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Structural violence and structural vulnerability within the risk environment: Theoretical and methodological perspectives for a social epidemiology of HIV risk among injection drug users and sex workers

### Permalink

<https://escholarship.org/uc/item/56k6s1xt>

### ISBN

9789400721371

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### Publication Date

2012-08-01

### DOI

10.1007/978-94-007-2138-8\_10

Peer reviewed

## **Chapter 10**

# **Structural Violence and Structural Vulnerability Within the Risk Environment: Theoretical and Methodological Perspectives for a Social Epidemiology of HIV Risk Among Injection Drug Users and Sex Workers**

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Peter Davidson, and Philippe Bourgois**

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**Abstract** The transmission of HIV is shaped by individual-environment interactions. Social epidemiologic approaches thus seek to capture the dynamic and reciprocal relationships of individual-environment interactions in the production and reduction of risk. This presents considerable methodological, theoretical and disciplinary challenges. Drawing upon four research case studies, we consider how methods and concepts in the social and epidemiologic sciences might be brought together towards understanding HIV risk as an effect of social, cultural and political condition. The case studies draw upon different combinations of methods (qualitative, ethnographic and quantitative) and disciplines (sociology, anthropology and epidemiology) in different social contexts of HIV vulnerability (street settings in Russia, Serbia and North America and a cross-border setting in Mexico) among a range of marginalised high-risk populations (injection drug users and female and transvestite sex workers). These case studies illustrate the relevance of the social science concepts of “structural violence” and “structural vulnerability” for a social epidemiology of HIV risk. They also explore how social epidemiologic work can benefit from the mixing of social science methods and theories. We contend that social epidemiology cannot advance in its understanding of structural vulnerability without embracing and relying upon ethnographic and qualitative approaches. We put forward the linked concepts of “structural violence,” “structural vulnerability” and “risk environment” as building blocks for a theory-informed social epidemiology of HIV risk among marginalised populations.

## Abbreviations

GIS	Geographic Information Systems
HCV	Hepatitis C virus
IDU	injection drug user
SRO	single room occupancy

## 10.1 Introduction

HIV transmission is influenced by an interaction between biological, individual and environmental factors. Social epidemiologic approaches thus seek to delineate how the distribution of HIV in populations is shaped by the “risk environment,” that is, by determinants that extend beyond “proximal” individual-level factors and their behavioural mediators (Farmer 2009; Krieger 2008; Rhodes 2002). This presents considerable methodological, theoretical and disciplinary challenges. In this chapter, we consider how methods and concepts in the social and epidemiologic sciences might be brought together towards understanding HIV risk as an effect of social, cultural and political condition. Our interest is in mapping how social, political and economic structures generate and reproduce vulnerability to HIV, especially among

socially marginalised populations, including injection drug users (IDUs) and sex workers. This brings into focus how multiple interacting social factors create a context of vulnerability to HIV risk across multiple marginalised populations. We, therefore, outline a case for a “social epidemiology of structural vulnerability” applied to HIV. In doing so, we emphasise the critical role of qualitative methods and social science theory in capturing and representing the “lived experience” of embodied structural vulnerability inside a mixed-method and cross-disciplinary approach. We suggest that social epidemiology cannot advance in its practical understanding of structural vulnerability without embracing and relying on ethnographic and qualitative approaches. Our aim is not merely to outline a case for a social epidemiology of structural vulnerability but also to reflect upon some of the limits, opportunities and challenges likely to be created through such cross-methodological and disciplinary work.

## 10.2 From the Individual to the Social

The field of public health, and in HIV specifically, has increasingly moved towards an understanding that health is an outcome of social and structural conditions and, in particular, sociocultural, economic and political inequalities (Farmer 1999; Navarro and Mutaner 2004). Accompanying this understanding is a growing critique of biomedical approaches to health research, which tend to emphasize individual-level factors over environmental or structural ones and which fail to adequately capture the social structural production of risk or the facilitators of change. In the case of HIV, however, the interplay between health and social marginalisation is, or should be, so visible as to be unavoidable (Farmer et al. 1996). This critique identifies a tendency in public health and the behavioural sciences to operationalize risk as primarily resulting from individual action and responsibility and, in doing so, cautions against an over reliance upon individual-level models of rational choice decision making. Behavioural interventions alone have been shown to only account for a modest reduction in HIV incidence in the absence of social and structural interventions and policies (Copenhaver et al. 2006). This critique also cautions against the “victim blaming” tendency of individual-level models, which give sole or primary emphasis to individual choice and agency as determinants of risk and risk behaviour. In contrast, social epidemiologic approaches seek to situate risk and risk responsibility as something shared between individuals, communities and environments – especially among the social and political-economic institutions that have a key role in risk production. While epidemiologic research has shown that physical, social, economic and policy environment factors are independently associated with HIV infection among vulnerable groups such as drug users, few studies have fully operationalized a social epidemiologic approach from the outset (Strathdee et al. 2010). Here we advocate for a shift “from the individual to the social” in public health, which emphasises, first, that the health of individuals and communities is an *embodiment of their social condition* and, second, that health improvement requires *social and structural change*.

One overarching heuristic for guiding research and intervention on HIV risk as an effect of social condition is the “risk environment” framework (Rhodes 2002, 2009; Rhodes et al. 2005; Strathdee et al. 2010). This has been defined as the space, whether social or physical, in which a variety of environmental factors interact to increase the chances of risk occurring (Rhodes 2002; Rhodes et al. 2003). The risk environment is conceptualised as comprising *types of environment* (physical, social, economic and policy) interacting with *levels of environmental influence* (micro and macro). This same logic implies an “enabling environment” framework of social and structural change (Table 10.1). This heuristic has given impetus to a number of studies investigating the primacy of social context in HIV and other risks related to injection drug use and sex work (Strathdee et al. 2010, 2008b; Rhodes et al. 2005; Moore 2004; Small et al. 2006; Shannon et al. 2008a, b; Cooper et al. 2009; Green et al. 2009). Within an overarching framework of risk environment, there are a number of overlapping (and to some extent competing) concepts in social science that have provided the conceptual foundations for social epidemiologic work, including in the field of HIV and drug use. These concepts include “political economy” and “structural violence.” Social epidemiologic approaches have long drawn attention to an overlap with *political economy* (Krieger 2001, 2008; Doyle 1979). For Krieger (2008), health “cannot be divorced from considerations of political economy and political ecology.” This reflects parallel assertions in the social sciences that the HIV risks of drug use or sex work are “virtually meaningless outside their sociocultural as well as political economic contexts” (Bourgois 2003) and that drug use is “the epiphenomenal expression of deeper, structural dilemmas” (Bourgois 1995). Crucially, political-economic perspectives posit social conditions as rendering *particular* sectors of the population vulnerable to harm. This “structuration of risk” is illustrated through the incarceration and enforcement-based policies that disproportionately affect those using drugs and working in the sex industry as well as those already suffering intense and systematic discrimination, including racial discrimination (Jurgens et al. 2010).

A related concept informing social epidemiologic work to date is *structural violence*. Structural violence is distinct from personal or direct violence in that it is embedded in social structures whereby “unequal power” shapes “unequal life chances” (Galtung 1990). Poverty, racism and gender inequalities provide examples (Farmer et al. 1996; Walter et al. 2004). Each of these may perpetuate constraints in agency, leading to unequal opportunity and disproportionate social suffering for the marginalised (Farmer 2010). Crucially, the institutionalisation and everyday internalization of structural violence can render it invisible or unnoticeable (Scheper-Hughes 1996). The embodied effects of structural violence may be understood as “oppression illness,” which is the “product of the impact of suffering from social mistreatment,” a type of “stress disorder,” where the source of stress is “being the object of widespread and enduring social discrimination, degradation, structural violence and abusive derision,” whether overt or hidden (Singer 2004). Drug use, itself, can be seen as a form of “self-medication” for oppression illness, providing “pain intolerance,” “chemical intervention” and a “solution” (Singer 2004). The internalization of social suffering (Kleinman et al. 1997) reproduces a cycle of

**Table 10.1** The risk and enabling environment: selected examples related to HIV, drug injecting and sex work

	Micro-environment	Macro-environment
<b>Physical</b>		
<i>Risk</i>	<ul style="list-style-type: none"> <li>Drug using, injecting and sex work locations</li> <li>Drug injecting in public spaces</li> <li>Prisons and detention centres</li> </ul>	<ul style="list-style-type: none"> <li>Drug trafficking and distribution routes</li> <li>Trade routes and population mobility</li> <li>Geographical population shifts and population mixing</li> </ul>
<i>Intervention</i>	<ul style="list-style-type: none"> <li>Creating safer drug using sites (e.g., sharps disposal, lighting)</li> <li>Developing supervised injecting facilities</li> <li>Prison-based harm reduction interventions and alternatives to prison</li> </ul>	<ul style="list-style-type: none"> <li>Changes to trafficking interdiction policies</li> <li>Interventions at truck stops and train stations</li> <li>Cross-border interventions</li> <li>Changes to immigration laws and routine enforcement practices</li> </ul>
<b>Social</b>		
<i>Risk</i>	<ul style="list-style-type: none"> <li>Social and peer group “risk” norms and intimate partner violence</li> <li>Local policing practices and “crackdowns”</li> <li>Community health and welfare service access and delivery</li> </ul>	<ul style="list-style-type: none"> <li>Gender inequalities and gendered risk</li> <li>Stigmatisation and marginalisation of drug users</li> <li>Weak civil society and community advocacy</li> </ul>
<i>Intervention</i>	<ul style="list-style-type: none"> <li>Social network and peer-based interventions</li> <li>Shelters for homeless and for battered partners</li> <li>Police partnership and training projects</li> <li>Developing low threshold accessible services for drug users</li> </ul>	<ul style="list-style-type: none"> <li>Fostering collective actions and political mobilization for social and human rights in combination with policy changes</li> <li>Mass media and social marketing of harm reduction</li> <li>Strengthening civil society infrastructure and self-help</li> </ul>
<b>Economic</b>		
<i>Risk</i>	<ul style="list-style-type: none"> <li>Cost of living and cost of health treatments</li> <li>Cost of prevention materials</li> <li>Lack of income generation and employment</li> </ul>	<ul style="list-style-type: none"> <li>Lack of health service revenue and spending</li> <li>Growth of informal economies</li> <li>Uncertain economic transition</li> </ul>
<i>Intervention</i>	<ul style="list-style-type: none"> <li>Subsidised and free treatment</li> <li>Distribution of free prevention materials</li> <li>Micro-economic enterprise and employment schemes</li> </ul>	<ul style="list-style-type: none"> <li>Increase investment in harm reduction relative to enforcement</li> <li>National health insurance schemes</li> <li>Laws governing employment rights</li> </ul>
<b>Policy</b>		
<i>Risk</i>	<ul style="list-style-type: none"> <li>Availability and coverage of clean needles and syringes</li> <li>Program-level policies governing distribution of materials</li> <li>Access to low-threshold and social housing</li> </ul>	<ul style="list-style-type: none"> <li>Public health policy governing harm reduction and drug treatment</li> <li>Laws governing possession of drugs</li> <li>Laws governing protection of human and health rights</li> </ul>
<i>Intervention</i>	<ul style="list-style-type: none"> <li>Scaling-up pharmacy-based syringe provision</li> <li>Secondary syringe distribution programmes</li> <li>Hostel-based and housing neighbourhood development</li> </ul>	<ul style="list-style-type: none"> <li>Legal reform enabling the scaling-up of harm reduction</li> <li>Legal reform enabling the protection of drug user rights</li> <li>National policy changes regarding public health strategy</li> </ul>

Source: Rhodes (2009)

risk production in which those marginalised can become complicit, including unconsciously, in their ongoing structural subordination (Bourdieu 2000).

Critiques of political economy perspectives and the ways in which structural violence informs social epidemiologic work emphasise that they tend to be “over deterministic,” underplaying the role of agency, subjectification and non-material forces in the reciprocal processes of individual-environment interactions (Bourgois and Schonberg 2009; Duff 2007; Giddens 1984; Biehl et al. 2007; Butler 1997; Foucault 1995; Pine 2008). It is critical that social epidemiologic approaches capture the dynamism of agency-structure transformations, in which environments constrain as well as enable agency, and are thus also produced and reproduced by participant practices. We take up these points below in the case study descriptions and discussion of the “structural vulnerability” of HIV risk.

### 10.3 Methodological Challenges

Rather than relying on reductionist models that hypothesize direct, linear associations between “risk factors” and “outcomes,” a shift towards a social understanding of HIV vulnerability can “scale up” an understanding of risk to embrace the dynamic, reciprocal associations amongst individuals and their social, physical and political-economic environments. Attention to the multilevel, complex systems that influence health outcomes, however, is not without its methodological challenges. In fact, developing research methods that can delineate causal and theoretical pathways in the social determinants of HIV is a critical step to informing social and structural interventions for reducing HIV risk (Strathdee et al. 2010; Rhodes 2009).

Researching causal pathways to HIV transmission demands a shift from binary epidemiologic models of simple “cause and effect” to “multilevel” models, which emphasise HIV as an outcome of multiple contributing factors at once interacting together (Galea and Vlahov 2002). Social determinants that derive from the risk environment perspective are often “non-linear” and “indirect” in their effects, and this presents considerable challenges to delineating causative relationships (Krieger 1994). Measuring the effects of structural violence, for example, is not as simple as assessing phenomena such as the direct experience of physical violence or economic dislocation; structural violence extends beyond the individual to the social structures that perpetuate poverty, racism, gender inequalities and other forms of systemic marginalisation, which ultimately shape HIV risk. HIV is thus an outcome of a “complex system” of interactions occurring within and between individuals and their environments, with the challenge being to better capture the dynamism of these reciprocal relations through mixed-methods research.

Understanding these complex systems requires an iterative and multidisciplinary approach in which qualitative evidence and social science theory help to map conceptions of “risk environment” and related risk pathways. Although there is a rich theoretical and empirical tradition in the social sciences of investigating health as an effect of social inequality and condition (Engels 1892), public health

has not dialogued systematically with social science theory and methods. In a research environment increasingly characterized by transdisciplinary and mixed-methods approaches, both social science and traditional epidemiologic approaches can benefit from the strategic integration of the other's theoretical approaches and research methods (Mason 2006). Such a synthesis has the potential to increase the public health impact of both fields by generating grounded conceptual frameworks with testable causal pathways contributing to intervention development on the one hand and by providing socially-situated interpretations of epidemiologic data on the other.

## 10.4 Four Case Studies

We will draw upon four short case studies to illustrate the relevance of the concepts of structural violence and structural vulnerability in social epidemiology studies of the HIV risk environment. Our four case studies explore relationships between viral harms (HIV and hepatitis C virus) and social condition. Case Study One explores the “structuration” of HIV risk through the everyday internalization of fear induced by policing practices among injection drug users in Russia and sex workers in Serbia. Case Study Two explores the legitimization of violence against young female IDUs in San Francisco leading to heightened vulnerability to hepatitis C (HCV). Case Study Three focuses on police-enforced displacement of female sex workers in Vancouver to remote, violent neighbourhoods that heighten their risk of violence and limit their capacity to negotiate condom use. Case Study Four explores gendered patterns of international migration and deportation associated with the risk of HIV infection in the United States/Mexico border region.

Each case study employs a different design and, taken as a group, show the strategic advantage of integrating multiple methodological approaches. Case Study One emphasises the critical role of ethnographic and qualitative research in capturing and representing the “lived experience” of embodied structural vulnerability, including as a means of informing subsequent epidemiologic study. Case Study Two demonstrates how the simultaneous use of ethnographic participant observation and epidemiologic survey research can both inform and refine research questions when ethnography uncovers associations that may be difficult to detect using quantitative measures. Case Study Three uses a participatory research approach to incorporate quantitative questionnaire data, social mapping and in-depth qualitative interviews in an iterative design that explicitly accounts for the complex physical and social environment in which HIV risk behaviour occurs. Case Study Four shows how counterintuitive findings from a classically-designed epidemiologic cohort study can be contextualized and interpreted through the use of supplemental qualitative research informed by social science theory. Our aim is not only to make a case for a social epidemiology of structural vulnerability (as applied to HIV) but also to highlight some of the methodological and theoretical challenges facing cross-disciplinary public health research.



### 10.4.1 Case Study One: Policing and the “Structuration” of HIV Vulnerability Through Fear

Data were drawn from qualitative studies among injecting drug users in Russia, in 2003, and sex workers in Serbia, in 2005, to capture the lived effects of HIV risk environment in which policing practices played a key role (Sarang et al. 2010; Rhodes et al. 2008).

One of the most visible structural mechanisms perpetuating social suffering and HIV risk among vulnerable populations of IDUs and sex workers is the criminal justice system, especially policing practices. International evidence links policies emphasizing repressiveness through law enforcement with higher levels of risk for health and HIV, and a growing epidemiologic literature points towards policing practices and fear of the criminal justice system as important factors (Strathdee et al. 2010; Rhodes 2009; Cooper et al. 2009; Friedman et al. 2006; Pollini et al. 2008).

Russia provides an acute example (as do other parts of Eastern Europe witnessing massive outbreaks of HIV among drug injectors). The enactment of criminal and administrative codes relating to drugs possession combine with aggressive police surveillance, resulting in the mass incarceration of drug users and other minority groups and a prison system linked to HIV outbreaks (Bobrik et al. 2005; Sarang et al. 2006). Intense police surveillance fosters reluctance to seek help or carry sterile needles for fear of arrest, caution, fine or detention (Rhodes et al. 2003). Police contact, from arrest to assault, is associated with increased risk of syringe sharing (Strathdee et al. 2010; Sarang et al. 2010; Pollini et al. 2008; Rhodes et al. 2004).

Qualitative research among 209 IDUs in three Russian cities (Moscow, Volgograd and Barnaul) illustrates the “structural violence” of drug policies emphasizing criminalization (Sarang et al. 2010). Everyday policing practices, and especially *extrajudicial practices*, generated a pervasive sense among drug injectors of *being at risk*, in turn reinforcing a sense of stigma, powerlessness and, importantly, a *fatalistic acceptance of harm and suffering*. Through the internalization of the effects of policing practices, we see the *embodiment* of social conditions into everyday risk perceptions and practices. Of key importance is the *fear* of policing practices and how this acted as an indirect force of structural violence affecting capacity for HIV risk avoidance.

First, drug injectors felt under inescapable surveillance (“You cannot hide from them” and “They know everything about us”). While the sense of being under pervasive surveillance was presented as normative, it is what police might do with such surveillance opportunity that drug users feared. The power of the police was ubiquitously perceived among drug injectors as *limitless* (captured by the Russian term *bespredel*).

The extortion of money and the planting of evidence were, for example, presented as common practices, with the latter also resulting in unjust incarceration. Yet extortion was seen as mundane. Drug users were participants in, and complicit with, extortion. It had an immediate function, for money was exchanged for freedom. This was seen as a risk management strategy.

But police physical violence and assault was perceived entirely differently. Physical violence by the police was experienced as an extreme act of moral indignation, aggression and subordination. It was police brutality that induced most fear: “I’m very afraid;” “I was so shit scared;” and “Fear, fear, that is the main thing.” Fear acts as both an effect and a force of structural violence. Here, Sergei (aged 27), an occasional injector from Volgograd, tells a story of how police violence produces fear:

We were just standing, talking, with my girlfriend. So a policeman comes by and asks to show my passport, as they always do. I didn’t have them. ...So he takes me out into his booth. ...After they searched me and couldn’t find anything, they just started to call someone, peek into my eyes, and say like I’m high or something. And they just start to get to me. Then my girl comes in. They searched her too, and found the pack of Russian cigarettes [where the cannabis was]. And that was it. Now we’re 100% junkies, and things are off and rolling. He locks us both on to these bars. There were maybe five other people in there. And he just starts to bully my girl. He says, “Your girl is a bitch, she’s a toad, a turd, I can see it in her eyes.” And he starts to wind me up. And when I start reacting, he just tears me out of there and starts to beat me, methodically on my belly, legs, and other parts so as not to bruise me too much. Then when he got tired, he just stretched me out on the floor, put handcuffs behind my back, pulled my legs through my arms and just left me there. I don’t know how long I just laid there, or why they bullied me, even though I didn’t even have anything. No reason. I don’t know what to call that. This is just scary. ...I don’t know. I’m still in a trance from all this horror.

The physical suffering narrated by Sergei has human rights and public health implications. It also has *practical consequences*, as the internalization of fear exacerbates structural vulnerability to HIV and other health risk. A state of fear heightens concerns to evade detection, resulting in rushed injections, short-cuts in needle hygiene, injecting in “hidden” locations (such as at dealers’ houses) and sharing needles and syringes to reduce the risk of arrest for carrying injecting equipment: “Fear. This is the main reason [for syringe sharing]. ... You just try and inject quick, quick, quick, and you don’t give a damn whether it’s clean” and “I am afraid, and so I hide. And so everything [drug injecting] takes place [on the street] in filth.” Fear can also lead to avoiding pharmacies and other needle and syringe outlets in an attempt to avoid arrest should the police be present. More subtly, all state representatives, including helping agencies, become feared as a source of risk: “Although the pharmacy was two houses away from me, always, always, the police stood there” and “Why I haven’t gone to the exchange? Well, shit, I’m scared, that’s why. It’s dangerous. Who knows who is there.”

It can be seen here how political processes of everyday violence cross over from public space to traumatize personal space and then cross back as collective experience (Kleinman 1991). Policing practices feature inside a broader complex of multiple interacting social and material inequalities, which over time become *institutionalized* and *normalized*. When internalized, the effects of such structural violence may be expressed as individual deficits, as psychological harm, powerlessness, and fatalism to risk.

A second example of qualitative research, focusing on the policing of female and transvestite sex workers in Serbia (Rhodes et al. 2008), illustrates further how policing practices targeting the vulnerable are best seen not in social isolation but as

institutionalized expressions of a wider complex of normative social and moral regulation. Among street-based sex workers in Belgrade and nearby Pančevo, violence, especially police violence, was a primary concern. While client violence was not uncommon, police violence was perceived as the greater threat and as less open to risk management: “You can manage your clients somehow, but to be honest, the greatest threat to us is the police.” Sexual services were provided to police without payment as well as secured by them through deception and coercion, often involving violence or the threat of it: “And at the end of the job he shows me his badge, and says like ‘Give me my money back now’. That’s what he does” and “They want blowjobs, fucks. I work for free, just so they don’t take me in.” Attempts to resist such demands could also incite violence: “He wants me to blow him for free. I don’t want to. Later, when he gets me on my shift, he beats me silly. Beats me silly” and “He beats me up with a baton. And several times I had to be [have sex] with him. I really had to. I was forced.”

Being coerced into providing sex to police in this setting was described as an *exchange for freedom* (from detainment, arrest or fine) enforced by a pervasive risk, sometimes realized, of physical violence (Rhodes et al. 2008). Again, we see fear induced by policing practices acting as an indirect force of structural violence. Embodied fear produced fatalist risk acceptance to the inevitability of violence (“I can’t fight destiny”) and an internalized sense of police “rights” to victimize (“They have a right to beat us because we do this prostitution thing”).

This study shows that while serving to protect state and public interests, policing practices can reproduce underlying societal injustices, fears and inequalities, including regarding gender, sexuality, drug use and ethnicity. Enforced sexual acts and payments to police were experienced as a form of governmentality, as if for moral wrong doing, to “bring sex workers to their senses.” Significantly, police “moral punishments” for selling sex were inextricably linked inside a broader complex of social discrimination, especially towards Roma and transvestites. In Serbia, Roma are a minority ethnic group subjected to immense social discrimination and Roma sex workers, most of whom were Kosovo refugees and all of whom were working as transvestites, were subjected to extreme acts of police violence:

They [police] kicked, kicked, kicked the hell out of us. Just transvestites. They took me to the woods, down by the bridge. They stripped everything off me. Flashlight in the eyes. I said a million times “Take me away. Did you come to arrest me? Arrest me then, but do not beat me up”. That makes it worse: “Shut up, motherfucker, shut up!”

They [police] started going wild, only on us transvestites. They let the girls go. They just pick us up, and go to the woods, and go wild on us. ...First, they beat us in the woods, and then they take us to the station. And then, they tell us at the station “Hey, freshen up”, and they beat us up in the bathroom.

I didn’t know where the blows were coming from. ...They just have this hate. Whether it’s towards prostitutes or specifically transvestites. But it’s terrible.

We see in these examples how qualitative research documents the everyday lived effects of the risk environment, shaping risk identities. Mapping pathways between individual risk actions and their structural contexts is inherently complex because these effects are *reciprocal* as well as often *indirect* and *non-linear*. They shape

values and patterns of subjectivities that can promote risk-taking practices. In this case example, *fear* and *discrimination* have direct as well as indirect effects on individual and collective capacity to reduce risk. Fear and discrimination are vectors of structural violence that can promote HIV risk. It is unlikely we could have uncovered their importance through traditional epidemiologic methodologies.

#### **10.4.2 Case Study Two: Gendered Power Relations and HCV Seroconversion Among Street-Based Youth IDUs**

Data were drawn from a prospective cohort study of young out-of-treatment IDUs in San Francisco (2000–2002) that included the simultaneous coordinated collection of epidemiologic survey research and anthropological participant observation.

In coordination with a prospective epidemiologic study of HCV and HIV transmission among out-of-treatment youth injectors, we simultaneously collected classic anthropological participant observation data among participants involved in an epidemiologic study. The epidemiologic study screened young (< 30 years old) IDUs for HCV and HIV and enrolled HCV-negative individuals into a prospective cohort. Participants were re-tested for HCV and HIV and quantitatively interviewed on a quarterly basis. A central aim was to explore behavioural differences between those who seroconverted for HCV and those who did not. The primary ethnographer was a young woman (approximately the same age as the average age of the youth injectors) and also a former outreach worker and epidemiologic questionnaire administrator for the project. She befriended and accompanied members of a series of extended social networks of neighbourhood-based youth injectors in their natural environment on the street. This involved frequenting street corners, parks, single room occupancy (SRO) hotels, hidden injection locales, homeless encampments, jails, hospitals, clinics, social service waiting rooms and needle exchange sites. She also accompanied the youth injectors in their daily search for drugs and income (primarily through panhandling, shoplifting, street-based sex work and retail drug sales). Ethnographic participants were initially selected through a classic opportunistic snowball sample of young women and men. Over time participants were then more strategically selected through the infrastructure of the epidemiologic project to develop causal explanations for social processes that might explain or contradict the emerging findings on risky practices and seroconversion.

Almost immediately, because of the positionality of the ethnographer, the subject of intimate partner violence within romantic relationships emerged as the primary theme organizing the lives of the young women surviving on the street in these social networks. The ethnographer was able to triangulate observational and self-report data on how romantic sexual relationships affected the details of heroin and methamphetamine injection practices as well as income generating strategies.

The ethnographic data revealed that newly arrived young women – especially those under 18 – entering this adolescent drug scene developed romantic relationships

with older, more experienced men who had violent reputations and who displayed jealous dispositions. These relationships protected them from harassment and rape by other men and also initially provided them with abundant access to drugs and advice on how to be street smart. Because of their number of years on the street, almost all of these “successful” domineering male street injectors were HCV infected. Some women were self-consciously aware of the protective benefits of selecting a partner with a “macho” and violent reputation. Most, however, understood their choice of partner in romantic terms. Many interpreted violent male love as inevitable and even desirable: “The more he hits you the more he loves you.”

The male partners generally attempted to oblige the women to conduct all their drug consumption exclusively with them. They often insisted on maintaining physical control over needle use and administered injections to the women. This allowed them to consume more than half of all the drugs they consumed together. It also reduced the opportunities for the women to meet other men and form alternative romantic relationships. Almost all the women eventually gravitated towards sex work to raise money for drugs, both for themselves and for their romantic partner. Over time, they would become the primary income generators within the relationship.

The ability to explore and document the details of the social logics for gendered violence was informed by social science theories of gender power relations with an emphasis on the concept of structural violence and the normalization of everyday interpersonal violence. The ethnographer’s findings about the prevalence of violence against women among street youth injectors and the romantic discourse surrounding it was also consistent with Bourgois and colleagues’ (2004, 2009) simultaneous documentation of violence against women in other street-based drug use scenes.

Regular monthly meetings with the epidemiologic team allowed the project to compare the emerging qualitative and quantitative findings and to redefine priorities for both qualitative data collection and for statistical analyses. The primary epidemiologic outcome measure for statistical analysis was seroincidence. At first there was no detectable association between HCV seroincidence and gender, despite the fact that the ethnographic findings strongly suggested that gender and violence were primary factors driving risk for bloodborne pathogen infection. The epidemiologists worried that the qualitative findings were driven by an ideological bias towards feminist theory and had “no basis in the science.” Unfortunately, there were no questions in the epidemiologic survey that assessed the factors uncovered in the ethnographic research – particularly with respect to exposure to violence and the details and influence of romantic relationships. New questions were drafted, but the field staff responsible for quantitative interviewing expressed concerns that asking sensitive questions about intimate partner violence and related issues might be potentially traumatic for respondents. The field staff felt that asking such questions might be considered unethical, given their lack of psychological therapeutic training and dearth of services available. A number of the investigative team concurred, and the proposed questions were never added. In contrast, using ethnographic methods to discuss intimate violence was not ethically problematic. The research participants actively sought the company of the ethnographer to discuss their personal concerns over violence in their lives. This occurred in the context of warm, long-term

friendship relationships in their natural environment. It sometimes led to improved self-protective behaviours on the part of the women.

By the end of the second year, the epidemiologic project documented an elevated rate of seroconversion among women compared to men (34.4% versus 23.4%), but this association did not reach statistical significance, possibly due to the inadequate number of seroconverters (approximately 27 seroconversions per year). We searched the epidemiologic survey for proxy variables for the social dynamics that were being documented ethnographically. One factor we were able to document was an age differential in sexual partnerships (i.e., men older than women). Also documented was a biologically implausible predictor of HCV seroconversion in the survey data, i.e. having a sexual partner who is an injection drug user, despite the current understanding that hepatitis C is very rarely sexually transmitted. This same biologically implausible association has also been reported in the literature on other large epidemiologic studies of HCV seroconversion (Miller et al. 2002). We were able to draw on our qualitative data to identify this finding as being a proxy variable reflecting gender power dynamics in romantic or sexually active dyadic relationships generally permeated by violence, jealousy and control.

This case study highlights one of the multiple challenges of integrating theory and methods into a social epidemiology of risk. The association between being a woman and HCV risk was tenuous and difficult to document through the quantitative data, despite the overwhelming qualitative evidence of the young women being at consistently more elevated risk than young men immediately upon entering the street scene. How can this lack of concordance between the two approaches be explained? One explanation is that variables that measure significant social power categories (such as gender and race/ethnicity) are highly correlated with many other variables and behaviours; therefore, it is difficult to disentangle them from other closely related variables. This is further complicated by the fact that significant power categories often have contradictory effects on risk. In certain contexts they can be protective and in others risk-enhancing. As an example, a woman in a relationship with an older, violent, highly controlling male who forbids her to inject with others may be both protected by the power relationship (in that the size of the pool of people she injects with shrinks) and put at risk by that same violent power relationship (if the male partner is infected with hepatitis C and controls all aspects of injecting). The complexity of overlapping disjunctive risks and vectors propelled by social dynamics may explain the often contradictory findings across studies and within studies around the category of gender and sexuality in the United States (e.g., Bourgois 2002; Bourgois et al. 2004; Collier et al. 1998; Strathdee et al. 2001; Hahn et al. 2001). These inconsistent quantitative findings illustrate the utility of introducing the social science concept of “social structural plausibility” in conjunction with that of biological plausibility and statistical association (Auerbach 2009).

A second explanation for the lack of concordance rests in the differing aims and methodological foci of the epidemiologic and ethnographic components of the research. The stated aims of the quantitative research were to find behavioural differences between those active injectors who became infected with hepatitis C and those who did not. Within this framework, an ideal outcome would have been to

discover a significant association between seroconversion and a specific injecting practice, leading to an individualized behavioural intervention that would assist individual injectors to avoid infection. By contrast, the ethnographic research was inherently more oriented toward exploring and describing structural risks – in this case, the complex interplay between gender power roles and the normalization of romantic violence and seroconversion described above. It is, therefore, perhaps unsurprising that the micro-practice-oriented quantitative data did not speak well to the broader structural issues emerging from the qualitative data.

Large-scale epidemiologic projects also have what might be termed a “logistic inertia.” Statistical methods usually hinge on testing specified hypotheses, which, in turn, tend to require large sample sizes to produce statistically significant outcomes. As such, re-purposing a quantitative study in midstream to respond to emerging findings requires a fundamental re-design of the study. In anticipation of this logistical inertia, the co-investigators and project directors of the ethnographic arms of the study held discussions during the grant writing phase before beginning the study to develop one neutral, quantifiable question about whether respondents had “pooled money with others to buy drugs to inject.” This question tested an anthropological hypothesis about the risk imposed by the reciprocal obligations for paraphernalia sharing imposed by the “moral economy” of drug exchanges (Bourgois 1998). This variable had no biological meaning, in that pooling money in itself cannot result in the transmission of a bloodborne virus, but it did have clear connections to the social contexts in which paraphernalia sharing can occur. Interestingly, this variable was one of only four variables independently associated with HCV seroconversion in multivariate analysis (Hahn et al. 2002).

The overarching pragmatic lesson from this collaborative study was that planning for mixed-methods studies must go beyond the boilerplate text now often used to justify such collaborations on grant proposals and must assume from the beginning of the study that both qualitative and quantitative processes *will* generate observations that can be tested or explored by the other. As such, thought needs to be given to *how* this will be carried out, for instance, through regular meetings, circulation of fieldwork notes and preliminary statistical analyses, development of proxy variables, additional targeted sampling and so on.

### ***10.4.3 Case Study Three: Structural Violence, Power and HIV Prevention Among Female and Transgendered Sex Workers in an Urban Setting***

Data were drawn from a multi-methods, community-based research study (2005–2008) in partnership with a local sex work agency in Vancouver, Canada.

This study was developed as a community-based research partnership between an academic institution and a local sex work agency to examine the factors shaping HIV prevention among street-based sex workers over a 2-year period (Shannon et al. 2007). The study was conceived as a multi-methods study using a participatory action

research approach, including an open prospective cohort (interview-administered research questionnaire and HIV screening at baseline and semi-annual follow-up visits over a 2-year period), social mapping completed alongside each questionnaire study visit and purposive sampling for qualitative in-depth interviews with a subset of the study sample (street-based sex workers). The study was purposefully designed to integrate a team of current and former sex workers as “peer researchers.” This team of peer researchers served as both key informants or experts and research facilitators. They were involved in content and questionnaire development and facilitation and interpretation of results, together with the academic research team. Their lived experience as sex workers and sometimes inconsistent consumers of public health messages provided critical “insider” insight into the complexities and dynamics shaping HIV prevention in the street-based sex industry.

Within Vancouver, Canada, as in many other international settings, the buying and selling of sex is legal, and yet criminal sanctions exist around most aspects of sex work (such as communicating and soliciting in public spaces, operating a brothel and living off the avails of prostitution). This study contributes to the growing literature on how enforcement of criminal sanctions facilitates the exacerbation of “risk.” Specifically, despite substantial program availability of HIV prevention resources in the inner city community of Vancouver (an area known as the Downtown Eastside), this study’s findings collectively revealed how structural violence mediates individual agency, reducing the capacity of sex workers to access resources and negotiate risk reduction (Shannon et al. 2008a). Our analyses of narratives drew on the risk environment framework (Rhodes 2002) and theoretical constructs of violence and power that emphasize the interconnectedness of interpersonal (Scheper-Hughes 1996; Bourgois et al. 2004), structural (Farmer 2004) and symbolic (Epele 2002; Bourdieu 2001) violence. We drew on a broad understanding of power and agency, building on earlier ethnographic studies (Bourgois 1998; Wojcicki 2002; Wojcicki and Malala 2001), which explored ways in which sex workers’ decision making and interpersonal risk negotiations might be rational, economic coping strategies in the face of social and structural violence. This relational understanding of power is developed in post-structural feminist critiques of institutionalized forms of social control and the discursive production and regulation of sexuality (Foucault 1981; Nencel 2001; Weedon 1987). At the micro level, the ubiquitous “everyday violence” of “bad dates” (i.e., violent clients) intersected with a discourse of disposal of symbolic violence and a lack of legal recourse to violence at a macro level in forcing sex workers to prioritize the immediate threat of violence over the negotiation of condom use with clients. At the meso level, local policing and enforcement of criminal sanctions (such as legal restrictions on working indoors) affected sex workers’ control over dates and their ability to negotiate HIV risk reduction, both directly through the threat of police violence, harassment and coercion and indirectly through displacement to isolated public spaces and lack of access to safer indoor spaces to service clients.

This study’s qualitative work was conducted by the same team members in parallel with social mapping and baseline quantitative data collection and helped inform questionnaire development and subsequent social epidemiologic constructs,



theory and analyses that provided empirical confirmation of the qualitative findings. For example, social epidemiologic analyses using mapping and questionnaire data revealed a geographic correlation between physical areas of avoidance due to violence and police harassment and the health access core (i.e., the area with the highest concentration of services and resources for vulnerable populations), which resulted in displacement of sex workers to outlying, isolated areas away from health and harm reduction resources (Shannon et al. 2008a). The use of mixed methods allowed us to elucidate the social meanings ascribed to place among sex workers that initially emerged from the qualitative interviews and to explore and map the empirical associations with HIV risk. For example, analyses of mapping data using geographic information systems (GIS) combined with questionnaire responses identified geographic clustering (or “hotspots”) of coercive, unprotected sex by clients among sex workers working in isolated public spaces compared to main streets and commercial areas (Shannon et al. 2009b). In multivariate analyses, adjusting for potential confounding effects of individual and interpersonal factors, structural factors, including enforced displacement, servicing clients in cars or public spaces and client-perpetrated violence, were independently associated with reduced ability to negotiate condom use among sex workers (Shannon et al. 2009a, b). The construct of structural police violence identified in qualitative studies by ourselves and others (Rhodes et al. 2008) emerged as being directly related to elevated likelihood of rape and client-perpetrated violence among sex workers (Shannon et al. 2009a, b). This study moved forward the importance of analysing the relational and gendered negotiation of condom use in HIV prevention studies with sex workers rather than relying on an overly simplistic construct of “unprotected sex” coded as a binary variable at the individual level in traditional epidemiologic analyses. This study also underlined the importance of upstream contextual factors in the casual pathway to gendered condom negotiation and subsequent risk for HIV transmission.

These results document how structural and everyday violence mediate the negotiation process of condom use and other risk reduction practices among sex workers, resulting in a heightened risk of HIV transmission. At the same time, the lived experiences of sex workers documented from the qualitative research articulate how certain risky sexual and drug use practices are rational coping strategies in the face of large scale social and structural violence and, as such, highlight the importance of active inclusion of sex workers’ experiences in redefining prevention policies and programmes. For example, sex workers describe how informal self-regulation mechanisms (e.g., prices charged for dates) can help promote a work culture of condom use, underscoring the importance of enhanced structural support for sex work collectives (e.g., networks, unions) in regulating safer industry practices. This initial work is now being tested through social cohesion measures in follow-up questionnaires. Adopting a social epidemiologic approach that combines qualitative, mapping and quantitative data sources helped us to capture the complexity of the daily lived experiences of sex workers in informing a re-conceptualized HIV prevention response and move beyond individual-level strategies. These results point to a critical need for safer environment interventions (e.g., managed sex work zones and safer indoor work spaces) and

structural policy support (e.g., legal reforms, sex work collectivism and empowerment) in stemming violence and, in turn, facilitating an “enabling environment” for condom negotiation in the sex industry.

#### ***10.4.4 Case Study Four: HIV Risk in the Context of Deportation: The Modifying Role of Gender***

These data were drawn from a prospective epidemiologic study of injection drug users in Tijuana, Mexico (2006–2008) that employed quantitative survey data supplemented by subsequent in-depth qualitative interviews.

The initial study was a classically designed, epidemiologic study examining HIV risks among male and female IDUs in Tijuana, Mexico. Baseline data from this study were examined in a logistic regression model to identify correlates of HIV infection, through which a significant association was found between HIV risk and years spent living in Tijuana (Strathdee et al. 2008b). Further exploration showed that this association was modified by gender (Strathdee et al. 2008a). Females who had lived in Tijuana longer had higher HIV risk; whereas, among males, the converse was true (shorter time periods lived in Tijuana were associated with greater HIV risk). Since this finding was counterintuitive, additional descriptive analyses were conducted to study the motivations for moving to Tijuana by gender. This revealed that most females moved to Tijuana voluntarily, primarily for reasons associated with employment or family. In contrast, males were primarily involuntary migrants, with the most common reason for living in Tijuana being deportation from the United States (i.e., 55% of male migrants were deportees). Indeed, further logistic regression models revealed that deportation explained the association between shorter time span lived in Tijuana for males and higher HIV risk. From an epidemiologic perspective, the question remained: how does deportation create an elevated risk for HIV among males? Is it a marker for a high-risk subset of male migrants who became HIV-infected in the United States prior to deportation? Or is deportation a true risk factor for HIV infection, representing a destabilizing force that disrupts social networks and creating economic and social vulnerabilities? In either case, research strategies employing a strictly epidemiologic perspective had reached their limit in terms of being able to identify how these sociopolitical forces were influencing HIV risk either directly or indirectly.

To explore these questions in more depth, subsequent studies were undertaken that drew from a social science perspective, both methodologically and theoretically, to “scale up” our understanding of the observed statistical association between deportation and HIV risk among men to consider the sociopolitical context in which HIV risk is produced. Methodologically, the studies were qualitative in nature, employing in-depth interviews to help “unpack” deportation as a construct among male drug injectors (Ojeda et al. 2010). In-depth interviews among male deportees explored themes of social isolation, stigma, unemployment, limited access to health and social services and cultural identity. Pre-deportation influences included social

factors (e.g., friends and/or family and post-migration stressors) and environmental factors (e.g., drug availability) that were perceived to contribute to substance use initiation in the United States. Post-deportation experiences pointed to the role of shame and loss of familial, social and economic support that exacerbated drug use and led to a sense of hopelessness and despair. From a theoretical perspective, the research identified deportation and United States-Mexico relations as a form of structural violence – a macro-level change in the risk environment that arises as a result of sociopolitical and cultural forces. This research provides a rich context for understanding the interplay between deportation and HIV risk in a manner that moves beyond the identification of statistical associations signifying individual-level “risk factors” into a depiction of the structural and environmental context in which bi-national politics, economic opportunity (or lack thereof) and sociocultural factors produce a system of structural violence that elevates HIV risk for certain individuals. Through the integration of epidemiologic and social science methods into a “social epidemiology of deportation,” this research also suggests multilevel targets for intervention. At a micro level, it suggests the need to implement supportive services for deportees. At a macro level, it points to the need to examine factors such as the United States’ health and immigration policies and whether they are working at odds.

## 10.5 Discussion

Conventional public health interventions and research primarily target individuals by promoting behaviour change through imparting knowledge, skills, motivation and/or empowerment using a cognitive model of rational choice theory in medical decision making. There is a growing recognition in the fields of public health and medicine, however, of the ways social inequality imposes risk on vulnerable population groups. This recognition is informed by an acknowledgement that a larger “risk environment” precedes and influences individual decision making (Rhodes 2002, 2009). In the case studies presented above, we have highlighted how a behavioural science perspective focused solely on individual-level constructs often fails to recognize the broader sociocultural and structural political economic framework in which risk behaviour occurs. A failure to incorporate an appreciation for socioeconomic and cultural context in public health research often also fails to uncover causal pathways. Moreover, it tends towards the design of primarily individual-level interventions that, at best, have limited impact and, at worst, result in victim blaming or further harm to already vulnerable individuals. These case studies advocate for the use of an approach that integrates social science and epidemiologic methods to enable a focus on social inequality at the local level while avoiding the tendency to individualize risk. It also offers a way to understand the *reciprocal relationships* between political-economic structures and the internalization and embodiment of vulnerability and harm. Social science concepts emerging as especially useful in the development of social epidemiologic approaches include: the Marxist structural

violence framework (Farmer 2010); theories of “structuration” (Giddens 1984), including the “logics of everyday practice” (Bourdieu 1977, 1990); the destructive effects of “symbolic violence” (whereby socially vulnerable populations come to accept their location in an oppressive social hierarchy that imposes risky practices on them for which they blame themselves) (Bourdieu 2000, 2001); and Foucault’s (1995) approach to discursive power and subjectification.

### 10.5.1 *Structural Vulnerability*

We propose that a “social epidemiology of HIV risk vulnerability” can elucidate the ways *structural violence* (Scheper-Hughes 1996; Farmer 2004; Galtung 1969) and *structural vulnerability* (Quesada et al. 2011) within the *risk environment* (Rhodes 2002, 2009) affect the health of individuals within distinctly patterned population groups and social contexts. The term “vulnerability” refers to a location in a social structure that makes an individual of a particular group prone to suffering from the effects of structural violence. It opens a linear, structural political economy analysis to broader theoretical domains to address the individual embodiment of the cultural, psychodynamic, symbolic and discursive dimensions of power. This is especially important in our contemporary historical moment because it counteracts the rhetoric of blame that creeps inadvertently into individualized approaches to behaviour change. A critical theoretical analysis of how larger structural and/or cultural forces shape intimate ways of being in the world also de-legitimizes punitive approaches targeted towards stigmatized populations, such as drug users and sex workers. Structural vulnerability thus draws attention to the larger upstream forces and processes that place specific population groups at a disadvantage for health and well-being by highlighting the biological and embodied effects of economic, social, gender and racial discriminations. It draws attention to how the embodied suffering of particular population groups is not only historically located but also reproduced through every day cultural practices interacting with the repressive effects of state policies.

One critique of political economy perspectives is that they *underplay* agency, positioning individuals as largely passive in their complicity to “structural determinants.” The relationship between individuals and their environments is ongoing and reciprocal. Risk environments constrain how agency is enabled, but they are at once also a product and adaptation of agency. It is critical that social epidemiologic approaches capture the dynamism of the reciprocity of individual-environmental interactions. Risk environments thus feature in a process of what Giddens has termed *structuration* (Giddens 1984). Structuration posits that structure is not “external” to individuals, for the “constitution of agents and structures are not two independently given sets of phenomena, a dualism, but represent a duality” (Giddens 1984). This means that “social systems are both medium and outcome of the practices they recursively organise” and that structure is “not to be equated with constraint but is always both constraining and enabling” (Giddens 1984). Foucault

(1981) would refer to this as the “positive” effects of power and would identify them as processes of “subjectification.” Bourdieu (2000) might identify this dynamic as a process of “habitus formation.” We, therefore, caution against models of risk environment that perpetuate dichotomous models of “structure” and “agency.” We see risk environments as capacitating individuals to act according to particular kinds of *habitus*, wherein socially acquired practices and habits are reproduced iteratively, and often unconsciously, through every day practices (Bourdieu 1977, 1990) that also incorporate processes of governmentality and the positive effects of power (Foucault 1981). Risk environments, then, are embodied through *participation*, through ways of being in the world and of understanding the ethics of self-formation or subjectivity.

The concept of vulnerability implicates social conditions and is intended to transcend the conceptualization of “at risk populations” (as the Vancouver case study emphasizes with respect to condom negotiations by vulnerable sex workers) in which individuals engage in risky practices with an accompanying connotation of individual guilt (e.g., Quesada et al. 2011; Hernandez-Rosete et al. 2005; Rocha 2006). As Bronfman et al. (2002) note, “while risk points to a probability and evokes an individual behaviour, vulnerability is an indicator of inequity and social inequality and demands responses in the sphere of the social and political structure. It is considered that vulnerability determines the differential risks and should therefore be what is acted upon.” Vulnerability is produced as the outcome of position in a hierarchical social order and a network of power relationships that constrain agency. Structural positioning influences personal decision making, limits life options and frames choices. It also determines how vulnerable populations make sense of their ailments and afflictions. Structural vulnerability is both a “space of vulnerability” (Rocha 2006) and an “embodiment of social hierarchy;” it is a “space that configure(s) a specific set of conditions in which people live, and sets constraints on how these conditions are perceived, how goals are prioritized, what sorts of actions and responses might seem appropriate, and which ones are possible” (Bronfman et al. 2002 as cited in Quesada et al. 2011). As an embodiment of social hierarchy, risk taking can be understood as the result of forms of violence enacted through cultural rationales and managed through modes of governmentality, often in a social milieu and political context of marked indifference to those afflicted (Watts and Bohle 1993).

Our case studies dealt with the gendering of risk as one, often core, way of exploring the structuration of vulnerability to HIV and related infectious diseases. They also examined the ways embodied distress at the individual level is shaped by criminalization and law enforcement, in this instance, through everyday street-level policing practices in Vancouver, Russia and Serbia that may, themselves, structure risk differentially by gender. Gender is particularly interesting because of the multiple and complex ways it articulates, with distinct material forces, cultural values, individual practices and political policies (including immigration and law enforcement), and it becomes a primary vector for structural violence. The Tijuana case is illuminative because it suggests that males and females are differentially propelled across the United States/Mexico border by subsistence crisis as well as by

immigration and/or deportation law enforcement, resulting in HIV risk taking across gender divides. The San Francisco case demonstrates the gendered, dissonant patterns to subjectification effects of normalized romantic violence against women. The Russia and Serbia case study highlights how day-to-day policing practices targeting the vulnerable induce an internalized state of oppression illness characterized by a subjectivity of fear that not only limits HIV prevention capacity but that reproduces and reinforces wider social, gender and racial inequalities in these societies.

### ***10.5.2 Mixing Method and Theory***

Our case studies employed different approaches to the use of mixed methods for documenting and analyzing complex social structural dynamics. Thus, in addition to the heightened understanding engendered by the integration of theoretical approaches, these case studies also illustrate both the challenges and added benefit of integrating the methodological approaches that are hallmarks of the disciplines. For example, the San Francisco case study illustrates the limitations of using probabilistic statistical analysis based on quantifiable individual-level variables to measure higher order social and cultural dynamics because variables that reflect social structural power relations, by definition, interface with multiple confounding and risky practices. The same gendered logics that normalize violence against women can sometimes prevent them from taking risks with other infected injectors. The jealous dyadic relationships that isolate them socially can be protective or toxic depending on the serostatus of the dominating partner. Simply describing a statistical association between HCV incidence and gender in San Francisco failed to describe the complicated structural and social processes that influenced this association. It was through the added contribution of in-depth ethnographic work that we were able to unpack the mechanisms behind the observed statistical pattern. In the Tijuana case, the initially counterintuitive statistical associations served as an inspiration for both additional quantitative analyses and a new qualitative component to the study that was designed to explore and contextualize the findings. In the Vancouver case, simultaneous implementation of geographic mapping, quantitative and qualitative data collection capitalized on local knowledge of study participants to explain the relationships between HIV vulnerability, social meanings and the built environment.

It is important to note that the San Francisco, Vancouver and Tijuana case studies each used a different mix of cross methodological dialogue, revealing the flexibilities of mixing methods. As the field of public health research increasingly adopts mixed-methods designs in order to capitalize on their ability to broaden and contextualize our understanding of complex multilevel influences on health, more researchers will face the challenge of successfully synthesizing data derived from multiple sources and methods. While integration of data from various sources is often stated as a goal of mixed-methods designs, both epistemological and methodological barriers to such integration have been identified (Bourgois 2002; Moss 2003; Bryman

2007). Synthesis and integration, however, does not require absolute agreement between data generated through different methods; the integration of mixed-methods results may, in fact, provide a sum that is greater than the individual qualitative and quantitative parts (Mason 2006; Bryman 2007). In the case studies presented here, we have demonstrated how ethnographic and qualitative methods can be used to develop and refine epidemiologic research questions in order to quantify associations that were observed in the field (Case Study Two) or to begin to understand the mechanisms behind counterintuitive associations detected through quantitative analyses (Case Study Four). A particular challenge facing mixed-methods design is the difficulty inherent in distilling broad social or cultural constructs down into variables that can be measured using epidemiologic approaches. A second challenge is to make the shift from deterministic, linear models to a greater emphasis on the dynamic systems in which individuals are embedded. Systems thinking requires an attention to the interactions, processes and, often contradictory, feedback loops inherent in complex social and environmental systems (Strathdee et al. 2010).

## 10.6 Conclusions

Bringing the concepts of structural violence, structural vulnerability and risk environment into the basic lexicon of social epidemiology would revitalize our subdiscipline's distinguished mid-nineteenth century historical roots. As Rudolf Virchow, one of the discipline's founders (who was trained as a physician, an anthropologist and as a pathologist) wrote about his experience with the typhus epidemic of 1847–1848 in Upper Silesia: “Medical statistics will be our standard of measurement: we will weigh life for life and see where the dead line thicker among the workers or among the privileged” (Taylor and Rieger 1984). The very real consequences of structural vulnerability are shorter lives subject to a disproportionate load of suffering. Recognizing the analytical terms structural violence and structural vulnerability within the risk environment is only a first step for the challenge of a critical social epidemiology that moves beyond the classroom, the laboratory and the clinic to develop upstream interventions that impact larger populations who are systematically subject to risk taking because of their subordinated status in society.

Already many public health and medical schools have instituted curricula to address “socially vulnerable populations” (King and Wheeler 2007). The paradigm of structural violence and structural vulnerability within a concrete risk environment extends this focus by linking health, political economy, culture and subjectivity to re-conceive risk as a structural outcome. Methodologically, it draws upon “thick” qualitative descriptions and critical analysis of the quantifiable relationship between risk taking and specific relations of power (Doyle 1979; Bourgois et al. 2004; Singer 2001). Despite the danger of reification inherent in any diagnostic tool, we envision that a clinical or public health outreach translation of structural vulnerability might take the form of administering screening protocols in clinics and on the street or in social service or carceral settings (Quesada et al. 2011). The goal

would be to widen the public health gaze towards an awareness of the embodied effects of social positioning in order to legitimize the allocation of increased resources (medical, social service and political) to the disenfranchised in the name of public health and to improve the quality of outreach services and care for the poor in the name of “best medical practices,” “public health efficacy” and “evidence-based practice.” It is not only a matter of training and sensitizing individual researchers and outreach workers to “see” risky individuals as structurally vulnerable but also a question of establishing viable institutional practices for health practitioners. Insisting that both health practitioners and the systems they work within include structural vulnerability as an etiological agent promoting risk taking pushes public health and medicine to extend their purview towards becoming more fully social as well as towards recognizing health as a fundamental human right.

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