Case Studies on Contemporary Social Issues

Ebola, Culture, and Politics: The Anthropology of an Emerging Disease

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Images and First Contact

Books such as Richard Preston's *The Hot Zone* and Laurie Garrett's *The Coming Plague* and films like *Outbreak* with Dustin Hoffman captured the attention of the public by dramatizing the fears of encountering the Ebola virus. Every Ebola outbreak since then has been extensively covered by news agencies around the world, but more people die each day from malaria in sub-Saharan Africa alone than have died in all the Ebola outbreaks since its emergence in 1976. What, then, is our fascination, our fear?

The media, public, and medical community are concerned and focused on Ebola, but we still know little about the disease as outbreaks are increasing in frequency and scope. However, popular books on the virus, many by Ebola researchers or physicians, have proliferated (Close 1995; McCormick, Fisher-Hoch, and Horvitz 1996; Peters 1998; Ryan 1998). They describe the physical horrors, suffering, and pain of the victims dying rapidly from a virus that causes "soaring fever, wrenching pain, and blood seeping from every opening." Films such as *Outbreak* seldom, if ever, show how local people view and respond to the outbreak. We see the images of the Western "medical cowboys," seemingly saving Africans from themselves, but not the experience of the African people, the story as they tell it. In *Outbreak*,we watch Dustin Hoffman and his medical team in yellow space suits take a helicopter into an African village where they find piles of dead bloodied bodies, evidence of what has been termed the "killing spree of the silent terror" (Garrett 2001) loose in the rainforest. In the film, the only survivor is the "juju man"[1] in the film, pictured on top of a hill with an exotically painted face, chanting and dancing with feathers and rattles. He attributes the outbreak to destruction of the tropical forest but has no solutions. It is Hoffman and his high-tech team who eventually control the outbreak, dismissing the juju man and his prophetic vision.

The representations of Africans in *Outbreak* are similar to those in the popular press, books, and documentaries. A *New York Times Magazine* piece (Hardin

1 *Juju* generally refers to objects indigenous healers in many parts of West Africa use to cure and prevent illness.

2001) described how Acholi villagers responded to the Ugandan outbreak in 2000: "Several hundred Acholi traditionalists took matters into their own hands in Gulu town. They tried to chase out the virus by shouting, running around with spears and beating on saucepans." But what, exactly, is a "traditionalist"? People like the Acholi, frozen in time? Other news stories have headlines such as "Local People Encouraged to Abstain from Eating Monkeys and Gorillas during Christmas Holiday," "Local People Drink *Jik* (Bleach) to Protect Themselves from Ebola," "Local People Attack International Health Team with Spears," "Monkey Brains off the Menu in Central Africa," or "Local People's Traditions Major Obstacle to Control Efforts." Indigenous people's responses to Ebola are rarely mentioned, but when they are, images of ignorance, exoticism, and superstition emerge. The descriptions are seldom contextualized, and one is left with the feeling that an outbreak is controlled only through Western biomedical knowledge and technology, in spite of, not because of, the actions of local peoples.

And what of local peoples' explanations for Ebola? Was the "juju man" in *Outbreak* an accurate spokesperson for Africans when he says epidemics are caused by the destruction of the rainforest? Or is this simply a Euro-American explanation (Ryan 1998) for the outbreak spoken through an African? We actually have few clues as to how Africans themselves view the disease or how their views influence their response. Laurie Garrett (2001) and Bill Close (1995) provide a few glimpses of local people's explanations when they say Africans link it to "evil spirits" but provide no details or contexts; one is still left with a sense of Africans as being a superstitious and exotic people.

The lack of understanding of local people's views and experiences with Ebola surprised us. While the Ebola outbreaks in the late 1980s and 1990s were taking place, Barry was working in Cameroon to help control tropical diseases such as schistosomiasis and onchocerciasis (river blindness). In both cases, local people had rather detailed knowledge of these diseases, and this knowledge was built into national health education programs (Hewlett and Cline 1997; Hewlett, Kollo, and Cline 1996). We also knew that medical anthropologists were involved in most HIV/AIDS control projects in Africa, and we assumed they would be involved in controlling emerging diseases such as Ebola. But this was not the case. We followed the Ebola stories and called the World Health Organization (WHO) in Geneva and the Centers for Disease Control (CDC) in Atlanta during the 2000 Ugandan outbreak to obtain the name of the anthropologist involved in control efforts. We were told that anthropologists never participated. Chapter 3 describes the inside connections that led to Barry being the first anthropologist invited by WHO to participate in Ebola control efforts in Uganda in 2000. We believe anthropologists were not invited previously because WHO and CDC emerging-disease specialists responsible for organizing control efforts had little or no experience with medical anthropologists, and if they did, they had doubts about what medical anthropologists could contribute during a rapid killing epidemic. What is the point of taking time for anthropological studies when so many people are dying every day? Control efforts focused on immediate action in establishing isolation units and following contact cases.

This book is a first attempt to provide the missing part of the Ebola story. How do local people view the disease? How did they respond to the rapid killer? Have they experienced epidemics like this in the past? How do they view the international teams sent to help control the disease? How do history and politics influence their views of the disease?

WHAT IS EBOLA?

Many regions in Africa have been hit hard by such diseases as AIDS, malaria, tuberculosis, dysentery, and measles, to name just a few, with thousands of people dying every day from these often-preventable outbreaks. What distinguishes Ebola is that it remains so mysterious and deadly. Ebola belongs to one of the few known virus families of which scientists have a profound lack of understanding. The natural reservoir, the very source of infection, is still unclear. Fruit bats have long been suspected as being the reservoir, but as of September 2006, the research is inconclusive (Swanepoel 2006). The exact modes of transmission are not always clear, and there is no vaccine to prevent and no antiviral to treat this usually fatal infectious disease. Little is known of the natural history of the virus and much less about the resulting illnesses, their pathogenesis, and detailed virology (LeDuc and Peters 1999). Healthcare workers can only provide treatments for the devastating effects of this virus, that is, the high fever, diarrhea, vomiting, bleeding, and pain.

Ebola is listed as a potential biological weapon by the U.S. government because of its high case fatality rate and mysterious nature. The Ebola virus can only be handled in a few existing high-containment facilities, where it is classified in the highest-risk group (biosafety level 4) to protect laboratory workers from infection.

Ebola hemorrhagic fever is a virulent viral disease causing death in 50–90 percent of clinically diagnosed cases. By comparison, case mortality rate for the recent SARS outbreak was 9.6 percent (World Health Organization 2004). The name *Ebola* derives from the river in the Democratic Republic of Congo (formerly Zaire) where the disease was first recognized. Ebola and Marburg are the two genera within the filovirus family, which is known for its threadlike morphology (*filo* is Latin for "filament") (see Figure 1.1). There are four species or subtypes of Ebola: Zaire, Sudan, Reston, and Ivory Coast; the Zaire and Sudan subtypes are responsible for more than 95 percent of all cases and deaths. We use the term *Ebola* to refer to both the Zaire and Sudan subtypes, but it is important to remember that the term *Ebola* refers to a genus, not a species. Ebola does not refer to a specific virus. Ebola-Zaire is the most virulent, having an 80–90 percent case mortality rate, while Ebola-Sudan has a 40–50 percent case mortality rate. Ebola-Zaire occurs in tropical forest areas, while Ebola-Sudan occurs in mixed savanna-forest environments. The viruses sabotage the body's defenses and eventually kill the white blood cells essential to fighting off infections (see Kuhn 2007 for more details on filoviruses).

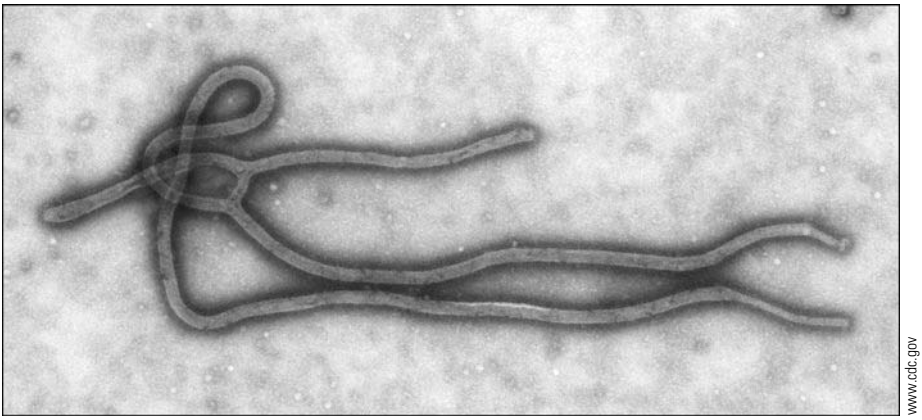

FIGURE 1.1 Electron micrograph of Ebola filovirus

Transmission of the Ebola virus occurs by direct contact with blood, secretions, or organs of infected persons or animals. Transmission from game animals often occurs in African rural areas because domesticated meat is generally not available and game meat is an important source of protein. Monkeys, apes (gorillas, chimpanzees), and duikers (similar to antelope) die from Ebola. People who butcher and handle infected game animals can become infected (called zoonotic transmission). In urban areas, nonsterile hospitals and clinics can become distribution centers for the disease (called nosocomial transmission). In some African cases, airborne transmission could not be ruled out by most studies, but at most it is a very rare form of transmission (Borio et al. 2002). The incubation period for the Ebola virus is two to twenty-one days, with the initial onset of the disease characterized by sudden fever, weakness, muscle pain, and headache. This stage is followed by a sore throat, vomiting, diarrhea, rash, and abdominal and thorax pain. The final stage is characterized by hiccups, delirium, and bleeding under the skin and from the mouth, nose, intestines and other openings, although hemorrhaging generally occurs in less than 50 percent of cases. It is extremely difficult to diagnose the early stages of Ebola, as the early signs and symptoms—high fever, diarrhea, and muscle pain—are associated with other common tropical diseases, such as malaria and bacterial infection. Simple laboratory tests for Ebola are not available in local hospitals; blood or tissue specimens must be sent to special laboratories for definitive diagnosis. The patient usually dies within seven days after becoming symptomatic (WHO 2003).

Figure 1.2 locates the primary African outbreaks of filovirus with the number of cases and percentage of mortality (Reston and Ivory Coast outbreaks involved only a few individuals and have been omitted). Between 1976 and 1979, three outbreaks of Ebola-Zaire, Ebola-Sudan, or Marburg occurred. None occurred again until 1994 when outbreaks reappeared in Gabon and have since increased in frequency and intensity (see Table 1.1).

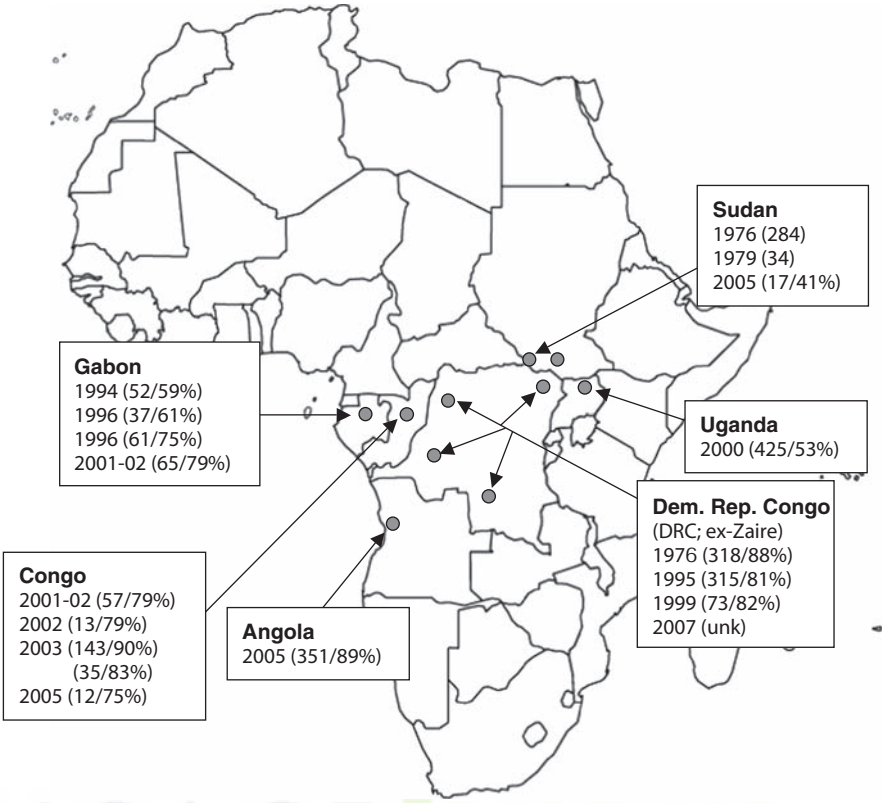

FIGURE 1.2 Locations of African outbreaks of filovirus with the number of cases and percentage mortality rate (Reston and Ivory Coast outbreaks have been omitted). The 2007 DR Congo outbreak was ongoing at time of publication.

TABLE 1.1 The Number of Filovirus Outbreaks and Cases Has Been Increasing in Recent Years.

	Number of Outbreaks	Number of Cases
1970–1979	5	640
1980–1989	2	3
1990–1999	8	592
2000–2005	7	1126

WHO strategies to contain the disease include (1) establishing isolation units for the infected and implementing barrier nursing techniques, (2) providing health education to inform the public of symptoms and modes of transmission, (3) limiting dangerous activities (burying without precautions), and (4) identifying individuals who had contact with infected individuals to watch and control their activities for twenty-one days.

FIRST CONTACT

Gabon 1997

Three relatively small outbreaks of Ebola occurred in Gabon between 1994 and 1996, and in early 1997, I (Barry) applied for and received a small university grant to travel to Gabon for one month to conduct a preliminary survey of how local people responded to the three outbreaks. The field trip also enabled me to visit hunter–gatherer populations (also called "pygmies" by local peoples) in Gabon. I had conducted research with Aka hunter–gatherers (foragers) in the Central African Republic for more than twenty-five years (Hewlett 1991) and was interested in conducting a comparative study. Both Ebola outbreaks and foraging peoples can be found in the forest areas of northeastern Gabon. One of my graduate students, Tom (pseudonym), who had never been to Africa, decided to join me in the field to conduct a preliminary survey of a forager group.

From Libreville, the capital, Tom and I rode in the back of a pickup with twenty-five other people for sixteen hours to get to Makokou (see Figure 1.3). In Makokou, we arranged for a motorized dugout canoe to take us up the Ivindo River to Mékouka and Mayibout, the villages known to have experienced recent outbreaks. As we traveled upriver, we visited Baka foragers and Bakola farmers living in small gold-mining camps. Baka, Bakola, and Bakwele are the primary ethnic groups in the region. The Baka hunt and gather a variety of forest products, trade forest products, and farm a little; the Bakola farm manioc, corn, and a variety of other crops as well as pan for gold in established forest camps; while the Bakwele are primarily fisher folk (both men and women fish) who farm less than the Bakola and seldom pan for gold.

Mékouka, the location of the 1994–95 outbreak, was a small forest gold-mining camp that had existed for at least twenty years (see Figure 1.4). About fifty Bakola used the camp part of the year, living most of year near Makokou. As we traveled up the river and stopped at villages and camps, I informally talked with men, women, and children about the Ebola outbreaks. During the two-day trip, local peoples consistently reported that Ebola was *ezanga*. *Ebola* was a new term from the whites, while *ezanga* was a Bakola term (other ethnic groups had their own terms). When first asked about the meaning of *ezanga*, people explained that the term referred to "vampires." Later, they elaborated, "*Ezanga* are bad human-like spirits that cause illness in people who accumulate [things] and do not share." Persons who are jealous of the material wealth or sociopolitical power of others can secretly send *ezanga* to eat their internal organs, making them sick or die. Local people explained that this is why gold miners and lumber-company workers (another Gabon outbreak occurred in a lumber company) were at great risk from Ebola. People who accumulate and do not share are targets of sorcery. These informal discussions also revealed that ambitious people can seek the supernatural assistance of *ezanga* to help them acquire wealth and power. People working in mines were suspected of being energized by *ezanga*: "People with *ezanga* can work harder in the gold mines because *ezanga* works with two hearts."

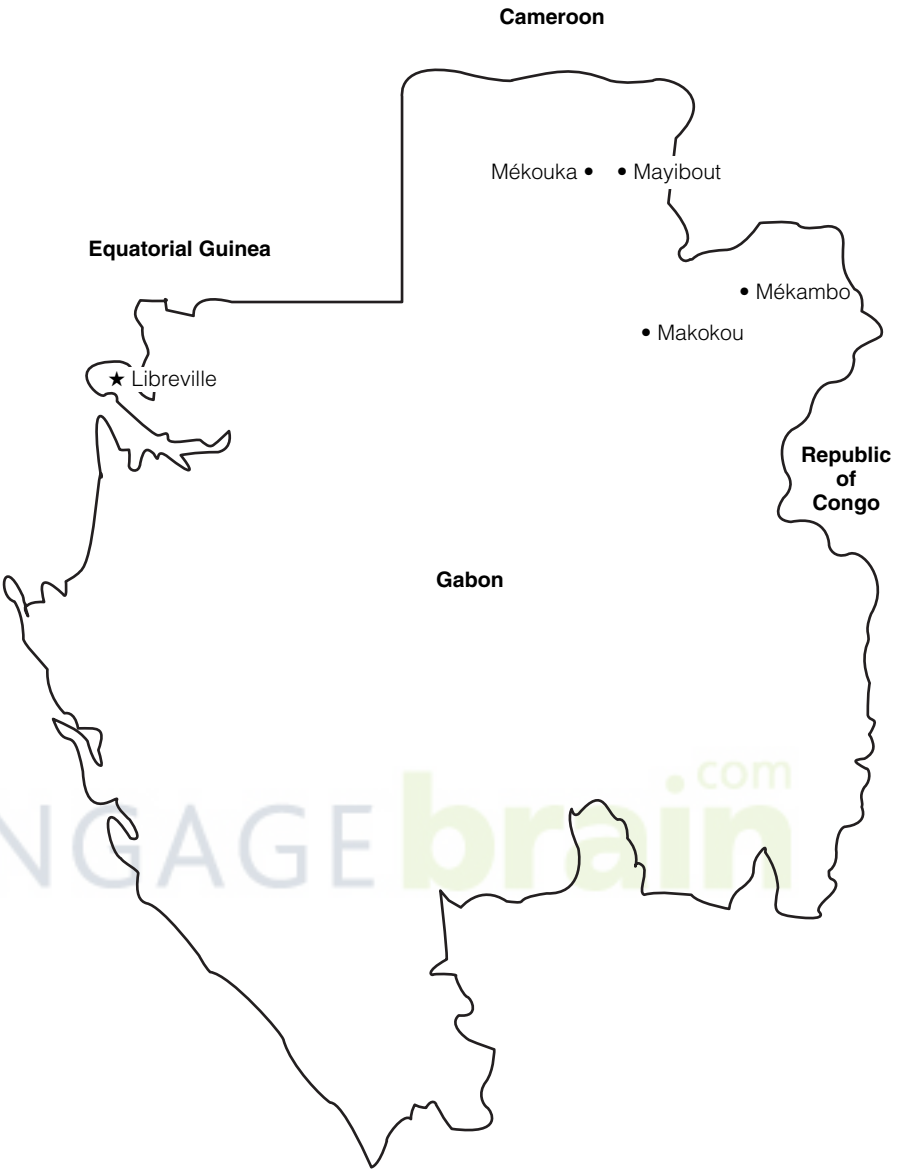

FIGURE 1.3 Map of Gabon with villages and cities mentioned in text.

Ezanga can also transform people into chimps, gorillas, or elephants—agents that can cause sickness in others. Everyone knew that the first Ebola cases in the Mayibout area were linked to eating a dead infected chimp, but many believed this was actually the effect of *ezanga* working through the chimp.

FIGURE 1.4 Mékouka gold mining camp

I asked one Bakota man on his way back to Mékouka to pan for gold, "How can you return? People died there last year and you may be at risk from *ezanga*" (see Figure 1.5). He responded, "I am a simple person and share and give generously to others. It is not a problem for me."

Indigenous healers, called *ngangas*, can diagnose and treat *ezanga*. They use their visionary forces to see *ezanga* and use a variety of techniques to extract *ezanga*. Not all healers treat *ezanga*, because the power of the *ezanga* can be stronger than that of the healer and cause the healer's death.

As people talked of *ezanga*, they described their responses to the epidemic. After three deaths, the people of Mékouka abandoned their village and headed downriver to Makokou. They often left behind stigmatized and shunned individuals who were not their family members.

Local people also described their interactions with international healthcare workers during the outbreaks: "First the French and then the Americans came up the river. Each time they took four tubes of blood, even from sick children. They never returned, and we never received results of the tests. Some children died after their blood was taken." People thought the blood was repeatedly harvested by the Euro-Americans for sale in Switzerland.

Our first stop on the way to Mékouka was at a Baka village on the Nouna River before going to Mékouka. We talked about Ebola with the chief, who provided details of Baka deaths that, we assumed, occurred in the 1994–95 Mékouka outbreak. Approximately half the people in his camp had died. After talking with him for about an hour, I came to an awful realization—he was describing deaths that had occurred earlier in 1997; in fact, these deaths had occurred only few months before our arrival.

FIGURE 1.5 Bakola man panning for gold

My stomach churned and head started to ache as I listened attentively. Before going up the river, we talked with Gabonese and Yale University physicians who told us the area was safe, Ebola free, and open for travel to previous Ebola sites. Although the deaths had occurred very recently, I knew enough about Ebola to realize that my personal risk was low. I was willing to take the risks to learn more about the recent outbreaks. Were we investigating the history of a potentially new or missed outbreak? The Baka community gathered around us and shared the details of infection and loss of family and friends. Thirteen of twenty-five village members had died within a few weeks.

A Baka man joined us for the trip farther up the Nouna River to visit Mékouka, the location of the first Gabonese outbreak. We traveled by dugout for four hours and stopped at a river camp associated with Mékouka. The village itself was a three-hour walk from the river. The brother of the Mékouka village chief was at the river camp and verified that the Baka deaths described to me earlier in the day had occurred months earlier. He said we were the first researchers to come up the river to investigate the deaths. We found that the

outbreak had started in Mékouka where the Baka were helping the Bakola pan for gold. As in the first outbreak, multiple deaths occurred, and individuals fled toward the larger Ivindo River where we met the survivors the previous day.

The next day, we walked for three hours to Mékouka village, the site of previously recorded outbreaks, and the nearby abandoned Baka camp, the site of the recent outbreak. Only one person, a Bakola woman, was present. Before I began talking with her, Tom demanded, "Can we leave NOW? This place does not feel right." I suggested he walk back up the trail and wait for me. After talking with the Bakola woman for a short time, I rejoined Tom and started walking back to the river camp. Tom was angry and asked to go back to Makokou to start his work with foragers; he had lost interest in Ebola and was afraid to continue.

The next morning, upon waking with uncontrollable chills and a fever, I treated myself for malaria. But I worried, could this be Ebola? I had worked in central Africa for more than twenty-five years and had treated myself for malaria and a wide range of other "bugs," but this was the first time I had experienced a high fever in an Ebola area. If I had Ebola, nothing could be done; I would be dead in a week. I thought about the local explanation for Ebola—*ezanga*. You only have to worry about *ezanga* if you do not share; had I not been a giving, generous, simple person? Was I in trouble?

Our campfire and a cup of coffee warmed me up and reduced the chills. We packed up the dugout canoe and started the sixteen-hour return down the river. Chills and fever persisted for most of the trip as I continually reflected on whether I was a giving person.

Sorcery is a common explanation for daily events in central Africa. I have known several sorcerers, but this was the first time I really began to understand how easy it is to begin to believe in sorcery. If you do not share and give to others, you can get sick and possibly die from malevolent spirits. It is a deterrent to accumulation of material wealth and quite the opposite of other cultures, such as my own, where acquiring material wealth can be a sign of virtue (Weber 1958).

Upon returning to Makokou, we paid a visit to the Yale University physician. After shaking my hand and a half hour of listening to me describe the sequence of sickness and death in the village, he stopped the conversation and asked, "Did you touch any of these people?" When I said "Yes," he immediately jumped up from the table and left the room to wash his hands. When he returned, he moved his chair to the far side of the room. This scared me. Even though existing literature at the time indicated that Ebola could not be transmitted through casual touch, this young physician was not going to take any chances. I asked him to explain, and he said, "Just in case. We don't know everything about this disease."

During the remaining week in Gabon, I visited Baka camps closer to Makokou to verify the sequence and contexts of deaths that had occurred in 1997 and talked with Mékouka villagers living near Makokou about the previous year's outbreak. The interviews with the individuals and families were the most difficult I had ever conducted in my anthropological career. Family members shared their grief and explained that this was the first time a researcher had ever talked to them about their feelings and experiences; nobody had taken the time

to listen. They were extremely open and receptive to sharing their lived experiences and talked for hours. I had to leave before they were ready to quit talking because I was emotionally drained. They complained about how Euro-American researchers moved up and down the river in fast boats, stopping only to take blood or fecal samples.

Villagers also described important features of the first Gabonese outbreak. I talked with the wife of the man who was identified by the villagers as the first person infected in the village (index case). She provided new information, as the Mékouka index case had not been described in published literature. She explained that her husband was walking through the forest and came across a dead gorilla that had been shot with a gun. He packed the game meat back to Mékouka, cooked it, and shared it with several others. People who had tasted the meat said it was acidic and thought the gorilla was ill. According to this woman and others interviewed, everyone who ate the meat died. I explained that it was probably spread by people who butchered and touched the dead gorilla rather than by eating the meat, as the virus dies once it is cooked. The deaths triggered accusations of *ezanga* related to jealousy over good luck in finding gold. The chief of Mékouka was accused of sorcery—using *ezanga* to kill his family members to increase his luck and fortune—and placed in the Makokou jail for several weeks until his name was cleared.

Origin Stories from the 1996 Gabon Outbreaks

Interviews consistently identified *ezanga* as the primary reason why particular individuals were infected with Ebola; however, as the deaths continued, other kinds of explanations emerged to explain why the virus emerged in Gabon. Since these explanations were based on the political and economic history of Gabon, it is necessary to provide a brief summary of Gabonese history. The French colonized Gabon in the late nineteenth and early twentieth centuries. As in other parts of Africa, local people experienced hundred of years of European exploitation via the slave labor trade, forced labor, and taxation, to name just a few. The current president, Omar Bongo, came to power in 1967 and is the longest-reining president in Africa. He has remained in power for several reasons, one of which is his extraordinarily close relationship to the French. Gabon is one of the few former colonies in the world to have permanent French military units on its soils. A large French unit of paratroopers surrounds Bongo's home in Libreville. French military personnel are common sight in downtown Libreville. The French military often carries out joint exercises with the Gabonese military in various regions of the country. Gabon is one of the wealthiest countries in Africa, in large part due to its oil reserves. It has developed its infrastructure (relatively good roads, good schools, and a high literacy rate), but the northeast, the area of the Ebola outbreaks, remains the poorest and least-developed part of the country.

Mékouka villagers identified the index case and explained why particular individuals were infected, but they were not sure why or how the gorilla was infected. Some speculated that *ezanga* could have transformed itself into a gorilla, but several others, including government officials, in the Makokou region

provided a different explanation. They pointed out that French President Mitterand had a problem in the 1990s—he had many nuclear plants in France to generate electricity but no place to dispose of the nuclear waste. To solve the problem, Mitterand made a deal with his good friend, President Bongo. Mitterand reportedly said, "I will give you and your ministers pocketfuls of money if you can dispose of our nuclear waste in Gabon." Bongo and his ministers accepted the offer, but they had to decide where to store the waste. After some consideration, they decided to bury it in the Mékouka forest area, the most remote location in the northeast part of the country. Since no roads existed into the area, nobody would find out. This area is now a new national reserve, but it is also the location of the small Mékouka gold camp. The nuclear waste altered the natural environment and gave rise to a new killer disease—Ebola.

Another outbreak occurred in 1996 in the village of Mayibout, located approximately fifty kilometers east of Mékouka. Villagers I interviewed knew about the Ebola index case; they said a man came across a dead chimpanzee in the forest, butchered it, brought it back, and shared the meat with family members in the village. In the past, if anyone came across a dead game animal in the forest, especially a large one, it was viewed as either a gift from god or from their ancestors. They also knew that those who touched the chimpanzee before it was cooked died and that several others died after touching the body of deceased relatives as part of customary funeral ceremonies. But the questions remained, "Where did the virus come from?" "How was the chimpanzee infected?" As mentioned earlier, one view was that the animal was *ezanga* transformed into a chimpanzee to transmit the poison virus. Another view linked the outbreak to the French. Days before the outbreak started, French troops parachuted into the nearby area and conducted military exercises with live ammunition. Villagers did not know what was happening. The day after the French soldiers left, the man found the dead chimpanzee. According to the villagers and several government officials, the French had conducted nefarious experiments and poisoned the forest with Ebola. They reasoned that whites know Ebola, and therefore they must have brought it into the forest.

Early Lessons

On this short trip, I only scratched the surface in terms of understanding local peoples' explanations and responses to Ebola, but the trip provided initial insights into understanding Ebola outbreaks. First, I experienced the fear of potentially being infected with Ebola and observed in Tom the fear and desire to flee. Fear and the desire to get out of a potentially infected area are human universals, a part of human nature. Local people's initial response to flee the infected village of Mékouka was similar to our own feelings.

Second, I understood sorcery much better than ever before. The experience with Ebola scared me to the extent that I continue to think about whether I am a giving and sharing person. If I give, I have nothing to worry about, but if I don't, something bad could happen to me. Why not share more? Giving and sharing seem like admirable human values. The experiences demonstrated to me that it is

not hard to believe in sorcery, especially in environments where child and adult mortality are high, death is a part of daily life, and giving and sharing can contribute to survival and equality.

Third, local people did several things that helped control the outbreak—they isolated infected people or limited their contacts, kept children away, and sought treatment and advice from many healers and government health personnel. Fourth, origin stories and experiences with French and U.S. teams repeatedly taking blood samples reflected local people's general mistrust of whites. Exploitive history and lived experiences with previous control efforts influenced their responses to outbreaks.

Fifth, my initial investigation illustrated the limitations of biomedical approaches to controlling Ebola and the potential contributions of a medical anthropologist to understanding and controlling Ebola outbreaks. The possible index case for the Mékouka outbreak was located, a possible new outbreak and its transmission patterns were identified, and local people were provided the opportunity to share their grief and possibly reduce their anxiety and anger.

Local people felt exploited or ignored by the international biomedical teams. Fierce competition prevented French and American researchers from sharing epidemiological data. Villagers experienced multiple blood draws and visits from the different teams without the teams reporting back or providing any compensation for the villagers. Team members did not show much compassion or empathy when they heard villagers speak of the loss of their loved ones. All of this convinced me that medical anthropologists can help to provide more humanitarian care during Ebola outbreaks.

Finally, this short trip revealed an inconsistency in how people explained Ebola and how they actually behaved during the outbreak. Sorcery cannot be transmitted by physical contact; it has to be sent. Accordingly, we expected to find no general aversion to physical contact with disease victims, but during the outbreaks, local people reported that only close family members cared for the sick; nonfamily members were reluctant to care for or touch victims.

The short field experience opened my eyes to several issues. It was a scary experience at the time and was emotionally draining, but it also demonstrated the potential for anthropological contributions to Ebola control. The chapters that follow provide more systematic research and details of the roles of medical anthropologists during active outbreaks.

WHAT IS CULTURE?

We use the concept of culture frequently in framing our understanding of Ebola and other epidemic diseases. In this book, we define *culture* as knowledge and behaviors transmitted and acquired through social learning. Major components of culture include habits and practices; knowledge and schema; technology and artifacts; and institutions (economic, educational, political and social). Our view emphasizes that culture is both "in the mind" (Geertz 1973) and a "provider of

FIGURE 1.6 Acholi healer

settings" (Whiting 1988). It has both mental and public representations (Shore 1996), and it has both cognitive constructs and public artifacts (Sperber 1996).

An understanding of culture is essential because it dramatically impacts how we think and feel. It patterns how we think by placing such things as foods and illnesses into social space and categories of meaning (e.g., what foods to eat or what not to eat, what is a serious illness and what is not, what causes illness and how should it be cured). Do you like to eat termites? Caterpillars? Guinea Pigs? Most North Americans would say no because these creatures culturally fall into the insect or pet categories, not the food category. In other parts of the world, they are categorized as food. While residing in the Central African Republic, we eat caterpillars with most meals during the rainy season and termites at the end of the dry season.

Culture also dramatically influences how we feel about the world. It not only patterns the foods we eat but also patterns how we feel about the foods we eat and the type of medical care we receive and feel is appropriate. Figure 1.6 shows an Acholi healer from Uganda with the objects she uses to attract spirits and cure

patients. How would you feel about receiving treatment from her? By comparison, imagine how the woman in the photo might feel if she were taken to an isolation ward run by the WHO physicians in yellow space suits. In both cases, feelings would run high because emotions are attached to cultural practices. Culture patterns emotional reality.

The think–feel processes of culture also generate ethnocentrism; once you learn and experience life in a particular way, you tend to feel it is better than other ways, especially those encountered in cross-cultural settings. Ethnocentrism is an inherent feature of culture; Euro-American people may be particularly intolerant of other cultures, in part because we usually speak one language rather than being multilingual, like most peoples of the world, but the processes of cultural transmission and acquisition lead to feelings of ethnocentrism in all cultures. The cultural frameworks of U.S. journalists pattern how they think and feel about what medical care or foods are best and appropriate. For example, they are often critical of how Africans eat "exotic" animals such as monkeys or gorillas or seek treatment from "witchdoctors," contributing to the spread of the disease. Their reports often depict Africans as ignorant and superstitious. Conversely, Central Africans often have strong negative feelings about the various western treatment options available to them.

Culture is not only in the mind; political, social, and economic structures and policies within the community and outside the community are socially transmitted and therefore cultural. They are part of the culturally constructed niche in which individuals live and make decisions. Access to resources (e.g., cash, hospitals), infrastructure (e.g., paved roads, formal education), and national or international policies (e.g., restricting travel) are just some examples of the political-economic structures that influence local peoples' responses to Ebola. This book presents the stories of local people along with our own observations to illustrate the impact of political and economic structures on efforts to control Ebola outbreaks.

Culture is also influenced by biology. For example, fear and a desire to protect children are common features of outbreaks in all parts of the world and are likely part of human biological nature. It is essential to consider how biology and culture interact if we are to obtain a holistic and realistic understanding of human responses to Ebola outbreaks.

KEY QUESTIONS

We initiated our research because we wanted to answer the following questions:

1. How do Africans think and feel about Ebola?
2. How do they explain the illness?
3. What knowledge do they have of other illnesses like Ebola?
4. Was Ebola a completely new disease to them?

As described, we know very little about how the people who experience these deadly outbreaks think, feel, and explain them.

5. How did local people actually respond to Ebola outbreaks?
6. What do people do when they observe several family members die within a few days of each other?
7. How do local peoples' views and responses to Ebola and the international teams' (e.g., the WHO) views and responses to the disease contribute to controlling or amplifying the outbreak?

   We also know very little about how local people respond to outbreaks. As described, most media reports of local peoples' responses in outbreaks suggest that African's beliefs and practices amplify the outbreak—for example, eating monkeys. They tend to assume that the international teams are the prime reason we are able to control Ebola outbreaks. Our early experiences with Ebola described in this chapter suggest that local people may do some things to help control the outbreaks and that some activities of international teams may have unintended negative consequences (e.g., not sharing data).

8. What do we know cross-culturally about human responses to rapid killing epidemics? Do cross-cultural commonalities exist that would enable us to generalize to future outbreaks?

This question emerged after we participated in two Ebola outbreak control efforts. While we were the first anthropologists to be involved with Ebola control, we wondered how our experiences with Ebola compared to other anthropologists' experiences and studies of epidemics.

ORGANIZATION OF THE BOOK

The book follows the sequence of our exploration and experiences trying to answer these questions. This chapter described the emergence of our interest in Ebola and our early field experiences in Gabon in 1997. Chapters 2–6 describe our two field experiences with the WHO in 2000 and 2003. Chapter 2 explains the ethnographic and applied medical anthropology toolkit we utilized during the outbreaks. This toolkit is adapted to Ebola outbreak situations because they are different from most anthropological and applied medical anthropology settings. Data are needed right away; usually it is not possible to live intimately with community members because of violence in the community or region, and it is not always clear who has or does not have the disease. Chapter 2 concludes by illustrating how anthropological theory influenced the selection of our research methods.

Chapters 3 and 4 focus on what we learned about local peoples' views and explanations of Ebola (see questions 1–6)—Chapter 3 presents research from the Uganda 2000–01 outbreak, the first time an anthropologist ever participated in Ebola control efforts, while Chapter 4 summarizes local peoples' views and explanations from Congo during the 2003 outbreak.

Chapters 5–7 examine data from several Ebola outbreaks. Chapter 5 focuses on the feelings and experiences of the healthcare workers who provided care to Ebola patients during three outbreaks (Democratic Republic of Congo 1995, Uganda 2000–01, and Congo 2003) and patients in the 2000–01 Uganda outbreak who survived the disease; both groups experienced pronounced stigmatization in their communities during and after the outbreaks.

Chapter 6 summarizes epidemiological and other data on how local people responded in the earliest (1976) and more recent Ebola outbreaks (e.g., Sudan 2005). Chapter 7 takes what we learn from all Ebola outbreaks in order to make recommendations for controlling future outbreaks. We evaluate what local people and international teams did during the outbreaks that helped control the spread of Ebola and what both groups did that increased the spread of the disease (i.e., questions 7–8).

After we participated in the control of Ebola outbreaks, we wanted to understand and explain why people do what they do during outbreaks. Chapter 8 examines cross-cultural and historic studies of human responses during outbreaks of various infectious diseases and presents a biocultural model to explain cross-cultural patterns (see question 9).

The final chapter considers the broader policy implications of our work. What should the role of anthropologists be during future outbreaks of Ebola or other potentially high mortality diseases, such as bird flu? Our Ebola story ends with a discussion of the implications of our study for understanding bioterrorism and a potential bird flu pandemic. While writing this book, we discovered that Ebola is recognized as a bioterrorist weapon. Millions of dollars are spent every year to prevent bioterrorism, but we found that anthropologists have not been involved in trying to prevent attacks or in planning how to respond if an attack occurs. Likewise, as we are writing this book, there is a global concern about a potential epidemic of bird flu that has a case fatality rate similar to that of Ebola. We examine our current understanding of human responses to bird flu and compare it to our studies of Ebola.

The book aims to (1) provide stories, perceptions, and feelings about Ebola from the local peoples in Africa who suffered and experienced this devastating disease; (2) illustrate ways in which medical anthropology research can be incorporated into efforts to control Ebola outbreaks; and (3) understand and explain cross-cultural human responses to killer epidemics such as Ebola.

WHAT'S NEW?

What we did in the field is not new in anthropology. The methods and theoretical frameworks that guided data collection are standard operating procedures in cultural anthropology. However, the topic, results, and analysis are relatively new. Since we were the first anthropologists to be invited to participate in Ebola control efforts, ours is one of the first systematic studies to report on how local people in Africa think, feel, and respond to Ebola. Second, it is one of the

few systematic studies to examine human behavior during an active killer epidemic (for exceptions see Nichter 1987, Coreil 1980). Anthropologists, especially those in the early 1900s, observed epidemics and provided descriptions of local responses to epidemics, but the data are limited since the epidemics were not the focus of their research. Disease epidemics are major events that shape human history, and this study provides one of the few glimpses into the nature of such events. Finally, the cross-cultural analysis of rapid-killing epidemics and the explanatory biocultural model presented in Chapter 8 are new. We try to provide a unique, holistic, and integrative view of human responses to killer epidemics.

TERMINOLOGY

Finally, a few notes on terminology. *Ebola* is used to refer to what is more precisely called ebolavirus or Ebola hemorrhagic fever (EHF). We use *Congo* to refer to the Republic of Congo and refer to the Democratic Republic of Congo, formerly Zaire, as DR Congo. The term *whites* is sometimes used in the book because local people in Africa use this term (e.g., *mundju* in Congo and *muzungo* in Uganda); people use this term to refer to a broad range of peoples from outside of Africa and is not limited to Europeans or Americans.

We tried to keep the number of medical terms to a minimum but use a few. The *index case* is the first person in an outbreak to acquire the disease. A *contact case* is someone who had regular contact with someone with Ebola. Contact cases are usually followed (i.e., healthcare workers go to their home every day to see if they have any symptoms) for twenty-one days, which is the incubation period for Ebola. We sometimes use the term *nosocomial* to refer to Ebola transmission that takes place in the medical setting, such as the hospital or clinic, often due to nonsterile conditions (e.g., reuse of syringe needles or lack of protective gear for nurses or surgeons).

We also limited the use of acronyms but often use "WHO" for the World Health Organization based in Geneva, Switzerland, and "CDC" for the Centers for Disease Control and Prevention in Atlanta, Georgia.

Finally, we prefer to use the term *healer* to refer to what are often called "traditional healers" or "witchdoctors." The term *traditional* gives the impression that healing practices never change, and the term *witchdoctor* gives the impression healers only treat sorcery. Africans tend to use one term (*nganga* in Congo, *ajwaka* in Uganda) to refer to all who heal, including those who cure sorcery, cure with herbs, help with childbirth, set bones or give injections of antibiotics or other medications. We chose to remain close to African usage. Biomedical nurses and physicians also fall into the local conceptions of "healer" but are referred to in this book as healthcare workers.