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Rare human outbreak of monkey malaria detected in Malaysia

Handful of people diagnosed with parasite found in macaques has scientists worried about increasing contact between monkeys and humans.

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nature

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Several people in Malaysia have become infected with a species of monkey malaria parasite that, until recently, had been recorded in just one person outside of the lab.

Although only a few cases have been detected, researchers are worried that the ongoing destruction of monkeys' forest habitat is increasing the amount of contact between people and primates, providing more opportunities for infections to jump to people.

In January, researchers identified the parasite *Plasmodium cynomolgi* in five people being treated for malaria in hospitals and clinics around Kapit, a heavily forested area in the centre of the island of Borneo. Although laboratory trials in the United States in the 1960s showed that mosquitoes can transmit the parasite from macaques to humans, researchers had thought that in the wild, *P. cynomolgi* was transmitted only among macaques. That view changed in 2014, when a study[1] re-examined malaria patient samples and found that a Malaysian patient had been infected with *P. cynomolgi* in 2011.

Malaria specialist Balbir Singh of the University Malaysia Sarawak presented the latest cases at a scientific meeting of the Malaysian Society of Parasitology and Tropical Medicine, held in Kuala Lumpur last month. He says that many more cases of *P. cynomolgi* in humans might be detected if researchers look for them. Singh was able to detect the cases because his tests used primers — short sequences of targeted DNA — that could distinguish *P. cynomolgi* from closely related parasites.

The monkey parasite is unlikely to start a public-health emergency, researchers say. It does not seem to cause serious illness in people, and it can be treated with antimalarial drugs, says José Rubio, a malaria scientist at the Carlos III Health Institute in Madrid.

But malaria scientist Bridget Barber, of the Menzies School of Health Research in Darwin, Australia, says that it will be important to determine the prevalence of *P. cynomolgi* in human populations in other areas and to study if the species can cause severe disease. She says it is too early to comment on the health burden of the parasite.

Barber suspects that *P. cynomolgi* infections have been occurring in people for years, but it may be misdiagnosed for another human malaria parasite, *Plasmodium vivax*, which looks similar. Routinely-used malaria diagnosis tools such as microscopy and genetic tests such as polymerase chain reaction may not be able to distinguish between the two species, she says.

A jump in encounters

P. cynomolgi is the second species of malaria parasite known to infect both monkeys and humans in the wild. In 2004, Singh and his team discovered[2] that a different monkey parasite, *Plasmodium knowlesi*, was also causing malaria in humans. Since then, patients infected with *P. knowlesi* have been reported all over southeast Asia. In 2013, such cases made up 57% of malaria infections in Malaysia, and the number of new cases continues to increase each year. *P. knowlesi* can cause serious illness if not treated. The five individuals diagnosed with *P. cynomolgi* were also infected with *P. knowlesi*, says Singh.

The rise in monkey-malaria infections among humans comes at a time when scientists are increasingly concerned about the effect of land clearing on disease spread. It could be making it easier for some simian infections to jump between macaques and humans, they say: closer proximity to macaques increases a person's chances of getting bitten by mosquitoes infected with malaria. "Malaria parasites can be promiscuous in their host specificity," says Richard Culleton, a malaria scientist at Nagasaki University in Japan. "They sometimes jump around."

A 2016 study[3] at the northern tip of Borneo found a high incidence of *P. knowlesi* among humans in villages that had cleared some of the forest surrounding them. Study leader Kimberly Fornace, a malaria researcher at the London School of Hygiene and Tropical Medicine, says macaques moved closer to human settlements after their forests were felled. They also found people living closer to macaque habitats. To work out whether land-use changes have also driven *P. cynomolgi* transmission to humans, researchers would have to determine if people with the infection had traveled to forests where the parasite is found in macaques, says Fornace.

Although *P. cynomolgi* infections might not yet pose a major health concern, researchers say, any new infections make it harder for public-health officials and governments to eliminate malaria in these regions. The hosts of *P. cynomolgi*, long-tailed and pig-tailed macaques (*Macaca fascicularis* and *Macaca nemestrina*, respectively), live across southeast Asia. This complicates efforts to eradicate malaria, say researchers, because there is a vast reservoir of the parasite within the monkey population. "We have been fighting malaria with drugs and bed nets, but we cannot apply these measures on wild macaques," says Culleton.

If people are constantly at risk of exposure to monkey malaria parasites at the fringes of forests, those areas cannot be considered malaria free, he says. "That becomes a real problem. And I'm not sure what the solution is."

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