



Malaria claims three times as many lives among children as HIV/AIDS.



A sick young girl lies in bed in her family's corrugated metal shack on the side of a road in Santa Rosa, El Salvador.

As significant as the HIV/AIDS epidemic has been, there are health threats that have been around much longer and continue to take a heavy toll in death and disability. Malaria, for instance, claims three times as many lives among children as HIV/AIDS. Sub-Saharan Africa continues to account for 80 percent of the malaria worldwide. Africa itself accounts for 91 percent of the malaria deaths in the world.¹⁸

African women “confront an endless series of menaces, from malnutrition to dehydration, but almost nothing poses a greater threat to the well-being of their children than malaria,” says Ray Chambers, a U.S. philanthropist who serves as the U.N.’s special envoy for malaria eradication. “Even those children who survive the disease often face lifelong challenges.”

With malaria, the impact of poor housing is easy to see. Huts with open windows and leaky roofs harbor insects that expose occupants to malaria and other diseases. Because access to clean water is sometimes hours away, families tend to improperly store water in open containers in and around the home, attracting mosqui-

Chapter 4

Malaria

¹⁸ AD Lopez, CD Mathers, M Ezzati, Murray ChJL. “Global and regional burden of disease and risk factors, 2001: Systematic analysis of population health data.” *Lancet* 2006; 367: 1747-57.

toes and helping the disease to spread.

Fewer than 10 percent of the population in the most heavily affected countries around the world had access to insecticide-treated mosquito nets in 2005. Since then a variety of aid organizations, large and small, the WHO and local governments have embarked on an ambitious program to make treated mosquito nets available to at least 40 percent of the population in these countries by the end of 2010. With more than 140 million nets distributed in the past three years alone, preliminary indications show the goal is in reach.

Still, eradication of malaria may not be attainable given the scope of the challenge and the tools available, at least not in the foreseeable future, the WHO has concluded.¹⁹ The goal now is to intervene “in easy to eliminate” settings, such as new housing construction in the hardest-hit countries.

These programs should include spraying areas inside homes and buildings with pesticides to rid them of mosquitoes and the larvae they leave on walls, furniture and bedding. It means more widespread use of insecticide-treated netting in bedding areas of homes. (Mosquitoes are more likely to bite humans during their sleep.) Such netting has been shown to decrease mortality by as much as 20 percent, the WHO says.

Coordination among health, housing and social services advocates will be crucial to effectively manage malaria outbreaks in endemic areas, the WHO concluded.

In Mexico, the connection between health and housing could not be clearer. In 2000, the Mexican government created *Piso Firme* (Firm Floor) a program that replaces the dirt floors of low-income families with concrete floors up to 538 square feet. Most houses had their floors replaced in less than 30 minutes, at a cost to the government of just \$150 per home. By 2005,

roughly 300,000 floors had been installed.

By comparing improved households with those left unimproved, researchers at the University of California, Berkeley, the Washington University in St. Louis, Missouri, and the World Bank found that the simple housing upgrade had a significant impact on the health and well-being of the families. Not only was there a 20 percent reduction in parasites, but also children younger than 6 showed almost 13 percent fewer episodes of diarrhea and a 20 percent reduction in anemia. The program also led to greater cognitive development among children mainly by reducing the incidence of intestinal parasites that cannot be treated with common deworming drugs.

Chagas' disease and dengue fever

Similar efforts are taking place in other parts of the world to deal with Chagas' disease and dengue fever, both borne by insects. The results have been encouraging, but here again coordination between health and housing organizations is essential.

On the western edge of Honduras, the indigenous Chortis population (part of the Mayan family) faces two major health threats: Chagas' disease and acute respiratory conditions. Both are exacerbated by their living conditions.

Chagas' disease (or American trypanosomiasis) is endemic in much of Latin America, where an estimated 8 million to 11 million people are thought to be infected.²⁰ It is spread by an insect known as “chinche picuda” (stinging bug), which harbors in the mud walls, holes in wood beams and straw roofs of the houses where the Chortis live. Without treatment, the infection can lead to severe cardiac problems and death. The infection can be spread from mother to child.

Against this challenge, a consortium of

19 Bulletin of the World Health Organization, Vol. 86, 2008, www.who.int/bulletin/volumes/86/2/07-050633/en/.

20 Centers for Disease Control, www.cdc.gov/chagas/epi.html.



Guillermo Martinez and his niece Anna sit on a bed in their family's house in La Pintada, Honduras, which is being renovated with the help of Habitat for Humanity Honduras.

groups has set out to improve 1,400 houses of indigenous Chorti families using a new kind of adobe block that is much less expensive than traditional adobe, along with mixing wood and bamboo in other parts of the dwelling, all of which is designed to prevent the chinche bug from finding a home within the walls. As much material as possible comes from local resources.

The re-emergence of dengue fever over the past five decades is also a significant global health concern. Inadequate housing is a predictor for the spread of the disease, especially in the villages and urban poverty dwellings of Latin America and Southeast Asia.

In 1998, the world took serious note of the disease once again when a pandemic affecting

1.2 million people was reported in 56 countries. Now the mosquito-borne viral disease infects an estimated 50 million people annually. It accounts for 22,000 deaths each year, mostly among young children.²¹

Insecticide-treated mosquito nets and some new, innovative housing material—including experimental insecticide-treated paint for walls—are part of the public health and housing response. But with dengue, the most successful approach seems to be in controlling the places where mosquitoes breed, especially around dwellings. Storing open water around the exterior of homes or holding livestock near the dwelling produces a significant risk.

21 WHO, "Impact of Dengue," www.who.int/csr/disease/dengue/impact/en/.



Aya Koffi and two of her children show off the mosquito nets in their new Habitat home.

THE HEALTH-HOUSING CONNECTION

Cote d'Ivoire: Winning the battle against malaria

Aya Koffi's four children had often been sick with malaria. But when Veronique, her oldest, developed cerebral malaria, a serious form of the illness, Koffi knew that her daughter could die in a matter of days. The mosquito-borne illness had already killed Koffi's two brothers. Luckily, Veronique got medical treatment and survived.

Since her husband was killed in a rebel attack during the war that raged in Cote d'Ivoire in 2002, Koffi and her children had been living in a one-room house that belonged to her husband's uncle in the village of Tougbokro. The family shared a toilet with three other families—20 people—and the toilet's drainage system in front of the house was a breeding ground for malaria-bearing mosquitoes and other insects.

"More than 20 children die every year in the village," said Tougbokro's village chief, Nanan N'dri Affian. "Who will be the next one? I, too, have lost three children this way. Better living conditions help us to tackle this problem."

After the uncle asked the family to leave his house because he wanted to give it to his children, Koffi was able to improve her living conditions by partnering with Habitat for Humanity and building a new brick house for her family in April 2009. The beds have mosquito nets, and the family has a bathroom with a good drainage system.

Her two sons and two daughters not only are able to attend school regularly because they are healthy, they also no longer fear getting sick, their mother said. "Today I have a safe and decent place to live with my children," she said. "They will not be afraid of rain and malaria as we used to be. I am happy and proud."