmaceuticals and the complexities of tracking down those responsible for their manufacture.

Fake anti-malarial drugs are an increasingly serious problem, particularly in South East Asia and Africa. In countries such as Myanmar (Burma), the Lao PDR, Cambodia and Viet Nam, with a large burden of malaria, as many as half of all purchased artesunate tablets, one of the most effective of anti-malarial drugs, are counterfeit.

The new collaborative investigation, known as "Operation Jupiter," was coordinated by the International Criminal Police Organisation (INTERPOL), the World Health Organization's Western Pacific Regional Office, and the Wellcome Trust-University of Oxford SE Asian Tropical Medicine Research Programme, in close cooperation with Chinese authorities. Scientists from five other laboratories analysed the composition of 391 samples of genuine and fake artesunate tablets collected across SE Asia, and also studied their packaging.

Most of the fakes examined contained no artesunate. Some contained a wide range of potentially toxic wrong active ingredients, including banned pharmaceuticals such as metamizole, and raw materials, such as safrole, used for the manufacture of the drug ecstasy.

Of additional great concern for public health, the counterfeiters sometimes included dangerously small amounts of artesunate in the tablets. This may be done to foil screening tests of drug quality, but these doses are too low to be effective at treating malaria yet high enough to encourage the spread of malaria parasites resistant to the medicine.

Dr Paul Newton (Wellcome Trust-University of Oxford SE Asian Tropical Medicine Research Programme), the study's lead author, said: "Artesunate, as part of artemisinin-based combination therapy, is vital for malaria treatment and is one of the most effective weapons we have against this terrible scourge."

"Those who make fake anti-malarials have killed with impunity," he said, "directly through the criminal production of a medicine lacking active ingredients and by encouraging drug resistance to spread. If malaria becomes resistant to artesunate, the effect on public health in the tropics will be catastrophic."

In addition to analysing the chemistry of the samples, researchers used a technique known as forensic palynology to study pollen contamination within the fake tablets with the aim of tracking down the likely location of manufacture. The pollen evidence suggested that at least some of the counterfeit artesunate came from southern China, and this was supported by examination of the mineral calcite, found in some of the samples.

Armed with these findings by INTERPOL, Chinese authorities arrested a suspect in China's Yunnan Province in 2006. He is alleged to have traded 240,000 blisterpacks of counterfeit artesunate, enough to "treat" almost a quarter of a million adults with a medicine with no activity against a potentially fatal disease. Whilst the Chinese authorities were able to seize 24,000 of these packs, the remainder are alleged to have been sold at crossings on the border of Yunnan and Myanmar (Burma), accounting for almost a half of all blisterpacks of artesunate sold to the

region.

Citation: Newton PN, Fernandez FM, Plancon A, Mildenhall DC, Green MD, et al. (2008) A collaborative epidemiological investigation into the criminal fake artesunate trade in South East Asia. PLoS Med 5(2): e32. ([medicine.plosjournals.org/perl ... journal.pmed.0050032](http://medicine.plosjournals.org/permalink/journal.pmed.0050032))

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