Monitoring Drug Epidemics and the Markets that Sustain Them Using ADAM II Final Technical Report

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Abstract

Effective law enforcement, drug abuse and related social policies and initiatives depend on the timely availability of information and its interpretation. This study examined trends in use of five widely abused drugs among arrestees at ten geographically diverse locations from 2000 to 2010: Atlanta, Charlotte, Chicago, Denver, Indianapolis, Manhattan, Minneapolis, Portland OR, Sacramento, and Washington DC. The data came from the Arrestee Drug Abuse Monitoring Program reintroduced in 2007 (ADAM II) and its predecessor the ADAM program. ADAM data are particularly valuable because they include urinalysis results that provide an objective measure of recent drug use; they provide location specific estimates over time; and, they include sample weights that yield unbiased estimates for each location.

Arrestees are often at the forefront of drug use trends. Moreover, this population is of central concern to law enforcement and related agencies. The ADAM data were analyzed according to a drug epidemics framework, which has been previously employed to understand the decline of the crack epidemic, the growth of marijuana use in the 1990s, and the persistence of heroin use. Similar to other diffusion of innovation processes, drug epidemics tend to follow a natural course passing through four distinct phases: incubation, expansion, plateau, and decline. The study also searched for changes in drug markets over the course of a drug epidemic. A variety of exploratory analyses strongly suggest that there is no simple relationship between the nature of individuals' drug market purchases and the broader course of drug epidemics.

As of 2010, the Marijuana Epidemic was in its plateau phase across the country. In contrast, by 2010 the Crack Epidemic had been in decline for some time at most locations. The timing of the decline phase varied substantially across locations. The decline started as early as 1990 in Manhattan and Washington DC and as late as 2003 in Indianapolis. As of 2010, the Crack Epidemic was still in the plateau phase in Sacramento. Powder cocaine use was only substantial at 5 of the 10 ADAM II locations. The Powder Cocaine Epidemic entered a decline early in the 2000s at two eastern locations (Charlotte and Manhattan) and closer to 2010 at two western locations (Denver and Portland OR). In Atlanta, the recent Powder Cocaine Epidemic was either still in plateau or had just entered the decline phase. Heroin use was limited to four locations and was in decline at three of the four (Chicago, Manhattan and Washington DC). Heroin use appears to be endemic to Portland OR; use is not widespread but appears to be embedded within a small population that continues to attract new young users. Methamphetamine use was substantial at two West Coast locations. Of note, the data strongly indicate that the Methamphetamine Epidemics in Portland OR and Sacramento entered the decline phase during the 2000s.

The primary limitation to this analysis is that it focused exclusively on male arrestees from the 10 urban locations included in the ADAM II Program. The trends identified do not necessarily parallel the trends in the general population. Additionally, there may be variations in drug use across gender not detectable with ADAM data. The ADAM II locations provide geographic diversity but the program does not include any rural locations.

Table of Contents

Tables and Figures

Methamphetamine epidemic and drug market trends

There was only one change in any of the methamphetamine market structure indicators. Purchasers who report having used a single dealer in the past month (MTHNDL1) dropped substantially in Sacramento in 2007.

Table M-9: Comparison of time trends in METHAMPHETAMINE Epidemic and drug market characteristics by ADAM II location

		YEAR							
		2000	2001	2002	2003	2007	2008	2009	Total
19.00 Portland, OR	MTHPOS18	16%	22%	20%	20%	15%	8%	7%	15%
	MTHPOS	21%	20%	22%	25%	22%	16%	13%	20%
	MTHCOP	61%	55%	57%	65%	61%	67%	47%	59%
	MTHCRD	4%	2%	1%	6%	3%	9%	5%	4%
	MTHELE	39%	32%	41%	43%	50%	50%	43%	43%
	MTHCRR	17%	21%	23%	16%	11%	24%	21%	19%
	MTHPID	80%	85%	72%	67%	82%	82%	77%	78%
	MTHNFT	75%	69%	66%	64%	59%	53%	74%	66%
	MTHNDL1	53%	53%	59%	43%	54%	47%	49%	51%
	MTHNDL3	87%	89%	85%	85%	89%	78%	85%	85%
	MTHRSC	49%	43%	54%	49%	56%	44%	34%	47%
	MTHHOD	54%	46%	50%	53%	56%	33%	52%	49%
19.50 Sacramento, CA	MTHPOS18	25%	16%	13%	32%	19%	11%	10%	18%
	MTHPOS	29%	29%	34%	38%	32%	30%	28%	31%
	MTHCOP	66%	62%	67%	65%	69%	54%	60%	63%
	MTHCRD	10%	10%	11%	7%	3%	6%	5%	7%
	MTHELE	35%	38%	39%	34%	41%	45%	37%	38%
	MTHCRR	10%	15%	17%	22%	21%	16%	24%	18%
	MTHPID	86%	86%	75%	74%	89%	74%	67%	79%
	MTHNFT	46%	63%	69%	64%	60%	53%	55%	59%
	MTHNDL1	52%	42%	48%	52%	33%	31%	33%	42%
	MTHNDL3	92%	89%	91%	88%	89%	80%	82%	87%
	MTHRSC	52%	55%	60%	50%	49%	50%	41%	51%
	MTHHOD	54%	54%	50%	45%	45%	45%	48%	49%

IV. Conclusions

This study provides an important update regarding drug epidemics at the 10 ADAM II locations. The theoretical advance of incorporating drug market information into the analysis of drug epidemics led to a finding of no effect. The extensive and alternative exploratory analyses strongly indicate that there is no simple relationship between the nature of individuals' drug market purchases obtained by the ADAM Program and trends in drug epidemics. Drug markets appear to be idiosyncratic. It had been hypothesized that drug markets varied from structured to entrepreneurial. Our analysis of arrestees drug market purchase experiences indicate that there are many more dimensions to drug markets than just an entrepreneurial-corporate scale. It is possible that there is still a relationship between drug market structure and the state of the drug epidemics. Possibly, the underlying structure of drug markets may change in response to changes in the phase of a drug epidemic. However, the nature of individual purchases by users may remain the same despite the changes. To understand these types of changes would require information from drug dealers and not users. This type of data was not collected by the ADAM nor ADAM II program.

Table M-10 presents a summary of drug epidemic findings. As of 2010, the Marijuana/Blunts Epidemic was in its plateau phase across the country. It entered that phase in the mid 1990s or early 2000s at each

location. Thus, the most pressing drug-related concern for most of the ADAM II locations would be marijuana and any anti-social behaviors associated with its use. To the extent that marijuana use is involved with fewer drug-related problems than crack cocaine this is good news (see Johnson, et al., 2006, for a more extended discussion). In addition, with several states introducing medical marijuana programs allowing citizens to use and grow marijuana legally, the attitudes of law enforcement in many of these areas are changing so the place of the expanding population of marijuana users in their communities may not be as disruptive as it might be for other illicit drugs.

At most ADAM locations, the Crack Epidemic has been in decline for some time among people who sustain arrests. However, the timing of the decline phase varied substantially across locations. The Crack Epidemic entered a decline first in the Northeast in Manhattan and Washington DC around 1990. The Crack Epidemic came somewhat later to Indianapolis (Golub & Johnson, 1997), which went through the expansion phase in the early 1990s. The plateau phase was reached in Indianapolis in 1994. This analysis indicates that the decline phase started in 2003. The data indicates that the Crack Epidemic was still in the plateau phase in Sacramento as of 2010. During the decline phase, many older users will persist in their use. These longer term users will need crack-related treatment and social reintegration services perhaps well into the future (perhaps decades) as some crack users continue to struggle with addiction, cause public safety concerns, and attempt social reintegration with varying success. In addition, should these users continue to engage in illegal activity the possibility exists that the population of older, incarcerated crack users increases and the need for correctional systems to provide treatment and health services for them could become problematic and costly for state governments. However, the situation is different in Sacramento. Sacramento is still in the midst of its Crack Epidemic and prevention efforts are still needed to discourage youths from use and bring the epidemic into its decline phase.

Table M-10: State of Drug Epidemics at ADAM II Locations as of 2010

	State of the epidemic in 2010 (date of last major change)				
ADAM Location	**Marijuana**	**Crack**	**Powder Cocaine**	**Heroin**	**Methamphetamine**
Atlanta	Plateau (1996)	Decline (<2000)	Plateau or early decline (2010)		
Charlotte	Plateau (<2000)	Decline (<2001)	Decline (<2001)		
Chicago	Plateau (1996)	Decline (1994)		Decline	
Denver	Plateau (1994)	Decline (<2000)	Decline (2008)		
Indianapolis	Plateau (1996)	Decline (2003)			
Manhattan	Plateau (1996)	Decline (1989)	Decline (<2000)	Decline	
Minneapolis	Plateau (<2000)	Decline (<2000)			
Portland (OR)	Plateau (2001)	Decline (1994)	Decline (2009)	Plateau	Decline (2008)
Sacramento	Plateau (<2000)	Plateau (<2000)			Decline (2001)
Washington (DC)	Plateau (1996)	Decline (1990)	--	Decline	--

Table M-10 illustrates a primary advantages of the ADAM data. The ADAM Program collects location specific information which facilitates tracking how drug epidemics vary across locations. The timing of the Crack Epidemic varied across location. Powder cocaine use was only substantial at 5 of the 10 ADAM II locations. The Powder Cocaine Epidemic entered a decline early in the 2000s at two eastern locations (Charlotte and Manhattan) and closer to 2010 at two western locations (Denver and Portland). In Atlanta, the recent Powder Cocaine Epidemic was either still in plateau or had just entered the decline phase. Heroin use was

limited to four locations and was in decline at three of the four (Chicago, Manhattan and Washington DC). These three locations need to consider services for the aging Heroin Generation, similar to our recommendation for dealing with the Crack Generation. The implications of this analysis for Portland (OR) are different. Heroin use appears to be endemic to Portland. The rate of detected heroin use was relatively constant across birth years from those born before 1960 through those born 1990. This strongly suggests that heroin use is embedded within a small population that continues to attract new young users, a conclusion supported by reports from Oregon police interviewed for the methamphetamine market study noted earlier. These findings suggests that it could prove worthwhile to develop a profile of recent young heroin users and prepare a targeted intervention aimed at similar youths that are not yet users in order reduce heroin use. Unlike in Chicago, Manhattan and Washington DC, heroin use is not likely to disappear over time as part of its own natural course of events in Portland (OR).

This analysis yielded surprising results regarding methamphetamine. Methamphetamine use had been widespread in the West and was spreading to the Midwest and Southeast (Brownstein, Mulcahy, Taylor, Fernandes-Huessy, & Woods, 2010; Herz, 2000; Hunt, Kuck, & Truitt, 2005; National Institute of Justice, 2003a; Taylor et al., 2011; Weisheit & White, 2009). In response, there have been concerted efforts to reduce methamphetamine use through prevention and supply reduction (National Drug Intelligence Center, 2007; Taylor, et al., 2011). The data suggest that there has been a shift in the popularity of methamphetamine at the two ADAM II locations with any substantial methamphetamine use: Sacramento and Portland (OR). In both West Coast locations, the Methamphetamine Epidemic appears to have entered the decline phase (also see Weisheit & White, 2009). When asked about methamphetamine use, police in Portland agreed that it is still around but that the greater problem has become pharmaceutical opiates and heroin use among young people. It would appear that Methamphetamine use will decrease over time and these locations will need to deal with an aging and shrinking population of persistent users.

It would be an inappropriate to generalize the findings from two ADAM locations where methamphetamine use had been widespread to make any claim about the state of the Methamphetamine Epidemic nationwide. Further information is needed from more locations that had experienced extensive methamphetamine use. Our emphasis on the drug epidemics perspective suggests that analysts in these communities could benefit substantially from studying reports from youth leaders and youths themselves. A decline in use among young adults would indicate that the Methamphetamine Epidemic may be in its decline phase. It would also be useful to examine whether youths have developed strong social norms against methamphetamine use to further confirm that the Methamphetamine Epidemic may be in decline. A similar approach could be used to track the phase of other drug epidemics at locations not fortunate enough to be served by the ADAM II Program.

Detected use of drugs among arrestees is just one indicator of drug use trends in the U.S. Other major indicators include general population surveys, seizures, treatment admissions, emergency department visits, and deaths. Two Federal ongoing programs are designed to make sense of this wealth of data: the National Drug Intelligence Center (NDIC) and the Community Epidemiology Work Group (CEWG). In completing this study, we compared our conclusions to those in the latest reports from each program (National Drug Intelligence Center, 2007; NIDA, 2011). The NDIC and CEWG reports provide broad assessments designed to support policy and program planning in a timely manner. The reports provide specific information about which drugs are of greatest current concern and the magnitude of the problem.

The NDIC report focuses on availability and its likely implications for use as in the following overarching statement (National Drug Intelligence Center, 2011, p. 24), “The overall availability of illicit drugs in the United States is increasing. Heroin, marijuana, MDMA, and methamphetamine are readily available, and their

availability appears to be increasing in some markets. Cocaine is widely available throughout the country, although at diminished levels since 2007." With regard to methamphetamine the NDIC notes the following (National Institute of Justice, 1996, p. 32), "Law enforcement and intelligence reporting, as well as seizure, price and purity data, indicate that the availability of methamphetamine in general is increasing in markets in every region of the country. Methamphetamine prices have declined steadily since peaking in 2007; purity levels have increased concurrently." This stands in direct contrast to the findings of this study, that methamphetamine use is in the decline phase in Portland (OR) and Sacramento. It is possible that the trend in these two locations represent an exception to the broader national trend. This emphasizes the need for additional location specific data. Another possibility is that use patterns do not necessarily follow availability patterns. Despite increased availability, greater purity and lower price, conceivably individuals are choosing to not use methamphetamine because the prevailing pro-use attraction of the drug has faded and because anti-use norms have taken hold. A last alternative explanation is that there has been a decline in use among those individuals who sustain arrests, but that use remains widespread among other persons who are less visible to law enforcement.

The CEWG incorporates supply and use information and data from a network of 22 geographically dispersed areas. Similar to the NDIC report, the CEWG primarily focuses on identifying the major drugs, the volume of use, and whether use has increased or decreased over the last year or perhaps last several years. The following observation regarding Chicago is typical of the report (NIDA, 2011, p. 66), "Cocaine, heroin and marijuana continued to be the major substances of abuse for Chicago and the surrounding metropolitan area in 2009 and 2010. Major indicators suggested that levels of cocaine, heroin, and marijuana abuse were high and steady, while some indicators suggested cocaine use was declining." With regard to services planning these data appropriately identify which drugs have been associated with the most problems in recent years. In contrast however, our study of the ADAM data clearly identifies that crack and heroin use are in decline. Most of the use of these drugs are among older persistent users, which has important implications for policy planning. The CEWG report contains occasional information about age of users which are particularly helpful. The report notes that in Atlanta, "Seventy-one percent of clients in public treatment for cocaine were older than 35." (NIDA, 2011, p. 61) This finding provides an indicator that the Crack Epidemic may be in decline in Atlanta, as identified in this study. However, the CEWG report does not go so far as to make that conclusion.

The CEWG report makes extensive reference to the level of use and treatment need among youths based primarily on the Youth Risk Behavior Survey (YRBS), school surveys and treatment data. These are excellent sources particularly given that the changes marking the decline of an epidemic tend to start among youths before the broader population. The CEWG report found, "Past-year use of methamphetamine reported by Minnesota 12th graders also declined, from 5.8 percent in 2001 to 1.4 percent in 2010, but it still exceeded the 1.0 percent among 12th graders nationally in 2010." (NIDA, 2011, pp. 85-86) This finding indicates that the Methamphetamine Epidemic is in decline in Minnesota. Similarly, the report notes that in San Diego, "[Prevalence of methamphetamine use among male arrestees] was 22 percent in 2009.… In contrast to adult arrestees, methamphetamine prevalence among juvenile arrestees decreased from 10 percent in 2008 to 6 percent in 2009." (NIDA, 2011, p. 95) The fact that use among youths had declined and that it was already much lower than among adults is strongly consistent with the possibility that the Methamphetamine Epidemic has been in decline for several years in San Diego. We believe that CEWG analyses would be enhanced by this type of application of a drug epidemics perspective. The longer perspective on drug use trends combined with a theoretically informed perspective can assist this program in providing even more insightful information

regarding development of an appropriate response to current and projected near term local drug abuse and related problems.

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VI. Dissemination of Research Findings

The findings of this study are being disseminated through various means to academic, law enforcement, and policy audience. At the time of this final report, two manuscripts based on the findings have been submitted to be considered for publication (Golub & Brownstein, In Review; Golub, Elliott, & Brownstein, In Review).

Golub, A., & Brownstein, H. H. (In Review). Drug Generations in the 2000s: An Analysis of the ADAM II Data. *Journal of Drug Issues.*

Golub, A., Elliott, L., & Brownstein, H. H. (In Review). Regional and demographic variation in the opiate pain reliever epidemic among US Arrestees, 2000-2010. *Journal of Ethnicity in Substance Abuse.*

Dr. Brownstein has extensive law enforcement contacts and has been in touch regularly with them regarding methamphetamine use. Dr. Brownstein had the opportunity to present the ADAM findings to Portland's Law Enforcement Senior staff during a face-to-face meeting. Formal presentation of the findings have occurred or are planned for the following occasions:

Golub, A., Brownstein, H. H. and Dunlap, E. (2011, November). *Monitoring Drug Epidemics and the Markets that Sustain them using ADAM II*. Paper presented at the American Society of Criminology Annual Meeting, Washington, DC.

Golub, A., and Brownstein, H. H. (2011, December). *The Decline of the Methamphetamine Epidemic among Arrestees at Two ADAM II Locations*. Paper presented at the NORC meeting on Local and Regional Dynamics of Methamphetamine Markets to be held in Bethesda, MD. Representatives from ONDCP, NIDA, DEA, NIJ, BJS, and SAMHSA will be in attendance.

Golub, A., Elliott, L. C., and Brownstein, H. H. (2012, August). *The Opiate Pain Reliever Epidemic among US Arrestees, 2000-2010.* Paper presented at the American Sociological Association Annual Meeting, Denver.

Finally, the findings of this study were a central part of a highly innovative proposal to the National Institute on Drug Abuse to study whether the decline of the Methamphetamine Epidemic is more widespread than just the two locations affected by methamphetamine use included in the ADAM II program (Portland OR, and Sacramento).

VII. Special Dissemination to Law Enforcement Officials

The project performed two special dissemination and collaboration efforts with law enforcement practitioners. These activities were designed to advance the project and fulfill the obligation of special dissemination efforts under this grant.

June 2011. Henry Brownstein presented and socialized preliminary findings with Law Enforcement Leaders in Portland (OR). Portland (OR) had some of the most profound findings with regard to methamphetamine and heroin. Dr. Brownstein had the opportunity to present the ADAM findings to Portland's Law Enforcement Senior staff during a face-to-face meeting in Oregon. They provided their insights into current trends in use and drug markets taking into account our findings. This meeting was documented in the grant report of 7/6/2011

12/20/2011. NORC held a local conference entitled, "Meeting on the Methamphetamine Industry in America: Local and Regional Dynamics," at NORC, 4350 East West Hwy., Ste. 800, Bethesda, MD 20814. NDRI PI, Andrew Golub Presented: "The Decline of the Methamphetamine Epidemic among Arrestees at Two ADAM II Locations." Numerous law enforcement and professionals government agency representatives were in attendance. Dr. Linda Truitt was also in attendance.