

7 When the pharmaceutical system creates persistent attachments or new appropriations of drug molecules

Divergent ACT distribution and use in Benin and Ghana

Carine Baxerres, Kelley Sams, Daniel Kojo Arhinful, Jean-Yves Le Hesran

The recommendation by the World Health Organization (WHO) to use artemisinin-based combination therapies (ACTs) as first-line treatment for malaria dates back to 2001 for Southeast Asian countries where the parasite (*Plasmodium falciparum*) had developed an intolerable resistance to the antimalarial drugs used up to that point (chloroquine, sulfadoxine-pyrimethamine [SP], and mefloquine) (Souares, 2007). After several years of lobbying orchestrated by the nongovernmental organization Médecins Sans Frontières (Doctors Without Borders), in 2006, this recommendation was applied to Africa, the continent most affected by the disease (Balkan & Corty, 2009).¹ Prior to this, as early as 2004, the Global Fund to Fight AIDS, Tuberculosis and Malaria had been promoting the use of ACTs in Africa; in that year, without waiting for an official WHO recommendation, the Ministries of Health in Benin and Ghana decided to change their recommendation for first-line treatment of malaria. In Benin, the health authorities adopted the artemether-lumefantrine (AL) combination, promoted by an agreement signed in 2001 between WHO and the Novartis company (see [Chapter 5](#)), despite scientists' preference for another combination (artesunate-mefloquine). Ghana first chose the artesunate-amodiaquine combination (ASAQ), later adding AL to its recommended treatment following the "ASAQ crisis" caused by a local industrialist, due to the technological limitations of Ghanaian industry, shortcomings of the regulatory authority, and the State's refusal to financially support drug manufacturers at the time (Pourraz, 2019).

Institutional, industrial, political, and economic stakes were already emerging in the countries' decisions to adopt ACT and in their choice of drug molecules. Benin and Ghana are very close geographically and have quite comparable epidemiological contexts for malaria.² In this chapter, we will see how the combination drugs on the market in the two countries are screened through the local

pharmaceutical system before being made available to consumers.³ Therefore, although consumers perceive the disease in a fairly similar way, as we will see, they actually use ACTs in very different ways. Moreover, when these drugs are introduced into countries, they do not arrive “*tabula rasa*.” ACTs have to compete with the multitude of other pharmaceutical products available, whether for malaria or other illnesses, not to mention herbal medicines, which will be discussed in the next chapter. This chapter will highlight how the ties that bind individuals to pharmaceutical molecules—through attachment, rejection, or appropriation—are primarily constructed through existing legislation and pharmaceutical distribution methods. The anthropology of medicine has been studying the relationships between individuals and industrial products since the 1980s (Van der Geest & Whyte, 1988). Initially, researchers looked primarily to local culture to understand these links, studying how such medicines were incorporated into medical traditions based on frameworks other than biomedicine. Later works included economic, political, and health system organization elements in the analysis (Desclaux & Egrot, 2015; Petryna, Lakoff, & Kleinman, 2006). Our work is from this second perspective. In this chapter, which draws its strength from the combination of qualitative and quantitative studies and the comparison between two countries, we will highlight the importance of structural factors over cultural factors.⁴

Palu, malaria, hwevó, abun, tanvio, atikéssi: Benin and Ghana share similar popular perceptions of the disease

A fairly extensive anthropological literature on malaria has highlighted the discrepancies that exist between this biomedical entity and people’s perceptions of it, as they associate it with various popular nosological entities (Jaffré & Olivier de Sardan, 1999). The terms *sibidu* and *sumaan ndiig* have long been used in Senegal, *atikéssi* and *hwevó* in Benin, and *koom*, *weogo*, and *sagba* in Burkina Faso, and these various French-speaking countries also use the term *palu* (from *paludisme*, or malaria in French) (Baxerres, 2013; Bonnet, 1986; Faye, 2009; Kpatchavi, 2011). These various popular entities do not strictly align with the biomedical entity of “malaria,” although in some aspects they may be similar. The differences between them concern the manifestations or first symptoms of the disease (which are much broader in popular perceptions), the etiological agents (which go far beyond the mosquito alone), and the potential severity of the disease (much lower in popular perceptions, where it is often trivialized because of its frequency and the many cases that spontaneously resolve). However, studies have shown that these popular perceptions can change significantly over time under the influence of health professionals and public health awareness campaigns (Baxerres et al., 2021; Faye, 2009).

In Benin, we have observed a kind of biomedical normalization of perceptions of *palu* since our first fieldwork in 2005 (Baxerres, 2013), which was much more evident in the city of Cotonou than in the rural Mono department. In contrast

to our previous study, the term *palu* is now used there almost exclusively to refer to headaches, fever, vomiting, body aches, chills, fatigue, loss of appetite, and the yellow color of eyes and urine⁵; this aligns with the symptoms described in biomedicine for uncomplicated malaria. Use of the term *palu* has gained over *hwevó* (meaning “sun” in Fon, the primary language spoken in Cotonou), and this latter term was only rarely mentioned in interviews. However, in the Mono department, in addition to *palu*, the terms *hwecivio* (in the Pedah language) and *hwecivoè* (in Sahouè), both of which also mean “sun,” *tanvio*, which means “mouth” or “bitter saliva” in Pedah, and *atikéssi*, which means “water from the root of the tree” in Ouatchi, are frequently used for similar symptomatology and etiologies.⁶ Perhaps related to this terminology, the symptoms mentioned by individuals here are broader than those stated in Cotonou, and include stomachache, “dirty stomach” (diarrhea), heavy eyes, red eyes, bitter taste in the mouth, heavy head, not being active, not being oneself, being sad, sleeping poorly, and having nightmares.

In Cotonou, it appears that popular perceptions more readily accept mosquitos as the causative agent for *palu* than in the previous study. This was routinely stated by respondents in the qualitative study, and 9 of the 15 mothers of Cotonou families only cited the mosquito as the cause of *palu*. “It’s mosquitoes, nothing else causes malaria, it’s mosquitoes. If I am tired one day and I lie down on the ground, you know that mosquitoes will eat the children and me, if you don’t pay attention and surrender yourself to the mosquitoes, they spit dirty things into your body” (mother of a “poor” family, Cotonou, February 2015). Most of the Mono respondents and six of the Cotonou mothers also referred to other causes, described in our previous study: sun and heat; other elements to which people are exposed (rain, coolness, cold, wind, the Harmattan wind, dust, impurities in food, food that is inappropriate for the person, being dirty); difficulties in life (hard and intense work, worries, thinking too much, getting angry, needing to move around, and not getting enough sleep).

In both urban and semirural contexts in Benin, individuals stress that there are two kinds of *palu*, one more serious than the other. This gradation existed at the time of our previous study in Cotonou, and we explained it by the influence of biomedical perceptions of “uncomplicated malaria” and “severe malaria.” It seems that this influence has increased, at least in conversations where *malaria* is linked to potential death, which was not the case in our previous study. “That *hwecivio asi*, that’s what causes the fever and is what we were talking about. *Hwecivio asú*, it turns your eyes yellow, even the palms of your hands, everything turns yellow, and when you open your eyes, you’ll see that it’s yellow. That’s when we talk about *hwecivio asú* and that’s the dangerous one... It’s not good, if you don’t get help quickly for that, it often leads to death”⁷ (father in a “middle-class” family, Mono department, December 2015).

In Ghana, contrary to what we found during our initial field investigations,⁸ popular perceptions associated with the English term “malaria” are similar to those in Benin. Yannick Jaffré and Jean-Pierre Olivier de Sardan highlight the “resonances,” “similarities,” and “overlaps” at work in the popular nosological entities

that are active in the countries of West Africa (Jaffré & Olivier de Sardan, 1999, p. 8). In Accra, perhaps because of the more concentrated use of English in the area compared with rural areas, *malaria* was usually referred to by its English term, even when speaking in local languages. In the semirural research site, Breman Asikuma, *malaria* was also referred to in Fanti as *abun* (meaning “green,” which could refer to the color of vomit) in households from all three socioeconomic categories. *Abun* was described by one mother to be synonymous with fever. “We call it *abun*...it is also the same [as fever]... both of them are the same. Sometimes we call it *atridi*⁹ in Twi” (mother, “middle-class” family, November, 2014).

Although there were some differences between rural and urban areas concerning the conceptions of etiology and symptoms of *malaria*, with more of a tendency toward a biomedical definition of the disease in Accra, in both the semirural and urban research sites, the popular definition of *malaria* was much broader than the biomedical entity. As expected, *malaria* was often associated with fever, but this was not the only symptom described by respondents. Like in Benin, the presence of *malaria* or *abun* was indicated by more than—and sometimes without—an elevated body temperature: it also meant experiencing chills, weakness, bitterness in the mouth, loss of appetite, or body pain. One respondent stated, “If the malaria comes into you, you’d realize that all your joints would be aching, and you can’t do anything. If you have to pick something up off the ground it would be a problem for you. Also, your mouth would be bitter, and you won’t be able to enjoy any taste from the food you eat, no matter how much you eat” (mother, “poor” family, Breman Asikuma, July, 2015). Other symptoms, seen to indicate by themselves the presence of *malaria* or *abun*, were also cited, for example, Anthonia¹⁰ (mother, Accra, “wealthy” family) stated that her lips and tongue would often turn white when she was infected. Mr. Tetteh stated that, in addition to weakness and body pains, *malaria* “makes your eyes yellow, and you wouldn’t be able to eat; and when you urinate, it would be very deep yellow... Also it makes your joints weak and also headaches” (grandfather, “middle-class” family, Breman Asikuma, March 2016).

The perceived etiologic agents of *malaria* in Ghana described by interlocutors were more diverse than in Benin, proving the dynamism of popular *malaria* perceptions. While most mothers interviewed in research households of Cotonou cited mosquitos as the sole cause of *palu*, in Ghana, mosquitos were cited as only one of several factors that were responsible for the symptoms that accompanied *malaria*. Some interlocutors explained their perception of *malaria* as a condition caused by a multitude of variables: “Mostly they say mosquitos cause malaria but I don’t totally agree. Maybe you would be bitten by mosquitos, but as you do hard work, and you have poor eating habits or you don’t eat well, you often get malaria. At the times I got malaria, I was not eating well, I mean like you go somewhere to work the whole day without eating, you see you would be excessively tired and it would cause malaria” (father, Breman Asikuma, “wealthy” family, March 2016). This very broad perspective on the factors that provoke disease was echoed by rural interlocutors like Mary, “[Malaria is] caused by the sun, sometimes

mosquitos too, also from the food we eat... from the water we drink. Also if you travel, you don't have a house to sleep inside, so you would have to sleep outside and bad air can cause [it]" (mother, Breman Asikuma, "poor" family, February 2015). Excess oil consumption and eating poorly were also cited as provoking the disease. The idea that heat or sun exposure, as in Benin, could cause *malaria* or its related symptoms was especially salient in lower socioeconomic status households, in both the semirural and urban research sites, and when respondents were discussing cases with high fever. Often, sunshine was described as working in tandem with mosquitos to provoke the disease, as explained by Gladys "Fever is brought about by sunshine. When the sun shines like that, and mosquito bites someone that increases fever. Mosquitoes bring fever, but the main cause of fever is sunshine and the mosquitoes add the malaria" (mother, Accra, "poor" family, January 2015).

In both semirural and urban areas, *malaria* was perceived as a common and simple illness to routinely self-treat with medications at home. Many interlocutors explained that reoccurring *malaria* infection was an expected part of life, classified with other routine illnesses, and that it was no reason to panic. Franck, for example, stated that, when one feels certain symptoms, "you know it's your malaria which is showing up... for malaria in Africa what I can say is that whether you like it or not you would get malaria (...). The way I see it no matter what you do, you would still get it" (father, Breman Asikuma, "poor" family, March 2016). While this regularly occurring, simple *malaria* was mainly treated at home, as in Benin, several interlocutors described the existence of another more serious version of the disease that required treatment at a health facility. Judith described when her 15-year-old son suffered from this version of *malaria*, "[He had] the serious one and I took him to Our Lady of Grace Hospital here in Asikuma... He was hot, and he became very high and aggressive. I remember he attacked me, held me so that I could not escape. I had to call people to help grasp him and take him to the hospital" (mother, Breman Asikuma, "middle-class" family, January 2015).

Various popular nosological entities that may be associated with the biomedical entity "malaria" in Benin and Ghana cover a variety of vague, nonspecific symptoms that occur frequently in daily family life among both children and adults. They are part of the normal course of events. These popular nosological entities are generally seen as benign, although people are aware of possible complications. In the contexts studied, they constitute active entities that people know how to identify and treat.¹¹ Several authors in Africa have pointed out that when people think they have "malaria," they turn first to the private and informal pharmaceutical distribution sectors and do not initially visit health facilities (Kamat & Nyato, 2010; Kangwana et al., 2011; ACTwatch¹²). We will therefore look at how the pharmaceutical distribution systems in these countries are critical to understanding the use of the "new" malaria treatments, ACTs, which had been officially recommended in Benin and Ghana when we began our field studies a decade ago.

Divergent ACT distribution and use between the two countries

Although these popular nosological entities are perceived in relatively similar ways in Benin and Ghana, individuals have quite different access to ACTs to treat them.

In Benin's pharmaceutical system, public and private distributions are clearly dissociated¹³; as a result, subsidized, inexpensive ACTs (CFA 150–600 or EUR 0.22–0.91 per dose, depending on the patient's age and weight) were distributed only through the public wholesaler (the Central Purchasing Office for Essential Medicines and Medical Consumables, or CAME¹⁴) and public health centers at different levels of the health pyramid (national reference hospitals, district hospitals, district and commune health centers, and isolated maternity units). Subsidized ACTs were not available in private pharmacies or pharmaceutical depots. Only unsubsidized ACTs were available in these locations, with the price for an adult dose ranging between CFA 1425 and 4660 (about EUR 2–7) depending on the product. Pharmaceutical company representatives did not make prescribers working in private clinics and health centers aware of the use of these subsidized products, as is done for other products available in private pharmacies.¹⁵ In Benin, private health facilities are not authorized to sell medicines; the professionals who work there write prescriptions that their patients then bring to pharmacies or depots.

In Ghana, however, private distribution actors are a considerable force, and the public and private sectors are closely intertwined. Subsidized ACTs were available not only in public and private health-care facilities but also through the many private wholesalers (nearly 600 companies) as well as all private retailers, which includes both pharmacies and the numerous OTC medicine sellers, which number more than 10,000 nationwide.¹⁶ They are promoted by representatives of manufacturers and wholesalers to prescribers in both the public and private sectors. In Ghana, these subsidized ACTs have also been the subject of a very effective communication campaign by the National Malaria Control Program, the malaria department of the Ministry of Health, using a green artemisia leaf logo on all boxes of medicines.



Figure 7.1 Sticker from the subsidized ACTs promotional campaign showing the green leaf logo.

Source: © IRD/Carine Baxerres, Accra, January 2014

At the time of our surveys, subsidized ACTs were priced at 1–6 Ghanaian cedis (GHC), or USD 0.2–1.2, depending on the patient's age and weight. The price of unsubsidized adult ACTs ranged from GHC 3.5 to 36.2 (USD 0.7 to just over USD 7.00), depending on the brand and distribution site.¹⁷

These differences in drug distribution result in individuals in Benin and Ghana adopting very different appropriation and use of ACTs, both subsidized and unsubsidized.

In Benin, the situations in the city of Cotonou and the department of Mono diverge significantly. In the latter, our qualitative studies show that people used very little ACT on their own, in self-medication.¹⁸ Of the 15 families we surveyed, only 2 “middle-class” and 1 “poor”¹⁹ family had self-medicated with ACTs. The vast majority of ACTs consumed by families in Mono department were prescribed by public health facilities, rarely private, or through community outreach workers.²⁰ Subsidized ACTs with the green-leaf logo, widely distributed in Ghana,²¹ were informally crossing borders and ending up in informal markets in Benin (Baxerres, Egrot, Hounghinin, & Le Hesran, 2015). But because subsidized ACTs are not prescribed by private health professionals or promoted by private retail distributors in Benin, individual demand for the green-leaf products is low. In this way, the formal pharmaceutical system also influences demand seen by informal vendors.

The situation in Cotonou was significantly different. With the exception of “poor” families, who consumed few or no ACT for self-medication, “middle-class” families and especially “wealthy” families all self-medicated with ACTs at one time or another, both for children and adults. This practice is in line with popular perceptions of *palu*, and as such may seem abusive to physicians. For example, one “wealthy” mother had taken an ACT “because she had headaches and a cold” (bimonthly monitoring, Cotonou, August 2015). An ACT was given to a 1.5-year-old boy from a “middle-class” family “because he wasn't eating well” (bimonthly monitoring, Cotonou, October 2015). Some families also self-medicated with ACTs to prevent *palu*.²² “Every three months, I treat the children, symptoms or no symptoms (...), every three months I buy *palu* drugs. I get para, amoxi and an antimalarial, very often ACTs, which I give them and then I deworm them” (mother of a “wealthy” family, Cotonou, December 2014). It may be that these ACT-based self-medication practices are gradually adopted from the most to the least advantaged families and from the cities to the countryside. More radically, it is possible that the practices observed 6–9 years after these drugs became available may be considered an issue of non-appropriation by the least advantaged families. Indeed, the parents of some “wealthy” or “middle-class” families in Cotonou were only familiar with ACTs to treat *palu* in their children. “I think that ACT existed before my children were born. The first time they got *palu*, I bought ACT. They prescribed it to us at the hospital” (mother of a “middle class” family of four children, aged between 1 and 9 years, Cotonou, December 2014). In contrast, many of the “poor” families living in Cotonou never even mentioned these treatments.

In Ghana, regardless of socioeconomic status, individuals were very familiar with ACTs, strongly appropriated these drugs, and self-medicated with them frequently. ACTs were widely used in both urban and semirural research sites to treat *malaria* by adults and children. This treatment was generally perceived very positively.²³ In the household monitoring, 25 of the 30 families reported that someone in their household had taken ACTs during the monitoring period. In both settings, this was reported by households in all three of the socioeconomic categories. Most of these ACTs were obtained from OTC medicine shops and pharmacies and used in self-medication or following the recommendations of the medicine seller. In interviews, many respondents expressed a desire to avoid the waiting time and hassle of seeking care at a health facility.

Apart from treating *malaria* and *abun*, in both Breman Asikuma and Accra, many interlocutors described using ACTs regularly to treat ailments such as headache or fever, either from the stock of medicine that the household already possessed or from a nearby drugstore (OTC medicine shops or pharmacy in urban Accra). For example, in one semirural “wealthy” family, members regularly consumed ACTs bought from the local drugstore for *malaria* prevention, and teenage daughter Agnes reported once taking three tablets of ACT to treat a headache. Another example of this broad use of ACTs was also reported by Rabiatu, the mother of a “poor” family in urban Accra, she said that anytime her husband is “feeling a bit hot or not feeling well he goes to buy the ACT medicine” (interview, April 2015).



Figure 7.2 Blister pack of an ACT monitored during the study in a family in Ayipey.

Source: © IRD/William Sackey, Ayipey, May 2015

Previous success of a treatment was often cited as a reason to try this type of treatment again for a new illness episode. Individuals also described imitating the prescription patterns of health centers or hospitals. Young children received the bulk of medication that was recorded during monitoring visits. These were often given based on past success with the medication, such as when Berenice (mother, “middle-class” family) bought Winthrop ASAQ tablets (subsidized ACT) from the pharmacy for Perpetual (age 5) after she started showing her “usual symptoms of malaria” (vomiting and signs of a cold) (monitoring visit, Accra, August 2015). Some interlocutors also reported relying on recommendations from drugstore attendants, for example, when the local drugstore recommended Ipca AL (subsidized ACT) to respond to Godwin’s (age 2, “poor” family) symptoms; “his urine was very yellow, he couldn’t play with the other kids, and his body was very hot” (monitoring visit, Breman Asikuma, October 2015).

Quantitative data from the population surveys we conducted in 2016 and 2017 in about 600 households in urban and rural areas in the two countries clearly show a difference in how families treat *palu* or *malaria*. In Benin, ACTs are not often used as first-line treatment. They account for only 21% of self-administered pharmaceutical treatments for *malaria* in Cotonou and 28% in the Mono department. However, if we include herbal treatments that are taken alone and not in combination with commercial products, this percentage drops to 10% in rural areas and 19% in Cotonou (Damien, Baxerres, Apetoh, & Le Hesran, 2020).

In Ghana, families use ACTs much more frequently. These drugs account for 77% (in rural areas) and 90% (in urban areas) of the pharmaceutical products taken as self-medication for *malaria*. Yet, as in rural Benin, families’ exclusive use of herbal remedies should also be taken into consideration, as this accounts for nearly 40% of cases in both the city of Accra (38%) and in rural areas (37%). In addition to “homemade herbal teas,” in Ghana, we also find a significant health-care phenomenon in the form of “standardized herbal medicines,” which are sold in OTC medicine shops and pharmacies alongside commercial treatments.²⁴ This phenomenon is more prevalent in urban areas. In fact, 55% of the herbal products consumed in Accra for *malaria* are “standardized herbal medicines” versus 33% in rural areas. The next chapter of the book is devoted to this issue.

A variety of antimalarial drugs and attachments to them

ACTs do not arrive in either country as unknown entities. In addition to herbal medicines, people’s daily lives are already peppered with commercial molecules that they use against *palu*, *malaria*, *hwevó*, *abun*, *tanvio*, *atikéssi*, and so forth, molecules to which they are more or less attached depending on their socioeconomic status, their place of residence (urban or rural), and above all the national contexts.

In Benin, antimalarial molecules that predate ACTs are well known to consumers. Some lump them together into a single category they call “quine-quine,” indicating they view these drugs as having similar effects. However, most people perceive differences between chloroquine, Nivaquine® (even though this is a

trade name for chloroquine), and quinine. Chloroquine is well known because of its longstanding promotion in public health for the treatment and prevention of malaria.²⁵ After the *P. falciparum* parasite developed significant resistance to this molecule beginning in the late 1990s, health authorities began recommending other antimalarial drugs. However, our surveys show that chloroquine was still used by several of the families questioned; to treat and primarily to prevent the popular nosological entities mentioned previously. This was true for more than half of the families we followed in the Mono department, regardless of their socioeconomic status; it was also the case for “poor,” “middle-class,” and “wealthy” families living in Cotonou. Our quantitative survey of the general population showed that nearly 10% of households used chloroquine as their first-line treatment for *palu*, both in urban (8.8%) and rural (9.2%) areas.

Quinine tablets were also used for curative and sometimes preventive self-medication by several “poor” and “middle-class” families living in Cotonou and, to a lesser extent, the Mono department. Our quantitative survey found that nearly 30% (28.8%) of families reported using quinine for curative self-medication in Cotonou, compared to only 4.5% in the Mono department. SP, which was initially recommended by the Ministry of Health and WHO as a replacement for chloroquine in the presumptive treatment of uncomplicated malaria and used since the early 2000s in intermittent preventive treatment of malaria during pregnancy, is also used in curative self-medication, more frequently in Cotonou than in Mono, by both adults and children. Several of the families interviewed, including “middle-class” and “wealthy” families, used SP before switching to ACTs. Our quantitative survey revealed that 7% of families living in Cotonou reported using SP for *palu*, but this drug was not reported by families living in the Mono department.

For several families, these various antimalarial drugs might be used interchangeably; they might sometimes use one and sometimes the other. Thus, for the same person, some *palu* might require ACTs, while for others, SP or quinine is sufficient. This was the case of a “middle-class” family living in the Mono department. Two of the four children in this family, aged 4 years and 12 months, had taken ACTs for *palu*, after a health center prescribed this medicine for the first child, and again a few days later for the second. The mother of the family had brought them for a consultation because she was particularly concerned about the children’s symptoms. This was actually the only biomedical consultation sought out by this family in more than a year of research; usually this family gave their children Nivaquine to treat *palu*.

Finally, in addition to antimalarial molecules, several other commercial products were used in Benin as curative or preventive self-medication against the popular nosological entities described earlier. We also found that at times no antimalarial drug was combined with these other molecules. This was especially the case in the Mono department for all socioeconomic categories and was true for “poor” families living in Cotonou. The therapeutic classes used were analgesics (paracetamol, paracetamol combined with caffeine, Aspirin®, Efferalgan®), anti-inflammatories (ibuprofen, diclofenac), vitamins (iron, foldine), sometimes antibiotics (cotrimoxazole, amoxicillin, ampicillin), and antihelmintics



Figure 7.3 Home pharmacy of a family living in the Mono department.

Source: © IRD/Emilienne Anago, Mono Department, November 2014

(albendazole, mebendazole). Paracetamol was the clear leader.²⁶ When resistance to chloroquine became a problem, public messaging communicated its lack of effectiveness, but this may have resulted in discrediting all antimalarial drugs among those who cannot afford ACT. “Later they said that if children have a fever and you use Nivaquine, it’s no good. A doctor told me that the fever increases; that’s why I don’t use Nivaquine anymore and I prefer paracetamol” (mother of a “wealthy” family, Mono department, February 2015). Quantitative surveys show that these commercial products, used without antimalarial drugs, represent 27.5% of the pharmaceutical treatments used in self-medication for *malaria* in Cotonou and 58.5% in Mono.

In Ghana, our quantitative surveys show that antimalarial drugs other than ACTs (chloroquine, amodiaquine, quinine, or SP) are used very little, both in rural and urban areas (only 7 out of 600 households reported using them). Many respondents through qualitative interviews referred to chloroquine or quinine as “old medicines” that were no longer used. Commercial products other than antimalarial drugs were also much less commonly used than in Benin, especially in Accra where they represented only 6.4% of cases. In rural areas, they still accounted for 20% of the pharmaceutical drugs taken. “Blood tonics” were used to prevent illness and in combination with *malaria* treatment. These blood tonics comprised nutritional supplements such as “B’co” (containing multiple B vitamins), multivitamins, or iron supplements. Other medications used in Ghana were similar to those used in Benin, including cotrimoxazole (for stomach problems), vermifuge, cough syrups, Efpac[®] (paracetamol, aspirin, caffeine), and “para” (paracetamol). In Ghana, the fact that subsidized ACTs are extremely well distributed—reaching every corner of the country, through public but most

especially through the very numerous private actors in pharmaceutical distribution—results in a very different landscape from that of Benin. Other commercial products to treat *malaria* lack such broad distribution in Ghana, thus limiting popular perceptions about them.

In Benin, however, popular perceptions have developed about the gamut of antimalarial molecules, related to an individual's socioeconomic status and the molecules that are within their financial reach. Chloroquine, Nivaquine[®], and the “quine-quinés” are perceived as old drugs and associated with the past by the “middle-class” and “wealthy” families of Cotonou who regularly self-medicate with ACTs. “Chloroquine, quinine, Nivaquine, that was it... those were very common at the time against *palu*. I used them all, especially when I was with my parents. We took them to prevent *palu*, mother gave them to us” (mother of a “wealthy” family, Cotonou, March 2015). This is also the case for “wealthy” families in the Mono department. Chloroquine (Nivaquine[®]), and quinine is also often described in interviews as causing numerous side effects. For chloroquine, people often mentioned ringing in the ears (“it clogs the ears too much,” “it kills the ears”), itching, allergies, and harmful effects on the eyes. For quinine, side effects in addition to those mentioned earlier include dizziness, fatigue, weakness, difficulty sleeping, headaches, stomach problems, and joint issues. Their very bitter taste is also often pointed out as a reason why some people reject them. These side effects are most often described by those who have “embraced” ACTs.²⁷ Thus, for all other Beninese who cannot afford to self-medicate with ACTs or who believe they do not need ACTs for the *palu* they have at the moment, and despite the fact that these compounds are not or are no longer officially recommended as first-line treatment for malaria, quinine, and even chloroquine, continues to be widely used.²⁸

Conclusion

In Benin and Ghana, we see two quite different, almost opposing, landscapes for the distribution and use of ACTs, despite the fact that these countries are very similar geographically, socioculturally, and in terms of health.

The simultaneous presence of different antimalarial treatments in Benin—quinine, ACTs, SP, and even chloroquine—in the consumption habits of families is surprising. At first glance, it may seem to underscore how much time is needed for individuals, families, and health professionals to become familiar with and accept new therapeutic protocols. Therapeutic recommendations pile up, change regularly, and, in the case of malaria, are different for children, pregnant women, and other adults, which certainly makes it difficult for both patients and caregivers to understand and become comfortable with them. Recommendations are not simply erased as the next one arrives but are associated in individual and collective memory.

However, the comparison with Ghana highlights the elements that influence these persistent attachments or new appropriations of molecules. It is not just people's perceptions of medicines and their knowledge and understanding of the

disease; in fact, the most significant factor seems to be the country's existing pharmaceutical system, the way in which various drugs are actually distributed to people and at what price.²⁹ We believe people's confidence in one compound or another develops on the basis of these structural factors (Brhlikova et al., 2011; Egrot, 2015; Hamill et al., 2019), as we saw in surprisingly different ways in Benin and Ghana. In the end, these are the elements that determine whether a pharmaceutical compound is abandoned, persists, or becomes integrated into individuals' lives (Fainzang, 2001; Gregson, 2007).³⁰

The different situations in the two countries clearly raise questions for public health. Will the broad use of ACTs in Ghana as self-medication, usually without a confirmed malaria diagnosis, lead to parasite resistance to these combinations? Conversely, in Benin, where they are less widely used as self-medication, is there a lower risk of resistance to ACTs emerging? If these questions are relevant in such close geographical areas with highly permeable borders, we are faced with a public health dilemma: a wide distribution and possibly inappropriate use of ACTs that could lead to resistance problems; or a more limited, more appropriate distribution, but also a significant risk of treating actual cases of malaria with ineffective drugs that are no longer recommended for the disease or even inappropriate drugs (Baxerres et al., 2015).

These biological considerations are important and need to be taken into consideration. However, our studies also show that how a country's pharmaceutical system functions appears to have a considerable impact on how consumers at the end of the distribution chain use drug compounds. In countries with limited or intermediate resources, such as Benin and Ghana, understanding the availability of inexpensive molecules (whether subsidized as here for ACTs or reimbursed through various insurance mechanisms), the distribution channels (formal or informal) used and how they are present in the country, is essential to build policies to combat diseases and assess their consequences on individual and public health as well as on the economy and society.

Notes

1. Refer to [Chapter 5](#) to understand the delay in WHO recommendations to introduce ACTs in Africa. See also Pourraz (2019).
2. See Ghana Demographic and Health Survey 2014, Chapter 12: <https://dhsprogram.com/pubs/pdf/FR307/FR307.pdf> and the 5th Demographic and Health Survey in the Republic of Benin, 2017–2018, p. 44–48: <https://www.insae-bj.org/images/docs/insae-statistiques/sociales/Sante/Enqu%C3%AAt%C3%A9mographique%20et%20de%20Sant%C3%A9%20au%20B%C3%A9nin%20%28EDSB%29%20de%202017-2018.pdf>, accessed April 2020.
3. Recall that a country's pharmaceutical system is defined by all the processes for the supply and distribution of medicines available on its territory, whether public, private, or informal. See the Introduction of this book.
4. See the Introduction of this book for information on the data collection methodology.
5. In malaria, when parasitized red blood cells burst, they release pigments that color the urine and conjunctiva. In the Mono department, the color red is often used instead of yellow.

6. We can see from these examples that some common diseases are named after the causal element while others are named based on the symptomatology or treatment. People often specify that *hwecivio*, *hwecivoè*, *tanvio*, and *atikéssi* also mean *palu* (*malaria*) and/or also one of the other entities mentioned previously.
7. Severity here is associated with masculinity: *así* in the Fon language means “wife, female” and *asú* means “husband, male.” In the Mono department, people also spoke of red *atikéssi* and simple *atikéssi*.
8. We found the English term “malaria” and mosquitoes to be more routinely used in Ghana than in Benin. At first glance, especially when research starts first in Accra, Ghana may appear to be more strongly influenced than Benin by Western lifestyles and biomedical knowledge; however, this impression dissipates upon leaving the large city and its billboards, multiple road interchanges and its endless “go slow” (traffic jams).
9. The term *atridii* is another known term for popular *malaria*, but we found it only once in the interviews. It is used mostly in the Aburi area and the Eastern region.
10. First names used in the text are pseudonyms.
11. Chapter 10 of this book is devoted to healthcare treatments in Benin and Ghana, looking at self-medication and consultations with a specialist.
12. Until recently, ACTwatch conducted predominantly quantitative studies on the distribution and consumption of ACTs in 10 malaria-endemic countries, including Benin: www.actwatch.info (accessed February 2020).
13. See Chapter 3 in which the pharmaceutical systems of Benin and Ghana and the many actors at work there—public, private, and informal—are described in detail.
14. As part of the wave of reforms to Benin’s pharmaceutical sector that has been underway since 2017, the CAME was dissolved in September 2020 and replaced with a new organization, the Société Béninoise pour l’Approvisionnement en Produits de Santé (Beninese Society for Health Product Supply or SoBAPS SA).
15. Chapter 9 is devoted to the issue of pharmaceutical promotion in Benin and Ghana.
16. The distribution of subsidized ACTs in the public and private sector in Ghana has been promoted by the AMFm (Affordable Medicines Facility-malaria) program, supported by the Global Fund. This was discussed in the previous chapter.
17. Depending on the fluctuating exchange rate, the euro is generally slightly higher than the dollar (1 euro \approx USD 1.15). Specifying prices in euros for Benin and in dollars for Ghana, as is customary in these two countries, helps to highlight the influence of each of these financial and cultural contexts in Benin and Ghana, respectively.
18. We consider self-medication to be an individual’s use of health products without the supervision of a professional they consider able to prescribe medicine, whether or not this person is actually authorized to do so. The issue of self-medication will be discussed at length in Chapter 10.
19. The mother of this “poor” family stood in sharp contrast to the other mothers of “poor” families. She had been educated up to year 9 in school and had previously lived in Parakou, the second largest city in the country. She was familiar with a large number of drugs and felt that she understood their effects.
20. Overall, public health facilities are more widely visited in the Mono department than in Cotonou, where a broader range of care is available. Private health centers do exist, but there are fewer of them than in Cotonou. The community outreach workers are village residents identified by the Ministry of Health and institutions that implement health projects locally to provide health advice and/or care, treatment, and vaccinations. In the case of malaria, they provide families with free ACTs for infected children under 5 years old.
21. Green-leaf CTAs were also widely distributed in Nigeria through the AMFm. That country is also a major supplier to Benin’s informal markets (Baxerres & Le Hesran, 2011).

22. Chemoprophylaxis for malaria is no longer recommended by health authorities, except for pregnant women. We have shown previously that in Benin, popular perceptions of *malaria* lead people to engage in significant disease prevention behavior, using both plant concoctions and commercial products (Baxerres, 2013).
23. We decided not to describe the popular perceptions of ACTs in depth here since they do not represent the variations in ACT use in the two countries. In Benin, people are most familiar with the trade name “Coartem,” because this brand was over-represented, if not the only available option, among subsidized ACTs for a long time. In both countries people describe the medicine as “the one taken four-four” or “the yellow ones.” Unsubsidized ACTs were known by their trade names, with people using different names depending on their purchasing practices. In Ghana, some consumers know the term “ACT.” There was a perception that ACTs were very efficient for treating *malaria* with few side effects, like temporary weakness. In Benin, ACTs were generally perceived as more effective than older antimalarial molecules, but this varied depending on the person’s socioeconomic status and whether or not the products were subsidized. “Wealthy” and “middle-class” urban families perceived subsidized ACTs, distributed in public health centers, as less effective than unsubsidized ACTs. In these families, the side effects of (subsidized) ACTs could be described (too sweet, unpleasant smell, itching). In rural areas, subsidized ACTs were mostly associated with children.
24. This phenomenon also exists in Benin but is quantitatively much less significant. Only 3 of the 30 families surveyed using our qualitative methods had once used a standardized herbal medicine treatment for *palu*.
25. From the early 1960s to the early 1990s, chloroquine-based mass chemoprophylaxis was recommended in Africa by WHO for children (Sarrassat, 2009). This recommendation was later suspended and a policy of presumptive chloroquine treatment for uncomplicated malaria on the basis of a clinical diagnosis mainly focused on fever was recommended until the late 1990s, when malarial parasites developed chloroquine resistance (Souares, 2007). Other molecules were then recommended (mefloquine, SP), before the advent of ACTs.
26. Paracetamol is widely consumed in Benin and Ghana. It seems that in many countries there are specific perceptions of this molecule, and it is highly familiar to most people, some of whom no longer really consider it to be a drug, and thus potentially dangerous. In France, it is the only pharmaceutical product to escape the dichotomy of biochemical drugs between “natural” and “tainted” (David & Guienne, 2019).
27. It should be noted that people who use chloroquine may also report these side effects for quinine, and vice versa. There is thus a kind of differential appropriation of antimalarial drugs that depends on the individual. The personalization often attributed to commercial products—that a drug is suitable for one person’s body but not for another’s, even for the same health problem—has been described several times in the literature (Baxerres, 2013; Hardon, 1994).
28. At the time of our studies, quinine was still recommended for the treatment of severe malaria, either orally by prescription, as an injection or infusion, or as artesunate. Chloroquine was prohibited for malaria-related indications. It could be prescribed for the treatment of certain rare diseases, such as lupus erythematosus or rheumatoid arthritis. At the time of our study, people could only buy this compound through the informal drug market. We identified widely shared discourses and practices (most prevalent in the Mono department but also in Cotonou) that associate this molecule with the treatment of several other health issues: primarily stomach problems and constipation, but also for respiratory congestion, sleep problems, contraception, and unwanted pregnancies. As this chapter was being written, chloroquine was returning to the global limelight as a possible treatment for Covid-19. It has been the subject of vigorous scientific controversy, widely reported in the media and social networks.

29. We know that in the second half of the 20th century, chloroquine was more heavily promoted in French-speaking African countries, whereas SP was promoted in English-speaking countries. But these historical elements appear to be relatively insignificant compared to the pharmaceutical system currently operating in the country.
30. Two exciting fields of research can be used here: studies on consumption (Chessel, 2012; Trentmann, 2012) and on domestic culture (Miller, 2001; Pink, 2004).

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