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## Income inequality, drug-related arrests, and the health of people who inject drugs: Reflections on seventeen years of research

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### Abstract

This paper reviews and then discusses selected findings from a seventeen year study about the population prevalence of people who inject drugs (PWID) and of HIV prevalence and mortality among PWID in 96 large US metropolitan areas. Unlike most research, this study was conducted with the metropolitan area as the level of analysis. It found that metropolitan area measures of income inequality and of structural racism predicted all of these outcomes, and that rates of arrest for heroin and/or cocaine predicted HIV prevalence and mortality but did not predict changes in PWID population prevalence. Income inequality and measures of structural racism were associated with hard drug arrests or other properties of policing. These findings, whose limitations and implications for further research are discussed, suggest that efforts to respond to HIV and to drug injection should include *supra*-individual efforts to reduce both income inequality and racism. At a time when major social movements in many countries are trying to reduce inequality, racism and oppression (including reforming drug laws), these macro-social issues in public health should be both addressable and a priority in both research and action.

### Keywords

Macro-social; People who inject drugs; HIV; Racism; Income inequality; Drug-related arrests; Drug law reform; Health

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Research on drug use and on people who use drugs often seems isolated from research on major societal trends, forces and conflicts even though these have been shown to affect many

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other health outcomes and behaviors (Des Jarlais et al., 2012; Drucker, 2011; Pickett & Wilkinson, 2009; Williams, 2012). This separation exists in part because much of this research focuses on individuals who use drugs (or do not do so) and on individual-level predictors of which individuals use drugs, how they use drugs, or the consequences of their drug use, and ignores macro-level structures and processes. While the Risk Environment Model – one of the most commonly used models for understanding HIV-related outcomes among drug users – emphasizes micro-, meso- and macro-level contexts (Rhodes, 2002; Rhodes, Singer, Bourgois, Friedman, & Strathdee, 2005), research guided by this model has largely failed to examine the implications of major societal trends, forces, or conflicts, focusing instead on neighborhood-level, network level and event-specific exposures (Friedman, Bolyard, et al., 2008; Strathdee et al., 2010).

This commentary takes a different approach. It is a reflection on some of our findings during seventeen years of studying drug use and related issues in 96 large metropolitan areas in the United States. In this research, all variables were characteristics of these metropolitan areas, such as level of income inequality, government expenditures in the metropolitan area, the population prevalence of people who inject drugs (PWID) in the area, or the HIV prevalence rate among its PWID. Thus, our focus is not on predicting individual outcomes or conditions, but rather on how metropolitan area characteristics are associated with the extent to which drug injection or HIV or HIV-related mortality among PWID occur in the metropolitan area. As we shall describe, knowledge of such associations can help us understand if and how policies and other macrosocial processes are associated with HIV epidemics or widespread injection drug use.

We will not attempt a summary of all the topics the project wrote about. [See these selected papers that describe trends in PWID or in HIV among PWID (Chatterjee et al., 2011; Cooper et al., 2008; Pouget, Friedman, Cleland, Tempalski, & Cooper, 2012; Tempalski et al., 2009, 2013; West et al., 2016); in services for PWID (Tempalski, Cleland, Chatterjee, Pouget, & Friedman, 2010); and predictors of service presence or coverage (Friedman et al., 2007; Tempalski et al., 2003, 2007, 2008).] Instead, we briefly and selectively summarize some key findings from five of these papers that directly addressed the predictors of PWID population prevalence or HIV prevalence or incidence at the metropolitan level, and then discuss some implications of these findings.

## Findings from five analyses

Our first analyses looked at the predictors of three variables that Holmberg (1996) had generated in a creative effort to estimate the size of three Key Populations (men who have sex with men, PWID, and high-risk heterosexuals) and HIV prevalence and incidence among these populations as of approximately 1992. We analyzed the predictors of PWID population prevalence (per 10,000 adult population), of HIV prevalence among PWID, and of HIV incidence among PWID. In one analysis, we showed that metropolitan areas in states with laws against over the counter purchase of syringes had higher HIV prevalence rates and incidence rates than those in states where syringes could be purchased (Friedman, Perlis, & Des Jarlais, 2001). In further analyses, we found that income inequality in a metropolitan area (as well as laws against syringe purchase) was positively associated with the population

prevalence of PWID and with HIV prevalence rates among PWID (Friedman, Perlis, Lynch, & Des Jarlais, 2001). We also analyzed the macro-contextual predictors of HIV incidence rates among PWID in the 52 metropolitan areas with HIV prevalence <20% where over-the-counter syringe sales were legal. (We had to restrict the analysis in this way because HIV incidence in a locality is highly correlated with both prevalence and with the presence or absence of over-the-counter sales laws.) In this analysis, metropolitan area income inequality was positively associated with HIV incidence rates among PWID.

A second analysis examined the relationships of deterrence and law enforcement to drug-related harms in 89 of these 96 large metropolitan areas in the year 1998 (Friedman et al., 2006). (Seven metropolitan areas had too much missing data to analyze.) The year 1998 was perhaps the last year in which high HIV prevalence rates could be interpreted as an unambiguously “bad” thing because highly-active antiretroviral therapy (HAART) was introduced in 1996 but took several years to reach large numbers of PWID in most US metropolitan areas. (After HAART became widely used, HIV prevalence rates would tend to increase or stay steady as a “good thing” because the therapy would keep infected PWID alive.) In this paper, we found that average arrest rates per capita for possession or sale of cocaine or heroin in 1994–1997, the number of police employees per capita in 1994–1997, and corrections expenditures per capita in 1995 (after appropriate controls like region of the country and laws against over-the counter syringe sales) were not associated with the population prevalence of PWID in 1998. On the other hand, they all were positively and independently associated with HIV prevalence rates in 1998.

We revisited this analysis of HIV prevalence among PWID in 1998 in a later paper to see how other variables might help us interpret the results (Friedman, Tempalski, et al., 2008). Fig. 1 (copied from p. 263 of the paper) presents a path analysis of our findings. Here we can see that income inequality and measures of racial residential segregation are associated with police-related correlates of HIV prevalence rates.

For this paper, we examined correlations among measures of income inequality, racial residential segregation, and the three measures of criminal justice systems for these metropolitan areas. The correlation matrix appears as Table 1. This matrix shows that the two measures of income inequality are both correlated with black-white residential dissimilarity (though not with Hispanic-white dissimilarity) and also with percent of the population that is nonwhite. Such correlations suggest the possible existence of a system of causation that leads to class inequality and structural racism being associated with each other.

A fourth paper revisited the issue of how drug-related arrests are related to the prevalence of PWID in a metropolitan area (Friedman et al., 2011). Specifically, in this paper, we focused on whether the arrest rate per capita for possession of heroin or cocaine during the period 1992–2002 was associated with change in the population prevalence rate of PWID. It was not.

The fifth analysis studied how metropolitan area characteristics were associated with changes in mortality rates (per 10,000 adult population) among PWID living with AIDS

(Friedman, West, et al., 2013). Here, then, we are examining what metropolitan area characteristics were associated with successfully reducing mortality among PWID living with AIDS once HAART was discovered and introduced. What we found (among other things) was that rates of mortality reduction were worse in metropolitan areas with higher income inequality and/or a greater increase in rates of hard drug arrests per 10,000 adults.

## Discussion

These results suggest that macro-social factors such as income inequality and racial/ethnic residential segregation are associated with higher rates of injection drug use, of HIV among PWID, and of mortality among PWID living with AIDS, and that drug arrests do not reduce injection drug use but do contribute to HIV and AIDS among PWID. There are of course limitations on what these associations mean. They are limited geographically, and notably do not include data from outside the USA. They by no means demonstrate that changes in institutional racism,<sup>1</sup> income inequality or policing cause changes in the population density of PWID or in disease rates among PWID. (They do, however, strongly suggest that hard drug arrests have little impact on the rates of PWID in a metropolitan area.) Likewise, these analyses study rates for metropolitan areas rather than individuals, so even if these relationships do turn out to be causal, this might have relatively little to do with the fate of an individual at risk of becoming a PWID or who is already injecting.

However, while we should not ignore this lack of proof of causality, it remains true that racism, criminal justice systems and income inequality do seem to be associated with (later) rates both of HIV infection and of mortality among PWID. Some set of causal processes is taking place, and whatever those processes are, they seem to be generating these associations. Since income inequality, institutional racism, and criminal justice all are structures and processes at the macro-social level, if something else is causing these changes, it is also likely to be at the macro level. Research to resolve these issues of causation may be currently beyond the power of science to conduct, although qualitative research can suggest potential pathways. Research into possible pathways that might connect these macro-level processes with changes in HIV and mortality is also needed, and our team has been involved in research with individual, metropolitan and other levels of spatial analysis and in research to develop measures to study other pathways (Cooper et al., 2011, 2012a, 2012b, 2016; Friedman, Sandoval, et al., 2013; Friedman, Pouget, Sandoval, Jones, & Mateu-Gelabert, 2015; Friedman, Pouget, Sandoval, Jones, Nikolopoulos, et al., 2015; Nikolopoulos et al., 2015; Pouget, Sandoval, Nikolopoulos, & Friedman, 2015). Research on the time lag between a given macrosocial change and any effects it may have would also be useful.

The impact of income inequality, racialized social systems and systems of criminalization on health is not unexpected. Such findings are common in public health research (Chang, 2006;

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<sup>1</sup>“Institutional racism” has been defined differently by different researchers. One definition, as given in Ramaswamy and Kelly (2015), is that is the “differential access to the goods, services, and opportunities of society by race.” In Friedman et al. (1998), we define it more broadly than this essentially distributionist approach. We argued that institutional racism also includes institutionalized power imbalance, which is a relational property, as well as dignity denial and attacks. We also suggested that institutional racism includes within itself relationships with core centers of society that provide it with support and also that, as in all power relationships, institutionalized racial power and domination bring forth discontent, resistance and sometimes open rebellion.

Charles & DeCicca, 2008; Des Jarlais et al., 2012; Drucker, 2011; Pickett & Wilkinson, 2009; Pinedo et al., 2015; Ramaswamy & Kelly, 2015; Rugh & Massey, 2010; Williams, 2012). We suspect that relationships of these or other similar macro-level variables will have similar associations in other countries with the population density of PWID, and with HIV rates and AIDS mortality among PWID, and urge that research be conducted on this issue internationally.

It will be useful for research to be conducted into (a) potential *pathways* that can transmit changes at the macro-level to the social contexts of small groups of people who might become injectors and/ or to people who use drugs and (b) whether and how changes in these pathway variables and social contexts in turn lead to changes in social networks and/or behaviors that can affect people's health. We and others have written extensively on such pathways (1) in general (Friedman, Sandoval, et al., 2013; Pouget et al., 2016); (2) in the context of how "Big Events" sometimes lead to large-scale increases in drug injection or to HIV outbreaks (Friedman, Rossi, & Braine, 2009; Pouget et al., 2015; Strathdee et al., 2006); and (3) in terms of specific pathways that affect outcomes. These specific pathways have included research on (a) the extent of dignity attacks on some groups of people – and thus the stigmatizations that result from this (Friedman, Rossi, & Ralón, 2015; Harris & Rhodes, 2013; Hatzenbuehler, 2014; Hatzenbuehler & McLaughlin, 2014; Hatzenbuehler et al., 2014; Hatzenbuehler, Phelan, & Link, 2013; Hatzenbuehler, Schwab-Reese, Ranapurwala, Hertz, & Ramirez, in press), (b) how people use their time (Rossi et al., 2011), or (c) how to measure PWID's altruistic and solidaristic actions and memberships and the relationships of these measures to risk behaviors (Friedman, Pouget, Sandoval, Jones, & Mateu-Gelabert, 2015; Friedman, Pouget, Sandoval, Jones, Nikolopoulos, et al., 2015). Such pathways are probably not deterministic, but involve interacting dialectics (Friedman & Rossi, 2011). An increase in income inequality (such as those seen in the USA and many other countries in recent decades) thus probably produces a tendency towards more HIV transmission among people who inject drugs, but interacting patterns of causation might prevent this increase from occurring. Much more research is needed on these issues.

For those who care about drug use and the fates of people who use drugs, the findings of the research reported here are nevertheless profound. They indicate that we have to pay attention to the "big issues" like income inequality, structural racism and other predictors both of flawed policies (like drug-related arrests or the failure to implement syringe exchange on a national scale in the United States or Russia) and of HIV incidence, prevalence and mortality as well as to the individual issues and care-related issues that take up most of our time in research and/or interventions. They also mean that when we think about "structural interventions" or the "risk environment," we need to think about interventions or research beyond finding housing for drug users, arranging regular supplies of naloxone and syringes to rooms or parks where people gather to use drugs, and the like.<sup>2</sup> Possible targets for intervention are drug laws and drug policies, which both feed and are fed by institutional and individual racism, a divided working class, income and wealth inequality, and a politics of

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<sup>2</sup>Changes in drug use or in related infectious diseases due to changes in medical insurance systems and related structures might also be studied. Such changes take time to diffuse into practice and then to have effects, if any, on the outcomes of interest at the population health level.

scapegoating (Burris, Strathdee, & Vernick, 2003; Burris et al., 2004; Burris, Anderson, Craig, Davis, & Case, 2010; Friedman et al., 2009; Friedman, Sandoval, et al., 2013; Friedman, 1998a, 1998b). The Black Lives Matter movement and the movement to reform criminal justice policies have directed attention to the harms posed by violent policing, repressive drug control policies, and criminal justice disparities, including drug-related policing and criminal sentencing (Alexander, 2010; Bassett, 2015). These have led to some Federal and state changes, including in sentencing policies, but the outcomes of these changes remain to be determined (Office of National Drug Control Policy, 2014). Many drug researchers have been leaders in analyses of the public health effects of policing and of incarceration (Cooper et al., 2012a; Drucker, 2011; Friedman et al., 2006; Rhodes & Simic, 2005).

We believe, however, that we need to “think even bigger” as well. For example, it may be that the best intervention to reduce drug use or HIV among PWID in a locality is to help workers to organize effective unions that can reduce income inequality and work with others to attack racism. Or perhaps to work with those who are systematically analyzing and attacking the structures that uphold the institutionalization of racism.

Current funding agencies might be unsympathetic to research designed to investigate whether these interventions work, and certainly it will be hard to approach any of this research using randomized controlled trials in which individuals are assigned to receive or not receive some treatment. Nonetheless, this paper, and this research project, indicate that for science and scholarship in this field to move ahead, we need to conduct research on such interventions and to test out these interventions at a macro scale. This is an opportune time for this work: for example, the current president of the American Public Health Association, Dr. Camara Jones, has prioritized tackling racism as a public health problem during her tenure; there is widespread attention to the health and other effects of mass imprisonment in the United States; and both before and after the Occupy movements, there has been increasing research attention to income and wealth inequalities and their effects (Alexander, 2010; Crutchfield & Weeks, 2015; Drucker, 2011; Friedman, Sandoval, et al., 2013; Pickett & Wilkinson, 2009; Pouget et al., 2016). “Health in all policies” approaches are gaining ground internationally. Even more important, since this is a time when major social movements in many countries are trying to reduce inequality, racism and repression, these macro-social issues in public health should be both addressable and a priority to be addressed in research and also in sociopolitical action.

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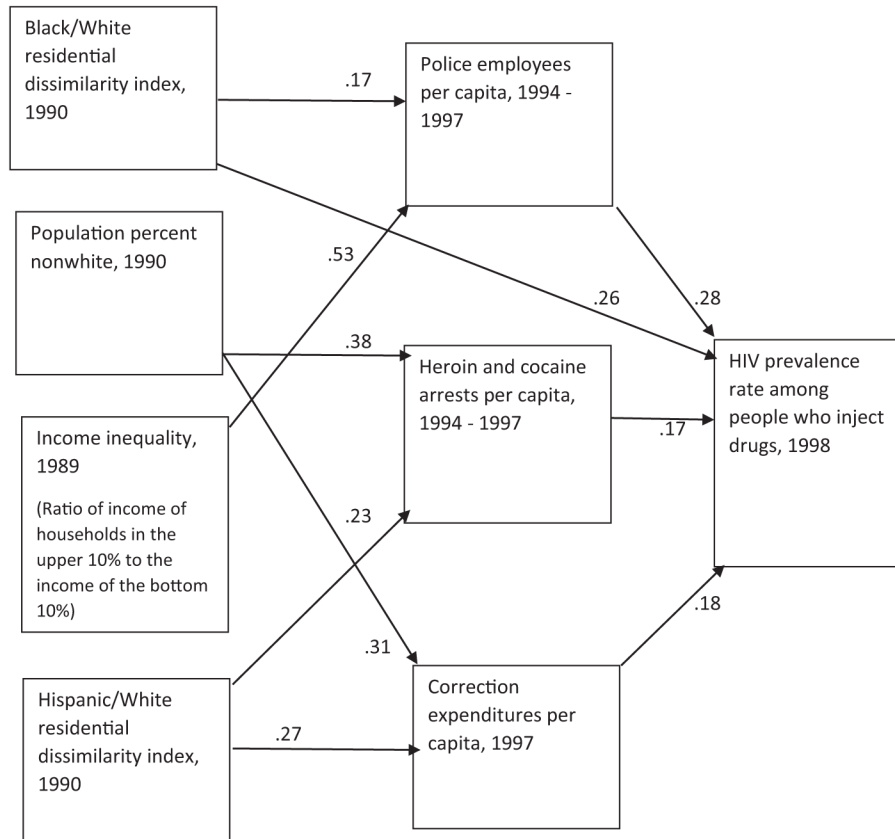
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**Fig. 1.** Associations among selected variables for 96 large US metropolitan areas (adapted from Friedman, Tempalski, et al., 2008, p. 263). Paths with  $p > 0.10$  are not shown.

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**Table 1**

Correlations among measures of income inequality, institutional racism, and criminal justice system variables in large US metropolitan areas.

	Income inequality measures		Institutional racism measures			Criminal justice system measures			Population percent nonwhite (as a contextual characteristic)
	Gini coefficient, 1989	Ratio of incomes of upper 20% to those of lower 20%, 1989	Black-white residential dissimilarity index, 1990	Hispanic white residential dissimilarity index, 1990	Arrests for cocaine or heroin per 10,000 adult population (average for 1994-1997)	Police employees per capita (average for 1994-1997)	Corrections expenditures per capita, 1997		
Gini coefficient	1	.939**	.284**	.161	.254*	.463**	.132	.420**	
Ratio of upper 20% to lower 20%		1	.349**	.185	.282**	.515**	.138	.452**	
Black-white housing dissimilarity			1	.215*	.061	.302**	-.069	-.268	
Hispanic-white housing dissimilarity				1	.345**	.192	.398**	.327**	
Hard drug arrests					1	.240*	.352**	.423*	
Police employee per capita						1	.091	.340**	
Corrections expenditures per capita							1	.417**	
Population percent nonwhite								1	

\*\*\*  $p < .01$ .

\*  $p < .05$ .

*N*'s for the correlations range from 81 to 95 due to missing data.