A history of malaria

The Making of a Tropical Disease: A Short History of Malaria

Randall M Packard

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Reviewed by Brian Greenwood

In October 2007, Bill and Melinda Gates announced the commitment of their foundation to the eradication of malaria. Their call to action has been endorsed by the World Health Organization (WHO) and the RollBack Malaria Partnership. This is, therefore, an opportune time to be reminded of the history of malaria control and the first attempts at its eradication half a century ago. Randall M. Packard does this in his new book.

Packard, a historian, has personal experience of malaria, both as a patient and as an observer, from his time as a Peace Corps volunteer in Uganda. This led him to an early appreciation of the interaction between major infectious diseases such as malaria and the socioeconomic environment in which they occur, a theme that runs through his book.

The book begins with descriptions of malaria outbreaks (in Archangel in 1922–1923, in Bengal in the 1870s and in Palm Beach in 2003) that show how malaria epidemiology can be influenced by poverty, civil disturbance, migration, climate change and changes in agricultural practice. The next two chapters discuss the origin of the four main human malaria parasites, their coevolution with man in Africa and their subsequent spread across the globe. Packard supports the view that *Plasmodium falciparum* emerged as an important parasite of man perhaps 10,000 years ago, when developments in agriculture (cultivation within forest clearings, for example) brought together humans and anthropophilic anopheline mosquitoes. Malaria probably reached southern Europe around 500 BC, perhaps with slaves from northern Africa. It did not become a major problem in northern Europe or North America until much later. The disease was rife among troops who fought in the American Civil War but from that time onward the incidence of malaria in the USA progressively fell, and local transmission had largely ceased by the 1950s. Similar changes occurred in most of Europe during the same period.

Packard next considers why malaria has persisted in the tropics. He implicates changes in indigenous agricultural practice introduced by the colonial powers—such as large-scale production of cotton, rice and sugar—as a major factor. I am not convinced by this argument. Some outbreaks can be attributed to factors such as irrigation and the migration of nonimmune workers to work on plantations, but, in most areas of Africa, traditional farming practices persisted throughout the colonial period as

they do to the present day. A stronger case might be made for the efficacy of the local vectors (the mosquitoes) and the lack of economic development as the main reasons why malaria has persisted in Africa.

In Chapter 5, Packard turns to the history of malaria control. The discovery of the malaria parasite and how it was transmitted by mosquitoes, at the end of the nineteenth century, raised hopes that technology would soon solve the problem of malaria control. Whether control strategies should be targeted to the parasite or the vector was fiercely debated. As Packard points out, some of the early successes (such as the control of malaria during construction of the Panama Canal) required a combination of antiparasite drugs, vector control and improved living conditions. But in the early 1940s, the discovery of DDT and its success in controlling outbreaks of malaria swung the balance in favor of using vector control alone to prevent malaria. In 1955, the World Health Assembly launched a malaria eradication campaign based largely on the use of DDT. Success was achieved in about half of the countries where eradication was attempted (a fact often forgotten), but these countries were either island nations, nations of wealth or nations with an effective health system. The emergence of DDT resistance was an important reason why eradication failed elsewhere, but Packard believes that the key reasons for failure were lack of flexibility in the control effort and reliance on a single tool (DDT), views with which I agree.

In 1969, the WHO officially abandoned the eradication program in favor of a control program based on case management. Malaria incidence subsequently increased in many of the areas where it had been largely controlled (such as India). No attempt was made to eradicate malaria in sub-Saharan Africa, and yet the malaria situation in Africa also began deteriorating at about the time of the abandonment of the eradication program. Packard attributes this to increasing poverty, wars, HIV, drug resistance and changing agricultural practices. All of these factors probably played a part, but I think that drug resistance should have been given more prominence as a possible cause—there is good evidence that increasing mortality from malaria in Africa paralleled increasing resistance to chloroquine.

In the final chapter, Packard considers the advances that have been made in malaria control during the past ten years. I found this chapter to be the least convincing part of the book. Packard does not give enough emphasis to the increased commitment to malaria control at the highest level of government and to the massive increase in financial resources that this has unlocked. Malaria control is now being supported by billions of dollars from organizations such as the Global Fund (given little mention in the book), the World Bank and the US President's Malaria Initiative, as opposed to the totally inadequate millions of dollars spent on malaria control ten years ago. There has also been a major increase in support for research on the development of new tools for malaria control (vaccines, drugs and insecticides) and better ways of delivering these tools. Nevertheless, I agree with the overall conclusion of the book: malaria control, and certainly malaria elimination, will not be achieved by advances in technology alone but will require consideration of the disease in each region, within its socioeconomic context.

This is an excellent and well-balanced book that will be of interest to a wide audience. It should be required reading for all those contemplating a second malaria eradication campaign.

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