

Neocolonial epidemiology

Public health practice and
the right to health in Guatemala

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Abstract

The relationship between public health practice and the fulfilment of the right to health is often assumed to be synergistic. With the goal of understanding how exactly this relationship happens, I studied the everyday practice of epidemiology in Guatemala, seeking to understand how it shapes and is shaped by the notion of health as a human right. Here I present findings from my ethnographic investigation of the Guatemalan Centro Nacional de Epidemiología (National Epidemiology Center), created in 2004 with the explicit mission of contributing to fulfilling the right to health for the inhabitants of Guatemala. While the relationship between epidemiological practice and the right to health is influenced by the specific configuration of local and transnational flows (bureaucratic, economic, ideological, political, scientific, social, and symbolic), epidemiologists also play an important mediating role. There are four intermediate social mechanisms that shape the relevance of epidemiological practice to fulfilling the right to health in Guatemala. Given how the country's economic and social inequalities translate into enormous health inequities, an epidemiological practice committed to the right to health should aspire to transform, rather than reproduce, the social hierarchies underlying such inequalities. The mechanisms I identified shape how epidemiological practice contributes to the reproduction or transformation of such hierarchies. These mechanisms shape what I call 'neocolonial epidemiology', and include: institutional chaos, disciplinary conformism, global health international relations, and social relations at the national level.

Introduction

When I graduated from Guatemala's public university as a physician I knew I wanted to become an epidemiologist. It was the year 2000, and during the previous seven years I had moved from dreaming of becoming a good doctor to feeling committed to the transformation of Guatemala's health system, and I genuinely believed that epidemiology would give me tools for speaking truth to the powers responsible for the country's tremendous social exclusion. And I was not exactly naïve because during my years as a student, I was an active participant in the social and political processes that led my country from a thirty-six-year civil war into a postwar period filled with hope and skepticism. In 2000 my country was trying to learn to live as a democracy at the same time that it was starting to come to terms with the fact that during the civil war the state had committed genocide against indigenous peoples in the countryside. By 2000 I had also worked shoulder-to-shoulder with indigenous rights and feminist activists as well as revolutionaries and shared their vision for our society. And yet, I wanted to become an epidemiologist. Six years later, I had worked with several epidemiologists and had earned a master's degree in public health with an emphasis in epidemiology and still thought that epidemiologists had the potential to speak truth to power, but at least in Guatemala they were just not doing it. And I saw that the more I did epidemiological work, the less I was paying attention to social inequalities and their transformation. I was living in a paradox: the more I sought the tools for understanding social inequalities in health, the farther away I was moving from actually dealing with them. The more I delved into the epidemiological tools, the less confronted I was with the human suffering that motivated my interest in epidemiology in the first place.

The research this article is based on aims at understanding how that paradox happens, in order to imagine ways to address it. After all these years, I still believe in the potential that epidemiological work has for addressing injustice. At the beginning of this research project, back in 2009, I knew there were several people in Guatemala who had followed an epidemiology career because, just like me, they wanted to address the 'real causes' of health problems but were getting trapped in the same paradox I was. I suspected that, just like me, they had gone through a lot of sacrifice to attend the country's public school of medicine but decided to go against the stream and not follow a clinical specialty or start a private practice. I imagined that even in their heterogeneity, their social backgrounds were in many ways like mine: middle-class urban folks who were without the means to go to a private university, who had spent all or most of their lives in the country's larger cities, and who were ladinos (that is Spanish-speaking, nonindigenous, nonblack, nonwhite *mestizos*, very likely uncritically reproducing racism towards indigenous peoples and unconsciously desiring to be white). Some of them had been my teachers, some of them had been my classmates, some of them had been my coworkers, none of them were my friends, and all of them had jobs I probably

would have had if my life circumstances had not brought me to get an anthropology degree in the United States. So when I decided to study ‘the tribe of Guatemalan epidemiologists’, as I found myself jokingly calling it, I was studying my own tribe, or more accurately, one of the tribes I am part of, or could have been a part of. And in that sense, when I point to epidemiologists’ mistakes, I think of them as mistakes I have made or I could make, just as I think about their achievements in the same way, because I am studying my own tribe; I am one of them.

Here I present findings from my ethnographic investigation of the Guatemalan Centro Nacional de Epidemiología (National Epidemiology Center, CNE), created in 2004 with the explicit mission of contributing to fulfilling the right to health for Guatemalan inhabitants. Given the country’s high levels of social exclusion and health inequalities, due to complex historical, social, and political dynamics, I wanted to understand how epidemiologists working at CNE saw their work as contributing to the right to health. My attention was at the intermediate social level, where institutional configurations are meant to implement political, technical, and administrative policies. My findings point to a complex set of mechanisms that limit epidemiologists’ well-intended efforts, which have the effect of making epidemiological work reproduce health inequalities. To be sure, I acknowledge that there are macrosocial and microsocial aspects I do not address in this article, and, furthermore, that social exclusion and health inequalities will not be eradicated through epidemiological work. Still, the intermediate social mechanisms I discuss here could potentially be addressed in the short or mid-term, promoting important changes that could contribute to larger societal transformations.

Epidemiology and the right to health

Epidemiology is considered by its practitioners as the main scientific foundation of public health practice (Brownson and Petitti 2006) and is broadly defined as the study of the origins and distribution of health-related events in specific populations, and the application of such study to the control of health problems (Porta 2008). However, epidemiologists understand the origins of health problems and their solutions in contrasting ways that lead them to propose bold transformative actions or timid band-aid control measures. Contemporary epidemiology originated in the eighteenth century. Historical critiques of the field have portrayed epidemiology as an attempt to control the spread of disease among the poor, who were considered to be a threat to economic and political life in industrial cities; others have analyzed epidemiology as a tool for controlling the poor through the control of disease and as a tool for the exploitation of European colonies, the American West, and peripheral states (Birn, Pillay, and Holtz 2009). Contemporary analysts of the discipline see it as an instrument for the protection of rich countries’ national security and it has, from this perspective, been

linked to social control more often than to improving people's well-being (Brown, Cueto, and Fee 2006). And yet, epidemiology has also inspired social justice efforts and has sometimes been instrumental in uncovering the causes of suffering. Breilh (2003) writes that the field has the potential to become an 'emancipatory science' if it addresses the political-economic causes of health problems and the triple inequality generated by sexism, racism, and classism. Almeida-Filho (2000) characterizes it as a 'timid science' for its lack of audacity and determination to live up to its emancipatory potential, and suggests epidemiologists should be more courageous.

The goal of epidemiology as a practice is to study the origins and distribution of health problems in order to contribute to their solution. Its contemporary discourse and practice is largely defined through international institutions, global philanthrocapitalists (see Birn, Pillay, and Holtz 2009), and a handful of universities and centers located in the global North. But epidemiology is not a homogeneous field, and its implementation needs to be understood as an assemblage of historically and geographically situated activities, symbols, and tools to be found in the awkward space that is neither local nor global (Comaroff and Comaroff 2003). For instance, there is a distinction between field, applied, and academic epidemiology. While field epidemiology focuses on the practical application of basic data collection and statistical analysis for the identification of risk factors, applied epidemiology articulates the discipline with the more general practice of public health, and academic epidemiology is more concerned with methodological sophistication and thematic specialization (Thacker and Buffington 2001; Susser and Stein 1999).

Another important subfield is that of social epidemiology, which aims to provide information relevant to understanding health inequalities with the explicit purpose of promoting social change at the macrosocial level (Krieger 2001; O'Campo and Dunn 2012). Latin American social medicine (LASM) is a practice derived from the social, political, and intellectual environment in the second half of the twentieth century in most Latin American countries, and which articulates critical theories with social movements and epidemiological methods (Morgan 1998; Waitzkin 2013). LASM is critical of mainstream approaches to public health and epidemiology and is epitomized by the theories and methods of critical epidemiology (Breilh 2003). Although LASM training and practice is robust in Mexico, Brazil, Argentina, Venezuela, and Ecuador, and has influenced other countries and the Pan American Organization, it remains a subaltern type of public health and epidemiology (Morgan 1998; Waitzkin 2013). These different types of epidemiology shape training programs and institutional practices, and although they can be the source of tensions among practitioners, they also can overlap in ways that promote collaborations (Segura 2006).

Anthropologists have approached epidemiology in different ways. Some have studied epidemic outbreaks from anthropological perspectives, pointing to the need for understanding epidemiology as a situated practice (Briggs and Mantini-Briggs 2003; Lindenbaum 2001; Briggs and Nichter 2009; Singer 2009; Atlani-Duault and Kendall 2009; Herring and Swedlund 2010; Moran and Hoffman 2014). Other efforts by anthropologists have aimed at influencing how epidemiology is conceived and practiced. For example, some Latin American medical anthropologists who are concerned with sociocultural epidemiology are calling for an epidemiology that takes people's perspectives and experience as a central concern (Menéndez 2008; Haro 2011). In the United States, anthropologists and other social scientists have addressed the challenges of articulating sociocultural perspectives into epidemiological practice (Hahn 1995; Inhorn 1995; DiGiacomo 1999; Hahn 1999; Krieger 2001; Trostle 2005; Susser and Stein 2009; Krieger 2009; O'Campo and Dunn 2012). Overall, this literature points to the shortcomings epidemiologists have in engaging the social and political aspects of health and disease, as well as in their own professional practice. Anthropologists have similarly contributed to our understanding of the 'right to health' (Petryna 2002; Ecks 2005; Farmer 2005; Comaroff 2007; Fassin 2009, Willen 2011; Biehl 2013), with particular emphases on structural violence and citizenship. Although the relationship between epidemiological practice and the right to health are not directly addressed by these authors, the overall takeaway is that public health practice needs to incorporate social participation and maintain a clear goal of addressing health inequities in order to contribute to the fulfillment of the right to health (Hunt and Backman 2008).

Overview of Guatemala's health system and epidemiological capacity

Guatemala has an estimated population of 15.6 million, of which 51 percent are women, 36 percent are 15 years old or younger, 41 percent are indigenous, and 49 percent live in urban areas (INE 2016). The service, manufacture, and agriculture sectors represent, respectively, 63, 24, and 13 percent of the gross domestic product (INE 2016). Although it is a lower-middle-income country, according to its gross national income of US\$3,790, an estimated 23 percent of Guatemalans live in extreme poverty and 59 percent live under the poverty line (World Bank 2016), which manifests in a Gini coefficient for income distribution of 0.59 (Cabrera, Lustig, and Morá 2015).

The health system is composed of a loosely coordinated network of public, private non-profit, and private for-profit institutions, and it is highly segmented and fragmented (Becerril and López 2011). In 1996, immediately after the end of its thirty-six-year civil war, Guatemala introduced a neoliberal health sector reform, primarily through loans from the Inter-American Development Bank and the International Monetary Fund (Verdugo 2004). Guatemala's total health expenditure is low by any measure (MSPAS 2015). Policies

implemented since then have impacted the magnitude and composition of the country's total health expenditure. Although public health expenditure increased from 1.4 to 2.0 percent of GDP between 1995 and 2001, it has since stagnated, oscillating between 1.8 and 2.2 percent (MSPAS 2015). In contrast, private health expenditure increased from 2.4 to 4.6 percent of GDP between 1995 and 2001, and it has oscillated between 4.0 and 4.7 percent since then (MSPAS 2015). As a consequence, the public sector is underfunded and there has been a proliferation of private health care facilities, with very little development of health insurance options, resulting in 55 percent of the country's total health expenditure being out-of-pocket (MSPAS 2015).

Data on health care coverage and utilization point to gross disparities. The public sector covers 58 percent of the country's population, while the private sector covers 11 percent, with 31 percent not having any health care coverage (MSPAS 2015). Health care utilization estimates show that 26 percent of people seeking care in private clinics were poor, while among those using public health care facilities, 41 percent were not poor (INE 2016). Between 2000 and 2014, the proportion of population using private clinics shrank (from 37 to 22 percent), while it grew for public health care centers (15 to 19 percent), public hospitals (9 to 18 percent), and private hospitals (3 to 5 percent) (INE 2016). Meanwhile, epidemiological trends show increased complexity, with 16 percent of deaths due to cardiovascular diseases, 16 percent to accidents and violence, 15 percent to communicable diseases, and 10 percent to tumors, with the remaining 43 percent due to a variety of causes (Moscoso and Flores 2008). As a consequence, available health indicators consistently show health inequities in health outcomes and in health access: indigenous people, people living in rural areas, and people living in households where the head does not have formal education have higher maternal mortality rates (MSPAS and SEGEPLAN 2010), higher percentages of children under five years of age with chronic undernutrition (MSPAS, INE, and SEGEPLAN 2017), and a lower percentage of births delivered in health care facilities (MSPAS, INE, and SEGEPLAN 2017).

Epidemiological practice has been part of the Guatemalan Ministry of Health since its creation during the country's 'democratic spring' of 1944–1954. When it was created in 1945, the Ministry of Health included an Epidemiology Section, which was upgraded in 1980 to become the Disease Surveillance and Control Division. At the time, Ministry of Health officials with job training but no academic specialization carried out epidemiological work, working under the supervision of physicians with no academic training in epidemiology. Although there were cases of epidemiologists with degrees earned in foreign universities, as a general rule they did not work for the Ministry of Health. In 1944, the Universidad de San Carlos de Guatemala (USAC), founded in 1676 and the country's only university until the 1960s, was declared public and autonomous, meaning that it would be funded through taxes

but the government would not influence the university's decisions. At the time, USAC's Facultad de Medicina became the Facultad de Ciencias Médicas (Faculty of Medical Sciences) but it remained dedicated to training physicians for private practice until the 1960s, when the country's context of social exclusion and political repression led USAC to find concrete ways to link higher education to the country's transformation. The Faculty of Medical Sciences approved an ambitious curricular reform, known as Actas Globales del '69, that aimed at making medical education relevant to the country's reality, by incorporating the study of social sciences, organizing education through thematic multidisciplinary modules, and incorporating social service at different moments during the six-year curriculum. Public health and social medicine were some of the new fields incorporated into the curriculum. The initial implementation of the reforms in the 1970s led to a new generation of medical students more aware of the country's reality, but also to the radicalization of some faculty members and students, who ended up joining the guerilla movement or being exiled, with some being assassinated or disappeared by the government's repressive forces, a phenomenon that extended to USAC as a whole (García Noval 2001). By the early 1990s, it was common to say that USAC had been *descabezada* (beheaded), with its most committed and brilliant minds no longer part of it. The Colegio de Médicos de Guatemala (Guatemalan Medical Association) was created as a professional organization in 1945, and it unsuccessfully opposed the creation of the Ministry of Health (Asturias 1989), and the Actas Globales del '69 curricular reform (Albizu 2005) because they both de-emphasized the private practice of the medical profession.

The turning point towards the current practice of epidemiology was 1990, when eight Ministry of Health officials were part of a master's program in public health and epidemiology, sponsored by the Pan American Health Organization and carried out by its Instituto de Nutrición de Centro América y Panamá. Also, around the turn of the century two universities, USAC and Universidad Rafael Landívar, started offering public health master's degrees with an emphasis in epidemiology. These programs were also supported by the Pan American Health Organization, designed to train Ministry of Health officials who would undertake epidemiological tasks, and emphasize 'applied' epidemiology, but with training that includes other public health foci, like health services. A milestone in the development of epidemiology in Guatemala was the devastation produced by Hurricane Mitch in 1998 and the response that followed. Part of that response was the support of the Epidemic Intelligence Service/Field Epidemiology Training Program of the United States' Centers for Disease Control and Prevention (CDC). The Epidemic Intelligence Service (EIS) of the CDC is a training program with origins in the 1940s as an effort to control and prevent malaria among the United States' armed forces located in Southeast Asia, which turned in 1951 into a training program in applied epidemiology with the idea that 'epidemiology is best learned by working on epidemics in communities as they occur, initially with close supervision from an experienced epidemiologist' (Thacker, Dannenberg, and

Hamilton 2001). By 2000 there were twenty Field Epidemiology Training Programs distributed throughout the world, one of them in Central America, located in Guatemala, whose goal is to build public health epidemiological capacity through training personnel to become leading field epidemiologists and by strengthening disease surveillance (López and Cáceres 2008). After failed initial attempts at coordinating with USAC, the Central American FETP has been housed at Universidad del Valle de Guatemala and it has trained more than one thousand epidemiologists from Central American countries.

Guatemala's National Epidemiology Center (Centro Nacional de Epidemiología, CNE) was created in 2004 within the Ministry of Health. Its creation was part of the changes facilitated by the Guatemalan Peace Accords, signed in 1996, marking the formal end of a thirty-six-year war that killed about one-quarter of a million people. The CNE was created with the explicit mission of contributing to the orientation of public health policy that aimed to fulfill the right to health of Guatemalan inhabitants. Although the CNE aspires to fulfill the traditional four functions of epidemiology, which include performing health situation analysis, research, epidemiological surveillance, and outbreak control, in practice it emphasizes the latter two. Guatemala's human rights record is among the worst in the Western hemisphere, with civil, political, and socioeconomic rights widely violated during the civil war, when state violence was so brutal that it was defined as genocide by the United Nations Truth Commission (CEH 1999). Although the general climate has changed since the war ended, human rights violations persist, and the country has one of the highest indices of social exclusion. Its health indicators show great disparities by race/ethnicity, sex/gender, class, and place of residence (WHO 2012). In that context, the CNE-stated mission demonstrates a pertinent commitment and a formidable challenge to the status quo.

Methods

Field site, participants, and data collection

The research reported here is part of a larger study examining the practices of the CNE. I received approval for this study from the Institutional Review Board of the University of Washington, and from the Guatemalan Ministry of Health's Research Ethics Committee. All participants gave informed consent before the beginning of interviews or observations, and were not compensated.

The CNE is a network of epidemiologists, with a central office located in Guatemala City, and personnel distributed across the country's twenty-two politico-administrative regions (*departamentos*). Although I aimed at including in my research all of the epidemiologists who were part of the CNE (a total of roughly fifty by informants' estimates, with no available

data to confirm it), I ended up interviewing thirty-four of them, from fifteen of the twenty-two *departamentos*. I did not conduct interviews with members of seven *departamentos* from the northern and eastern regions of the country, where initial meetings were cancelled and I was unable to reschedule. I interviewed other key informants following suggestions by CNE epidemiologists.

I collected data through semistructured interviews, unstructured interviews, observation, and archival research. I conducted fifteen in-depth semistructured interviews with CNE's epidemiologists between February and May 2011. The unstructured interviews took place between 2009 and 2012, and included twenty-three with CNE's epidemiologists, ten with former CNE epidemiologists, thirty-five with officials at institutions (including schools of public health, the Pan American Health Organization, the CDC, and other Ministry of Health divisions), and forty-four with a variety of other actors, including public health consultants, members of nongovernmental organizations working on health policy, and members of communities that had experienced an intervention from epidemiologists after an outbreak. In addition, between January and August 2011, I observed twenty-one activities conducted by CNE (health situation analyses, analyses of epidemiologic trends, discussions of research findings, and trainings), and participated in twenty activities related to CNE's work (analyses of epidemiologic trends, discussions of research findings, and trainings). Finally, I conducted archival research on documents produced by CNE in the form of reports, guidelines, and protocols. Recruitment of participants as well as all data collection focused on identifying achievements, failures, and challenges of epidemiological work in Guatemala, as well as obtaining participants' explanations for the achievements, failures, and challenges they identified. I interviewed participants in person at their Ministry of Health offices or in hotels where they were participating in meetings organized by the Ministry of Health. Some unstructured interviews took place in coffee shops or other public spaces.

Data processing and analysis

I used an inductive analytic strategy. During the interviews and observations, I took notes using pen and notebooks. Additionally, I audiorecorded in-depth interviews that I then transcribed verbatim. Based on these, I also wrote analytic notes or memos. I conducted thematic analysis of the interview transcripts, fieldnotes, and analytic notes using paper and colored pens. I then used open coding and focused coding (Emerson, Fretz, and Shaw 1995; Bernard and Ryan 2010) to produce a list of codes that I later analyzed following the stages recommended in thematic analysis: familiarization with data, generating initial codes, searching for themes among codes, reviewing themes, defining and naming themes, and producing a preliminary report (Braun and Clarke 2006).

I sought to maintain analytic rigor through triangulation, member checking, and expert checking. I made sure that each of the themes were mentioned by several epidemiologists, but also that they were confirmed by my own observations and by informal interviews with other actors. Once I had identified initial themes, I met with key informants to talk about my preliminary findings, which led me to develop the interpretive explanation (Sandelowski and Barroso 2003) I report here. I presented this interpretive explanation to an audience of epidemiologists at CNE in May 2013, and to an audience of public health academics and practitioners at the Universidad Del Valle de Guatemala in June 2013 and, from the reactions and feedback I received, I am confident that this interpretation is valid in terms of credibility (Whittemore, Chase, and Mandle 2001).

Findings

There are four meso-level social mechanisms that shape the relevance that epidemiological practice has to fulfilling the right to health in Guatemala. Given how the country's economic and social inequalities translate into enormous health inequities, an epidemiological practice committed to the right to health should aspire to transform, rather than reproduce, the social hierarchies underlying such inequalities. The mechanisms I identified shape how epidemiological practice contributes to the reproduction or transformation of such hierarchies. These mechanisms emerged first as themes in every one of the interviews with epidemiologists currently or formerly working at CNE, and include: institutional chaos, disciplinary conformism, global health international relations, and social relations at the national level.

Institutional chaos

During my fieldwork it was evident that the CNE did not have enough resources to perform its job well. It was impossible to live up to CNE's aspiration of implementing the four traditional functions of epidemiology, namely health situation analysis, research, surveillance, and outbreak control. In weekly epidemiology meetings there was always some mention of the need to do specific research in order to better understand the trends that had been identified for particular diseases, but I never knew of any initiative to actually do such research. Nobody was responsible for doing such research because the Ministry of Health's authorities had dismantled the CNE's research unit in the previous years. Epidemiologists in and outside the CNE questioned the authenticity of an epidemiological practice without epidemiological research and had coined the term '*brotólogos*' (which I translate as 'outbreakologists') to refer to such practice: epidemiologists whose only job is to respond to reported outbreaks without ever investigating their causes or analyzing the systemic conditions at their roots. But the CNE was not even doing good '*brotólogo*' work because the

Ministry of Health's authorities had also dismantled the rapid response unit that had been created within the CNE to give an accurate and timely response to outbreaks without distracting the CNE's efforts to do research and analysis. In order to function, the rapid response unit needed two or three epidemiologists to be able to go to any part of the country where an outbreak was taking place in order to coordinate an appropriate response. This meant having one car available for this purpose, laboratory tests ready to use, and money to cover the epidemiologists' expenses, especially when they would spend several days at the outbreak site. But those resources were not available to the CNE, creating frustration within and outside the CNE. In a couple of situations during my fieldwork, given the relevance of a particular outbreak, an epidemiologist was sent to help with the outbreak response, but they were not provided institutional material resources. According to several epidemiologists I interviewed, the CNE was working with about half of the people it needed to function and with virtually no resources in their budget other than for paying the salaries of their reduced staff.

But it is not only the insufficiency of resources that characterizes the work of epidemiologists in Guatemala. I found through my research that many relevant actors do not comply with their epidemiological duties, as the following description makes clear. Virtually no private hospitals or private physicians comply with reporting the diseases of mandatory notification (*enfermedades de notificación obligatoria*). Public (Ministry of Health) hospitals often actively resist following national epidemiological protocols, do not notify the CNE in case of an outbreak, and do not send the weekly and monthly epidemiology reports they should send to the CNE. Public (Ministry of Health) health posts and health centers usually send their reports and notify the CNE in the case of an outbreak, but there is always a percentage of them (10–25 percent, from the data I got) who do not notify, which in turn makes it the CNE's job to spend time every week making phone calls requesting the reports, which are still often not received. I witnessed several heated discussions between public hospital authorities and epidemiologists when the issue of mandatory reporting was raised. I know that when several nosocomial infection outbreaks took place in public hospitals, hospital authorities resisted (sometimes successfully) letting the CNE epidemiologists have access to study the outbreak. Similarly, there was a lot of conflict surrounding mining projects during my time in Guatemala, and there was a particular project that was rumored to have health impacts on people living near the mine. Rumors were common and there were even some videos on the Internet showing the negative health impacts of the mine. When I asked epidemiologists if they had thought of investigating these rumors, they told me their Ministry of Health supervisor had advised them not to, because it was better not to touch the interests of the powerful people involved in the mining project.

For this reason, if an epidemiologist at the CNE does her job well from a professional and technical perspective, she has a high chance of getting fired by her supervisor. Every single

epidemiologist I interviewed gave me examples of this, without me explicitly asking. To be clear, there often are interpersonal problems (some of which may be motivated by political rivalry or inflated egos) in an institution such as the Ministry of Health, and these may influence institutional decisions such as renewing someone's contract. But that is not what I am talking about here. Epidemiologists at the CNE often do not finish their investigations because what they may find could create problems for Ministry of Health authorities, as was the case in public hospital nosocomial infection outbreaks. More importantly, CNE's analysis and outbreak reports are not made publicly available through their website, and every time I asked if they had them filed in an organized way, they told me they did not. For instance, in August 2012, the health situation analysis available on the CNE's website was from 2007, and no analysis was available through their website in June 2013, June 2014, and June 2015. They have been producing such analyses every single year since then, but they do not make them available because – I was told more than once – making them available on the Internet could be used against the Ministry of Health. For another example, when one of the most respected and experienced epidemiologists finished her report about a hospital infection outbreak that killed several newborns, she told me with a mix of frustration and resignation that the report was presented to the Minister of Health and that nothing was going to happen, and that it was most likely going to be managed with secrecy because she had found some wrongdoing by the hospital authorities. As another epidemiologist explained:

The [creation of the] CNE was a step in the right direction, but there have been some political decisions that haven't been made [such as creating the] position of epidemiologist [in the Ministry of Health's structure], or [turning] the CNE into the Epidemiology Department [as one of the Ministry of Health's main departments]. There have also been lots of [institutional] divisions, or as I always say, fiefdom disputes. . . . Hospitals don't want to give up their freedom, SIGSA people [Ministry of Health's official information system] don't want to open up to our suggestions, people at the [Ministry of Health's care delivery department] want to be the ones making all the important decisions. . . . I have come to see the [creation of the] CNE as a lost opportunity.

Institutional chaos has many manifestations, but I group the manifestations and their causes into three large sets of problems. First of all, the Ministry of Health's institutional weakness (itself a manifestation of the Guatemalan state's weakness) is a reflection of the low priority public health has had in the social and political agenda. For instance, the debates surrounding the appointment of the Minister of Health in 2012 made it clear that the priorities at stake had to do more with who would benefit from large government contracts (related mainly to pharmaceutical products and medical equipment purchases) than with a

public health agenda. Public health's low priority and institutional weakness results, among other things, in a lack of capacity to enforce public health-related regulations, such as the compulsory reporting of epidemiologically relevant events by private physicians, clinics, and hospitals.

Secondly, institutional chaos shapes and is shaped by job instability, which is endemic in the Ministry of Health, but manifests in particular ways within the CNE. Job instability here is marked by about half of the CNE's personnel being hired on a yearly basis (with no benefits) and the remaining half being tenured but shifting specific job positions very often. As an illustration of the kind of job instability I am talking about, I noticed that between 2009 and 2013, there were six different CNE directors. Similarly, none of the sixteen CNE epidemiologists I interviewed in the first half of 2011 was doing the same work by April 2013, with ten of the sixteen not even working at CNE anymore. Even if all these epidemiologists were highly committed and technically capable, there is just no way to give continuity to the processes with such a high job turnover rate.

Finally, institutional chaos is also influenced by a varied set of sometimes-contradictory demands of epidemiologists posed by different institutional and extrainstitutional actors. For instance, health authorities and health care workers all throughout the country expect timely technical and logistical support when faced with an epidemiologic outbreak, but the CNE is not able to respond to that expectation, mainly because this has not been defined as a priority. Similarly, top-level officials such as the minister and vice-ministers see the CNE as technical advisers for their political and administrative goals, with the CNE director participating in weekly high-level technical meetings and prioritizing actions derived from those meetings. Moreover, the Health Care Delivery department (in charge of health care provision) wants the CNE to help out with the training and monitoring of the operational aspects of epidemiological surveillance by physicians, nurses, and nurse aides, but the CNE does not see that as its function. At the same time, a variety of actors want the CNE to provide thorough and in-depth analysis of the health situation and to do research that helps identify the causes of health problems. And yet others want the CNE to participate in setting up norms, procedures, and protocols for a variety of health problems. These contradictory demands add to the level of chaos.

Many epidemiologists I spoke to identify the source of this chaos with the lack of institutional space for epidemiologists within the Ministry of Health. To date, the job position of epidemiologist does not exist within the institutional organization, so everybody working as an epidemiologist is fulfilling the functions of epidemiologists but is actually hired as something else. So epidemiologists are 'lent' from other job positions. Despite efforts to have this changed, the bureaucratic process is so complicated that every attempt made so far has failed. But the CNE also has a rather arbitrary place in the Ministry of

Health's organizational chart, mainly because it was created through a ministerial decree, rather than through a presidential or legislative action. This means that any Minister of Health could make the CNE disappear and, more likely, the CNE's functions and priorities change with every new minister. And because this is so, opinions among epidemiologists are divided as to whether the CNE should remain as a technical adviser to the minister or become a department on par with the department of regulations and the department of health care provision.

As many epidemiologists pointed out, the role of advising the minister is an important one, but there should be a way of separating this role from the other roles the CNE needs to play, such as outbreak control, operational training/monitoring, and research. In fact, epidemiologists seemed to think that it would not be complicated to organize the CNE's work in a way that all those functions could be fulfilled without too much trouble. But, the problems of instability and low political priority would remain, and they will remain unless there is a major political shift in the country that results in a strengthening of public health and other social policies and institutions. Such an effort, as impossible as it may seem, needs to be undertaken as a part of a larger social change effort. However, informants stressed that the only way the CNE could strengthen itself despite a more systemic public health weakness would be through the promotion of a more stable leadership and the development of strategic and loose alliances with actors outside the Ministry of Health, such as researchers, social activists, and universities. In their view, such alliances should be around specific projects and specific individuals, rather than trying to conceive of a larger, more institutionalized alliance.

Disciplinary conformism

Epidemiologists were ambivalent about the relevance of their training for addressing Guatemala's health problems. Although they stressed the value of the skills and knowledge they gained through their training, they also pointed to shortcomings that did not allow them to fully carry out effective epidemiological work in the Guatemalan context. When doing so, epidemiologists contrasted specific characteristics of their training programs with the needs they faced in their professional practice, as the following quote from a CNE epidemiologist trained through the CDC program exemplifies:

Look, I received the FETP training [CDC's Field Epidemiology Training Program] and learned a lot from it, but I also see the program as a sort of *maquila* [sweatshop] that produces 'field epidemiologists'. And I think the CNE should include a mix of people with the FETP training and public health training from different universities, and even some specialists in social sciences. I even think there should be an effort to

offer epidemiology training to nurses, psychologists, and nutritionists to improve what we do. Because, look, if we conform to only having a lot of physicians with the FETP [training], we will be stuck – as I think we probably already are.

I heard similar opinions from several epidemiologists during my fieldwork. There was an acknowledgement of the conceptual and methodological limitations of the epidemiological practice for understanding and addressing many epidemiological problems. I heard in different moments the potential benefit the CNE would get from lawyers, nutritionists, nurses, sociologists, psychologists, biologists, toxicologists, environmental experts, social workers, and educators. I also heard some discussions about the convenience (or not) of having some of those disciplines represented within the CNE, and the general consensus seemed to be that it would be impossible to have such an interdisciplinary staff, but that it would be very good to be able to at least have those specialties available for consultation in specific cases. Some epidemiologists also rejected the idea of having anything other than epidemiologists within the CNE.

Informants seemed to agree that epidemiological work would benefit from an interdisciplinary approach particularly when performing health situation analyses and epidemiological research. A few also said that epidemiological work would be better and more useful if epidemiologists found ways to include the perspectives of indigenous peoples, women, residents of rural areas, residents of urban impoverished areas, sexual minorities, people with disabilities, and workers. Finally, they argued that Guatemalan epidemiologists would greatly benefit from establishing collaborations with institutions (universities, research centers, and nongovernmental organizations) that are already doing social epidemiology, sociocultural epidemiology, and critical epidemiology.

But epidemiological practice is not determined only by its institutional context. There is also the problem of defining what epidemiology is and what constitutes good epidemiological work. This is largely shaped by epidemiology as an academic discipline and the way it is taught in Guatemala.

Guatemalan epidemiology as an academic discipline is relatively new and has been taught mainly through three academic programs. These programs are designed to train people who work in the Ministry of Health, although they are open to independent individuals or people working in other public institutions (Ministry of Agriculture, for instance), nongovernmental organizations, or the private sector. The three programs started at the turn of the century and they all share a focus on ‘application’ rather than ‘theory’, the effect of which is that epidemiologists are trained in a few research techniques but are not trained in analyzing the contexts in which health problems occur; as a result, they are only able to ask a small number of questions when faced with an outbreak or a health/disease pattern. The kind of questions

they are able to ask using the techniques they learn leave out many social and economic aspects that are important in explaining and solving health problems. They also learn not to take into account 'lay' or 'folk' perspectives or to dismiss them as 'beliefs', 'myths', or 'superstitions', and they do not learn how to promote social participation in what they do.

Many informants expressed a need for epidemiologists to know how to work with people from the communities they serve. Social participation is considered a key element in the construction of the right to health (Riedel 2009), and it is impossible to understand and address the determinants of health inequalities without social participation. And yet, Guatemalan epidemiologists are trained to not promote or value social participation. All this is a shame, especially since every single epidemiologist I interviewed told me that one of their motivations for becoming an epidemiologist was precisely to escape the reductionist views of medicine or nursing or psychology, and to be able to address the real causes of health problems. In their desire to become epidemiologists were, of course, ideas of professional and economic promotion, but at the heart was also the intention to do research that would be relevant for solving health problems. But they do not and will not do research as they imagined, not only because they are ill equipped to ask relevant research questions but also because there are no institutional or professional incentives to do it, nor any institutional infrastructure for developing research proposals.

Global health international relations

International public health institutions are important to CNE's work. Epidemiologists acknowledge that training and expertise have often come from organizations such as the CDC and PAHO. They also know that most of the resources for implementing epidemiological work have come from international financial institutions. But many informants lament that expertise and resources may come at the price of imposing agendas and unexperienced experts. This is seen by informants as a potentially tense relationship, and some question the long-term benefits for Guatemalan institutions and the health of Guatemalans, as this quote from a CNE epidemiologist shows:

Look, don't get me wrong. I don't have anything against international cooperation. . . . Only God knows how we would be doing without it! But – how can I say this – HIV/AIDS has been one of the worst things that has happened to the development of epidemiology from an institutional perspective. Don't get me wrong, I know it is an important disease and people with it need as many resources as possible, but from an institutional point of view, HIV initiatives have received such a tremendous amount of money that they can give themselves the luxury of working on their own, without paying attention to the Ministry of Health. But it is not just HIV, look at

malaria, for instance. The World Bank decides malaria is a priority and they give money earmarked for malaria, and they hire some of the most successful epidemiologists and, because they have the money, and their own goals, they end up doing work that weakens the Ministry of Health's efforts. The same goes for USAID's prioritizing birth control. There is nothing wrong with those priorities, but they come here with all their money, and the impact they have on us as an institution, with our very scarce resources, is huge. . . . You can even see it with the H1N1 case, where all our resources ended up going towards controlling a pandemic that was not even what it was supposed to be. And we have other priorities in the country, right?

This is one of the more troubling aspects of my findings. The problem as I have come to understand it is three-fold: while international agencies have clear agendas tied to relatively large budgets, the CNE does not have clearly defined priorities, and at the same time there are private researchers and institutions better placed for accommodating international agencies' projects. Moreover, the CNE finds itself having to respond to the Guatemalan government's international commitments as they relate to international epidemiology, such as the International Health Regulations (WHO 2008). In addition to the CNE's lack of a clearly defined agenda, it does not have the infrastructure for generating its own research funds. These conditions, combined with the institutional chaos and the ambiguous place of epidemiology within the Ministry of Health, exacerbate the country's vulnerability to the effects of an international agenda that conceives Guatemala as a potential source of contagion and as a country that needs to 'catch up' in terms of international indicators such as the Millennium Development Goals. All these elements become part of a vicious cycle that results in epidemiologists who are unable to generate their own ideas, and more importantly, who are incapable of interrogating the reality they are part of. Guatemalan epidemiologists are, generally speaking, unable to generate a research question, as they are unable to come up with a set of locally conceived priorities that guide research efforts and health situation analyses.

Epidemiological protocols reflect international consensus about prioritized health problems and their prioritized solutions. They also reflect a mainstream epidemiological approach to health problems, focusing mainly on the identification of infectious agents and their sources. There is nothing wrong with the existence of epidemiological protocols, but basing epidemiology's practice solely on those protocols does not allow for defining context-specific priorities and actions, and does not permit the analysis of health inequalities. The uncritical following of epidemiological protocols to the detriment of epidemiological analysis is conditioned by the training received by epidemiologists, all of which is based on the priorities of the CDC and PAHO. Again, there is nothing wrong with the CDC's and PAHO's priorities, but they do not necessarily respond to the health priorities of Guatemalans. There is an absence of locally produced knowledge and of critical approaches

to epidemiology from other countries, and most strikingly of Latin American social medicine, which has a more than fifty-year tradition in countries such as Mexico, Bolivia, Costa Rica, Venezuela, Ecuador, Brazil, Chile, and Argentina.

Social relations at the national level

Social exclusion characterizes Guatemalan society and it permeates epidemiological practice. Informants expressed the importance of acknowledging that Guatemala is a highly unequal society, and that social exclusion manifests in the country's main health problems. Although different informants showed distinct levels of sensibility towards racism, sexism, classism, and other forms of exclusion, they frequently made reference to how social exclusion may be influencing epidemiological practice. This generates confusion and lack of clarity as to how to address social exclusion through epidemiological practice, as these insights from a CNE epidemiologist show:

I find all that '*interculturalidad*' stuff to be fascinating, but I would find it even more interesting to see what would happen if we had some epidemiologists who were indigenous, because look at us at the CNE, we are all *ladino*, we do not reflect the larger Guatemalan society where half of the population is indigenous. We are doing a little better now in terms of women, because there are now more women working here, but what about indigenous people? I think that is what we need to do but I just don't know how we can even start to implement such an idea.

All Guatemalans are immersed in a social dynamic that generates social exclusion and discrimination. Guatemalan social relations are marked by sexism, racism, and classism, as they are marked by discrimination against sexual minorities, people living in rural communities, and people with disabilities. Health inequalities go hand in hand with all these forms of discrimination. The only way Guatemalan epidemiologists and the CNE will be able to address these unequal relations is through an intentional and sustained effort to become more like the larger society they are part of (as the epidemiologist above suggests), and to develop collaborations with groups that represent the most excluded social groups in Guatemala's society.

In addition to international relations, there is the issue of social relations within Guatemala. There are different ways of approaching it, but, as noted above, most Guatemalan epidemiologists are *ladinos* (that is, nonindigenous *mestizos*) from the lower-middle class, and they all come from urban settings. Although there is a tendency towards feminization in all the health professions in Guatemala (as in many other parts of the world), most epidemiology directors are and have been men. Every Guatemalan epidemiologist I have

met graduated from Guatemala's public university, a fact that, generally speaking, situates them at the lower end of the physicians' social structure; even though they are among the less than 3 percent of Guatemalan's who make it to a university (making them an elite of a sort), they do not come from rich families, which highly influences their position as social actors. Given that racism, sexism, classism, and discrimination against coming from rural areas permeates Guatemalan society, one can at least ask how this plays out in the practice of epidemiology. At the same time, given that Guatemala is a formally independent nation but has a ruling elite and an international context that reproduces the social inequalities established during the colonial period, how do Guatemalan epidemiologists see themselves and their role in achieving social change?

Discussion

I argue that the elements of Guatemalan epidemiological practice presented above reveal it to be a neocolonial endeavor. 'Neocolonialism' describes the continued existence of colonial relationships in today's world (Oztabak-Avci 2008). Neocolonial relationships are maintained through patterns of interaction that operate at multiple levels, including the local, subnational, national, international, and transnational levels. Although economic, financial, and political mechanisms operate in the reproduction of neocolonial relations (Nkrumah 1996, Hoogvelt 2001), control over knowledge production and other cultural elements of a society, people, or institutions also play an important role; unquestioned epidemiological practice can thus play a crucial role in reproducing neocolonial relations (Braveman 2001). In this situation, subaltern groups find that their lives are highly affected by neocolonial forces, through how such forces identify, organize, and study these groups and their problems. Understanding Guatemalan epidemiology as a neocolonial practice implies finding ways for decolonizing it. In that sense, it is necessary to study the particular aspects of life where neocolonial control is manifest as well as the hierarchy of individuals that helps maintain such relations.

In the case of Guatemalan epidemiology, neocolonial relations are maintained and extended at various levels and through different means with distinct effects. I find the notion of neocolonial epidemiology to be a compelling and illustrative way of synthesizing my research findings because this concept highlights the unequal relationships between Guatemalan epidemiologists and 'international' epidemiologists (such as those at the PAHO and CDC), while also highlighting the role Guatemalan epidemiologists end up playing in maintaining the quasicolonial social relations of exclusion on which the Guatemalan nation has been built. But to be honest, I had a hard time deciding which term to use, because at some point I considered equally compelling the following terms: 'post-neocolonial epidemiology', 'postcolonial epidemiology', 'Third World epidemiology', 'Fourth World epidemiology', and

even ‘magical realism epidemiology’. I wanted the term to precisely capture the features I identified in my research. ‘Neocolonial epidemiology’ won out because it is the term that best resonated with informants when I reported back my findings in two separate meetings.

Guatemalan neocolonial epidemiology is postcolonially undisciplined, intellectually colonized, institutionally weak, norm obedient, fearful of the powerful, deprecatory of the powerless, marginal, egocentric, and ineffective. This is not to say that these are the characteristics of Guatemalan epidemiologists, but rather that these are the circumstances in which they operate. This is a key distinction, because the vast majority of epidemiologists I met were attracted to epidemiology by the idea of dealing with the causes of health problems – even if that meant going against the tide – because it seemed the right thing to do. As a result, despite epidemiologists’ intentions, Guatemalan neocolonial epidemiology does not investigate the causes of health problems and does not contribute to addressing health inequalities. That is, the CNE does not fulfill the goals of epidemiology or its right-to-health aspirations.

Neocolonial epidemiology needs to be decolonized and, in the process, give life to postcolonial epidemiology, which would move from a practice that sees people as spaces of pathogenic behavior and individuals as mobile vectors of infection to a practice that, acknowledging epidemiology’s pitfalls and stereotypes of the past, brings back people’s well-being as its aim and purpose (Kelm 2010). This turn to postcolonial epidemiology should start with epidemiologists understanding that their apparently scientific and authoritative discourses and practices have the effect of merging their desire for a scientific truth with the dismissal of people’s knowledge and situation (Anderson 2002), a combination that leads epidemiologists to perform a role filled with ambivalence and mimicry, resembling attitudes during the colonial period (Bhabha 1994). A postcolonial epidemiology acknowledges the existence of the epistemic violence inherent in dominant epidemiologic practices, and embraces alternative modernities and the challenges they pose to contemporary knowledge production (Anderson 2002). A postcolonial epidemiology accepts that the legacies of colonialism are actively shaping Guatemalan social life, and takes on the challenges of building a new, more just society. A postcolonial epidemiology, finally, understands epidemiological practice as a ‘technopolitical regime’ (Winner 1998, 55), where *technē* (applied knowledge) and *politeia* (the proper order of society) co-constitute each other.

Neocolonial epidemiology serves the purpose of the national and international powerful elites, and dismisses the interests of the excluded, marginalized people who face the worst of health inequalities. Neocolonial epidemiology is not set up for challenging health inequalities but to justify them. Neocolonial epidemiology co-opts some of the most humanist-inclined health professionals and turns them into a semiacademic elite, unable to live up to its dreams

of explaining and solving health problems, helping to maintain the status quo. Neocolonial epidemiology, in a word, goes against the fulfillment of the right to health.

About the author

Alejandro Cerón is an anthropologist interested in the social and cultural aspects of health, especially sociocultural epidemiology, public health practice, and the right to health. Prior to earning a doctoral degree in anthropology (University of Washington, 2013), he graduated as physician and Master in Public Health in 2000 and 2006, respectively, from Universidad de San Carlos de Guatemala. He is currently Assistant Professor of Anthropology at the University of Denver.

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