

STOPPING MALARIA



A pilot programme is now underway for a vaccine that could cut malaria cases by 40%. We hear from one of the scientists.



The bite of the female *Anopheles* mosquito is still feared in many parts of the world, for her saliva is likely to be infected with the parasites that cause malaria, which remains one of the most destructive global diseases.

According to the WHO, there were 219 million cases of malaria in 2017, causing 435,000 deaths. While the disease is concentrated in a geographical band around the equator, 92% of cases and 93% of deaths occur in Africa, where it is especially bad in the sub-Saharan region. The money spent on controlling and eliminating the disease in 2017 topped \$3.1bn.

Focus on prevention

Treating malaria is mostly straightforward, but the sheer number of infections, coupled with rising drug resistance, means that the focus needs to fix on prevention. For years the key preventative measures against the disease in tropical areas have been insecticide-treated bed nets and indoor insecticide

sprays, but the war against the disease took on a new dimension in April with the launch in Malawi of the pilot programme for the first anti-malaria vaccine, called RTS,S. Children up to the age of two will be vaccinated in a drive to reduce the 250,000 childhood fatalities across Africa.

The vaccine is the first ever to target malaria. According to Dr David Schellenberg, Scientific Advisor to the Director of the WHO global malaria programme, the inherent difficulty of devising a vaccine against the disease lies in the complexity of the organism it is combating. "Viruses are relatively simple to deal with," he says. "Bacteria are more complicated, but parasites are several times more complicated again, because there is a lot more genetic material to deal with."

The launch of the vaccine is a significant moment for everybody involved, not least Schellenberg, who has been working on the global response to malaria for the best part of 20 years. "This is

probably the longest intervention in the history of malaria," he says. "The vaccine was first developed by scientists back in the 1980s and it has since gone through an extensive clinical development programme with phase 2 and phase 3 trials across seven countries."

Reduction in cases

In 2015 the European Medicines Agency reviewed the data from these trials and subsequently endorsed the vaccine. "As far as they were concerned, the merits of implementing the vaccine outweighed the potential risks," says Schellenberg, "and if malaria was endemic in Europe the vaccine would have been given market authorisation". The next step, though,

was the WHO's committee on vaccine safety, which also looked at the data and swiftly recommended that the pilot programme should proceed in Malawi, followed by Ghana and Kenya.

The sense of excitement and satisfaction among all who had

been working on the project for so long was palpable. "It's difficult not to be excited," says Schellenberg. "But some people perhaps got a little too excited. The phase 3 trial showed that the vaccine reduces the number of clinical malaria episodes by about 40%. That's not a perfect vaccine by any stretch. But the existing cornerstone to malaria control is insecticide-treated mosquito nets and they are far from perfect, either, yet the imperfect application of this imperfect tool has led to dramatic reductions in malaria deaths and disease. When you have a modest proportion of a very large number, that can still be a very large number. If we are able to reduce malaria episodes and deaths by 30-40%, that would be fantastic."


Before the full-scale implementation of the vaccine can happen, the pilots need to iron out any lurking operational issues. "We have to generate experience of deploying the vaccine at scale through routine systems, then we can really understand how we can get four doses of the vaccine to vulnerable children and

what the impact is in terms of lives saved."

A project on this scale calls for a high degree of collaboration between the WHO, national governments and the commercial partners. The financing for the programme has come from Gavi, the vaccine alliance; the Global Fund to fight AIDS, tuberculosis and malaria; and Unitaid. GSK, the manufacturer of RTS,S, has donated ten million doses of the vaccine, while the NGO PATH is helping to coordinate the work. "The WHO is also working to support the individual countries' immunisation programmes to introduce the vaccine," says Schellenberg. "That support comes not just from Geneva, but also the regional office in Brazzaville, and the offices in each country. We are also working closely with research groups in each of the countries to evaluate the different aspects of the programme."

Operational feasibility

So with the vaccination pilot underway, how long before we can expect an indication of the outcome? "The full programme is expected to run four years from now," says Schellenberg. "It will be important to finish that because only at the end of the programme will we have the formal estimate of the impact upon survival."

"We know that the vaccine works and the extent to which it works. That has been clearly shown in the phase 3 trials. The questions now are largely around operational feasibility and understanding the real impact in routine implementation. We've had an extensive piece of work going on the past six months or so to look at the evaluation, and in about two years or so there should be sufficient information available to inform further consideration by the WHO policy advisory committee. So hopefully within those two years we should be in a position to say whether it is worth moving forward with a much larger scale application of the vaccine." 

DR DAVID SCHELLENBERG

- ✓ Degrees in clinical science and medicine, a diploma in tropical medicine and health, an MRCP(UK) diploma and a PhD.



- ✓ Various research positions include 10 years with the Ifakara Health Institute in Tanzania, where he led malaria treatment and prevention studies.
- ✓ Professor of Malaria and International Health at the London School of Hygiene and Tropical Medicine, 2005-2016.
- ✓ Directed and supported several large-scale research initiatives addressing malaria drug delivery, malaria research capacity building in selected African universities.
- ✓ Served on various task forces and committees to advance the global response to malaria.

