Factfile on Nobel anti-malaria drug artemisin

October 6 2015

Today's frontline drug to fight malaria, artemisinin has a history going back many centuries, for it traces its past to ancient Chinese medicine.

Tu Youyou, who helped discover its therapeutic treasures in lab work at the height of China's Cultural Revolution, was honoured on Monday with the 2015 Nobel Prize for Medicine.

Following is a factfile on the drug:

What is it?

Artemisinin kills Plasmodium parasites that cause malaria. It derives from a plant called sweet wormwood—Artemisia annua in Latin, or qinghao in Chinese.

It comes to us today comes from work in 1970s by Tu and her team, who spotted references to a fever-easing plant in ancient Chinese medical texts and sought to extract the active ingredient to combat malaria.

From the 1990s, artemisinin gradually took on a frontline role, replacing previous generations of medicines that had lost their effectiveness as malaria parasites became resistant to them.

The drug acts fast initially to attack the parasite, but is used in conjunction with longer-lasting medicines to destroy the holdouts, said Teresa Tiffert, a malaria researcher at Cambridge University.

How did it change malaria treatment?

Artemisinin has greatly increased the odds of survival for people hit with the most stubborn strains of the disease.

The numbers of survivors of malaria has jumped from one in five a decade ago to one in 10 today.

While vital, it is but one element in a broader strategy to fight malaria, which includes simple, low-cost measures such as distributing insecticide-treated bednets.

The coordinated effort has driven down deaths by nearly three-quarters over the past decade, said parasitology expert Colin Sutherland at the London School of Hygiene and Tropical Medicine.

World Health Organization (WHO) statistics show malaria deaths have fallen from about two million per year in the early 2000s to an estimated 584,000 in 2013.

Health authorities estimate there are nearly 200 million new cases of the disease every year, with about 90 percent of deaths in Africa.

What is its future?

The malaria parasite has a tremendous ability to mutate, causing it to build resistance to treatments when they are prescribed or used incorrectly.

There have been two examples in history of malaria drugs losing their effect, at a cost of millions of lives.

From the 1950s to 1970s, chloroquine-resistant parasites spread from

Asia to Africa.

Chloroquine was then replaced by sulphadoxine-pyrimethamine (SP), which itself lost its parasite-killing powers and was followed by artemisinin.

In February this year, researchers said they had observed malaria strains showing resistance to artemisinin in Myanmar, and raised fears it could spread westward to Bangladesh and India, even beyond.

In Africa, where malaria claims most of its victims, some artemisinin-based therapies are also no longer working as well as they used to, doctors say.

At a WHO meeting this year, experts will weigh recommendations to beef up the combination therapy, perhaps by increasing doses of the drug or the duration of treatment.

"I'm reasonably confident that we can get another five to seven—maybe 10 years' life out of our artemisinin combination approach, by which time we should have a new generation of combination therapies ready to go," Sutherland said.