

Scientists make dengue vaccine breakthrough

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Dengue is one of the most widespread mosquito-borne viral diseases in the world, with WHO estimating that around half of the world's population are currently at risk. While infection usually causes flu-like symptoms, it can develop into a more serious form of the disease, known as severe dengue, which is a leading cause of severe illness and death among children in some Asian and Latin American countries. The incidence of dengue appears to have grown dramatically in recent decades – before 1970 only nine countries had experienced severe dengue epidemics, but the disease is now thought to be endemic in more than 100 countries across the world.

There is currently no vaccine to protect against dengue, and efforts to develop one have been hampered by the fact that dengue is not caused by a single virus, but rather four different related [viruses](#) (known as DENV 1, 2, 3 and 4), making development of an effective vaccine considerably more complicated than for some [viral diseases](#). Furthermore, the disease appears to be unique to humans, meaning that scientists cannot use animal models to test prospective vaccine candidates.

Several possible dengue vaccine candidates are currently in development, but the new results are the first to be published showing that an effective and safe dengue vaccine may be possible. Researchers based in France and Thailand tested the effectiveness of a [vaccine candidate](#) called CYD-TDV on a group of 4002 [schoolchildren](#) in Thailand, aged from four to eleven years old. The trial took place in Thailand because dengue is known to be endemic in this area, and local

residents have a good awareness of the disease and its symptoms.

2669 children were given the CYD-TDV vaccine, and 1333 given a [placebo](#). Overall, there was no statistically significant difference between the number of dengue cases recorded in the vaccine (76 cases or 2.8% of the vaccine group) and control groups (58 cases or 4.4% of the [control group](#)). However, secondary tests showed that the vaccine was effective against DENV 1, 3 and 4 (in the range of 60 to 90%), with only DENV 2 appearing to be resistant to the effects of the vaccine in this trial. Furthermore, CYD-TDV appears to be safe and well-tolerated, with no vaccine-related serious adverse events being reported in the group who received it.

While the scientists point out that the phase 2b trial is limited by the fact that it was conducted in a single geographical area, the results nonetheless represent a substantial advance in the development of a vaccine for dengue. According to co-author Dr Derek Wallace of Sanofi Pasteur, the company which developed the vaccine, "Our study constitutes the first ever demonstration that a safe and effective dengue vaccine is possible. Further trials of CYD-TDV are currently underway in a number of different countries, and our hope is that the positive results of this trial will be confirmed by these larger studies, taking place in a wide range of epidemiological settings. Nearly half a million people are thought to be hospitalised with dengue every year, the majority of which are children, so the development of a safe and effective vaccine has the potential to make a hugely positive impact."

In a linked Comment, Dr Scott Halstead, of the International Vaccine Institute in Seoul, said: "Results from this vaccine trial provide hard evidence of protection against DENV 1, 3 and 4 mild disease but insufficient data to calculate vaccine efficacy rates for severe disease. Future dengue vaccine trials should provide robust evidence of efficacy against severe disease by selecting populations weighted to assure

inclusion of sufficient numbers of at risk children."

More information: [www.thelancet.com/journals/lan ...](http://www.thelancet.com/journals/lan...)
 [\(12\)61428-7/abstract](http://www.thelancet.com/journals/lan...)

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