SWEET WATER: LOCAL PERCEPTIONS OF GUINEA WORM IN TCHETTI, BENIN

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Omi ni dze aye a

(Water is the source of life)

Goutte à goutte l’eau remplit la jarre

(Drop by drop water refills the jar)

La Jarre Trouée¹

La jarre trouée ne pourra jamais garder
de l’eau.
Unique jarre, la jarre percée,
Nous avons tous le sang commun
Et comment faire pour trouver de l’eau à boire ;
Il faut nous dépêcher pour boucher la jarre trouée.
Béninois venez, venez de tous coins ;
Bouchez la jarre trouée.
Ecoliers venez, venez de tous coins,
Bouchez la jarre trouée ...

The Jar with Holes

The jar with holes cannot hold water
Unique jar, pierced jar,
We all have common blood.
And how to find drinking water;
We must quickly cork the holes in the jar.
Beninese come, come together
Cork the jar
Students come, come together
Cork the jar ...

¹ This song is taught in primary schools throughout Benin. Several informants told me the jar represents Benin. It is a calling for all Beninese to work together for the benefit of the country. An image depicting several hands holding a jar with holes is a widespread symbol throughout the country.
## CONTENTS

### Acknowledgements

<table>
<thead>
<tr>
<th>Acknowledgements</th>
</tr>
</thead>
<tbody>
<tr>
<td>v</td>
</tr>
</tbody>
</table>

### Prolegomenon

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guinea Worm in Benin</td>
<td>1</td>
</tr>
<tr>
<td>Transmission and Prevention</td>
<td>2</td>
</tr>
<tr>
<td>Project Focus</td>
<td>3</td>
</tr>
<tr>
<td>Methodology</td>
<td>4</td>
</tr>
</tbody>
</table>

### Tchetti

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Sketch</td>
<td>8</td>
</tr>
<tr>
<td>Guinea Worm Situation</td>
<td>10</td>
</tr>
<tr>
<td>Water Situation</td>
<td>11</td>
</tr>
</tbody>
</table>

### Water

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitality</td>
<td>14</td>
</tr>
<tr>
<td>Insufficiency</td>
<td>15</td>
</tr>
<tr>
<td>Accessibility</td>
<td>17</td>
</tr>
<tr>
<td>Salty vs. Sweet</td>
<td>18</td>
</tr>
<tr>
<td>Potability</td>
<td>20</td>
</tr>
<tr>
<td>Adaptation</td>
<td>22</td>
</tr>
</tbody>
</table>

### Religion

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Vodù</em></td>
<td>24</td>
</tr>
<tr>
<td><em>Vodù</em> and Rainwater</td>
<td>25</td>
</tr>
<tr>
<td><em>Gris-gris</em> and Guinea Worm</td>
<td>26</td>
</tr>
<tr>
<td>Sorcery and Guinea Worm</td>
<td>29</td>
</tr>
</tbody>
</table>

### Dirt

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dirt and Water</td>
<td>31</td>
</tr>
<tr>
<td>Dirt and Guinea Worm</td>
<td>32</td>
</tr>
<tr>
<td>Chapter</td>
<td>Title</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>6</td>
<td>Guinea Worm</td>
</tr>
<tr>
<td></td>
<td><em>PEVG Initiatives</em></td>
</tr>
<tr>
<td></td>
<td>Symptoms</td>
</tr>
<tr>
<td></td>
<td>Varieties</td>
</tr>
<tr>
<td></td>
<td>Treatment and Cures</td>
</tr>
<tr>
<td></td>
<td>Causation</td>
</tr>
<tr>
<td></td>
<td>Worms in the Blood</td>
</tr>
<tr>
<td></td>
<td><em>Kôkôrô</em></td>
</tr>
<tr>
<td>7</td>
<td>Filters and Filtering</td>
</tr>
<tr>
<td></td>
<td>Filtering Practices</td>
</tr>
<tr>
<td></td>
<td>To Filter or Not to Filter</td>
</tr>
<tr>
<td></td>
<td>Filtering Acceptance</td>
</tr>
<tr>
<td></td>
<td>Filter Reinterpretation</td>
</tr>
<tr>
<td>8</td>
<td>Stigmatization</td>
</tr>
<tr>
<td></td>
<td>Poverty and Guinea Worm</td>
</tr>
<tr>
<td></td>
<td>Quartier <em>Categorization</em></td>
</tr>
<tr>
<td></td>
<td>Age and Gender Issues</td>
</tr>
<tr>
<td>9</td>
<td>Discussion</td>
</tr>
<tr>
<td></td>
<td>Transmission</td>
</tr>
<tr>
<td></td>
<td>Summary</td>
</tr>
<tr>
<td></td>
<td>Cultural Creolisation</td>
</tr>
<tr>
<td></td>
<td>Concluding Remarks</td>
</tr>
<tr>
<td></td>
<td><strong>Literature</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Appendices</strong></td>
</tr>
<tr>
<td></td>
<td>Map of Benin</td>
</tr>
<tr>
<td></td>
<td>Map of Tchetti</td>
</tr>
<tr>
<td></td>
<td>Table 1 and 2</td>
</tr>
<tr>
<td></td>
<td>Table 3 and Graph 1</td>
</tr>
<tr>
<td></td>
<td>Photographs</td>
</tr>
<tr>
<td></td>
<td>Glossary</td>
</tr>
</tbody>
</table>
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This paper is a product of a lifetime of events which have lead me to this point. My ongoing interest in health, education and other cultures resulted in my attendance of the AMMA (Amsterdam Master's in Medical Anthropology) program at the Universiteit van Amsterdam. Countless people along the way have given me inspiration, encouragement, and motivation to complete this endeavor. I am indebted to a great many.

I am always astounded by the generous hospitality of the Beninese. People in Tchetti went above and beyond to make our (my colleague and I) stay a pleasurable experience. I am grateful to all who took the time to respond to my infinite questions about water, dirt, filters, Guinea worm disease and other related topics. Specifically, I would like to express my gratitude for the consistent help of my assistant, Tchakibou Baksoul. His assistance was indispensable for the research. He proved to be both a loyal assistant and friend.

I am also thankful for the encouragement of my mother, Judith C. Fagan, throughout the AMMA program. As a professor in religion and culture her comments on the Religion chapter were most helpful. In addition, I am grateful for the constant support of my partner, Douglas J. Falen. As a sociocultural anthropologist specializing in Benin, he guided me throughout the research: finding obscure articles, confirming data, and accompanying me during several interviews. Last but not least, I would like to thank my advisor Sjaak van der Geest. He was not only willing to read and critique the several versions I wrote in the five-week time period, but also knew when to tell me to let it go and relax. Unfortunately it is impossible to acknowledge everyone here by name. To all the rest, thank you.
1. PROLEGOMENON

Dracunculiasis (Guinea worm disease) and poliomyelitis are the only two diseases that are part of a global eradication effort. Towards the latter part of the 1980s, both international agencies and national governments of endemic countries committed to Guinea worm eradication. (Brieger 1997: 99). Total eradication of Guinea worm disease has already occurred in all regions of the world apart from sub-Saharan Africa. To date, dracunculiasis remains in the following thirteen countries: Sudan, Nigeria, Ghana, Burkina Faso, Niger, Togo, Côte d’Ivoire, Benin, Mali, Uganda, Mauritania, Cameroon and Ethiopia. According to Hopkins et al. (2000: 163), the number of cases reported worldwide has reduced by more than ninety-seven percent between the years 1986 and 1998. International Guinea worm eradication agencies hope to achieve total eradication by the year 2002.

Guinea Worm in Benin

Benin has been Guinea worm endemic for over a century. In 1900, Brunet and Giethlen (1900: 42) documented that Guinea worm was prevalent on the coast of Dahomey¹. Today, Benin is in the final stages of the Guinea worm eradication process with 187 reported cases² for the year 2000 (WHO...2001:3). Based on national Guinea worm epidemiological reports, between January and May 2001 Benin reported thirty-eight cases. The majority of these reported cases are clustered in the Zou department (see Map 1). The department’s geophysical conditions contribute to the region’s high prevalence rate. The hardpan terrain makes it difficult to dig borehole wells³. Therefore, many endemic communities in the Zou do not have access to potable water sources (Chippaux et al. 1992: 73). The risk for Guinea worm disease is significantly higher in areas where there is no or limited access to potable water.

Peak Guinea worm transmission season in Benin is between the months of September and February. This time period corresponds with the rainy season. The rains collect in hollow land pits and create temporary ponds. Many people use these ponds as a drinking water source. Unprotected, stagnant drinking-water sources, such as these temporary ponds, are the origin for Guinea worm transmission.

¹ Benin was formerly called Dahomey.
² The number of actual cases may be higher than the number reported.
³ Borehole wells are hand-pump operated tube wells (Hunter 1997: 71).
Transmission and Prevention

A succinct description of the transmission cycle includes the following seven steps: 1) an infected person temporarily relieves burning pain by submerging his/her open Guinea worm wound in a community drinking-water source; 2) Guinea worm larvae are discharged from the wound into the water source; 3) intermediate hosts, minuscule crustaceans called cyclops, ingest the larvae; 4) non-infected persons drink the contaminated water containing the cyclops and larvae; 5) the human host digests the cyclops and the larvae sojourn in the abdominal muscles; 6) the Guinea worm matures and slowly migrates towards the lower extremities\(^4\); and 7) the worm secretes an acid-like substance, which creates a blister, and pushes through the skin. Once the worm emerges, the patient winds it gradually around a matchstick for several days or weeks until it expels entirely. On average, the transmission process takes approximately ten to twelve months. Secondary infections can be very painful, and infected persons may be incapacitated for several months (Bierlich 1995, Brieger 1997, Diamenua 1998, Hunter 1996, Périès 1998, Watts 1987).

Prevention methods include: educating and mobilizing the community to avoid entering water sources with an infected wound, chemically treating unsafe water with temphos\(^5\), providing safe drinking-water, and using household filters to remove cyclops from contaminated water (Akinsola 1997: 270). When feasible, Guinea worm-free water sources, such as borehole wells, pipe-water systems, enclosed wells, or community filter systems are constructed in endemic areas. Due to the expense, time and difficulty involved in constructing such water systems, the international eradication program sees individual filters as a quick, cheap, and easy way to ensure that all endemic populations have access to Guinea worm-free water. For several years international agencies have donated monofilament nylon filters to all endemic countries (Olsen et al. 1997: 449). In Benin individual households in all endemic zones receive complementary nylon mesh filters. The Guinea worm program educates community members about the transmission cycle and proper filter use and instructs persons with emerging worms to avoid entering community drinking-water sources.

As stated above, the majority of reported cases in Benin are in the Zou department. To achieve countrywide eradication, Benin’s national Guinea worm

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\(^4\) Ninety percent of cases emerge from the leg or foot.

\(^5\) Temphos is a chemical added to unsafe drinking water sources. It eliminates the vector thereby halting the transmission cycle.
program, *Programme d'éradiation du ver de Guinée (PEVG)*, must focus on endemic regions in the Zou. To implement effective eradication strategies in this region, a deeper understanding of the complex issues revolved around perceptions of Guinea worm disease and filter use is needed. Périès *et al.* (1998: 407) assess that, “Future programme interventions and evaluations will need to focus not only on the effectiveness of intervention strategies, but also on the awareness and practices of communities, which will address problems such as the non-utilization of provided filters, or the preference for pond water over clean water from a protected source.”

After seven weeks of field research in an endemic community in the Zou department, I have attempted to address such issues.

*Project Focus*

While working with the Guinea worm eradication program in West Africa from 1996 to 2000, I noticed certain individuals in endemic regions failed to consistently filter non-potable drinking water. Bermejo and Bekui (1993: 1145) reason that, “The cultural perception of disease causality will have a major effect on the health behavior of people.” Before entering the field, I suspected local notions of Guinea worm disease and disease transmission directly affect perceptions of Guinea worm filters and filter use. Planning to use my own experience and Bierlich’s (1996) and Ward’s *et al.* (1978) research in Ghana as a basis, I initially proposed to examine local perceptions of Guinea worm disease and filters. In addition, I hoped to determine whether there is a discrepancy between local and healthcare workers’ perceptions of Guinea worm disease and filters, and if so, whether this affects filter use. The original aim of the study was to 1) explore in depth local perceptions and practices concerning Guinea worm disease and filters, 2) examine how these factors influence filter use, and 3) contrast these findings with Guinea worm healthcare workers’ perceptions.

I conducted the research in Tchetti, a Guinea worm endemic community in the Zou department of Benin. While working in Tchetti, I extended my focus to include perceptions and practices concerning water. Conceptions of water are intertwined with perceptions and practices relating to Guinea worm disease and filters. This is an apparent connection considering Guinea worm is a waterborne parasitic disease. Tchetti is a predominately agrarian society, yet many residents lack permanent access to water. Water is an integral part of the society and its subsistence. The Iše proverb *omi ni dze aye a* ‘water is the source of life’ illustrates this well. The juxtaposition of
the necessity of water and the deficiency of water in Tchetti create a focal point in community member’s lives. As a result, I thought it necessary to incorporate the aspect of water into the research.

In addition, I extended the comparative component to include not only Guinea worm healthcare workers but also people living in non-endemic zones. Central Tchetti is comprised of distinctive endemic and non-endemic quartiers ‘localities’. The endemic situation in Tchetti constructs a social division between endemic and non-endemic localities within one single community. Therefore, my final aim was broadened to explore in-depth local perceptions and practices concerning water, Guinea worm disease, and filters. In order to do this I looked at: 1) meanings, symptoms and signs people attach to the indigenous terms used for Guinea worm disease, 2) what is considered to be safe drinking water, 3) measures people take (if any) to prevent Guinea worm disease, 4) whether people consistently filter unsafe water, 5) local notions of Guinea worm disease and disease transmission and how they relate to perceptions of filters and filter use, 6) local perceptions of filters and how they affect filter use, and 7) the contradistinction between the perceptions and practices of persons living in an endemic locality with both persons living outside an endemic locality and Guinea worm health care workers.

Methodology

There are few studies concerning local perceptions of water, Guinea worm disease and filters in West Africa. Both Bierlich (1995) and Ward (1978) conducted research on indigenous notions of Guinea worm in Ghana. In view that no information was available in the Beninese context, I conducted an exploratory study. To gain triangulation, I contrasted the perceptions of people living in an endemic zone with the perceptions of people living in a non-endemic zone. In addition, I compared local perceptions with Guinea worm healthcare workers’ perceptions. Hence, the overall study was exploratory with a comparative component.

Miranda van Reeuwijk, a Dutch colleague who conducted research on children’s perceptions of dirt, hygiene and disease transmission, accompanied me to the field. Two months prior to our arrival, I contacted a Beninese friend who offered to secure housing for us. Within days of our arrival, we moved into a three-room cement house in the quartier of Attiba in Tchetti. This enabled us to start working immediately, which was essential considering we only had seven weeks to conduct our fieldwork. Many anthropologists spend one to two years in the field; seven weeks
is an extremely limited amount of time to collect ethnographic data. However, I have lived and worked in West Africa, including Benin, for over four years. For eight months, I worked as consultant for PEVG in the Zou department of Benin. I had already visited all endemic communities within in the Zou (including Tchetti) and briefly spoken with residents and local PEVG staff about Guinea worm disease and filters. Before the fieldwork, I was already familiar with Guinea worm disease in Benin and somewhat familiar with Beninese culture. My research interests stemmed from my previous work. As a researcher, I hoped to apply what I learned as a consultant for PEVG using ethnographic methods to comprehensively look into local notions of water, Guinea worm disease, and filters within one community. My previous experience in Benin aided my research; otherwise, I would not have been able to go into such depth in seven weeks time.

I collected data over a period of seven weeks from 14 May to 3 July 2001. Data collection included a combination of participant-observation and ethnographic interviews. Observations of practices were compared to people’s own statements of their behavior and their reports of others’ actions. I compared data regarding people’s perceptions of water, Guinea worm disease, and filters to actually occurring events, such as water selection, prevention methods, and filter practices. I found that the in-depth interviews provided detailed information while the infinite number of informal interviews filled in the gaps and created an overall picture.

Due to the fact that I lived in Tchetti, I conducted many informal interviews. Essential places to collect data were the community borehole well, drinking water ponds, and homesteads. For example, two or three times a week I would wake at six in the morning and walk to the ponds, located on the outskirts of Tchetti, where women collect water. There I would talk informally to people about issues concerning water, Guinea worm and filters. In addition, I gained a wealth of information through casual conversations in a more social context. I found the hairdressers to be an excellent setting to collect information. Women spend hours having their hair braided. As they sit patiently, friends often gather and gossip about the latest news. I would hang around at the hairdressers and ask women questions about my research topic. People were often interested in my work and why my colleague and I were living in Tchetti. Once I explained the focus of my research,

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6 I previously lived in Abomey, which is mostly comprised of the Fon ethnic group; however, Tchetti is predominately Ifé. My past experience with the Ifé ethnic group was in Atakpamé, Togo.

7 Note that throughout this paper I differentiate between interviewees and informants. Interviewees refer to persons participating in an ethnographic interview and informants refer to persons offering information via informal interviews and/or conversations.
people were always willing to offer their thoughts. One night at a dinner party I asked a group of persons what they thought about the cause of Guinea worm. The nine people present launched a heated debate about *diakpa* 'Guinea worm' for about thirty minutes. These informal settings were indispensable for my research.

To complement the data collected during participant-observation, I conducted eighteen ethnographic interviews: twelve in endemic localities, four in non-endemic localities, and two outside Tchetti. Although emphasis was at the community level, I conducted two in-depth ethnographic and two brief interviews with members of the PEVG staff to gain a multi-level perspective. I used purposeful sampling techniques to select interviewees. To incorporate maximum variation, I selected a range of persons including males and females and formally educated and illiterate individuals. The interview sample included eight males and ten females. The age range was between fifteen and seventy-five with an average age of forty-three. Education varied from no formal education to university level.

All ethnographic interviews were conducted in the interviewee’s home. Since the research corresponded with planting season, most persons were occupied during the day. Therefore, interviews took place in the early morning or late evening. Prior to all interviews, I 1) explained the nature of the study, 2) obtained informed consent, and 3) discussed confidentiality and anonymity. Interviews ranged from approximately twenty minutes to two hours. Recorded on audiocassette, interviews were summarized in English within twenty-four hours and later partially transcribed in French.

In this text, I use italics for the original word or phrase and single quotation marks for my translated version. I eschew from using double quotation marks to assure that the reader understands that my translated version may vary from the original. I take pains to translate as close to the original text as possible; however, personal interpretation always plays a role in translation.

I originally intended to interview persons with direct and indirect Guinea worm experience. I planned to include both persons who were personally infected and persons who indirectly experienced the disease through family members or friends. However, all persons interviewed in Tchetti had personally experienced Guinea worm at some point in their lifetime. At first, I proposed to conduct a small group discussion towards the end of the research, using my preliminary findings as a topic list. Instead I conducted several informal group discussions in the course of the research concerning findings that were unclear.
I anticipated working with two assistants who spoke the local languages and French. Knowing beforehand that the research coincides with planting season, I expected the assistants to be preoccupied with cultivation activities. I planned to distribute the workload between the two assistants, thus limiting their time away from their main activities. However, this was not an issue. The assistant I worked with, Tchakibou Baksoul, is a contract painter and artist and was readily available.

I expected Tchak to primarily act as a translator. However, as a link to the community, he took on an assistant-type role. I explained to him in detail my research goals, the ethnographic interview processes and focus group discussion techniques. Interviews were conducted in Ife, Fon, Hausa and French. As a French and Hausa speaker, I was able to conduct some of the interviews directly. However, I was thankful to have Tchak’s assistance with all interviews for the translation of culturally related subtleties. Periodically, I was stumped due to a language barrier. When such a situation arose I continued to ask questions until I was satisfied that I understood. As an anthropologist working in a different culture and language, an essential aspect of my work was to observe, absorb, ask, and attempt to create an interpretative meaning of the experience. My findings are a conglomeration of these actions that took place during the fieldwork.
2. **Tchetti**

In the following section I give a brief introduction to Tchetti followed by an explanation of the Guinea worm and water situation in the community. In the back of this paper I have included several appendices including: maps of Benin and Tchetti, quantitative tables of the Guinea worm and water situation in Tchetti, and a glossary. The map of Tchetti was designed by my assistant Tchak and indicates major water sources within the community. Although it is written in French, it can be easily read in conjunction with the glossary. The maps and tables in the appendices complement this chapter describing Tchetti.

**Community Sketch**

Tchetti is located in the northeastern section of the Zou department. It is part of the subprefecture of Savalou, which is thirty-eight kilometers to the east of Tchetti. Tchetti and its surrounding area consist of roughly 300,000 inhabitants while central Tchetti’s population is approximately 14,000. Central Tchetti is five kilometers from the Togo border. The town is nestled between three large rocky hills: Montagne Nànàgbédé, Colline d’Osikpi, and Montagne d’Attiba. Residents often refer to Tchetti as le foyer ‘traditional cooking stove’. Throughout West Africa, people prepare food by creating a wood or charcoal burning fire between three rocks and positioning an iron cooking pot on top of the rocks. The three rocks used for a traditional cooking stove resemble the three rocks surrounding Tchetti.

Residents explain that the original inhabitants of Tchetti were Ifé. According to I.A. Akinjogbin (1967: 12) the Ifé originated from the Yoruba region in Nigeria and slowly migrated northwest into areas such as modern-day Tchetti. Village elders claim that during the reign of Behanzin, the Fon ethnic group conquered the Ifé in Tchetti. The elders claimed that residents who were not killed fled to the Atakpame region in Togo, about eighty-five kilometers southwest of Tchetti. Today, some Ifé feel animosity towards the Fon. One informant regularly complained, ‘You cannot

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8 Figures are based on the 1996 consensus conducted by the subprefecture in Savalou.
9 In this text, Tchetti refers to central Tchetti unless otherwise specified.
10 This translation is based upon the context in Francophone West Africa.
11 Behanzin was the king of Abomey from 1891-1894. He is famous for his attempt to keep the French rule out of Dahomey (Argyle 1966: 52).
trust the Fon’. It seems probable that this acrimony stems from the history between the two ethnic groups.

At present, the majority of residents in Tchetti are still Ife. However, many outsiders have migrated to Tchetti. One informant explained that outsiders settle in Tchetti because farmland is available and relatively inexpensive compared to more populous areas such as Abomey and Bohicon. The main crops in the area are: yams, cassava, corn, beans, groundnuts, cashews, and cotton. Palm oil and mango trees are abundant, as well. New comers buy large plots of land, grow crops, and sell the produce to areas where prices are more costly. In consequence, there are a considerable amount of grand camions ‘lorries’ in Tchetti parked in front of the owner’s yard waiting for the next harvest.

Although the Ife dominate, Tchetti is now a mixture of several ethnic groups. The language Ife, a derivative of Yoruba, is spoken throughout Tchetti and its surrounding area. Other indigenous languages include: Hausa, Fon, Kotokolé, Dendi, Yoruba and Fulfulde. In addition, all formally educated persons speak French, the official language in Benin.

Healthcare facilities in Tchetti consist of a government-run health center equipped with a maternity ward, three private health clinics, a multitude of traditional healers and diviners, a biomedical pharmacy, and an herbal pharmacy. Health education messages are often aired on the community radio. Kokoko Saliou, the director of one of the private health clinics, broadcasts health messages in local language on the radio twice a week. His clinic is quite popular as he claims to practice both biomedical and traditional medicine. In addition to Kokoko’s health messages, Guinea worm education messages are broadcasted regularly. I rarely listened to the radio while working in Tchetti; however, I happened to hear the Guinea worm message twice. The community radio station’s air coverage includes many highly endemic communities in both Togo and Benin; therefore, both Benin and Togo’s national Guinea worm eradication programs donate money to Tchetti’s radio station to air these messages.

Although Tchetti is a moderately sized town, the community has no access to running water or electricity; however, there is telephone communication. A public telephone booth was installed in March of this year at the main crossroad in town. My colleague commented that the telephone is positioned where one usually finds a church in a small European town. Although the crossroad appears to be the center of town, the heart of Tchetti still lies in the quartiers Kököberi and Ngbenou, the autochthon section. This is where is king’s palace is located.
Tchetti has a political administration comprised of a mayor and eight delegates, one from each locality. In addition, there is a traditional royal court. The king died six months ago in January 2001. There are two camps that have rights to the throne. According to one informant, there is competition and jealousy among the camps. He said that no one wishes to become king because the king lives in constant fear of being killed by the camp whose candidate did not win. Normally the names of the candidates are given to the royal family’s oracle and the oracle makes the final decision. At the moment, the king’s successor has yet to be selected.

Tchetti is divided into two communes: Lema and Tchetti. The main laterite road running east/west divides the two communes. The communes are further divided into quartiers ‘localities’. The commune of Tchetti is comprised of five localities: N’gbenou, Tchoundja, Kokogberi, Attiba and Elavagnon\(^\text{12}\). Lema contains three localities: Lema, Zongo and Carré. Each locality has distinctive characteristics. For example, people commonly refer to Kokogberi, Tchoundja and N’gbenou as the autochthon inhabitants of the commune of Tchetti. These localities are predominately Ifé. In contrast, Zongo\(^\text{13}\) is the largest and more recently developed locality. It is a mix of Hausa, Kotoko!, Ifé, as well as other ethnic groups. I will later go into more detail about the social distinctions among the localities in the Quartier Categorization section. In addition, to social differences, the localities vary geophysically. One of the three hills, Montagne d’Attiba, abruptly borders the northern side of Kokogberi, N’gbenou, and Tchoundja, localities; in consequence, there are few wells in the area. Whereas, Zongo is situated further from the hills and has a higher percentage of wells compared to other localities. The geophysical conditions of each locality affect its access to water and Guinea worm endemicity.

**Guinea Worm Situation**

Benin is approaching countrywide eradication; however, Tchetti remains Guinea worm endemic. In March 2001 there was a sudden increase of cases in the area. Local Guinea worm staff reported four indigenous cases in Tchoundja and N’gbenou. Comparatively, there were no cases reported in Tchetti for the month of March in 1999 or 2000. Overall, Tchetti reported fifteen cases for the year 1999 and seventeen cases in 2000. Although the number of reported cases in Benin continues to significantly decline, the number of cases in Tchetti is increasing.

\(^{12}\) Elavagnon is sometimes referred to as Oureoufè.

\(^{13}\) Zongo is a Hausa term meaning hamlet or small exterior village.
Increasing reported cases might indicate an increase in actual cases or an increase in surveillance. In February, PEVG installed a new local Guinea worm staff member in Tchetti. PEVG staff in Tchetti now consists of eight village volunteers (one for each locality), two commune coordinators (one for each commune), and the newly installed local supervisor. Outside of Tchetti, PEVG staff includes a supervisor at the subprefectorial level, a supervisory team at the departmental level and a supervisory team at the national level. Although Tchetti has a well-equipped staff, Guinea worm cases continue. Several factors such as an insufficient water supply and nearness to highly endemic communities contribute to Tchetti’s endemism.

Due to Tchetti’s rocky terrain, the community has limited access to potable water. The land consists of mostly solid rock making it intractable to drill water. The lack of potable water in the area increases the chance of Guinea worm. People without access to a safe water source often opt for pond water. To collect water from these sloping, shallow ponds, people must enter the water. This has serious implications knowing that infected persons who enter these ponds will contaminate the water. In consequence, people must filter unsafe water to prevent Guinea worm disease.

The community’s proximity to Togo also plays a significant role in the area’s Guinea worm prevalence. Tchetti is walking distance from highly endemic communities in Togo. Beninese and Togolese constantly travel between the two regions sharing farmland and drinking ponds. Throughout Benin, people’s farmland is often several kilometers from their home. Many families in Tchetti have farmland in Togo. Some people carry a safe water supply with them to the field; however, a large portion drinks from temporary ponds. When these ponds are located in highly endemic zones, the risk for Guinea worm is high.

**Water Situation**

When I asked both outsiders and residents what they thought of Tchetti, the most common response concerned the lack of water. A very popular phrase is, *il n’y a pas de l’eau à Tchetti* ‘there is no water in Tchetti’. Several governmental and non-governmental projects have previously attempted to drill for water without success. To date, Tchetti has one functional community borehole well. Financed by UNICEF, the borehole well was only recently installed this past April. According to a national UNICEF agent, they financed and drilled for three borehole wells but only one was
successful. Clearly, one borehole well is insufficient for a town with a population of 14,000.

Besides the one functional borehole well, there are two borehole wells that are currently broken. One broken ‘pump’ \(^{14}\) is located in the Lema *quartier* and the other on the outskirts of town off the main road towards Togo. Both non-functional borehole wells are over ten years old. Neither was operational during my stay in Tchetti. In addition to the borehole wells, there are two cemented traditional wells in Attiba and Zongo. Both wells are open to the public and free of charge. The public well in Zongo is located near the side of the main laterite road. People use this well for drinking water on a regular basis. However, this is not the case with the well in Attiba. The top of the well in Attiba is not covered and the water is laden with dirt and debris. According to the women who collect water from this well, people use it solely for washing purposes.

Due to the lack of community potable water sources, many people rely on household water supplies such as cisterns and traditional wells. Based on a household water assessment where Tchak and I went to every household in Tchetti and counted the number of functional wells and cisterns, less than twenty percent of all households have cisterns and/or wells.\(^{15}\) This is insufficient for the total population and many people rely on shallow ponds as a drinking water source.

Outside agencies recognize the water problem in Tchetti and are currently searching for alternatives. *Hydraulique* (the government’s water engineering program) has secured funds to install a *chateau d’eau* ‘water tower’ in Tchetti. The water source would derive from a town three kilometers from Tchetti; pipelines would then carry the water to Tchetti. The program demands a financial contribution by the community before proceeding with the project. The program has asked for a 5,000,000 CFA (6,993 USD) contribution, which is approximately six percent of 75,000,000 CFA, the total estimated cost. Counting that there are approximately 14,000 inhabitants in Tchetti, individual contribution is calculated at 357 CFA (0.50 USD) per person.

According to one *PEVG* member, so far, no money has been collected and the project remains halted. (S)he\(^{16}\) says Tchetti is capable of coming-up with the money, but the problem lies with the community’s *gestion* ‘administration’. I probed a little,

\(^{14}\) Although they are technically borehole wells, people in Tchetti refer to them as pumps. In this text I use the term pump synonymously with borehole well.

\(^{15}\) Twenty percent represents the maximum number of possible cisterns per household, considering several households have more than one cistern and/or well.

\(^{16}\) For confidentiality reasons, I use the (s)he form when referring to all *PEVG* staff members. Also, I do not explain whether the staff member is part of the national, regional, or local team.
but sensed that (s)he did not want to go into further detail. In contrast, a member of Tchetti’s administration informed me that the community is currently in the process of collecting the money.

Later on, another informant informed me that the community has tried to collect money for such a water project on three separate occasions and each time the money disappeared. ‘Someone ate the money’. He initially declared it was *étrangers* ‘strangers’ that came and took the money. In a more hushed tone with eyes diverting downwards, he later said it was also the ‘sons of Tchetti’ who stole. He explained that people are hesitant to give money again. At this point, I decided to drop the subject. I did not want any suspicions that I had ulterior motives to investigate the alleged water tower scandal, especially since it so closely ties to my research topic. My only interest in the water tower was to gain a deeper understanding of the water situation in Tchetti.
As I previously stated in the **Project Focus** section, conceptions of water and drinking practices are intertwined with perceptions and practices relating to Guinea worm disease. In this chapter, I focus on the conceptions of water and drinking water practices. I look at what meanings people attach to water, what people consider safe drinking water, and which drinking water sources people choose. As I will show, such factors as: local customs, accessibility, economics, perceived potability, and taste preference effect people’s conceptions of water and drinking water practices.

**Hospitality**

In Tchetti, as in other parts of Benin, water plays a significant role in social venues. When a guest is received, the host always offers a glass of water. Whether they wish to drink or not, the guest accepts the water out of respect for the host. Either they take a sip or pour a small amount on the ground for the ancestors. I learned this custom within days of my first visit to Benin. While working with PEVG, I was frequently offered potentially contaminated water in Guinea worm endemic communities. I was thankful that I could politely pour some water on the ground as an offering to the ancestors rather than drink it. I found this to be a way to avoid insulting the host without putting myself at risk for Guinea worm. A couple of the PEVG staff members confided in me that they also use the custom of offering water to the ancestors as a socially acceptable way to not drink.

However, others feel obligated to drink the water regardless of its source in order to please the host. One interviewee explains:

**Interviewer:** When is the last time you drank water from a pond?

**Interviewee:** About a month ago

**Interviewer:** You previously said that you have access to cistern water all year. Why did you choose to drink pond water?

**Interviewee:** If I am at a friend’s house, I cannot refuse to drink water because it is pond water.
This example demonstrates that drinking water practices are not solely dependent upon what people consider safe drinking water. Earlier in the interview, the interviewee told me that pond water is non-potable. Although she considered pond water unsafe, she drank it out of social obligation.

Brieger et al. (1990: 7) claim that in order to stop the transmission cycle people must not only filter water every time potential Guinea worm contaminated water is collected, but also ensure they do not drink unfiltered water when they visit friends and neighbors. This is a difficult task in Benin considering that it is a tradition to offer a guest a glass of water. As the above example illustrates, some people in Tchetti, who regularly drink water from Guinea worm-free sources, drink potentially contaminated pond water when it is offered to them.

After I completed my fieldwork in Tchetti, I went to visit a friend in Abomey before leaving the country. During our visit she told me, ‘You are not like the other Yovos (white people); you drink our water. Even after spending seven weeks in the field researching conceptions of water, I was taken aback by her statement. I asked her to explain what she meant. She said that most ‘white people’ she had encountered carry their own water supply at all times and never drink the water she offers. She said she immediately knew I was a simple ‘down-to-earth’ person the first time she offered me water and I accepted without hesitation. ‘You are like us because you drink the same water that we drink.’ I failed to mention to her that by the time I met her I had already adapted to the tap water in Abomey. I knew the water she offered me was relatively safe and I had no qualms drinking it. On the other hand, I do not drink water in Guinea worm endemic regions unless I am absolutely certain of the source. Regardless, my friend’s comment exemplifies the value of graciously accepting water in a Beninese home.

I have found that Beninese pride themselves on their generosity and hospitality. People offer their best to their guests. When people offer pond water to their guests it is because they have no access to a Guinea worm-free source.

**Insufficiency**

Because potable water is so scarce in Tchetti, it has become a commodity. As expected, wealthier residents have greater access to potable water. Persons with money can afford to install a well or cistern on their property. If a surplus amount of water exists, they can sell it to persons who do not have their own water supply.
Nearly all cistern owners I asked informed me water collected in the cistern during the rainy season does not last through the dry season. When the cisterns dry up, users must search for water elsewhere. One option is to buy water. Persons with wells or larger cisterns, sell water to persons without access. One interviewee told me she occasionally sells water from her personal cistern. The day before the interview she sold water to three women. However, in the afternoon she noticed the water level was getting low and planned to stop selling water until another heavy rainstorm. That morning another potential buyer came by in search of water and she refused to sell.

An informant collecting water at a temporary pond site told me that one basin of pump water costs about 15 or 20 CFA compared to 25 or 50 CFA for a basin of cistern or well water. She said the prices are even higher during the dry season. According to her, the reason people are willing to pay more for cistern or well water is there is no queue and therefore water collection takes less time. Tchak nodded and commented in English, “Time is money.” I later asked her why she preferred pond water to other options; she mentioned both time and cost factors. When I originally asked her if she by chance knew the price of pump water per basin she hesitated before answering. Knowing that people often feel obligated to give a response whether they are sure of the answer or not, I felt it necessary to ask others.

A Guinea worm staff member informed me that in principle water from the community borehole is not sold; it is free for all. (S)he says the supposed landlord personally gave 100,000 CFA towards the community’s contribution and now plans to sell the water until he is reimbursed. I later asked several women who collect borehole well water on a regular basis how much they pay. All said 10 CFA per basin. According to them the money is used to cover future repair costs, if needed. This cost is comparatively lower in contrast to the previously estimated 25 to 50 CFA for well and cistern water. In fact, prices for well and cistern water appear to vary from household to household and often fluctuate depending on the season. One woman claimed she paid 250 CFA for well water at the end of last years’ dry season. This is a considerable amount of money considering some persons in Benin live off less than 1,000 CFA per day.

As seen above, water choice depends upon the amount of time needed to collect water. When I asked persons who drink pond water why they choose not to collect water from the new borehole well, many expressed that the queue lines are too

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17 Habitually rainy season lasts from March to September and dry season lasts from October to February.
18 Based on current rates, 100,000 CFA is approximately 140 USD.
long. For example, an informant who collects water at the pond told me she prefers going to the pond because she does not have enough time to wait at the pump. She told a story of how one day she went to the pump to collect water. She arrived there in the morning and did not get water until the evening.

During the numerous mornings I spent at the community borehole well, I never saw a person wait in line for more than a couple of hours. However, I was told that the queues are longer in the heart of the dry season. During the dry season alternative water sources are scarce and more people rely on the pump for water. Another informant who regularly collects water from the borehole well estimated that she waits on average an hour in line for water. When the lines are exceptionally long, she heads for the pond rather than wait in line. Ogunniyi et al. (1990: 378) describes the same problem in a community in Nigeria. People complained that it took too long to collect water at the borehole well. They preferred their old water sources where there were no queue lines. One can reason that at least some people would choose to drink pump water if it was readily accessible.

As the above examples demonstrate, the lack of water in Tchetti affects people's drinking water choices. Economic and time factors both play a role in water selection. If pump, well, or cistern water is too expensive or takes too long to collect, people opt for pond water. Unfortunately, this in turn increases the chance for Guinea worm disease.

**Accessibility**

The selection of water is foremost dependent upon accessibility. On several occasions I noted that the hand pump of the newly installed borehole well was locked. When I initially noticed it was locked, I asked people in the vicinity when it is normally open. People responded that pump water is available all the time. I then asked if I could have some water and was told the pump’s propriétaire ‘landlord’ was working in the field and would be back in the evening. Knowing that it is planting season and the majority work in the fields from sunrise to sundown, I questioned whether the borehole well was locked often.

Based on my previous work with PEVG, I am well aware that both the Guinea worm program and the hydraulique program often preach to populations with newly installed pumps to keep them unlocked. According to a PEVG staff member, everyone should have access to water when they need it. ‘If the pump is locked, people are without safe water.’ The persons in Tchetti, who told me the borehole well
is available all the time, may have perceived this as a desired response. I gather that rather than giving an accurate account of what was going on, they told me what they thought I wanted to hear. I further investigated the pump situation to verify whether it was available all the time, as these people said, or was periodically locked.

On five other occasions I walked past the borehole well and noticed it was locked. One informant supposed it was because it had recently rained. 'When it rains no one is in need of water.' He said they lock it to ensure the children do not play with the hand pump and accidentally break it. I asked a woman, who collects water from the borehole well on a regular basis, about the locked pump. She said on occasion she goes to the pump in search of water and it is locked. When it is locked she proceeds to the pond. Hence, if one water source is unavailable people must choose another option.

In addition, water choice is dependent upon how distant the water source is from the user's home. A woman in the Lema quartier informed me she had been drinking pump water for years. However, within the past few months the borehole well in Lema went kaput. Rather than walking five minutes to the newly installed functional pump in N'gbenou, she now fetches water from a pond only 500 feet from her house. According to V.A. Illegbodu et al. (1991: 35), people in Nigeria who live far from a source of potable water are more likely to contract Guinea worm. People who live far are more likely to choose a potentially Guinea worm contaminated source which is nearby. Like the people in Nigeria, the woman in Lema opted for a potentially contaminated source because it was closer to her home.

**Salty vs. Sweet**

The taste of water also influences people’s drinking water choice. One morning during my first week in Tchetti, I walked through the Zongo quartier and stopped to chat with a Hausa woman who was in the process of collecting water from the public well. I asked her if she drank that water. She said she only used the water for washing because the well water has gishiri ‘salt’ in it. When she told me this I thought I misunderstood. I knew that gishiri was the word used for salt in Hausa, but I questioned whether it had an additional meaning that I did not know. I found it hard to believe that she was telling me the water had salt in it considering Tchetti is a five hours drive to the coast. She then invited me to her house and offered a plastic cup of rainwater collected in a cistern. She told me rainwater was drinkable because there
was no salt in it. This conversation proved to be the first of many about salty and sweet water.

I soon discovered that people refer to the taste of water as salty or sweet. Many people claim that pond water is douce ‘sweet’, whereas pump, cistern, and well water are salty. *L’eau douce* is commonly translated as fresh water. However, in this context, it is compared with salty water and is best translated as sweet water. *L’eau douce* is a French translation of the Ifé term *omi didô*, which is defined as sweet water.

A number of informants told me they prefer drinking pond water because they do not like the taste of pump water. Referring to other people’s perceptions, one informant argued that others prefer dirty water that tastes sweet in lieu of clean water that tastes salty. He says that for others dirt is less of a priority than the taste of the water. He claims people have been drinking dirty pond water for generations. ‘They are used to the dirty water.’ The dirt does not bother them where the salty taste of pump, cistern and well water does. Also, another interviewee argued, ‘Old women prefer pond water…the taste is the reason. The priority is not the dirt…it is the taste.’

After an interview where we discussed salty vs. sweet water, Tchak affirmed the interviewee’s comment that pond water is sweet. He professed that it tastes much better than other sources of water. He suggested I taste it. I really didn’t want to try it for myself and said I would take his word. I also mentioned that I could not taste the saltiness of the well and pump water and gathered I wouldn’t be able to taste the sweetness of the pond water as well.

A woman who was collecting water at a temporary pond told me she puts alum in the water to settle the dirt. She said, ‘The taste is not good but it is clean.’ Because the taste is unpleasant she only uses alum for water used in cooking preparation. When I asked what she does for drinking water, she said she filters the pond water with a Guinea worm filter. She said that the water is still murky after filtering but it does not affect the taste. ‘The water is still sweet.’

A couple of people living outside of Tchetti commented that all water in Tchetti is salty. A *zemidan* ‘motorbike taxi driver’ from Savalou asked me how I managed in Tchetti because the water there is salty. He suggested I buy a reserve of bottled water in Savalou to drink while in Tchetti. He explained that the tap water in Savalou is not salty because it is treated. In addition, a *PEVG* staff member also informed me the water in Tchetti is salty. (S)he argued that the salty taste is due to the minerals in the ground. (S)he said not all pump water is salty; it is only in certain geographical areas, such as Tchetti. I then asked a friend living in Abomey (a large
town located in the southern part of the Zou department) what he thought of people in Tchetti’s ideas of salty and sweet water. He agreed that pump water is salty and pond water is sweet. Just as the PEVG staff member, he also thought the saltiness was due to the minerals in the ground. He went on to say that salty water is better for you. ‘Salty water has no microbes in it.’

The notion of sweet water extends beyond Benin. Burghart (1988: 188) says that the Mathil people in Nepal believe that drinking water should taste sweet rather than bitter. Bierlich (1995: 506) briefly mentions that people in northern Ghana prefer sweet stream water to the bitter or salty well and borehole well water.

In Tchetti, some people mentioned the relationship between sweet water and Guinea worm disease. One interviewee held that Guinea worm is only found in sweet water. She said that pump water is salty and therefore has no Guinea worm in it. ‘Salt protects against maladies.’ Another interviewee makes a similar distinction: ‘Well water is different from pond water. Pond water is not salty...it is sweet and there are worms in it.’ Several other informants commented how salt protects against worms:

**Informant 1:** Salt prevents worms.

**Informant 2:** Because the water is salty the worms don’t go into the body.

**Informant 3:** The salt diminishes the worm.

Some people prefer the sweet taste of pond water to other sources. Some choose to drink pond water even if they believe it causes maladies because it tastes better. In the above examples, taste influences water choice. On the other hand, some people choose pump, well or cistern water despite of its taste because they believe it is potable. Ergo, perceptions of potability also influence water choice.

**Potability**

The type of water a person drinks can influence his/her perception of water and its potability. In many cases, I found that no matter which water source a person was drinking from (s)he considered it potable. Numerous people who drink traditional well or cistern water expressed that pond water is the only non-potable water. They claimed that pond water causes stomach problems whether it is filtered or not. On the other hand, they said they had never become ill from well or cistern
water. From a biomedical standpoint, it is feasible to contract certain waterborne maladies from both well and cistern water.

Some persons who have access to water outside of Tchetti perceive all water in Tchetti as undrinkable. Three informants and one interviewee, who obtain their drinking water outside of Tchetti, all said that water in Tchetti 'is no good' and causes *mal au ventre* 'stomach problems'. These four persons are similar in the sense that all live and work in Tchetti but originate from elsewhere. They all have the means, by vehicle or motorcycle, to collect potable water in large plastic containers on a weekly or bi-weekly basis. One informant claimed that he travels to the capitol, Cotonou, twice a month and brings back *l'eau propre* 'clean water' for drinking. I initially found this incredulous considering Cotonou is approximately a four-hour drive from Tchetti and there are plenty of potable water sources nearby; however, when I saw several large containers full of water in the back of the car when he returned from a weekend trip to Cotonou my suspicions were allayed.

In some cases, people believe pond water to be potable. Several informants with access to only pond water maintained that pond water is drinkable and causes no problems as long as you are used to it. One interviewee explained that he had been drinking pond water since he was a child and had never experienced any problems due to the water. He reported a story about a friend from Cotonou who visited him last year in Tchetti. Living in the capitol with access to tap water, his friend had never drunk pond water before. The interviewee said that during his friend's stay they drank pond water everyday. After a weeks time his friend fell severely ill with cramping and diarrhea. The interviewee accompanied his friend to the regional hospital in Savalou. According to him, the doctor said he was sick because he was not used to the water. Later on in the interview, he said that Yovo 'white people' counsel to avoid drinking pond water. He said, white people are not used to the water and become ill, but *Africains* can drink pond water without any problems. I then asked why his friend from Cotonou became ill, if all Africans can drink pond water without complication. After laughing and noting that I had listened to his story, he clarified that people who are not used to the water may become ill. In his view, pond water is potable, but only for persons who are used to it.

Although many who drink pond water believe it is drinkable, not everyone who drinks it thinks it is potable. An older man who drinks pond water explained that pump, cistern, well, and rainwater are all potable. When I asked about pond water he professed, *L'eau du marigot...ce n'est pas bon!* 'Pond water...it is no good!' He says he drinks pond water because there is no option.
In addition, Guinea worm education may influence people's ideas about potability. Several interviewees list pump, well, cistern, and filtered pond water as sources of potable water. For example one informant argued, 'Well, rain, and pump water are good. They are clean, potable waters. They do not cause maladies.' This notion may originate from the ongoing Guinea worm eradication messages in the community. PEVG explains that pump, well, cistern, and filtered pond water are Guinea worm-free. It is viable that people have interpreted this to mean that these water sources are potable.

Also, fresh water is perceived as potable water. An interviewee told me that she prefers drinking rainwater. 'Rain water is the most potable because it is fresh.' Five women gathered at the pond told me they prefer pond water because it is fresher than other water sources. An interviewee maintained that, 'Rainwater is the freshest, purest, and the best for you.' I asked him if he drank pond water and he said he refuses to drink it. He later explained that pond water is fresh but is also dirty. He prefers cistern water because it is both fresh and clean.

**Adaptation**

In general, there is an association with illness and maladaptation. After one week in the field, my colleague Miranda came down with a bout of diarrhea. Virtually everyone attributed her illness to the fact that it was her first time in Africa. Whether the cause was said to be the sun, the food, or the water, it was always associated with the fact that 'she was not well adapted'. Similarly, I tried to explain to a woman that I am allergic to cats. I explained that my eyes become watery and itchy and I sneeze. She responded by saying, 'you are not used to them'.

Notions of adaptation also apply to water. One Tchetti resident, who previously studied in France, explained that some people continue to drink pond water even though they aware that 'Guinea worm is in pond water'. He explained that changing a water source causes diarrhea. He said that people do not understand that the diarrhea will cease once they are habituated to the water. When he went to France he had a stomachache and diarrhea for a few weeks, which terminated once he adapted to the water. He claims the water in France is salty compared to the water in Benin. He blamed his diarrhea on the saltiness of the water. 'Salty water can cause diarrhea.' Once he got used to the salty water, his diarrhea stopped.

In Nepal Burghart (1988: 190) also found a connection between adaptation and water. He says, "A person’s well-being is threatened by drinking water from
sources to which he is unaccustomed.” In Tchetti, regardless of the water source, it may cause problems if the person is not well adapted. One interviewee said she switched from pond water to borehole water when the community borehole well was installed in late-April. She explained that borehole well water was causing diarrhea, stomach problems, and burning when she urinates. She expected that she would eventually adapt to the water and supposed that she would continue to drink it in the hopes that she would get used to it.

Water choice depends upon: 1) the perceived taste of a water source, 2) the perceived potability, 3) the amount of time needed to collect it, 4) how far the water source is from the user’s home, 5) how much it costs, 6) the availability of the water source, and 7) whether people are adapted to it. As I have shown, all of these factors are connected to the perceptions of water and drinking water practices. In addition to these aspects, religion also plays a role in perceptions and practices of both water and Guinea worm disease. The following chapter concerns this issue.
4. RELIGION

The ways people view Guinea worm disease is linked to ways people view religious orientation. In this chapter, I give a brief description of *vodu* in Benin and then describe the connection between *vodu*, perceptions of water, and Guinea worm disease.

**Vodu**

*Vodu* (pronounced voh-doon) is a Fon word. The French have variously used the terms *voodoo*, *vaoudou*, and *vodoun* to refer to the same practice. The term *Vodu* denotes a religious orientation practiced throughout Benin and surrounding parts of West Africa. It is both a group of practices and religious orientation towards the world. It encompasses such aspects as *Fá* divination, the preparation and utilization of *gris-gris*, sorcery, sacrifices to deities, and ceremonies.

*Vodu* is not practiced in isolation of Christianity and Islam. All three religious doctrines are integrated into Beninese culture. The presence of various religious traditions has created a pluralistic religious culture. Many persons in Benin fuse aspects from one tradition with another. This creolized version is created without conflict.

During my first stay in Benin, I was struck that many practicing Christians and Muslims also partake in *Vodu* ceremonies and consult diviners. I found this to be the same in Tchetti. For example, my assistant Tchak is a devout Muslim, but also consults the *Fá* divisier when he sees need. Referring to *Vodu* in an Ewe community in western Togo, J. Rosenthal (1998: 20) says that many city-dwelling Ewe are strictly Christian in the sense that they do not perform traditional *Vodu* ceremonies nor consult diviners; however, there are a larger number who practice both. She says: “Probably more numerous though, are Ewe who both attend church and take care of their family or village *Vodús*. They have *Afa* divination performed before making important decisions as well as for significant events such as birth, death, marriage, the purchase or sale of land, illness, and spiritu possession.” I will further explore the concept of religious creolization in the *Cultural Creolization* section.

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19 Originating from Ife, Nigeria, *Fá* divination is found throughout Benin.
In Benin, each region has its particular deities. According to the propriétaire ‘caretaker’ of Bûkùìù, who I interviewed in Tchetti, the most common deities in Tchetti include: Ògù ‘iron deity’, Ôtsümàrè ‘rainbow deity’, Àgbàfùììfùìì ‘python deity’, Àyèrà ‘thunder deity’, and Bûkùìù ‘rain deity’. He explained that the deity speaks to the ‘caretaker’ who then translates what the deity says. For example, if one falls ill, (s)he can go to the propriétaire, who will determine whether the illness was caused by sorcery. As I previously stated, Vodù and its practices are incorporated into Beninese culture. In the above example, it is connected to health and illness. In the next section, I will show how it is connected to water.

**Vodù and Rainwater**

As an agrarian based society, rainwater is essential for people’s livelihood. Not only do people depend on rainfall for farming purposes, but also as a drinking water source. During the rainy season the cisterns are filled, the ponds are abundant, wells are replenished, and even the borehole well is faster to pump. When a rainstorm occurs virtually every household puts large basins outside to collect water. The pouring rain muffles everyday sounds of town activity and one can hear the *tink, tink, tink* as the raindrops fill the metal basins. With this in mind, it is not surprising that rainwater and Vodù are connected.

There are Vodù taboos that deal with rainwater. In the Fon region, people say that during a rainstorm one should not directly use the rainwater that runs off from the roof. If someone breaks this taboo Xcvioso, the Fon deity associated with thunder, will become angry. In Tchetti, people say if you take a shower in the rain, Àyèrà, the Ifè equivalent of Xcvioso, will become angry. If people do not abide by certain social rules, the deities can be angered.

Bûkùìù, the deity associated with rain, is considered the supreme deity. In March, the time period before the rainy season, an annual ceremony is held in honor of Bûkùìù. This ceremony is called *oti odzo*. The literal translation for *oti odzo* in French is *boisson pluie* ‘rain drink’, but its meaning more closely resembles *fête du moisson* ‘harvest festival’. During *oti odzo*, the elders give offerings to Bûkùìù to ensure rain for the upcoming planting season. This year a cow was sacrificed on behalf of Bûkùìù.

A handful of informants told me the ceremony was not as grandiose this year. Many attribute the lack of rainfall this planting season to the subdued nature of this year’s ceremony. One evening after Catholic mass, a group of people complained
that it has not rained in Tchetti this year as it has in the past. One person mentioned the heavy rainstorm the night before which covered the surrounding area to the east of Tchetti but fell short by about one or two kilometers leaving Tchetti dry. He found it strange that the rain stopped immediately before approaching Tchetti. The group speculated that it was a sign that Bukūū was angry. Some say Bukūū's indignation is due to the fact that a successor to the recently deceased king has not yet been selected. Others blame the lack of rain on the recent case of incest.

In the above examples, rainwater is connected to Vodū. On occasion, Vodū practices are utilized for Guinea worm disease. I would never suggest that all persons in Tchetti connect Guinea worm disease to Vodū and its practices such as gris-gris and sorcery. However, it was mentioned by several persons and is worth acknowledging.

Gris-gris and Guinea Worm

Gris-gris is a French term, which is often translated as ‘amulet’ or ‘talisman’; however in Tchetti, it has a broader meaning. It refers to a power that can be used for both benevolent and vindictive purposes. One healer informed me that gris-gris are more powerful than sorcery because they can be used as protection against sorcery.

After three weeks in the field I went to visit a well-respected guérisseur ‘traditional healer’. Attached to the side of his house was a small cement room with a barricaded door. Tchak explained that it was the house of one of the Vodū deities. The guérisseur explained that he mainly treats four different types of illnesses: 1) If a woman is unable to get pregnant due to an insect in her stomach, he can kill the insect so she can have children. 2) If a person has a sleeping sickness, he can make a medicine so (s)he stops ‘turning’. 3) If a person falls ill because someone ‘made a gun gris-gris’ to cause him/her harm, he can remove the bullet from the stomach and treat the wound. 4) If a man26 ‘becomes crazy, but not too crazy’, he can treat him. I then asked if he knew anyone who treated Guinea worm disease. He replied that he is capable of treating it. He went on to say that people rarely come to him asking for a Guinea worm gris-gris but if someone wants it, he will go to their family and perform the ceremony. I questioned why it is rare that people ask for a Guinea worm gris-gris. He said, ‘Everyone knows you can avoid Guinea worm by filtering water.’ He later said, ‘People that do not have a gris-gris must filter water. There is a lot of information now telling people to filter water.’
The guérisseur then told me about the Guinea worm gris-gris. He said that ten years ago everyone in his family suffered from Guinea worm. He then ‘found a gris-gris for Guinea worm’. In this particular context, gris-gris appears to be more synonymous with ‘cure’. The guérisseur claimed that once he used the gris-gris, no one in his family has suffered from Guinea worm. He then explained to me certain aspects of the Guinea worm gris-gris.

In order to prepare the gris-gris, he killed and prepared a chicken. His family then ate the chicken except for ‘the parts that are not normally eaten.’ He explained that, ‘This is the part of the chicken that told the family things.’ The chicken part explained rules that the family must abide by to avoid Guinea worm. He then listed three taboos: 1) ‘Dirt that is in the water... pond water... can never be brought into the house.’ 2) ‘One should never eat palm nuts with grilled corn.’ 3) ‘One should not chew millet and spit it out.’ If the family follows these rules, they will never suffer from Guinea worm. If one of the taboos is broken by any family member, ‘the gris-gris will lose its power.’

A Guinea worm staff member told me that (s)he once convinced a guérisseur in an endemic zone to include as part of his gris-gris regimen that people must avoid drinking all unprotected water sources. (S)he said that some traditional healers who claim they have a gris-gris for Guinea worm are counterproductive for the eradication program. (S)he said that traditional healers need to promote drinking Guinea worm-safe water.

In December 1999 and January 2000, PEVG trained a group of traditional healers in endemic zones about Guinea worm education. No follow up has been done to investigate whether the healers incorporate the Guinea worm eradication message into their work. I asked the traditional healer whom I interviewed whether he participated in the Guinea worm training. He maintained that he never heard about it, yet part of his gris-gris is to avoid bringing pond water into the house.

Others also spoke of a Guinea worm gris-gris. After an hour interview with a man living in an endemic quartier, he told me he possessed a gris-gris for Guinea worm. He learned it from his father who was a traditional healer. He said that when he was twelve years old he suffered from Guinea worm and his father gave him the gris-gris. After ingesting the gris-gris drink, twenty-seven worms emerged at the same time. He says that after this experience he has no longer suffered from Guinea worm disease. He is not a practicing traditional healer, but says he knows how to make the Guinea worm gris-gris. Through word of mouth people come to him and ask for the gris-gris. I asked him how to make this Guinea worm potion. He laughed
and told me it was a secret. Later on he said one must drink the concoction as well as avoid eating beans for an entire year.

Another interviewee informed me that he knows a man that works for the subprefecture in the Borgou department of Benin who has a *remède* ‘cure’ for Guinea worm. He said he trusted the man because he is a government worker. ‘He is not a healer or a quack or anything...he works for the subprefecture and only makes the *gris-gris* for friends and family.’ The interviewee described that a few years ago he used to have Guinea worm on a regular basis. However, in 1997 he went to the man in Borgou for help. The man gave the interviewee a ‘gris-gris drink.’ According to the interviewee, ever since he drank the gris-gris, he has never contracted Guinea worm again. I then asked him if he still drinks unfiltered pond water. He proclaimed, ‘Yes, absolutely!’

One informant reported that he recently attended a meeting where the group spoke of a Guinea worm gris-gris. He declared that he refuses to believe that one exists:

> The only way to get Guinea worm is by drinking bad water. The only way a person can give another Guinea worm is when someone deceives you by offering you water and then telling you it is filtered water when in fact they know it has the worm in it.

He tried to convince the other members of the group. They agreed that people may willingly give others Guinea worm contaminated water, but they also insisted that an effective Guinea worm gris-gris exists. The informant said you can buy gris-gris for Guinea worm, but they are worthless.

The belief that a person may offer another contaminated water in an attempt to cause him/her harm is common throughout Benin. Therefore, people take precautions to avoid accusations. For example, after pouring water into a glass, the host often takes a sip before handing it to the guest. This way the host assures that (s)he will not be accused of willingly causing harm to the guest. Also, the guest is assured that the water is safe to drink or at least perceived to be safe by the host. Similarly, at restaurants and bars throughout West Africa the server always opens the bottle of soda or beer at the table in front of the patron. This concept not only deals with drinking but also ingesting medicines as well. Herscovits (1938: 274) describes a situation where a traditional healer tasted the medicines in front of the patient. He explains, “...when a dealer in magic sells something to be taken internally, he must first take some himself in the presence of the person to whom he sells his remedy, to
demonstrate that it is not poisonous.” In Benin, such acts, where one purposely causes another ill will, are often connected to sorcery.

**Sorcery and Guinea Worm**

Sorcery is a common topic of conversation in Tchetti. One boy claimed, ‘Sorcerers are all over Tchetti.’ On three separate occasions people told me that Benin is underdeveloped because of sorcery. If a Beninese starts to excel, the sorcerers become jealous and cause that person to fail. I once asked Tchak whether the community is aware of the identity of the sorcerers. He explained:

> There are people with four eyes. We can only see their two eyes, but with these other two invisible eyes they are able to see things. They can even see what is going on in the United States at this very moment. These people with four eyes can see who the sorcerers are.

During my questioning to interviewees and informants, some people spoke about the connection between sorcery and Guinea worm. One interviewee said: ‘You know it is sorcery when the person has the worm for more than three or four years in a row.’ A few people told me that if the person suffers from many worms at one time, it is sorcery. For example, one informant said that sorcerers have the capacity to amplify the suffering of Guinea worm disease. He argued, ‘If a sorcerer sees a person suffering from Guinea worm, he may turn the worm into several worms.’ He went on to explain, ‘If two people are quarreling and one says fine you wait and see...if you get many worms, you know that person was a sorcerer.’ After hearing this, I assumed that people associate multiple worms with sorcery because cases of Guinea worm with more than one worm are an anomaly in the area. *PEVG* does not record the number of worms per case; I was therefore unable to verify my supposition. Hunter (1996: 1403) explains that multiple infections are the norm. Persons may have two, three, or even more worms at one time. A field study in India showed that out of 800 cases, eighty percent of the patients had more than one worm. Whether or not cases with multiple worms are common in Tchetti is still unclear.

Another interviewee talked about sorcery and Guinea worm. She said, ‘Old people do not know that Guinea worm is in water; they think that someone else gave it to them.’ Further on in the interview I asked if she thought sorcery could cause
She said, ‘No, but others think so.’ She went on to explain that sorcerers cause other maladies such as malaria. Her reasoning was, ‘...there is no other explanation for malaria so it must be sorcery.’ As we were finishing the interview I asked if there was anything else she would like to add. She began, ‘Well, there is the red worm...’ She said when she was a small child she saw a person with a red worm. According to her, the red worm lasts a long time and is very painful. She supposed that the red worm is probably caused by sorcery. I then asked again if she thought sorcery could cause ‘normal’ Guinea worm. She clarified, ‘No, the white ones come from water; only the red ones are caused by sorcery. I will go further into detail about the red worm in the Varieties section.

Additionally, I asked people how one treats a case of Guinea worm that was caused by sorcery. One interviewee informed me that it must be treated with a gris-gris. He also said, ‘If you don’t know the person who is vexing you, you can go to the Fá and he will tell you.’ Another informant said, ‘When you make a gris-gris the worms in the blood die. The gris-gris has more power than the worm.’

Bermejo and Bekui (1993: 1146) claim, “Most Ghanaians attribute Guinea worm disease to ‘evil spirits’, witchcraft and the gods and action to combat is oriented towards mollification of these spiritual causes.” In contrast, Bierlich (1995: 505) says, “…only on a few occasions was witchcraft (brought on by envy of fellow human beings) mentioned as the cause of Guinea worm. I would not claim that ‘most’ people in Tchetti attribute Guinea worm to sorcery as Bermejo and Bekui suggest. In fact, many say the contrary. For example, during the interview with the traditional healer, I asked if sorcery is a cause of Guinea worm. He argued that Guinea worm does not come from sorcery:

There are people who don’t have a good organisme (body) and they have many worms. When the worms emerge all over the body people often blame it on sorcery, but really it is just that they have a weak body.

I also would not claim that only on a few occasions was sorcery mentioned as Bierlich suggests. In general, I have found sorcery to be a common topic of conversation. The connection between sorcery and Guinea worm is sometimes mentioned. In my opinion, it is neither frequent nor rare but somewhere in between.
In Tchetti, people often connect dirt to germs and microbes. Some see dirt as an agent of contamination. Many believe Guinea worm is found in dirty water. In this chapter I discuss the link between dirt, water, and Guinea worm disease.

Dirt and Water

Many people believe dirty water is non-potable and clean water is potable. For example, one interviewee who drinks pond water on a regular basis said she puts alum in the water to settle the dirt. “The microbes stay in the bottom...what is left on top is clear, clean water...like pump water.” She had previously listed pump water as a potable source. I then asked if alum treated pond water was potable; she said yes. She believes that clear, dirt-free water is omi rere ‘potable water’. After using the alum, she believes the water is safe to drink. Similarly, Bierlich (1995:506) says that at the end of the dry season in northern Ghana “the group dam” is low and the water becomes too mucky to filter through a cloth Guinea worm filter. Women explained to him that they were unable to filter the water and now only treated it with alum. The fact that they did not filter the water after treating it with alum indicates that they also believe alum treated water is safe to drink.

Tayeh et al. (1996: 1210) say that people in Ghana also make the distinction between dirty and clear water. People associate cleanliness with clearness. There, people drink pond water without filtering it during the rainy season when the water became less murky.

Many people commented that dirty water is not drinkable. One interviewee professed that, ‘dirty water is not a good water.’ An informant said, ‘Rainwater is the purest, most potable water because it comes from the air. It is cleaner than pump water, which comes from the ground.’

Some believe that dirty water causes illness. One interviewee claimed, ‘When water is dirty and microbes are in it, you have a stomachache.’ Another interviewee told me she used to get her water from the pond before the new borehole well was installed. She prefers the pump water because it is ‘clear and there are no maladies in it’. She says that some women prefer pond water because pump water is too salty but she prefers pump water because it is cleaner and disease-free.
During the dry season many ponds dwindle to dark, muddy puddles. When this happens, people dig deeper in search of water. One interviewee explained that this water is very dirty and causes more health problems than pond water in the rainy season. According to him, 'Dirt brings microbes.' Hunter (1996: 1410) links the dry season with Guinea worm endemicity. He explains that during the dry season the volume of pond water diminishes and cyclops densities increase. People also drink more during the dry season. Such ecological factors increase one’s chance of contracting Guinea worm. This biomedical explanation is in accordance with the interviewee’s comment that maladies are heightened during the dry season.

**Dirt and Guinea Worm**

Many people link dirt and Guinea worm disease. Early on in the research, an informant told me, ‘Guinea worm is found in dirty water.’ Later on I found this to be a common theme. One interviewee declared that Guinea worm comes from dirty water such as pond water. I asked if Guinea worm is only in pond water and she said no, it is also found in river water that is dirty. One informant said, ‘Guinea worm is in dirty water. It is only found in dirty water—in pond water.’ Similarly, three informants who were collecting pump water explained that Guinea worm is only found in dirty water. When I asked if you can get it in clean pond water, they said no. Another informant reasoned, ‘Guinea worm is in pond water...dirty water...if things are not dirty there are not any microbes in them.’ I asked another interviewee where Guinea worm comes from. (S)he started by saying, ‘Our grandparents did not know that Guinea worm is in dirty water.’

A fifteen year-old student believes that Guinea worm derives from dirty water. He initially stated, ‘The teachers at school told me Guinea worm can be in clear water too. If the water in the pond is as clear as pump water there still maybe Guinea worm in it.’ However, when I later asked what causes Guinea worm, he said ‘the rains wash the debris from town into the ponds...the dirt brings the microbes, which cause Guinea worm.’ At the end of the interview he said that he did not understand why Guinea worm is only found in ponds while well water and borehole water comes from the soil too.
Although I did not interview a schoolteacher, I deduce that they chose their education message with the understanding that there are local conceptions regarding dirt and Guinea worm. In the summer of 2000 I worked with departmental and national PEVG members to train schoolteachers about Guinea worm. This year, Guinea worm education was incorporated into the school curriculum. Although PEVG discussed the importance of explaining the Guinea worm cycle in terms that the children would understand, the notion of Guinea worm and dirt was never mentioned.

One informant mentioned that the Fulani, a nomadic ethnic group found throughout West Africa, contaminate the open water sources in Tchetti. He said, ‘The Fulani come through Tchetti and drink wherever they want. They only pass by and have no concern for the repercussion of their actions.’ I automatically assumed he was talking about contamination via larvae emission. I had heard many PEVG staff members say before that infected Fulani contaminate several ponds while traveling without the local residents being aware that a Guinea worm infected person had passed through the community. However, this informant went on to say that the Fulani allow their cattle to drink from the water. The cattle then defecate and urinate in the water. He pointed to a pond and said; ‘See here the Fulani have made our water dirty.’

At one drinking pond at the foot of Montagne Nàmàgbede (one the three hills surrounding Tchetti), users placed a large tree log diagonally across the pond’s narrow bank. The log enables people to step on the log and lean into the water without putting their feet in the water. After questioning several people at this pond, I came to the conclusion that people were mostly concerned about dirtying the water source. Not a single person mentioned water contamination via an open Guinea worm wound. In fact, throughout the research, only one person mentioned on their own accord that people should avoid entering an exposed drinking water source when they have an emerging Guinea worm. Many people maintained that Guinea worm is found in dirty water. Virtually everyone I spoke with was aware that Guinea worm is connected to water; however, barely anyone said that a person with an infected wound contaminates the water.

In Tchetti, there is a direct link between dirt, microbes, and Guinea worm. When people use the term “dirty water” they refer to more than just the soil and debris in the water. ‘Dirt’ and ‘dirty water’ refer to agents that make a person ill. The Ifé

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22 My research coincided with school vacation. The majority of the teachers were on holiday.
term *gbeerī* means both ‘dirt’ and ‘microbes’. The distinction is determined by contextual clues. This idea is similar to Green’s (1999: 163) discussion of Sexually Transmitted Infection (STI) causation theories. He says that healers in Zambia claimed that STIs are caused by “dirt” or “dirty”, which he labels as “code words for pollution”. In Tchetti, people say Guinea worm is caused by ‘dirt’ or ‘dirty water’. Perceptions of dirt are directly connected to contamination or illness agents. In this case, dirt has both the literal meaning of soil as well as a broader connotation encompassing ideas of germs and contamination.
6. GUINEA WORM

Here I discuss local notions of Guinea worm disease. I look at the symptoms, varieties, and causes people attach to Guinea worm disease and contrast these beliefs with the ideas of Guinea worm healthcare workers. In addition, I detail practices concerning treatment and prevention.

PEVG Initiatives

In 1993, PEVG began actively surveying Guinea worm cases throughout Benin. They implemented eradication strategies in all endemic zones with an emphasis in the Zou department. In recent years, PEVG deemed Tchetti an endemic hotspot and boosted all eradication activities in the area including: 1) documenting all cases, 2) educating the community about the transmission cycle, 3) chemically treating unsafe water 4) distributing household filters, and 5) mobilizing the community to avoid entering water sources with an infected wound.

The effects of the program's efforts are apparent in Tchetti. Both interviewees and informants spoke directly about the prevalence of Guinea worm education:

Respondent23 1: There is a lot of information now explaining that it is important to filter your water. They also say when you go to the field take a supply of pump or well water and use a filter when it runs out.

Respondent 2: The white people24 came and said Guinea worm is found in water and that we should filter our water.

Respondent 3: Before they used to drink the pond water without filtering it, but now due to education they don’t do that anymore.

Eradication activities effect how people in Tchetti view Guinea worm disease. I will illustrate this in the subsequent sections.

23 I use the term 'respondent' to indicate that the person speaking was either an interviewee or informant.
24 PEVG are all Beninese. Only a few outsiders have assisted with eradication IEC activities.
Symptoms

People in Tchetti regularly describe itching prior to the worm’s emergence. *Avant que le ver sorte, le corps gratte.* ‘Before the worm emerges, the body itches.’ A handful of interviewees and informants maintained that when the itching stops a sore appears. Pus oozes from the sore and then the worm emerges. One informant succinctly described these symptoms: ‘Your skin itches, you have a sore, and then the worm leaves the body.’ Another said, ‘The worm stings you and this starts to itch. A bump arises from the sting. When you see the bump, you know it is Guinea worm.’ Another informant mentioned chills, as well as the itching: ‘Guinea worm starts as a skin sore. The whole body starts to itch and you get chills. After the chills, the worm emerges.’

I asked a couple of interviewees why the body itches. One woman responded, ‘...the worm bites you under the skin. The bites cause the itching.’ Another claimed, ‘When the worm moves around in the body, it itches.’ Just as in Tchetti, Brieger and Kendall (1992: 478) also mention itching in their study of a Yoruba endemic community in Nigeria. In their study, they quoted a man saying, “I had itching on this (right) side. I scratched it, and after some time a Guinea worm came out. At times the worm will be moving inside my body for years, and may not come out, but just gives pain.”

Hunter (1996: 1401) explains that no symptoms occur at the stage when Guinea worm migrates from the abdominal muscles to lower extremities. “Such movement is undetected by the human host, and is without symptom or sign.” He says that a few days prior to the worm’s emergence people may experience nausea, vomiting, diarrhea, asthma, giddiness or fainting. He does not cite itching as a symptom. In Tchetti, no one mentioned symptoms as Hunter describes; itching, sores, and chills were the predominate indicators of Guinea worm. In a study conducted in Nigeria, Ilegbodu *et al.* (1991: 38) found that only eleven percent of people asked were aware of an infection before the sore caused by the emerging worm arose. In contrast, people in Tchetti said they knew they had Guinea worm disease when their bodies began to itch. This demonstrates that symptoms are not merely fixed pathological phenomena attached to a particular disease, but are rather culturally specific.

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25 *Bouton* is the French word used to describe what appears after the itching. *Bouton*, commonly translated as a spot, is best translated as a sore in this context.
Varieties

Some Tchetti residents recognize different types of Guinea worm. For example, a teenage interviewee explained to me that he had *aveugle* ‘blind’ Guinea worm. According to him, *aveugle* Guinea worm is different than the kind that emerges. His knee was swollen for several days, but a worm never emerged. He said that compared to an emerging Guinea worm, blind Guinea worm does not last as long and causes minimal pain. I then asked if he could not see the worm how did he know whether it was Guinea worm. He responded, ‘the adults told me it was Guinea worm.’ I then asked if it does not emerge where does the worm go? He explained that it stays in the body and eventually emerges. He then reported a story of a friend who suffered from blind Guinea worm. According to him, his friend’s worm stayed in the body for three years before it finally emerged. He suspects his worm will eventually emerge as well. I then asked why the worm emerges if it has stayed in the body for so long. He said: ‘...the worm wants to disturb man. That’s why it comes out. For some there are many worms in the body and for others there is only one. When it leaves it is done.’ Similarly, Ramakrishna *et al.* (1986: 105) found that people in Idere, Nigeria, identified Guinea worm by the swelling. “Any swelling or subcutaneous nodule is thought to be the work of Guinea worm, even if no worm has emerged for years.”

A *PEVG* staff member informed me that Guinea worm disease is easily recognizable by all *PEVG* staff and healthcare workers, as well as community members in endemic regions. (S)he said that at the onset of the program some village volunteers had difficulties defining a case. When the leg swelled, certain volunteers would register it as a Guinea worm case. After further explanation, the volunteers began to only record a case at the emergence of the worm. The fact that some village volunteers distinguished Guinea worm by the swelling coincides with the teenage interviewee’s explanation of the blind Guinea worm. The program identifies a case of Guinea worm disease once the worm emerges; however, at least some residents in Tchetti identify it with the swelling prior to emergence. In this case, cultural definitions of Guinea worm contradict with those of *PEVG* staff.

Another variety of Guinea worm mentioned was *le ver rouge* ‘the red worm’. The first time I heard the red worm mentioned in Tchetti was during an interview with an older man. He exclaimed, *le ver rouge la...ça chauffe le corps plus que le piment*

26 Village volunteers are *PEVG* staff at the level of the endemic locality.
‘The red worm...this burns the body even more than hot pepper.’ Just as others consequently pointed out, his analogous description refers to the fact that the red worm is more painful than the ‘normal’ Guinea worm. He also said the red worm is not as thick as the ‘white’ worm. He went on to say there is also a black worm. He said it is not true black in color, but more resembles an earthworm. According to him, the black worm is thicker than the white worm. He never personally experienced the red or black worm but has seen both in his lifetime. He said both are extremely rare.

M.L. Eberhard et al. (1989: 479) explain that, “...a large, creamy-white worm” is typical for Guinea worm disease. In 1987 and 1988 two cases of red Guinea worm were discovered in Pakistan. The authors say that these red worms were similar in size to Dracunculus medinensis, commonly known as Guinea worm. These were the first cases of red Dracunculus to be reported in modern literature. Researchers have yet to determine the reason for the red color, but have ruled out blood as the cause.

I first heard of the red worm in 1999 while in Togo. Togolese residing in endemic regions in the Ogou department spoke of such a worm. I asked members of the national PEVG staff in Togo and Benin about the so-called red worm. Although they had heard rumors, they said they had never seen such a worm and were under the impression that the red worm was a legend. Later while working in Togo in 2000, I encountered a woman with an emerging worm that appeared to be bright red. I first believed it to be covered in blood, but soon realized it was the worm itself that was red. I put the worm in a bottle of alcohol and sent it to the Centers for Disease Control (CDC) for further analysis.

The endemic community in Togo where I discovered the red worm is approximately sixty kilometers from Tchetti. Hence, I was not surprised when the elder man in Tchetti spoke of the red worm. Just as the man pointed out that the red worm is smaller in size compared to the white worm, I too noted that the red worm in Togo was thin and fragile compared to standard Dracunculus medinensis. This differs from M.L. Eberhard et al.’s findings in Pakistan that the red worm was typical in size. During the interview, the man also mentioned a blackish-brown worm. This was the first time I had heard of such a thing. As far as I know, no black worm has ever been documented.

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27 When differentiating between varieties of Guinea worm, people often use the terms ‘white’ or ‘normal’ when referring to conventional Guinea worm.
Treatments and Cures

As I explained in the *Gris-gris and Guinea Worm* and *Sorcery and Guinea Worm* sections, some people hold that there are *gris-gris* that can prevent and/or cure Guinea worm disease. Outside of *Vodü* practices, only one person I spoke with mentioned a cure for Guinea worm. Days before my colleague and I arrived in Tchetti, a self-proclaimed traditional herbal pharmacy opened for business. After a few days in town, I went there to introduce myself and ask questions. Inside the clinic there was one wooden shelf with various herbs in clear glass bottles. All the bottles were methodically labeled with what appeared to be scientific names. The woman working at the clinic explained that the herbs are used for different types of illnesses. I then asked if she had anything to treat Guinea worm. She explained that she had both a powder and a drink for Guinea worm. ‘If you ingest it, you will never have Guinea worm again.’

Although this woman insinuated that she had an herbal remedy for Guinea worm, the majority of residents in Tchetti told me that there is no cure. Instead, these people spoke of treatments for the wound caused by the emerging worm.

One interviewee said when she had Guinea worm she bought ‘effective products’ in the market which killed the worm. A couple of weeks later I met a Hausa man in the market selling traditional medicines. I asked him if he had anything for Guinea worm. He said he had a substance, which you grind into a powder and mix with milk. ‘After you drink the milk medicine, you take leaves (which he pointed to) and mix them with salt and boiling water. You then put it on the wound to help the healing process.’ I asked if there was any medicine to prevent Guinea worm. He exclaimed, ‘Jamais! (Never!) There is no *gris-gris* for Guinea worm.’

When I asked people how they treat Guinea worm disease, most said they crush neem leaves, mix them with oil, and apply the substance directly to the wound. One woman explains how she uses neem leaves to treat the wound:

You crush the leaves and put it on the wound. The bitter liquid from the leaves goes into the body. The worm does not like it. He does not like the bitterness.

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28 Neem (*Azadirachta indica*) is a tropical tree found in West Africa.
Similarly, Ward (1978: 158) said people in Ghana use local herbs to reduce swelling and palm oil to soften the skin. Brunet and Giethlen (1900: 42) mention the same type of treatments used in Benin in the early 1900s. They say that indigenous treatments included applying grounded charcoal, palm oil, and various leaves or herbs to the wound.

*PEVG* provides bandaging for all Guinea worm patients. Before dressing the wound the Guinea worm healthcare worker applies a topical antibiotic gel. Bandages cover the wound and not only prevent secondary infections, but also deter the infected person from entering a community water source. Infected persons regularly refuse treatment by Guinea worm staff and opt for traditional treatments such as oil and neem leaves. I will go into further detail about the refusal of bandaging in the *Poverty and Guinea Worm* section.

**Causation**

An overwhelming majority says Guinea worm is caused by water. People frequently tell a story of a nearby community which was previously Guinea worm endemic and has now eradicated the disease. The basis of the story is that in the past the community had Guinea worm but when they began to filter pond water and/or drink water from Guinea worm-free sources, the endemic disappeared. When I ask people what causes Guinea worm they first reply that it is caused by water and then tell this story as proof. I had heard this story before conducting research in Tchetti. The *PEVG* staff throughout Benin consistently tells this story to endemic communities for education purposes. The name of the community varies depending on the region. As Benin eradicates the disease, more formerly endemic communities become Guinea worm-free. It is likely that there are indeed several communities surrounding Tchetti that eradicated the disease once people began to filter and/or drink from safe water sources.

People also use their personal experiences as attestation that Guinea worm is 'in the water'. One older woman I interviewed said that when her family built a cistern ten years ago they stopped drinking pond water altogether. She said she used to suffer from Guinea worm every year, but now that she only drinks cistern water she has not contracted the disease.

Although most said contaminated water is the cause of Guinea worm, a few persons gave other reasons, such as sorcery. Out of the persons who acknowledged water as the cause, a large number combined other theories concerning alternative
causes with the notion that Guinea worm is found in water. Hence, Guinea worm disease is synonymously connected to water and sorcery, dirt, or blood. I will now discuss the theory that Guinea worm is found in the blood, which I label ‘worms in the blood.’

Worms in the Blood

A few days after arriving in Tchetti, I woke-up at daybreak to the sound of a man hollering in Ife through a large megaphone. As I peered over my shower wall to see what the raucous was all about, I saw a large automobile resembling an ice-cream truck strolling down the main laterite road in Tchetti. On the side of the truck was an advertisement for blood tonic. The ad claimed that the blood tonic cures rheumatism, anemia, menstrual problems, general malaise, hemorrhoids, malaria and loss of appetite. Although the advertisement did not mention Guinea worm, it did connect blood and illness.

Prior to my fieldwork, I conducted a preliminary literature review where I discovered Bierlich’s findings about local notions of blood and illness in northern Ghana. Bierlich’s research revealed that people often thought of Guinea worm as an innate part of the body within ‘the blood’. According to this theory, Guinea worm remains dormant in the body and on occasion is exacerbated and rises to the surface (1995: 505). Beforehand, while working with PEVG in Benin, I had never heard this theory. Now seeing the blood tonic in Tchetti, I questioned whether the Ghanaian blood and illness theory existed in Benin, as well. However, I soon discovered that the people selling the tonic were from Kumasi, a town located in the southern part of Ghana. I then asked a Tchetti resident why she thought the medicine was called blood tonic. She said it was merely an advertising ploy. Pointing to the image on the side of the truck of an elderly woman playing soccer, she commented how it was all a hoax. ‘Have you ever seen an old woman playing soccer? No medicine can do that.’

Afterwards, I asked a PEVG staff member if he had ever heard anyone in Benin claim that Guinea worm is an innate part of the body within the blood. He declared that he had never heard such a theory. At this point I was doubtful whether the blood theory existed in Tchetti.

Nevertheless, a week later, I heard people question whether Guinea worm derives from water or is innate in the body. I attended a dinner party with a group of government workers. Government workers have a high level of formal education and

39 A small flyer used for advertising purposes depicting the same image is included as an appendix.
speak French fluently. They tend to transfer to a new town every two or three years. Although all were Beninese, none of the people present at the party were indigenous to the area. Few spoke Ifè and their only common language among each other was French. After explaining that I came to Tchetti to conduct research on Guinea worm, a heated topic on the origin of Guinea worm flourished. They questioned whether Guinea worm is indeed caused by contaminated water as health educators claim. To them it made more logical sense that Guinea worm is inherent in the body. One person said that according to the biomedical theory the Guinea worm process is a cycle where an infected person contaminates the water and then another drinks the contaminated water and becomes infected. He asked if a person can only be infected by water that was contaminated by another infected person, how did the very first person contract Guinea worm. I was instantly reminded of tautological question: which came first, the chicken or the egg. There is no final answer to the question of origin. Based on this reasoning, they found it to make more sense that Guinea worm is inherent in the body.

Once I began conducting ethnographic interviews, I noted that many persons mentioned the idea of Guinea worm in the blood. Excluding the above example, all other persons who spoke of Guinea worm in the blood blended other theories with the notion that it is found in the blood. For example, several interviewees initially claimed that Guinea worm disease is found in water and later described how it stays in the body:

**Respondent 1**: The worms come from the water but they don't leave the body at the same time. For example, this year maybe you will have three worms, which emerge and the following year three worms will emerge again. It comes each year until it finishes in the body. Once all the worms leave, you won't suffer from Guinea worm anymore.

**Respondent 2**: It is in the water. It is not sorcery as some people think. It is caused by larvae in the water. You drink contaminated water and the larvae grow into a worm in the body and then leaves the body. When you drink water, the worms stay in the blood.

**Respondent 3**: It stays in the body...in the blood at all times due to the water.
Many suppose that once a person drinks infected water, the worms stay in the body or blood for an extended period. According to this theory, not necessarily do the worms emerge at one time. One interviewee explained that every three years he contracts Guinea worm. 'It stays in the blood and then emerges.' He had Guinea worm two years ago and he is convinced that he will have it again in a year. Bierlich (1995: 505) describes a similar case in northern Ghana. He says people, ‘...knew the Guinea worm to go around in their body before it emerges.’ He says people would claim, ‘...it has a time when it will come out.’ In Tchetti many people would say the worms stay in the blood for years before emerging. In contrast, biomedical figures estimate that the worm emerges within ten to twelve months.

One man applied the ‘worms in the blood’ theory to biomedical ideas of infection and white blood cells. As others, this man said that Guinea worm is found in water. Later he said, ‘Your white blood cells are the ones that fight infection. When the white blood cell count is low, the worms come out.’ He said that Guinea worm is located in the body. The worms emerge when a person is ill. I then asked about his previous comment that Guinea worm is found in water. He responded, ‘People get Guinea worm from water. Once they have it, it stays in the body.’ This differs from Bierlich’s findings of people in Ghana who attested that Guinea worm was innate in the body. Rather than being inherent in the body, most people in Tchetti said that Guinea worm derives from the water. Once people drink contaminated water, the worms stay in the body or the blood.

Kòkòrò

In Tchetti, the idea of ‘worms in the blood’ extends beyond Guinea worm disease. People in Tchetti distinguish between the terms atàkpa ‘Guinea worm’ and kòkòrò. The term kòkòrò is often described as worms or insects, which are inherent in the body. In contrast to Guinea worm, kòkòrò is innate in the body. One informant said, ‘Kòkòrò is always there. You do not know it until it is disturbed.’ When describing illness entities in West Africa, Olivier de Sardan (1998: 212) says that throughout West Africa the ‘...internal-illness entity is considered as being latent in its normal state...they might remain unnoticed and harmless, until the moment they are awakened.’ This coincides with the above example that kòkòrò remains in the body and is unnoticed ‘...until it is disturbed.’

Tchak described kòkòrò as invisible worms in the body: ‘They are there all the time. You are born with them. You have to use a microscope to see it, so therefore it
Green (1999: 13) says that many societies in sub-Saharan Africa describe “the agents of infection” as worms or tiny insects rather than germs. In contrast, Tchak combines the concepts of worms and germs. Kòkòrò is both an ‘invisible worm’ and ‘microbe’.

One interviewee said, ‘Kòkòrò causes diseases. It causes itching and then small sores.’ As seen in the Symptoms section many people identify Guinea worm disease by the itching and small sores prior to the worm’s emergence. These same symptoms are also identified for kòkòrò.

Several persons told me that àtákpa is a specific type of kòkòrò. One informant said, ‘Àtákpa is the malady and kòkòrò is the worm itself.’ An interviewee distinguished between the two terms:

**Interviewee:** Kòkòrò are other worms, which emerge from the head of small children. It gives small wounds all over the head and then water comes out from the holes.

**Interviewer:** Are àtákpa and kòkòrò the same?

**Interviewee:** No, they are different. You cannot drink kòkòrò. No, it is not like àtákpa. You are born with it (referring to kòkòrò).

Whether kòkòrò is a worm, insect, microbe, agent of infection, or all of the above, it is clear that notions of kòkòrò are intertwined with perceptions of àtákpa.
7. FILTERS AND FILTERING

Filtering Practices

Throughout the research I observed filtering practices and compared them to people's own statements of their filtering behavior. In my presence, people consistently filtered pond water in their homes. When Tchak and I went from house to house counting the number of personal wells and cisterns, I noted that several households had filters on top of their clay water pots or hanging to dry after being used. This demonstrates that people also filtered when I was absent. During the seven weeks, I witnessed only one person drink directly from a pond. A woman who was collecting water at a pond took a sip before placing the heavy basin on her head to return home. Normally, the basin of pond water is poured through a filter into a clay water pot permanently fixed in the homestead. Hence, people must return home before filtering. In Tchetti, women walk up to an hour to collect pond water, yet no one carries a safe water supply when collecting water. I question whether other women also drink the unfiltered water before returning home. People must filter each and every time they collect water from an unprotected water source; otherwise there is a chance they may contract Guinea worm disease.

Aikhomu et al. (2000: 49) note that in certain endemic areas people's perception that Guinea worm is already inside the body conflict with the concept that filtering can prevent Guinea worm. In Tchetti, the idea that Guinea worm is inside the body is combined with the notion that Guinea worm is caused by water. According to this theory people contract Guinea worm disease from the water. Once they contract it, it stays in the body indeterminately. Many people in Tchetti believe that Guinea worm is caused by water and filters are a way to prevent this disease. The fact that people believe the worm stays in the body has little effect on filtering practices.

To Filter or Not to Filter

All but one person whom I spoke with said they filter pond water. The person who drinks unfiltered pond water said he drank a gris-gris to prevent Guinea worm and is now immune. He said he drinks unfiltered pond water on a regular basis and never has any problems. Another person said that he filters, but admitted to drinking
unfiltered water in the past. According to him, he drank the water because he had no choice. He explained that there is a pump nearby his field. For a couple of months during the last planting season the pump was broken and he was forced to drink pond water.

The majority said they filter on a regular basis. I asked them why. Their responses included:

**Respondent 1:** When the water is clear you can determine if there are microbes in it, but not when it is dark and murky... I filter it (referring to pond water) because I cannot see what is inside.

**Respondent 2:** It removes dirt, which removes the microbes.

**Respondent 3:** Filters are used to calm the maladies, to avoid illnesses, and avoid the microbes. The filters were designed for Guinea worm but also prevent stomachaches.

**Respondent 4:** The filters are intended for Guinea worm, but they also get rid of microbes.

I asked another woman if she thought that people filter all the time. She said in some communities they do but in ones where the majority no longer suffers from Guinea worm, people tend not to filter. A PEVG staff member said:

**Interviewee:** I noticed in Kokogbri people do not filter all the time. The women have filters but they leave them in their house and do not use them.

**Interviewer:** Why do you think people do not filter?

**Interviewee:** I do not think there is one reason, but it is laziness and negligence. When Guinea worm is no longer a problem in that household people stop using filters.

The last examples show that people filter when they see it as a priority. If people do not perceive Guinea worm as a threat, they are not likely to filter.

Several persons mentioned that the filters prevent other maladies such as diarrhea and stomachaches in addition to Guinea worm. These people see the filters as a way to prevent illness. People's comments about dirt and microbes complement
what others said in the *Dirt and Guinea worm* section. Some people believe that filters remove dirt and therefore remove the microbes or ‘illness agents’. Guinea worm filters are designed to filter out cyclops, the intermediary host, thereby halting the transmission cycle. Although it is not the primary aim, the filters also separate large dirt particles from the water. Following people’s logic that Guinea worm is in dirty water, some people filter the dirt to prevent Guinea worm. Hence, the fact that the filters eliminate dirt is a major reason people filter in Tchetti.

Based on the literature, several researchers found that people use filters as a means to filter dirt. After interviewing residents in an endemic zone in southwestern Nigeria, Aikhomu *et al.* (2000: 50) found that the most common feature people liked about the filters was that they removed dirt. Bierlich (1995: 506) said that women in northern Ghana associate filters with removing dirt. Both Aikhomu *et al.* and Bierlich suggest that people filter to remove dirt rather than filter to prevent Guinea worm or other illnesses. However, in Tchetti people use the filters to remove dirt, ergo preventing Guinea worm or other illnesses. In fact, few people in Tchetti use the filters solely for the purpose of removing dirt and debris. Only two persons I spoke with did not connect the act of filtering dirt with illness prevention. The traditional healer, who made a Guinea worm *gris-gris*, told me his family filters pond water. I then asked him why he filters if his family is protected by the *gris-gris*. He said, ‘Pond water is dirty. It is not for the Guinea worm, it is for the dirt.’ Another woman said: ‘Some people use the filters to filter out dirt. They do not know that they are meant to prevent Guinea worm.’

One interviewee, who only drinks pond water, said that sometimes after she filters, the water is still murky. I also found that the filters do not strain all dirt particles. While in Tchetti, I drank murky well water. I attempted to use a Guinea worm filter in the hopes that it would separate the fine dirt from the water. Much to my chagrin, the water was still murky. Although the filters do filter out larger pieces of dirt, the smaller particles slip through the nylon mesh leaving the water murky. I later asked the woman, who claimed the water was still murky, why she filtered. She said she filters to prevent Guinea worm. This shows that albeit many people connect dirt to Guinea worm disease not everyone in Tchetti makes this association.

*Filter Acceptance*

The majority I spoke with thought the Guinea worm filters were effective. However, a few people questioned the efficacy of the filters. One interviewee said,
The filters don’t work very well. After three days I see small worms in the water.’ As cyclops, the intermediate Guinea worm host, are very difficult to see with the naked eye, I instantly wondered whether the ‘worms’ she was referring to were mosquito larvae. Another man said he has been filtering water for over seven years yet he still continues to have Guinea worm. In fact, I did notice the filter on top of his clay water pot. It was still damp indicating that it had been recently used. I asked why he thought he continues to have Guinea worm even though he filters. He said he questioned the efficacy of the filters. ‘Even after you filter, the water it is still dirty.’ Earlier in the interview he attested that Guinea worm comes from dirt. He connected the murky filtered water with Guinea worm. As I stated earlier, many others connect dirt and Guinea worm disease. If the filters do not effectively filter dirt, some believe they are not effectively preventing Guinea worm disease. Perception of efficacy is decreased because the filters do not filter fine dirt particles. If people do not believe the filters are effective, they are not likely to use them. This can create problems for eradication efforts.

Filters in Benin are large square cotton-cloth filters with a small piece of nylon mesh sewn into the center. They lie on top of the jar and do not need to be affixed with a drawstring as some designs in other countries. This is beneficial considering that clay water jars used to store water in Tchetti are a mix of both flat-mouthed and lip-mouthed jars. Residents can use the filter regardless of their water jar style.

Overall, people seemed satisfied with the design of the filters. One woman said, ‘People are used to them. They know how to use them correctly.’ Soon after, she said she wished the nylon mesh in the center were larger. After talking to her for a while, I gathered that she thought only the nylon mesh material in the center was effective. I then asked whether the cloth material filters out Guinea worm. She said no, only the mesh material. A group of women collecting water at the pond said they preferred the ‘big filters’ distributed in Togo. In fact, filters distributed in Benin are larger than the ones in Togo. Although Togo filters are smaller, they have more nylon mesh. What is considered to be a filter is the nylon mesh.

PEVG only distributes filters in endemic localities. They counsel persons in non-endemic localities to filter with a piece of cloth. If people believe that only the nylon mesh filters are effective they are not likely to filter with cloth filters.

30 Cyclopes are large enough that a piece of cotton cloth is sufficient to filter them out of the water.
Filter Reinterpretation

Some people use objects originally intended for other purposes to filter Guinea worm. One interviewee in a non-endemic locality complained that he no longer has access to filters. He said: 'I used to filter my water with a Guinea worm filter, but the program no longer brings them.' He said his family now uses a large piece of cotton cloth or filters designed to filter əkasə, a traditional starch made of fermented corn. I asked him if people also use Guinea worm filters for preparing əkasə. He said no, because the Guinea worm filters are too small. They would be too time-consuming for preparing əkasə. According to him, the əkasə filters are much faster. 'They are better for əkasə and better for filtering the water.' In this case, the filters originally designed for əkasə preparation are used to prevent Guinea worm. This is problematic for the eradication program. Guinea worm filters were designed with the intent to filter cyclops. If the filter is too porous the cyclops will pass through. It is possible that the əkasə filters reinterpreted as Guinea worm filters do not filter cyclops and thus do not prevent Guinea worm.

On occasion, people create a new meaning for the Guinea worm filters. Contrary to what the man in the previous example said, two people told me that some use the Guinea worm filters for preparing əkasə. Another woman said that in the past people used the filters for əkasə, but now '...since the radio told us not to, we stopped doing it.' Another informant told me that he uses a Guinea worm filter to sieve unwanted particles from black-market gasoline. This was not the first time I had heard this. While working in Niger, I regularly witnessed men filtering poor quality gasoline for their motorbikes. These alternative filter interpretations create an entirely different filter meaning, which is in no way connected to Guinea worm prevention.

31 PEVG does not distribute filters in non-endemic localities.
8. Stigmatization

Drinking pond water has become a mark for poverty. As Guinea worm disease derives from unprotected water sources such as pond water, it is also a symbol of social difference and economic inequality. In this chapter, I discuss the levels of stigmatization within Tchetti in regards to Guinea worm disease.

Poverty and Guinea Worm

Farmer (1996: 262) states that diseases are generally not recognized as caused by poverty or inequality. Nevertheless, Guinea worm disease is widely recognized as a disease of the poor. The onset of the disease corresponds to the rainy season, cultivators’ peak production period. Secondary infections caused by emerging Guinea worms prevent farmers from working and are hence a major obstacle to subsistence. As I have previously said, communities without access to potable water are more likely to contract the disease; endemic zones are preeminently poor, rural communities. These circumstances show that Guinea worm disease causes poverty and poverty causes Guinea worm disease.

Although Guinea worm disease existed for centuries, it did not gain international attention until the last few decades. According to Watts (1998: 801), it is likely that urban-based health professionals did not detect cases, and prevalence rates were grossly underestimated given that endemic regions predominated in remote, rural areas. Not only did cases go undetected, but also Europeans and urban elite in endemic countries distanced themselves from infected persons, perceiving the disease as only affecting ‘the Other’. Brieger and Kendall (1992: 472) say, “It has been called a neglected disease of neglected people since it strikes the remote rural populations that have often been passed over by national development efforts and is thus an indicator for poverty and underdevelopment.” Direct correlation between Guinea worm and poverty leads to stigmatization. Non-infected persons label the disease a poor person’s disease.

Guinea worm disease is associated with poor rural communities. At a more micro-level, it is connected to poorer persons living within a community. Researchers have previously documented the stigmatization of Guinea worm endemic communities by outsiders. However, little is said about stigmatization within an endemic community. Not only do non-endemic communities ostracize endemic
communities, but also non-infected persons within an endemic community shun infected individuals. Within Tchetti there are endemic and non-endemic *quartiers*. Some living in non-endemic localities stigmatize others living in endemic localities. Also, non-infected persons within an endemic locality stigmatize others living within the same locality.

During an interview, one woman told me she always gets her water from the pump in the Lema *quartier*. I then asked where she got water that morning. She said from the pump in Lema. However, I knew the borehole well in Lema had been broken for several weeks. After this experience, I gradually noticed that people did not want to tell me they drink pond water. Some residents would tell me that they do not drink pond water; yet, I would later see them at the ponds collecting water. What people said they do was not consistent with what they did.

As I previously explained, public water supplies are insufficient in Tchetti; therefore, some rely on private wells and/or cisterns funded by personal finances. People who cannot afford their own well or cistern either buy basins of water from others or collect water at the pond. One interviewee concisely said, ‘Wealthy people can afford clean water; poor people cannot.’ Ergo, there is a direct link between income and Guinea worm disease. Poorer members of the community with no access to potable water are more likely to contract Guinea worm. Of course, poor members of the community are not always victims of Guinea worm and wealthier members are not immune. Contamination is dependent upon water selection. If people choose to drink unfiltered water they risk contracting the disease. Nevertheless, many people link Guinea worm disease with poverty. This association between drinking pond water, Guinea worm disease and poverty has led to stigmatization.

One interviewee in an endemic locality told me people dislike the bandages. I was well aware of this beforehand. While working with *PEVG*, I noticed that people consistently refused bandaging. Ones who accepted it would remove it as soon as the *PEVG* staff was out of site. I had often questioned why people dislike the bandaging and reasoned that it was due to the uncomfortableness of the bandage. This interviewee explained that people dislike the bandages because everyone will know they have Guinea worm. Without the bandages, infected persons are able to conceal their illness. I then asked why people would want to hide Guinea worm disease. He said, ‘Guinea worm is no good. Only poor people get Guinea worm. Nobody wants to be poor.’

Subsequently, I told a *PEVG* staff member about this man’s explanation why people dislike Guinea worm bandages. (S)he doubted whether social stigma prevents
people from using bandages. (S)he said people cover the wound with neem leaves, which is as conspicuous as a bandage. ‘If people were trying to conceal the worm they would not use neem leaves.’ Regardless, whether people avoid bandages or not for social stigma reasons, the interviewee’s comment illustrates that people connect Guinea worm disease with poverty.

Quartier Categorization

As I explained in the Community Sketch section, Tchetti is divided into two communes, which are further divided into eight quartiers. The five endemic localities are: Kôkgberi, N’gbenou, Attiba, Elavagnon, and Tchoundja; while, the three non-endemic localities are: Carré, Lema, and Zongo. Although all of the endemic localities are located in the Tchetti commune and non-endemic localities are in the Lema commune, residents rarely make the distinction between communes. The eight localities have both social and geological differences.

Many consider Carré, Attiba, and Elavagnon the newer and more privileged localities. Although there is a large mixture of different ethnic groups in these three localities, most of the Fon who live in Tchetti reside in these areas. As the houses are dispersed further apart, wealth is physically apparent. The current and past three mayors live in these localities as well as the majority of government workers. The Zongo quartier is the largest locality and also recently developed. It is a mix of Hausa, Kotokolé, Ifē, as well as other ethnic groups. People living in Zongo are both merchants and cultivators. Thirty percent of all private water sources are located in Zongo (see Table 1). In contrast, Lema is the smallest quartier with only fifty-two households. Nearly all inhabitants are cultivators. Prior to the recently installed pump in N’gbenou, Lema was the only locality with a pump located nearby. Kôkgberi, Tchoundja and N’gbenou make up the original section of Tchetti. Inhabitants are predominately Ifē. When people refer to Guinea worm disease they almost always refer to Kôkgberi, Tchoundja and N’gbenou. All of Tchetti is surrounded by three large rocky hills. However, the land in Zongo, Lema, Carré, and Elavagnon is less rocky and easier to dig for water.

When I asked people in endemic localities why Guinea worm is prevalent in the area, most spoke of the hardpan terrain and the difficulty in digging wells. One
man in N’gbenou said, ‘We dig for water, but we do not find any.’ Another man complained of the hardpan terrain in Kôkôgberi:

**Informant:** When we dig for wells we cannot find water. Also, there are not a lot of cisterns here.

**Interviewer:** Why is that?

**Informant:** (He laughs and pauses) Cement is expensive and there is pond water nearby.

I then asked a woman in Tchoundja why some localities in Tchetti are Guinea worm free. She also said, ‘In other quartiers when they dig for water they find it.’

In contrast, when I asked people in non-endemic areas why some parts of Tchetti are endemic, they often pointed out social reasons. For example, a woman in Lema said: The people in the endemic quartiers do not listen. Some people filter and some do not.’ Another person in Zongo said, ‘Before there was not évolution ‘advancement’ or ‘development’… once people started filtering water (in Zongo) the Guinea worm gradually disappeared.’ A woman in Carré said:

Carré is the quartier of strangers. We came to Tchetti to help les villageois (the villagers). … Guinea worm is only a problem of the villagers. … Have you been down in that area and seen all the dirt?

Another group of people from the Elavagnon quartier also used the term villageois. One woman said:

People over there (referring to an earlier comment about Kokogberi, Tchoundja and N’gbenou) do not have the money or the education to prevent Guinea worm. They are the villageois, they do not know any better.

As the above examples demonstrate, people in endemic localities often point out the geological differences, whereas, people in non-endemic localities point out the social differences.

**Age and Gender Issues**

Both age and gender issues play a significant role in how people view Guinea worm disease. When I asked one person why certain localities are Guinea worm
endemic, he responded that Kôkôgberi and N’gbenou are endemic because those localities are comprised of mostly older people. He suggested that Guinea worm disease is more common in elderly people. A local PEVG staff member explained that this is not the case. (S)he conferred that no age group is more likely to contract Guinea worm than any other.

On several occasions younger adults miscategorized elderly people claiming that they were unaware that Guinea worm is found in water. Such comments included:

**Respondent 1:** Older people drink pond water because they prefer the taste.

**Respondent 2:** I know Guinea worm is in the water but the older people do not. They are the ones who do not filter. Teachers told us that it is our responsibility to teach the old people.

**Respondent 3:** Our grandparents think Guinea worm is in the blood.

**Respondent 4:** Older people do not know Guinea worm is in water.

Contrary to the above assumptions, I found that elderly people were just as knowledgeable about the biomedical conceptions of Guinea worm disease as others. In fact, only one person spontaneously reported that a person with an emerging worm should not put his/her open wound in a community drinking water source. That person was a seventy-five year old woman.

In Kenya, Geissler (1998: 71) says that old women often doubt the validity of the biomedical model; however, younger adults “...keep biomedical and traditional models separately in repertoire of available discourses and use them interchangeably according to the context and communication partner.” He later contrasts this to children who often mix the two theories together and “...attempt to create coherent pictures out of them.” Among the persons I interviewed in Tchetti, ranging from fifteen to seventy-five years old, I did not find such age distinctions.

In addition to the apparent ageism, I discovered gender divisions, as well. Both men and women blamed women for Guinea worm contamination. During an interview with a PEVG staff member, I noticed that (s)he consistently used the French

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35 Miranda van Reeuwijk, who accompanied me to the field, compares and contrasts children’s and adult’s notions of illness and disease in Tchetti. Her thesis is entitled *Children in Tchetti, Benin. The ideas and practices concerning dirt, hygiene, and disease transmission: diarrhea and other gastrointestinal diseases.*
'elle' 'she' form when referring to persons who do not filter. Indeed, almost all persons who collect water are female. The person who collects the water is responsible for filtering the water. If a household contracts Guinea worm, the person responsible for collecting water is often blamed. One man informed me that he had recently contracted Guinea worm. He explained that it was his wife’s fault. He said his wife collects the water and therefore she was the one who did not filter the water. I then asked if others in the household had also contracted Guinea worm; he replied that it was only himself. Epidemiologically speaking, if an entire household were drinking Guinea worm contaminated water, it is highly unlikely that only one person would contract the disease. I wondered whether he contracted Guinea worm elsewhere. Later on in the interview he admitted to ‘tasting’ unfiltered pond water a few times while working in the field. Regardless of where he contracted the disease, he blamed his wife.
9. DISCUSSION

Transmission

A few months ago, a member of an international agency working towards Guinea worm eradication asked me why it seems fairly easy to convince people to filter but difficult to stop an infected person from putting his/her foot in an unprotected water source. Several factors contribute to this complex problem. In order to collect water from certain ponds, people must put their foot in the water. In Tchetti, during the dry season, the ponds dry out. People often dig deeper until they reach water; hence, many ponds are deep pits with high edges. There is no option but to climb into the pit to collect water. The natural features of the pond force people to enter the water source thereby potentially contaminating the water. In addition, some people are unconcerned about contaminating the water source because they have confidence in the filters. One man told me, ‘If the filters work, it does not matter if people put their foot in the water.’ Others enter the water source in search of clearer water. One woman explained that people prefer the clear water in the middle of the pond. She said:

People put their foot in the water. They have to...there is no choice...even the shallow ponds where you can collect the water without putting your foot in...the water is clearer in the middle of the pond. If you want clear water you must put your foot in.

People habitually enter the ponds to collect water. If a person is in the habit of putting his/her foot in the pond, there is great chance that (s)he will continue to do so if (s)he has an emerging Guinea worm. As I explained in the STIGMATIZATION chapter, some try to conceal the fact that they have Guinea worm disease. If people attempt to hide the disease, they are not likely to ask others to collect water for them. All of the above factors directly affect Guinea worm endemicity in Tchetti. In previous chapters I have discussed these factors in detail. As I have shown, people’s perceptions of water, filters, and Guinea worm disease affect endemicity.
Summary

Tchetti, Benin remains Guinea worm endemic, albeit Benin is nearly Guinea worm-free. Throughout this paper I have explored local perceptions and practices concerning water, Guinea worm disease, and filters. These factors directly affect endemicity. The lack of safe water sources in Tchetti is a major reason for the community’s endemicity. People who live far from a potable water source may opt for a potentially contaminated source, which is more convenient. Likewise, if the lines at the public borehole well are too long, people may choose to collect water at the pond. Potable water is scarce and has become a commodity. Persons without monetary means do not have access to a safe water source. In turn, Guinea worm disease and the act of drinking pond water have become marks of poverty.

People prefer the ‘sweet’ taste of pond water as opposed to the ‘salty’ taste of pump, well, or cistern water. In reaction, some choose to drink pond water for its ‘sweet’ taste, while others choose ‘salty’ water for its capacity to protect against illness. Others believe if they are not well adapted to a water source, they may become ill. Hence, people may be hesitant to change water sources. All these factors affect people’s water choice. If people choose pond water over Guinea worm safe sources, their risk for the disease is increased.

Perceptions concerning water and Guinea worm disease are connected to perceptions of filters and filter practices. The majority of people believe that Guinea worm is found in water and many filter to prevent the disease. However, some believe that Guinea worm is in dirty water and believe filters are only effective if they filter dirt. If the filters do not filter out all of the small dirt particles, people consider them ineffective.

A few people connect Guinea worm disease with Vodú practices such as sorcery and gris-gris. Some believe that Guinea worm is connected to sorcery only in rare cases such as when there are multiple worms emerging at once or the worm is an abnormal color. However, the majority of people maintain that Guinea worm is found in pond water. Pond water is often described as ‘sweet’ or ‘dirty’ water. Dirty water is considered non-potable water. Dirt is often seen as an agent of illness and some connect Guinea worm with dirt. Many connect the idea that Guinea worm is found in dirty water with the idea that it stays in the blood. According to this theory, Guinea worm derives from dirty water and then stays in the blood until it is ready to come out. This last concept is widely accepted and has become a culturally shared model. I will discuss this further in the next section.
Cultural Creolization

In the RELIGION chapter I explain that religious orientations such as Christianity, Islam, and *Vodù* are integrated into Beninese culture. Many persons fuse aspects from one tradition with another. For example, visionaries at a Christian church in Tchetti can tell if a sorcerer is vexing a certain individual. People attend this church to find out who is causing them harm. One informant described:

> The sorcerer comes at night when you are dreaming. You wake-up, remember the dream, and go to church to tell them about it. The church will tell you what to do to get rid of the sorcerer.

Also, Islamic traditional healers in the Zongo quartier provide *gris-gris* with Koranic verses to prevent illness. These creolized versions are created without conflict. The notion of cultural creolization extends beyond religion. It is also found in relation to health.

As I explained in the Community Sketch section, healthcare facilities in Tchetti consist of a government-run health center equipped with a maternity ward, three private health clinics, a multitude of traditional healers and diviners, a biomedical pharmacy, and an herbal pharmacy. With a range of healthcare options, people often pick and choose what suits them. This not only applies to healthcare services, but also treatments and medical ideologies.

One afternoon at the hairdressers several people engaged in a heated debate about urine therapy, the process of drinking one’s urine for health benefits. One informant explained that there are so many contradictory ideas about health that ‘...you must choose what works for you.’ Another said, ‘If you believe in it, it will work.’ The latter informant explained that he uses urine therapy to deter sorcerers from vexing him. This informant employed urine therapy (a practice associated with India) as a prevention method for sorcery (a practice seen throughout sub-Saharan Africa).

In reference to his study in Ghana, Bierlich (1995: 507) says, “People make use of both local and Western medicines, without knowing or being committed to the technical or philosophical premises of one or the other medical system.” Concerning people’s approach to medical treatment, he says, “Their practices are not

36 In this case, ‘*gris-gris*’ refers to amulets and talismans.
homogenous, but diverse or ‘un-systemized’, and highly innovative.” I would argue that in Tchetti people are aware of the “technical and philosophical premises” behind certain medical systems. People’s practices and ideologies are diverse and innovative because people have incorporated certain aspects from various medical doctrines to create a creolized version. Bierlich says practices are un-systemized. I would say that after time the creolized construction becomes a system in itself.

Geissler (1998: 65) talks about the notion of worms in the body in western Kenya. He says:

The resulting views did not belong to a coherent, shared cultural model, but were attempts to create some order among conflicting ideas stemming from different traditions of knowledge. They reflect positions in an open learning process, not an established medical culture.

In Tchetti, people are also confronted with “conflicting ideas stemming from different traditions of knowledge”. As I previously said, in reaction to the presence of conflicting medical doctrines, people pick and choose certain aspects thereby creating a creolized construction of knowledge. Although it may be confusing to the outsider, this new construction composed by bits and pieces from various ideologies creates a logical structure to the insider. Geissler says, “The resulting views did not belong to a coherent, shared cultural model.” In Tchetti, I would contend that not only were people’s views coherent but also many held similar views suggesting they have become a shared cultural model. For example, numerous people believed that Guinea worm is found in dirty water and then remains in the blood until it is disturbed. This concept stems from several traditions of knowledge. It is a mixture of ideas, which has become a common cultural model.

Lévi-Strauss (1962: 30-43) discusses cultural creolization in his theory about the bricoleur. Bricoleur is often translated as “handyman”. There is no direct English translation. The term signifies a person who creates an object from already existing tools and materials. A child who builds a robot out of old cereal boxes, pipe cleaners, and cotton balls is a bricoleur. Lévi-Strauss says the bricoleur is confronted with a wide array of tools and materials; (s)he picks and chooses the materials to create a new object. The new creation is a reorganization of the original tools. It is confined in the sense that the bricoleur is constricted to the original tools (s)he has to work with, but the tools are reconstructed to create an entirely new meaning. As I have shown, the notion of bricolage, bridging existing ideas to create a new concept,
applies to health. It extends beyond Tchetti and beyond Guinea worm disease.

Concluding Remarks

In the past, medical anthropologists have taken pains to categorize healthcare ideologies into separate entities. In sub-Saharan Africa, researchers often distinguish between biomedical and indigenous healthcare systems. In Tchetti I found it difficult to differentiate between certain doctrines. Health conceptions are a compilation of several philosophies, which create an entirely new idea. One should not attempt to deconstruct the creolized creation in search of universal concepts stemming from traditions of knowledge such as biomedicine or what has become labeled indigenous medicine. Rather, the creolized concept must be viewed in its whole entity. Helman (2000: 59) says: “... healthcare of any society cannot be studied in isolation from other aspects of that society, for the medical system does not exist in a social or cultural vacuum. Rather, it is an expression of, and to some extent a miniature model of, the values and social structure of the society from which it arises.” One who merely looks at health ideologies as fragmented concepts of biomedical versus indigenous ideas misses the fact that these pieces put together create a new structure. The creolized version is a culturally specific ideology comprised of manipulated segments arising from economic, educational, sociocultural, religious, political, and health aspects. We must attempt to understand it in its whole context.
Aikhomu, S.E., W.R. Brieger, and O.O. Kale  
2000  Acceptance and Use of Communal Filtration Units in Guinea Worm Eradication.  

Akinsola, H.A. and O.O. Kale  
1997  Copepod filters for guinea worm control- users have their say. _World Health Forum_  
18: 270-273.

Argyle, W.J.  
1966  _The Fon of Dahomey: A History and Ethnography of the Old Kingdom_. Oxford:  
Clarendon Press.

Audibert, M.  
1993  Social and epidemiological aspects of guinea-worm control. _Social Science and  
Medicine_ 36: 463-474.

Bermejo A., and A. Bekui  
1993  Community participation in disease control. _Social Science and Medicine_ 36 (9): 1145-  
50.

Bierlich, B.  
1995  Notions and Treatment of Guinea Worm in Northern Ghana. _Social Science and  

1997  Eradicating guinea worm without wells: unrealized hopes of the Water Decade. _Health  

1997  Ethnic diversity and disease surveillance: Guinea worm among the Fulani in a  
predominantly Yoruba district of Nigeria. _Tropical Medical and International Health_ 2  

Brieger W.R. and C. Kendall  
1996  The Yoruba farm market as a communication channel in guinea worm disease  
surveillance. _Social Science and Medicine_ 42 (2): 233-43.

Brieger WR and C. Kendall  
1992  Learning from local knowledge to improve disease surveillance: perceptions of the  
Brieger, W.R., J. Ramakrishna, J.D. Adeniyi, and M.K.C. Sridhar

Brunet, L. and L. Giethlen

Burghart, R.

Chippaux, J.P., A. Banzou, and K. Agbede

Chippaux, J.P. and A. Massougbdjii

Diamenua, S.K. and A.A. Nyakub

Eberhard, M.L., M.A. Rab, and M.N. Dilshad

Farmer, P.

Gardner, M. and E. Graveling
2000 *Dictionnaire Ifé – Français*. SIL Projet Ifé.

Geissler, W.P.

Geissler, W.P.

Green, E.C.
1999 *Indigenous Theories of Contagious Disease*. Walnut Creek: Alta Mira Press.
Helman, C.  

Herskovits, M.J.  


Hunter, J.M.  

Hunter, J.M.  

Ilegbodu, V.A., A.F. Ilegbodu, R.A. Wise, B.L. Christensen, and O.O. Kale  

Lévi-Strauss, C.  

Ogunniyi, T.A.B. and B.O. Amole  

Olivier de Sardan, J.P  

Olsen, A., P. Magnussen, and S. Anemana  

Périès, H., C. Rooy and Y.Y. New  

Ramakrishna, J., W. R. Brieger, J.D. Adeniyi, and O.O. Kale  
Rosenthal, J.

Tayeh, A., S. Cairncross, and G.H. Maude
1996 The Impact of Health Education to Promote Cloth Filters on Dracunculiasis Prevalence in the Northern Region, Ghana *Social Science and Medicine* 43 (8): 1205-1211.

Tayeh A., S. Cairncross, and G.H. Maude

WHO Collaborating Center for Research, Training and Eradication of Dracunculiasis
2001 Guatemala Worm Wrap-Up #110. Atlanta: Public Health Service Centers for Disease Control and Prevention, Department of Human Health Services, pp. 1-8.

Ward, W.B., D.W. Belcher, F.K. Wurapa, and M.E. Pappoe

Watts, S.

Watts, S.
Benin

International boundary
Province boundary
National capital
Province capital
Railroad
Road

0 25 50 75 Kilometres
0 25 50 75 Miles

**TABLE 1**

*Water Situation in Tchetti: June 2001*

<table>
<thead>
<tr>
<th>Quartier</th>
<th>Number of Households</th>
<th>Number of Household Wells</th>
<th>Number of Household Cisterns</th>
<th>Number of Public Wells</th>
<th>Number of Functional Borehole Wells</th>
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<td>Attiba</td>
<td>239</td>
<td>24</td>
<td>13</td>
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<tr>
<td>Carré</td>
<td>253</td>
<td>129</td>
<td>16</td>
<td>0</td>
<td>0</td>
</tr>
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<td>Elavagnon</td>
<td>196</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<td>Kokogberi</td>
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<td>3</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Lema</td>
<td>52</td>
<td>8</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>N'gbenou</td>
<td>178</td>
<td>6</td>
<td>7</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Tchoundja</td>
<td>95</td>
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<td>7</td>
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<td>Zongo</td>
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<td>65</td>
<td>29</td>
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<td><strong>TOTAL</strong></td>
<td><strong>1552</strong></td>
<td><strong>240</strong></td>
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<td><strong>1</strong></td>
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**TABLE 2**

*Guinea Worm Situation in Tchetti: 2000*

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<th>Quartier</th>
<th>Jan</th>
<th>Feb</th>
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<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th><strong>Total</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Attiba/Elavagnon</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Carré</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
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<td>Kokogberi</td>
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<td>3</td>
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<td>5</td>
<td>2</td>
<td>17</td>
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<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>N'gbenou</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>Tchoundja</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Zongo</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
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<td><strong>TOTAL</strong></td>
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<td><strong>0</strong></td>
<td><strong>0</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

1 *PEVG labels the quartiers as localities.*
2 *PEVG combines Attiba and Elavagnon as one locality.*
### TABLE 3

**Guinea Worm Situation in Tchetti: 1999**

<table>
<thead>
<tr>
<th>Quartier</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attiba/Elavagnon</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Carré</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Kokogberi</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Lema</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>N’gbenou</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Tchoundja</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<td>5</td>
</tr>
<tr>
<td>Zongo</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td><strong>15</strong></td>
</tr>
</tbody>
</table>

**GRAPH 1**

- **1999**
- **2000**

Number of Cases

<table>
<thead>
<tr>
<th>Attiba/Elava</th>
<th>Kokogberi</th>
<th>N’gbenou</th>
<th>Zongo</th>
<th>Quartiers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>QUARTIERS</td>
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<td>1</td>
<td>0</td>
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<td>10</td>
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</tr>
<tr>
<td>1</td>
<td>3</td>
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<td>0</td>
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</tr>
<tr>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

- **1999**: February, July, October
- **2000**: December
Pond water

Central Tchetti
Private Cistern

Waiting in line for the pump
Hausa medicine vender in the market

ABEREWA B&B CO
BUL SPLOOD TONIC

Alias Original
Rhumaatisme, Anémie
Manque d'appétit
Troubles Menstruels
Cobarturg, Fatigue générale
Hémorroides, Pahudisme

POSOLOGIE
Adultes: 2 cuillérées à soupe 3 fois/jour
Enfants: 2 cuillérées à café 3 fois/jour
Nourrissons: 1 cuillérées à café 3 fois/jour
A prendre après les repas

Agiter avant d'utiliser

Batch Nr. 01 Tel: 22-01-08 Lome 027-439059 Kromh-Akwaasi 851-26959 061-22157 K'Daa 027-439057

COMPOSITION
Antochonsta nobilis
Combretodendron macrocarpum
Khaya Senegalensis
Ricinodendron heudolfii
Sorgum bicolor

Produit par
Smailar Karim
Koforidua E/R
<table>
<thead>
<tr>
<th>English</th>
<th>Yoruba</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agbàfúfú</td>
<td>Python deity</td>
</tr>
<tr>
<td>Ahoun</td>
<td>Salt</td>
</tr>
<tr>
<td>Ambara</td>
<td>Blood</td>
</tr>
<tr>
<td>Atükpa</td>
<td>Guinea worm</td>
</tr>
<tr>
<td>Ayèrè</td>
<td>Lightening deity</td>
</tr>
<tr>
<td>Bùkùù</td>
<td>Rain deity</td>
</tr>
<tr>
<td>Colline</td>
<td>Hill</td>
</tr>
<tr>
<td>Éérfi</td>
<td>Dirtiness or impurity</td>
</tr>
<tr>
<td>Fá</td>
<td>Yoruba diviner</td>
</tr>
<tr>
<td>Fleuve</td>
<td>River</td>
</tr>
<tr>
<td>Gbèrèfì</td>
<td>Dirt/microbes</td>
</tr>
<tr>
<td>Kàga</td>
<td>Well</td>
</tr>
<tr>
<td>Kòkòró</td>
<td>Insects/worms</td>
</tr>
<tr>
<td>Marre</td>
<td>Pond</td>
</tr>
<tr>
<td>Montagne</td>
<td>Mountain</td>
</tr>
<tr>
<td>Odò</td>
<td>Pond</td>
</tr>
<tr>
<td>Òdzò</td>
<td>Rain</td>
</tr>
<tr>
<td>Ògú</td>
<td>Iron Deity</td>
</tr>
<tr>
<td>Omi</td>
<td>Water</td>
</tr>
<tr>
<td>Omi dídò</td>
<td>Sweet water</td>
</tr>
<tr>
<td>Omi orù</td>
<td>Salty water</td>
</tr>
<tr>
<td>Omi rere</td>
<td>Potable water</td>
</tr>
<tr>
<td>Omùmù</td>
<td>Worms</td>
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<td>Otsò/ Akpàtsò</td>
<td>Sorcery</td>
</tr>
<tr>
<td>Òtsùmàrè</td>
<td>Rainbow deity</td>
</tr>
<tr>
<td>Pòmpì</td>
<td>Borehole well</td>
</tr>
<tr>
<td>PENVG</td>
<td>Guinea worm eradication program</td>
</tr>
<tr>
<td>Puits</td>
<td>Well</td>
</tr>
<tr>
<td>Quartier</td>
<td>Neighborhood or locality</td>
</tr>
<tr>
<td>Sitèni</td>
<td>Cistern</td>
</tr>
</tbody>
</table>

1 Gardner and Graveling’s Ife-French Dictionary was used to verify spelling.