Tracing Unbounded Mosquitoes

An Ethnographic Study of Mosquito Control and Mosquito-borne Disease Outbreaks in the Complex Landscapes of Rio de Janeiro and Niterói

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University of Oslo
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Abstract

Drawing on six months of fieldwork in the state of Rio de Janeiro, Brazil, this master’s thesis provides a portrait of Rio de Janeiro by following activities related to mosquitoes. Mosquito-borne diseases pose grave health and social burdens in many areas of the world, and since the 1980s mosquitoes have been vectors of dengue, and more recently of chikungunya and Zika, in the metropolitan region investigated in this account. Topics such as public health related municipal governance, scientists, global health initiatives, health scares and fragmented cities, often discussed separately by anthropologists, are brought together by this minute, barely visible and mobile agent. Specifically, I will explore this through ethnographic attention to mosquito control and reactions generated by mosquito-borne viral disease outbreaks.
Acknowledgements

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I dedicate this work to my son’s aunt, Carolina. Saudades eternas.
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Map and population

Figure 1: Map of Rio de Janeiro. (IBGE n.d.a)

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rio de Janeiro</td>
<td>6,520,266</td>
</tr>
<tr>
<td>Niterói</td>
<td>499,028</td>
</tr>
</tbody>
</table>

Figure 2: Population of Rio de Janeiro and Niterói (IBGE n.d. b,c).
Chapter 1

Introduction

A buzzing Zika infected Aedes aegypti landed on a pregnant woman’s arm and bit her while ingesting blood required for its egg production. The mosquito then took off and flew over a wall into a patio and laid her eggs at the surface of some accumulated water. Within a week a herd of adult mosquitoes appeared from the pupae. After five times of this reproduction cycle, it had emerged two hundred adult mosquitoes. A uniformed municipality employee, however, had localized one of her breeding spots and applied larvicides, which interrupted the development for many of her larvae. While flying around in a city entangled with humans, viruses and mosquitoes, one of her male offspring, mated with a female that was infection immune —this as a result of a novel “experimental” mosquito project. When the offspring was brought into the world, they contained a Wolbachia bacterium, which impedes virus transmission. The mosquito “grandmother” herself was captured by another uniformed man. He sucked her into a huge “bazooka”—a battery-driven device, while he screamed, “I caught Aedes aegypti”. She ended her days under a microscope at a recognized Brazilian research institution. Five months later, the pregnant woman bitten by the now dead mosquito, cried, “Eu não quero um filho doído” (I do not want a crazy child). The “filho doído” she referred to was children, born with the Congenital Zika Syndrome¹, caused by the mosquito-borne Zika virus.

The viruses and parasites carried by mosquitoes pose a major health problem in the world and the most violent killer on the planet is the mosquito. As the WHO Malaria Report (2017) shows, there were an estimated 216 million cases of malaria in 2016, 5 million cases more than the year before. Moreover, there are 390 million cases of dengue infections each year, in addition to the diseases and pain caused by the yellow fever, chikungunya and Zika virus. The viruses can have severe health related and social consequences for those affected.

Mosquitoes are much more than almost invisible creatures, carrying microscopic viruses. Social, moral and economical connotations are brought with them. Consequently, the insect

¹ The term covers a range of birth defects related to congenital and neurological deviances, including microcephaly: when the brain does not develop into the size that is considered the normal standard. The severity varies widely from child to child. In November/December 2015, the Zika virus officially became associated with the increase of these abnormalities.
provides a window into a more obscured part of society that can be explored by an anthropologist.

**The thesis’ anthropological contribution**

A six month fieldwork in Brazil, where the Zika virus hit the most and where a multitude of mosquito species and viruses thrives, made me question: *what is being done in regard to mosquito prevention? Which kinds of obstacles exist, leading to new outbreaks? In which ways do locals react to outbreaks?*

Notably, Brazil has a long history of local scientists researching mosquitoes and hosts an internationally recognized national research institution, called Fiocruz (Oswaldo Cruz Foundation). At this place, along with a broad field of public health research, mosquitoes are studied, and insecticides are researched and developed. Additionally, the Fiocruz’ vaccine manufacturer BioManguinhos is one of the world’s largest producers of the yellow fever vaccine, and notable for the thesis, Fiocruz is also engaged in a novel, global mosquito intervention. *What is this institution’s and scientists’ role in regard to the “mosquito problem”?*

This thesis provides a portrait of the urban Rio de Janeiro region by exploring activities related to mosquito control and reactions to mosquito-borne viral disease outbreaks in Rio de Janeiro and the neighboring city Niterói. The thesis is built up around several interlocutors and localities where the mosquito is the actor who connects them and the different chapters together. Each group of protagonists, roughly separated by chapters, contains their own “situated knowledge” (Haraway 1988) related to the mosquito. In turn, this may offer a more holistic view in regard to the larger social processes in this context.

From the very beginning of this project, my wish was to bring together discussions on topics traditionally often hidden in ethnographic accounts, as the middle class’ and formal sector employees’ voices. Such perspectives tend to be much excluded from “classical” “poverty ethnographies”, written by both Brazilian scholars (see Caldeira (2000: 9) commenting “national anthropologists’” studies of otherness and subaltern groups,) and by anthropologists from privileged countries elucidating the suffering or violent life of “favela” dwellers (as Schepens-Hughes 1992; Goldstein 2003; Larkins 2015). Further, this thesis deviates much from what have been told in regard to the Zika virus in particular, as for
example newspaper journalists stories about the Zika victims’ miserable backgrounds or a Zika story from the perspective of those living in the Northeast where the virus caused most harm, as the Brazilian anthropologist Débora Diniz had done through her documentary film and book (2016), a short time before I began my fieldwork. Instead, I give the voice to the Southeasterners, and among them scientists, those Diniz (2016:12) claims having the power.

After reading about the anthropological discipline’s history, the inherent interpretive problems, the discussion of bias and power relations between the researcher and researched (see Clifford & Marcus 1986), I thought I could avoid uncomfortable and to some extent embarrassing pitfalls by grasping a theme that includes much more than one particular socioeconomic group and, perhaps, more interesting – the everyday routines of Brazilians that are maintaining the city in order and disease free, which is ignored by so many.

I do not follow a fixed direction within the discipline of anthropology and below I attempt to show how my contribution relates to several subfields.

**Post-human anthropology and the study of fragmented cities**

In this thesis I choose a “non-human” agent - the mosquito, as a tool to write an ethnographical account about the metropolitan region of Rio de Janeiro and to track the broader social factors playing a crucial role in the emergence and management of mosquito viral borne diseases. In this way, I draw on the innovative post-human direction in anthropology, where interspecies relationships and non-human actors can teach us about humans and human cohabitation.

This contribution is an addition to the direction of STS (Science and technology studies) that have brought biomedical and scientific practices of disease-making into the discipline, which can enable us to see beyond the societal conditions and social causes of disease and instead or additionally observe the practice or treatment of diseases (Chandler and Beisel 2017). This practice of diseases is in this thesis related to the activities of mosquito control, carried out by both scientists and municipality employed endemic disease control agents (ACEs). The phenomenon of ACEs, is more common in tropical countries and is unfamiliar to the average citizen in Norway, however, a few social scientists have written about this particular group of “street-level mosquito workers”, in other contexts. For instance, Nading’s (2012; 2014) elaboration of brigadistas in Nicaragua, Kelly (2011) on mosquito catchers in Tanzania, and
Beisel (2015) about mosquito sprayers in Ghana. Nading’s (2014) work on dengue and health workers, discussed through his concept of “entanglements” and Kelly and Lazaun (2013; 2014) articles on mosquito breeding spots and mosquito control in Dar-es-Salaam, have provided a multispecies direction which include mosquitoes and where the imagined mosquito-human strict separation is being challenged.

My contribution deviates from theirs, in the sense of weaving together a post-human ethnography with the geography of neoliberal cities and fragmented enclaves. Here I supplement the disease and mosquito related empirical data to themes linked to territorial enclosure. Murray’s (2011) description of Johannesburg as a city of a dual character, divided between the wealthy zones of fortified enclaves and the opposite zones of marginality, can be compared with Rio de Janeiro and Niterói. Caldeira’s (2000) elaboration of the urban transformation and spatial segregation, generated by fear and violence in São Paul, also serves as a comparable case. Through the mosquito, the separation between poor and rich and between public and private spaces, including governance and the mosquito related activities are brought to attention.

Outbreaks: moral panic and epidemics

Regarding mosquitoes, many anthropologists have focused on malaria and the suffering of people affected by the disease (Chandler & Beisel 2017:414). To some extent I go beyond this by looking at the practice described above, however, the suffering of people will be included in one of the chapters, where I additionally draw on the concept of moral panic, which is more frequently used in the discipline of sociology.

Furthermore, Brown and Kelly (2014), based on their work in Western Africa, mention the dearth of ethnographic data on viral hemorrhagic fevers and challenges of conducting fieldwork in an epidemic. I was “fortunate”, and happened to be present when a yellow fever outbreak occurred. Due to this I can contribute with knowledge of what was actually going on at the moment, which can be empirically and methodologically challenging to grasp form an otherwise retrospective way, as such outbreaks and hyped up reactions often fades away after a short time.
Public and global health: experiments and the state’s presence

Scientists, and common citizen’s involvement with science, in the case of Brazil, is a much untouched area by anthropologists. For people outside the natural sciences it is an unknown world, which deserves a social sciences’ perspective. Likewise, by shedding light on a new mosquito control strategy (a global health initiative): the releasing of mosquitoes containing a Wolbachia bacterium, which is in a global perspective relatively new, I will contribute with something that deviates from literature on more individual-body related experiments, as vaccine or drug trials (as for instance, Fairhead, Leach & Small 2006 or Petryna 2009).

Through my ethnography, I will show the state’s presence and caring for the inhabitants, in contrast to what is common in the broad field of medical anthropology, where the state is often conceived as something “evil”, unable to provide health care or protecting their citizens from diseases, as Biehl and Petryna’s (2013) “judicialization” of the right to health. Furthermore, I will argue that the local public health institution in my account is not being weakened or sidestepped by global health initiatives, in opposite to what critical global health contributors, based on their research at the African continent, often state (see Geissler 2015; Prince 2016; Prince & Otieno 2014; Nguyen 2009).

Finally, a clarification of the thesis title, “Tracing Unbounded Mosquitoes”, is needed. “Unbounded mosquitoes” is a metaphor which covers much of what this thesis is about. The mosquito inhabit every part of the city, and do not follow the “social rules” of the inhabitants, where questions of belonging and “the right to the city”, as Roth-Gordon puts it (2009:58), “have long been determined by where one lives”. The mosquito and the “mosquito workers” cross geographical and socioeconomical boundaries. Finally, the mosquito’s “bounded” agency as something evil and harming is being challenged with the benevolent laboratory mosquito used in control. In the “mosquito world” nothing is an isolated unity, which brings my topic into dialogue with, for instance, literature on fragmented cities.

Altogether, bringing this into attention, I believe I can contribute with something fresh to anthropology, where people, the city, the state, diseases and mosquitoes are intertwined.

Field site, access and choices

Brazil and Rio de Janeiro was not unfamiliar to me. I had already gone through the many experiences a novice anthropologist face at the beginning of fieldwork, as being “lost in
translation” or sensing new smells and tastes while mapping all the first impressions. For me the sounds, smells and tastes brought back memories of an exciting time in my life. A bit more than a decade ago I went on a high school exchange where I lived for one year with a Brazilian family in the Northeastern part of Brazil. The city was peripheral and less “developed” in comparison to the larger and central cities of Brazil, as São Paulo or Rio de Janeiro. The experience gave me insights of the life in shantytowns and among the poorer social strata. This time I wanted to learn something less familiar to me. With spatial segregation and Teresa Caldeira’s City of Walls in mind, my original intention was investigating social consequences related to the Zika virus and spending time with wealthy pregnant women or women in their reproductive age, living in enclosed condominiums. However, the fieldwork took another direction, with less attention to this particular group and the close attention to the Zika virus.

In November, before I for real initiated the fieldwork in January, I attended a Zika conference in Rio de Janeiro, organized by Fiocruz. I got connected to researchers which welcomed me to stay at their laboratory and at my later arrival, they gave me access to join them and their colleagues doing fieldwork, including the possibility to explore the mosquito related field trials, also in Niterói. They connected me with the municipal employees endemic disease control agents (ACEs), household associations and doctors working in the public health sector. These possibilities made it achievable to include other voices of actors much involved in the topic of disease control, and not only the vulnerable people or victims of diseases.

As a consequence I ended up doing a “multi-sited fieldwork” within the city of Rio de Janeiro and Niterói, which includes Fiocruz (laboratory), a hospital, health clinics and various communities (three in particular). I moved around, in and out of several neighborhoods and traced mosquito related issues in all the corners of the city of Rio de Janeiro and in some neighborhoods in the neighboring city Niterói and the yellow fever affected Casimiro de Abreu. The reader might question the validity of the data doing it that way. I have to emphasize that even if I had multiple localities, the mosquito related activities brings them together. Moreover, interacting with different actors and observe various environments enabled me to verify my collected data.

The different field sites will be described in more details throughout the thesis. Briefly, I will describe the more general landscape of Rio de Janeiro.
Rio de Janeiro had developed much at the time of my arrival. New metro lines and new trains with women-only carriages connected the Barra region with the rest of the city, and the urban revitalization project had given a facelift to the Port region. Starbucks cafes had been established around the city and people frequently used Uber. This modern city atmosphere came into contrast, when you looked up at the many surrounding hills (favelas) or went to the North Zone of the city, where Fiocruz is located –places where regular violent confrontations and poverty come to the fore. Even if the city in many ways is divided by social and spatial segregation, it is characterized by geographical proximity, especially remarkable in the Rio de Janeiro’s South Zone. As an example, an entrance to a comunidade (shantytown) can be at the end of or at the other side of a wealthy residential street, as is the case of the Cantagalo comunidade in the Ipanema area. There you can observe drug addicts and beggars at the Cantagalo’s entrance while nice apartment buildings are situated within few meters distance. Meetings, beyond social class belonging mostly happen through the working-class employment providing services for the wealthier Brazilians.

At the time of my fieldwork, Rio de Janeiro was filled with a lot of tension and faced a deep economic crisis. People were not satisfied with President Temer and his government, or the implementation of a labor and pension reform. It caused a general strike and mass protests, which marked the atmosphere. The bestialities of violence and discrimination in the society came as well to the front, by for example my roommate’s role as a jury member and her revealing of grotesque murders and crimes. My homosexual friend, harassed at work because of his sexual orientation and my roomie’s transgendered friends, likewise witnessed about sad social problems in a society full of contrasts. Overall, there is a lot who could have been told and many topics anthropologists can investigate in Brazil.

**Methodology and ethical considerations**

This time, now as a fieldworker, I came back to Brazil with more experience, including a bachelor degree in the Portuguese language and I had lived in lusophone Mozambique for a period. Having good language skills and a small network in Rio de Janeiro, enabled me to turn into the fieldworker role at the very beginning of my arrival. Collecting data on such a practical and “manual work” as mosquito control with the ACEs and scientists who were themselves fieldworkers, facilitated my attempt to enter and understand their role in a considerable way. By dressing the same uniform as them, follow their work schedule, using
my own body just as them by walking, carrying equipment, collect or release mosquitoes, applying larvicides and take part in conversations with locals, made it possible to perform participant observation at its very best. At our fieldtrips I also gained plenty of time to question my doubts and their thoughts concerning situations we together had faced during the day. Being in the field with them and observing the environment often took us into relevant topics I elaborate in the thesis. All these actors I met on a regular basis throughout the fieldwork.

At the laboratory my participant observation became more limited, I could not perform the same work as the biologists researching viruses and mosquitoes, and for instance, I did not have access to the room where they worked directly with virus experiments. At the insectary and the spaces I had access, I was limited to barely observation, it could be observing them doing PCRs and how the live mosquitoes were maintained. The lunch breaks turned into an important time of data collection, I could speak without feeling I interrupted their work. The methods applied at the health clinic and the hospital –sites which will not be shed much light on in the thesis (due to limitation of space), were much based on conversations and observation, and some participation –as attending consultations with patients and carrying babies or documents for doctors. I used this site mainly to get in touch with Zika affected parents and children, persons I also went home to with the aim of conducting more profound semi-structured interviews, which most of the time became less formal. Home visits and informal interviews, sometimes tape recorded, were performed with locals who were in different ways affected by viruses or virus outbreaks. At the end of my fieldwork I likewise conducted interviews with some scientists and mosquito collectors, in case I had missed or needed to clarify central aspects of earlier conversations with them. To keep updated on the yellow fever outbreak, I read and analyzed newspapers. In this regard I was also present at a health clinic observing vaccine injections and talked with locals and health workers.

Conducting a health related research in Brazil include strict ethical implications. Being involved with Fiocruz turned ethical issues and approval from a national ethics committee even more important. I always informed people about my study both written and orally. Protecting the scientists' and the laboratory’s identity, I find a bit challenging as the laboratory is well known within the Brazilian research community, however I attempt to do my best by applying pseudonyms, as is the case with all informants. The localities, especially where the mosquito trials took place still have their original names in this account.
**Positionality**

Performing an urban fieldwork with formal sector employees with a day-based working schedule facilitated my private situation of being a single mother bringing my own child with me to Brazil. Conducting fieldwork at an institution and with multiple dislocations was, however, not doable with a three-year-old hanging around, and for that reason he became enrolled in a kindergarten. This situation opened up a broader world of connections, where I got to know the society not only from the mosquito angle. I came closer into aspects concerning regular people’s lives, and I experienced the city as many locals with children, including the anxiety of mosquito-borne viral diseases and safety precautions. However, being a single mother traveling to a city perceived as extremely dangerous, made me sometimes feel awkward as people frequently stated “Raquel, você é doida (Rachel, you are crazy), who took that decision”. Having a child helped me to gain foothold in the community, just as Levey (2009) writes about children and ethnography. I brought my child with me to household association meetings as well as to some families’ home conducting interviews. I also entered mosquito related conversations with families at playgrounds. For my child being dark-skinned, our background generated curiosity among the locals and we connected easily also with Afro-Brazilians. I experienced that my role as a mother influenced how my informants perceived me, which can be explained by the elevated status of the mother in Brazil. My role as a fieldworker was taken seriously, I was not just hanging around – what I collected and the reason for being there was for real leading to a final product.

Depending on the informants, I frequently maneuvered situations by drawing on my previous knowledge of Brazil and personal experiences, which could connect us. Some may assume that my blond hair and white skin made me stand out very much, but many of my informants were themselves white and even blond. Still, of course, I was a foreigner and I could not blend in, in the same way as a white, young person among, for instance, the many male ACEs. However, the wearing of uniform connected us and for them it was less frightening “criticizing” their fellow citizens to a foreigner. In regard to the interaction with scientist, I encountered myself in what Latour and Woolgar (1979) wrote about the anthropological strangeness while conducting a research among scientists at a laboratory. It was for sure like entering an unknown tribe, with an unfamiliar language. Even if I had good Portuguese skills, understanding the biological world required a lot of concentration. At the same time, it was the social processes I tried to capture, and not the virus dynamics like a virologist.
A map of the thesis

In the following chapter called *The Spatial Mosquito*, the reader will be introduced to the municipal employees ACEs, routine laborers, preventing and appealing for a collective engagement in the combat against mosquito-borne viral diseases. The chapter speaks to the larger tensions and patterns in the society, marked by residential segregation, violence and inequalities. This will be brought to the fore by the ACEs and aims to show how these factors influence the ACEs’ struggles promoting a participatory disease control approach and the attempt of going beyond these obstacles.

Chapter 3, *The Acute Mosquito* will elaborate a society in emergency, where the rupture of normality is caused by anxiety and fear of viruses and outbreaks. The aim is to empirically investigate exceptional episodes of and reactions to yellow fever and the Zika virus. The yellow fever, I will argue, resulted in insecurity, sensation, exaggerated and moralizing reactions, known as moral panic, while the latter will be discussed in a more neutral way, recognizing that it was a genuine problem for those involved, rather than out of proportion.

The main point in Chapter 4, *The Traced Mosquito*, is to show the state’s presence in the society. This will be done through scientists and their colleagues at Fiocruz and their connection to the broader city. As with Chapter two, to a certain extent it describes routines. Drawing on Fiocruz’ authority and recognition, together with Brazil’s relatively strong national health system in comparison with public and global health in Africa, I bring to the fore that my informants experience their virus and mosquito related work with aspiration and as a public good for all citizens.

The final chapter, *The Experimental Mosquito*, explores a new virus control strategy, distinct from the one in the Chapter two. The aim is to argue that this experimental global health initiative has become “nationalized” in the way it is implemented and the actors it involves. Further I discuss how it is perceived by some with skepticism and resistance while others relies on scientific knowledge.

Finally, at the very end, the thesis will be summarized in a short conclusion.
Chapter 2

The Spatial Mosquito

“Oi de casa, Prefeitura² do Rio, combate à dengue” (hello house, Municipality of Rio, combating dengue), the female endemic disease control agent (ACE) said with a firm voice outside a residence. We were waiting for someone to attend us in front of the newly painted concrete wall separating the house from the calm and tiny seaside promenade. At our right we could see the Corcovado hill and Christ the Redeemer, and just five meters behind us the polluted Guanabara Bay with the bridge to Niterói in the horizon. Behind the residence, the green vegetation embraced the hills of the Sugar Loaf and Morro da Urca. The house captured my attention because of the three surveillance cameras that had our faces in its vigilance. The gatekeeper, who also worked as a gardener and took care of the residence’s two dogs, looked over the concrete wall. The two ACEs dressed in their white and blue uniforms were easy for him to recognize. They explained that they wanted to take a look in the patio, and the humble gatekeeper opened the gate for us, an act he probably regretted later. As we walked around and looked after spots the female Aedes aegypti might nest and where we could find larvae, the house owner entered the gate. She looked at us with a murderous glance and aggressively expressed, “What the hell are you doing in my patio?” She continued to look distrustful at me and at the uniformed ACEs. Then she started to yell to the gatekeeper, “The neighborhood is suffering assaults and robbery, you cannot let strangers inside!” The gatekeeper responded with a brittle voice, “I looked over the wall and I know her”, pointing at the female ACE. The woman did not look at us again. She rushed inside and slammed the doors.

I begin this chapter illustrating the complexity related to the ACEs’ daily work preventing mosquito breeding in a middle and upper-class neighborhood in the Zona Sul (South Zone) of Rio de Janeiro, where there is an increasing tendency for the population to isolate themselves behind fences and surveillance cameras. As will be revealed later, violence in this neighborhood is nonexistent compared to the ACEs private life in the poorer and violent Zona Norte (North Zone) and in the other neighborhoods where I conducted my fieldwork. Having this in mind, ironically enough, fear is a present part of the population in the bairros nobres (noble neighborhoods, expensive and wealthy areas) daily lives as well, and the fear, among other factors, is an obstacle for the ACEs’ success preventing vector-borne viral disease

² Prefeitura is the executive branch of the municipality and is divided into secretarias (government departments).
outbreaks. The mosquito control in this context advertises a participatory approach, which depends on the population, as the house owner I just mentioned.

In this chapter my focus is on the ACEs in the neighboring municipalities Rio de Janeiro and Niterói, and through them and their routine based work with mosquito prevention, I bring into focus some of the larger tensions in these two urban cities: the deep marked inequalities, residential segregation and violence which influence the variation of trust, suspicion and (non-)participation. I will argue that insecurity and fear, and the mosquitoes’ dirty symbolic meaning lies in the core of the main obstacles: household access and civic commitment. As I will show, the struggles and success related to their work takes different forms, depending on the particular neighborhood and the ACEs themselves.

The next section briefly outlines the history of mosquito control and interventions in the city of Rio de Janeiro and will be followed by identifying the contemporary ACEs, their practical work, how they are organized and how they approach different localities. I will particularly examine the interaction between the ACEs and residents and it will be highlighted throughout the chapter, but the discussion of it will be done, together with emphasizing the ACEs special role, serving the state and entering the citizens’ private spaces, in the chapter’s second half.

**A brief history of the ACEs**

Mosquito control is a longstanding practice in Rio de Janeiro. During the 19th century, the poor state of public health resulted in many deaths and massive epidemics of yellow fever. Since the 1850s yellow fever became endemic in the city of Rio de Janeiro, with regular epidemic recurrences (Löwy 2006: 53; Benchimol 1999). At this time the scientists were still studying the causes of the disease, and the *Aedes aegypti*’s role as a vector in the transmission was unknown, however, during the 1880s the Cuban doctor Finlay claimed that is was a connection between yellow fever and mosquitoes (Löwy 2006: 63).

The bad drainage system and Rio de Janeiro’s infrastructure contributed to outbreaks and had negative impact on the city’s reputation and commerce. As a response to this, in 1902 President Rodrigues Alves implemented an urban renovation plan and in 1903 he appointed Oswaldo Cruz the director of public health (Löwy 2006:86; Coutinho 2003:80). Together they attempted to solve the city’s health problems. Cruz initiated a campaign against smallpox, the bubonic plague, and by using a successful eradicating yellow fever model carried out by the
Reed Commission in Havana some years earlier, the yellow fever was soon coming to an end. To control epidemics a pedestrian public health group, the Mata-Mosquitos (Kill-Mosquitoes) was born. They went around in the city destroying the mosquitoes’ breeding grounds, sprayed and killed rats. Fumigation of sulfur dioxide inside houses was the principal activity to reduce the number of the yellow fever’s vector Aedes aegypti. The Mata-Mosquitos, identifiable with their uniforms, and presented as combatants of the war against yellow fever, also attempted to destroy Stegomyia (subgenus of the Aedes genus) larvae, but this task was considered secondary in relation to the fumigation (Löwy 2006:88). The application of these methods succeeded and deaths due to yellow fever decreased significantly. In 1955 the Aedes aegypti mosquito was eradicated, but according to Instituto Oswaldo Cruz (IOC n. d.), the relaxed attitude related to mosquito control resulted in a reintroduction of the species in the end of the 1960s.

The regular and systematic vector control, carried out by the pedestrian health workers regained its central place during the 1980s, when the dengue fever virus emerged in the country. In 1986, Niterói and in Rio de Janeiro faced the first clinical and laboratorial documented occurrence of the virus. Since then regular dengue outbreaks left a lot of Fluminenses (inhabitants of the Rio de Janeiro state) ill. The dengue emergence caused health problems in other parts of Latin-America as well (see Nading 2014). During the last years new viruses were identified in Brazil, the chikungunya virus in 2014 and the Zika virus was discovered circulating in the country in 2015. All of them carried by the urban mosquito specie Aedes aegypti.

By taking the current virus situation and the world of emerging viruses and epidemics into consideration, the role of ACEs seems more important now than ever and I will in what follows return to the contemporary ACEs.

**Identifying the contemporary ACEs**

The current organization of the ACEs is in some ways similar to the one during Oswaldo Cruz era. Some of my informants called themselves Mata-Mosquitos, as in the old days. Others referred to Agentes da vigilância, but their formal name in Portuguese is Agentes de combate à endemias (ACEs). The municipalities of Rio de Janeiro and Niterói vary a bit in their way of organizing the ACEs’ work, but in practice they are similar and have the same goal: preventing disease outbreaks by controlling vectors of diseases, the mosquito and rats. The
latter is only the case in Niterói, where in addition to controlling rodents they are carrying out information work about animal well-being, reproduction control and hygiene. Comlurb, Latin America’s largest urban cleaning organization (Prefeitura do Rio 2009), is responsible for preventing rodents in Rio de Janeiro.

The ACEs are public functionaries, entering by passing an exam. Before entering the field they are trained by the Divisão de Vigilância em Sáude (DVS) in Rio de Janeiro or the Centro de Controle de Zoonoses in Niterói. The leader of the Disease control center in one of the municipalities claimed that probably 70% of the ACEs have nível superior completo (higher education). He explained, “For one reason or another, there are nurses, pedagogues, psychologists taking our exams, even if the job is considered a “low-level-of-education-work””. One explanation is the lack of opportunities at the job marked. Due to much unemployment, the informal sector embraces many, some, for instance, sew and sell their things at markets, others collects recyclable waste –a possible destiny for the ACEs, if they had not become low-paid public functionaries. Another reason for becoming an ACE is that they become public employed, which means that they are guaranteed work for the rest of their life, although, the salary is relatively low. The ACEs working in the high-income Zona Sul complained about their salary, that it is not equivalent with the hard work they perform. They gain about 1400 Reais (376 Euros) per month, and receive a health insurance and “Lunch-tickets”. Every third year their salary increases a little bit. Living in Rio de Janeiro with that salary, is almost impossible. To place this in an understandable contextual perspective, minimal wages in Brazil is approximately 950 Reais, and students, for instance, are paying minimum 1000 Reais for renting a room in a shared apartment, in addition to 200 Reais in gas and energy expenses. Working as an ACE and at the same time supporting a family, they can obviously not afford to live in the central asfalto (asphalt), as in opposite to the morros (hills), neighborhoods in Rio de Janeiro. The majority of the ACEs live in comunidades or the city’s periphery, often densely populated areas with relatively small brick houses located in narrow lanes. As public functionaries the ACEs are not living in extreme poverty, but their budget is obviously very tight.

The two ACEs mentioned in the introduction, had been working in Zona Sul for almost six years. Both of them had to travel 50 kilometers, every day, to their work. The distance and the

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3 Favela is a term for Brazilian shantytowns. The concept has negative connotations and is offensive. Instead, “comunidade” or “morro” are used by locals. Places where apartment buildings are located are referred to as “asfalto”.

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traffic jams they encountered were challenging. On the other hand, they escaped from the “civil war”, as they named the violent situation, a reality for the ACEs working in the poorer neighborhoods, by performing their work in the Zona Sul. Additionally, it allowed them to circulate in a neighborhood distinct from their own and enter wealthy people’s private spheres, which is rare in this class divided society. Other ACEs worked close to or in their home community, as for example Danilo in Niterói. He preferred to work in his neighborhood, but far from the majority had the same preference. Some of his colleagues, he claimed, were afraid of passar vergonha, they felt it was humiliating working among their friends or family. It was related to the ambivalent situation of pointing at close related people’s “errors” or bad habits. Danilo, on the other hand, liked it, he experienced it as a contribution to his family – he talked about the comunidade as his family – people he wanted to help. The idea about helping kept him motivated. By dressing the uniform, he managed to separate the distinct positions of being a common citizen and a municipal worker. His uniform was a white t-shirt with “Zoonosis Control” printed in orange, at the back of it. Additionally, he and his colleagues were equipped with closed boots and a bag containing insecticides and rat poison. In Rio de Janeiro the appearance of the uniform gave a more formal impression. They were dressed in blue and white t-skirts, pants, and a vest in the same colors. As I will explain later on, the use of uniform is crucial in this context. I could observe that the female ACE, Valentina, was preoccupied with her appearance. It was important to look proper. They were after all entering people’s private spaces.

The ACEs’ work have some similarities, but also differences with other ethnographic descriptions of disease control and street-level health workers – the special personnel that connect institutions, citizens and spaces of governance together. Whereas Geissler, Kelly, Manton, Prince and Tousignant (2013), based on their work at the African continent, reveal that street-level health worker’s positions are uncertain, temporary and often informal, the ACEs in Brazil on the other hand, as I have shown, have a stable career and are able to persist with their routines. Furthermore they are proud holders of the carteira assinada (signed worker ID). This ID, as also Millar (2014:41-42) shows in her work on waste collectors at a garbage dump in Rio, brings the status of a respected worker and thus the job is conceived as “proper” and honest, especially among the working class. Manual labor, is, despite of this, much devalued among the wealthier population, something that goes back to the time of slavery.
In contrast to Nading’s (2014) elaboration on the community health workers, the *brigadistas*, preventing dengue in Nicaragua, the majority of the ACEs were men. I will very briefly outline this gender dimension with a little insight to my own gendered body as a fieldworker.

**The gendered field**

Out of fifteen ACEs, I only met two women, Valentina and a forty year old woman in Niterói. She was the only one among her eight male colleagues in her area.

> I am accustomed working with a group of men. I really like it and I feel protected. It is good for the “boys” (they were middle aged men). I can pull their ears if they become too much *safados* (naughty). As now, you see and hear the way Sérgio is talking to you, Rachel. That old man is trying to conquer you. I have to educate them.

The female ACE laughed and the conversation entertained the group of males surrounding us. As we talked I overheard one of the men commenting to Sérgio that I had a child and probably a man. After this conversation he changed his way of talking with me, the flirted tone shifted into a respectful way of approaching me. During our fieldwork I often got attention from other men in uniforms working with road construction in the area. They never talked to me, but I could read their curiosity at their faces. A blond, young, female–apparently well-off person, working as an ACE, it did not fit into the normative structures. The preventive work has long been dominated by men, and still is. Earlier they had to carry heavy equipment, and back then they more often climbed walls and roofs to observe the water containers. The leader showed me a thirty year old picture of himself and his male colleagues at a pickup truck on their way to the field. “You see the equipment. Women could not have used it”. I experienced myself that women were not expected to perform such a heavy work, especially not a wealthy woman, as one day I was told to not climb a fence like the ACE did. First I thought it was because I was not allowed entering some ones property, but I soon understood it was because of being a “wealthy” woman.

In Brazil it exists another group of street-level health workers, called *Agentes Comunitarios de Saúde* (ACS) and among them the majority were women. The ACS’ also work as uniformed pedestrian field workers doing home visits, but in contrast to the ACEs, the ACS’ are obligated to live in the area they work. They face many of the same struggles as the ACEs,
however, their task is not particularly with mosquito prevention. They are preoccupied with the populations health and follow-up the local health clinics patients. If they observe accumulated water and breeding spots they inform the residents, but it is not their responsibility. The ACS’ knew the ACEs working in their area, because they shared their offices with them. The ACEs had to pass by every day to register their presence and the day’s route and findings.

In this section I attempted to identify the ACEs. I described who these uniformed, often men, civic servants are, related to their education, that they enter by taking an exam and that it is a permanent “proper” public job. They are representing the state’s presence by engaging with the citizens. I also mentioned that they are living in peripheral popular neighborhoods and that their salary impedes a life in, for instance, the Zona Sul of Rio de Janeiro. The next section focuses on their practical work.

**Entering the field with ACEs**

The prevention work covers the whole city. In both municipalities the ACEs work in a determined territory, they call *setor*. In each sector one ACE is responsible for in-between 800-1200 households. The exact number depends on the territory’s characteristics. If the houses are very remote and there are long distances between them, the ACE is responsible for fewer households. In the *morros* and *comunidades* they are often responsible for up to 1200 households. Each house is revisited every second month, they call it a *ciclo de trabalho* (a work cycle), and one year contains five *ciclos*.

The work consist a lot of walking, up and down hills, through narrow lanes or crossing large avenues. During house-to-house visits they are trying to promote healthy behaviors, as the importance of a tidy household without spots of accumulated stagnant water. They attempt to engage the population to participate in the “fight” against mosquito-borne diseases, while they are eliminating pools of stagnant water – *os focos dos mosquitos* (the mosquitoes’ breeding spots). In case they find larvae they use larvicides, and insecticides in cases of virus outbreaks. The following example illustrates how an ACE was maneuvering to get his job done.

The ACE, Eduardo, showed me some tarpaulins outside a residence. “This place can develop into a *foco*. With a little bit of rain, the tarpaulin will accumulate water. The female *Aedes*
aegypti lays her eggs at humid place at the edge of the water and the eggs can survive for a long time. They develop into larvae with only a small amount of water”. He continued to explain the mosquito’s life cycle, the three stages before reaching adulthood. When they localize a foco they destroy it by turning the boxes or bottles of water upside down, if that is not possible they use larvicides. The lack of running water is the reality in the comunidades. The water is a valuable good and cannot be thrown away and in these situations larvicides are used also in water consumed by the locals. Eduardo continued to explain the preventive work. We do everything we can for the prevention, we only use the fumacê (insecticide spraying) and pyrethroid (a type of insecticide), when it is very much needed. Then we use it in the quarteirão (city block) and in the houses in front of the ill resident’s home. We are failing with the prevention in case we need to use it. Prevention is cheaper, less will become ill.

We walked into a narrow lane with houses on each side. To maintain the control they visit the houses at the same side. The ACE took a little yellow flag from his purse and placed it at the wall, “If the supervisor is coming after me, then he will know where I am”. Throughout our walk several of the house owners were not home. People living in this low-income area were working and could not afford a domestic worker in contrast to the example in the chapter’s introduction. We met a woman outside her home. Her entrance was full of plants that caught the agent’s attention immediately. Potted plants are perfect breeding spots. The woman knew it and used sand to absorb the water at the pot’s plate. “Good”, the ACE commented, “But you should use more sand here”, while he pointed at the plate. We walked through her house into her backyard. The ACE knew where to look and in just a few minutes he found larvae in a drainpipe. It was full of larvae in the standing water. “Earlier we brought the larvae to the laboratory for analysis. Now we use larvicide, it does not matter if we cannot identify the specie”, he explained. The name of the larvicide is “SumiLarv” and with a spoon he removed the granules from a plastic box into the drainpipe. It does not kill the larvae, but it disrupts the development of it. The woman claimed “It is not my fault, the mosquitoes are flying form the neighbor’s patio to my house, just take a look at his dirty place and all his garbage”. A lot of people in this area were collecting recyclable waste to earn money and they often kept the items outside their residence, waiting to sell them to scrap yards. It is an irregular form of employment connected to the global recycling industry (Millar 2014). Or as the ACE Danilo said “Even my own patio is full of broken items I attempt to fix. People like us, cannot throw
valuable things away”. The possibility to accumulate water is higher with the presence of objects retained outside.

In a polite way the ACE Eduardo tried to explain that the mosquitoes were created here at the woman’s home as well, as we just witnessed. Before we left the household, the ACE wrote at his worksheet and registered his visit at the residents’ own little sheet. Later he emphasized that he always had to talk well-mannered. “If we are complaining and the locals feel accused, they will not let us inside again”. The importance of this proper way of acting or socialize with the community was also stated by Nadings’ (2014) *brigadistas* in Nicaragua.

The ACEs’ work is, as I have shown, manual and their own body is used a tool, both in locating and dislocating them in the territory and their practical tasks, preventing breeding grounds and larvae. The right sociality, knowing how to be polite was also important. Below it will be explained that the use of insecticides have caused health injuries for some ACEs.

**Insecticides**

“I am almost blind at my left eye”, Danilo scratched his neck and continued, “It is because of the use of *abate* (an organophosphate insecticide). It left a lot of us, ACEs, with bad health”. Several of the ACEs explained that the oldest generation of their colleagues or retired colleagues, suffered the aftereffects of their heavy work. Some died of cancer, and others sued the state because of their work injuries. Scientists, ACEs and the ACEs’ supervisors commented the DDT (Dichloro-diphenyl-trichloroethane) an organochlorine substance and the organophosphate *abate*, used as insecticides in earlier mosquito control campaigns (see Nading 2017:122). DDT became the main control tool during WHO’s global mosquito eradication program from 1956 to 1969 (Cueto 2013:34; Beisel 2015:287), however, the insects’ resistance against DDT and the toxicity led to an end of the use of it. “The DDT was effective, it killed the mosquito in large-scale, but the organophosphate gave us cancer”, one of the supervisors in Niterói claimed. “*Abate*, poisoned many ACEs because they did not follow the recommended use of the product. They had to use protective equipment, but they did not”, the leader of the Disease control center said and was confirmed by two former ACEs themselves:

> We did not use much EPI (Individual Protection Equipment). Nowadays people are more concerned about it. People died and some believe it is a relation to many
years of work with pesticides. We stopped using the organophosphate in the end of the 90s, although, it is the most effective, it kills all the mosquitoes. On the other hand, it puts the worker at risk.

I asked about the health and environmental risks of the products used today. “We have to trust the scientists, but there is no guaranty when you mess with biology”, a supervisor responded. He claimed that they still use some of the products in extreme situations, when there are no other options.

“Yesterday we used the “bomba” (bomb), the ACEs’ supervisor showed me the round can. “It is Pyrethroid. It kills all the insects. It is like an atomic bomb. It is funny, because what we are doing is like a war against the mosquito”. The war metaphor dates back to the Oswaldo Cruz prevention campaigns. The way of “conquering” the territory, pushing the enemy (mosquito) back and the control of it, makes the mosquito control and military interventions metaphor applicable. Studies on mosquito control in Nicaragua (Nading 2014) and in Ghana (Beisel 2015) refer to a similar analogy, used by locals and health workers.

The ACEs had used the “bomba” because of a small outbreak of Chikungunya. Five houses on each side of the ill person’s home were sprayed. “Not all let us use the “bomba”, because you have to stay outside for at least thirty minutes after spraying. The cause of the refusal is probably related to illness or they are cooking at the time we arrive”, the supervisor and an ACE explained.

I am now ending this section about the ACEs practical work. As I have explained, their work is much about routines, order and spatiality. They have paths they follow and revisit them through their work cycle. The territory is carefully cleaned by focusing on one side of the road and its houses at a time. They inhabit knowledge of the mosquitoes breeding habits and know where to look. The work involves a technical intervention in the way they apply larvicides, and insecticides in times of emergencies. The usage of these devices has manifested itself in their older colleagues’ bodies.

In one of the examples of the house visits, the woman refused that the mosquito develops in her own patio, instead she pointed at her neighbor. After elaborating spatial aspects of the control, it will be shed light on the discourse of blaming among other factors.
Figure 3: ACE and breeding spot.

Figure 4: Larvae
Figure 5: Applying larvicides

Figure 6: “Bomba”
**Spatial mosquito interventions and its implications**

It has been a lot of anthropological work done concerning malaria (see Chandler & Beisel 2017), the parasite transmitted by the *Anopheles* genus, and it should be emphasized that the *Aedes aegypti* interventions deviates from the malaria interventions. The *Aedes aegypti* specie is in some aspects, as also Nading (2014:64) writes, more difficult to control than the *Anopheles*. In contrast to the *Anopheles’* breeding grounds (see Kelly & Lezaun 2013), often larger bodies of water, exposed for sun light, the *Aedes aegypti* breed and thrives in enclosed, small and dark areas—as people’s private spaces. Public health interventions related to dengue, and later the other viruses carried by the *Aedes aegypti*, have mostly concentrated on personal behavior change and domestic, individualized responsibility, as is the case in Brazil and in Nading’s (2014) account on dengue fever in Nicaragua. This can be seen in contrast to the insecticide-threatened bed nets and indoor residual spraying (see Beisel 2015)—the two main domestic interventions in malaria prevention (see Kelly, Koudakossi & Moore 2017). In the *Aedes aegypti* control there is a need for constant vigilance of the breeding spots in people’s households which relies on the local’s participation. The prevention, as Nading (2014) states, requires effective water and waste management, but the state’s attention relies on households and personal responsibility for health and space, rather than the infrastructure. In the context I describe, of course the broader environmental and social conditions have to be taken into consideration, however, I have to narrow down the focus to the participation the ACEs are trying to engage.

Pylypa (2009), in her work on community-based dengue fever prevention in Thailand, explains that domestic control has proven to be an enormous challenge worldwide and as she (Pylypa 2009:74) writes, “Because of the difficulty of sustaining active participation, dengue prevention is typically deemed a failure, both in Thailand and worldwide, and *Aedes* mosquitoes continue to thrive”. Whereas she explains the Thai’s perception of risk related to dengue as negligible and thereby influences their motivation toward participation, the Brazilians I met, are aware of the different diseases and the variation of symptoms in regard to the four dengue types and the vector that transmits them. The limitation, I will argue and which will soon be emphasized empirically, consists of two main factors 1) the lack of commitment caused by the mosquito’s dirty symbolic meaning and 2) because of access to households. Both factors are related to space.
The ACEs work, doing home visits blurs the boundaries between private and public spaces. It creates an intimate engagement of public institutions in private spaces and practices. Further, it causes ambivalence toward the household understood as a site of separation from the public spaces (Kelly et al. 2017). This separation and the tension between public and private life manifests itself particularly today because of the fragmentation of the city and the middle/upper classes’ increased demand for privacy and separation.

As Gaffney (2015) and Sánchez and Broudehoux (2013) write about the urban landscape of Rio de Janeiro related to the impact of the last years’ global mega-events, the variable residential landscapes are changing rapidly due to real estate speculation and increase in rents. Attempting to improve the city’s image, urban planning strategies have resulted in new aggressive state-sponsored forms of gentrification which has exacerbated socio-spatial segregation. This echoes, as mentioned earlier, where the ACEs can afford to live. Additionally, the tendencies in many areas of Rio de Janeiro and Niterói, are in some ways similar to what Caldeira (2000) describes about São Paulo, where narratives of fear and crime have increased the wealthier population urge of living in “fortified enclaves”, gated communities separated by walls and technologies of security, while abandoning public spaces. Patterns like this and the shrinking public spaces and circulations are also described about millennial urbanities across the world (see Geissler 2013 about the geography of public health research in Kenya). Territorial enclosure has become interlinked with the practice of social exclusion (Murray 2010:210), and “The disappeared common commitment to construct communal spaces shared by diverse publics in a negotiated compromise over their use” (Murray 2010:211). In other words, a consequence of these segregated cities is a creation of a new character of public space and citizen’s participation in public life. However, even if people and buildings are segregated, they are often located within geographic proximity, which of course is crucial for disease transmission and insects as they do not respect these walls. Consequently it can create a polarized discourse about responsibility. The boundaries between private and public spaces, the hierarchal class dimensions and the right of an ACE to demand participation, hence create tension, as will be shown below.

Creating relations and participation

To successfully complete the work, creating relations is crucial. The head of the Disease control center emphasized, “When we establish relationships, we create at the same time
commitments. The educative message, the orientation and the doubts are easier understood and explained with the ACEs regularly presence”. Through this we can understand the important advantage concerning the sectored organization. As mentioned in the introduction, the gatekeeper knew the female ACE through her regularly visits and because he trusted her, he allowed me and the other ACE to enter the property together with her. The lady, who lived there, on the other hand, did not know her or us as she was usually not staying home during daytime and as a consequence she reacted with fear and disliked that someone entered her property.

The group based citizenship, in the sense of an idea of a collective social belonging and the civic duty it brings, is strongly needed in the vector control. It requires the householders to cooperate with the ACEs and take care of their own gardens. It is not as easy as it seems to. Consciousness about the collective responsibility was, according to many ACEs, the main challenge in the vector control. One of them explained:

I worked here since 1991 and the population still has the same way of thinking as back then. They are doing the same errors. Now we have the “10 minutes per week campaign” and there are posters about it all over the city and at the television, but still, even if we are informing locals about the diseases, nothing is changing. I should not clean up their mess, but inform them. It turns out that I have to walk around and empty their waste for water. It happens that doves are swimming around in their drinking water. They know about it, but they do not care.

According to this, people distance themselves from the problem, and as will be argued in the next subsection it has to do with the mosquitoes’ negative symbolic connotations.

**Obstacle one: Blaming the dirty neighbors in a hierarchal landscape**

“Many have bad hygiene”, nurses, ACEs and community health workers repeated. One day at a health clinic, health workers called me and wanted me to observe this problem. I had to look at a patient. He had myiasis. His leg had a huge open wound and fly larvae were feeding on him. The smell was terrible and the nurses told him he was dirty and disgusting. “You see, Rachel, the population does not even care about themselves. They do not care about waste and excrement even inside their own houses. They are creating rats, mosquitoes and the
diseases. Then they claim they do not have a problem”. They continued, “Only “visit the neighbor – It is always the neighbor who is mal (bad) and sujo (dirty)”. They all agreed about the popular discourse, “The person will never assume that someone got a disease at their home, because “my home is the cleanest home in the world. My home is perfect. The dirty and problematic home belongs to the neighbor””. I commented that I did not know it was possible that fly larvae could infest humans. “Minha filha (my daughter), in Brazil everything is possible, we have all the disgusting things you can imagine”, one of the nurses revealed. “In the comunidade you can observe children playing in excrement, with their faces covered in nasal mucus and their parents do not care”. “The larvae-man” screamed, he was standing naked and the nurses did not hesitate giving him injections in his buttock while they were laughing at him. The next day, the nurses and the community health workers commented “The larvae-man is back, oh my God!” He approached me and told me he had taken a shower.

Many do not recognize that the mosquito control should be a personal participatory concern and that the mosquito can breed at their “clean” places. Poor and humble people, as “The “larvae-man”, are often blamed. They are believed to create the mosquito as a result of negligence, ignorance, laziness and a particular lifestyle. Just as Cueto (2003) writes about stigma and blame during a cholera epidemic in Peru in 1991, where individual responsibilities of becoming sick or avoid it were reinforced by authoritarian political decisions, instead of dealing with the real problems, as improving the water and sewage system. The negative association between cholera and dirt resulted in people denying having cholera because they were ashamed. In similar way the mosquito and the breeding spots are closely related to stigma and dirt, and hence is a reason for negation and non-participation. This makes Douglas (1966) unescapable, where she writes that “dirt is essentially disorder”, however, she continues to state that “there is no such thing as absolute dirt: it exists in the eye of the beholder” (1966:2). In the context of mosquito control, the mosquito and its breeding grounds are considered as dirt and offend against order, and the ACEs are trying to organize the environment, as a disease free space. They are attempting to transfer the moral code about mosquitoes and larvae to the population as something dirty and that it should be eliminated. The mosquitoes and viruses are a “matter out of place”, according to the mosquito control’s system of classification. They should be strictly separated from humans. The ones that are listening to them are performing a good citizenship. One of the problems is the negation of the dirty mosquitoes or viruses as a personal responsibility.
The middle class does not accept that an ACE enters their home to tell *them* what to do. The ACE themselves told me many stories underpinning this. Some ACEs claimed that in Urca, in the Zona Sul, a large amount of the inhabitants believe that the failing and the virus outbreaks are related to the *comunidades*, and that the prevention is only needed in that kind of environment. However, this is certainly not the case.

Nading (2011) claims that dengue previously has been limited to being a "neglected disease", in densely populated, low income areas of tropical cities and that these patterns have shifted, and affect people who previously would have been considered as a non-risk group, as the Asian and Latin American middle class (see also Nading 2012; 2015). This is also revealed by Kroeger et al., (1995) while describing how Colombians who could afford water tanks –those of higher socioeconomic status, as well got dengue fever. Similarly, a study in a Brazilian urban area argues that the risk of dengue infection is present beyond socioeconomic groups (Teixeira et al. 2002:759). This underscores the importance of mosquito control also in the wealthy Zona Sul. The ACEs frequently explained the population about these shifts and that people in wealthy areas also had to do their part in the prevention.

A middle class woman in Zona Sul, in contrast to some neighbors, did not think that wealthy areas were mosquito and disease free, and confessed that almost everyone she had been affected by dengue, Zika or chikungunya. Those who had felt the pain of the disease at their bodies were more likely to take part in the prevention. She stated, “The prevention is complicated. It is not enough to turn my son’s toys in our garden upside down. The eggs can survive for a long time. I have to scrub the toys. It is really hard to be efficient”. She continued to explain that some in the neighborhood were afraid of the ACEs. The population does not like that ACEs discover mosquitoes or breeding spots at their property. They do not want to be informed about changing their habits, use other types of pots for their plants or remove the Bromelia plants, where the *Aedes aegypti* often breed. According to the woman, it was mostly *senhores* (older men) who complicated the prevention.

The culture of blaming the others does not happen much among the poorest part of the society. If ACEs find larvae at their property, they often respond that they will be more careful, although, they do not always perform this in practice. This humbleness came to surface one day we walked into a poor settlement surrounded by a small forest. The ACE whispered that this place was ideal for the mosquitoes. He turned old paint cans upside down and a man with an alcohol odor approached us and said that he was going to remove them.
The man looked uncomfortable and did not look us in the eyes. “You should clean the dog dishes, once a week”, the ACE informed. The man started to clean them. “Tranquilo, que é isso”, the ACE tried to calm down the worried man. He was clearly embarrassed about his poor and untidy settlement and immediately did what the ACE told him to.

It is question of a hierarchal positionality between the ACE and the local, related to who got the right to tell someone to about the right way to live and how to care for their home. The ACE receives the poorer population’s respect. The ACEs have after all a symbolically valued “proper” formal job. The middle/upper class, on the other hand, does not appreciate the state interfering in their private lives. This leads to the Brazilian anthropologist Roberto DaMatta, much influenced by Turner’s and Dumont’s theoretical frameworks. By turning to Turner’s studies of “social drama”, the elaboration of social actions as meaningful actions, DaMatta shows how both “hierarchical”/“personalistic” and “egalitarian”/“individualistic” codes operate simultaneously in the Brazilian society (Hess & DaMatta1995:8). The authoritarian voice of the citizen who imagines himself having special rights and authority is described by DaMatta (1997:72) by the use of the aggressive question Sabe com quem está falando? (Do you know who you are talking to?) He describes it as a ritual of reversal, where an egalitarian, “individualistic” situation can transform into a hierarchical, “personalistic” one. An example to this “ritual” can be when the ACEs encounter a refusal doing home visits and the local express directly or indirectly “do you know who you are talking to? “I am X” or “I know X” and the ACE have to be humble and almost apologize themselves, even if they are working for the state, because the ACE is below the wealthy local in the hierarchy.

The hierarchal dimension of the home, marked by, for instance, race and class (servants) came to surface one day during an interview with an ACE and a wealthy household association member in the latter’s living room. The ACE hesitated to sit down and he barely accepted the juice as she offered us. He acted like this because of respect and the well-established house-owner/ servant culture. In the poorer communities ACEs tended to be more relaxed. They obviously felt at home and were used to talk, sit down inside the citizens’ homes and often had to interrupt the conversations to move on with their routines, whereas in the wealthy areas the ACEs were not offered refreshments and were not likely to enter conversations.

Through this subsection it have been discussed that especially the wealthier part of the population used a segregationist discourse when it came to control and responsibility. Other people’s morality related to cleanness and dirt is much criticized. It is deeply connected to
locations and a generalization of people living there, yet, as described the mosquito can infest and breed in wealthy “clean” areas as well.

In the final subsection below, I will return to the social contrasts and the extremities the ACEs face in the Zona Sul neighborhood, as well as how the ACEs maneuverers the work in violent areas.

**Obstacle two: fear and (in) security**

One day doing home visits with ACE Valentina we got a refusal, while we tried to access a house with a swimming pool, elevators and home cinema. Also this house was equipped with surveillance cameras. The domestic worker did not want us there, but the situation took another form. When we talked with her, the house owner was leaving the house. He stopped the car and said “of course you are going inside”. We started mapping the garden and looked at plants near a fountain. Then we went with the doorman inside the house and took an elevator to the third floor. We passed through the home cinema and went to the pool at the terrace. Valentina and I exchanged surprising glances, while the doorman explained that they always use *bloco*, a product that treats the swimming pool and prevents mosquitoes. When we left the house Valentina expressed her frustration:

> It is too much inequality in this city. Some have much money and others cannot even buy bread. It is sad and we all the time hear about the corrupt politicians stealing, and the power is in their hands. We, in the East and North Zone of the city are abandoned. *A cidade maravilhosa é só a Zona Sul* (The marvelous city is only the Zona Sul).

The two ACEs working in Zona Sul, Valentina and João-Paulo, have to face the contrast between the wealth in the neighborhood they work and the extreme poverty and violence in their home neighborhood on an everyday basis. João-Paulo revealed that he suffered much more struggles working within the riches parts of Urca. It can be houses of for example judges and politicians. When he started to work as an ACE, their doorman or domestic worker did not let him inside:

> If the house owner was at home they told me to come back later or “you should take a look in my neighbor’s garden instead”. It was more like that during my first years here. I do not know if the fact that I am *negro* (black) had a negative impact
on my access, to be honest I believe anyone suffer difficulties in the beginning. In Urca it is hard to find negros, I have never met one here. It is few negros with money and the rich does not mix with us. Class and color are related and the worst thing is to be black and poor. It is hard to get a job. You know the “boa aparência” (good appearance) (See Edmonds 2010:109), many job announcements require a good looking person, you need a nice skin, eyes and hair, not cabelo crespo (curly hair), as us negros. The rich people have all the privileges. They can pay university fees, o pobre não (not the poor).

Through João-Paulo’s work the social and racial differences came to the surface. As a matter of fact, in Brazil black men are often criminalized (see Caldeira 2000:112), and can have had an impact on his access.

Figure 7: Female ACE in Zona Sul.

Gender has an implication for the ACEs work, and it is easier being for a female to get access to households. Valentina claimed that locals prefer women entering their homes. I asked why and she responded that sexuality and security contribute to this. “You know, the men like to
look at us women”. João-Paulo chuckled, “Yes”, as we were sitting at the “Mureta da Urca”, the little promenade wall at the edge of the Guanabara Bay. Valentina continued our gender talk, “Ainda bem que é mulher” (thank goodness, it is a woman), the locals often comment. It is a question of security. The locals’ fear of women is not that prevalent as the fear of men. The empregadas (female domestic workers) are afraid and reluctant opening the door, especially for men.

On our walk, we went inside a three-floor building and we knocked on the apartments doors. An empregada attended us having the door ajar. I could barely see her face. She did not let us inside and Valentina tried to pass the educative message and map the house by asking if they had veranda, drainpipes and potted plants. The empregada answered quickly, “No, no” and closed the door quickly. Valentina said that they cannot force people open their door, but have to do the best out of the situation. “The empregadas and porteiros (doormen) are usually our defense. They are the ones who get to know us and they are from the same reality as us, but it is hard for them knowing what to do when their bosses tell them to not let any inside”. It is an ambivalent position, but the locals’ tension tends to be less prevalent toward women, even if in this case she was not welcomed inside.

João-Paulo said he never would substitute his territory with a poor area, mainly because of violence. “It is always calm here, I am privileged that I got the job in this neighborhood. It is one of the calmest places you can find in Rio”. As a matter of fact violence is unequally distributed throughout Rio de Janeiro (Goldstein 2003:175). In the comunidades violence is a “real event” obstacle, compared to the fear-based obstacle in Zona Sul. If there are ongoing violent confronts the ACEs have to leave the area. They try to work more in the mornings, and then they can be out of the area before the “bandits” wake up. Two ACEs working in that kind of environment had passed through an incident where they were caught in the middle of a gang confrontation. They tried to hide inside a garage. It took time for them to overcome the fear caused by the situation.

While accompanying an ACE in a comunidade in Niterói, I did not know that we were passing a boca de fumo (a place where drugs are distributed), and right there I took a picture with my phone. The ACE reacted and whispered not to do it and if the drug dealers had seen me they could have taken my cellular. After the house visits we went down the hill. We passed a drug dealer sitting at his spot with his walkie-talkie in his hands, observing the environment. In a few meters distance the ACE said, “Thank you and have a good day”. I
could never have entered this comunidad by my own, I was told. The drug dealers would never have accepted an unfamiliar face to enter.

The way the population responds to the ACEs work depends on the house owner’s background. The ACEs’ uniform, for instance, is interpreted differently. In the areas in Niterói, described above, I was going to participate in the field one day with an ACE. We agreed to meet at the local health clinic. While I was waiting, a nurse asked, “Did you bring the uniform, so you can be identified?” I answered that I forgot it. “Menina, tenho que puxar a sua orelha?” (Girl, do I have to pull your ear?), she said with a strict voice and gave me a nurse coat. Identifying yourself is a serious issue in this context. On our walk the ACE explained:

Everything changes when you use uniforms. People treat you as a professional. Uniform é bom (is good), but not always. When you are working for the state, the residents in dangerous area might look at you as being um olheiro (a spy). Then people disappear and soon a person approaches you by stating, “Do not enter here”. Anyway, there can also be an exchange: the criminal tells the ACE about problems concerning rats and the ACE give him poison and then he or she will be allowed to walk in his area and accomplish the work.

The uniforms’ intention –the identification, should in most cases lead to trust. It is not always the case in this context, nor in the wealthy areas or in the poorer localities. It had been occurrences where criminals had taken an advantage of the little trust that existed among the locals by stealing ACEs uniforms and other public officials’ uniforms, and managed to enter some residents’ houses and robbed them. These incidences had a negative impact on the ACEs’ work.

As described in this section, the contrasts in the society are huge, and the ACEs have to handle the situation of working in environments marked by fear and violence. Creating relations is essential and the sector-organization is important. The use of uniforms might help, but as described it is not enough, it can create suspicion among comunidade dwellers and criminals. They can view the ACEs as representatives of the state that is not at their “side”. Among the rich population, ACEs can be viewed as criminals dressing the state’s uniforms. The ACEs are entering the residents’ houses and patios. They are crossing boundaries that must be taken into consideration in this disease preventive work.
Concluding remarks

This chapter has focused on the ACEs, their routine based and stable work and the complex landscapes of inhabitants they attempted to engage to become conscious and participatory citizens. The ACEs tried to break down the narratives of blaming others, and engage people to maintain a tidy household. At the same time the mosquito continued to be treated by locals as something out of order that belonged to marginalized people and spaces, which make locals distancing themselves from the commitment. People’s participation is essential to get rid of the epidemics, because the mosquito does not only breed in the public spaces, but also in private gardens, however, the engagement of civic workers in private spaces creates tension especially today because of the more and more fragmented cities.

Outbreaks will be the core of the next chapter. Instead of elucidating routines, a state of emergency will be brought to the foreground.
Chapter 3

The Acute Mosquito

Poor Brazil! First, the yellow fever that plagues the country with 14 million unemployed, and now the yellow fever that just murdered.

The vaccine represents an effective mean to impede, to prevent a particular disease. Sadly, in the State of Rio de Janeiro, this conception was not absorbed correctly by the authorities. They wait for the death of people and animals before they act. 4

This chapter elaborates a society in emergency, where the rupture of normality is caused by anxiety and fear of viruses and outbreaks. The aim is to empirically investigate reactions to yellow fever and the Zika virus. I will argue that the yellow fever resulted in insecurity, sensation, exaggerated and moralizing reactions, known as moral panic. The chapter’s opening remarks indicate concerns generated by a dramatic episode, outside the range of normal, where the reactions toward it erupted suddenly. The authorities were criticized and constructed as a “folk devil” (see Cohen 2003), deemed as the episode’s responsible – characteristics present in literature related to the moral panic concept (see Cohen 2003; Hier 2011; Krinsky 2013). The Zika virus will be discussed in a more neutral way, recognizing that it was a genuine problem for those involved, rather than out of proportion.

By drawing on empirical data related to the yellow fever outbreak that took place during my fieldwork, I will discuss reactions in the media, at public health clinics, and in day-to-day discourse. Related to the Zika virus, I draw on empirical data achieved through conversations with families and women pregnant during the peak of the outbreak. The reason for choosing these two particular viruses is because both of them were more or less emerging in the contemporary context I describe, and both of them created thereby much uncertainty, reactions and sensationalism. Despite of being mosquito-borne viral diseases, they differ in several ways, as the distinct vector species, the spaces they hit – forest versus city, the possibilities of prevention and the groups of risk, for instance, the Zika virus is inoffensive for

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4 (Velloso 2017; Vollmer 2017). Letters to the editor, O Globo. Edited and translated by the thesis’ author. The newspaper O Globo is based in Rio de Janeiro and is considered one of the most influential in Brazil.
the population in general, but is preoccupying when it comes to pregnant women, due to the consequences for the fetus.

The pages below explore empirically a situation caused by yellow fever and will be followed by a discussion concerned with the reactions and the panic it created. Then, I will turn the lens toward the Zika virus.

**Death in Casimiro de Abreu**

March 16, 2017, the newspaper *O Globo*, announced at the first page that the State of Rio de Janeiro had confirmed its first death due to yellow fever. The faces of the victim’s family, printed in the newspaper, were people I met after a 3-4 hours’ drive from the state’s capital. The municipally of Casimiro de Abreu, is named after one of Brazil’s famous 19th century poets and host 41 000 inhabitants. As a result of this incident, the little municipality suddenly received an overwhelming attention from the media, scientists and health authorities. In a rural zone, 7, 2 kilometers from the seat of the municipality, one could localize a settlement of seven houses and around thirty persons, eight of them children. The houses were in simple conditions. Banana and pineapple plants were planted in the valleys and hills behind the houses. This place became the hotspot of Rio de Janeiro’s yellow fever outbreak.

Five days before the announcement in *O Globo*, and in the other regional newspapers as *O Dia* and *O Fluminense*, a 38 year old carpenter passed away after being infected by yellow fever. The victim, Henrique’s twin brother shared his sad and unfortunate story. “He looked just like me, except from me being a hippie with long hair”. He asked his ten years younger wife if she could bring a picture of him, while he continued, “We were really close, he was a funny guy. I miss him. Now he left us and his partner with her five children. They already left the settlement”. He pointed at the little house that once had been painted in white, where his brother used to live. Henrique went three times to the local hospital, already suffering with fever, tachycardia, body pain, headache and lack of air. The doctors claimed it was sinusitis and told him to go home. He returned to the hospital again, and this time he was diagnosed with virus, probably dengue fever. The third time he went, he felt extremely bad. He could not eat. He was just vomiting black blood. This time the *Corpo de Bombeiros* (firemen) came and brought him to the hospital. The twin brother explained his last memory of this brother, “He looked at the surroundings, at the houses and at us. His glance was a farewell. I could read his thoughts through his eyes “I am not coming back” ”. At three o’clock in the morning he died.
According to the doctors he died because of respiratory complications. The twin brothers’ mother thought it could have been caused by yellow fever, and the family struggled to find someone to listen to them. “There would have been more deaths, if it were not for us, running after the authorities. You know, we have three other victims here at our settlement, but they survived. The silly little mosquito ruined everything inside of him”, the brother sighed. The victim’s sister in-law entered the conversation. She was eager to talk about the situation and was especially frustrated about Henrique’s wife:

People started to think that Henrique got yellow fever in the Reserva (Reserva Biológica de Poço das Antas), (the reserve), but he did not. He had not been traveling to outbreak affected areas. The mosquito bit him right here. It happened because the couple, tourists from Minas Gerais, brought the virus with them and Henrique’s wife, she did not care about him. She had hepatitis, I am sure she gave him problems down there, it was full of wounds –I saw it when I cleaned the body. I think it contributed to his death. His partner started to hide the results of the samples, she was embarrassed. Before he met her, he was clean and used condoms. After he started to date her, we observed him always scratching himself at his intimate parts.

During our conversation, the family expressed their disappointment toward the broader health system as well. Critics that later gained space in the newspapers. The critical voices were based on the lack of an efficient health system, that the health workers and doctors were not trained to identify yellow fever, and that it was especially blameworthy because of the already known occurrences of yellow fever in the neighboring states. The family members explained the time after the death, “We started to worry and the hospital here is not trained to diagnose yellow fever. After six days they told us it was yellow fever and we were afraid –we are still afraid”. Further, the authorities did not want to liberate the body. Then the body went “sightseeing”, they took the corpse to Macaé, another city, and the doctors did not want to take the samples in the beginning or talk with the family members. They could only bury him after the results. When they came back with the body, the hospital did not want the dead body inside again. The body started rotten, it was disrespectful, in the eyes of the family. The sister in-law continued, “I had to clean the body, the smell was terrible. No one wanted to enter the room. It was full of body liquids and rotten blood that attracted flies. His body was yellow and swollen and I had to put cotton in his nose to stop the bleeding”.

I knew about the other victims of yellow fever, and when the opportunity appeared I was quick to enter in a conversation with one of them. “That guy over there escaped from yellow fever, now he cannot eat chili and drink beer because of his liver”, the sister in-law pointed at a shy man standing ten meters away from us. It was Henrique’s uncle. Even though he was young, I could observe how tired he was, something he, himself commented. “I am exhausted”, he said with a low voice and shared his experience:

I was hospitalized for two weeks, I had fever, my eyes became yellow, I felt dizzy and I vomited. The stomach pain was unbearable. I was afraid. The results showed it was dengue, but it was wrong. I understood it was yellow fever and not dengue before I got the results of the new samples. I already knew about the death of my nephew, I saw it at the television. I also knew that medicines to treat the disease do not exist. I still feel dizzy and the doctors told me it takes six months before it will leave my body, however, I do not need to take the vaccine. I am immune now.

Some days after the death was announced, health workers came to the settlement to inject vaccines and the dwellers were told to leave the settlement for ten days, the time it takes for the body to get immune after an injection. The family members explained that they were still worried, and they used repellent, but it is expensive and the settlement is infested by mosquitoes. Since it was a sylvatic outbreak, the prevention became more problematic as the houses were surrounded by the forest. It is impossible to eradicate sylvatic mosquitoes. The most effective prevention is the vaccination, but here the state was to slow offering the vaccines.

The empirical example about the situation concerning the first death shows how the victim’s family struggled at a time of sorrow. They tried to explain the causes of the death, which involved the victim’s wife, his sexual health, the travelers who could have been carrying the virus, the mosquito and perhaps most eye-catching: the health system. The family had to deal much with a situation themselves, which actually was a public health concern. The health authorities were not prepared to handle the yellow fever, they were unable to diagnose and the protocols after the death were chaotic. The state contributed in that manner with uncertainty in an insecure world of diseases.
Entering a state of emergency

The circulation of the virus in Rio de Janeiro’s neighboring states was known before the death in Casimiro de Abreu. In December 2016 Mineiros (inhabitants of Minas Gerais), became ill, and the announcement of an ongoing yellow fever outbreak was informed in January. It was considered the major sylvatic yellow fever outbreak in Brazil’s contemporary history and the virus had infested the South Eastern part of the country, which had for a long time been yellow fever free. Even though the announcement of it only took place in beginning of 2017, already in April 2016 the authorities knew about the first signs of a potentially circulating virus, it was observed through dead monkeys. In the middle of January there were 333 suspected cases of yellow fever affected people in Minas Gerais and 23 deaths were already confirmed. São Paulo in the south and Espirito Santo at Rio de Janeiro’s northern border also had suspected cases. In March, there were 1,538 suspected cases in the country and 255 deaths (Ministério de Saúde 2017). Due to the increase of yellow fever in the bordering states, Rio de Janeiro was considered vulnerable. Scientists and the authorities became concerned about the regions close to the Minas Gerais frontiers, and in the end of January the “bloqueio” (the vaccination) was initiated. The remaining areas of the state could wait until the end of the year, including Casimiro de Abreu. This view, however, altered with the first death. It was a turning point, a shift of the media’s, scientists’, health authorities’ and the common population’s approach toward the yellow fever.

As mentioned in the previous chapter, Oswaldo Cruz’ pedestrian health-workers, the “Mata-Mosquitos” eradicated the urban yellow fever in Rio de Janeiro in the early 20th century. An outbreak recurred in 1928 and the last case of urban transmitted yellow fever was registered in 1942, however, the sylvatic yellow fever has always been present in many parts of the country. In the South East, included Rio de Janeiro, yellow fever has not been considered a threat, and the region has not been a vaccine recommended area, which means that the very majority of its population was not immune to the virus. Shortages of vaccines contributed to the tension. “If it hits the cities it will become explosive” (Pains & Amorim 2017), journalists quoted statements of tropical medicine experts. Sylvatic mosquitoes – *Haemagogos* and *Sabethes* were the vectors of the current virus transmission. The nightmare, that worried experts, was if the urban *Aedes aegypti* turned in to a vector of the same virus in the big cities. The possibility of an urban transmission was frightening, since the *Aedes aegypti* inhabit over 90% of the country’s cities. “It is crossing states, frontiers do not exist”, a virologist
expressed in an interview with O Globo (Azevedo 2017). The mosquitoes and the viruses could be anywhere and nowhere at the same time.

**Moral panic**

In the month of January only a few, minor reports about the yellow fever gained space in the local newspapers as *O Globo, O Dia* and *O Fluminense*. In March the discourse about the disease became another and the narrative took form as “a coming plague” and created tension among the population. I will go so far to label it as a sort of apocalyptic approach, based on my observations in the society.

“In the gravest cases, the yellow fever can kill within a week” and “**Morte de macacos preocupa**” (Death of monkeys preoccupies). These words and phrases appeared in the newspaper articles and headlines in the following time after the death in Casimiro de Abreu. Everything about the outbreak and yellow fever was written under the headline “**Ameaça à saúde pública**” (threat against the public health). It is interesting to observe how the journalists chose the words. “**Matou**” (killed) was used when referring to the yellow fever with lethal outcome. “**Estado do Rio tem primeira morte pela doença**” (Marcedo 2017) (The state of Rio has the first death of the disease). “**Morte**” (death) is a powerful word, and was used instead of the word “**falecimento**”, a softer word with the same meaning. “**Morte** indicates a sudden death, something more violent. The use of the concepts mentioned, trigger seriousness. The media stories are telling something alarming, and can create panic.

By employing moral panic as an analytical tool, it can provide an understanding of the response to viral disease outbreaks. The concept was first described by Stanley Cohen in 1972, where he applied it in the analysis of sensationalistic media accounts related to youth subcultures, and took from due to the concern with the media’s role in stereotyping and misrepresenting deviance (Cohen 2003). According to Goode and Ben-Yehuda (2011:21), “Generally, moral panic is the outbreak of moral concern over a supposed threat from an agent of corruption that is out of proportion to its actual danger or potential harm”. Most moral panics are, in addition, volatile. It has been much used in sociological studies of deviance and labeling theory, however, the concept has been criticized for its “suspected negative inherent bias and with its heuristic value, that tolerated deviants” (Thompson 2011:
The concept has in the last decades regained its value and is being used in for instance work on risk, but the use of it is still much debated and driven by three analytical orientations that Hier (2011:1) calls conventional, skeptical and revisionist. The intention here is not to enter this debate, but I allow myself to follow the widening focus (see Hier 2011:9) of the use of the concept and apply it to diseases, even if in Goode and Ben-Yehuda’s (2009:42) opinion, diseases lack the “folk devil element”, that must exist in the usage of the concept, but here I argue that the state became the “folk devil” –the moralized responsible causing the situation. The sociologist Sheldon Ungar, have contributed with research on real world events, as emerging diseases such as Ebola and the bird flu, which have produced social scares. As Ungar (2013:349) puts it, diseases have resurfaced and become a major source of social anxiety. As we witnessed few years ago, the 2014-2015 Ebola outbreak created health scares, as well as the frightening warnings of outbreaks as Swine flu, SARS and avian flu. Other tendencies are concerns in regard to resistant antibiotics that are preoccupying more and more.

Béland (2011) examines SARS and BSE (mad cow disease), and states that health scares and moral panic are analytically distinct, but empirically overlapping concepts, where health scares is not necessarily driven by media reports or a moral discourse. He conclude with stating that moral panic is not applicable to BSE, as is was not a widespread panic and people could stop eating beef, however, the SARS took part of a broader moralization process. The media sensationalized the situation and rumors helped to fuel these fears, and furthermore Chinatowns and its population became “folk devils” that other people should fear. As Ungar (2013:357) exemplifies with the 2009 H1N1 in Mexico and Caduff (2015) writes about avian flu in the U.S., the predictions of a worldwide catastrophe never took place. The case Caduff (2015) labels, only had a few lethal cases in the U.S., in spite of this it created huge preoccupations and responses, driven by American scientists and public health professionals framing of it. In similar ways Lachenal (2015) discusses how a global network of virologists, which he calls virus hunters, constructed a retroviral risk and how they elaborated responses to these still unknown retroviruses in Cameroun that could provoke another AIDS pandemic. As he shows it was printed posters of warnings of bush meat consumption, that was believed to be a source of risk in this new emerging viruses, but the actual intervention never occurred, it remained fictive –only a document printed and a story told by scientists and authorities to themselves (Lachenal 2015:124). In both cases, the avian flu and the next HIV were framed as global biosecurity issues, which were hyped up, and the emerging worldwide viruses never
really emerged. Whereas Lachenal (2015) and Caduff (2015) discusses the scientists’ and authorities’ voices of pandemic prophecy, this account focuses more on the local population and how their reactions were related with insecurity toward the disease and the state.

As already stated about some of the characteristics of moral panics, the fear is out of proportion to the actual threat and is a perceived threat to the social norms or community’s interests. What about the yellow fever in Brazil? Was it an exaggeration? Or was it a real threat to the community’s interest of being healthy? The predictions about an explosive epidemic if the yellow fever reached the cities in Brazil has still not occurred. Whatevsoever, the epidemiologists do remember the history of the past epidemics in the early 20th century with high mortality rates, and the virologist and the medical experts that shared their frightening predictions about the current yellow fever, actively based their statements on the past. Joffe (1999:90-96) uses the term anchoring when explaining the understanding of new diseases as linked and configured in terms of past epidemics. Lockerbie and Herring (2009) describe as an example to this, how the perceptions of bird flu became linked to the 1918 Spanish flu, “the mother of all pandemics”. An evidently fact regarding the yellow fever in Rio de Janeiro, is that it was still a relatively small number of human deaths when these sensationalistic statements were shed light on. Some of my scientist informants interpreted the fear of yellow fever as plainly irrational. “They do not understand that it is still just a sylvatic outbreak”, scientists expressed, as a counterpart to the statements in the media and the populations’ worries. I read in the newspaper that one of my informants tried to calm down the population by stating that there was no reason for panicking and that his laboratory was analyzing the mosquitoes in the affected area and tried to discover the mosquitoes’ infection level and the species transmitting the virus. He disagreed with other virologists’ statements in the media and he believed that the population exaggerated. However, even his laboratory faced a change due to the outbreak, but they were more used to it and did not react with fear. “Every time there is an epidemic like this there is an imbalance. A disarrangement of something that was arranged and organized. There is a non-expected change of the laboratory’s routines”, he explained during this time of emergency. At the same time he confessed that the movement of the virus into new regions caused surprise and it was a novelty in the Brazilian epidemiologic scenario.

The following section will look closer into the locals’ reactions, which can further underpin if it was a moral panic that took place.
Reactions: killing monkeys and running after vaccines

Monkey panic

At the same day as the first death of yellow fever in the state of Rio de Janeiro, was announced in the newspaper *O Globo*, it was written about five dead monkeys, located in the capital of Rio de Janeiro. The monkeys tested positive as carriers of yellow fever, however, the results from the control samples, were still not known. The monkeys were found in “the noble” neighborhoods, Gávea, Jardim Botânico and Copacabana, in October 2016, several months before the public awareness of it. The announcements increased the preoccupation concerning the risk of the virus circulating in the city. Some people resonated that monkeys could transmit the disease to humans. Several cases became known where individuals that wanted to handle the situation by themselves, started to kill monkeys. Similar tendencies where the population or the authorities violently approach the animal in disease outbreaks can be observed in other contexts. Lockerbie and Herring (2009), for instance, explain the impacts of the avian influenza in Vietnam and how the fear resulted in gassing, burning and burying alive chickens, which in the end of the story had an impact on the poor small scale poultry farmers. In Brazil, the killing of monkeys led to the “#aculpanãoédomacaco” (it is not the monkey's fault) campaigns.

Also zoonotic diagrams were printed in the newspapers, explaining the zoonotic cycles, to increase the population’s consciousness. Health workers and scientists tried to explain that, in fact, the monkeys are important for humans to indicate if there is an ongoing circulation of the virus. The preoccupation continued with the discovery of a dead monkey in the metropolitan area of Niterói, which also became investigated. The findings of monkeys increased the areas of the *cinturão*, the mass vaccination, to prevent the expansion of the virus. 64 out of 92 of the state’s municipalities had initiated mass vaccination at March 18, three days after the confirmed death of Henrique. The monkey killing incidences highlight that some citizens did not feel that state alone was able to protect them from health threats. By actively enter the monkey’s habitat to kill, affirms that they were driven by a panic and viewed the monkeys as a threat, “a folk devil” to social norms that in this case was their healthy body. The situation shows a breakdown of order.
Also the following empirical examples about people’s reactions and actions in regard to vaccines shows how people manifested their responses, and the rupture of the normality established a “fight” between the population’s health interest and the dangerous virus.

Figure 8: The monkeys do not transmit yellow fever, they are victims of the disease. (Blog da Saúde, Ministério da Saúde 2017).

**Vaccination panic**

The newspapers wrote about the vaccine queues and lack of vaccines. Everyone was talking about vaccines, and I kept my ears and eyes open. At the laboratory, where I conducted much of my fieldwork, it was a constant subject of conversation. One of the scientists at Fiocruz went with me to one of the institute’s own vaccination clinics. “We are out of vaccines, and 240 persons are at our waiting list”, the nurses told us. This was the situation at one of the world’s largest yellow fever manufacturer institutions. Another day when I went to the kindergarten with my son, the teacher wanted to have a private conversation with me. She looked preoccupied and asked, almost whispering “I know you are working at Fiocruz, could you help me and my colleagues to obtain some vaccines?” I told her that I was sorry, even those working at the institution are searching for vaccines and there were large queues even there. I tried to calm her down, while I relied on my scientist informants’ knowledge about the virus. I explained that the yellow fever was still sylvatic. If she was staying in the urban zones, she would have time to wait.
At a Saturday in March, 34 clinics in Rio had an extraordinary vaccination day, the injections were applied from 8 in the morning until 12. I went to a clinic myself to get a second injection and at the same time I wanted to observe and talk with the worried population about the situation. I was told to come early, at least before 7 in the morning. I found myself in a crowded line with approximately hundred people in front of me. Some had brought their own chairs with them. The line wrunged down the street and around street corners. The same situation occurred at clinics in different neighborhoods. Worried about the consequences of contagion, many had been there since the sunrise at five in the morning, waiting to be immunized. The atmosphere was full of tension, patience was almost nonexistent. Health workers were circulating along the queue, answering many questions. They were not distributing senhas (queue numbers) because of opportunistic people who had seen a benefit in desperate persons who did not wake up early or want to spend a long, humiliating time in the line. A health worker explained that “the rich” did not want to be seen in the line. Later I read in the newspaper about the incidences of selling senhas, also at the clinic I visited. Some had paid fifty Reais (fifteen Euros) to get a place in the line. At some clinics health workers
had called the police to handle the situation. These incidences had of course consequences for honest people waiting. We had to wait even longer. The *senhas* were only distributed when people had shown their ID and their names were registered. While waiting in the line, my son had to pee, and I asked the woman next to me to watch my place as we passed through the crowd and went inside the clinic. People started to yell with dissatisfaction, “Hey, look at her, she is sneaking, you cannot pass us”. I continued to walk in front of the unhappy people, many apparently from the middle class. When I came back, the woman next to me said, “If there are not enough vaccines, I will go straight to the private clinic”\(^5\), her mood had changed and she started to complain about my son’s stroller, as it by accident bumped into her. After two hours, the health workers announced, “No more vaccines, you can go home”. I approached the health worker and asked if they had particular injections for persons traveling to affected areas, as I was going to Minas in ten days. I did not get another injection even if I had a valid reason. I believed in the Brazilian scientists’ authority and the two dose recommendation\(^6\), as they had been researching and produced it for a century. During my time in Brazil, the government changed their recommendations to alleviate the production pressure and started to give the population fragmented doses, which also became a subject of debates and worries due to various experts’ opinions about the issue. It became followed by populations’ uncertainty. They questioned if the fragmented doses were safe and if it was enough with only one dose.

**The authorities as folk devils**

The anger toward the government, president Temer, corruption scandals and the economic crises, became transferred to the outbreak as well. “The Government is just robbing and in crises. They think it is better to avoid spending money on vaccines and a few deaths are the solution”, close friends of the yellow fever victim expressed. Instead of blaming neighbors (Chapter two), the state became conceived as the responsible in this outbreak. “The problem in Brazil is the laziness, it is possible to prevent”, my laboratory informants said. In the newspapers some used analogies while referring to infectivity of the state, “The fever of

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\(^5\) 3,50 Reais (approx. 1 Euro) is the cost of the public Fiocruz produced yellow fever vaccine. It is distributed as a free vaccine through the public health system. In the private health sector a Sanofi, French produced yellow fever vaccine is available for 130-200 Reais (approx. 40-60 Euros). It has been lack of vaccines also in the private sector (Oliveira 2018).

\(^6\) Brazil was at that time the only country in the world not following WHO yellow fever recommendation.
ignorance and delay”. While other stated, “Victim of the fever and of the health system’s incapacity of identifying the disease, he died” and “Yellow fever reveals governance failures”.

As a doctor (Azevedo 2017:15) in an elegant way explained it “In 1904, it was a revolt provoked by the rejection vaccinating themselves⁷, now it is caused by the lack of it”. During the outbreak, in comparison to the situation one century ago and other vaccine anxieties as the suspicion toward measles vaccines in Europe and in the U.S. (for more about vaccine anxieties see for instance Leach and Fairhead 2007), most wanted a yellow fever vaccine, however, some were not allowed due to their health condition and health workers strictly informed about who could not get an injection. To emphasize that the reactions and the obsessions with vaccinating oneself were not uniform, it should be noted that some became afraid of the side effects, believing the vaccine could harm them. A lady at a health unit confessed that she would never take one. She believed it was a mean of the government to get rid of the population. “It is just like the seasonal flu injection, they want to vaccinate the elderly population because they want to eliminate them”, she expressed. The majority, after all, wanted to become vaccinated, and as just showed, rushed to the health clinics.

As I have shown, non-vaccinated people in the city reacted desperately toward the yellow fever. Just as the description of people who found themselves caught in a desperate situation, and were willing to buy queue numbers at the health clinics. The atmosphere was filled with tension and dissatisfaction toward the authorities and the lack of vaccines. Specialists and the population claimed that the current situation with yellow fever was caused by the government’s irresponsibility, which was slow initiating the vaccination and untrained in diagnosing the virus, as the Casimiro de Abreu case indicated. It caused unsafety and criticism. People had these reactions in the city, a space that was not hit by human contagion of the virus and the urban mosquito species were not yellow fever carriers, which underpin the moral panic. The actual threat and circulation of the virus was in the rural and sylvatic regions. The hype in the media employed the history of the yellow fever in Rio de Janeiro to recall the possibility of a repeated outbreak. The urban population was afraid of the still unknown urban yellow fever virus that could provoke an outbreak. The sensationalistic

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⁷ The Vaccine Rebellion in 1904 was a revolt against the authorities’ implementation of a mandatory smallpox vaccine. The implementation became violent, health workers forced themselves inside people’s houses and injected vaccine against the citizen’s will.
statements in the newspapers, including the news about the dead monkeys –that were found long time before the hypes initiated, triggered, together, the population’s reactions.

**The Zika virus as a genuine problem**

“The Zika case”, was much harder for the scientists to understand. In contrast to the yellow fever, the Zika virus was unfamiliar in Brazil and surprised scientists. When the Zika virus became linked to the increase of babies born with neurological and cognitive deviances, it was a lot of unanswered questions. It was not known that even if a baby, of a Zika affected mother, was not born with microcephaly, the child could still face development delays and other problems, which sometimes were not prevalent before the six months’ age. Other babies were born with the Congenital Zika Syndrome even if the mother did not have any symptoms of the Zika virus during pregnancy.

This makes the reactions and fear, which will be explained in the next subsection, more “rational” than toward the yellow fever. Based on the empirical examples, the concept of moral panic has to be used in a more loosely manner, less concerned with stating that the situation was out of proportion, instead it was a genuine problem for especially women in reproductive age –as the example below shows.

One of the children which happened to be within the Congenital Zika Syndrome’s statistics was Érica, born in November 2015. Her mother spent months at home, crying behind occluded curtains. It was difficult to accept the daughter’s health condition. The situation worsened at the end of her six month maternity leave. After two weeks at the law firm, where she worked as a lawyer, she was fired by her boss for being a mother of a child with a diagnosis. Érica’s parents did not talk openly about their daughter’s health condition before she turned one year. They were afraid of becoming stigmatized and associated with the working-class where this “dirty mosquito disease”, perceived by many, belongs. Some, including the family’s relatives, imagined the parents as responsible for the child’s destiny as a result of not maintaining a tidy and clean household. They were blamed for creating the breeding spots and the mosquitoes which in turn inflicted the mother with Zika during pregnancy. The parents, on the other hand, pointed at the governmental authorities, “Knowing that Érica’s health condition is caused by the public state, is very frustrating”. The family was profoundly disappointed about the government, the lack of structure and support. They felt forgotten by the state and were at the same time victims of stigmatization.
The majority of the babies born with the Congenital Zika Syndrome had a working-class background and the Zika virus is strongly connected with poverty, however, through the little glimpse into Érica’s story, it does not, by a matter of fact, signify that it did not affect emotionally or directly the wealthier population. Beside of the sorrow and difficulties brought with the child’s health condition, the middle class family faced moral and social consequences—remarks to have in mind related to the generated panic among wealthy women.

**Zika panic**

Two women living in the wealthy South Zone, in Jardim Botânico and Lagoa, revealed their health preoccupations and reactions toward the Zika virus. They were pregnant at the peak of the outbreak. One of them stated:

Cara (Carioca slang, man), I became very paranoiac, I covered myself with clothes, I closed all the windows and I used repellent, a lot, I mean a lot. Today, the smell of the repellent makes me sick. It was the Exposis, the best and the most expensive. I was afraid. I did not read the newspapers to protect myself from stress. I had some moments when I got a bit hysterical. If I got a mosquito bite, I started to think “could it be…”. Maybe the fear was irrational, but it was a lot of mosquitoes were I lived. Of course I became afraid when I heard about microcephaly. It is still something we do not know much about.

The other mother’s reactions generated itself in extensive actions. When she, at a Monday, heard about the association between the Zika virus and microcephaly, she packed her suitcase and left the city at the coming Wednesday. She escaped from Rio de Janeiro and moved to the capital, a city less exposed for mosquitoes. Even in this city, she did not leave her house and did not attend job conferences or meetings, because of her health scares. Her fear was associated with certain spaces:

I have always been preoccupied protecting me from diseases and now I am protecting my children. I do not go anywhere, as to the North and East Zone of the city. Where I choose to live completely depends on health and security. To avoid the public health clinics, where there are a lot of germs, I prefer the private sector. To protect my daughters from diseases, the nurses do home visits instead. Brazilians are much more preoccupied with health than Europeans and domestic
workers leave our home clean. I am frequently doing various health checkups.
These habits are different among the working-class.

This woman’s obsession with health echoes Leibing (2007) description of the Brazilian population’s extreme preoccupation with health. When she was looking back at the Zika outbreak, she reflected on her reaction, if she overreacted in comparison with other mothers. However, she resonated that she did not, while comparing herself to other wealthy Brazilians, as her friend that left Brazil during pregnancy. During the yellow fever outbreak, however, she was not afraid at all because of the existence of vaccines and the scientists do have the knowledge of it, for the Zika it was the contrary – there were no existing vaccine and much uncertainty.

Another woman from the same area, a doctor working with children exposed to the Zika virus, confessed that she would even not at that moment get pregnant because she was still afraid of the virus, and she would for sure had taken a clandestine abortion. She explained, “The children I am examining are suffering so much, and I would never whished a child facing those pains”. Several women I met, in the similar way chose to wait having babies. The statement of a politician during the outbreak, recommending people to wait, and the health authorities’ recommendation about only getting pregnant a year after the contagion, indicated that it was a serious issue.

As just explained, these wealthy women became emotionally affected by the outbreak, they became afraid and it challenges the view of the Zika virus as “the poor’s disease”. It is not only about the confirmed numbers of babies born with birth defects, but include how the anxiety of it affected pregnant women’s actions and generated stress. The mosquito is unbounded and the wealthy women’s experiences of it highlighted this, even if they were able to prevent themselves with expensive repellent, move to another city or keep themselves away from the public spaces associated with germs and viruses.

The wealthy women demonstrated something similar to what Tomes (2000) calls a “germ panic” or “viral panic”, where she discusses Americans anxiety about diseases and germs by adopting the concept of moral panic in a more neutral way –recognizing germs or viruses’ status as a problem, supported by scientific reports, which can state that anxiety was not out of proportion. However, still the reactions toward the Zika virus lack some of the other characteristics required in the elaboration of an episode of moral panic. As previously referred
to, health scares and moral panic are analytically distinct, but empirically overlapping concepts (Béland 2011). Through my empirical findings related to the Zika virus, there is a lack of evidence of a moral discourse and “folk devil”. These women were not explicitly moralizing others for causing the disease, but as one of the mothers stated, she avoided places she associated with dirt and risky areas. However, it still should be noted that many Zika affected families became themselves stigmatized and moralized as responsible actors, as Éricas parents. At the same time the health scares around the Zika was driven by media reports and the Zika virus outbreak already had faded away from the media’s attention, during my fieldwork, a common hallmark of moral panics as well.

Throughout the fieldwork, scientists, locals and health workers did not talk much about Zika virus in particular. Instead, dengue and yellow fever dominated the conversations. For me, like the wealthy women revealed here, the Zika was obviously the most “serious” and frightening among the mosquito viral diseases, but of course we were biased by our gender, the reproductive age and for being mothers ourselves. Taking that into consideration, it caused more fear among a “little group” of the society, the pregnant women or women in reproductive age. Moreover, in contrast to the yellow fever the Zika is carried, by the urban *Aedes aegypti*, a species present in all parts of the city. By taking all these factors into consideration, the Zika virus generated “health scares”. Moral panic is not applicable to the Zika virus.

**Concluding remarks**

In this chapter I have elaborated the rupture of normality caused by anxiety and fear of viruses and outbreaks. Both yellow fever and Zika virus caused reactions. The two cases had some similarities: the fear, the media’s sensationalistic announcements of threatening viruses, the tension which erupted suddenly and the public attention that was limited in duration. The reactions toward yellow fever caused moral panic. The virus had been circulating in in the country for a long time, scientist had the knowledge of it and it was still a sylvatic outbreak. It was not in the cities where the reactions took form. In addition, the numbers of deaths were relatively low and more importantly a vaccine exists and even if it was a shortage of vaccines in the cities –the fear was out of proportion and the situation took form as a moralized episode. The state and, by some, also monkeys were conceived at the responsible “folk devils”. The reactions and anxiety toward the Zika virus, on the other hand, was not out of
proportion. It circulated in the cities, through the urban *Aedes aegypti*, which can be everywhere, and the uncertainty and the lack of scientific knowledge, at the time it occurred, including a non-existing effective “magic bullet” against it, as a vaccine, cannot be argued causing irrational health scares.

In the next chapter, the focus will be on a research institution studying disease and insect vectors, where I will look at scientists’ and their fieldworkers’ role and relation to the city and public health.
Chapter 4

The Traced Mosquito

Even if the city of Rio de Janeiro is fragmented with extreme social and economic disparities and uneven distributions of rights and goods, along with the local’s obsession with fear, crime and the feeling of the state’s absence protecting their citizens, just like a lot of existing literature on Brazil elucidate (Caldeira 2000; Goldstein 2003; Biehl 2005), the aim of this chapter is to highlight another story within this context. Through scientists and their laboratory colleagues, working at a public research institution, I will show the state’s presence in society. The scientists and the laboratory staff experience their work as a public good benefiting all citizens and by beholding the city as a whole, their civic imagination deviates from the patterns of neoliberal fragmented cities. Throughout the chapter I will additionally draw on the research institution’s history which, I argue, fuels the scientists with aspiration and a sense of public responsibility. By doing a comparison with the health situation in many African countries, where global health initiatives remain strongly anchored (Geissler 2013; Beisel 2015; Prince 2016), I will further argue that Brazil has a relatively strong national health system. The interplay between science and the city, where I attempt to explain laboratory’s staff expertise and encounters with the city and mosquitoes, will be shed light on, in the chapter’s second half, by empirically describing their daily tasks, as how “wild” mosquitoes are collected and brought to the laboratory.

Situating the laboratory

The laboratory, where I conducted my fieldwork, is connected to the Oswaldo Cruz Foundation (Fiocruz), a scientific, public health related research institution, located in Manguinhos in the North Zone of Rio de Janeiro. It is surrounded by the heavy traffic roads, Avernida Brasil and Rua Leopoldo Bulhões, and many comunidades. The comunidade of Manguinhos is the closest one, but also the more well-known as Complexo da Maré and Jacarézinho are located nearby the institution. The gates into the about 850 thousand square meters of the Fiocruz area are controlled by guards. To get inside, your identity documents are scanned and you are asked about the purpose of the visit. It was always a relief to escape from the heavy traffic and the violent and risky areas outside the gates. The space inside this “enclave” is filled with a calm atmosphere and green vegetation is stretched between the
campus’ buildings. The contrast between the areas inside and outside Fiocruz is huge, both when it comes to the aesthetics, as the architecture and the gardens, and the knowledge and modernity it represents. Similarities to such modern, enclaved research institutions, can be observed in other countries in the South (for Kenya see Geissler 2013; 2015), although, these “research archipelagoes” differ in the way their staff are experiencing their work and are engaged with the areas outside the gates.

The main symbol of Fiocruz is a Moorish pavilion, known as the “Castelo”, situated at a little hill. Nowadays, the second floor of the pavilion functions as a museum, and is open for visitors and school classes seeking to learn about Oswaldo Cruz and the history of public health. The area contains many buildings hosting laboratories, auditoriums, hospitals and ambulatory services, cantinas, a kindergarten, a library and the Bio-Manguinhos, where vaccines are produced. To dislocate yourself from one area to another, it is possible to jump on a golf cart or minibuses. Crossing the campus you can to observe goats and sometimes other animals used in research. To facilitate the employees’ arrival at the institution, Fiocruz’ busses are driving back and forth to the closest metro station.

The laboratory is connected to IOC (Instituto Oswaldo Cruz), a subunit of Fiocruz. To get access to the building where the laboratory is located, you once again, need to register your identification card in the reception. The building contains several laboratories, each of them with its own area of specialization.

Mosquitoes and mosquito-borne viruses are the laboratory’s research specialization. It can be anything from research on malaria in the Rio de Janeiro region or in indigenous villages in the Amazon, to the arboviruses that include chikungunya, Zika, dengue and yellow fever. The scientists are studying aspects of the interaction between the mosquito and the virus and the dynamics of the virus transmission, additionally, it involves environmental factors. Further, they observe the movement of the mosquito population and different vector genetics.

Researching the vector competence –which mosquito is most capable of transmitting the virus and if genetically different virus or viruses form differentiated localities in Brazil or outside the country are capable to infect the national mosquitoes or not, is also a part of the laboratory’s specialization. Besides of the laboratory and desk work, their profession consists of fieldwork collecting mosquitoes, eggs and larvae.
The laboratory, like the entire institution, cooperates with the Ministry of Health, and identifies and provides information about the vectors and viruses of specific outbreaks. The scientists, and especially the head of the laboratory, are often interviewed by journalists and appear both at television and their statements are cited in newspapers. Around 37 persons are working at the laboratory, whereas nine are researchers and twenty are students –at all levels from undergraduate students to Ph.D. students. Two técnicos concursados (entering by taking an exam) are working at the insectary and two “scholarship technicians” work at the laboratory and in the field. Four are mosquito collectors, who earlier worked at as endemic disease control agents (ACEs). Most of the researchers are biologists, but some are trained in biomedical science and some have a veterinarian background.

**Going beyond the human-animal relations at the laboratory**

The scientists, the mosquito collectors and the lab staff’s sociality is clearly entangled with not only humans, but also with mosquitoes. A lot could be explained about the human-animal assemblages at the laboratory, as going deeper into the way the scientists and the insectary technicians tried to adapt the “domesticated” environment at the insectary to the mosquitoes’ natural habitat, about how as Gieryn (2006:1) puts it, “wild nature gets repositioned in a technical and cultural environment that gives all power to the investigators”. As well as drawing further on how the scientists and lab staff’s knowledge of the mosquito and the domination over it enabled them to see the mosquitoes as beautiful and even adopting a motherly role in relation to them. Or explaining in detail about how the technicians maintain the mosquitoes alive and allow them to reproduce themselves, and furthermore describing the experiments and the performance of PCR’s.

I did observe parts of their analyses, as at one day when I was sitting next to two female students doing lab-work, utilizing a microscope with a “cooling” function, while separating the mosquitoes’ heads and bodies. It was the first step toward a yellow fever virus analysis, or as they emphasized, “Actually the first step is the collection in the field, the “aspiração””. It is this first step of the “the construction of scientific facts ” of this Brazilian “Laboratory life” I attempt to capture. However, instead of following Latour and Woolgar (1979) footsteps, capturing all elements of the scientific work, as the publication of papers or research finances, I look at the laboratory as not an “enclosed human-animal assemblage”, rather I adopt a
“human-animal-society” approach, as my aim is to explain that the laboratory is connected to a larger part of society.

**Nation building through science and health**

The name of Oswaldo Cruz and his importance was frequently repeated by the scientists and the staff. He was referred to as a “national hero” with successful solutions in the public health campaigns. An important component was that he achieved this before the health interventions lead by the Rockefeller Foundation entered the scene in 1917 (see Stepan 2011). Oswaldo Cruz was not a figure that represented the imperialist nations, as was often the case in studies of tropical medicine in, for instance, many African countries (see Stepan 2003; Coutinho 2003). Before the arrival of the Portuguese royal family that had escaped from Napoleon’s army in the early 19th century, the country did not host any universities and only a few, almost nonexistent science related institutions (Schwartzman 1991). During the 19th century, however, it occurred a shift and a growing national practice of tropical medicine. The Escola Tropicalista Bahiana, is an example of this. It was a school that was based in Salvador with a history back to the 1860s, which made new discoveries in parasitology and favored Brazilian expertise while they questioned the authority of European ideas and knowledge about the tropics and its people. The historian Peard (2000) examines this school and this, as he puts it, “neglected episode in Latin-American history”. The more known history is dated back to the early 20th century, at a time when the institution, Instituto Soroterápico Federal, that later became Fiocruz, was established to combat epidemics, principally the yellow fever and the bubonic plague. This was performed through both sanitation programmes and the manufacturing of sera and vaccines. In the beginning they focused on the urban centers, but in few years sanitation experts and scientists also went the rural hinterlands of Brazil, including the Amazon region, to survey the disease conditions.

As Stepan (2003) reveals about the history of malaria control in the Amazon, the health concern was motivated by other forces than the population’s health itself. The rubber extraction played a significant role and with the collapse of the Brazilian rubber boom during the first world war, the malaria concern disappeared from the country’s national consciousness (Stepan 2003:43). Similarly, during the colonial period at the African continent, the efforts in malaria control focused on groups deemed relevant to the colonial economy, such as whites, urban residents and some African laborers (Gerrets 2015:182).
African women and children, on the other hand, were labelled by the existing medical segregationist views as wild vectors or reservoirs of disease infecting vulnerable civilized and “domesticated” Europeans (Schumaker 2011:420). An interesting comparable case to the current disease blaming in Brazil (see Chapter two).

The early 1900s’ sanitation campaigns, led by Oswaldo Cruz, in Rio de Janeiro were also motivated by other factors than the population’s health itself—the wish of national development was a crucial component. During this time the Brazilian elite was obsessed with a desire of “civilization” and an imitation of Europe, especially France, which also included the “whitening” desire of the nation through racial crossings and the favor of European immigration. The urban sanitation campaigns and urban planning reforms were going to bring the nation out from the stereotyped “backward new world”. Similar tendencies, at different times, where linkages between health, science related innovations and expertise, together with the desire of nation building can be observed in other contexts, as for instance in Japan and Cuba. Frühstück (2003) reveals a story with different examples back to the early 1900s about how powerful forces, such as scientists and government agencies, shaped the creation of a normative sexual behavior among the Japanese population that was declared vital to the health, improvement and future of the Japanese empire. In the case of Cuba, Reid-Henry (2010) problematizes the relationship between science, space and political-economic orders and states that Cuban scientists were given the order by Fidel Castro to create a biotechnology industry within a public health framework to confront health problems. It was put together on the basis of certain epistemic distance from Euro-American dominated biotechnology science (Reid-Henry 2010:162). Later the nation became a world leader in biotechnology science, just as Castro desired. Together with the role of Fiocruz, these examples serve as comparative cases where the nation has intervened in the inhabitants’ lives or decided the scientific agenda in order to build a strong, healthy nation.
Figure 10: Oswaldo Cruz and Castelo. (Biblioteca Virtual Oswaldo Cruz n.d.).
Fiocruz as the “braço do estado” (state’s arm)

The scientists highlighted that diseases transmitted by mosquitoes are the base of the establishment of Fiocruz. The first published work at IOC (Instituto Oswaldo Cruz) was a description of mosquito species. Not plague, but mosquito! The mosquito has been a research theme from the very beginning. This fact gave the contemporary scientists a guaranty that they were following a path created more than hundred years ago. To stress this, the head of the laboratory explained that the institution is hosting a mosquito collection of importance and it was initiated by Oswaldo Cruz, and it is still useful, even today.

Oswaldo Cruz himself, still viewed as an important person, has turned into a national symbol and the achievements of the institution’s past made sense of who the current scientists are in the world. The symbol of Oswaldo Cruz functions as a national identity-marker and gave the scientists a research authority. The scientists and the laboratory staff affirmed that the institution is imagined by the broader Brazilian population, as well, as a prestigious federal institution. Fiocruz is present in many parts of Rio de Janeiro, also where the other public actors have obstacles reaching the population with basic health services. Fiocruz is viewed as the braço do estado (state’s arm) that is producing vaccines and is eliminating viruses transmitted by mosquitoes through science.

It should be noted that Fiocruz, as well as the ACEs, described in chapter two, are included in the National Unified Health System (Sistema Único de Saúde), SUS. As we can see below, the core values of Fiocruz are:

- To produce, disseminate and share knowledge and technologies in order to strengthening and consolidating the Unified Health System (SUS) and contribute to the promotion of health and quality of life of the population. Besides of the reduction of social inequalities, and contribute to the national dynamics of innovation, with the defense of the right to health and full citizenship (Fiocruz n. d.).

In contrast to the “citizenship” Fiocruz is referring to, the concept has been used by global health anthropologists, as “biological citizenship” (Petryna 2002), “biomedical citizenship” (Biehl 2004) and “therapeutic citizenship” (Nguyen 2007). They use the concepts to analyze actors’ health claims and struggles achieving health care, that be radiation exposed Ukrainians, activist AIDS patients in Brazil, or in Burkina Faso where the local’s claims
appeals to the global order. Fiocruz, on the other hand, as their guiding vision state, attempts to “be an agent of citizenship” (Fiocruz n.d.) by providing equal health rights to citizens. Just as the ACEs, in Chapter two, provide through their mosquito control. Fiocruz’ statement is claimed in a context of a regime of differentiated citizenship (Holston 2011), with unequal distributions of protection and rights, and where the population imagines the state often as incapable of protecting their own inhabitants. For example in regard to security or the institutions of law and justice (see Caldeira 2000 or Holston & Caldeira 1998). In spite of the population’s perception of the Brazilian state as weak, when it comes to combating corruption and violence, and the lack of well-functioning public institutions, such as the public school system, SUS embodies a different kind of authority. The public health system receives a relatively large recognition and satisfaction from the population and Brazilians who work within the system. Health workers observed the impact the economic crises in Rio de Janeiro had on the health system. Wealthy people who earlier went to the private health sector were now coming to the public health clinics and the system had to attend a larger amount of the population, and as elaborated in Chapter 3, many, beyond the working-class, were heading to the public vaccination units to obtain an injection of the yellow fever vaccine. Biehl (2005:46), do not share this perception with me, he states that the health system is malfunctioning, which comes to the fore through his analyzes about social abandonment.

SUS is considered one of the world’s largest public health systems and as the Ministry of Health (Ministério da Saúde n. d.) puts it, “It include everything from simple attendance to blood pressure assessment and organ transplantation, ensuring integral, universal and free access to the country’s entire population”. The fact that the Brazilian Constitution of 1988 states that "Health is everyone’s right and the duty of the state", have resulted in large numbers of “right-to-health litigations”. As Biehl and Petryna (2013) describe, this has become an alternative route for Brazilians to access health care, when their right is being injured by the state. Together with Biehl and Petryna’s (2013) contribution to anthropology about patient-litigants who obtain medicine in the name of the right to health, other claims, that some, perhaps, rather call bizarre claims, as the access of free, public covered plastic surgeries (see Edmonds 2010), assert how Brazilians imagine the nation and the SUS as an actor with duties toward the population. Furthermore, both Biehl (2004; 2009) and Nguyen (2007) mention that Brazil has a strong public HIV/AIDS program, and was the first developing country providing universal access to antiretroviral drugs for their own population. By producing low cost medication (Nguyen 2007), together with a combination of
a strong social organization of activists, political will and international cooperation (Biehl 2009; Larvie 2003) enabled in the end this treatment. The success story of the decreased numbers of the HIV growth rate in the country, has led the Brazilian model to an important component of international medical activism (Biehl 2004). Research concerning HIV and projects related to PrEP (Pre-exposure prophylaxis) are also performed at the institution of Fiocruz. During carnival Fiocruz’ HIV researchers were out in the streets informing about safe sex and PrEP.

The description above provides a notion about the relatively strong existing health system in the country. Despite of this, regular people’s interest and engagement with science is not that prevalent. Some researchers emphasized:

The thing is that science has become popularized and we are attempting to reach the population. The tools and the information exist. You can always find science related programs at television. Science is not in an enclosed bobble, however, as we are reaching out to the population with information, the povo (the people, referring to the working class), themselves are closing the doors by, for instance, choosing to watch novelas (soap operas) rather than informative programs. Nor the emergentes (the emerging middle class), are interested in science.

Throughout our conversation, the female scientists expressed feelings of despair about the more or less ignorant population, while they themselves work for an institution that is trying to reach the population and improve the citizens’ health.

**A comparison with global health in Africa**

The institution and the broader national health system in Brazil can be seen in contrast to the situation of faltering national health services in Africa. As described by critical social anthropologists of health, often based on African ethnography, structural adjustment reforms had a negative impact on the national health systems (Pfeiffer & Chapman 2010). As a consequence global health initiatives have flourished especially since the 2000s, where the state is being sidestepped by funders and donors using nongovernmental organizations to deliver the disease specific interventions (Prince 2016 see also Prince & Marsland 2013). Such magic bullet approaches (Biehl & Petryna 2013:3) target one specific disease, while other diseases receive less attention. An example of a high-profile disease, that funds and
interventions targets, is HIV/AIDS (Nguyen 2009; Prince & Otieno 2014). A result of such global health initiatives is that public health services remain under-resourced and unable to attend other diseases and provide basic health care. Another tendency is qualified health workers that have left the public health sector in favor of the private sector or non-governmental organizations (NGOs) (Geissler 2011; Prince & Otieno 2014).

The Brazilian scientists and their colleagues’ possibility to work for a federal institution and their collective commitment toward the population, have some of the similar patterns as post-independence local workers in public health research in Kenya, where these “men of government” viewed their role as players making a healthier Kenya (Geissler 2011; 2013:541). This role experiencing themselves in the same way as part of a civic and collective national project, has, on the other hand, faded away with a younger generation of Kenyans working for an institute that relies on collaboration between local, parastatal and non-governmental institutions and “Northern” agencies (Geissler 2013). Aspirations about contributing to public health and safety, is a theme Tousignant (2013) discovers among pharmacy graduates in Dakar, however, even if many of their thesis were public health related and they were driven by a wish of being useful, the greatest part of them were forced to end up working in the private and commercial sector.

By comparing Brazil with the health situation at the African continent and global health anthropologists’ renderings of the African situation, highlights that the Brazilian state remains a strong actor when it comes to health, and fuels the possibility for Brazilian civic workers to feel a commitment toward the population by being a part of the puzzle improving the nation’s health.

An interesting fact about the authority of Fiocruz as a national institution is their partnership with institutions in the Portuguese speaking Africa. Fiocruz is present in Mozambique by having a subunit in Maputo. In conjunction with this, the Fiocruz laboratory cooperates with Mozambican scientists working for the Mozambican Ministry of Health’s malaria programme. Three of the scientists at the laboratory had been in Mozambique several times where they had given lectures and courses. During my fieldwork the scientist invited four Mozambicans to Rio de Janeiro. They were visiting the laboratory and learned about the urban Aedes aegypti. The scientist in charge of this knowledge-exchange explained that the reason for the visit was the emergence of dengue virus in Northern Mozambique and Fiocruz’ scientists could contribute with familiar knowledge of this virus. This transnational meeting
gives a picture of an existing “south-to-south” connection between two former colonized countries that are cooperating through public institutions.

When I underpin that Fiocruz is a strong national actor, I do not mean that they are not involved at all with multinational actors and the international science community, rather I would like to emphasize that they are not managed by foreign institutions and multinational companies, as what is the case in, for instance, Beisel’s (2015) description about a public-private partnership malaria control program in Ghana. Beisel reveals that as a part of a corporate social responsibility activity of a multinational gold-mining company, the company received a grant from the Global Fund and is the responsible for the malaria project’s implementation. It has turned out to be the biggest public health project on malaria in the country, and transformed public health into a “para-statal project”, that is more based on the company’s own interests rather than the community’s demands, however as she reveals, it has in some ways replaced the state, but at the same time it depends on the state.

The scientists and mosquito collectors in Brazil, on the other hand, are not being sidestepped by such companies. They experience their role as part of a national commitment and draw on the history of public health to frame their position and motivation, which is emphasized a bit further through the voices of some scientists below:

Of course the history of the institution and the name of Oswaldo Cruz –one of Brazil’s major scientists mean something for us. With no doubt, an institution created by him and Carlos Chagas (a Brazilian physician that discovered the Chagas disease, see Coutinho 2003) –certainly engage any young researcher to try to make a difference for the population, like they were capable of.

It is almost like a legacy we received from the past’s grand masters, and we are trying to maintain Fiocruz as a guard of knowledge and disease control in Brazil. At Fiocruz there is research diversity and it is a recognized institution. The fact that Fiocruz has its own vaccine manufactory, which is not profit motivated, but is for the population’s well-being, is in itself a motivating factor. Oswaldo Cruz is such an important figure for knowledge production and he contributed a lot to public health. You cannot find other institutions, at least in Brazil and Latin-America, which is better on public health research.
As I have shown until now, the history of the institution together with the memories and the identity of Oswaldo Cruz are of great significance to the scientists and motivate them to work for a public research institution. I have also argued that the Brazilian public health system together with the research institution deviates from the global health situation at the African continent.

The following pages maintain, to the greatest extent, an empirical focus on how the laboratory and their research, actually is connected with the spaces and population outside the institution’s walls. This will provide evidence to my argument against a view of the institution as an isolated island behind guarded gates. I will do so by describing the fieldwork’s mosquito collections. In turn it provides an idea about how it could occur and portray the fieldworker’s expertise about both mosquitoes and the city.

**Science and the city**

To the laboratory’s experiments and research, as one post-doc’s research project called “Projeto Olímpico”, there is a need for material to carry out the experiments, and the material is the mosquitoes, and sometimes larvae. The mosquitoes have to be collected in the field and be brought to the laboratory. The scientists often go to the field themselves, especially during virus outbreaks to observe the environment as well as collecting mosquitoes. A lot of time is required both to collect mosquitoes and to analyze them. To manage this, some years ago the laboratory called FUNASA (Fundaçao Nacional de Saúde), the responsible for the endemic disease combat in Brazil, and asked for mão-de-obra (manual workers), and in this case it was the ACEs, who could collaborate with Fiocruz. As they already were public employed, it did not involve extra expenses. Since 2004 four ACEs or “mosquito collectors”, as I call them from now on, have worked with Fiocruz. “Capivara” (Capybara), “Iguana” and “Jabali” (Wild boar), were the nick names three of them had on each other and I choose to use them as well, as it illustrates their camaraderie and the humor that kept them together. Capivara explained their entrance at the laboratory:

> The new job description and the new work environment was an apprenticeship. I did not think about that in the beginning, at that time I just wanted to get a new job and then this opportunity working for the laboratory appeared. The head of the laboratory, Doutor Eduardo, presented two projects for us and our job description was to collect the mosquitoes. We did a good job and they liked what we were
capable of, and Doutor Eduardo requested that we stayed for a longer time. It was a win-win situation, for us and for them. Our knowledge enriched and the researchers could analyze more mosquitoes.

“We work with all the endemics and viruses. We participate in all of the epidemiologic researches, both in the field and at the laboratory, if they need us”, Iguana added. “Only Iguana can work at the laboratory, because he had the opportunity to do a course. He is an insectary technician”, Jabali interrupted. Iguana entered the conversation again, “Doutor Eduardo always supported us and he wanted us to study, however, I am the only one of us that did the one year course and if they need me to do maceration or a work with RNA or something, they call me. I also montage mosquito traps and the mosquito cages”. When samples of monkeys are needed, the mosquito collectors can also capture these primatas in the forest.

Jabali emphasized, “Our work is very different from what we used to do before as ACEs”. Their earlier work used to be the house visits, communicate information about prevention and elimination of the breeding spots, the work elaborated in Chapter two. Jabali said that they wanted new challenges. The routine based labour the ACEs perform, was from their perspective very static, had few possibilities for developing within the job and they were tired of all the obstacles they encountered in the field as ACEs. “Thanks God, we got the opportunity working for this institution”, the three of them said. Being connected with Fiocruz generated more status. In opposite to the ACEs, often conceived as annoying low-level municipality actors in the eyes of especially the wealthy population, the mosquito collectors felt useful, particularly since the scientists, above them in the class hierarchy needed and depended on the collectors. The collectors themselves felt more motivated and thought it was exiting interacting with scientists. They could learn something new.

Capivara asked me to turn of the audio recorder and explained the “dilemma”, as he called it. “Here we want to capture and find mosquitoes and not kill them”, he said. Their approach to the mosquito had obviously undergone a change. Earlier, working as ACEs the aim was to eliminate the breeding spots and interrupt the development of the mosquito. The current work was different, but they felt that through science they were still contributing to the populations’ well-being.
**Tracing mosquitoes in a complicated city**

Every morning the mosquito collectors met each other at the laboratory a little bit before eight o’clock. They gathered the materials used in the collection. The main tool was the *armadilha* (mosquito trap) or *aspirador* or *bazooka*, as they sometimes named the locally produced battery-driven vacuum-machine. The device’s vacuum sucks the mosquitoes into a net inside of it. A transparent cylinder of plastic and rubber, the *aspirador de castro* (mouth aspirator), is used orally (blowing in and out) to transfer the live mosquitoes from the *bazooka* into small *gaiolas*, netting-covered cups. The *gaiolas* were then placed in a “biological risk” box. After preparing the devices and they got dressed in their Fiocruz’ field uniform they went outside the building where the booked Fiocruz’ car and driver picked them up. The localities they drove to, depended on the scientists’ projects. The “Olímpico” project was one of the main activities. The localities varied, but were determined due to the project.

One day we went to a Catholic church in the East Zone. It was a clean and organized area. I shared the observation with Capivara and Iguana, while they added, “Yes, it is clean, but it is a paradise for the *Aedes aegypti* because many people are coming to this place, and I will show you what is hiding behind the wall. The *vizinhaça* (vicinity)”, Capivara expressed displeased. We climbed up to the church’s store room, and we got a view over the neighbor’s backyard. It was a lot of vegetation mixed with litter and recyclable items. “Ideal for mosquitoes and it is probably full of larvae to”. We continued walking around, the mosquito collectors with their “bazooka-machines” followed by me carrying the *risco biológico* box. They were tracing mosquito in the kitchen, the toilets, in the little church’s shop, in the church room, around the altar, behind a statue of Jesus Christ and also a dark corner with a statue of the Virgin Mary captured the mosquito collectors’ attention. My first thought was, is it not a bit invading and disrespectful doing this in a church? We were representing something dirty, both the way we were dressed, the equipment and the dirty thing we were looking for. I soon understood that health and the prevention come above all. No one is immune to dengue, Zika or chickungunya, not the rich and not the religious.

After we had collected the mosquitoes, the church’s servant offered us coffee and water. Two other men appeared and wanted the collectors to tell them about mosquitoes. “Some people we meet do not believe that the mosquito is capable of killing. But you know, of all animals in the world, mosquito is the most violent. *Pessoas sem cultura* (people without consciousness), that do not believe in science”, the mosquito collector told the audience. After the
conversation we went to one more place to collect mosquitoes, but we caught *Culex* – a common genus of mosquitoes, still considered harmless in the Brazilian context, not the specie we were searching for.

**Expertise, the violent city and access**

The mosquito collectors have an extraordinary expertise about the city that is not based on the many frequent assumptions regular citizens adopt or are not always experienced by themselves. Few wealthy *Cariocas* enter comunidades and the majority strictly avoids them. At the same time few comunidade dwellers, beside of domestic workers and people in the service sector, frequent the expensive zones. The mosquito collectors’ work is different from the ACEs’, as they are not working within a determined, fixed territory. On the contrary they enjoyed much variation, as they collected mosquitoes in both wealthy and poor areas. Furthermore, they decided themselves which households or buildings they attempted to access and could therefore also, in contrast to the ACEs, avoid others. This gave them much freedom. Another factor that must be taken into consideration is that their work is less physical, instead of much walking as the ACEs, they were by a Fiocruz driver dislocating themselves around in the city.

Having this in mind, the mosquito collectors gain a special knowledge about the city as a whole that is more profound than the ACEs. A well appropriate comparison to the Brazilian mosquito collectors’ knowledge about the city, is how Geissler (2013:541) and his retired Kenyan health workers informants expressed it, “‘We were the eyes of government’, extending a panoptic gaze over the urban territory”. The mosquito collectors had remarkable control and knew precisely where they could go.

After locating the collection area, the mosquito collectors had to trace the mosquitoes’ habitat. In contrast to the ACEs search for breeding spots, the laboratory’s collectors were most of the time hunting adult female mosquitoes, and they are gathered were they can find blood, where humans are. Enclosed, dark and humid places are often its preferences. The aspiração (aspiration), with the bazookas is the most effective way collecting mosquitoes in urban areas, but the effectiveness depends on the person doing it. You have to be active. One scientist confirmed this by explaining, “You have to knock on the sofas, move the curtains and move around to successfully capture the mosquitoes”. Collecting sylvatic mosquitoes, the method was another –the human landing catch (HLC), where humans are exposing their bodies as a
trap to catch the mosquitoes as they come to feed. The HLC is also used in malaria research at the African continent, and as Ndebele and Musesengwa (2012) state, this kind of performance raises questions toward several ethical dilemmas, as it involves humans. As a matter of fact, during a fieldtrip one of the laboratory’s students got malaria while using the HLC technique. I participated as well in a collection of yellow fever vectors where the HLC was applied, and I was strictly told to not use repellent, it would have ruined our catch. The HLC requires much patience in contrast to the urban mosquito collection using the bazookas. Instead of sucking the mosquitoes off the body they suck it out of the bazooka’s net and instead of being a silent and static work, it requires movement and activity.

The challenge using this method is that you have to carry the enormous, bazooka-look-a-like object and it is difficult in a violent city like Rio de Janeiro. The profound economic crises during the last year and the resulting escalation of violence in Rio de Janeiro, have generated more tension and fear among the population. Confrontations between the police and gang members have resulted in an increase of deaths and regular citizens have also lost their lives. Some call the situation a war and have compared Rio de Janeiro with Syria. During the first three months of 2017, 1,867 people lost their lives due to violence, robberies and police interventions, compared with 2,188 Syrians that lost their lives during the same period (Jornal Nacional 2017). One case that shocked the population was the death of the schoolgirl Maria Eduarda. She was by accident hit by a bullet during a regular day at school, during a police and gang confrontation.

The presence of violence in the city and in the North Zone where Fiocruz is located influence the scientists work. It impedes them to have long workdays and the institution recommend the employees to leave before darkness. The violence has manifested itself through the bullet marks at the institutions walls and many have witnessed and heard the sounds of shootings. During these incidences the employees have to leave their offices and gather themselves in spaces near the buildings’ elevators to keep themselves away from windows and risky areas. It had been cases where criminals had fled into the institutions areas. When violent situations occurred, the lunch room and the laboratory were filled with tension, and one of these days a scientist said, “The more I know the human being, the more I like animals”. The violent context of the city also impacts the laboratory staff’s fieldwork, just in the same way as with the ACEs, where local’s suspicion comes to the fore. For instance, the Fiocruz collectors had met people that thought they were thieves in uniforms. To make this clear, just as Roth-
Gordon (2009:58) writes, “fear and vulnerability infuse what it now means to be a Carioca (a Rio resident): enduring daily life in an urban center with notoriously high levels of drugs, crime, and violence, where government officials and law enforcement are unable to protect city residents”.

Fiocruz is well known, especially among the wealthy population. The governmental authority the mosquito collectors inhabit through their profession as Fiocruz workers, which is more recognized than the ACEs’, is not always enough to get access. The locality is crucial. Some places they are warmly welcomed, however, other places they are not and cannot access spaces or buildings. Iguana affirmed, “Sometimes wealthy people are less receptive, even if we represent science and Fiocruz”. Jabali supplemented, “It is always like that”. I asked why. Jabali answered, “They think money can buy health”. The other two laughed while they agreed. Capivara added, “I also think it is because they believe it only happens in the periphery, and not in the South Zone. But epidemics are not like that, it affects the entire population”. I asked the collectors to make a list of the neighborhoods they encounter most obstacles getting access. “Copacabana!” they all agreed. “Copacabana is really complicated”. “Even worse than Barra, descarado (shameless)”, one of them said. Copacabana is located in the wealthy and expensive South Zone of the city and is a typical bairro that can be called asfalto (asphalt), in contrast to the morros (hills). The neighborhood is hosting the famous beach with the similar name.

Another difficult factor, the collectors wanted to emphasize, is citizens who do not believe in the state’s work, that it will not lead to anything valuable. To illustrate this one of them said that he went to a place, identified himself and the response from the person he talked with was that he believed it was a palhaçada (joke), that it is just loss of time collecting the mosquitoes. This incident reflects peoples despair in relation to public institutions and the collective as a whole. With all the social problems and corruption scandals it is difficult to believe in honest governmental care. Just as Caldeira (2000:199) writes about the urge of Brazilians relying on private security instead of public security infrastructures.
Figure 11: Sylvatic mosquito collection. HLC

Figure 12 and 13: Collecting mosquitoes with the bazooka inside a church and a backyard.
The implication of appearance and where you belong

One day we were heading for Vila Valqueire, in the North Zone. Not anyone can enter a comunidade, the two collectors explained. “For instance, Iguana cannot walk with us when we are trying to get inside let say “Jacarézinho” Capivara pointed at his colleague. “Do you know why?” he asked. “He looks like a policeman, the shape of his body, his facial features”.

“I, on the other hand, look like a man living in the comunidade”. People’s appearance and habitus play a crucial role in this class divided society and influence their access. The manner you talk, as Roth-Gordon (2009) exemplifies with the use of slang in Rio de Janeiro, or your skin color (Goldstein 2003) determines who you are and where in the hierarchy you belong.

Collecting mosquitoes in specific areas, Capivara confessed that he sometimes dress the municipality’s ACE uniform, instead of the Fiocruz uniform. He explained that there is a lot more trust among the inhabitants of the comunidades toward the ACEs because they are always present in the area.

One of the days we were departing for fieldwork, I came to the laboratory early in the morning. Capivara was already there and the new Spanish post-doctoral biologist. After greeting each other, Capivara said, “Rachel, look at him!” I commented to the Spaniard, “Do you want to get killed?” Capivara explained that he could never have joined us in the comunidade wearing his camouflage pants. Then the shantytown dwellers could resonate that he was a policeman. To the Spaniard, on the other hand, this kind of clothing at fieldwork made sense to him, as he was used to the sylvatic collections.

When Jabali came, we went to Barra, the land of the emergentes, the ones that improved their living conditions and are living in condos (Edmonds 2010:165). To get there we drove the Linha Amarela highway and on our drive we passed through Cidade de Deus. The community became internationally known after the famous film City of God. “I grew up there”, one of the collectors told us. “Both of my brothers got into drug and crime related problems and my parents solved the problem by moving”. His story of choosing a different path than his brothers reminded me of the main characters in the film: the two friends where one became a photographer and the other a drug dealer. His statement about where he came from and belonged in the city, was something I already had an assumption about, as he had worked as an ACE, but also because of his appearance. This collector did certainly not belong to the city’s elite. Having the social hierarchy in mind, I was curious about if they, as manual workers, with a low level of education felt inferior at the laboratory. “Nada disso (Not at all),
we respect each other and we know about the established positions”. The other mosquito collector added, “Without the technician, in what manner would they be able to perform the work? They need us to manage this”.

I have now looked closely at the collector’s knowledge about the city and how they maneuvered themselves around in a city that is full of possible obstacles and hurdles that can impede this kind of work if the person lacks the right awareness. In the ultimate pages I will continue with an empirical focus, and more specifically describe the mosquito collectors’ knowledge, the way they spoked to locals and the satisfaction capturing the mosquitoes.

**Knowing the mosquito**

At the field trip mentioned above, we stopped close to the Olympic Park, in front of a hotel. Capivara went into the hotel asking for a permission to collect mosquitoes. We were still in the car and the Spanish biologist said, “What? Collecting mosquitoes inside the hotel?” He was surprised. I, on the other hand, had already become a bit assimilated to this urban mosquito collection. After collecting mosquitoes inside a church and restrooms, nothing could surprise me anymore. Jabali explained that they never ask for permission in advance, because then they will clean everything, come up with excuses and complicate the visit. I was told to leave my purse in the car to not create any suspicions. Instead, I carried the *risco biológico* box, the box containing the small cages to retain the mosquitoes. The mosquito collectors captured mosquitoes behind the hotel’s reception, in the common areas and in the restrooms. Then they went outside in the backyard and inside the hotel functionaries’ dressing room where they captured a lot of mosquitoes. “The space is ideal for the mosquito. Sweat, clothes, smelly shoes, and it is dark and humid. The females are intelligent –they know where to find their prey”, the collectors commented. They enjoyed showing me and the curious staff functionaries the mosquitoes and classified them rapidly. “That one is a *Culex*, or *Pernilonga* –the popular word, and the rest of them are *Aedes aegypti*, it is black with white stripes at its legs”.

The hotel’s functionaries offered us coffee and water before we left and went to Banco do Brasil. It was an interesting sight –collecting mosquito inside a bank. Jabali laughed, “The mosquito enjoys money as well”. Trying to take part in the mosquito jokes I responded with a stupid commentary, “Then I guess it’s only machos you find there”. We waited to get permission to collect in the neighboring office building, it took time and they did not let us in.
When they cannot get access they return to the location after some weeks with the hope of meeting another, more easygoing person who lets them inside or they select other places nearby.

Some days after the fieldwork described above, one of the collectors commented in the Olímpico-project Whatsapp group, “We only captured machos, which indicate that there are breeding spots in the area, but we did not find any breeding spots. I am disappointed”. The aim of the collection was to find the females. The successfulness of a fieldtrip influenced the collector’s mood. Through their facial expressions I could interpret if it was a good capture or not. Capturing mosquitoes was a pleasure. It was clearly a satisfaction achieving the goal of the fieldwork. The compliments they received from the scientists clearly fueled their self-esteem. Gaining recognition from important scientists gave them a different kind of motivation than the ACEs who were very rarely or not applauded at all by citizens for disrupting the development of the larvae through their civic work.

The scientists and the mosquito collectors often had to translate the scientific language into a popular language. While explaining the mosquito’s reproduction and the distinction between the female and male mosquito, the collectors often said things like O macho é bomzinho (the male is gentile). The way of passing information and the words used in the explanation influenced the locals’ reactions, as one day collecting larvae and mosquitoes inside an older couple’s home. Jabali commented many times, “I caught an Aedes aegypti”. Every time he said that, the couple’s faces became grayer. Their worries increased. They said, “Before you leave you should bring all the mosquitoes with you”, and opened more doors and we entered in all of the rooms. The mosquito collector showed them the captured mosquitoes and “sucked” them into the aspirador de castro. “This one is full of blood”, he pointed at one of the black and white legged creatures. The woman expressed with a frightened voice, “Oh no, it attacked my son during the night. Bring them all with you”, she repeated. Their empregada (domestic worker) entered the conversation and joked, “I cannot work for Seu José anymore, with all these mosquitoes flying around”. The mosquito collector’s presence generated consciousness about mosquitoes, viruses and breeding spots.

It should be mentioned that during virus outbreaks the scientists and the mosquito collectors’ work becomes intensified and they have to act carefully working in epidemic areas because of stigmatization, as discussed in the previous chapters. The head of the laboratory explained that they cannot go to the neighbor and tell them directly, “I am coming here to collect
mosquitoes because the neighbor is ill”. It can stigmatize them, because it is related to dirt and untidiness. Moreover, from not wanting to let Fiocruz employees or ACEs enter their home or pretend they are not there, the local population’s comportment undergoes a shift during outbreaks. Some locals are even calling for the mosquito experts. This was also the case when we went to the yellow fever affected Casimiro de Abreu. When we left the settlement of yellow fever victim’s family they thanked us and said, “Please don’t forget us. Come back soon, you are taking care of our health”.

Concluding remarks

Based on my empirical data, this chapter was driven by two main arguments which I have now discussed. 1) Even if the city of Rio de Janeiro is much fragmented, the Fiocruz workers have a different vision: they embrace it as a whole. They interact with the broader city through their fieldwork and imagine themselves having a national commitment toward the entire population. Their aspiration is much related to the institution’s past and the legacy of Oswaldo Cruz. 2) The health situation in Brazil and the Fiocruz employees’ notion of a civic commitment is different compared to the situation at the African continent, where public health often is sidestepped by global health initiatives.

Throughout the next chapter, the population’s common idea of the mosquito as something that must be eradicated is challenged through a new intervention which involves the city and the citizens in an even larger scale. The perception about the mosquito as something dirty has to turn in to the scientists’ imagination of it as something fascinating.
Chapter 5

The Experimental Mosquito

“Take these, but you know that they are really hungry and will attack us when we open the tubes”. The endemic disease control agent (ACE) gave me a handful of tubes, each of them containing one hundred and fifty buzzing *Aedes aegypti* carrying the Wolbachia bacterium. The *Aedes aegypti* literally did attack us. During the whole event releasing the new health tool I was covered with thirsty female *Aedes aegypti*. I became all red, but it was exciting and I had on my mind that with the contribution of my blood I was facilitating the mosquitoes’ reproduction process. Now the females could lay their eggs and produce “wild” offspring containing Wolbachia that make mosquitoes incapable of transmitting viruses. At this day I hoped that she was going to find the breeding spots, the ones the ACEs usually inform the locals to eradicate.

The aim of this final chapter is to examine a new virus control strategy, which, as described above, is distinct from the “traditional” virus control in Chapter two. In this strategy the vector itself is transformed into a prevention tool. Before a releasing of the mosquito –as the example illustrated, it had been a longer process of implementing the project in the respective areas. Even if it is different from the conventional ACEs’ mosquito control approach, some of the same actors are involved in this project. Throughout the chapter I will describe that the implementation depends on the ACEs’ cooperation with scientists and local communities’ acceptance. It will be argued that this intervention, elaborated as a global health initiative, has become “nationalized”. Further, it is a solution in disease control that is strongly connected with technology and science, and I attempt to bring to the fore and discuss how the new strategy is linked, by some, to reliance on scientific knowledge while others reacted with skepticism, rumours and resistance.

Apart from the empirical findings, I will draw on critical global health contributors (as Biehl & Petryna 2013; Gerrets 2015) and comparable cases related to trials (as Beisel & Boëte 2013; Campos, Hartley, Koning, Lezaun & Velho 2017). The chapter begins with outlining the project as a global health initiative, supplemented with the new possibilities such disease control strategies can create. It will be followed by an empirical account of the implementation process, and two “case studies” leading to the final discussion about the
various ideas that emerged with the releasing of this “experimental mosquito” and the discourse the different actors employ.

**A Global Health project**

“Eliminate Dengue” was until recently the name of the project, now it is called World Mosquito Program and is led from the Monash University in Melbourne, Australia. I prefer to call the program the “Wolbachia project”. As the bacterium not only prevents dengue, but also Zika and chikungunya transmission, “Eliminate Dengue”, is not accurate enough, and it is also the program’s own explanation for altering the name.

According to the program’s website (World Mosquito Program n.d., a), “The program has funding relationships around the world with philanthropic groups, governments, research institutes and private enterprise”. One of its most eye catching supporters is The Bill and Melinda Gates Foundation, which has played a major role in the investment of developing insect technologies. The private-public partnerships and the technology delivery that targets a specific category of diseases make this a project that fits into what has become known as global health.

Since 2011 the program has conducted trials releasing mosquito containing the Wolbachia bacterium. It was first implemented in northern Australia and the project has since then expanded to twelve countries. The project was brought to Brazil by Fiocruz and was initiated in 2012 and the first releases happened in 2014. Brazil was selected to participate for being one of the countries with major quantity of dengue cases per year and the scientists wanted to observe the viability of incorporating the Wolbachia bacterium in the native *Aedes aegypti* population. Two small *bairros* called Tubiaganga (at Ilha do Governador in Rio de Janeiro) and Jurujuba in Niterói were the first areas the trials took place. Before releasing, the project monitored natural mosquitoes, and achieved both the respective communities and the government’s approval. The trials were, according to scientists, until now successful, but are still being monitored. During my fieldwork the project was in a phase of expansion, and I witnessed the ongoing large-scale deployments that will reach more than 2.5 million Brazilians during the next two years. Fiocruz scientists and the program’s internet site emphasize the natural and self-sustaining method and that it is not posing any risks to natural ecosystems or public health (World Mosquito Program n. d., b).
Figure 14: The self-sustaining method. (IOC/Fiocruz 2016)

Figure 15: *Aedes aegypti* with Wolbachia
Global health initiatives have been much criticized by social scientists. According to Biehl and Petryna (2013:4), critical global health contributors “Are concerned with the actual impacts initiatives has on care, health systems and governance”, and as they emphasize further, disease is not just one thing, technology delivery does not equate with care and biology and technology interact in ways we cannot always predict. Biehl and Petryna (2013:19) continue to address that people’s accounts often are hidden from view and that an ethnographic contribution can explore “The altered landscapes left behind after programs scale up, break down or move on”. Strathern (2011) suggests that a focus on perspectival knowledge (epistemology) in medical research, where the aim is shaping perspectives, is not a solution, but part of the problem. Instead of relying on knowledge, one can rely on relations, the bodies and persons in relations, around field research. For this Wolbachia-case, these program incorporated landscapes and the new connections and relations between the actors involved blur the harsh boundaries between scientists and community, Western driven global health projects and “apathetic” trials participants.

As Gerrets (2015) writes, about partnerships in global health, disease targeted interventions are both praised and criticized. On the one hand, it has prevented deaths as populations receive vaccines or drugs that otherwise would have been unavailable. In addition, such projects have attracted sizable recourses to the particular countries. On the other hand, it has been argued and criticized, just as discussed in Chapter four regarding global health at the African continent, that such initiatives weakens nation-states further, especially those already highly dependent on foreign aid, and that the public sector is infrequently playing a dominant role (Gerrets 2015). Cueto (2013) explores, however, that the politics that shaped global health in relation to malaria in the 1950s, has in some ways reemerged, but that there is now more sensitivity toward local actors and policy-makers and a greater interest in cooperating with them (Cueto 2013:51).

Global health initiatives and medical research cover a range of types and diseases targeted. Sometimes they are individualized, where people” receive treatment, as for HIV, or are study subjects, contributing with bodily substance in vaccine trials (Fairhead, Lock & Small 2006) or with their body as part of drugs trials (Petryna 2009). As both Lock and Nguyen (2010) and Petryna (2009) show, drug trials are often outsourced to developing countries or placed in these countries as a result of intensified new pharmaceutical market opportunities. Like Lock
and Nguyen (2010:198) state about the participants in trials, “The belief that research subjects who consent to participate in trials do so in a disinterested or uncoerced manner is a fiction”. Trials benefit often the participant with access to health that is otherwise much out of reach.

The Wolbachia project is, in contrast, very different. First of all, whereas Gerrets (2015) is referring to the minor public sector role in these projects and Cueto (2013:51) claims that there is still little real community participation or engagement at the local level at the African continent, the situation is quite different in the Brazilian context. The Wolbachia project is conducted by local scientists and implemented by their own citizens. It has become much “Brazilianized”, and to emphasize this, even Brazilian scientists themselves went to Australia to bring with them mosquitoes containing the bacterium back home. Further, for the Wolbachia project, the local cooperation is essential in regard to ethical guidelines and the practical implementation. Secondly, the Wolbachia trial is not individual-body based, but involves the community as a whole, but of course, the mosquito is a blood sucking insect, and for especially that reason it resulted in skeptical reactions, which will be taken into consideration later on.

Brazilians, in the communities I studied, do not lack understanding of the mosquito-borne viral disease transmission nor a belief that they cannot be prevented. What is new here, is the understanding and acceptance of the mosquito employed as a technological prevention device. The post-war idea of eradicating mosquitoes with DDT failed, and scientists and global health programs seems to understand that the mosquito is here to stay. What can be done is to impede the virus to enter the mosquito. Beside of the mosquito with Wolbachia, GM (genetic modified) mosquitoes have also been considered a possible prevention strategy, and have been replaced from the high-tech laboratories in Europe and the USA (Beisel & Boëte 2013:47) to open field experiments in the southern hemisphere. The first high-profile GM trial in the world took place in Brazil in 2009 and much of the current knowledge about GM mosquitoes as a method is based on the experience of the British developed OX513A (a strain of GM Aedes aegypti) in Brazil (Campos et al. 2017). The project gained tremendous support from the Brazilian political authorities, however, the community engagement and authorization was left behind in the shadow. This GM project was initially going to include Fiocruz, but because of the British firm reluctance to transfer the technology to its Brazilian partners, Fiocruz decided to not participate (Campos et al. 2017:18). Beisel and Böete (2013:48) state that the British firm is hoping to sell the OX513A for profit, something the
firm has been criticized for in the way that they are maybe not interested in the best solution for the public or eco-system. The intentions of the Wolbachia project, in contrast, appears for real to be non-for-profit driven and the community participants are not engaging in this project with the aim of receiving individual health service benefits, as is often the case in drug trials. By taking this into consideration it looks like the project is driven by altruistic and humanitarian aspirations toward the population living in the endemic regions where *Aedes aegypti* borne viral diseases cause harm.

“Nationalizing” new viruses and projects

The emergence of new viruses has created opportunities and new challenges for researchers at Fiocruz and at the particular laboratory I conducted my fieldwork. To underline this, I will give an example of a postdoctoral researcher. He had worked one year directly with mosquitoes. Before entering the field of mosquitoes he had studied the Chagas disease. He explained the three reasons that made him shift his research field. First of all he wanted to study another insect, and then the two new arboviruses that entered the country, the chikungunya virus in 2014 and the Zika virus the year after. This contributed to a growing personal interest exploring this field. Secondly, as a molecular biologist he felt that he could contribute with knowledge to epidemiology. The third factor, important to notice here, was the financial investments to the field of mosquito. In Brazil, many important fields of research are lacking financial funding, but the research of arboviruses still receives. The funding facilitates employment of new researchers and the continuity of mosquito related research. The emergence of the Zika virus and the congenital problems it causes the fetuses of affected pregnant women, lead to a priority of this kind of studies, despite of other serious diseases such as cancer, obesity and cardiovascular diseases –grave health problems among the Brazilian population.

The new outbreaks and viruses resulted in the possibility of new projects and the Ministry of Health wanted the scientists to discover the causes of outbreaks and support new prevention strategies. The Zika virus resulted in the post-doc’s Olimpio project. He explained:

The project I am conducting, is analyzing mosquitoes in Rio de Janeiro before and after the Olympics. In case the Olympics had an impact, it can contribute to a worldwide protocol to prevent new outbreaks. The first publications about the zika virus, related the outbreak to “world events” as the FIFA Confederations Cup
and the Catholic event “World Youth Day”. We had new arboviruses and new components on our mind, and we know that mosquitoes have been resistant to some insecticides. The movement of people, scientists thought, was a possibility for virus transmission. In Rio it was built new roads that connected remote places. With all the movement and encounters it is possible that new viruses surge. You can bring mosquitoes with you in the car travelling and mosquito populations can be mixed. Modifications were possible, people thought.

In similar ways, the Wolbachia project created new employment opportunities. As was the case with the introduction of British developed genetically modified (GM) mosquitoes in Brazil, where the aim was to carry out the project locally, hence to reduce the overall costs, create new jobs and create high quality local facility (Campos et al. 2017), the Wolbachia project has some of the same features. The scientists gained new skills with the introduction of the project, and ACEs and ACS’ from the municipal health secretariats in Rio and Niterói became partners in the project. Because of the emergence of the new viruses, and just as Campos et al. (2017:16) explain, “The new threat of Zika energized arguments in favour of insect biotechnology in Brazil and mobilized further institutional support for GM insects”.

The Wolbachia project in Brazil receive support and funding from Fiocruz, the Ministry of Health, the Department of Science and Technology (DECIT / SCTIE), the Ministry of Science, Technology and Innovation, the National Council for Scientific and Technological Development (CNPq) and from the National Development Bank (BNDES). This highlights that the international, global health project has turned very much into a local project, both in terms of financing and the usage and development of local facilities and local staff.

**Implementation and the persons involved**

The laboratory in Chapter four is not directly involved with the Wolbachia project. One of the scientists, however, used to work within the project and some of the graduate students are writing thesis somehow related to the Wolbachia method. The team working with the Wolbachia at Fiocruz is physically separated from the Fiocruz campus by the Avernida Brasil. They have their own insectary where they are creating the mosquitoes and an annex used as semifield station. I visited their laboratory and went with their team to the field. Suddenly, I was not allowed to speak or travel with them anymore. I felt guilty and that I was looked at as a spy, because of the project director’s sharp explanation and condescending attitude toward
my contact person at my “main” laboratory. I felt that my right to speak with regularly citizens was taken away, and I became afraid to enter areas were the project was involved. By support of scientists at the “main” laboratory, I handled the situation by continue my research related to Wolbachia. I went by my own to the actual field sites where I interacted with locals, the household associations, health workers and ACEs, all these people were involved in the scientists’ intervention. Some of the locals affirmed that I was always welcomed and, “The neighborhood is not a separate republic and you do not need any visa to enter”.

The following sections describe the implementation process, from the very beginning of the process to the final stage which involves monitoring. It will be presented by a mixture of the voices of scientists, locals, health workers and ACEs.

**Becoming allied**

During few months in Rio de Janeiro and Niterói, the project became more visible in the public life. Posters of 1 x 2 meters were observable at the walls of newsstands and a huge announcement of the project was soon to find at the ferry port’s doors, where you can take a *barca* (ferry boat) to Niterói. “*Aedes aegypti* with Wolbachia is our allied in the combat against dengue, Zika and chickungunya. Become an allied you as well” was written at the posters. The military metaphors still have continuity, also in this project. To analyze the poster further, it contains a drawing of a happy and a diverse group of citizens below a shiny sun. It represents a scientist from the project dressed in his t-skirt uniform, and a man in a suit carrying a box with mosquitoes, that can be representing the authorities and its support. The drawing also contains a community health worker also dressed in a uniform and three locals, a dark-skinned lady, an older man and a young school girl. A DLO (Dispositivos de Liberação de Ovos), “egg release device”, is placed at the typical Carioca “Pedra Portuguesa” pavement, the flat pieces of stone placed in a pattern. The people are smiling while the locals have their toms up. The drawing is very symbolic. It represents the project as a good and collective initiative in a diverse Brazilian context. The global health project is being transformed to a localized, national initiative.

A huge, oversized mosquito was also illustrated at the poster. A scientist explained that sometimes campaigns and mosquito preventive initiatives do not consider the populations difficulties understanding. The scientist continued arguing that it should be an easy understandable discourse, “You are Norwegian, the language I speak is not your mother
tongue, and it is the same thing with my language as a scientist and the population’s language. Do you see the importance of anthropology here?” The visual question is very important, to make the person understand that the mosquito is small, black and that it like to be around the person’s feet. The size of the mosquito at the Wolbachia program’s poster might not have any incomprehensible implications and one can understand the mosquito’s size by reading the drawing as three-dimensional, however, as a new project and a still relatively unfamiliar prevention tool, it can create a mystical imagination. Without explaining the implications and safety of the “laboratory mosquito” well, it can create suspicion and fear and thereby impede the community’s acceptance.

Creating understanding among locals, community health workers and ACEs, was the first and the most important step of a successful releasing of the Aedes aegypti with Wolbachia. The project had its own equipe de engajamento (engagement team) that traveled from Fiocruz to the local communities. The team presented the project and recruited participants to host the DLO in the releasing or electric armadilhas, mosquito traps, used to capture mosquitoes both in the monitoring before the releasing and after. Becoming a participant hosting the devices, they have to sign a contract. The cost of the electric energy consumed by the armadilha, which was between three to five Reais (1-1,5 Euros) per month, was, after three months, payed back as supermarket tickets. The reason for not paying back in money was to emphasize that it is a non-profit motivated project.

I went with the equipe de engajamento to a community in Niterói, new to the project. The team consisted biologists, a geographer, a journalist and political scientists, all of them were young. Because of the distance from Fiocruz to the field, the trip turned into a social event as well. As we were not allowed to circulate in the dangerous community by ourselves, a group of local ACEs met us at the health clinic and together we went to the community’s household association’s office. The ACEs had requited local participants that were supposed to sign the contract and obtain more information about the project. Only five persons were present and the ACEs told us that the locals probably will show more interest when they observe neighbors participating. The project’s representatives explained the project, and emphasized that it is a non-profit project and that it is a natural bacterium, that already exist in for example butterflies. “It is better to be bit by mosquitoes containing Wolbachia than by mosquitoes with dengue or chikungunya”. By comparing the laboratory mosquito with the risk of the natural specie, they tried to convince the locals about the benefits of the new
program. Some of the participants were going to host armadilhas and some the DLOs. The DLO had to be placed outdoor, while the armadilha always had to be connected to power. It was easily observed that the participants did not pay much attention and because of that and potential illiteracy, the team read the contract out loud. The participants, apparently marked by the hard lives in the comunidade, did not ask any questions. One of the locals expressed that she did not want to participate and left before the meeting ended.

The social differences in the city of Niterói were remarkable, as we drove to another part of the city, a prosperous neighborhood that also was going to be implemented in the project. One of the team members had been visiting a private school with the aim of informing the school’s director about the project and the possibility of hosting a mosquito trap. Unfortunately she had told him to come back another day because she had forgotten the meeting. The situation affirmed the obstacles working with prevention control in private and wealthy areas. While we were waiting in the car and observed a group of wealthy school boys passing us, everyone in the car commented nenhum preto (no blacks). “Full of money”, one gesticulated the “money sign” with his hands. “Here in Brazil people like to show they have money, using a school uniform does not help, they express their status through their shoes or watches”. The Fiocruz representatives had to handle the sad facts of living and working in cities of huge inequalities and through the project they have to approach people with different economic and cultural backgrounds, and maneuver themselves in a landscape of skepticism, just as elaborated in Chapter two and four.

Due to this, the local health workers and the ACEs are important collaborators. One ACE affirmed, “We are at the territory and we understand the locals. The locals trust us and respect us. When we tell them that we support Fiocruz, it is easier for locals to trust them as well”. The ACE experienced the project as an exchange where the ACE learned about science while they facilitated the implementation. Two ACEs confessed that personally they did not like the idea of the project at all. “The population is complaining about the mosquitoes. I think the Wolbachia will turn into other diseases. Every year it is a new mess. I cannot say it out loud, because of my work”. Another man thought that “zombie-monsters” could emerge from the mosquito with Wolbachia.
An ACE explained his cooperation with scientists and the releasing of mosquitoes:

Last week I went up the hill and the drug dealer told me to leave. I tried to explain the project, but he interrupted me and said “I do not want to know, leave!” Before I left he commented, “You are bringing diseases to us, small children are living here, and whatever they say at the TV are lies. New diseases will emerge from it, for sure”. Then I went down, and used my “jeitinho brasileiro” (“the Brazilian way”, bending rules): I just went up another narrow lane and released the mosquitoes at that place instead. You see, the scientists need us to get the work done.

A scientist told a similar story of mistrust, “Some locals are still a bit distrustful toward the Wolbachia”. A woman he had met acted aggressive while she claimed that the Wolbachia probably was connected to the Zika virus. The scientist explained her that most cases of the Zika virus had occurred in the country’s Northeast, a place where *Aedes aegypti* with Wolbachia was not released. Similar rumours circulated, also in the media, in regard to the emergence of the Zika virus linked to the releases of GM mosquitoes in Bahia and São Paulo (Campos et al. 2017).

Here we can see that the communication of the project is important and Fiocruz scientists are well aware of it. Through the engagement team and the ACEs they are attempting to create consciousness toward the method and at the same time requite participants. In the similar way, the posters placed around in the public spaces are tools used to inform the population about the ongoing project. As described, it exists suspicious believes concerning the project, that also emerged from the health workers and ACEs, however, it is mainly in the implementation process.

**Monitoring**

As already mentioned, after a releasing of mosquitoes, the scientists are monitoring the percentage of the mosquito population containing the bacterium. Together with scientists I went to one of the “pioneer” communities where mosquitoes with Wolbachia had been released in 2014. Some households, fewer than earlier, were still hosting the armadilhas. Fiocruz had an agreement with the ACEs who collected the small nets with the obtained mosquitoes and left them at a local barber once a week, where Fiocruz employees could find
them, without visiting every household. The agreement was not implemented in the “pioneer” neighborhood in Niterói, and the Fiocruz personnel had to collect them themselves. For being a larger area, we were six persons in the car, including the driver. We went to a health clinic were an old generation of ACEs met us. Each of them walked along the Fiocruz workers, due to access reasons. “Nossa” (interj. gosh), one of the young biologists expressed surprised, “one of them has heart problems. I do not want to walk with him, imagine him having an attack when we are walking up the hills”. I asked if they always work with the old ACEs and if they understand the project. “We were introduced to work with the old boys. I do not know why, and yes, in the beginning we were worried if they really understood the project and the new implications of it as a control strategy”. As the young biologists divided the areas between them, I went with the driver and another biologist twenty minutes by car to a more isolated area where the road was narrow and curvy. Similarly, to the other places involved in the first releasing trials, this place was selected because of its geographical isolation. It was a calm place with few houses. We visited three household, all of them were in simple conditions. A woman was standing outside her house and while we collected the mosquitoes captured in the small mosquito nets inside the electric trap, she commented, “I will not travel to Espirito Santo during carnival because of the yellow fever”. The biologist responded, “Carnival is just a mess and chaotic, I do not like it”. Then we went to the neighbors, a formerly fisherman family. Some of them were lacking most of their teeth and their faces had features of hard working lives. They were laughing and told me that Niterói is much better than Rio. The biologist said that it was important to small talk with the participants, it had to be reciprocity and the scientists could not act arrogant. At the same time the locals enjoyed talking, and the scientists had to be efficient to reach over all the households to collect the mosquitoes.

We went to back to the more crowded community and walked up the hills. The biologist talked about the implementation process in the communities and said that these neighborhoods did not host DLO, the egg releasing device, anymore because the mosquito with Wolbachia had stabilized itself, by emphasizing that 90% of the monitored mosquitoes contained the bacteria. Most of the households hosting armadilhas were “poor”, many of them had pictures of saints at their walls and the houses were small. We walked up a narrow lane and greeted people we met on our way. In one neighborhood, called Preventório, the scientists did not enter because of security, and the situation was resolved by using the ACEs in a greater way. To prevent suspicion and dangerous situations during the release of mosquitoes,
they did not enter with the tubes containing mosquitoes in backpacks, but in more transparent plastic bags. Also in the bairro, where the release, mentioned in the chapter’s introduction, took place, the ACEs received the main task by implementing the project in practice themselves.

Figure 16: An armadilha placed inside a local household.

I have now described both the implementation and the monitoring process. As we can observe, the scientists’ practical approach to the neighborhoods varied, depending on how much they relied on the ACEs. The following section is “case-studies” of two neighborhoods. In one of them, the project was implemented successfully, whereas in the other one, the project ended unsuccessfully before the mosquitoes were released.

What happened in Urca and Tubiacanga?

Urca

In Chapter two it was written about the neighborhood of Urca in Rio de Janeiro’s Zona Sul. A neighborhood characterized as “noble”, where the majority of people living there have education and economic and cultural capital. It was not mentioned that Urca was introduced
to the Wolbachia-project. The locals learned to know the project and *armadilhas* were installed in several household, however, the project did not reach its aim of releasing the mosquitoes. At a household association meeting locals asked, “Why did Fiocruz disappear? Why did not they release the mosquitoes? Even people who had open their doors for the scientists and the *armadilhas* questioned it. A lady commented, “It was because of economy”. The reality was another. It was the locals themselves.

The household association’s leader was clearly disappointed:

> I felt tricked. Fiocruz do not receive the respect I previously had. I wanted to support the project and at the same time it was a good way to teach the children at the school where I am working about scientific research. At the school we hosted one *armadilha* and Fiocruz came once a week to pick the collected mosquitoes. We had informed the children about the project. When Fiocruz left, it was hard to explain the children the reasons. I want to teach them that when you initiate something, you finish it. These people are scientists. They should do things in a proper manner.

The releasing of the mosquitoes required knowing the local’s opinion and if they accepted it. By using surveys the locals’ acceptance was determined. For being an area where the inhabitants often fear the unknown, the *equipe de engajamento* always suffered obstacles working there. At least 75% of the population had to accept the project, but the surveys showed that only 66% approved it. The local ACEs explained their experience informing the Urca population about the Wolbachia.

> People were afraid, Wolbachia was an unfamiliar method. Some locals expressed that they were afraid it could bring new diseases and kill people. They did not want it in their neighborhood. “What if Chikungunya and Zika emerged because of the Wolbachia?”, “Release even more mosquitoes? It is enough with all the mosquitoes we already got here”, were questions and comments we got from the locals. The inhabitants of Urca have a conservative mindset, in the manner that they are not very open to change.

During the implementation in 2013, the ACEs were well known in the neighborhood and they accompanied the scientists at house visits. To facilitate the access and participation, the household association made a little article with pictures of the scientists in the neighborhood’s
newspaper. Both the scientists and the ACEs were conscious about not frightening the locals at house visits. They only entered two or three persons at each house visit while explaining the project. “Unfortunately the mosquitoes were not released, even with the scientists’ and ACEs’ effort”, a household association member explained, “The household association’s effort as well”, the ACE supplemented. “At least the weekly presence of Fiocruz in the bairro, gave the population an alert about the viruses”, the two of them agreed at the end of the conversation.

“Urca will become a part of the project later when it expands to the Zona Sul”, a scientist explained. Later on the inhabitants probably will be more open minded and trust the scientists the obtained evidence and safety of the method.

The lack of explaining the reasons of the withdrawal of the project in Urca, resulted in, as I showed, that Fiocruz lost an important community member’s respect. On the other hand, the project retraction highlights that the project follows ethical guidelines, and does not force the implementation upon communities which do not receive it with open arms.

**Tubiacanga**

Tubiacanga, on the contrary embraced the project. It is a “fisherman” community of approximately 4000-5000 inhabitants and is a non-typical Carioca community. It is small, a bit isolated and everyone knows everyone.

Inside a small, old school grocery shop I entered a conversation with locals. “You are the first Norwegian visiting us. We have met people from many nations. Australia for example”, locals told while they explained their experience with the Wolbachia project. “People were afraid in the beginning. The results are good and we do not have dengue here”, a lady working in the shop explained. Our conversation got interrupted by a customer, some meters away from us. She was paying the cashier and did not look at us. She had overheard the conversation and expressed her meaning. “I do not agree at all. I disagree! They should not have released mosquitoes. They cannot do these experiments close to human-beings. Only when a person dies, then it will become a topic of discussion. My daughter is a doctor and she does not agree at all”. By mentioning her daughter’s profession, and thus the authority of it, she attempted to validate her argument.
At the other side of the street, the little household’s association was located. I had planned a meeting with three of its members. One of them was an old lady that picked some matured acerolas from a tree in the patio, while we waited to start our conversation. They were proud representatives for the bairro. A poster with “I love Tubiacanga” was attached to the wall and they showed me a collection of newspaper reportages about their neighborhood and the participation in the Wolbachia-project. They also showed me a framed diploma they had received from Fiocruz. “We are the project’s pioneers in Brazil, actually pioneers in America”. In 2012, the scientists initiated their fieldwork in the neighborhood. “It was not like a lottery, they needed a place that could function as a laboratory and this place had the requirements needed”.

The places of the releasing had to be an isolated space and the distance from Tubiacanga to another neighborhood is about three kilometers. Another requirement was an already existing amount of mosquitoes. Beside of the well suited geography, the social aspects of Tubiacanga played a favor. Violence was almost absent, compared to other neighborhoods.

In 2013 the Fiocruz scientists had a direct contact with the household’s association. Through them it was easier to create a relationship with the local population. “You know, the leaders of the community have the locals respect, and the scientists know that. They see us as a communication tool”. Suddenly, Tubiacanga became a place of more movement. Australians, French, Americans scientists and representatives from the Bill and Melinda Gates Foundation visited the community. “They did not visit us only at one occasion, but several times. Also Venezuelans and Colombians came, and now they are releasing mosquitoes in Colombia as well”, they continued to explain. The household association members were engaged in the project and expressed with enthusiasm their knowledge about it.

The lady told that there had never been many cases of dengue in the area, but her grandson almost died of dengue. One of the men, on the other hand, said that it had been a huge problem. He explained that there had always been a lot of mosquitoes there, even now with the Wolbachia program. “We have many species beside of Aedes aegypti. The difference is that the mosquito with Wolbachia does not transmit dengue. The latest result of the monitoring showed that 79% of the mosquitoes here contain Wolbachia. I never hear about people affected by Zika, chickungunya or dengue anymore. Because of that they do not even touch the topic”.
The population’s first reaction to the project was patterned by desconfiança (mistrustfulness). “We had to prepare the population about the releasing, because it was not done in one day and it was 200 thousand mosquitoes to be released during twenty weeks. 10 thousand mosquitoes each week, but it is nothing, because we already had a lot”. The locals felt it was a lot. People were critical and with the new mosquitoes arrival they started to complain. They complained in an educated way, and said things like, “Now we cannot watch television because of all the mosquitoes around”. The household association member explained the critics by the lack of knowledge about the benefits. Community meetings and the presence of Fiocruz’ scientists who explained the project, helped the locals to get used to the idea and slowly they altered their meanings. Fiocruz brought big screens and projectors, and even explained the project through drawings. “Today I believe that almost 100% accept and embrace the project”, one of the members explained. I told them about the woman in the shop that was not happy about the project. The answer they gave me was, “We respect any kind of critics, but how can a person that is not working with the topic have such a strong meaning? You do not have the scientific knowledge. It is a lack of respect towards knowledge”.

The three household association’s members claimed that the project had social impacts and that it created some changes. Many people came to the area including foreign groups of scientists. They claimed that they learned a lot about science. Things they did not even know existed. One of the members’ grandsons was mentioned. He always observed and participated when the scientists visited Tubiacanga. “The visitors spoke German, French and English, and that little kid in the middle, observing and participating. Today he is just talking about becoming a biologist”. I commented “So, the project brought the city and the science closer to each other?” They responded:

Exactly! The project is good for the inhabitants’ health. It is a hope for our country. We hope the project will expand to the entire country. The famous Bill and Melinda Gates foundation, they invested in the project because they believe in it and we believe as well. Knowing that it is a world-wide project creates trust. And we were the first and are proud participants.

One scientist had mentioned a name of “an easy going person” that probably could talk with me. I went around in the neighborhood looking for him and the locals indicated his house to me. He revealed his experience related to the project:
The project’s first chapter was the most important to achieve a successful story. Fiocruz way of elaborating the project was good. The households association became intermediaries between the scientists and the locals. They organized community meetings. People accepted the idea. The Fiocruz’ is an institution of much authority. The foundation is recognized even if it is located in the “third world”. Because of that, people accepted it and they opened their doors for the mosquito traps. The second chapter was the releasing of it. It was successful. Everyone became satisfied and happy about all the journalists and television reportages made about the neighborhood’s involvement in the project. People understood it was a serious initiative.

We finished the conversation and I told him that I wanted to talk with more locals. He asked if a fisherman was well suited for a conversation and he accompanied me to the fisherman’s house. He, a toothless man with wrinkles was sitting outside and said, “I am just a fisherman, you should talk with someone with that knowledge”. I responded that I wanted to talk with regular inhabitants of the bairro. He also had a positive experience with the project, but he also had another explanation, “It is not much mosquitoes here because of the airport nearby. It is a lot of wind and the fuel keep the mosquitoes away. The fuel has the same smell as insecticides, do you understand? I prefer to tell you about my life as a fisherman”.

I continued my walk throughout the neighborhood and I met some older senhoras outside a little boteco (a bar). “I did not like it. It was strange. They told us to combat the mosquito, but they released it, how is that going to kill it? They came during the madrugada (early in the morning) and released it. I heard the noises, but I did not see the scientists. The mosquitoes attacked me”. For her, the project represented something mystical, unknown and deviated from the regular routines of the disease combat and the life in the neighborhood.

In this section I focused on two distinct neighborhoods, one of them a wealthy neighborhood in the more “central” and well-known part of Rio de Janeiro –a place that always receives international visits through tourism. The other, situated in an isolated and poorer area which had its first meeting with international scientists and the media. One embraced the project, while one did not.
Approaching the new health tool

The use of Wolbachia as a mosquito control strategy is different from the traditional control strategy with the elimination of breeding spots or the insecticide spraying in times of emergencies. The way of approaching the mosquito is obviously different and this new method’s deviance form the other prevention strategy was conceived by the locals. To emphasize this and the method’s paradoxes, an ACE and his supervisor said:

It is a paradox, releasing more mosquitoes – during ten weeks we will release 403,500 mosquitos only here in this neighborhood. Earlier we were known as “the mosquito killers” now we are known as “the mosquito releasers”, what a paradox! What if it turns out wrong, that will be a scandal (laughing). And the population is complaining about them already.

It is an approach that undergoes a change from killing and avoiding it to a releasing of and cohabitation with “benevolent mosquitoes”. As Beisel and Böte (2013) write about GM mosquitoes, the mosquito transforms from a disease-bringing agent to a benevolent public health tool, but at the same time it is also risky. The skepticism I mentioned throughout the chapter is related to the risk and uncertainty toward scientific knowledge. As Beisel and Böte (2013:40) describe, “Creating a GM mosquito means to surrender public health practices to the lines of flight of the mosquito itself and to relinquish control to techno-nature”. It was this loss of control the skeptical voices in my account became afraid of. Could it in the future adapt itself and create zombie-monsters? Could it create harm and kill? Rumours, as Lock and Nguyen (2010:197) write, are of “Potentially powerful influence on the way biomedical technologies are perceived and ultimately used”. Interventions, can thus create diverse local meanings, just as Moran-Tomas (2013:208) elucidates with the example of a Guinea worm intervention in Ghana, where popular believes resonated that “Witchcraft made the worm come out” or “ABATE chemical woke up the worm” – that the chemical was causing the worm instead of killing it. Or what the historian Luise White (2000) writes about vampire rumours related to biomedical practices within a broader economy of exploration, in colonial Africa, which in turn echoes Fairhead et al.’s (2006) ethnography of the economy of blood and “blood-stealing” which surged with vaccine trials the Gambia.

The non-favoring Wolbachia individuals became targeted, by some, of the pro-Wolbachia persons, as ignorant and with somehow lack of respect toward scientific knowledge. As
brought to the foreground through the empirical examples, there were different perspectives, where the project’s supporters indirectly stated that theirs’s and the scientists’ perspective is the “one reality” and the “non-scientific” perspective should be shifted.

Through the participants of Marshall, Touré, Traore, Famenini & Taylor’s (2010) study of public perceptions of GM mosquitoes in Mali, it was found a widespread desire to see the method’s evidence with no negative consequences for human health and the environment, and as they also state, GM organisms face strong skepticism in both developed and developing countries (Marshall et al. 2010:12). Of course, the Wolbachia mosquito is not genetically modified, as it is only injected by a bacterium, but still these comparable cases do have something in common, as they are not entirely natural species. The population wanted to be sure about the method as harmless.

The scientists viewed the Wolbachia as a promising, self-sustaining method. No one of the scientists raised questions related to downsides of the method, as the viruses’ adaptability to the bacteria. The benefits of the project was instead measured with the risk of the potentially virus carrying natural mosquitoes. They claimed that no risks were involved with Wolbachia mosquitoes. In Beisel and Böte (2013), they question the uncertainty of GM mosquitoes and the attention to the interplay between knowledge and non-knowledge, and that the prospects of the GM prospects remain unclear while they draw on the earlier knowledge of resistant Anopheles mosquitoes to insecticides and the Plasmodium parasite drug resistance. The past’s evidence of its adaptability can raise questions, not only to GM mosquitoes, but also to Wolbachia mosquitoes. This potential adaptability, which the scientists ignored or refused, remained obscured by the public health promise of the project. Peoples’ uncertainty towards it often faded away or became silenced with the time and after the releasing. As the molecular biologist stated while talking about his Zika project: mosquitoes travel. With the release of the Wolbachia mosquito, despite of the local monitoring, the laboratory insects become unbounded. At this moment it is desirable, but what if it turns wrong in the future?

**Concluding remarks**

In this chapter I have argued that the global health initiative became nationalized, the mosquitoes were brought to Brazil by Brazilians themselves and they were further created and maintained by local scientists and the project was implemented by Brazilians themselves through the engagement of ACEs, household associations and the locals. Moreover, I have
revealed and discussed that people had different perspectives and opinions about each other, where some deviated from the scientists believes of it as a promising method, and reacted instead with skepticism. An evidential truth is that the project created new forms of social relations, where actors involved became gathered together.
Conclusion

Alongside the shiny image of Rio de Janeiro—the white beaches, carnival, teeming festivities and Sunday Chorinhos, the everyday activities of the Fluminenses proceed. Among them, the ACEs, scientists and mosquito collectors, preventing outbreaks and ensuring the population’s well-being in cities where viruses can be everywhere and nowhere at the same time. In this thesis, I have attempted to elucidate these activities and diverse perspectives which come to the fore through the “unbounded” mosquitoes—which cross geographical boundaries, and natural limitations through science. By looking into the practice of disease prevention, it has provided a unique possibility to grasp the social relations constructed by the elaborated interventions. How these meetings or viewpoints, in regard to the disease preventive activities, manifest themselves, are deeply related to the larger social processes in society. Along these lines, the almost invisible mosquito and viruses, together with the related activities have throughout this ethnographic account, provided a portrait of the variable and complex landscapes Rio de Janeiro and Niterói.

The practices of mosquito control have been elucidated by zooming into the breeding spots and the detailed descriptions of the capture or the releasing of mosquitoes (Chapter 2, 4 and 5). By bringing the larger tensions in society into attention, as violence and residential segregation, including the popular discourse about where mosquitoes belong (Chapter 2, 3, 4 and 5), we can see that these factors influence the interventions, and the mosquito control’s effectivity. This in turn can, potentially, lead to new outbreaks. The rupture of normality, in contrast to the much routine based interventions in the remaining chapters, came to the fore in Chapter 3. By showing the seriousness of and reactions to diseases, it was argued that particularly the yellow fever resulted in a sensationalistic, exaggerated and moralizing episode among the broader population, whereas the Zika virus caused a genuine problem and health scares among middle class pregnant or women in reproductive age. The middle class’ walls and the gated residential buildings do not necessarily protect citizens from viruses. The mosquito-borne viral diseases do not collaborate with boarders.

Throughout the thesis, relations between locals and actors representing the authorities have been presented. In all chapters the governmental authorities were, to a certain degree, present. That be, the house-visits preventing and appealing for a collective engagement in the combat against mosquito-borne viral diseases, through Fiocruz’ mosquito collections, the community
trials, or as in Chapter 3, the populations anger and moralizing criticism toward the authorities. The public employed ACEs, scientists and mosquito collectors evidently show the state’s presence in society and they attempted to improve the population’s health through their scientific research and community interventions. The authorities were taking mosquito-borne viruses seriously by employing ACEs, intensifying the investments in mosquito related science and by supporting new global health strategies.

In Chapter 3 I mentioned that the parents of a child born with the Zika Congenital Syndrome blamed the state for causing their daughter’s birth defects. My intention was not to state that the parents were wrong or that the governmental efforts or practices are perfect. Rather, I wanted to provide a more nuanced picture, by giving these state officials a voice and show how some civic workers and scientists, on a regular basis are directly engaged with the population. After what have been brought to the foreground in the thesis, many Brazilians have tense relationships with the state. As much literature state (Caldeira 2000; Biehl 2005; Biehl & Petryna 2013), the Brazilian state is much perceived as absent and unable to protect their citizens. The authorities are often blamed for being inefficient, just as with the hyped up reactions toward the yellow fever. Moreover, I have shown that many locals do not believe in the state’s capabilities of protecting them or that the civic workers can make a difference. However, as elucidated, groups of state representatives were actually out in the field and they had to maneuver themselves in this trust-lacking landscape.

During my fieldwork, the situation in Rio de Janeiro, was very pessimistic. People screamed fora Temer! (out with Temer) and protested against the worker and pension reform. What about the situation a year later? What my informants and the newspapers are stating is depressing. Brazilians are angry, and the anger manifested itself in during the 2018 Carnival. The povo and a samba school used Carnival to speak up, by, for instance, the “neoliberal vampire-President Temer” costumes. The violence has increased even more, and Temer has placed the army in Rio de Janeiro’s streets which brings associations to the past’s military dictatorship. Moreover, the brutal murder of the black, bisexual Rio councilor, Marielle Franco, shocked the country in a year of elections. The recently imprisonment of Lula, former president and a likely winner of the 2018 presidential election, has triggered even more anger and pessimism. The country is facing much uncertainty and the results of fall’s election are unpredictable. In what way does this impact disease control and the actors described in this thesis? What I know is that the ACEs are suffering in 2018 and the violence is impeding them
to perform a good preventive civic work. One of the mosquito collectors texted me, “It is worse now, the urban violence increased and the feeling of insecurity has strained the reality. It is hard and it is our everyday truth”. The leader of the Disease control center explained that they are lacking cars and things are complicated. The budget cuts and the lack of the right equipment, remind of Geissler et al. (2013) elaboration of the street-level health workers at the African continent. The pessimistic atmosphere in Brazil, is, perhaps, leading to a situation similar to the status of public health workers at the African continent, where the effects of the 1970-1990s crisis, disrupted civic, public workers possibility and the post-independence’s aspiration of nation building. To observe how the disease control will develop, there is a need for new ethnographic studies in the following years, and anthropologists should not ignore these public sector employees that are maintaining societies in order.

What is sure: the mosquitoes are here to stay and the prevention relies on governmental, political and local action. The existing dengue-vaccine is expensive and only obtainable in the private health sector, and there are no magic bullets available to prevent Zika, except for a study that indicates that perhaps a drug used to treat hepatitis C, potentially can prevent the Zika to affect the fetus (O Globo 2018). In May 2017 the Brazilian Health Ministry announced the end of the Zika emergence, but there are still new cases and much uncertainty around the Zika-affected children’s future.

Mosquitoes and viruses are not unique for Brazil, but they have a deep meaning here, rooted in the past and present. As well as in the future, as epidemics can surge and cross borders just as rapidly as the movement of humans and commodities. Mosquitoes and viruses are anchored to the population’ feelings, as the scientists and their imagined purpose of proceed by following a recognized research path, in an otherwise unequal world of knowledge production. Mosquito-borne viruses have manifested themselves in lives that barely have begun and where the marks of the mosquitoes will accompany them throughout their lives.

As with societies and urban landscapes that continually changes, the mosquito is continually adapting itself. It can become resistant to insecticides, “conquer” new spaces or being developed through science as a response to the hardship relying on the traditional mosquito control. Thus, the story does not end here, but the thesis captured the situation in Rio de Janeiro during the first semester of 2017.
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