

# “Big Events” and Networks<sup>1</sup>

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*Some, but not all, "big events" such as wars, revolutions, socioeconomic transitions, economic collapses, and ecological disasters in recent years seem to lead to large-scale HIV outbreaks (Friedman et al, in press; Hankins et al 2002). This was true of transitions in the USSR, South Africa and Indonesia, for example, but not those in the Philippines or (so far) in Argentina. It has been hypothesized that whether or not HIV outbreaks occur is shaped in part by the nature and extent of changes in the numbers of voluntary or involuntary risk-takers, which itself may be related to the growth of roles such as sex-sellers or drug sellers; the riskiness of the behaviors engaged in by risk-takers; and changes in sexual and injection networks and other "mixing patterns" variables. Each of these potential causal processes, in turn, is shaped by the nature of pre-existing social networks and the patterns and content of normative regulation and communication that happen within these social networks-and on how these social networks and their characteristics are changed by the "big event" in question. We will present ideas about what research is needed to help understand these events and to help guide both indigenous community-based efforts to prevent HIV outbreaks and also to guide those who organize external intervention efforts and aid.*

## INTRODUCTION

“Big events” such as wars, political or economic transitions, gentrification or urban desertification, and perhaps some natural disasters can sometimes unleash HIV or other epidemics of sexually- and/or blood-borne infectious agents (Aral 2002; Buve et al., 2002; Hankins et al., 2002; Friedman et al., 1999; Friedman and Reid 2002; Friedman et al., in press; Pederson 2002; Rhodes & Simic 2005; Rhodes et al.,

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2005; Wallace and Wallace 1998). This does not always happen, probably for a mixture of poorly-understood causal patterns plus a degree of random chance (Friedman et al in press; Gisselquist 2005; Kretzschmar and Wiessing 1998; Spiegel 2004).

To some extent, the relationships between Big Events and epidemic outbreaks undoubtedly involve network phenomena. This is because becoming infected with infections of this type is a probabilistic function of (a) one partner being infected and the other not; and of (b) their engaging in a risk behavior together that has a probability of transmitting the infection. The probability that the act will transmit the infection is itself a function of the agent, the behavior and both host and partner characteristics. Furthermore, the probability that two people who have sex together will use a condom, or two people who inject drugs together will share a syringe, is itself a function of the normative communications of which they have been a part.

The points made above about the probability of infection being transmitted overlap with several different kinds of network processes in important ways. The probability that two partners (in sex or injecting) will be discordant in infection status for a given agent is itself a function of their locations in community risk (sexual and/or injecting) networks. Friedman et al (1997, 1999), for example, showed this for HIV in relation to the Seidman 2-core of a large connected component of a network of injection drug users. They showed that probabilities of using a condom or of sharing a syringe are also functions of such “risk network location” variables, as well as of the norms of those in one’s social network. The probability that HIV or hepatitis C will be transmitted sexually, it should be added, is a function of whether one (or both) partners has various sexually-transmitted infections—and this is, in turn, a function both of risk network variables and also of behavioral specificities and, thus, of network-based normative processes.

Given this, what are some of the processes that Big Events unleash that may affect whether, how, and in what social locations one or more of these infectious disease epidemics breaks out?

Before addressing this question, it is worth considering that the different categories of Big Events differ in many of their effects on society and community, and also that there is considerable difference between one event of a given kind (say, one war) and another. Nonetheless, Big Events often involve the destruction of housing, neighborhoods, and places of employment; they lead to a variety of forms of movement of people through space, whether as refugees, captives, displaced people, or members of armed forces or clean-up crews; they often create violence; they perhaps cause trauma and post-traumatic stress disorder on a wide scale; and they can lead sometimes to the destruction of long-term hopes and perhaps to the creation of generations of youth without career or other goals. Medical and public health institutions are often weakened, disrupted, or destroyed; and sometimes police forces and centers of economic activity are also harmed or destroyed.

### **Big Events and risk networks**

Although there is relatively little research to base some of these claims on, in this and the next section of the paper we lay out an outline theory of how Big Events may affect risk and social networks in ways that can influence epidemics. In the course of this, we also provide some support for some claims—but, in general, we think that more research is needed to develop a better sense of whether this theory is useful.

All of the processes in the prior section of the paper seem to be able to affect both risk networks and social networks. Sexual networks often get disrupted when spouses or other partners are separated (or one is killed) by a Big Event. New partnerships get formed by refugees in search of physical or economic protection, or as a consequence of forced concubinage, or due to the growth of new attachments.

Economic hardship due to the Big Event often leads some people to sell sex for goods or money; and this can lead to their potentially becoming at high risk for infection and, thereafter, for transmitting infections to large numbers of other people.

Parallel patterns happen with drug injectors. Previous drug-using partnerships may be disrupted. Refugees often need to share drugs and/or syringes as favors to other users in order to be able to buy drugs in a new location (Friedman et al 1999); and the lack of housing faced by many refugees can lead to injectors' doing drugs with wider networks of other people (perhaps in unsafe locations like shooting galleries or other quasi-anonymous injection settings). If the drug trade is disrupted so that access to drugs becomes more difficult, this can lead to more users taking up injection (as seems to have happened in Pakistan [Hankins et al 2002; Strathdee et al 2003] after the US invasion of Afghanistan in 2002) or, contrariwise, to decreases in injection use (as in Argentina in recent years [Rossi and Ranguini 2004]). On the other hand, some people deprived of access to drugs or to the social environments in which they used drugs might stop this form of risk altogether. This seems to have occurred to many US soldiers who injected drugs in Vietnam when they returned Stateside (Robins 1973, 1974, Robins et al 1974; Zinberg 1984).

The possibilities of entrepreneurial activities in the sex or drug trades may be improved due to Big Events. This can arise due to the combination of an increase in potential workers due to economic desperation (and perhaps due to relaxed or changed normative climates, as is discussed below) plus a weakening of police controls over these activities due to institutional disruption or due to increased willingness (and perhaps need) of police staff for graft to look the other way.

One network phenomenon that has been understudied is “quasi-anonymous risk networks” (QARNs), which are sites or events in which multiple people come together and either inject drugs together or have sex together without coming to know each other (Friedman et al 2002). Common examples of these are group sex events such as parties where people go and have sex with a number of partners; gay “baths”; brothels; and shooting galleries and injection houses for drug users. Weeks et al. (2002) have shown that networks of injectors of different race/ethnicity in Hartford who appeared to have only weak linkage on the basis of a social network study (i.e., there were only two paths connecting their otherwise-distinct networks) were connected through many more paths once attendance at the same shooting galleries was taken into account. Although we know of no studies of this, it seems likely that Big Events can disrupt QARNs in an area. It seems likely that they can promote the formation of new QARNs, whether in the form of new brothels with different mixing patterns for clients and different recruitment streams for sex worker employees; new forms of group sex parties; or new forms of multiple-person injection settings. How the destruction, change, and/or formation of QARNs affect epidemics remains, however, an unstudied but important question.

### **Big Events and social influence and social support networks**

When Big Events create large-scale movement of individuals and groups, destroy economic and other institutions, and inflict trauma on large numbers of people, they often greatly weaken or re-shape the social influence and social support networks that form the basis of normative regulation in communities (Heckathorn 1989, 1990, 1999). People who have spent their whole lives in relatively small communities in which relatives, long-term friends, and elders have communication networks that let each other know what the others are doing, and that express authoritative opinions on how people should conduct their lives, can suddenly find themselves in refugee camps or other settings in which none of this is true. This greatly increases the probability that some of them will undertake previously-taboo forms of activity such as drug use, “unchaste” sex, or using violence or money to compel others to engage in sex or prostitution. Although not in itself a network phenomenon, the experience of

living through the Big Event may discredit some previously unquestioned rules of conduct; and the effects of trauma might weaken individuals’ ability to live up to such rules of conduct even if they continue to believe in them.

Youth who grow up in such normatively unstructured or, alternatively, normatively conflicted or multivalent circumstances, are likely to form friendship networks that develop their own norms with less supervision and intergenerational transfer than would have been the case prior to the Big Event. In many localities in the former Soviet Union and Eastern Europe after the transitions that those countries went through, some of these youth networks have accepted high-risk sex, high-risk drug use, and sex trading as legitimate activities—and in some of these localities, outbreaks of HIV and/or of bacterial STIs have developed thereafter. In Argentina, there appears to have been a rise in coca paste use among youth after their economic crisis and political transition of 2001 – 2002, although it is not yet clear whether this is associated with increased sexual risk behavior or with infectious disease transmission (Rossi et al., 2006). (Coca paste [also called basuco] is an intermediate step in the manufacturing process between coca leaves and purified cocaine.)

Although we are not familiar with the relevant research, neither normlessness nor post-Big-Event development of previously-taboo norms and behaviors are likely to go unchallenged. Normative reconstitution and restoration processes do occur, often in religious or politically-nationalist form. In Russia, for example, both religious fundamentalism and also authoritarian nationalist political projects took root, in part, in reaction to normlessness, “improper behaviors,” and emerging problems that many youth encountered. In addition, communities at risk, such as drug injectors and sex workers, and sometime their neighbors, develop their own protective communications, social networks, and norms (Friedman et al., 2004, 2005)

Sometimes, both restorationist movements and the efforts of communities-at-risk take the form of social movements. This has been the case of drug users’ organizations and sex workers’ organizations in Eastern Europe and elsewhere, for example. There is a wide literature (Diani and McAdam 2003) that points to the role of social network processes in social movements.

## **CONCLUSIONS**

Both social networks and risk networks are affected by Big Events, and these effects may greatly influence whether or not epidemics break out and, if they do break out, how much damage they do. The theory outlined above attempts to capture some aspects of these processes. This theory, however, is far too general in that very little of it is based on studies of Big Events.

Such research is sorely needed. Wars, transitions, revolutions, urban re-structuring, and ecological disasters are by no means decreasing in frequency or scope. Indeed, given current plans on the part of the United States government, they seem likely to increase. Their consequences will be severe in and of themselves—and these consequences may be much worse to the extent that they unleash epidemics.

Thus, we propose that retrospective studies of Big Events, networks, and related phenomena and epidemics should be organized and funded. Monitoring studies should be set up to provide useful information quickly in localities that seem likely to be caught up in Big Events; and these monitoring data should be such as to allow prospective studies of these localities during and after the Big Event. Additional work is needed into ways in which local populations can effectively respond when caught up in Big Events, and into how outside agencies can helpfully respond without making matters even worse.

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