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

Andrew Golub, PhD
National Development and Research Institutes, Inc.

Henry Brownstein, PhD
NORC at the University of Chicago

August 2012

This project was supported by Award No. 2010-IJ-CX-0011 awarded by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice. The opinions, findings, and conclusions or recommendations expressed in this publication are those of the authors and do not necessarily reflect those of the Department of Justice.

Final Technical Report to the National Institute of Justice

Monitoring Drug Epidemics and the Markets that Sustain Them Using ADAM II
(Grant #2010-IJ-CX-0011)
Andrew Golub, PI; Henry Brownstein, Eloise Dunlap, Co-Investigators
August 20, 2012

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

I. Introduction

A. Statement of the problem.

The complex and combined problem of illegal drug abuse, drug dealing and associated criminality represents one of the largest problems facing law enforcement and related agencies today. Understanding, anticipating, containing and reducing these problems will greatly serve our nation. The development of responsive and effective law enforcement practices depends on an informed understanding of the underlying problems and the measurement of changes over time in response to initiatives. The Arrestee Drug Abuse Monitoring (ADAM) program has been one of the most valuable information resources with regard to confronting drug abuse, drug markets and the crime, safety and public health impacts associated with them. ADAM obtains careful scientific measurements of drug use and related experiences among those people who sustain arrests. Additionally, ADAM provides location-specific information which is extremely valuable because drug use and the markets that sustain them can differ dramatically across locations. In this regard, each jurisdiction must address its own local drug problem. This study advanced the use of ADAM II data by developing the more complete story behind drug use trends through the use of a drug epidemics perspective.

B. Literature Citations and Review.

This study builds on prior empirical research into the structure of drug epidemics and drug markets. These two literatures have primarily developed separately from each other. The drug epidemic literature typically looks at the demand side of use and follows the natural course in the change in use assuming that the supply of drugs evolves to meet demand. The drug market literature places purchasing behaviors at the center of analysis and explores how it is affected by law enforcement initiatives and how the changes in drug markets affect use behavior. This supply side perspective typically ignores the secular shifts in demand associated with the natural course of an epidemic. The blending of the drug epidemic and drug market perspectives provides a more comprehensive view of both drug use and drug markets. The U.S. Drug Control Strategy focuses on employing both supply and demand reduction strategies (ONDCP, 2009b). Indeed, both are needed. However, how much of each depends on the currently prevailing conditions which differ by drug, location and time. Much of the most important empirical research regarding drug epidemics and drug markets has used the ADAM data. This review presents some of the key insights from that work and the techniques used to obtain them.

A framework for studying drug epidemics with ADAM

Prior empirical research suggests that the popularity of a particular drug tends to grow and then wane forming drug epidemics (Becker, 1967; Hamid, 1992; Hunt & Chambers, 1976; Johnston, 1991; Musto, 1993). The natural course of these drug epidemics is mathematically similar to disease epidemics (Anderson & May, 1991) and to other diffusion of innovation phenomena such as the spread of new agricultural technology, teaching methods or fashions (Rogers, 1995). Golub, Johnson and Dunlap (2005) identified that a drug epidemic tends to pass through four distinct phases: incubation, expansion, plateau and decline. This framework was central in pinpointing the decline of the crack epidemic, its expected course for the near future, and the variation across locations (Golub & Johnson, 1994, 1996, 1997). The perspective has been subsequently used to analyze the emergence of the Marijuana/Blunts[1] Epidemic of the 1990s (Golub, 2005; Golub & Johnson, 2001; Golub,

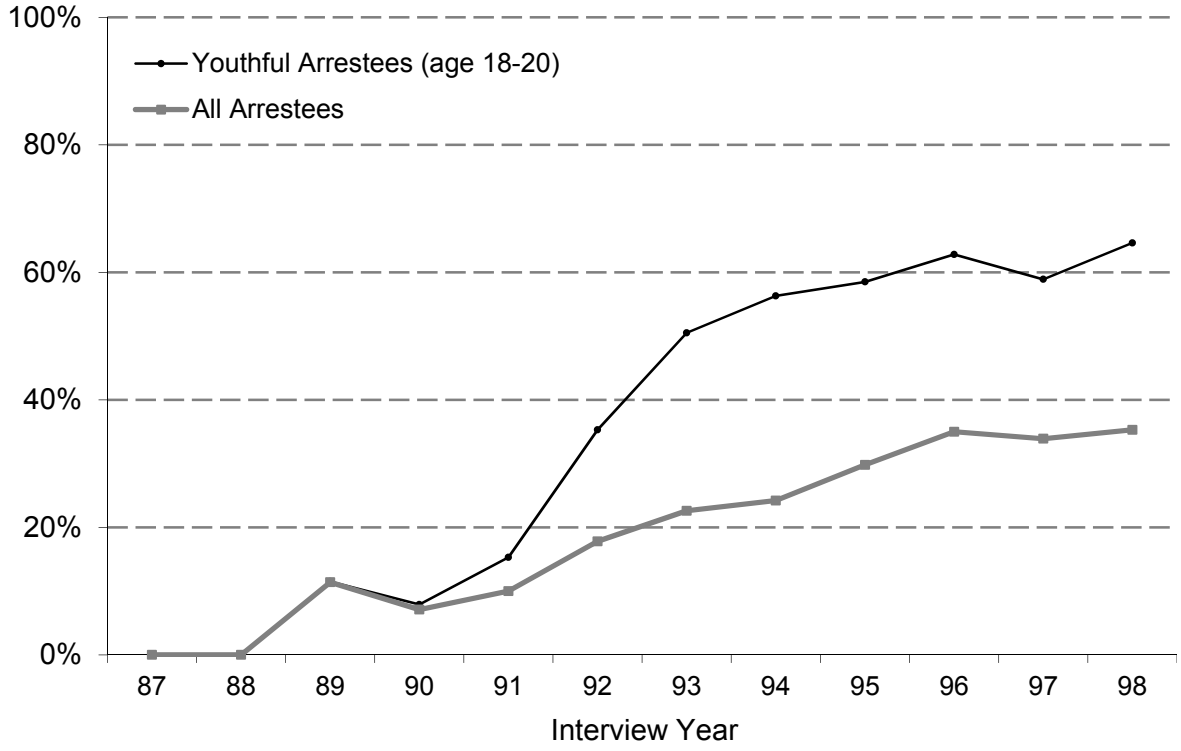
[1]A blunt is an inexpensive cigar in which the tobacco is replaced with marijuana.

Johnson, Dunlap, & Sifaneck, 2004) as well as to study the course of the Heroin Injection Epidemic prevailing in the 1960s and early 1970s (Johnson & Golub, 2002) and to evaluate the significance of a modest rise in use of hallucinogens such as MDMA in the 1990s (Golub, Johnson, Sifaneck, Chesluk, & Parker, 2001).

This study used the drug epidemics perspective to identify the recent course of drug use and project the near term future of use for each of the most commonly abused street drugs (marijuana, crack, powder cocaine, heroin, and methamphetamine) at each of the ten geographically dispersed ADAM II locations. Specifically, the study identified the drug epidemics prevailing at each location, the current phase of the epidemic, whether the epidemic showed signs of entering a next phase, and the expected near-term future net of any major changes.

A first step in the analysis of a drug epidemic is the visual examination of the drug use trend. Figure 1 presents a graph of detected marijuana use among Washington, DC, arrestees (originally appearing in Golub & Johnson, 2001). This chart illustrates the dynamics of the incubation and expansion phases of a drug epidemic as described below. The data are from the Drug Use Forecasting (DUF) program, the predecessor to ADAM (Golub & Johnson, 2001). Figure 2 presents a graph of detected cocaine use (presumably crack) among Manhattan arrestees using the DUF data (originally appearing in Golub & Johnson, 1997). This chart illustrates the plateau and decline phases.

Figure 1: Detected Marijuana Use among Washington, DC, Arrestees



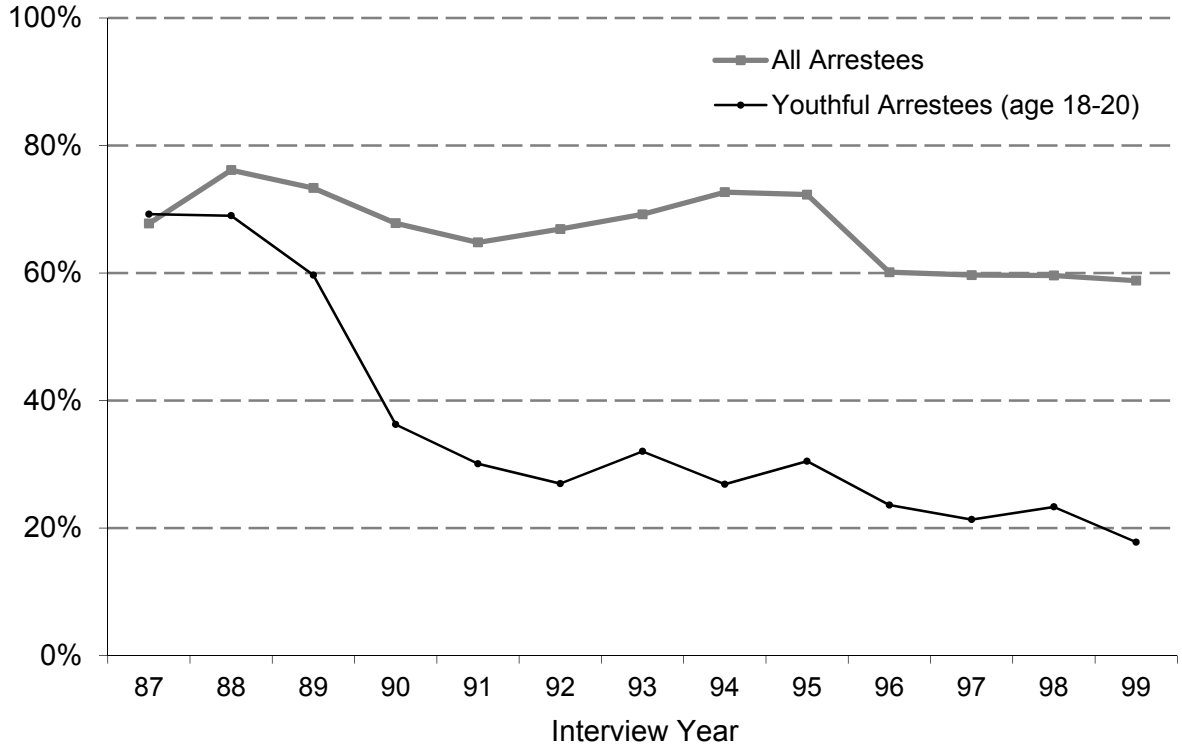
Incubation phase. A drug epidemic typically starts among a highly limited subpopulation. At that time, the prevalence of drug use would be relatively low, as low as marijuana use was in 1989-1990 in Washington DC (Figure 1), or even lower for other illegal drugs that are much less common. In general, the incubation phase can not be identified in advance. It is only after an epidemic has undergone an expansion that one can observe when the incubation period occurred. Ethnographic research indicates that the incubation phase for recent drug epidemics have been associated with very specific contexts involving social gatherings, music, and fashion. The Heroin Injection Epidemic grew out of the jazz music scene (Jonnes, 2002). The Crack Epidemic started with

inner-city drug dealers at after-hours clubs (Hamid, 1992). And, the Marijuana/Blunts Epidemic was based in the hip-hop movement (Sifaneck, Kaplan, Dunlap, & Johnson, 2003).

Expansion phase. Sometimes, the pioneering drug users successfully introduce the practice to the broader population. The prevalence of use during this diffusion period tends to follow an s-shape with initial exponential growth that subsequently tapers off. Figure 1 shows that this growth period for the Marijuana/Blunts Epidemic occurred from 1990 to 1996 in Washington, DC. Golub and Johnson (2001) also performed an age-period-cohort analysis to identify the group most associated with the increased use. This analysis involved the visual inspection of cross-tabulation of the prevalence of detected marijuana use by both birth year and year of use. That analysis indicated that marijuana use was most common among those persons born since 1970, dubbed the Marijuana/Blunts Generation who generally avoided the drugs used by their predecessors: crack and heroin. Ethnographic research indicated that many of these youths preferred smoking their marijuana in a blunt (Golub, 2005).

The expansion phase of the Marijuana/Blunts Epidemic differed substantially from the Crack Epidemic in which it was primarily older users of other hard drugs (powder cocaine and heroin) that were the early users of crack cocaine (Golub & Johnson, 1994, 1996, 1997). Golub and Johnson used age-period cohort analysis to identify the birth cohort involved in the expansion phase and used both least-squares and logistic regression to identify the characteristics of early users and confirm statistical significance.

Figure 2: Detected Cocaine/Crack Use among Manhattan Arrestees



Plateau phase. Eventually, everyone most at risk of the new drug practice (typically users of other illicit drugs) has either initiated use or at least had the opportunity to do so. This point marks the end of the expansion and the beginning of the plateau phase. For a time, widespread use prevails. During this period, youths first coming of age typically initiate use of the currently popular drug(s), if any. These users form the core of a drug generation for whom the drug has particular symbolic significance based in their social activities and relationships. Figure 1 indicates that the Marijuana/Blunts Epidemic had plateaued in Washington, DC, by 1996.

Figure 2 indicates that the Crack Epidemic was already in plateau in Manhattan in 1987-1988. Quantitative and ethnographic analyses of the Crack Epidemic indicated that the epidemic and its open-air drug markets at its peak were associated with extensive violence (Brownstein, 1996; Goldstein, Brownstein, & Ryan, 1992). The decline of the Crack Epidemic was a major factor in the crime drop in New York City and in many jurisdictions across the country (Blumstein & Wallman, 2006; Johnson, Golub, & Dunlap, 2006).

Decline phase. Eventually, the use of an illicit drug tends to go out of favor. New conduct norms emerge that hold that use of a drug is bad or old-fashioned. Ethnographic research revealed that early in the decline phase of the Crack Epidemic that "crackhead" became a dirty word in inner-city New York and that youths avoided peers they suspected had used (Curtis, 1998; Furst, Johnson, Dunlap, & Curtis, 1999). The subsequent diffusion of innovation process of anti-use sentiments then competes with the prevailing pro-use norms. This leads to a gradual decline phase of a drug epidemic. During the decline phase, a decreasing proportion of youths coming of age become users. However, the overall use of the drug endures for many years as some members of a drug generation continue their habits. Figure 2 indicates that the crack epidemic entered the decline phase in Manhattan around 1989, as the prevalence of use among youthful arrestees (age 18-20) declined dramatically to 20% and below by 1996.

A framework for studying drug markets with ADAM

Dr. Bruce D. Johnson distinguished two ideal types of drug markets: the business and freelance models (Brownstein, Mulcahy, Huessy, & Taylor, 2009; Johnson, 2003; Johnson, Hamid, & Sanabria, 1992). The business model is characterized by a highly-organized and disciplined hierarchical structure that dependably attends to the supply and distribution functions. It is the hallmark of a mature drug market in which one or a few corporate-style organizations have cornered the market and firmly established its relationship with users. A classic example of this model would be the dominance of the heroin markets by Italian-American organized crime groups in the 1960s and 1970s. In the freelance model, individual entrepreneurs (or small groups) continually vie for a customer base often through open-air sales in public locations. The powder cocaine market of the early 1980s followed this form. The freelance model may be expected to occur when a new drug becomes increasingly popular or when the dominant selling/distribution organization is put out of business by law enforcement efforts (Curtis & Wendel, 2007).

This study examined the nature of shifts in drug market structure over the course of a drug epidemic. In 2000, the ADAM program introduced a battery of drug market questions that are asked of respondents who reported acquiring drugs (Taylor & Costa, 2003). In a previous analysis, Golub and Johnson (2004) used these data to provide current and perhaps some of the most accurate estimates of the cost of drug users' habits. Based on Johnson's model, Brownstein and Taylor identified various characteristics that can be measured with ADAM data that indicate whether transactions in a particular drug market (distinguished by type of drug, location and time) are more similar to the ideal business or freelance type (Brownstein & Taylor, 2007; Taylor & Brownstein, 2003). These drug-market-stability variables are listed in Table 1. Brownstein et al. (2000) distinguished structural stability as the extent that patterns of organization are fixed over time. The first six variables in Table 1 identify different manifestations of structural stability. In contrast, Brownstein et al. identified interactional stability as the durability of relationships among participants as measured by the last three variables in Table 1.

Brownstein and Taylor used these measures to study the changes to crack and methamphetamine markets. Taylor and Brownstein (2003) found that crack market stability differed across the four locations studied and

within each location from 1995 to 2000. The indicators often moved in different directions over the five-year period for a given location suggesting that drug markets may vary along other dimensions than just a simple continuum between the freelance and business ideal types.

Table 1: ADAM II Indicators of Drug Market Structure

Indicator of Market Stability	Theoretical Basis
Had a cash-only purchase in the last 30 days	The use of currency indicates standardized, routine interactions
Got drugs on credit on last non-cash transaction	Extending credit indicates that dealers and customers anticipate further contact
Contacted dealer using electronic technology	Making advance contact indicates purchases are planned and arranged as opposed to impulsive
Delivered by courier	Courier service indicates selling organizations have coordinated role specialization
Purchased indoors	An indoor location indicates dealers operate from recognized and fixed locations
Did not have a failed transaction in the past 30 days	A failed purchase indicates that supplies are less dependable. ADAM also identifies the percentage of failed transaction due to no dealers available, dealers not having any drugs, and police activity
Number of dealers bought drugs from in past 30 days	Using fewer dealers indicates greater stability of dealer-customer relationships
Last purchase from “regular” dealer	Having a regular dealer indicates ongoing dealer-customer relationships
Last purchase occurred in the neighborhood	Purchasing locally allows the possibility of other ongoing interpersonal interactions between dealer and customer

By 1995, the Crack Epidemic was in the decline phase at each location studied (Golub & Johnson, 1997). Taylor and Brownstein (2003) found a substantial increase in crack market stability in Manhattan from 1995 to 2000. The drug markets more resembled the business model for several measures: fewer failed transactions and more transactions involved a regular dealer. Contrary to the general direction, however, there were more transactions taking place outdoors. In San Diego, stability also generally increased; there were more indoor transactions, fewer transactions failures due to the dealer not having crack, and customers used fewer dealers. There were no significant changes in Portland OR. In contrast, there was generally less stability in Chicago: more failed transactions and more transactions outside the neighborhood, but more customers used a regular dealer. Taylor and Brownstein’s (2003) study indicates that drug market stability does change over time and that during the decline phase of an epidemic greater stability can be generally expected, though not necessarily at every location and not necessarily across all indicators.

Brownstein and Taylor (2007) examined methamphetamine markets from 2000 through 2003. They found that the 6 structural measures of drug market stability formed a reliable index; Cronbach’s Alpha for the combined dataset was .68. This suggests that all of the structural indicators do generally measure a single underlying factor at least for methamphetamine markets during this period. Brownstein and Taylor (2007) found modest variation in the stability of methamphetamine markets across the ten locations studied. Phoenix had one

of the most stable methamphetamine markets with a structural index score[2] of 2.3 and most transactions (61%) involving a regular dealer. San Diego had one of the least stable markets with a structural index of 2.0 and only 48% using a regular dealer. Variations over time for any given location were generally moderate. One of the largest within location variations was observed in Salt Lake City where the structural index ranged from 2.1 to 2.5 and the percent using a regular dealer ranged from 36% to 60%.

C. Statement of hypothesis or rationale for the research

As described above, the ADAM and DUF data have proven to be an excellent resource for studying the local nature of drug epidemics and drug markets. This study used the ADAM II data collected 2007-2010 combined with prior ADAM data collected 2000-20003 with the following study objectives:

Objective 1. Describe the natural course of drug use among arrestees since 2000 through to the expected near-term future in the 10 jurisdictions served by ADAM II.

Objective 2. Evaluate over time the relationships between the changing organization and operation of local drug markets and the direction and course of local drug epidemics in 10 jurisdictions, particularly with regard to the possible impact of law enforcement initiatives.

It was hypothesized that drug market changes are associated with shifts between the phases of an epidemic. The larger question to be determined was whether supply generally follows changes in demand, supply anticipates changes in demand, or whether changes in supply can cause a change in demand. The key focus was upon transitions between phases: incubation-to-expansion, expansion-to-plateau, and plateau-to-decline. The plateau-to-decline transition was of particular interest. The study examined whether drug epidemics entering a decline tended to experience a shift to the more mature business model once demand started to decrease. As an alternative, the study examined whether drug markets become more business-like in anticipation of a coming decline, in which case the change in the drug market stability would have provided an early indicator. Lastly, the study examined the alternative that a disruption to the drug markets could lead to a more entrepreneurial structure and this change could then be associated with the drug epidemic entering the decline phase. An understanding of the relationship between drug markets and drug epidemics was examined to provide additional methods for tracking a drug epidemic, preparing for coming changes in drug markets, for informing law enforcement interventions, and for tracking the efficacy of any such initiatives.

II. Methods

This section describes the steps followed to complete the study.

A. Obtained and prepared data.

The study obtained the ADAM 2000-2003 and the ADAM II 2007-2010 data from the National Archive of Criminal Justice Data (NACJD). Because of the gap between the ADAM and ADAM II programs, there are no

[2]The scale measures drug market stability. The scores can range from 0 indicating the least stable market and most like the freelance market ideal type up to 6 the most stable market representing the business model ideal type.

data available for three years, 2004-2006. The 2010 data became available in November 2011, after all of the analyses had been completed. The study applied for and obtained an extension to this study in order to update analyses. All analyses of the drug epidemics were redone in order to cover 2000-2010. The analyses of drug markets where not revised; they cover 2000-2009.

The DUF program was established in 1987 by the National Institute of Justice to measure trends in illicit drug use among booked arrestees across a geographically diverse group of local jurisdictions. Arrestees are a group of great interest to law enforcement and other related agencies tasked with dealing with illegal drugs and related problems. In 2000, the DUF program underwent substantial improvement, especially with regard to obtaining a representative sample and obtaining drug market information, and was renamed the Arrestee Drug Abuse Monitoring [ADAM] program (National Institute of Justice, 2003a, 2004b). In 2007, the ADAM program was reintroduced as the ADAM II program. The ADAM II program purposefully follows the same recruitment and interview procedures as its predecessor in order to maintain compatibility (Hunt & Rhodes, 2009; ONDCP, 2010a). The analysis will be limited to the adult male arrestees from the 10 locations participating in ADAM II: Atlanta, Charlotte, Chicago, Denver, Indianapolis, Manhattan, Minneapolis, Portland OR, Sacramento, and Washington DC. The data include 37,933 adult male arrestees age 18 and above who provided urine samples.

Figure 3: Geographic Variation in ADAM II Locations.

West	**Midwest**	**Northeast**
Portland (OR)	Minneapolis	Manhattan
Sacramento	Indianapolis	Washington (DC)
Denver	Chicago	
		Southeast
		Charlotte
		Atlanta

The ADAM program (hereafter referring to both ADAM and ADAM II) approaches a representative sample of arrestees awaiting booking within 48 hours of their arrest at each participating location and asks them to complete a 20-25 minute survey and provide a urine sample. They are offered a small incentive (e.g., a candy bar) for participation. Participation rates are generally strong. From 2000 to 2010, 75%-86% of selected respondents that were available agreed to participate and 77%-91% of those provided urine samples (National Institute of Justice, 2003a, 2003b, 2004a, 2004c; ONDCP, 2008, 2009a, 2010b, 2011). In conjunction with data collection, the ADAM program uses censuses and propensity scoring to develop sample weights. Samples weights for each location for each year were renormalized so that the sum of all weights equaled the number of cases. This assured that the multi-year analysis would give the appropriate weight to data collected in any given year proportional to the number of cases collected. These weights were used in all statistical calculations presented in this report to provide unbiased estimates for the target population of adult male arrestees at each location.

The ADAM program performs urine tests to obtain an objective measure of recent drug use not subject to respondents' lack of full and accurate disclosure, which is a problem with the self-report data provided in other surveys (GAO, 1993; Harrison, Martin, Enev, & Harrington, 2007). The detection window differs between drugs (National Institute of Justice, 2003a; ONDCP, 2009a). Methamphetamine, cocaine, and heroin pass through the system within 3 days. Marijuana can remain in the system for up to 30 days, depending on

frequency of use. A major limitation of ADAM urinalysis data is that it does not distinguish mode of consumption. Arrestees that test positive for cocaine may have used crack or power cocaine. Hence, we use the term detected cocaine/crack use. At the locations where more than 10% of arrestees in any year reported past-30-day use of powder cocaine, the analysis examined trends in self-reported past-30 day use of both crack and powder cocaine to make further sense of trends in detected cocaine/crack use. These locations included Atlanta, Charlotte, Denver, Manhattan and Portland (OR). The analysis of self-report data provides a rough indication of whether detected trends in cocaine/crack use might be due to changes in use of crack or powder cocaine. In general, self report rates are much lower than detected rates.

The urinalysis tests also do not distinguish between heroin and other opiates. Hence, we use the term detected opiate/heroin use. At the start of this analysis, it was thought that the test for opiates/heroin might also detect use of prescription opioids such as oxycodone and hydrocodone. Further analysis suggests this is not the case. Only about a quarter of arrestees that reported use of opiate-based painkillers in the past three days were detected as recent opiate users by ADAM. In contrast, the rate of detection for self-reported heroin use was 89%. There are numerous reasons for this possible discrepancy including low opiate levels in painkillers, synthetic vs. natural compounds, and frequency/quantity of use. This report does not examine prescription opioid use among ADAM arrestees because that is outside the scope of the project. However, a paper that derived from the research for this project does look at trends in prescription opioid use among arrestees using the ADAM self-report data (Golub, Elliott, & Brownstein, In Review).

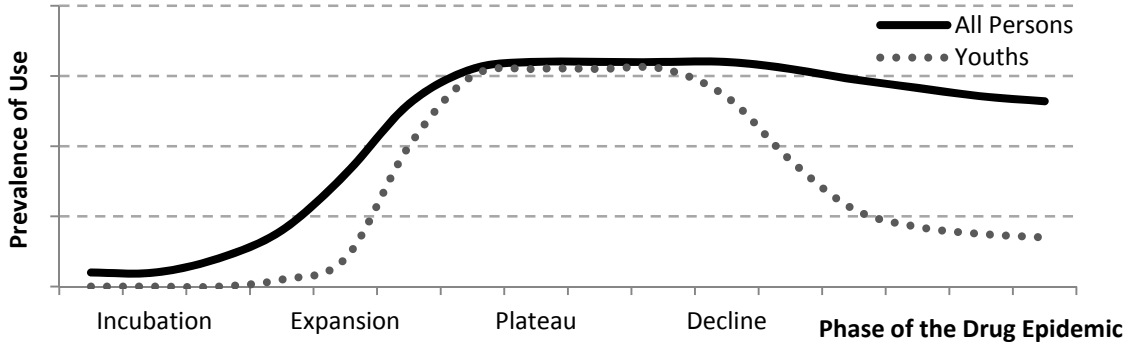
B. Analyzed drug epidemics

The study evaluated trends in marijuana, crack, heroin, and methamphetamine at each of the ten ADAM II locations using a drug epidemics framework. The analyses of heroin and methamphetamine trends are limited to the ADAM sites that have had higher levels of use of these drugs. The analysis also examined the use of cocaine powder in contrast to crack cocaine at the five locations most affected by powder cocaine use. The report presents three sets of analyses for each drug at each site: a graphical trend analysis of variation in detected use of each drug throughout the 2000s, a logistic regression analysis of the variation in detected use across birth cohorts, and a graphical presentation of the variation in detected use across birth cohorts.

Graphical trend analysis

The four phases of a drug epidemic can be distinguished from a graph showing the trend in use of a drug over time (e.g. Figures 1 and 2). The procedure involves comparing the empirically-derived trend graph with a theoretical view for the expected course of a drug epidemic as illustrated in Figure 4. Figure 4 presents two trend lines: the overall rate of use and the rate of use among youths. For this study, overall use is measured as use among all arrestees age 18 and above and use among youths is identified as use among youthful adult arrestees age 18-20.

Figure 4: The four phases of a drug epidemic (A theoretical perspective)



The incubation phase is particularly difficult to identify. During this period use among all persons and among youths specifically are both low. The incubation phase is best identified retrospectively after the expansion phase has been identified. The transition from the incubation to expansion phase is identified as a dramatic increase sustained across multiple years in use among all persons. The transition from the expansion to plateau phase is identified by the prevalence among all persons reaching a sustained level across multiple years. The transition from the plateau to decline phase is identified using the trend among youths as opposed to all persons. The decline phase is distinguished by a rapid decline among youths, while the rate among all persons may remain relatively constant.

A major challenge to the visual analysis is the limited reliability of the estimates obtained with the ADAM data. The standard error (S.E.) the conventional measure of statistical reliability is calculated according to the following formula which reaches a maximum when the probability (P) is 50%: $S.E. = \sqrt{P(1-P)/N}$. The number of ADAM arrestees interviewed at any location in any year was typically around 450. This provides a worst case S.E. at P=50% of about 2.4%. The number of youthful adult arrestees was typically 60 yielding an S.E. around 6.5%. Conventionally, analysts will often consider a margin of error around an estimate of twice the S.E., which corresponds to an approximate 95% confidence interval (CI). This leads to a margin of error of about 5% for adult arrestees and about 13% for youthful adult arrestees. In reading the graphs, greater credence was given to variations larger than the margin of error especially if they were sustained across multiple years. Single-year variations were given limited attention because of the likelihood that they represented chance variation due to the limited reliability of the estimates.

Logistic regression analysis

A logistic regression was performed to identify the extent that detected drug use varied systematically with birth year, interview year, race, arrest charge and charge severity. Logistic regression has the important property of estimating the variation associated with each independent variable simultaneously and thereby controlling for the influence of all other variables included in the analysis (Hosmer & Lemeshow, 1989). In this manner, it was possible to estimate how much detected use varied across birth years controlling for policing priorities that could be identified by a difference in the mix of arrestees and arrest charges, variations across race, and any other factors that could affect year-to-year variation. The Wald statistic was used to test whether the variation associated with each independent variable was statistically significant. This statistic also provides a rough indication of the relative importance of each factor, net of all other variables included in the model. In this

manner, the regression model was able to approximate how much the variation in detected drug use was more associated with birth year than with interview year, race/ethnicity, arrest charge, and charge severity.

Logistic regression models how the odds of detected use systematically vary across arrestees. Odds are an alternative method for represent the probability (P) or percentage of arrestees with specific characteristics test positive. The formula for calculating odds is as follows: Odds = P/(1-P). Logistic regression represents the systematic variation as odds ratios (or ORs). By convention, a parameter value of 1.0 is associated with the reference category for each variable. For example, arrestees born in 1980 were selected as the reference category for birth year. Logistic regression provides an estimate for how detected use differed with birth year. For example, the parameter associated with 1990 identified the extent that arrestees in 1990 were more (or less) likely to be detected. An estimate of 2.0 would indicate that arrestees born in 1990 were twice as likely (had twice the odds) of being detected as users than those born in 1980. A parameter estimate below 1.0 indicates that a group is less likely to be detected.

Graphical analysis of variation across birth cohorts

A graph of the variation in detected use of drugs as it varies across birth years was calculated for each ADAM II location. Golub and Johnson (1999) used this procedure to identify three generations of drug users among Manhattan arrestees: the Heroin Injection Generation born 1945-59, the Crack Generation born 1960-79, and the Marijuana/Blunts generation born since 1980. For this analysis, the study combined all of the ADAM data collected 2000-2010. Visual inspection of the graph was use to indicate a drug generation as those birth years with the highest rates of detected use. The graph also indicates those drug epidemics that are in decline as those drugs that are less popular among arrestees born more recently.

Data for the arrestees born before 1980 were combined into five-year birth cohorts and pre-1960 for ease of presentation. Prevalence estimates for each location are provided for each birth year since 1980 in which at least 25 arrestees provided a urine sample. This minimum helped assure the reliability of estimates. A minimum sample size of 25 assures a maximum standard error of 10%. Accordingly, in reading the graphs, limited credence was given to an estimate for a birth year that differs from the preceding birth year by as much as 20% (an approximate 95% confidence interval) unless rates were comparably high in successive birth years. The pre-1980 multiple birth year cohorts typically had 500 cases or more yielding more reliable estimates with S.E.'s around 2%. ADAM interviewed many fewer arrestees in Washington DC. In order to track recent trends, Washington arrestees born 1986-88 and 1989-92 were combined into larger multi-year birth cohorts.

C. Analyzed changes in drug markets over time

The following three approaches were used to analyze ADAM drug market variables:

1. Micro-data: Reliability and factor analysis of how market structure variables tend to be associated at the level of the individuals' experience.
2. Site-Year Aggregated data: Reliability and factor analysis of the systematic variation in drug market variables over time and across locations.
3. Trend analysis: Visual inspection of the variation in each drug market variable at each site over time comparing the trend to the course of prevailing drug epidemics.

Drug market data preparation

Ten binary indicators of drug market stability were created. The variables used a six-character subject-verb format. The first three characters indicated the drug as follows. There was one set of factors for each of the major ADAM street drugs: marijuana (MJA), crack (CRK), powder cocaine (COC), heroin (HER), and methamphetamine (MTH). The second three characters indicated individuals' drug market experience according to Table 2. Thus, the variable MJACOP indicated that the ADAM arrestee had a cash-only purchase in the last 30 days of marijuana.

Table 2: ADAM II Indicators of Drug Market Structure

Drug market Variable Suffix	ADAM Variable	Indicator of Market Stability
COP	MU1 MU4	Had a cash-only purchase in the last 30 days (1 if had a cash-only exchange 0 if cash exchange was for cash and something else 0 if had a non-cash exchange and no cash exchange)
CRD	MU23	Got drugs on credit on last non-cash transaction 1 if last cash or non-cash transaction was set up
ELE	MA9 MA24	Contacted dealer using electronic technology on either last cash or non-cash exchange used 1. pager [since 2000] or text message [added 2007] 2. telephone [since 2000] 6. internet or chat room [added 2007]
CRR	MU6	Delivered by courier
PID	MU10	Purchased indoors
NFT	MU19	Did not have a failed transaction in the past 30 days
NDL1 NDL3	MU18	Two binary variables were created for number of dealers bought drugs from in past 30 days: only 1, and 3 or less
RSC	MU8	Last purchase from “regular” dealer
HOD	MU11	Last purchase occurred in the neighborhood

Micro data analysis

The first analysis examined whether the drug market variables were interrelated at the individual level, i.e., were users that contacted their dealer electronically more likely to also purchase indoors, or use a regular source. This analysis used the entire dataset for all ten sites from 2000 thru 2009. This analysis was limited to the last 8 variables for each drug which are measured for ADAM arrestees who had cash purchases. The first two variables (COP and CRD) look at non-cash transactions. This analysis was necessarily limited to those respondents that reported having acquired the drug; the analysis excluded ADAM respondents that did not disclose their use or that reported use but did not report having acquired the drug.

The first step involved trying to create a drug-market-stability scale for each drug to combine the information across multiple variables into a more powerful indicator. Eight of the nine drug-market-stability variables in Table 1 are binary, which is convenient for creating a scale. Number of dealers in the past 30 days was used to create a pair of nested binary variables: has a single dealer in the past 30 days and had 3 or fewer dealers in the past 30 days. All of the other variables in Table 1 were coded such that a 1 indicates a market that is more stable.

For each drug, the a factor analysis was performed to determine the number of dimensions to drug market stability (Johnson & Wichern, 1982). The number of apparent underlying dimensions was identified as the number of Eigen values greater than 1 in the principal component analysis, a standard cutoff level. If all of the variables are associated with a single underlying latent characteristic then the analysis should identify a single factor that explains nearly all of the variation. The plan was to calculate simple point score scales based on a varimax rotation and to then test the reliability of each scale using Cronbach's Alpha (Cortina, 1993). However, the factor analysis suggested that there were not strong and consistent factors. So this follow-up step was not completed. For the subsequent analyses, all ten drug-market-stability variables were analyzed instead of a fewer number of stability scales.

Site-year aggregate variable analysis

Weighted averages were calculated for each of the ten drug market stability variables for each drug at each site in each year. Analysis was limited to those drugs at each site where the overall prevalence reached at least 10% in a single year. This yielded a total sample of N=77 site-years combinations from 2000 through 2009 for marijuana and crack cocaine. Only 5 sites were included in the analysis of powder cocaine, 4 for heroin, and 2 for methamphetamine. The data are percentages, a ratio variable, which is more appropriate for use with statistical analyses that call for continuous variables such as correlation, reliability and factor analysis.

Time trend analysis

The analyses of scales specified in the micro-data analysis did not identify any systematic findings. Similarly, the analysis of the scales using site-year aggregate variables also did not identify any systematic time trends. To provide a more thorough approach, a detailed visual inspection was performed to identify any major shifts in any drug market variable over time. The tables presented examine detected use for youthful adult arrestees age 18-20 for each drug (e.g., MJAPOS18) and for all adult arrestees age 18 and above (e.g., MJAPOS). The visual inspection of time trends involved the very basic procedure of reading each line of each table (other than POS or POS18) and identifying all substantial and sustained changes in a drug market variable. The goal was that some patterns would pop out. Particular credence was given to shifts of 20 percentage points or better that were sustained for at least two years, especially if similar patterns occurred at more than one site.

Limitations

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. A major value of this study is that it confirms its own geographic limitations. The sometimes idiosyncratic drug use trends identified strongly suggest that it can be difficult and sometimes inappropriate to try to generalize the findings of this analysis based on 10 locations to the nation overall or to other locations not included in the ADAM II Program. The ADAM II locations provide geographic diversity but the program does not include any rural locations. Hence, it would be inappropriate to project the broader trends identified here to rural areas. Another problem is the possible existence of individual locations that are exceptions to the broader trends. Conceivably there could be some locations where crack may still be common among youthful adult arrestees and marijuana less common. This potential for location-specific trends is very important with regard to tracking the use of heroin, powder cocaine and methamphetamine which were common at only a few of the 10

locations studied. These substantial variations across locations indicate that it is not possible to tell whether a community is dealing with these less common drugs and the nature of any trends in use without data specific to that location. This location specific focus is both the primary advantage and the central limitation of the ADAM data.

III. Results

State of the drug epidemics by location

Atlanta

Atlanta

(N=3,469)

Atlanta Marijuana Epidemic in plateau since 1996. (Golub & Johnson, 2001) found that marijuana use was in plateau or possibly still expanding as of 1999. The rate of detected use among youthful adult arrestees had reached 70% in 1996 where it had remained through 1999. In 2000, the rate detected by ADAM was still about 70%. The rate then increased modestly to a peak of 85% in 2007and then declined substantially for two years down to 67% in 2009-2010 (Fig. 1). However, the logistic regression analysis indicated that arrestees born 1981-90 were consistently much higher (ORs=1.6-3.7) than for arrestees born before 1980 (ORs=0.2-1.0), and that the rates among those born 1987-1990 (2.1-3.1) were still near the peak levels prevailing. Thus, marijuana use among young persons who sustain arrests is still widespread and at peak or near peak levels. The data suggests that the decline among youthful adult arrestees represents a stabilization of the plateau phase as opposed to the beginning of a decline.

Atlanta-Crack Epidemic in decline before 2000, cocaine powder use possibly in plateau or early decline. Golub and Johnson (1997) estimated that the crack epidemic had been in plateau from 1990-96 as detected cocaine/crack remained relatively stable. As of 2000 (Fig. 2), detected cocaine/crack use was still high among all adult arrestees (49%). Detected cocaine/crack use among youthful arrestees had dropped to 14%. However, further analysis suggests that crack use among youths had declined to even lower levels and that the rate of detected cocaine/crack use among youthful adult arrestees represented primarily a sustained use of powder cocaine more so than crack. The self-report data indicates that powder cocaine (0%-8%) was more popular than crack (0%-5%) among youthful adult arrestees during the 2000s, although neither was particular popular. The graph of self-report use by birth year further confirms this trend (Fig. 3). Arrestees born before 1970 were the most likely to report having used crack in the past 30 days (36%-46%). Arrestees born since 1980 have been extremely unlikely to report using crack (0%-7%) as would be expected during the decline phase. Identifying the state of the cocaine powder epidemic is extremely difficult because the analysis depends on reported use as opposed to urinalysis and the prevalence was never that high among youthful adult arrestees. There was a one-year drop from major dip 5% in 2009 to 0% in 2010. This could be the start of the decline phase, however it could be premature to make this claim since the drop has only been observed for a single year. Powder cocaine use had been 0% among youthful adult arrestees in 2007, but that rate was not sustained the following year.

Figure 1-Atlanta: Detected Marijuana Use 2000-10

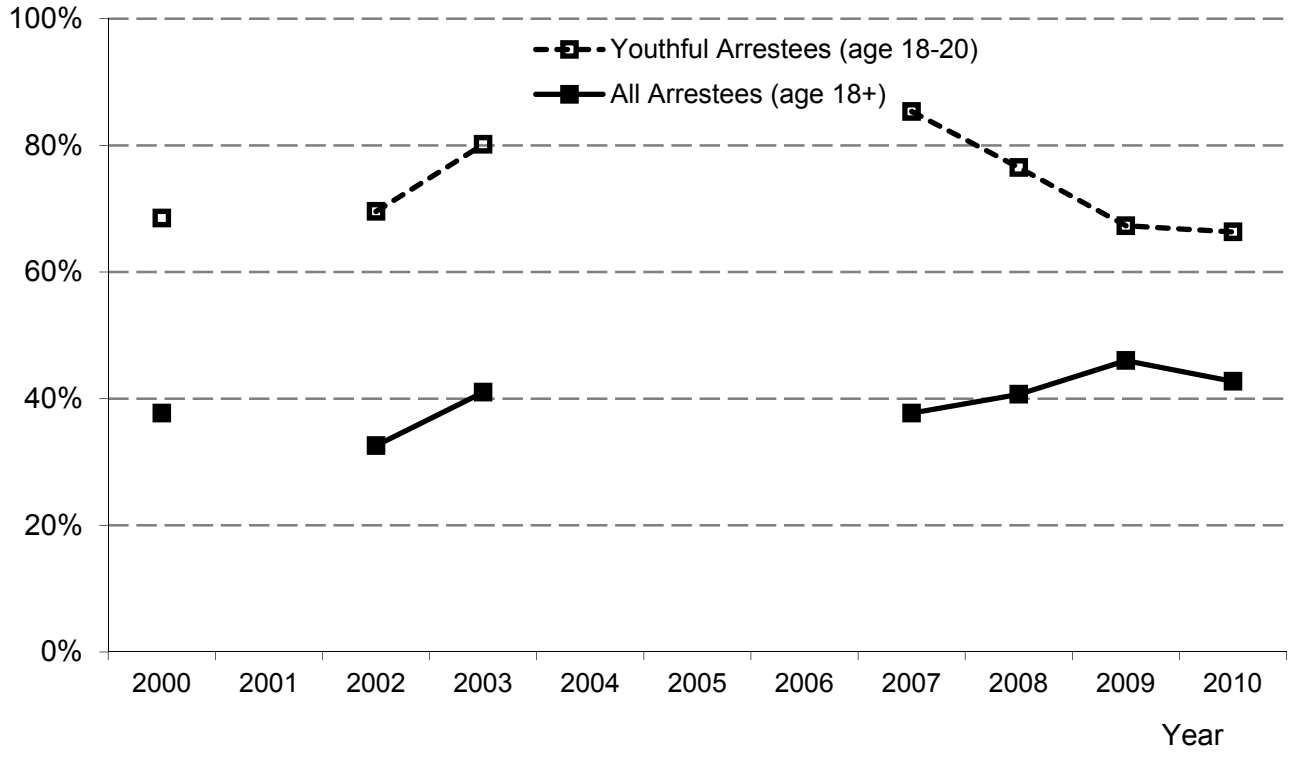


Figure 2-Atlanta: Detected and Reported Cocaine/Crack Use 2000-10

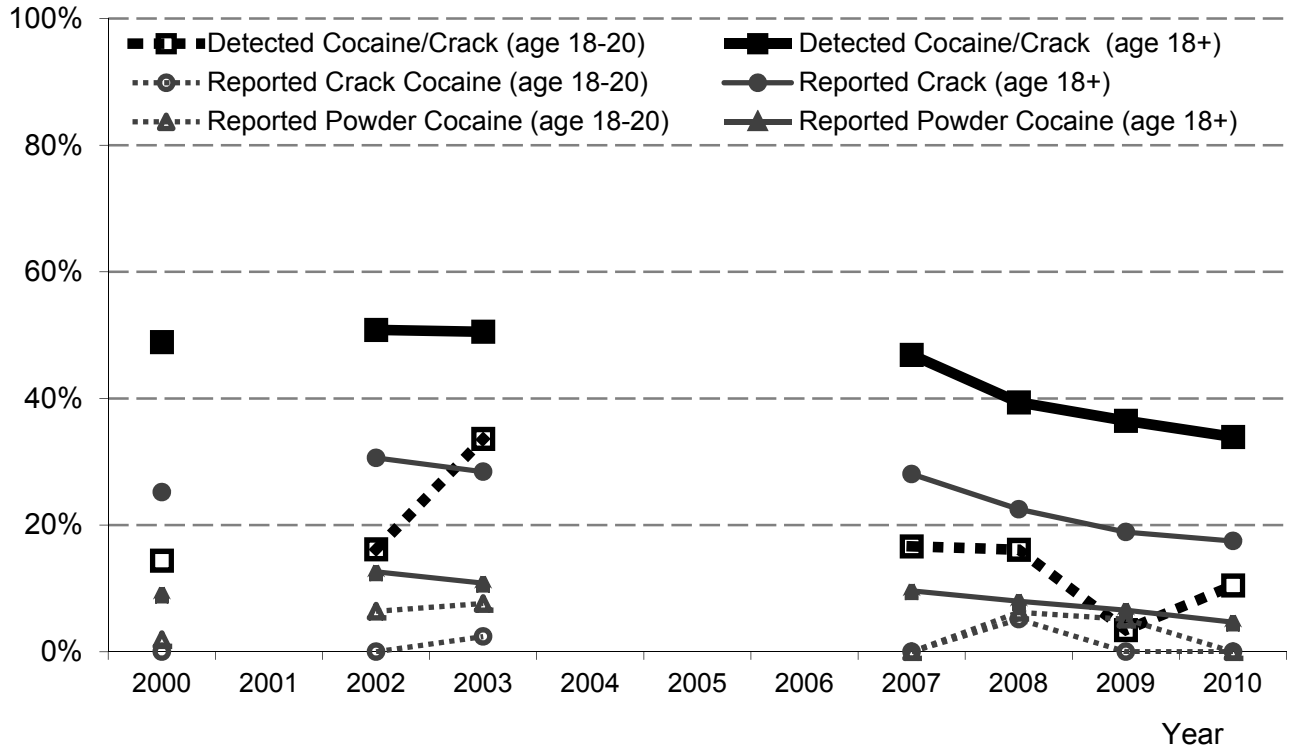


Figure 3-Atlanta: Variation in Detected Drug Use by Birth Year

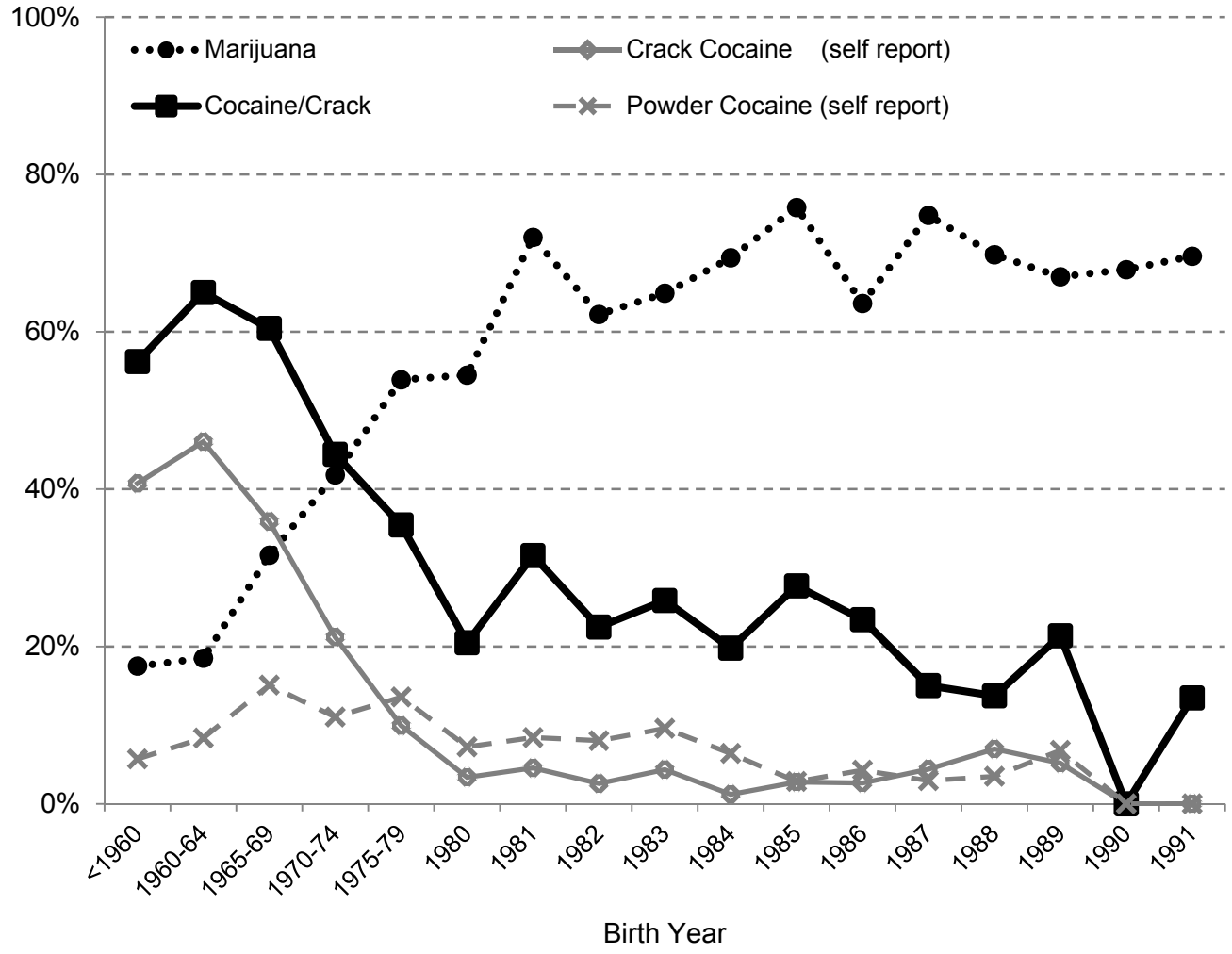


Table 1-Atlanta: Logistic Regression of Detected Marijuana and Cocaine/Crack Use

	Odds Ratio (Wald Statistic)	
	Marijuana	**Cocaine/Crack**
Birth Year	(475.0)**	(295.1)**
<1960	0.2	2.4
1960-64	0.2	3.6
1965-69	0.4	2.8
1970-74	0.7	1.5
1975-79[a]	1.0	1.0
1980	1.1	0.5
1981	2.2	0.7
1982	1.6	0.5
1983	2.0	0.6
1984	2.1	0.5
1985	3.7	0.7
1986	1.7	0.5
1987	3.1	0.3
1988	2.6	0.3
1989	2.1	0.5
1990	3.0	0.0
1991[c]	--	--
1992[c]	--	--
Interview Year	(27.2)**	(21.4)**
2000[a]	1.0	1.0
2001[b]	--	--
2002	0.6	1.4
2003	1.0	1.4
2007	0.6	1.2
2008	0.7	1.0
2009	0.8	0.9
2010	0.6	0.9
Race/Ethnicity	(64.1)**	(66.4)**
African American[a]	1.0	1.0
White	0.7	0.4
Hispanic	0.2	0.6
Other/missing	0.8	0.7
Charge	(70.3)**	(74.6)**
Drugs[a]	1.0	1.0
Violent	0.4	0.3
Income	0.3	0.9
Other	0.4	0.5
Severity	(0.2)	(4.0)
Felony[a]	--	--
Misdemeanor	--	--
Other	--	--
Base Odds	3.8	0.9

[a]Reference Category
[b]Data not collected in Atlanta in 2001
[c]Parameter estimates not shown because they were based on fewer than 25 arrestees born this year.
--Parameter estimates not shown because variation with this variable was not statistically significant*Statistically significant at the α=.05 level. **Statistically significant at the α=.01 level.

Charlotte

Charlotte
(N=2,785)
Charlotte joined the ADAM program in 2000. Hence, Golub and Johnson (1997, 2001) do not provide information about the Crack and Marijuana Epidemics based on DUF data collected in the 1980s and 1990s.

Charlotte-Marijuana Epidemic in plateau since before 2000. There was a sustained decline in detected marijuana use among youthful adult arrestees from a recorded peak of 85% in 2000 down to 50% by 2009 (Fig. 1). In 2010, there was a major one-year increase back to 81%. From 2000 to 2008, the overall rate among adult arrestees remained relatively constant at 40%-46%. This rate dropped to 33% in 2009 but returned to 48% in 2010. The logistic regression analysis strongly suggests that there has not been a substantial decline in marijuana use among youthful adult arrestees. The odds ratios of detected marijuana use among arrestees born 1990-91 (ORs=2.6-3.6) are even higher than those for arrestees born 1980-89 (ORs=1.1-2.2). The variation in detected use by birth year indicates a fairly wide fluctuation in detected marijuana use ranging from 50% to 75% among arrestees born 1980-91, but no sustained decline (Fig. 3). This lack of a decrease is the primary basis for estimating that the Marijuana Epidemic in Charlotte is still in its plateau phase.

Charlotte-Crack Epidemic in decline since 2001 and possibly earlier. Powder cocaine epidemic has also been in decline since at least 2001. There was a dramatic drop in detected cocaine/crack among youthful adult arrestees from 53% in 2000 to 10% in 2001 and a further steady decrease down to 5% in 2010 (Fig. 2). Self-report data suggests that this drop was the result of a decline in powder cocaine use among youthful adult arrestees rather than crack. The rate of reported powder cocaine use among youthful adult arrestees dropped from 23% in 2000 to 7% in 2001. There was a slight increase in 2002 to 12% followed by a steady and sustained decline down to a mere 1% in 2010. The low rate of self-report crack use among youthful adult arrestees throughout the 2000s suggests that the Crack Epidemic might have already been in decline before 2000. Further confirmation with urinalysis data is not possible given that Charlotte joined the ADAM program in 2000.

The variation across birth cohorts provides further confirmation of the decline in crack use (Fig. 3). Reported crack use was relatively uncommon among arrestees born 1975-86 (4%-8%) and even less common among those born 1987-91 (0%-2%). This suggests that most of the detected cocaine/crack use among arrestees born since 1980 is for powder cocaine, not crack, and that the percentage associated with powder cocaine increased over time. The proportion of arrestees reporting use of powder cocaine also declined from a high of 14% among those born 1981-82 down to 0% for those born 1991, with an anomalous one-year peak of 13% among those born 1989. This suggests that the use of powder cocaine is also in decline.

Figure 1-Charlotte: Detected Marijuana Use 2000-10

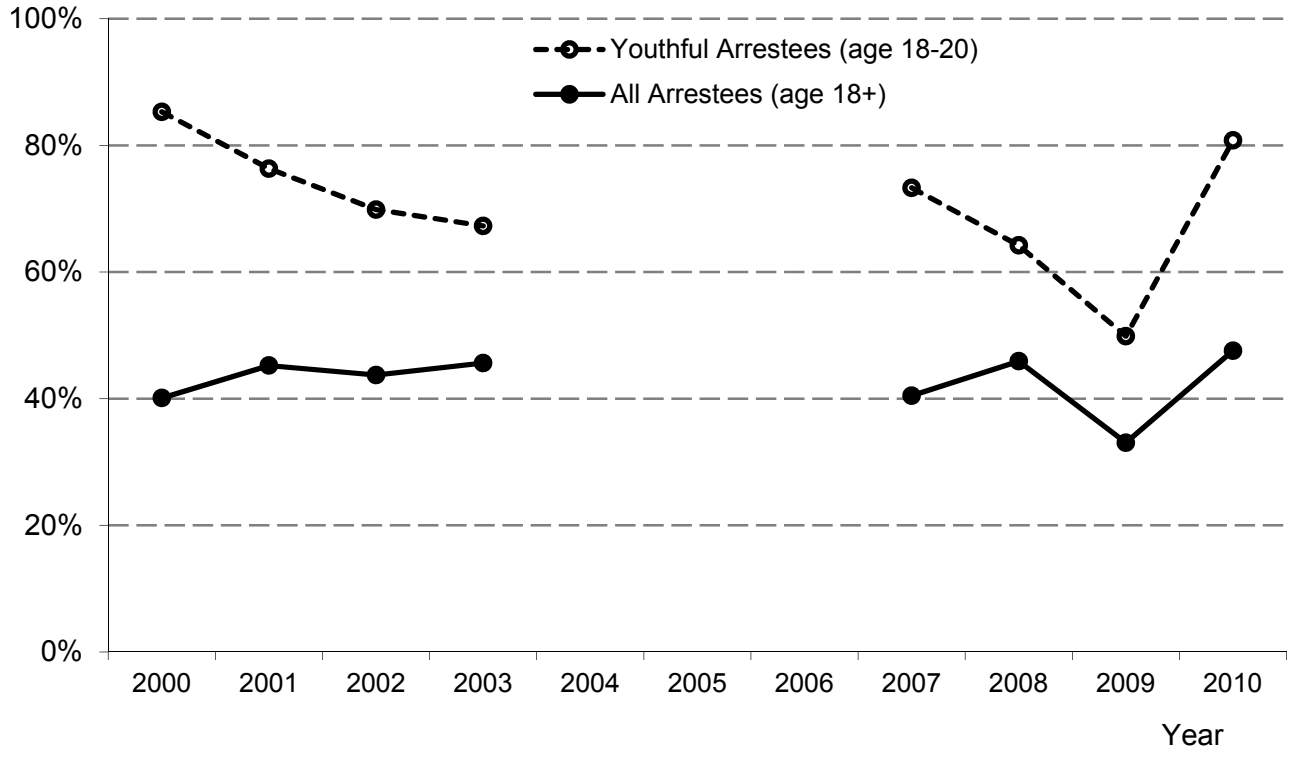


Figure 2-Charlotte: Detected and Reported Cocaine/Crack Use 2000-10

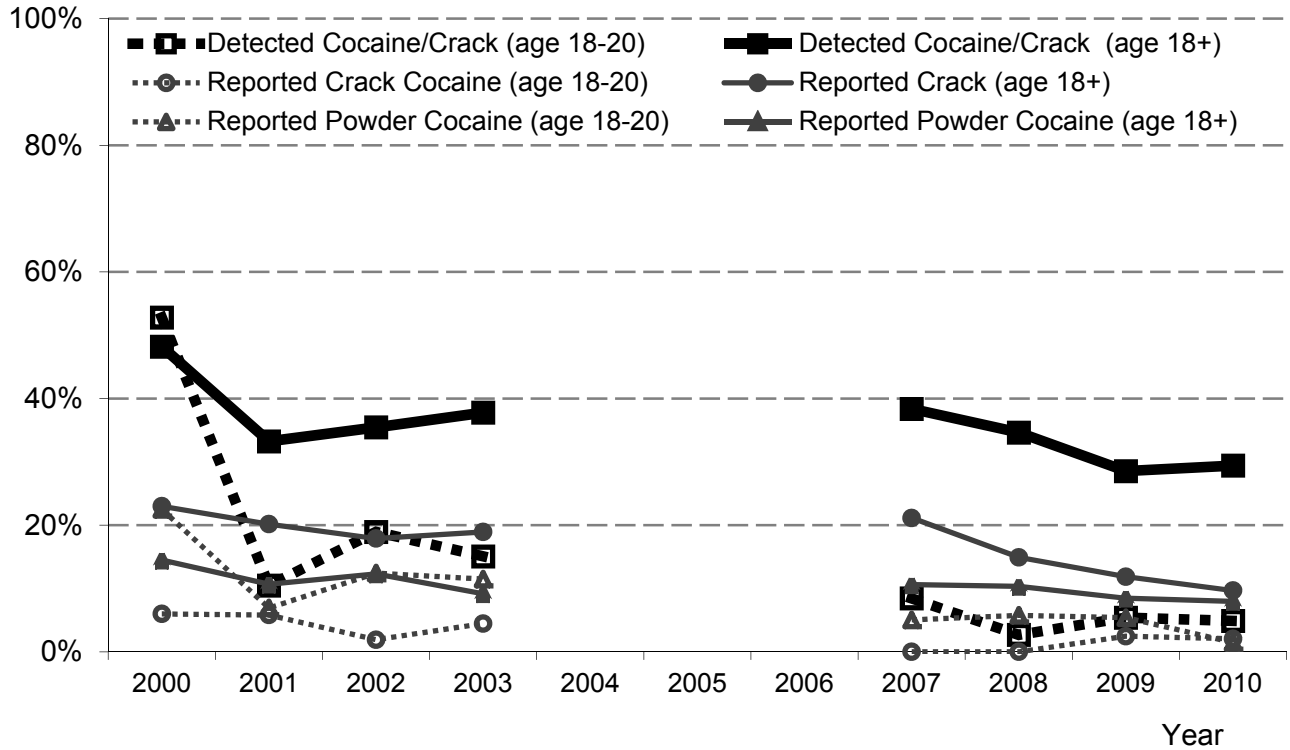


Figure 3-Charlotte:Variation in Detected and Reported Drug Use by Birth Year

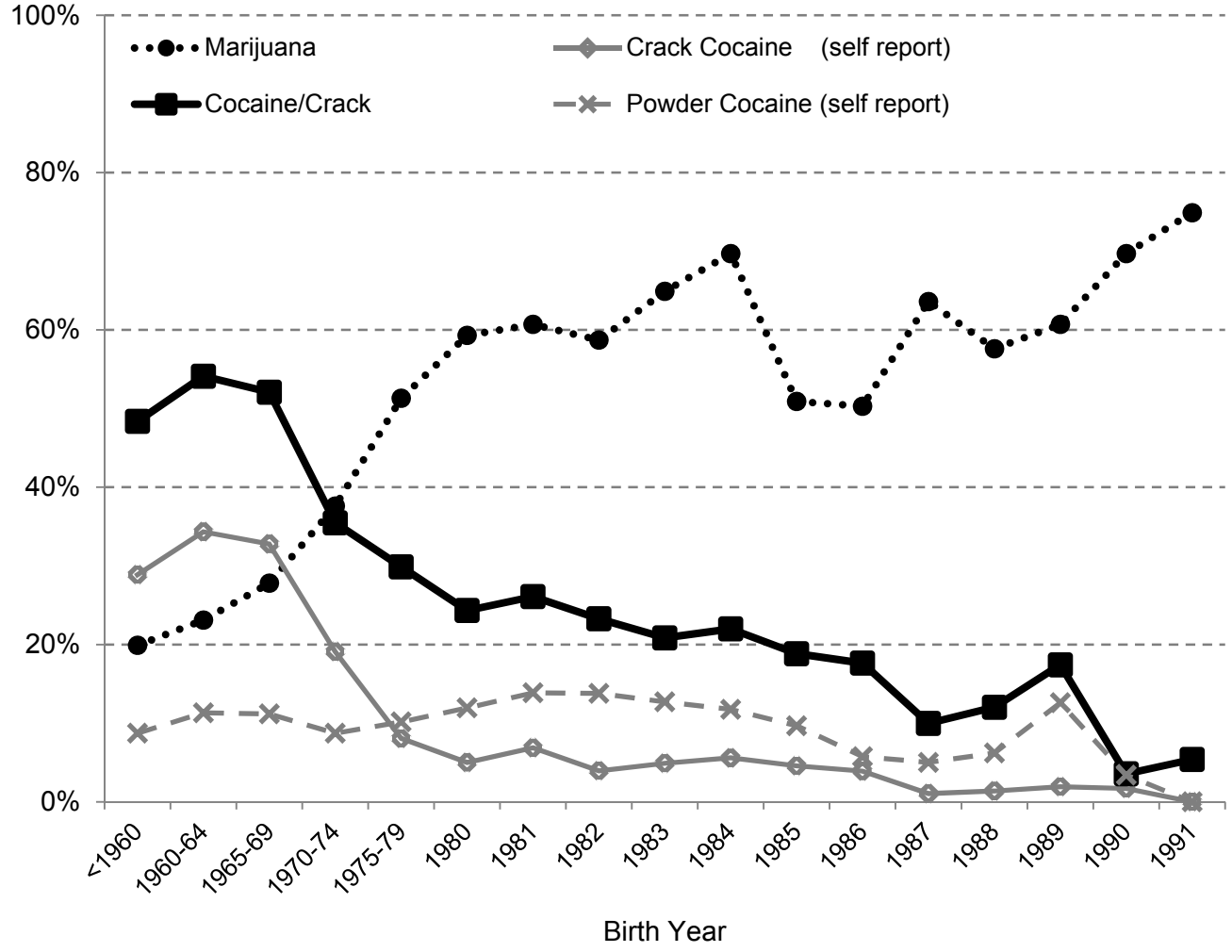


Table 1-Charlotte: Logistic Regression of Detected Marijuana and Cocaine/Crack Use

	Odds Ratio (Wald Statistic) Marijuana	Cocaine/Crack
	(335.7)**	(239.6)**
<1960	0.2	2.4
1960-64	0.2	2.9
1965-69	0.3	2.8
1970-74	0.5	1.4
1975-79[a]	1.0	1.0
1980	1.5	0.7
1981	1.5	0.8
1982	1.5	0.7
1983	1.7	0.5
1984	2.2	0.5
1985	1.1	0.5
1986	1.2	0.4
1987	2.0	0.2
1988	1.4	0.2
1989	1.7	0.4
1990	3.6	0.1
1991	2.6	0.1
1992[c]	--	--
Interview Year	(21.3)**	(16.6)*
2000[a]	1.0	1.0
2001	1.1	0.5
2002	1.0	0.6
2003	1.1	0.6
2007	0.8	0.9
2008	1.0	0.7
2009	0.6	0.6
2010	0.9	0.8
Race/Ethnicity	(132.1)**	(20.3)**
African American[a]	1.0	1.0
White	0.6	0.7
Hispanic	0.1	0.6
Other/missing	0.5	0.5
Charge	(63.3)**	(85.2)**
Drugs[a]	1.0	1.0
Violent	0.3	0.2
Income	0.4	0.7
Other	0.4	0.4
Severity	(3.6)	(6.8)*
Felony[a]	--	1.0
Misdemeanor	--	0.8
Other	--	0.7
Base Odds	4.3	1.8

[a]Reference Category
[c]Parameter estimates not shown because they were based on fewer than 25 arrestees born this year
--Parameter estimates not shown because variation with this variable was not statistically
*Statistically significant at the α=.05 level. **Statistically significant at the α=.01 level.

Chicago

Chicago
(N=4,228)

Chicago-Marijuana Epidemic in plateau since 1996. Golub and Johnson (2001) estimated that the Marijuana Epidemic in Chicago entered the plateau phase in 1996. In the mid to late 1990s, 70% to 80% of youthful adult arrestees were detected as recent marijuana users. Those rates continued into the 2000s (Fig. 1). There was a peak rate of 87% detected in 2001, followed by a drop to about 80% in 2002-2007, followed by another drop just below 70% in 2008-2009, and a subsequent increase back to 79% in 2010. The logistic regression analysis suggests the Marijuana Epidemic is solidly in plateau (Table 1); arrestees born in recent years are just as likely to be detected as recent marijuana users as older birth cohorts. The odds ratio for detected marijuana use among arrestees born 1985-92 (1.6-10/0) was generally higher than those born 1980-84 (1.3-2.2). The rate of detected marijuana use (Fig. 3) among arrestees born 1981-91 had been rather steady and high ranging from 65% to 79%.

Chicago-Crack Epidemic still in a slow decline since 1994. Golub and Johnson (1997) estimated that the Crack Epidemic in Chicago had entered the decline phase in 1994. Detected cocaine/crack use among youthful adult arrestees dropped from about 50% in 1993 down to 20% in 1996. In 2000, the rate of detected use among youthful adult arrestees was down to 14% (Fig. 2). In the late 2000s, detected cocaine/crack use decreased modestly among all adult arrestees from 35% (2007) down to 26% (2010). Moreover, there was a dramatic drop among youthful adult arrestees from 25% in 2008 down to 3% in 2009 and only a modest increase to 8% in 2010. This latter trend strongly confirms that the crack epidemic was still in decline as of 2010.

Chicago-Opiate/Heroin Epidemic continued its decline throughout the 2000s. Detected opiate/heroin use among youthful adult arrestees in Chicago remained moderately low ranging from 1% to 10% throughout the 2000s. The rate of detected use among all adult arrestees descended steadily from 29% in 2000 to a new low of 12% in 2009.

Figure 1-Chicago: Detected Marijuana Use 2000-10

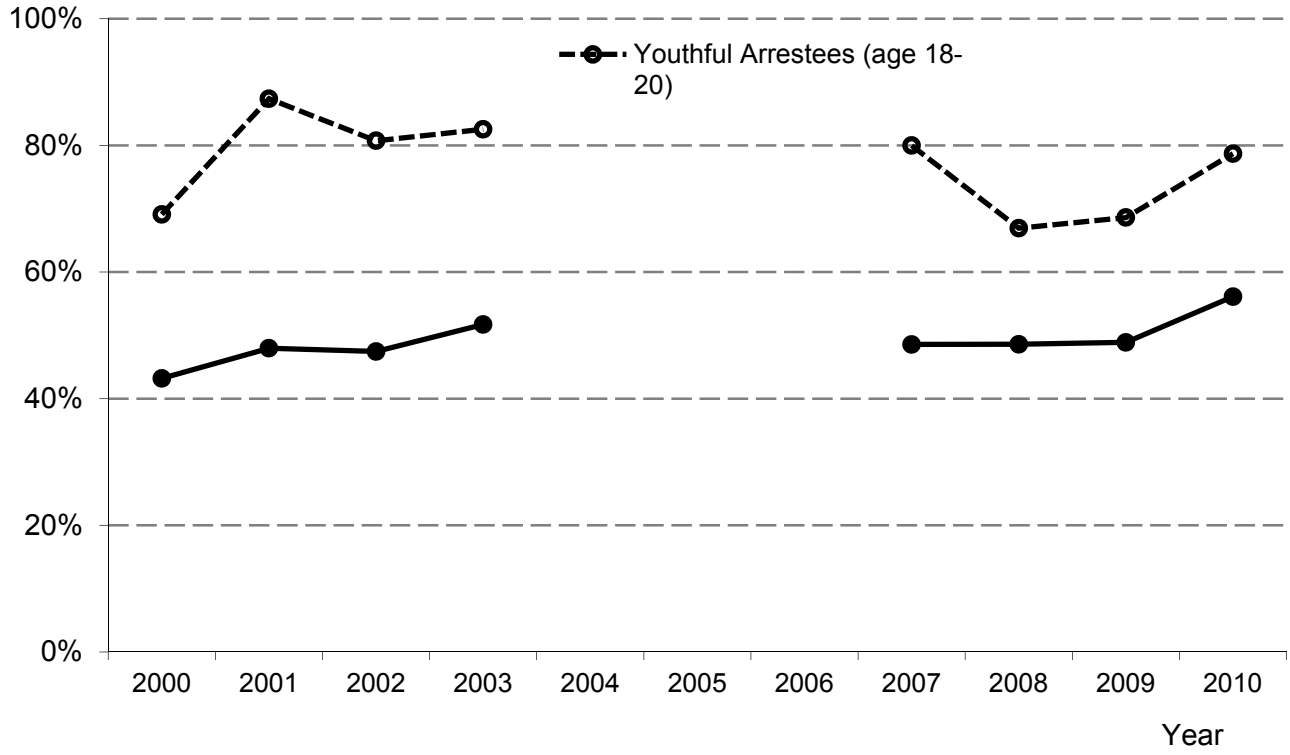


Figure 2-Chicago: Detected and Reported Cocaine/Crack Use 2000-10

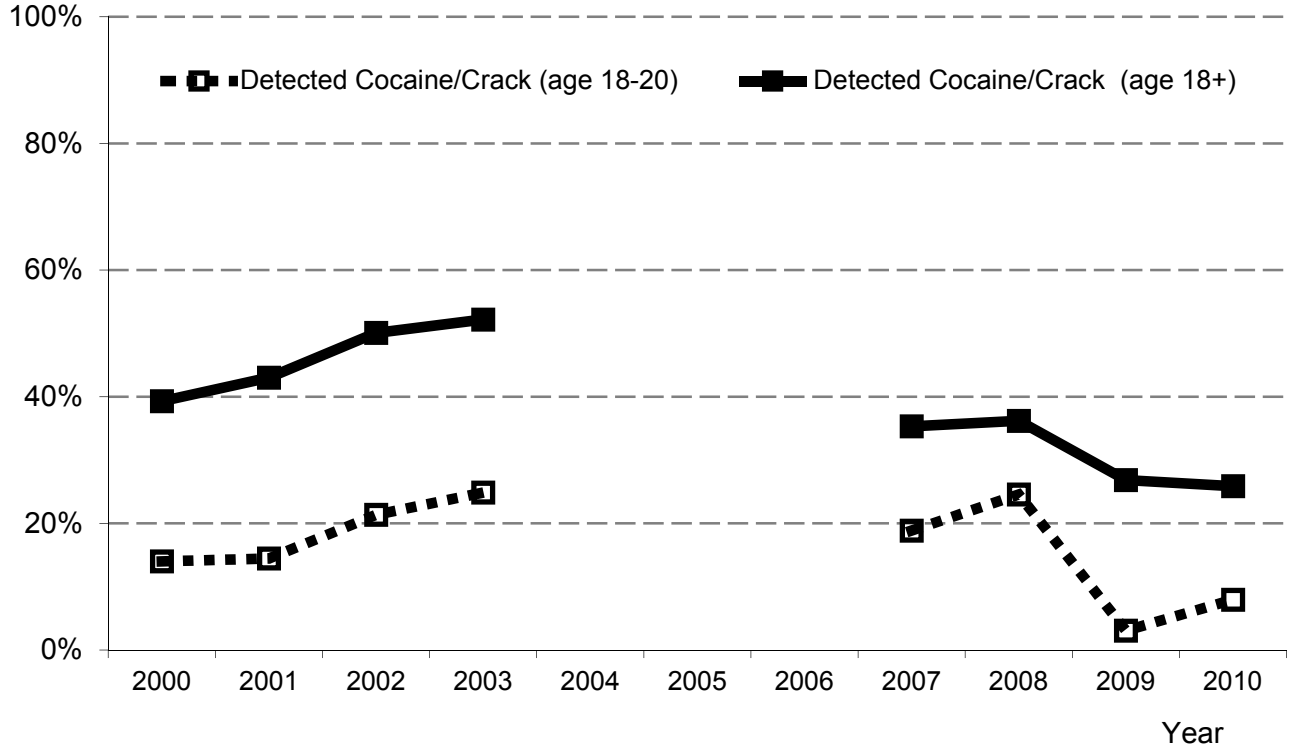


Figure 3-Chicago:Variation in Detected Drug Use by Birth Year

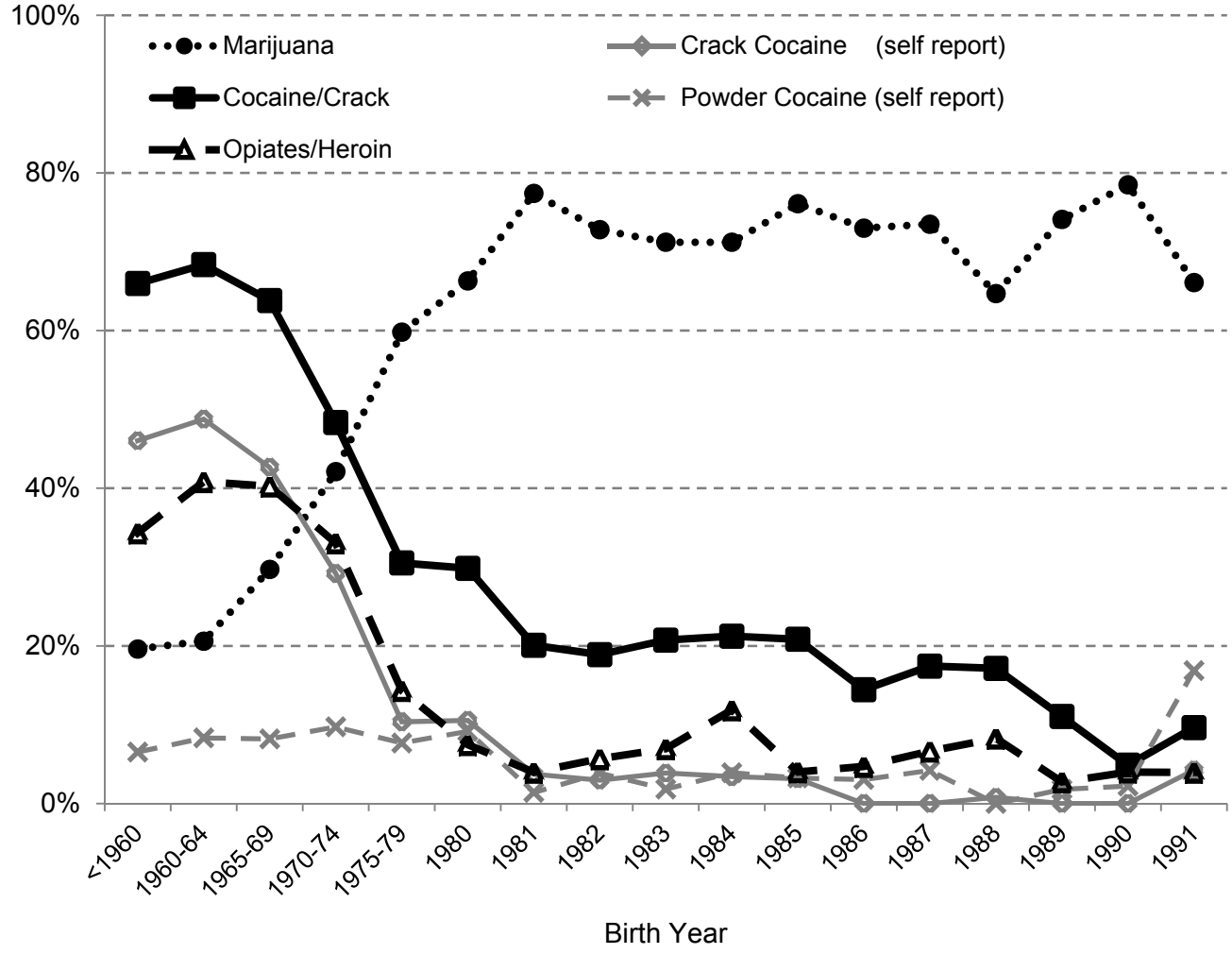


Figure 4-Chicago: Detected Opiate/Heroin Use 2000-10

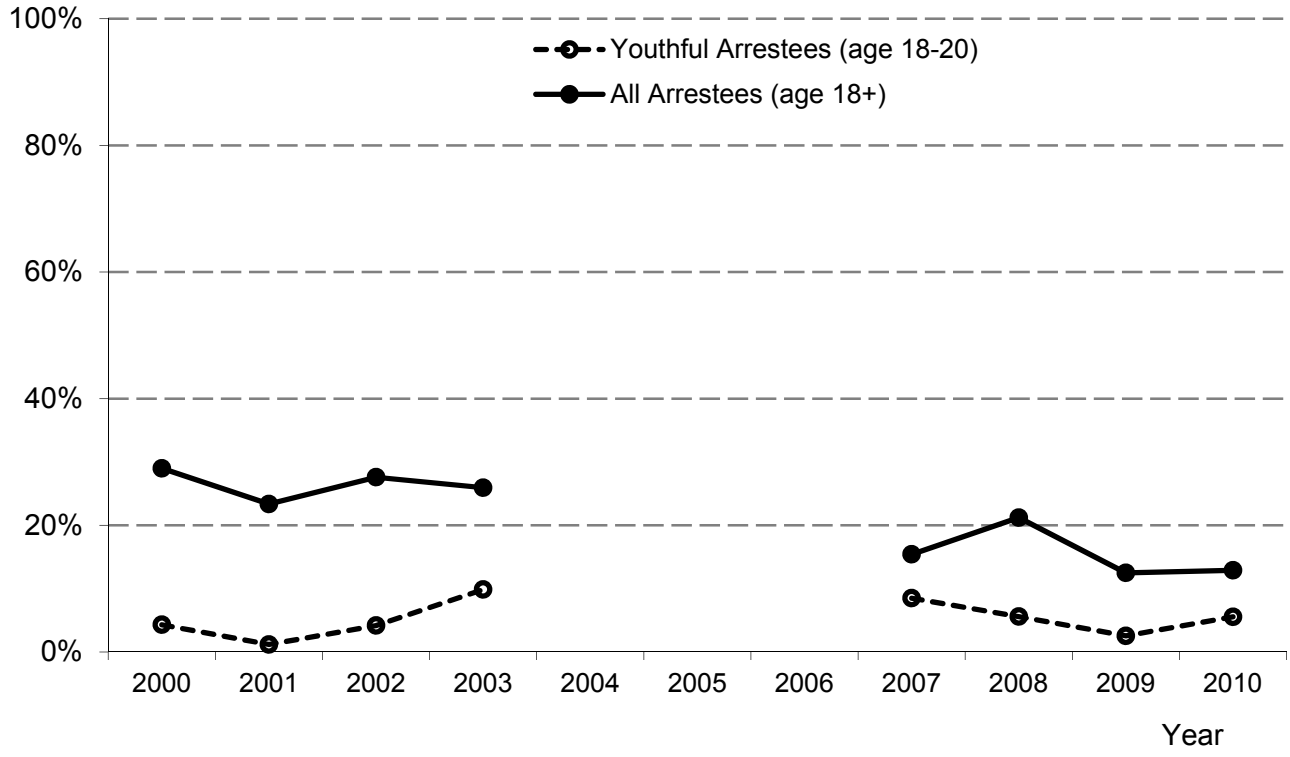


Table 1-Chicago: Logistic Regression of Detected Marijuana, Cocaine/Crack and Opiate/Heroin Use

	Odds Ratio (Wald Statistic)		
	Marijuana	**Cocaine/Crack**	**Opiate/Heroin**
Birth Year	(755.9)**	(609.0)**	(377.0)**
<1960	0.1	4.7	3.0
1960-64	0.2	5.3	4.1
1965-69	0.3	4.2	3.9
1970-74	0.5	2.2	3.3
1975-79[a]	1.0	1.0	1.0
1980	1.3	0.9	0.5
1981	2.2	0.5	0.2
1982	1.7	0.5	0.4
1983	1.6	0.6	0.5
1984	1.8	0.5	0.7
1985	2.4	0.5	0.2
1986	2.3	0.5	0.4
1987	2.4	0.7	0.5
1988	1.6	0.6	0.7
1989	2.7	0.4	0.2
1990	3.2	0.2	0.3
1991	1.6	0.4	0.3
1992	10.0	0.4	0.4
Interview Year	(11.1)	(25.0)**	(20.4)**
2000[a]	--	1.0	1.0
2001	--	1.2	0.6
2002	--	1.5	0.7
2003	--	1.9	0.7
2007	--	1.7	1.0
2008	--	1.8	1.3
2009	--	1.4	0.9
2010		1.4	1.0
Race/Ethnicity	(51.0)**	(24.5)**	(35.3)**
African American[a]	1.0	1.0	1.0
White	0.9	1.3	1.9
Hispanic	0.5	1.6	0.8
Other/missing	1.0	0.7	0.7
Charge	(35.9)**	(112.3)**	(81.7)**
Drugs[a]	1.0	1.0	1.0
Violent	0.7	0.2	0.2
Income	0.5	0.7	0.9
Other	0.7	0.3	0.3
Severity	(1.0)	(0.3)	(21.7)**
Felony[a]	--	--	1.0
Misdemeanor	--	--	0.5
Other	--	--	1.3
Base Odds	2.1	0.4	0.3

[a]Reference Category
[c]Parameter estimates not shown because they were based on fewer than 25 arrestees born this year -- Parameter estimates not shown because variation with this variable was not statistically significant
*Statistically significant at the α=.05 level. **Statistically significant at the α=.01 level.

Denver

Denver
(N=4,469)

Denver—Marijuana Epidemic in plateau since 1994. Golub and Johnson (2001) estimated that the Marijuana Epidemic in Detroit reached a plateau in 1994. Marijuana use among youthful adult arrestees in the 2000s (Fig. 1) grew from 53% in 2000 up to 82% in 2009. During this period use among all adult arrestees remained quite stable at 40%-45%.

Denver—Crack Epidemic in decline in since early 2000s. Powder Cocaine Epidemic in decline since 2008. Powder cocaine as opposed to crack had become the drug of choice for those youths that do use cocaine. Reported use of crack cocaine among youthful adult arrestees was low throughout the 2000s dropping from 6%-7% during 2000-03 down to 0%-2% by 2009-10. Detected cocaine/crack use among youthful arrestees declined from 28% in 2008 down to 7% in 2009 and 5% in 2010. This drop was likely the result of decreasing powder cocaine use among youthful adult arrestees starting in 2008.

Figure 1-Denver: Detected Marijuana Use 2000-10

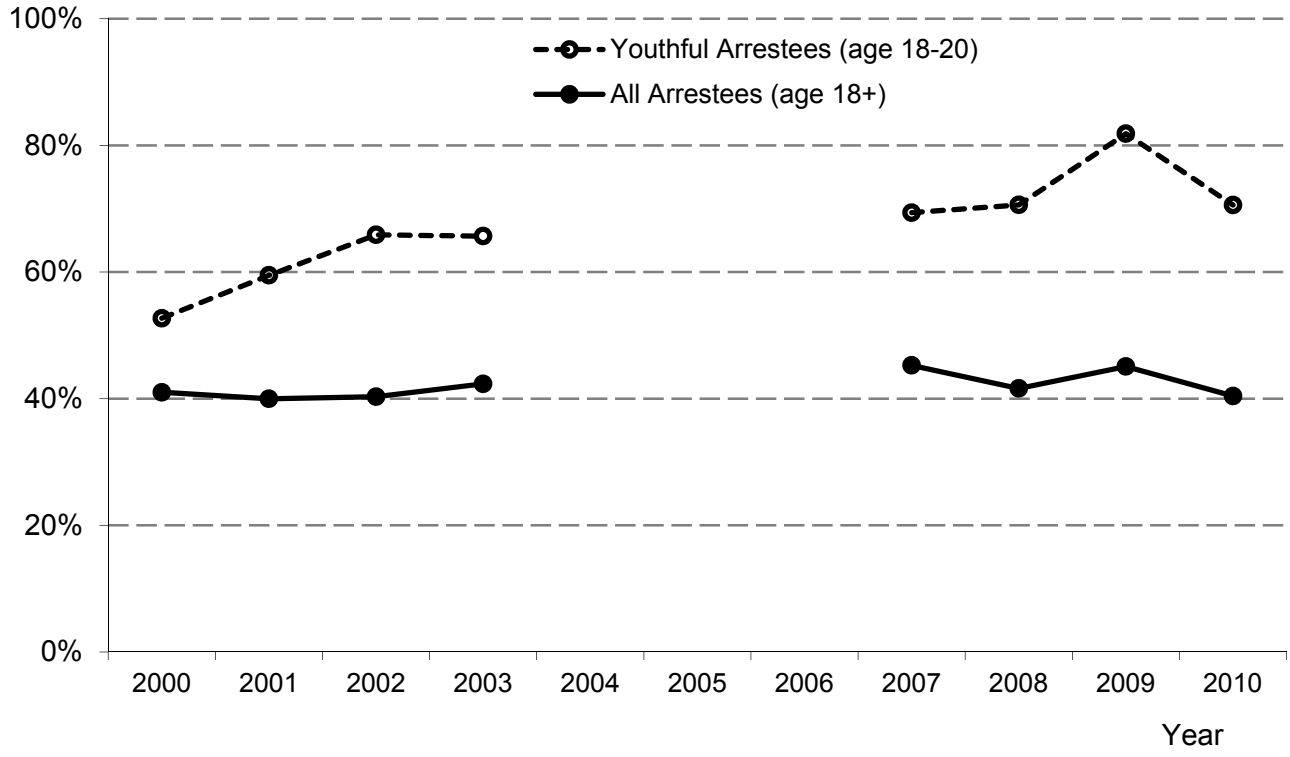


Figure 2-Denver: Detected and Reported Cocaine/Crack Use 2000-10

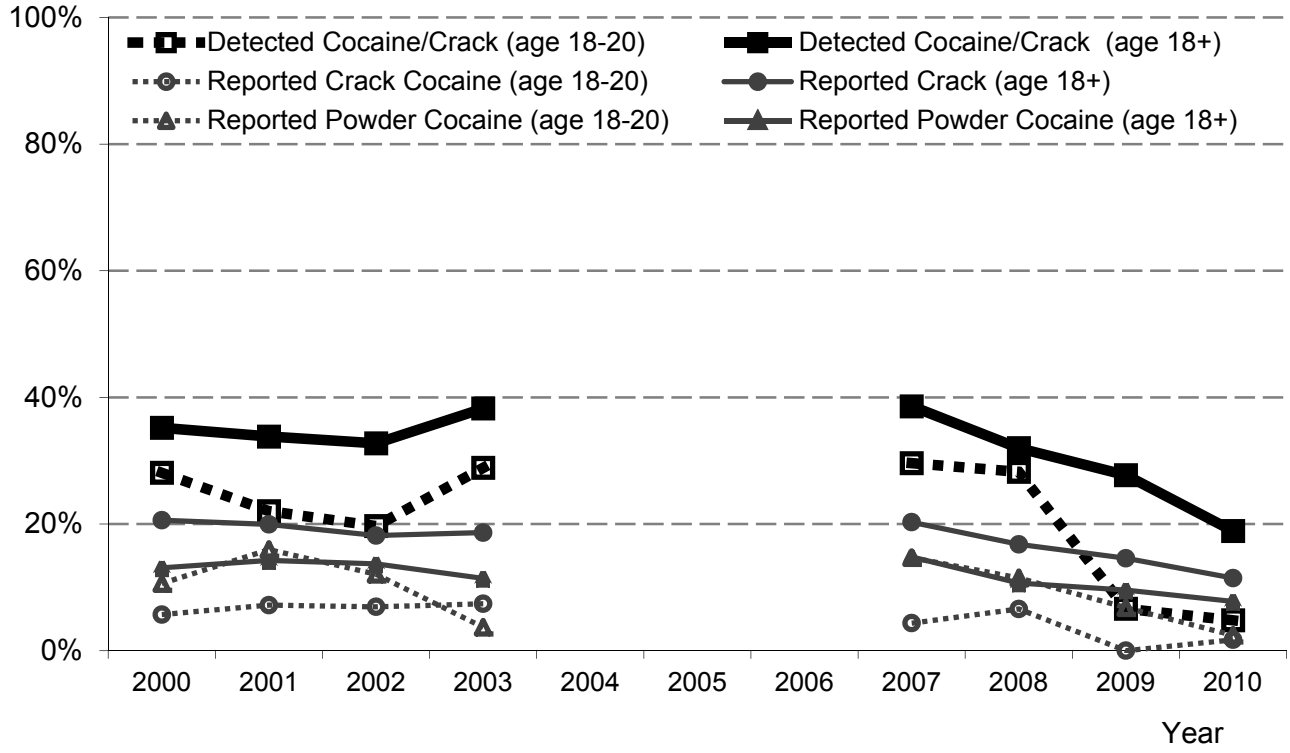


Figure 3-Denver: Variation in Detected Drug Use by Birth Year

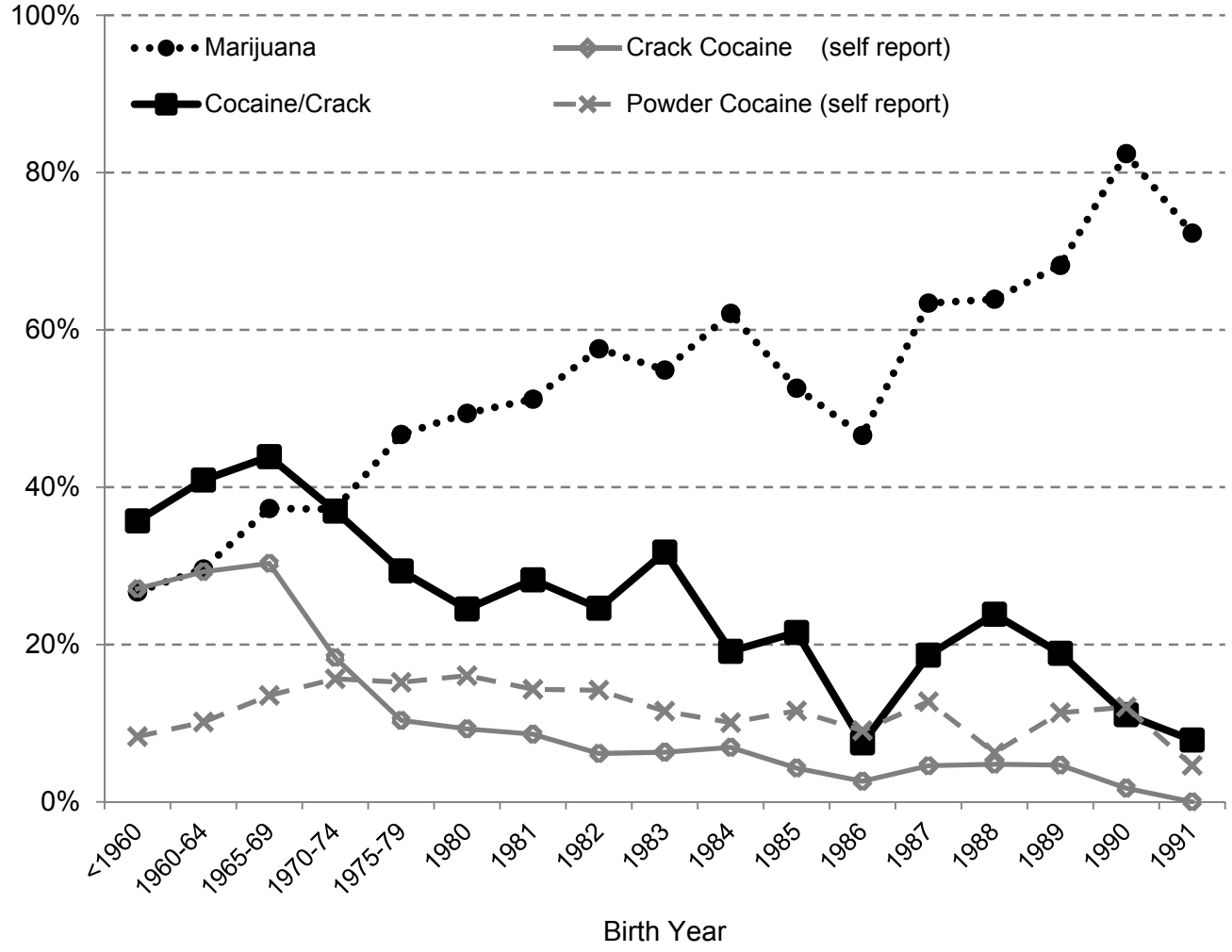


Table 1-Denver: Logistic Regression of Detected Marijuana and Cocaine/Crack Use

	Odds Ratio (Wald Statistic)	
	Marijuana	**Cocaine/Crack**
Birth Year	(315.4)**	(151.8)**
<1960	0.4	1.5
1960-64	0.4	1.9
1965-69	0.6	2.0
1970-74	0.7	1.5
1975-79[a]	1.0	1.0
1980	1.1	0.7
1981	1.2	1.0
1982	1.6	0.7
1983	1.4	1.0
1984	2.1	0.5
1985	1.3	0.7
1986	1.2	0.2
1987	2.2	0.5
1988	2.6	0.8
1989	2.9	0.5
1990	6.2	0.3
1991	3.5	0.2
1992[c]	--	--
Interview Year	(22.8)**	(33.6)**
2000[a]	1.0	1.0
2001	0.9	0.9
2002	0.8	0.9
2003	0.9	1.2
2007	0.9	1.3
2008	0.7	1.0
2009	0.7	0.9
2010	0.5	0.5
Race/Ethnicity	(53.5)**	(94.2)**
African American[a]	1.0	1.0
White	0.8	0.5
Hispanic	0.6	0.9
Other/missing	0.9	0.4
Charge	(43.9)**	(101.3)**
Drugs[a]	1.0	1.0
Violent	0.5	0.3
Income	0.6	0.5
Other	0.5	0.4
Severity	(9.1)*	(23.2)**
Felony[a]	1.0	1.0
Misdemeanor	1.3	0.8
Other	1.3	1.1
Base Odds	2.1	1.4

[a]Reference Category
[c]Parameter estimates not shown because they were based on fewer than 25 arrestees born this year
*Statistically significant at the α=.05 level. **Statistically significant at the α=.01 level.

Indianapolis

Indianapolis
(N=4,544)

Indianapolis—Marijuana Epidemic in plateau since 1996. Golub and Johnson (2001) estimated that the Marijuana Epidemic in Indianapolis reached a plateau in 1996. At that time, detected marijuana use among youthful arrestees reached 70% and among all arrestees about 40%. In the 2000s similar rates prevailed (Fig. 1). Marijuana use among youthful adult arrestees ranged from 63% to 83% and among all adult arrestees from 44% to 50%.

Indianapolis—Crack Epidemic in decline since 2004-2006. Golub and Johnson (1997) estimated that the Crack Epidemic had reached the plateau phase in Indianapolis by 1994. At that time, the prevalence of detected use among adult arrestees was above 40% and the rate among youthful adult arrestees was about 20%. Those same rates prevailed through 2002 (Fig. 2). From 2003 to 2010, the rate among youthful arrestees tumbled from 25% down to 3%. The variation in detected cocaine/crack use across birth years (Fig. 3) indicates that the Crack Generation primarily involved arrestees born before 1975 (36%-45%). The data also confirms that the Crack Epidemic has been in decline. Arrestees born 1975-1988 were less likely to be detected as cocaine/crack users (11%-22%), those born 1989-91 were even less likely (0%-7%).

Figure 1-Indianapolis: Detected Marijuana Use 2000-10

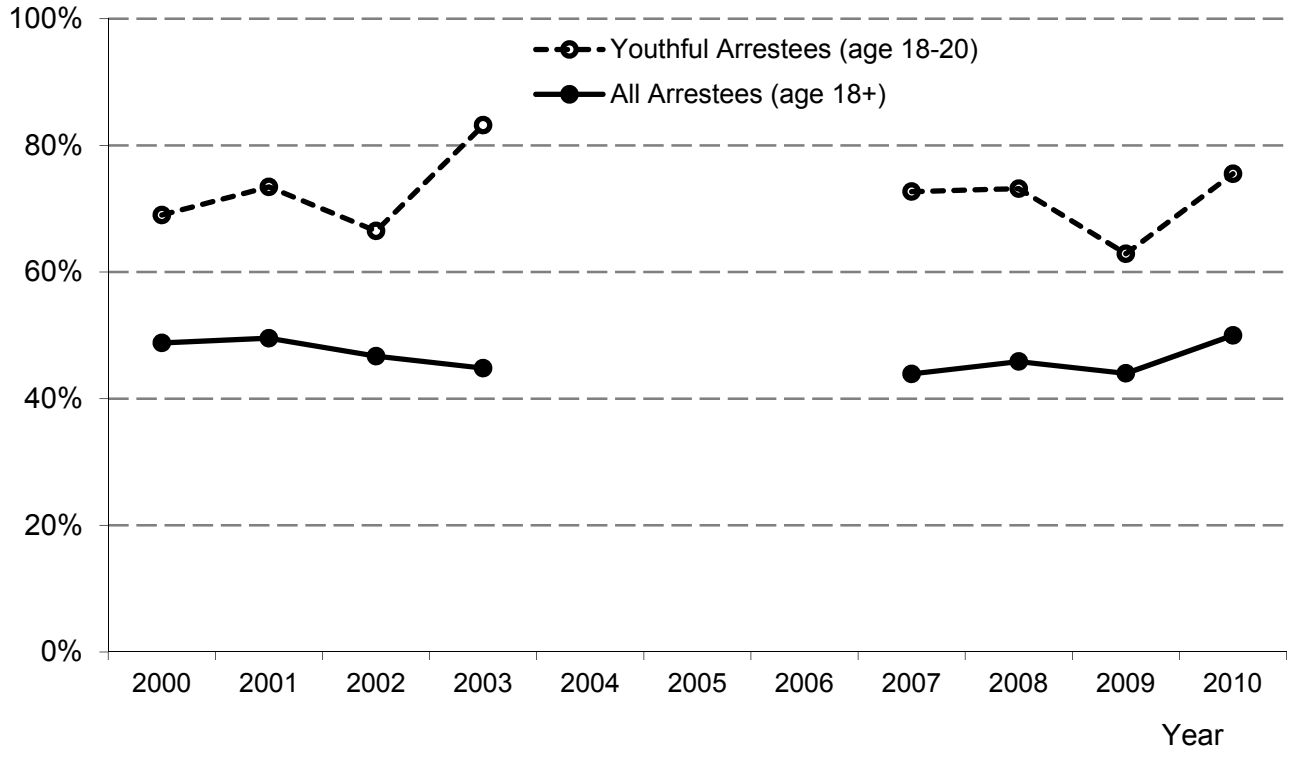


Figure 2-Indianapolis: Detected Cocaine/Crack Use 2000-10

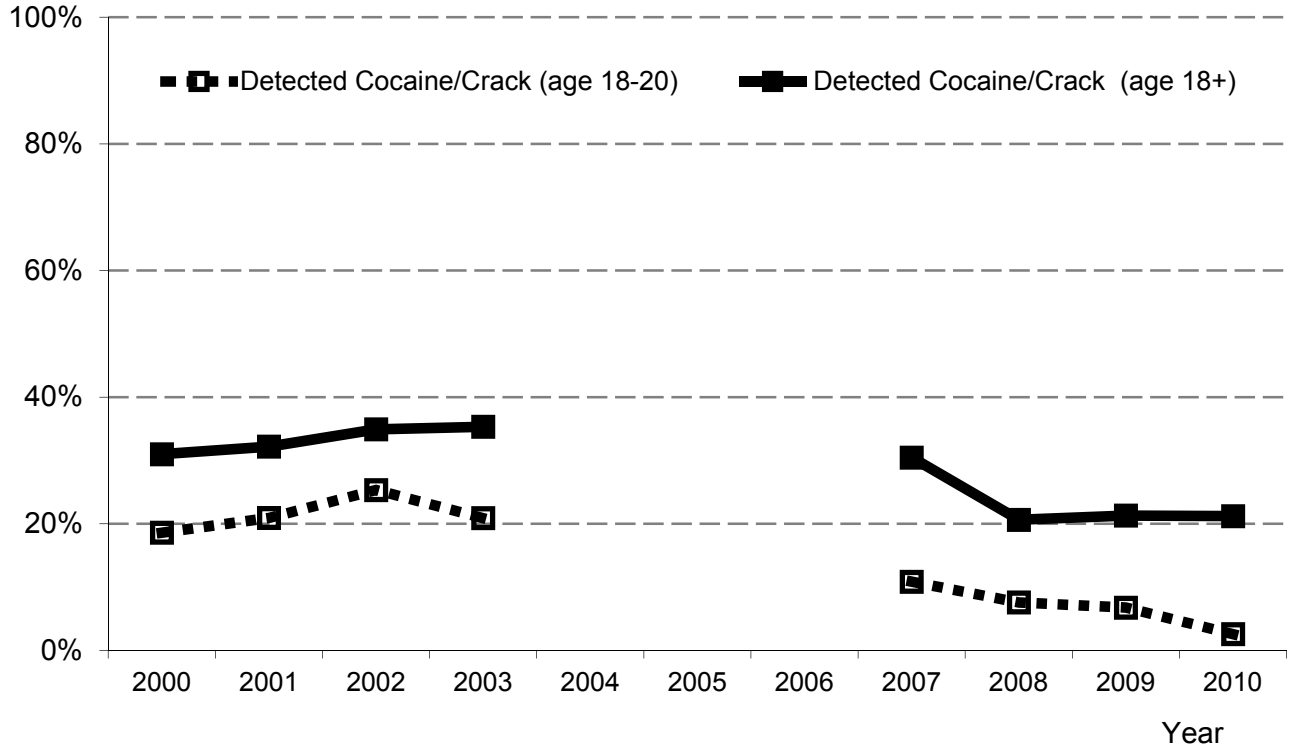


Figure 3-Indianapolis: Variation in Detected Drug Use by Birth Year

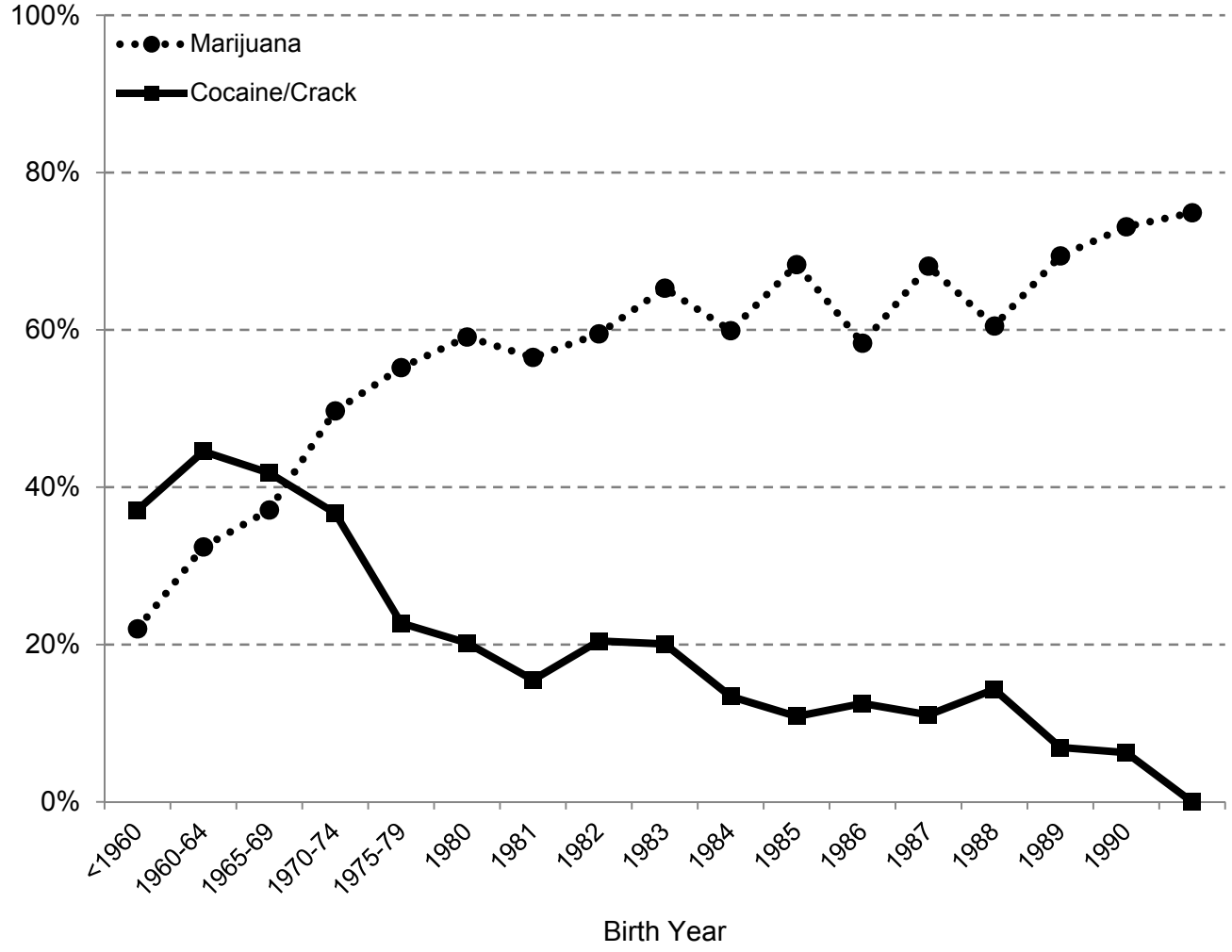


Table 1-Indianapolis: Logistic Regression of Detected Marijuana and Cocaine/Crack Use

	Odds Ratio (Wald Statistic)	
	Marijuana	**Cocaine/Crack**
Birth Year	(459.1)**	(252.3)**
<1960	0.2	2.1
1960-64	0.3	2.9
1965-69	0.4	2.7
1970-74	0.7	2.1
1975-79[a]	1.0	1.0
1980	1.1	0.8
1981	1.1	0.6
1982	1.3	0.9
1983	2.0	0.7
1984	1.6	0.5
1985	2.2	0.4
1986	1.5	0.6
1987	2.2	0.4
1988	2.0	0.6
1989	3.0	0.3
1990	3.0	0.3
1991	3.3	0.0
1992	2.7	0.2
Interview Year	(45.0)**	(22.2)**
2000[a]	1.0	1.0
2001	1.0	1.1
2002	0.9	1.3
2003	0.8	1.5
2007	0.6	1.3
2008	0.6	0.8
2009	0.5	1.0
2010	0.6	1.0
Race/Ethnicity	(174.9)**	(105.7)**
African American[a]	1.0	1.0
White	0.9	0.5
Hispanic	0.1	0.6
Other/missing	1.0	0.5
Charge	(56.4)**	(68.0)**
Drugs[a]	1.0	1.0
Violent	0.5	0.4
Income	0.4	0.9
Other	0.5	0.5
Severity	(1.7)	(0.8)
Felony[a]	--	--
Misdemeanor	--	--
Other	--	--
Base Odds	3.7	0.6

[a]Reference Category
[c]Parameter estimates not shown because they were based on fewer than 25 arrestees born this year -- Parameter estimates not shown because variation with this variable was not statistically
*Statistically significant at the α=.05 level. **Statistically significant at the α=.01 level.

Manhattan

Manhattan
(N=4,692)

Manhattan-Marijuana Epidemic in plateau since 1996. Golub and Johnson (2001) estimated that the Marijuana Epidemic in Manhattan reached a plateau in 1996. At that time, the prevalence among youthful adult arrestees reached 60%. Throughout the 2000s, the rate of detected marijuana use among youthful adult arrestees hovered between 63% and 76% with the exception of a one-year dip to 54% in 2007 (Fig. 1).

Manhattan--Crack Epidemic continued its decline since 1989. Powder cocaine use has also been in decline since before 2000. Golub and Johnson (1997) estimated that the Crack Epidemic had entered the decline phase in 1989. By 1996, about 60% of adult arrestees and 20% youthful adult arrestees tested positive for cocaine/crack. In the 2000s, the rate of detected use for youthful adult arrestees remained at 21% or less (Fig. 2). Self-report data suggests that detected cocaine/crack came to more represent powder cocaine use rather than crack over time. In 2000, somewhat more adult arrestees reported past-30-day use of crack (23%) than powder cocaine (17%). Reported use of crack declined substantially and then hovered around 12% during 2007 to 2010. During this time the use of powder cocaine held steady at about 10%. Reported crack use was extremely uncommon among youthful adult arrestees during the 2000s (0-5%) no more common than reported use of powder cocaine. (1%-7%). Because of the low rate of reported powder cocaine use among youthful adult arrestees throughout the 2000s (0%-7%), it is estimated that the decline in the Powder Cocaine Epidemic started before 2000. The variation in reported use across birth years further reflects this variation (Fig. 3). Arrestees born before 1970 had the highest rate of reported crack use (30%-32%). They comprised the Crack Generation. Arrestees born 1975-81 were less likely to report use (6%-7%) and those born 1982-91 were even less likely (0%-4%). Some arrestees, but not many, born since 1980 report past-30-day use of powder cocaine (0-8%).

Manhattan--Opiate/Heroin Epidemic in the last years of its decline phase by 2007. Golub and Johnson estimated that the Opiate/Heroin Epidemic in New York City reached its plateau phase of greatest widespread use back in the 1960s and early 1970s (Golub & Johnson, 2005; Johnson & Golub, 2002). It has been a long decline phase. The Opiate/Heroin Epidemic continued its decline throughout the 2000s (Fig. 4). From 2000 to 2003, relatively few youthful adult arrestees were detected as heroin/opiate users (4%-11%). More dramatically, no youthful adult arrestees were detected as heroin/opiate users in 2007-08, although the overall rate was higher in 2009-10 (7%-10%). The data suggest that a diminishing percentage of older users persisted in their use. Among all adult arrestees, the rate of detected heroin/opiate use declined from 20% in 2000 down to 6% in 2007.

Figure 1-Manhattan: Detected Marijuana Use 2000-10

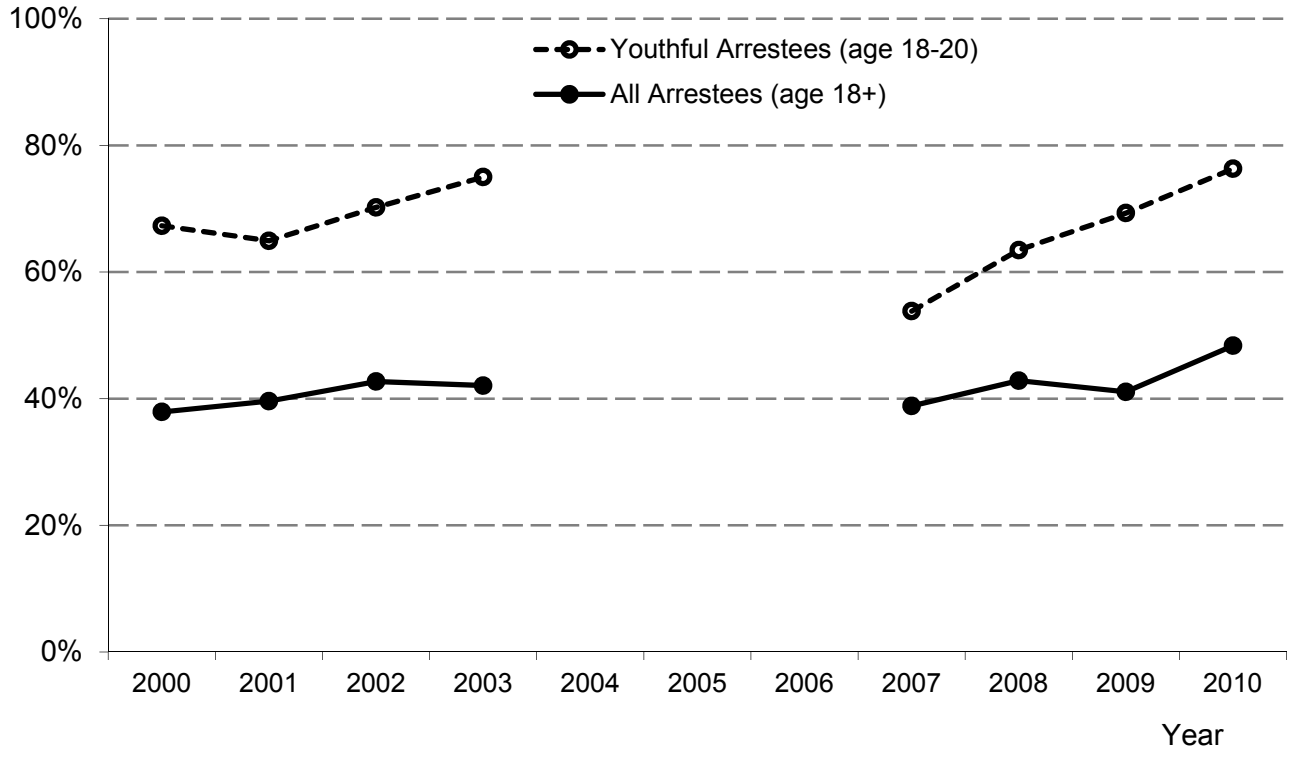


Figure 2-Manhattan: Detected and Reported Cocaine/Crack Use 2000-10

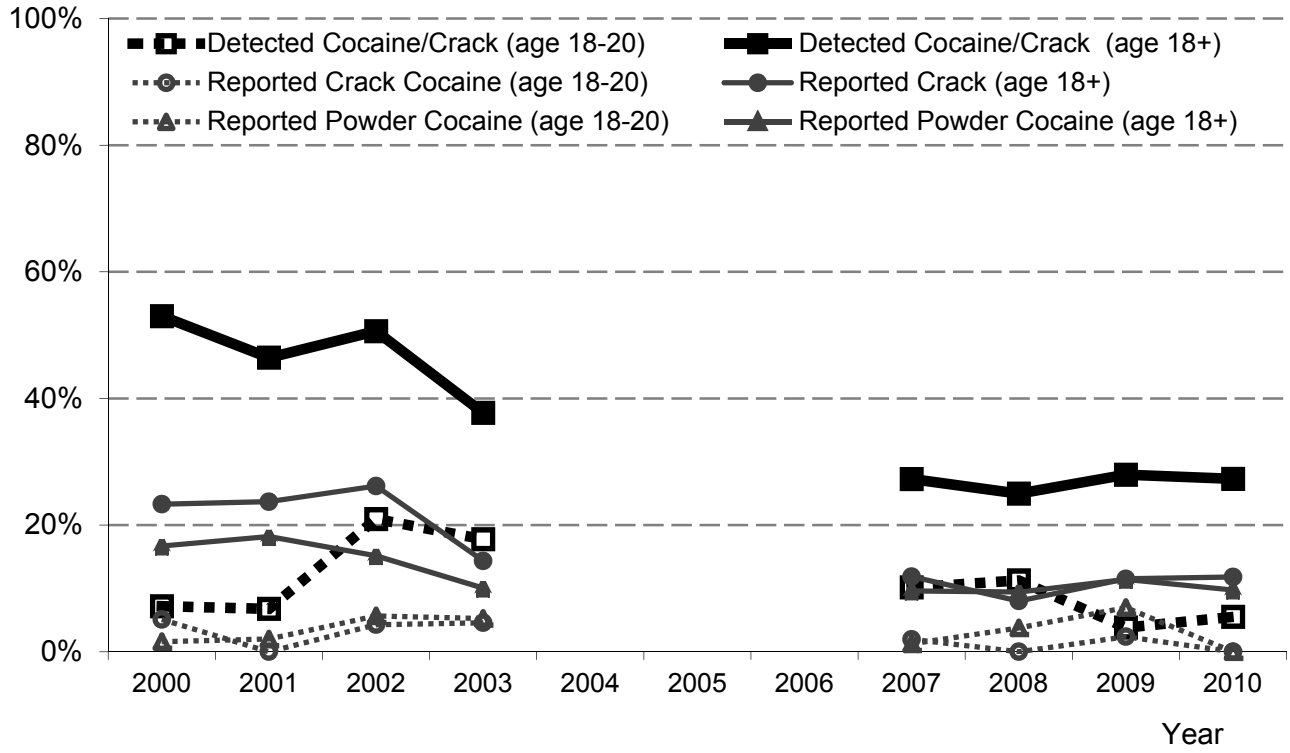


Figure 3-Manhattan: Variation in Detected Drug Use by Birth Year

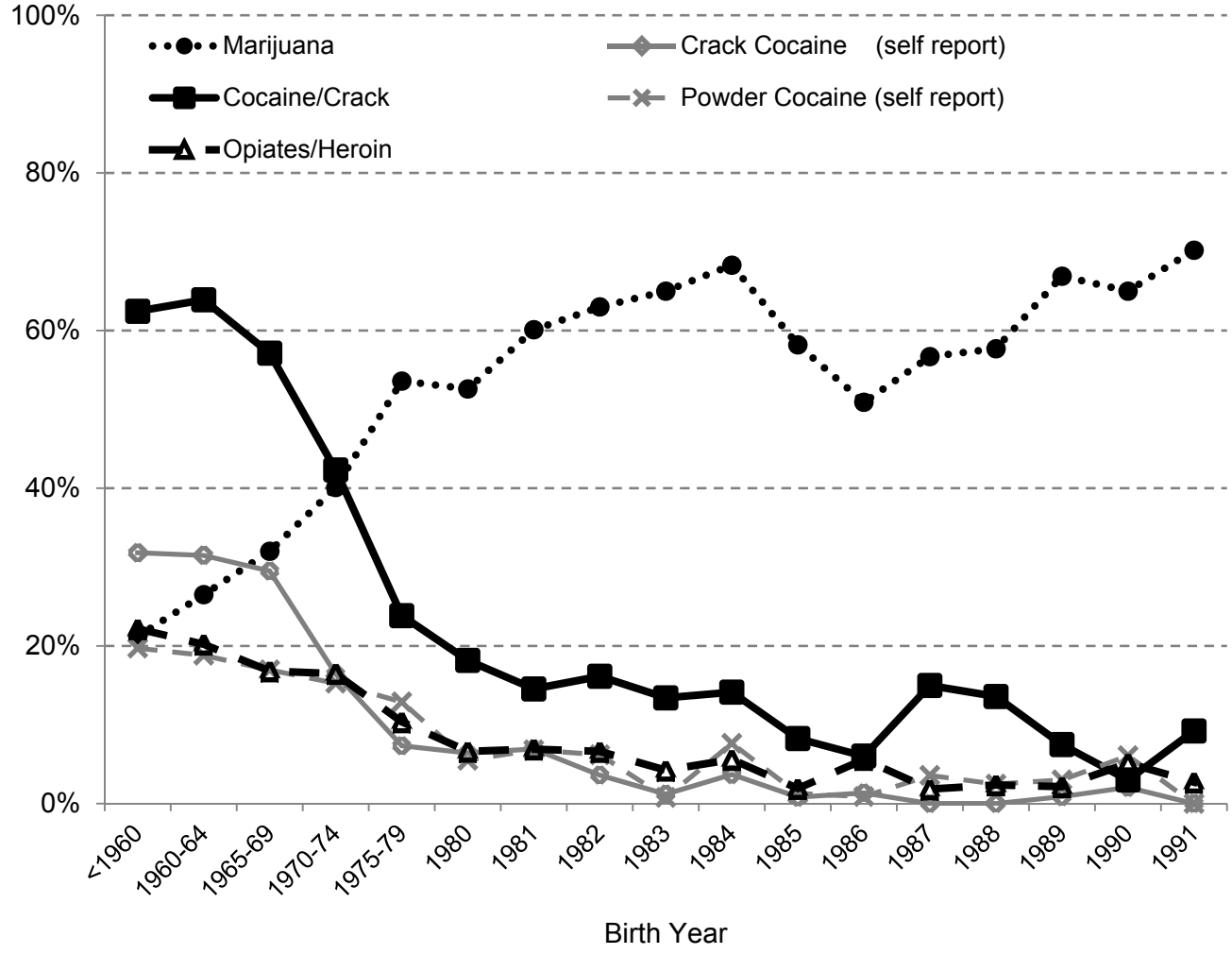


Figure 4-Manhattan: Detected Opiate/Heroin Use 2000-10

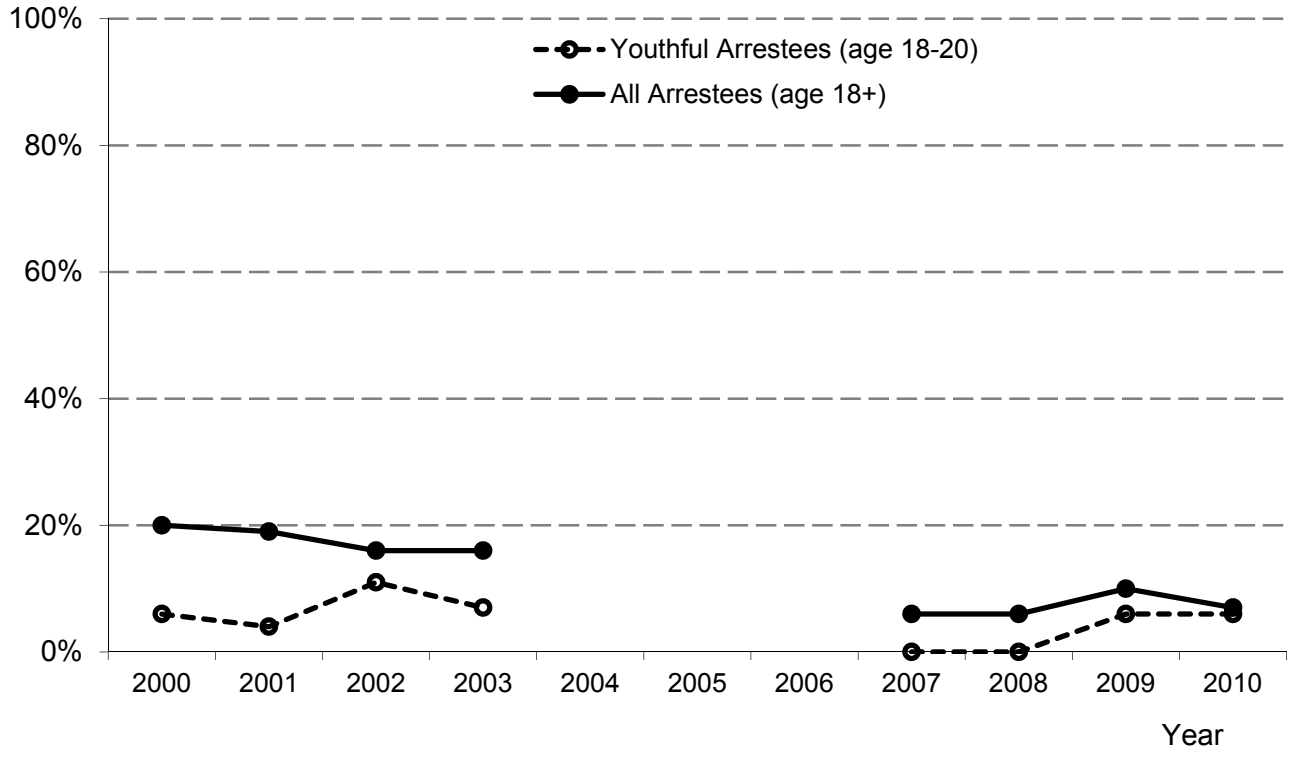


Table 1-Manhattan: Logistic Regression of Detected Marijuana Cocaine/Crack and Opiate/Heroin Use

	Odds Ratio (Wald Statistic)		
	Marijuana	**Cocaine/Crack**	**Opiate/Heroin**
Birth Year	(401.8)**	(634.9)**	(139.9)**
<1960	0.2	5.4	3.0
1960-64	0.3	5.9	2.6
1965-69	0.4	4.4	1.9
1970-74	0.6	2.5	1.8
1975-79[a]	1.0	1.0	1.0
1980	0.9	0.7	0.6
1981	1.4	0.6	0.7
1982	1.5	0.6	0.6
1983	1.6	0.5	0.5
1984	2.0	0.6	0.6
1985	1.5	0.4	0.2
1986	1.3	0.3	0.7
1987	1.8	0.8	0.3
1988	1.6	0.7	0.4
1989	2.2	0.4	0.4
1990	1.9	0.1	0.7
1991	2.8	0.5	0.4
1992[c]	--	--	--
Interview Year	(14.2)*	(34.1)**	(32.1)**
2000[a]	1.0	1.0	1.0
2001	1.0	0.8	1.1
2002	1.0	1.2	0.8
2003	1.0	0.8	0.9
2007	0.7	0.7	0.4
2008	0.8	0.6	0.5
2009	0.7	0.7	0.6
2010	0.9	0.8	0.5
Race/Ethnicity	(21.5)**	(26.9)**	(101.9)**
African American[a]	1.0	1.0	1.0
White	0.6	0.9	2.7
Hispanic	0.8	0.8	2.4
Other/missing	0.6	0.5	0.7
Charge	(123.4)**	(56.2)**	(29.7)**
Drugs[a]	1.0	1.0	1.0
Violent	0.5	0.4	0.5
Income	0.4	0.7	0.9
Other	0.4	0.6	0.6
Severity	(10.3)	(3.1)	(4.5)
Felony[a]	1.0	--	--
Misdemeanor	1.3	--	--
Other	1.0	--	--
Base Odds	2.2	0.6	0.1

[a]Reference Category
[c]Parameter estimates not shown because they were based on fewer than 25 arrestees born this year -- Parameter estimates not shown because variation with this variable was not statistically
*Statistically significant at the α=.05 level. **Statistically significant at the α=.01 level.

Minneapolis

Minneapolis
(N=4,338)
Minneapolis joined the ADAM program in 2000. Hence, Golub and Johnson (1997, 2001) do not provide information about the Crack and Marijuana Epidemics based on DUF data collected in the 1980s and 1990s.

Minneapolis-Marijuana Epidemic in plateau throughout 2000s. By 2000, detected marijuana use among youthful adult arrestees in Minneapolis was already widespread (Fig. 1). During the 2000s, use fluctuated around 80% (70%-86%) with the exception of a low year of 55% in 2007. The variation across birth years indicates that detected marijuana use remains high among the most recent birth cohorts (Fig. 3). Arrestees born 1989-91 (77%-89%) were more likely to be detected as recent marijuana users as those born 1980-1988 (54%-70%).

Minneapolis-Crack Epidemic in decline throughout 2000s. The rate of detected cocaine/crack use in Minneapolis was highest among those born before 1975 (32%-48%)—(Fig. 3). Detected cocaine/crack use was much less prevalent among arrestees born 1980-91 (4%-15%). These data indicate that the Crack Epidemic had entered the decline phase prior to 2000. The rate of detected cocaine/crack use among youthful adult arrestees had a one-year spike at 20% in 2007 (Fig. 2.). However, the rate subsequently declined to 3% by 2009 providing further evidence that the decline phase is well underway.

Figure 1-Minneapolis: Detected Marijuana Use 2000-10

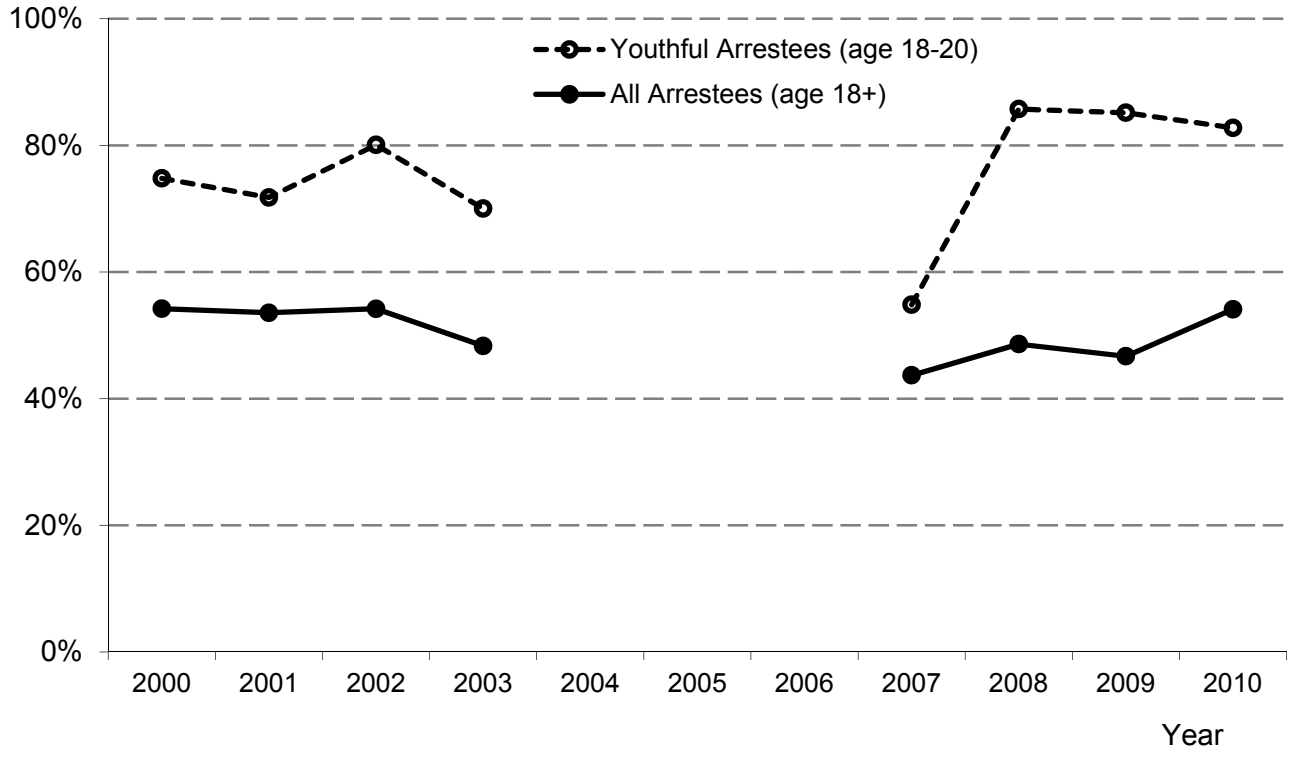


Figure 2-Minneapolis: Detected and Reported Cocaine/Crack Use 2000-10

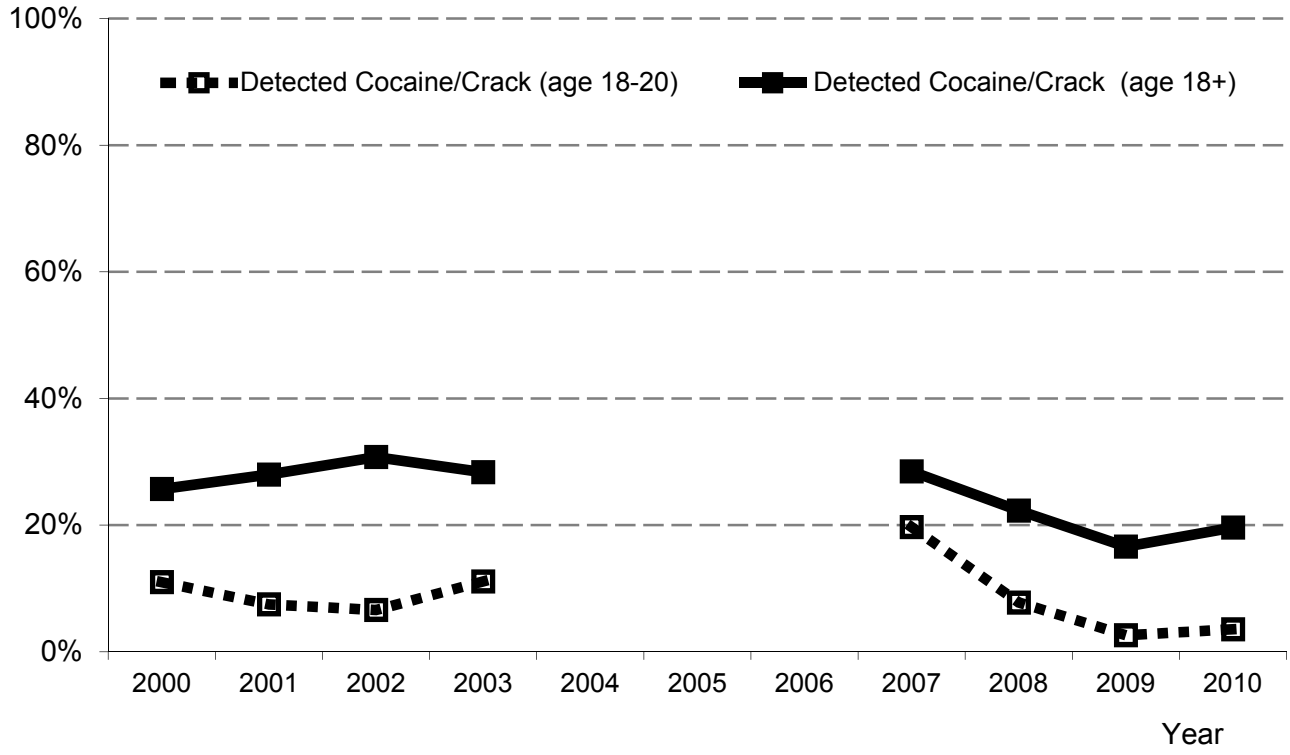


Figure 3-Minneapolis: Variation in Detected Drug Use by Birth Year

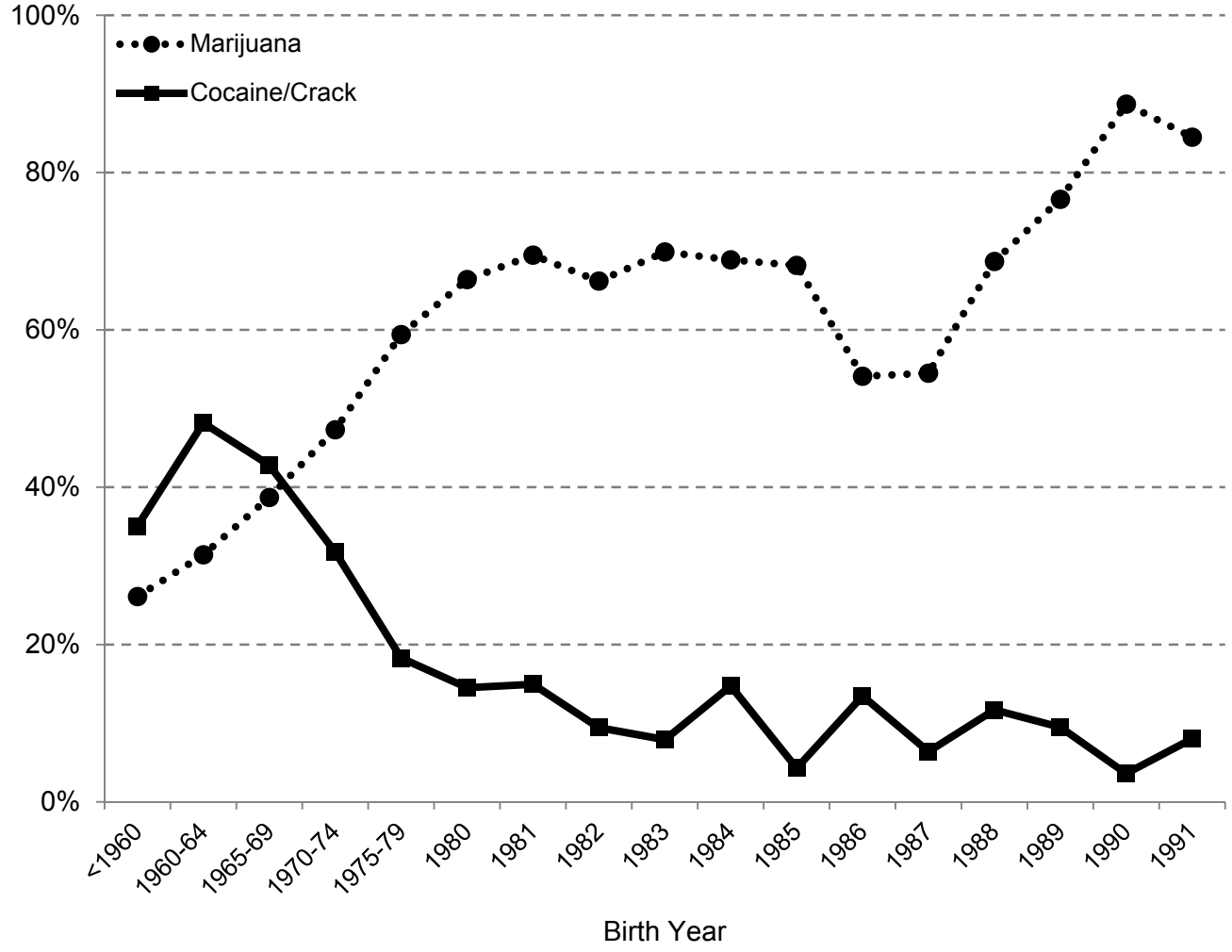


Table 1-Minneapolis: Logistic Regression of Detected Marijuana and Cocaine/Crack Use

	Odds Ratio (Wald Statistic)	
	Marijuana	**Cocaine/Crack**
Birth Year	(447.7)**	(426.3)**
<1960	0.2	2.9
1960-64	0.3	5.0
1965-69	0.4	4.0
1970-74	0.6	2.2
1975-79[a]	1.0	1.0
1980	1.2	0.7
1981	1.6	0.7
1982	1.4	0.5
1983	1.7	0.3
1984	1.7	0.6
1985	1.8	0.2
1986	1.4	0.7
1987	1.2	0.3
1988	2.2	0.6
1989	3.2	0.5
1990	7.4	0.2
1991	4.3	0.4
1992[c]	--	--
Interview Year	(51.4)**	(18.1)*
2000[a]	1.0	1.0
2001	0.9	1.1
2002	1.0	1.3
2003	0.7	1.2
2007	0.4	1.5
2008	0.6	1.1
2009	0.6	0.7
2010	0.6	1.1
Race/Ethnicity	(159.8)**	(101.8)**
African American[a]	1.0	1.0
White	0.5	0.4
Hispanic	0.2	1.0
Other/missing	0.9	0.5
Charge	(44.2)**	(133.9)**
Drugs[a]	1.0	1.0
Violent	0.5	0.3
Income	0.6	0.7
Other	0.5	0.3
Severity	(18.0)**	(6.4)*
Felony[a]	1.0	1.0
Misdemeanor	1.5	1.4
Other	1.2	1.3
Base Odds	3.3	0.4

[a]Reference Category
[c]Parameter estimates not shown because they were based on fewer than 25 arrestees born this year
*Statistically significant at the α=.05 level. **Statistically significant at the α=.01 level.

Portland OR

Portland OR
(N=4,302)

Portland (OR)-Marijuana Epidemic in plateau since 2001. Golub and Johnson (2001) estimated that the Marijuana Epidemic was still in the expansion phase in Portland OR through 1999. The prevalence of detected marijuana use among youthful adult arrestees reached of a peak of 68% in 2001 marking the end of the expansion phase and the beginning of the plateau phase (Fig. 1). Subsequently, the rate remained relatively stable ranging from 56% to 74% in 2002-10.

Portland (OR)-Crack Epidemic in decline since 1994. Powder cocaine use also in decline since 2007. Golub and Johnson (1997) estimated that the Crack Epidemic in Portland had entered a slow decline back in 1994. Detected cocaine/crack use among youthful adult arrestees remained between 11% and 16% up to 2008 when it started to decline further down to 5% in 2010 (Fig. 2). The low rates of reported crack use (0%-6%, except for 2001 when it reached 11%) among youthful adult arrestees confirms that the Crack Epidemic had been solidly in decline. Self-report powder cocaine use among youthful adult arrestees fluctuated from 5% to 12% from 2000-03 and then reached a peak level of 14% in 2007-08. After 2008, the rate declined down to 4% by 2010 suggesting the Powder Cocaine Epidemic entered the decline phase in 2009.

Portland (OR)-Opiate/Heroin Epidemic in plateau during the 2000s. Detected opiate/heroin use was not that widespread among adult arrestees (9%-15%) from 2000 to 2009 and then spiked to 24% in 2010 (Fig. 4). Tellingly, the rate among youthful adult arrestees was nearly as high (6%-10%) as among all adults from 2000 to 2009 and also spiked in 2010 (21%). This finding suggests that use of heroin is just as popular among some subpopulation of youths who sustain arrests as ever and that the Opiate/Heroin Epidemic was still in plateau as of 2010. Among adult male arrestees there was a rate of detected of opiate/heroin use of about 10%-15% throughout the 1990s (National Institute of Justice, 1996, 2000). Hence, the trend in the 2000s is a continuation of the trend in the 1990s. This fact was confirmed by the variation across birth cohort (Fig. 3) which reveals that detected opiate/heroin use is not associated with any particular birth years but fluctuates from 8% to 21% across birth years. Indeed, the logistic regression analysis found that there was no statistically significant association between of detected heroin use and birth year (Table 1).

Portland (OR)—Methamphetamine Epidemic in decline since 2008. From 2000 to 2003, the methamphetamine epidemic had been solidly in the plateau phase with detected use near 20% among both adult arrestees and youthful adult arrestees (Fig. 5). From 2007 to 2010, there was a steady drop among youthful adult arrestees from 15% down to 3%. Because the 15% among youthful adult arrestees in 2007 was substantially lower than the last estimate in 2003 of 20%, it was estimated that the Methamphetamine Epidemic entered a decline in 2008. The significance of this decline was confirmed in the logistic regression analysis (Table 1). The odds ratio for the detection of methamphetamine use among arrestees born 1980-89 ranged from 0.5 to 0.8 and among those born 1990 the odds ratio was 0.0. The graph of the variation across birth cohorts (Fig. 3) also indicates a substantial decline in the rate of detected methamphetamine from 18%-23% among arrestees born 1980-86 down to 0%-14% among those born 1987-91.

Figure 1-Portland (OR): Detected Marijuana Use 2000-10

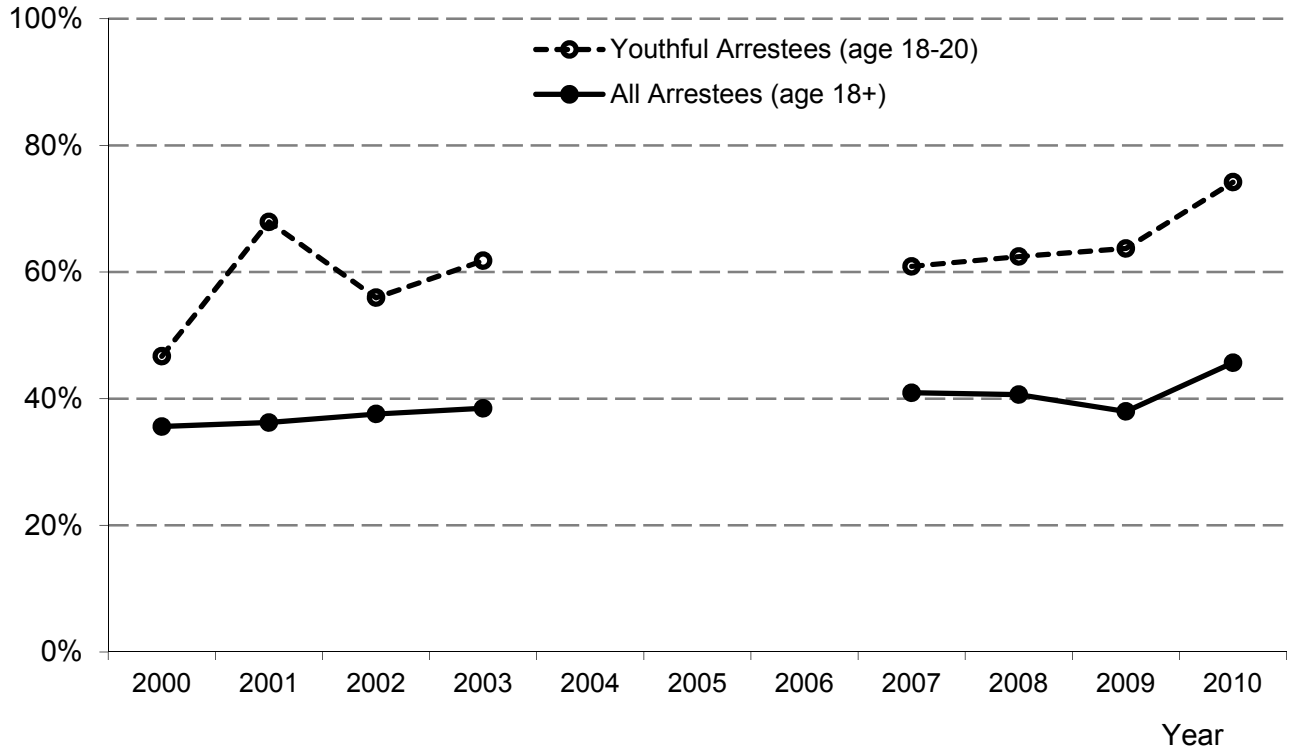


Figure 2-Portland (OR): Detected and Reported Cocaine/Crack Use 2000-10

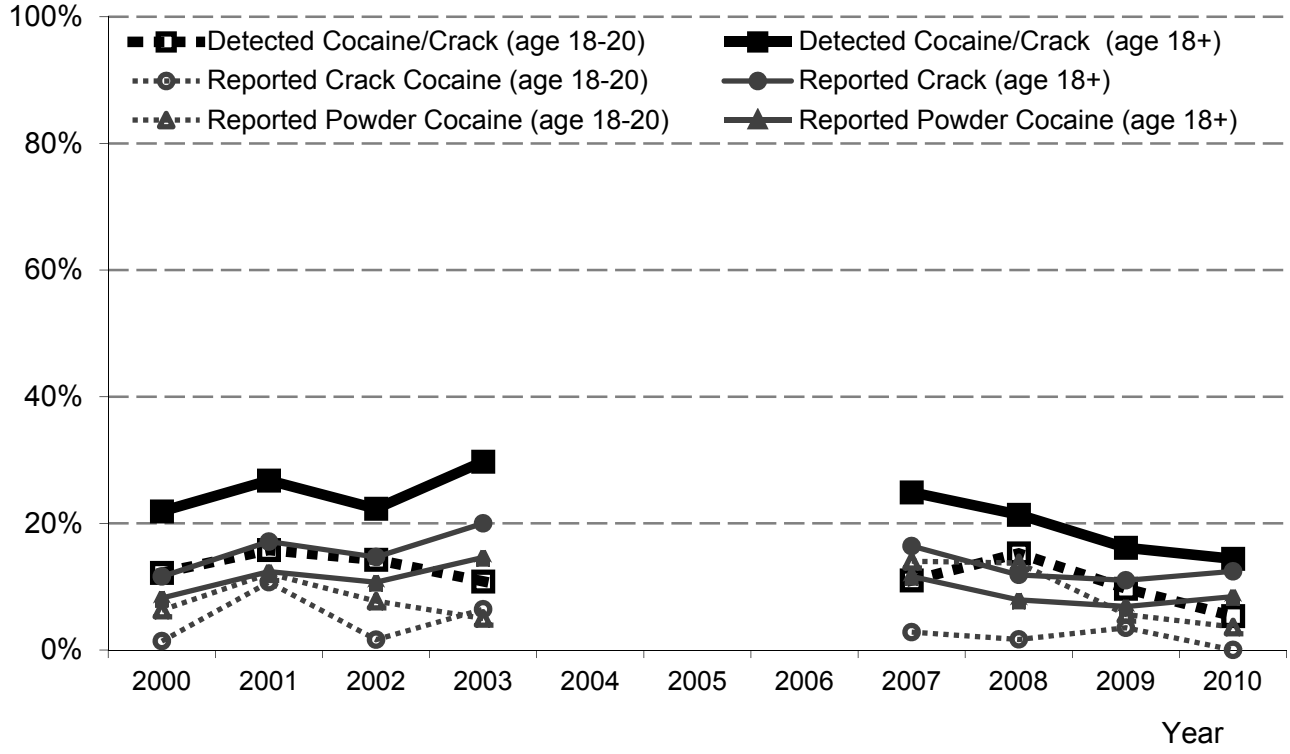


Figure 3-Portland (OR): Variation in Detected Drug Use by Birth Year

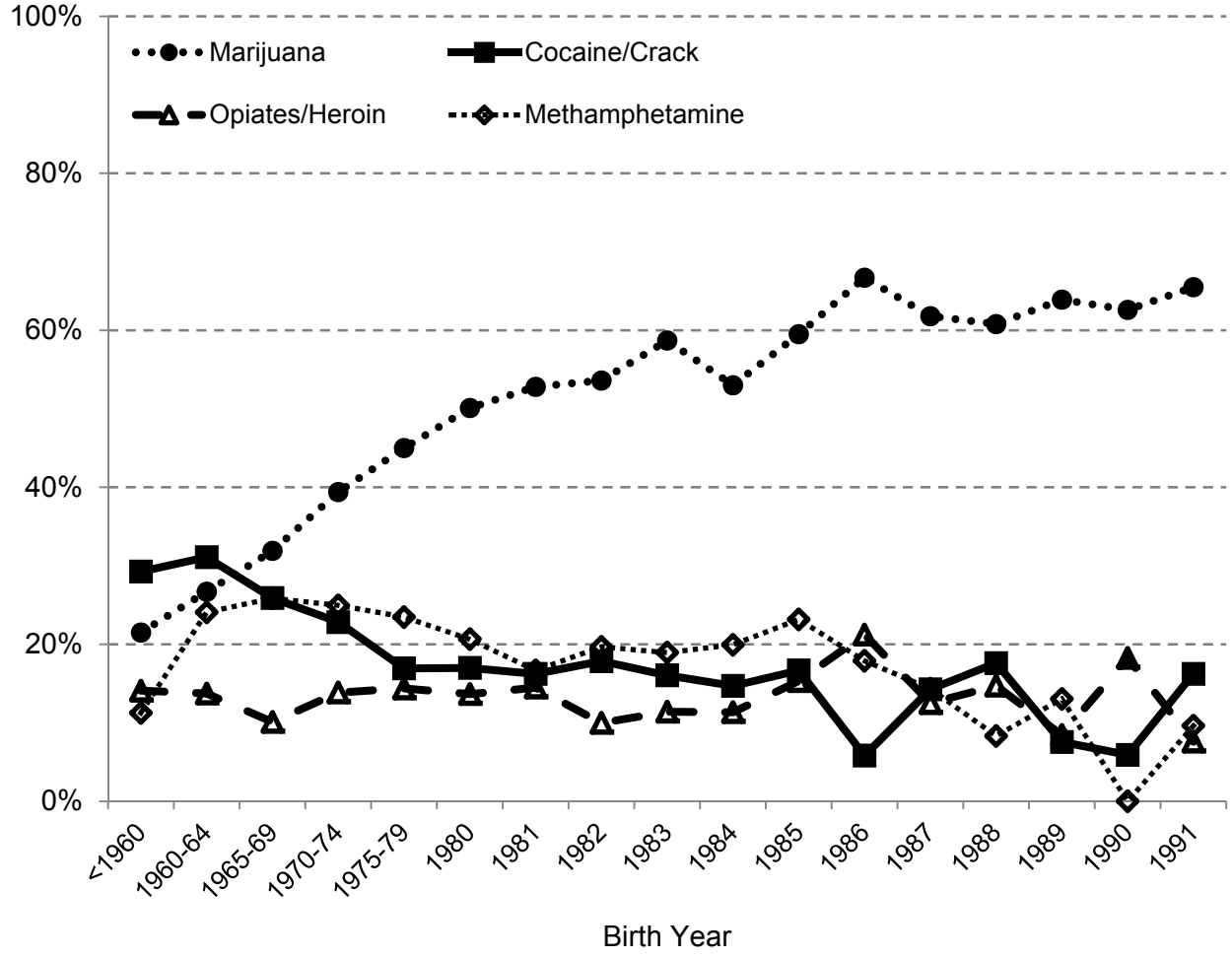


Figure 4-Portland (OR): Detected Opiate/Heroin Use 2000-10

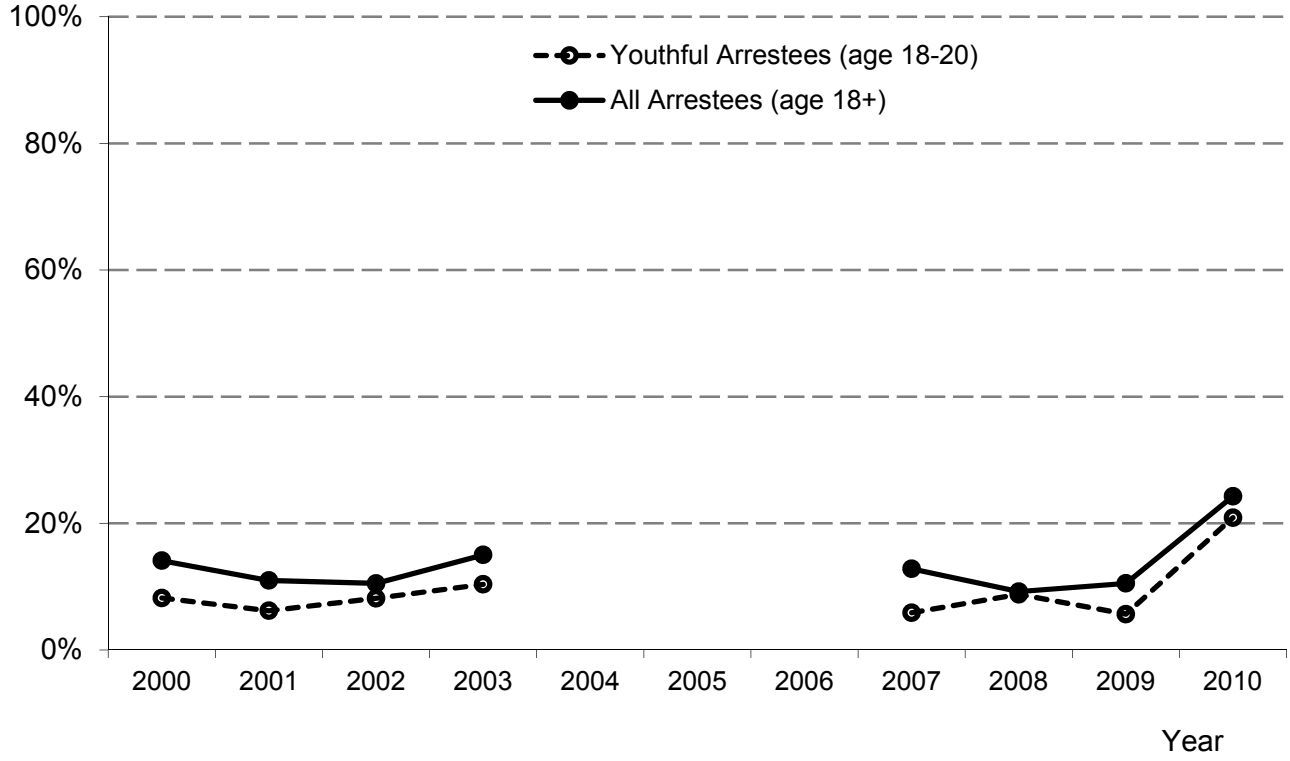


Figure 5-Portland (OR): Detected Methamphetamine Use 2000-10

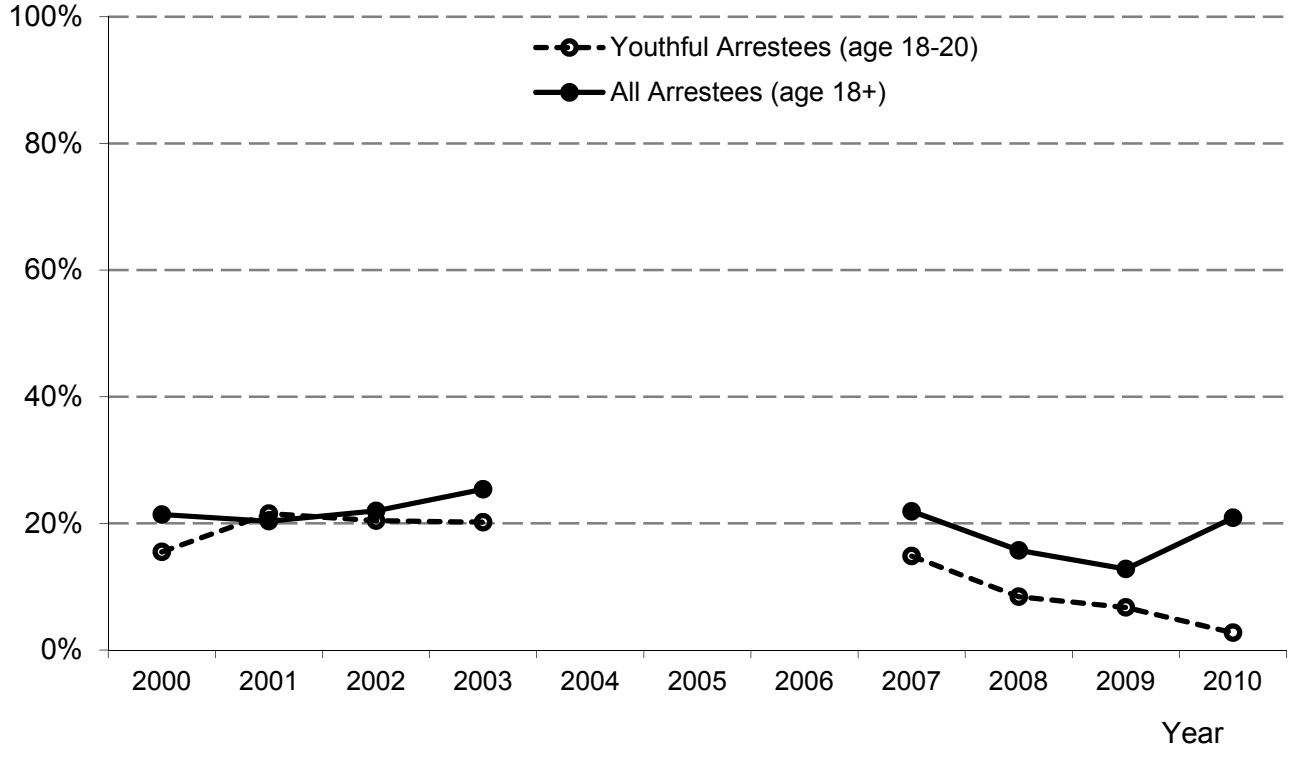


Table 1-Portland (OR): Logistic Regression of Detected Marijuana, Cocaine/Crack, Opiate/Heroin, and Methamphetamine Use

	Odds Ratio (Wald Statistic)			
	Marijuana	**Cocaine/Crack**	**Opiate/Heroin**	**Methamphetamine**
Birth Year	(293.1)**	(96.7)**	(20.6)	(58.4)**
<1960	0.3	2.3	--	0.4
1960-64	0.4	2.3	--	1.0
1965-69	0.5	1.6	--	1.2
1970-74	0.7	1.4	--	1.1
1975-79[a]	1.0	1.0	--	1.0
1980	1.2	1.0	--	0.7
1981	1.4	0.8	--	0.6
1982	1.5	1.0	--	0.7
1983	1.7	0.7	--	0.8
1984	1.3	0.7	--	0.8
1985	2.2	1.0	--	0.7
1986	2.6	0.4	--	0.7
1987	1.8	0.8	--	0.5
1988	3.0	0.9	--	0.5
1989	2.2	0.3	--	0.5
1990	2.0	0.5	--	0.0
1991[c]	--	--	--	--
1992[c]	--	--	--	--
Interview Year	(5.9)	(32.0)**	(36.5)**	(13.6)
2000[a]	--	1.0	1.0	--
2001	--	1.5	0.8	--
2002	--	1.2	0.7	--
2003	--	2.1	1.2	--
2007	--	1.3	0.9	--
2008	--	1.3	0.7	--
2009	--	1.0	0.8	--
2010		1.2	2.6	
Race/Ethnicity	(59.5)**	(307.8)**	(50.4)**	(195.5)**
African American[a]	1.0	1.0	1.0	1.0
White	0.7	0.2	2.8	9.6
Hispanic	0.4	0.4	1.7	3.7
Other/missing	0.7	0.2	2.2	6.8
Charge	(9.3)*	(128.5)**	(96.6)**	(71.8)**
Drugs[a]	1.0	1.0	1.0	1.0
Violent	0.7	0.2	0.2	0.3
Income	0.8	0.5	0.6	0.9
Other	0.8	0.4	0.4	0.5
Severity	(0.5)	(3.2)	(0.4)	(42.3)**
Felony[a]	--	--	--	1.0
Misdemeanor	--	--	--	0.5
Other	--	--	--	0.7
Base Odds	1.5	1.2	0.2	0.1

[a]Reference Category

[c]Parameter estimates not shown because they were based on fewer than 25 arrestees born this year -- Parameter estimates not shown because variation with this variable was not statistically significant *Statistically significant at the α=.05 level. **Statistically significant at the α=.01 level.

Sacramento

Sacramento
(N=4,246)
Sacramento joined the ADAM program in 2000. Hence, Golub and Johnson (1997, 2001) do not provide information about the Crack and Marijuana Epidemics based on DUF data collected in the 1980s and 1990s.

Sacramento—Marijuana Epidemic in plateau throughout the 2000s. Detected marijuana use among youthful adult arrestees varied from 67% to 81% in Sacramento except for a one-year dip down to 56% in 2009 (Fig. 1). Detected marijuana use across birth cohorts from 1975 through 1991 fluctuated between 51% and 76% (Fig. 3) with the peak among persons born in 1990. These steady high levels indicate that the Marijuana Epidemic was in its plateau phase.

Sacramento—Crack Epidemic in plateau throughout 2000s. Detected cocaine/crack use among adult arrestees held constant around 20% from 2000 to 2008 and declined to 10% in 2009 and remained low at 13% in 2010 (Fig 2). However this decrease was not mirrored among youthful adult arrestees. There was a large one-year decline in detected cocaine/crack use among youthful adult arrestees from 13% in 2008 down to 4% in 2009. However, the rate returned back to 13% in 2010. This suggests that the Crack Epidemic remained in the plateau phase through 2010. The logistic regression analysis (Table 1) suggests that there has not been a decline across birth years, there was a lower rate among those born 1987-88 (ORs=0.2-0.7), however the rate was much higher among those born 1989-91 (1.0-1.2). Indeed, variation across birth years (Fig. 3) indicates that the rates of detected cocaine/crack use among arrestees born 1988-91 (8%-13%) were similar to those among arrestees born 1970-86 (9%-16%). The low rate of detected cocaine/crack use among arrestees born in 1987 (3%) appears to be an anomaly.

Sacramento—Methamphetamine Epidemic in decline since 2001. From 2000 to 2002, detected methamphetamine use among youthful adult arrestees declined steadily from 25% down to 13% (Fig. 4). In 2003, the rate among youthful adult arrestees hit a one-year spike of 32%. The subsequent analyses strongly suggest that this spike was an anomaly. By 2007, the rate among youthful adult arrestees had returned to 19% and subsequently declined down to 9% in 2010. This suggests that the Methamphetamine epidemic entered a decline in 2001. The logistic regression analysis (Table 1) confirmed that arrestees born more recently were less likely to be detected as methamphetamine users. The odds ratio for arrestees born 1986-91 (0.1-0.4) were lower than for those born 1980-85 (0.5-1.3). The variation across birth years (Fig. 3) reveals that the peak birth years for detected methamphetamine use were 1960-80 when the rate hovered around 40%, except for arrestees born 1975-79 who were somewhat less likely to be detected as methamphetamine user (31%). Arrestees born 1981-85 were somewhat less likely to be detected as methamphetamine users (21%-30%) than their predecessors, arrestees born 1986-89 were even less likely (15%-18%) and the rate declined further to only 5% among arrestees born in 1991.

Figure 1-Sacramento: Detected Marijuana Use 2000-10

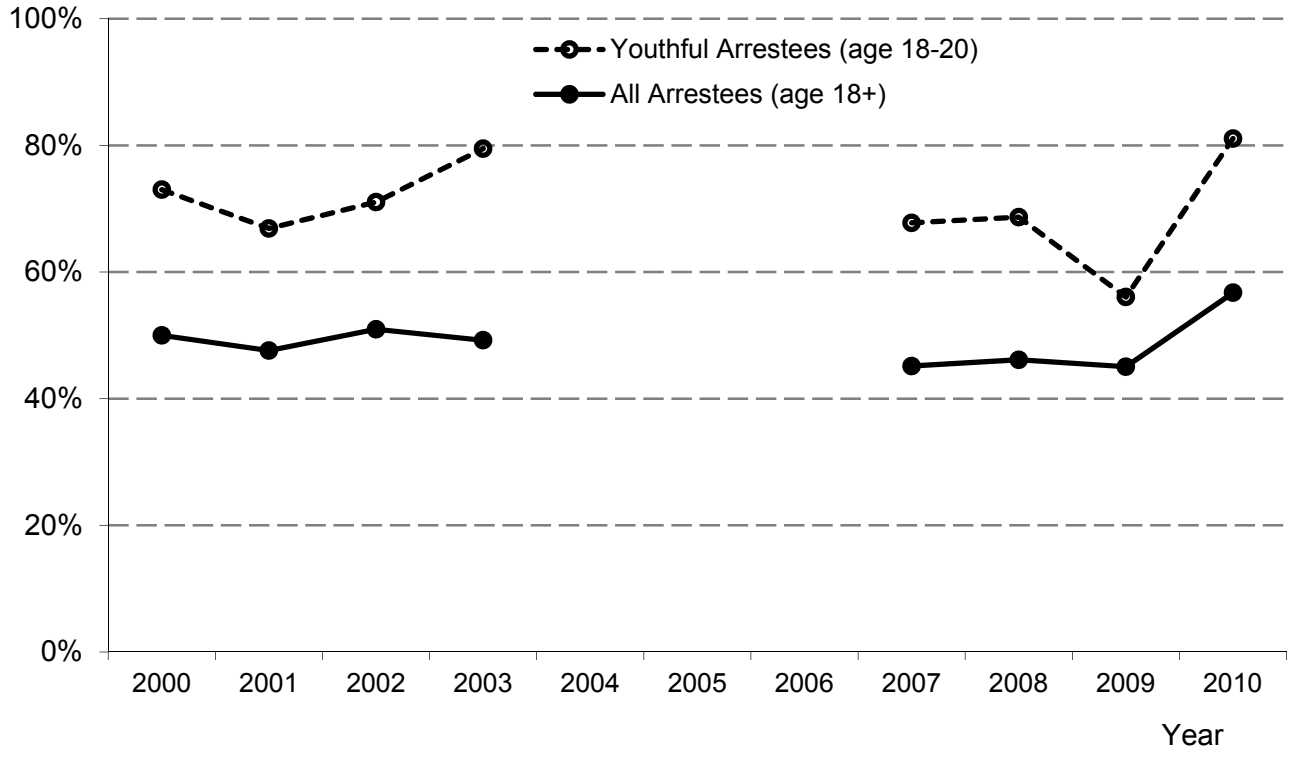


Figure 2-Sacramento: Detected and Reported Cocaine/Crack 2000-10

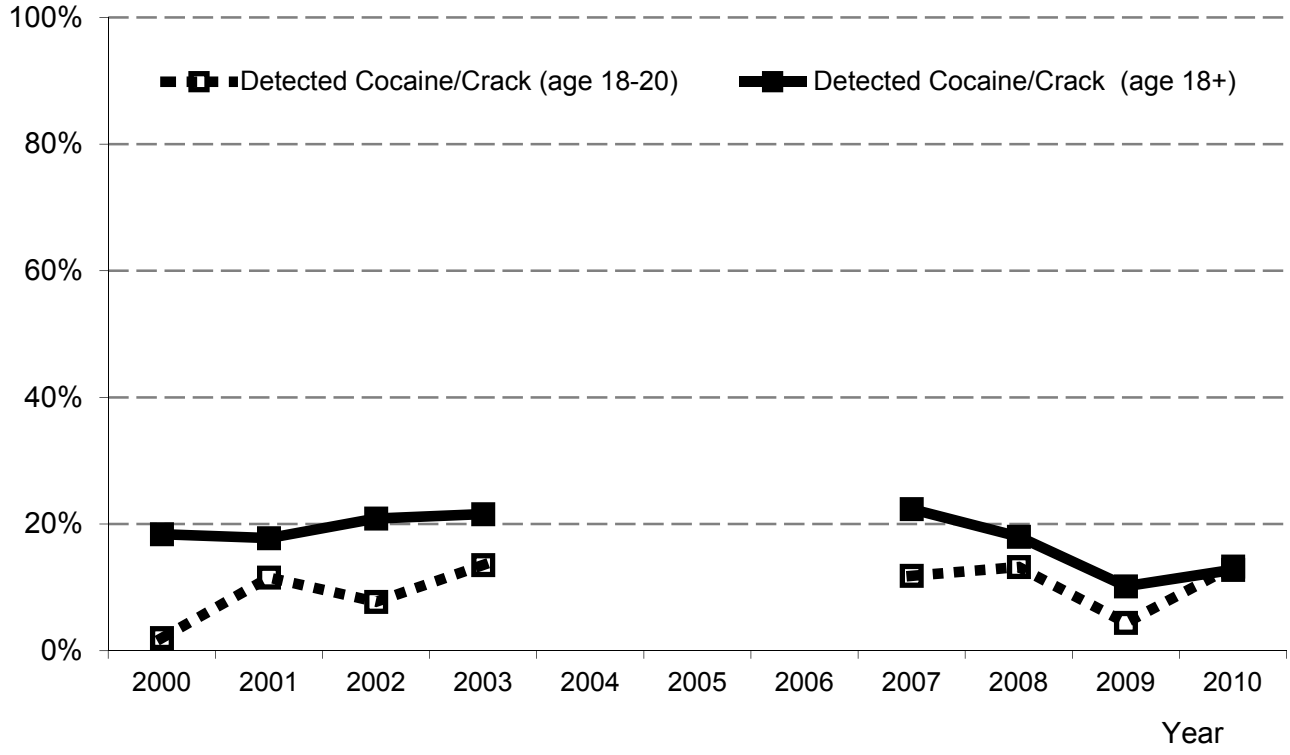


Figure 3-Sacramento: Variation in Detected Drug Use by Birth Year

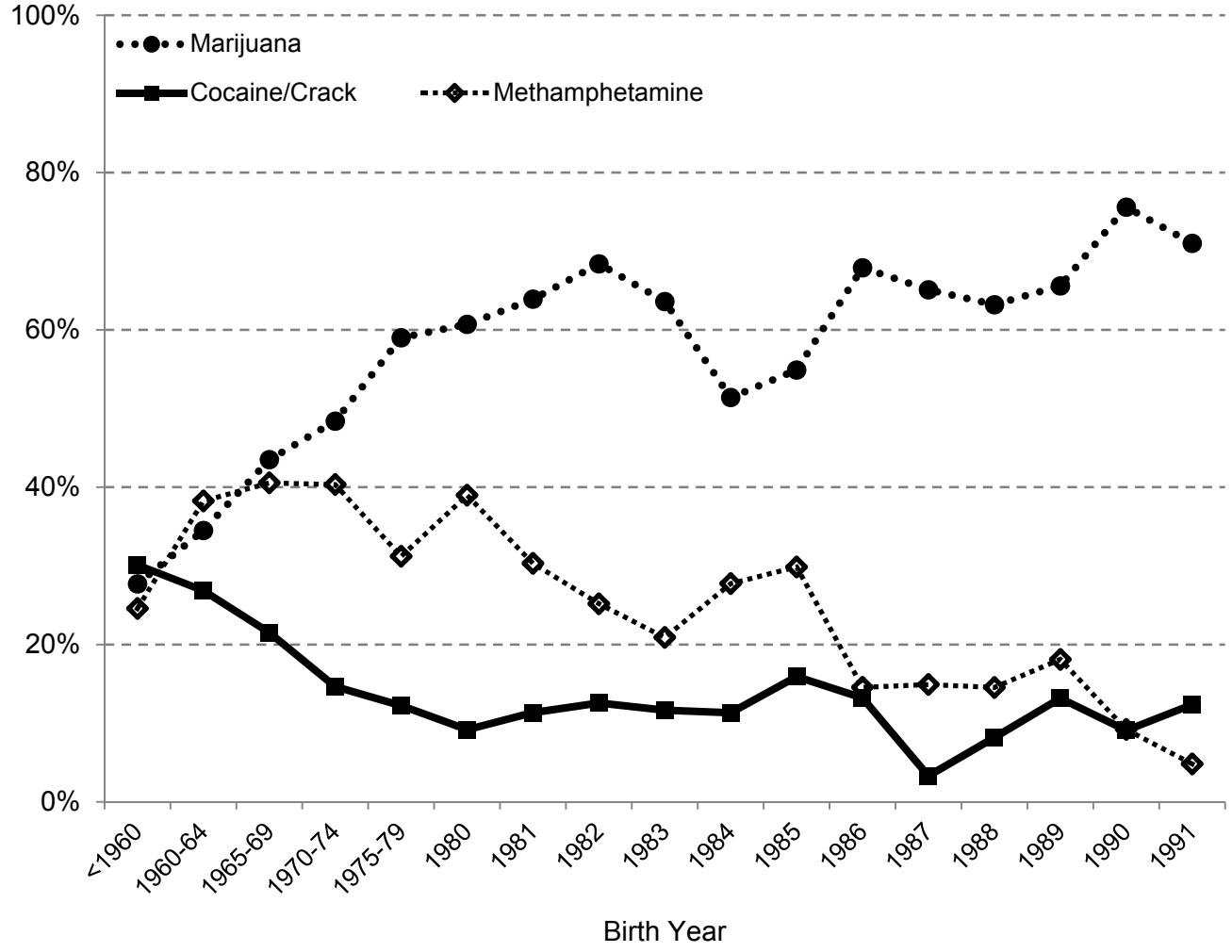


Figure 4-Sacramento: Detected Methamphetamine Use 2000-10

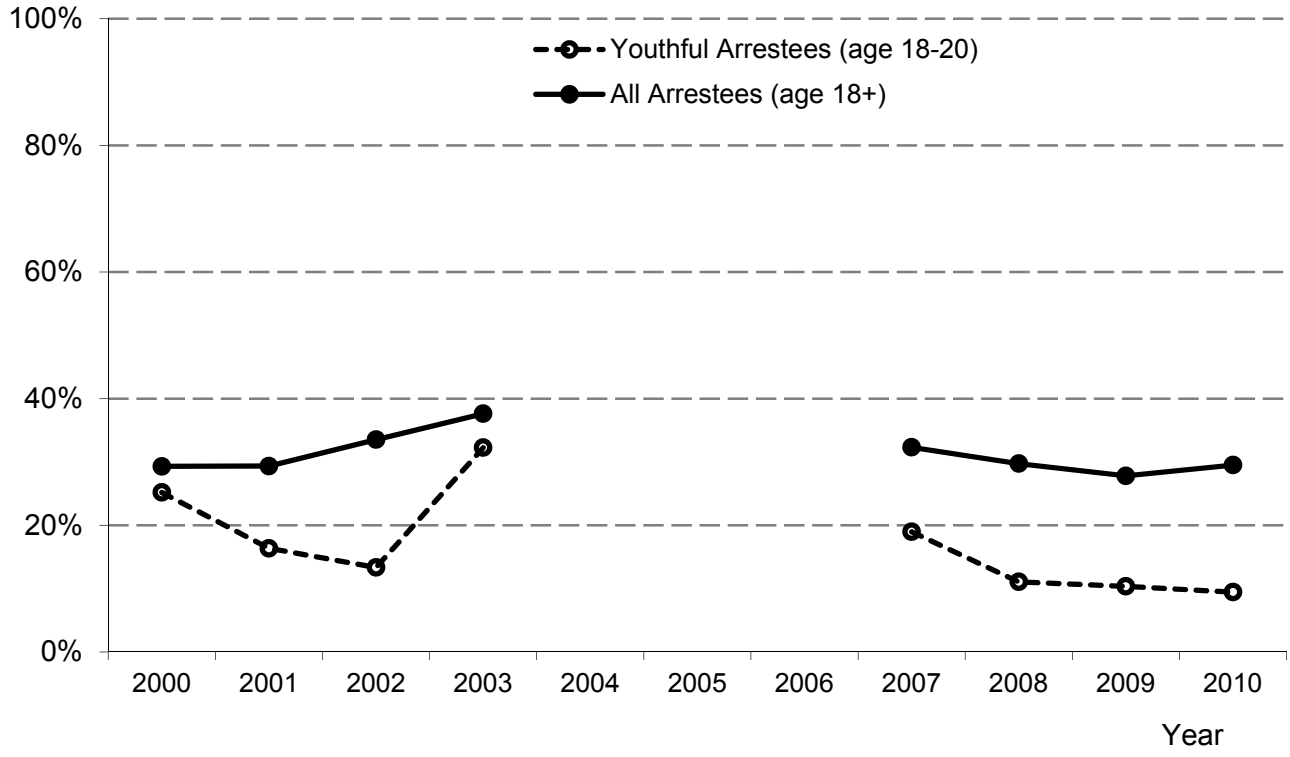


Table 1-Sacramento: Logistic Regression of Detected Marijuana, Cocaine/Crack and Methamphetamine Use

	Odds Ratio (Wald Statistic)		
	Marijuana	**Cocaine/Crack**	**Methamphetamine**
Birth Year	(342.8)**	(148.5)**	(134.9)**
<1960	0.2	3.8	0.7
1960-64	0.3	3.3	1.3
1965-69	0.5	2.4	1.5
1970-74	0.6	1.5	1.3
1975-79[a]	1.0	1.0	1.0
1980	1.2	0.9	1.3
1981	1.4	1.1	0.9
1982	1.7	1.1	0.6
1983	1.3	0.9	0.5
1984	0.8	1.0	0.7
1985	1.1	1.4	0.8
1986	2.1	1.0	0.3
1987	1.6	0.2	0.3
1988	1.6	0.7	0.3
1989	1.6	1.2	0.4
1990	2.5	1.0	0.1
1991	1.7	1.1	0.1
1992[c]	--	--	--
Interview Year	(31.1)**	(26.4)**	(16.1)*
2000[a]	1.0	1.0	1.0
2001	0.8	1.1	1.0
2002	1.0	1.3	1.3
2003	0.9	1.6	1.4
2007	0.6	1.7	1.6
2008	0.6	1.4	1.3
2009	0.6	0.7	1.2
2010	0.9	1.0	1.4
Race/Ethnicity	(65.4)**	(384.5)**	(295.9)**
African American[a]	1.0	1.0	1.0
White	0.7	0.1	6.1
Hispanic	0.5	0.2	4.4
Other/missing	0.6	0.3	3.3
Charge	(18.1)**	(37.2)**	(176.9)**
Drugs[a]	1.0	1.0	1.0
Violent	0.7	0.5	0.2
Income	0.6	0.6	0.5
Other	0.8	0.5	0.3
Severity	(2.9)	(1.0)	(34.8)**
Felony[a]	--	--	1.0
Misdemeanor	--	--	0.6
Other	--	--	0.9
Base Odds	3.3	0.5	0.3

[a]Reference Category

--Parameter estimates not shown because variation with this variable was not statistically

[c]Parameter estimates not shown because they were based on fewer than 25 arrestees born this year

*Statistically significant at the α=.05 level. **Statistically significant at the α=.01 level.

Washington DC

Washington DC
(N=897)
The ADAM prevalence estimates for Washington DC are particularly unreliable given that the sample sizes are particularly small in each year. Accordingly, the rates among youthful adult arrestees are not provided for 2007-2010. Greater attention was paid the variation across birth cohorts (Fig. 3) and logistic regression (Table 1) than the variation across years (Figures 1, 2, and 4).

Washington DC-Marijuana Epidemic in plateau since 1996. Golub and Johnson (2001) estimated that the Marijuana Epidemic in Washington DC had reached a plateau in 1996. At that time, the prevalence among youthful adult arrestees reached 60%. The variation across birth years suggested that there might have been a decline in use from the 1983 to the 1985 birth year when detected use dropped from 60% down to 20%. However, this drop was not sustained and the rate among arrestees born 1989-92 was back up to 72%.

Washington DC—Crack Epidemic continued its decline since 1990. Golub and Johnson (1997) estimated that the Crack Epidemic had entered the decline phase in Washington DC in 1990 or even earlier. In 1989, the rate of detected cocaine/crack use had been over 60%. The rate among arrestees born since 1975 was consistently below 20% (Fig. 3). Moreover, the logistic regression indicates a massive drop from ORs as high as 8.4 among those born 1960-64 down to 1.0 1975-1980 and then to 0.0-0.3 in1985-1992 (Table 1). Additionally, the rate of detected use among adult arrestees dropped from 35% in 2007-08 down to 13% in 2010 (Fig. 2).

Washington DC--Opiate/Heroin Epidemic in the decline phase 2002-2010. Detected opiate/heroin use dropped from 25% among arrestees born 1960-64 to 7% among those born 1965-69 and ranged from 0% among those born 1986-92 (Fig. 3). The logistic regression indicates a drop in the OR from 3.1-3.2 among arrestees born before 1964 down to 1% among those born 1975-79 and remaining extremely low 0.0-0.4 among those born since 1980 (Table 1). These findings indicate that the Opiate/Heroin Epidemic was solidly in its decline phase throughout the 2002-10 period of ADAM data collection in Washington DC.

Figure 1-Washington (DC): Detected Marijuana Use 2000-10

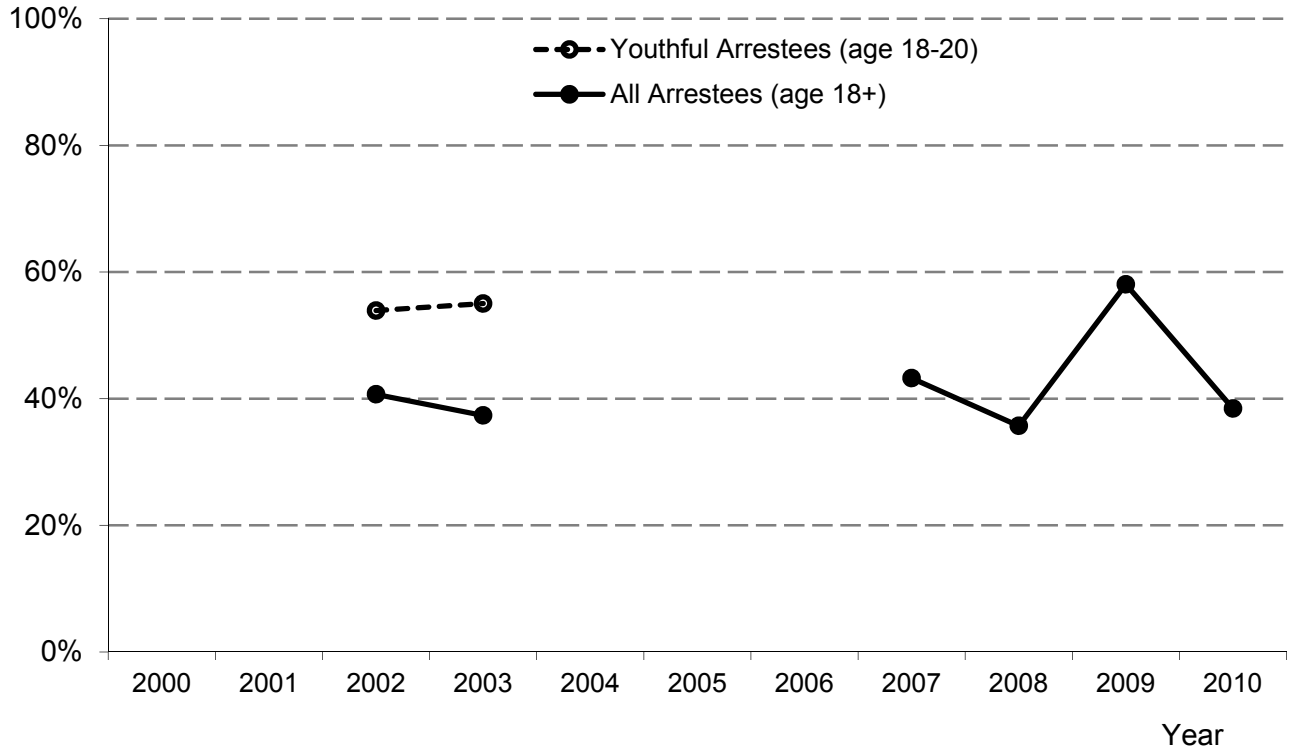


Figure 2-Washington (DC): Detected Cocaine/Crack Use 2000-10

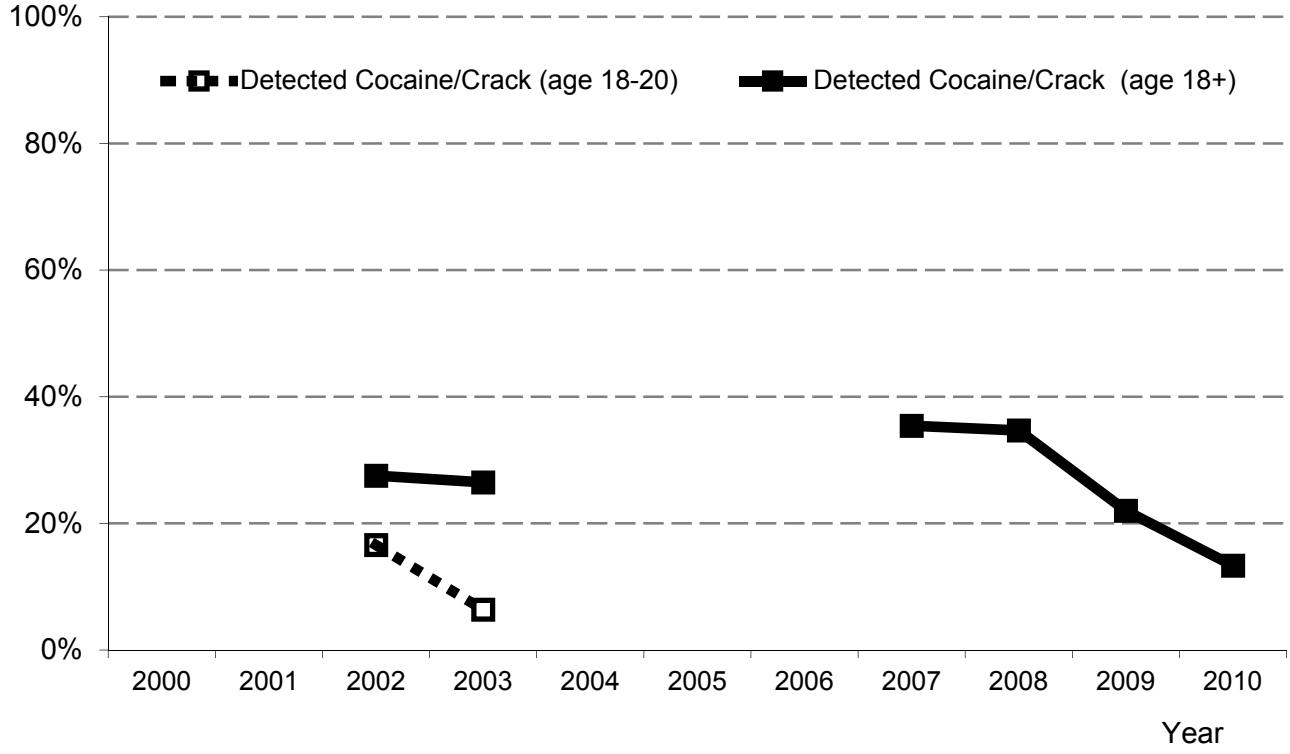


Figure 3-Washington (DC): Variation in Detected Drug Use by Birth Year

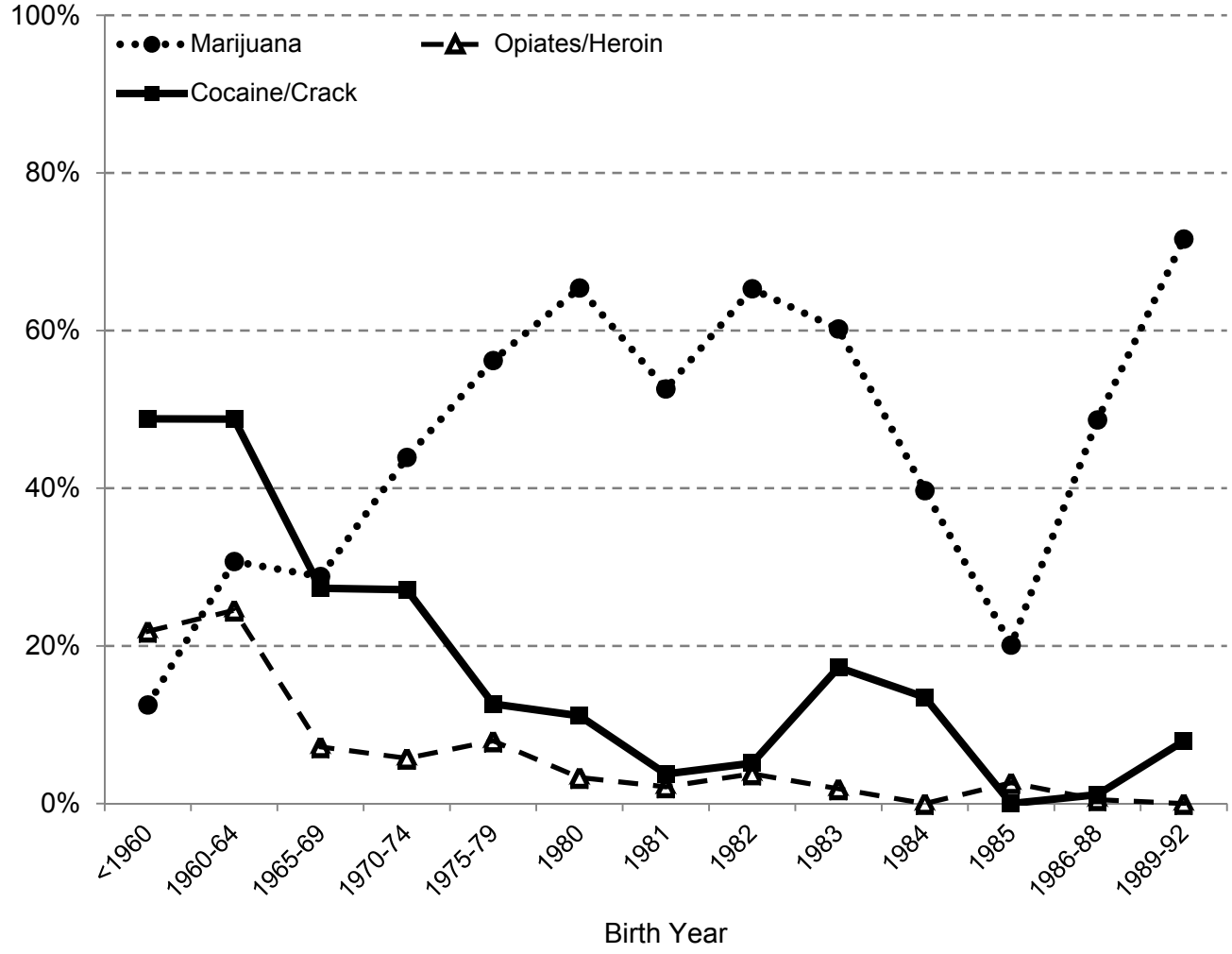


Figure 4-Washington (DC): Detected Opiate/Heroin Use 2000-10

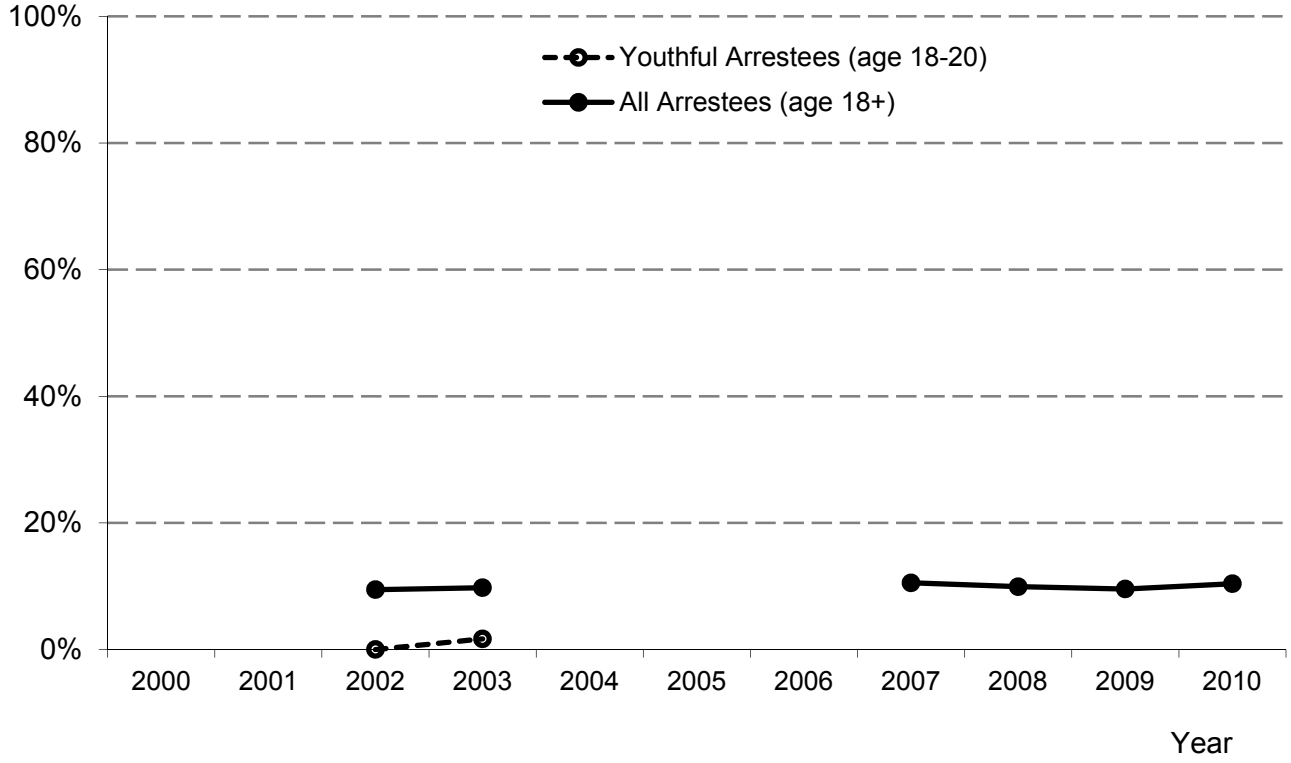


Table 1-Washington (DC): Logistic Regression of Detected Marijuana, Cocaine/Crack and Opiate/Heroin Use

	Odds Ratio (Wald Statistic)		
	Marijuana	**Cocaine/Crack**	**Opiate/Heroin**
Birth Year	(112.6)**	(97.6)**	(40.0)**
<1960	0.1	7.4	3.2
1960-64	0.3	8.4	3.1
1965-69	0.2	3.4	0.9
1970-74	0.6	3.1	0.7
1975-79[a]	1.0	1.0	1.0
1980	1.3	1.0	0.3
1981	0.6	0.2	0.2
1982	1.5	0.2	0.4
1983	1.2	1.3	0.2
1984	0.5	1.2	0.0
1985	0.2	0.0	0.3
1986-88	0.6	0.1	0.1
1989-92	1.8	0.3	0.0
Interview Year	(8.3)	(25.2)**	(2.1)
2000	--	--[b]	--
2001	--	--[b]	--
2002[a]	--	1.0	--
2003	--	0.9	--
2007	--	3.2	--
2008	--	1.2	--
2009	--	1.0	--
2010	--	0.4	
Race/Ethnicity	(6.2)	(2.0)	(1.4)
African American[a]	--	--	--
White	--	--	--
Hispanic	--	--	--
Other/missing	--	--	--
Charge	(17.5)**	(26.2)**	(8.3)*
Drugs[a]	1.0	1.0	1.0
Violent	0.3	0.2	0.3
Income	0.6	1.4	0.4
Other	0.5	0.8	0.7
Severity	(8.4)*	(22.8)**	(15.9)**
Felony[a]	1.0	1.0	1.0
Misdemeanor	1.1	0.6	0.4
Other	0.6	0.2	0.2
Base Odds	3.0	0.3	0.3

[a]Reference Category

[b]Data not collected in Washington DC in 2000-01

--Parameter estimates not shown because variation with this variable was not statistically *Statistically significant at the α=.05 level. **Statistically significant at the α=.01 level.

Drug markets

The unfortunate outcome was that none of the analyses identified any significant association among the drug market variables collected by the ADAM Program and no association between changes in the drug market variables with the timing of changes in drug epidemics. Accordingly, this section provides the details of what proved to be a fruitless research direction. The major finding is therefore that there appears to be no simple relationship between drug market variables that can be estimated from ADAM arrestee responses with the changes in a drug epidemic.

Micro data analysis

Overall, on an individual basis, the drug market stability variables were not very highly associated with each other. The 8 cash-purchase-related items did not form a very reliable scale at all. The Cronbach's Alpha reliability measures ranged from .3 to .4, depending on the drug (Table M-1). The factor analysis found three distinct factors (4 for heroin) that account for substantial variation. Furthermore, these three to four factors still only accounted for 51% to 63% of the total variation (Table M-2). In other words, there is extremely poor variable reduction potential among these variables.

Table M-1: Reliability of an 8-Item Drug-Market Stability Scale by Drug, ADAM 2000-2009 micro-data

Drug	Cronbach's Alpha
Marijuana	.40
Crack	.38
Powder Cocaine	.37
Heroin	.38
Methamphetamine	.26

Table M-2: Factor Analysis of 8 Drug-Market Variables by Drug, ADAM 2000-2009 micro-data

Drug	# of Factors[a]	Variance Explained
Marijuana	3	51%
Crack	3	52%
Powder Cocaine	3	52%
Heroin	4	63%
Methamphetamine	3	49%

[a]Eigenvalues >1.0.

Site-year aggregate variable analysis

The 10-item scale made with the aggregated site-year-data was even less reliable than the 8-item scale with the micro-data. Cronbach's Alphas ranged from -.03 to .39 (Table M-3). This indicated that it was not the case that the 8 items tended to vary together across time. The results of the factor analysis were not much more encouraging. The results indicate that even at the aggregated level that each market factor tends to vary independent of another. The 10 items formed 4 distinct factors and still only accounted for 69%-79% of the variation (Table M-4).

Table M-3: Reliability of a 10-Item Drug-Market Stability Scale by Drug, ADAM 2000-2009 Data Aggregated by Site and Year

Drug	Cronbach's Alpha
Marijuana	.28
Crack	.29
Powder Cocaine	-.03
Heroin	.39
Methamphetamine	.25

Table M-4: Factor Analysis of 10 Drug-Market Variables by Drug, ADAM 2000-2009 Data Aggregated by Site and Year

Drug	# of Factors[a]	Variance Explained	Variance Explained by the first factor
Marijuana	4	74%	31%
Crack	4	69%	24%
Powder Cocaine	4	70%	27%
Heroin	4	79%	29%
Methamphetamine	4	75%	30%

[a]Eigenvalues >1.0.

It had been hypothesized that there would be one or two big factors that explained most of the variation across sites and over time. Accordingly, the amount of variation explained by the first factor was examined. It ranged from 24%-31%, which is not particularly large. Then, the composition of the factors was examined. Table M-5 examines the factor loading for the unrotated matrix. This matrix presents the factors in size order, with the biggest factor first based on a principal component analysis. Commonly, one takes a varimax rotation after deciding how many components to keep. This rotation gives you the most distinct factors. However, it would have been fortuitous to have a first big factor for each drug. Typically with principal components analysis, this will be a factor that includes all of the variables and is associated with how large the factor might be, such as how structured the market might be. The table shows the factor loadings for 5 separate principal component analyses, one for each drug. Those items with a factor load of .6 or higher are highlighted. It was hypothesized that the first column would be almost completely highlighted. It was not. In general, none of the factors include loading by more than 4 of the 10 items. Most problematic are the items in the first factor that are negative. A factor loading of zero indicates an item that will not help your measure, but won't particularly hurt it. It measures something unrelated or orthogonal to the other items in the factor. A negative score indicates that the item will hurt the scale or that the item should be reverse coded. However, the coding was based on the theory of those factors that characterize drug market stability. So reverse coding some of the variables would contradict the theoretical model.

It is possible that all ten factors are still indicators of market stability. It could be just that market structure is idiosyncratic. In this case, it would not necessarily be the case that those markets that are more structured tend to be higher on all of the items. Similar, as market structure changes over time it may be only a few of the items that increase. It is still possible that one or a group of items could be useful for predicting a shift in a drug epidemic.

Table M-5: Factor loading of 10 drug-market structure items, ADAM 2000-09 Site-Year Aggregated Data

	Marijuana				Crack				Powder Cocaine			
	Component				Component				Component			
	1	2	3	4	1	2	3	4	1	2	3	4
COP	-.29	.89	-.01	-.07	-.56	.13	.50	-.25	-.54	.55	-.40	-.01
CRD	.42	.43	-.31	.30	.31	-.36	.51	-.15	.37	.05	-.63	.44
ELE	.85	.18	-.18	-.17	.71	-.07	.32	.26	.31	.52	-.19	-.66
CRR	-.40	-.23	-.11	.81	.49	.36	-.46	.32	.67	-.09	.46	.38
PID	.78	-.40	-.03	.14	.80	-.25	.17	.30	.83	.01	-.25	-.21
NFT	-.19	-.16	.70	-.29	-.44	.21	-.30	.42	-.39	-.14	.48	-.32
NDL1	.72	-.17	.43	.14	.33	.80	.09	-.29	.42	.60	.30	-.10
NDL3	.83	.12	.26	.13	.27	.82	.06	-.17	.08	.72	.25	.33
RSC	.19	.71	.39	.22	-.16	.36	.71	.39	-.48	.61	.14	.25
HOD	-.32	.02	.65	.28	-.49	.17	.17	.58	-.73	-.15	-.12	.06

	Heroin				Methamphetamine			
	Component				Component			
	1	2	3	4	1	2	3	4
COP	.87	.07	.00	.03	.42	-.61	.41	-.05
CRD	-.75	.22	.00	-.37	.37	-.59	.12	-.34
ELE	-.13	.78	.40	.04	-.27	-.38	-.67	.39
CRR	.12	.63	-.22	.59	-.78	.15	.52	-.04
PID	-.40	.62	.46	.11	.42	-.08	.26	.79
NFT	.74	.00	-.16	.28	-.06	.79	.11	-.07
NDL1	.15	-.52	.72	.23	.34	.53	.07	.26
NDL3	-.29	-.66	.49	.26	.87	.32	.27	.02
RSC	.55	.40	.55	-.14	.74	-.26	-.10	-.09
HOD	.66	.08	.17	-.63	.62	.50	-.45	-.25

Time trend analysis

The following tables highlight any major change in a drug epidemic in yellow and any major change in any of the 10 drug epidemic variables in green. The hope was to observe that the timing of changes in several of the drug market variables would be linked with the timing of changes in the prevalence of use. In particular, changes in the drug market could presage, coincide or follow changes in the popularity of use. No major consistent findings were identified. Observations are presented before each table.

Marijuana epidemic and drug market trends

Overall, marijuana drug market variables generally showed great stability over time across locations. There were a variety of substantial changes in Manhattan during the 2000s. Most involved decreased market structure: fewer cash only purchases (MJACOP), more failed transactions (MJANFT), fewer regular sources (MJARSC), and fewer purchases in own neighborhood (MJAHOD). Two elements represented an increase in structure: electronic purchases (MJAELE) and indoor purchases (MJAPID).

Table M-6: Comparison of time trends in MARIJUANA Epidemic and drug market characteristics by ADAM II location

		YEAR							
		2000	2001	2002	2003	2007	2008	2009	Total
1.00 Atlanta, GA	MJAPOS18	68%		70%	80%	85%	76%	67%	75%
	MJAPOS	38%		34%	42%	38%	41%	46%	40%
	MJACOP	62%		75%	63%	61%	74%	73%	68%
	MJACRD	4%		10%	7%	4%	2%	3%	5%
	MJAELE	14%		24%	24%	24%	27%	29%	24%
	MJACRR	9%		7%	11%	12%	10%	10%	10%
	MJAPID	55%		65%	61%	55%	47%	51%	56%
	MJANFT	63%		45%	68%	53%	52%	65%	57%
	MJANDL1	53%		52%	46%	64%	47%	62%	54%
	MJANDL3	84%		86%	84%	91%	75%	88%	85%
	MJARSC	54%		51%	47%	60%	52%	61%	54%
	MJAHOD	47%		43%	46%	42%	55%	52%	48%
2.50 Charlotte, NC	MJAPOS18	85%	76%	70%	67%	73%	64%	50%	69%
	MJAPOS	44%	48%	44%	47%	41%	46%	33%	43%
	MJACOP	52%	70%	70%	62%	84%	70%	63%	67%
	MJACRD	0%	9%	13%	8%	3%	7%	8%	7%
	MJAELE	25%	27%	37%	31%	45%	27%	38%	33%
	MJACRR	10%	15%	11%	15%	6%	13%	6%	11%
	MJAPID	60%	59%	58%	57%	71%	70%	67%	63%
	MJANFT	28%	50%	43%	70%	62%	62%	76%	56%
	MJANDL1	48%	51%	41%	57%	62%	47%	70%	54%
	MJANDL3	76%	95%	88%	92%	96%	87%	98%	90%
	MJARSC	28%	50%	39%	47%	59%	55%	57%	48%
	MJAHOD	51%	34%	33%	36%	44%	43%	27%	38%
3.00 Chicago, IL	MJAPOS18	69%	87%	81%	83%	80%	67%	69%	76%
	MJAPOS	46%	50%	49%	53%	49%	49%	49%	49%
	MJACOP	70%	72%	73%	75%	73%	65%	70%	71%
	MJACRD	2%	4%	5%	5%	10%	5%	7%	5%
	MJAELE	13%	10%	13%	15%	24%	25%	28%	18%
	MJACRR	21%	21%	18%	19%	20%	11%	12%	17%
	MJAPID	30%	18%	28%	25%	49%	38%	41%	33%
	MJANFT	56%	73%	63%	76%	61%	71%	70%	67%
	MJANDL1	49%	57%	41%	52%	63%	48%	44%	51%
	MJANDL3	79%	87%	79%	87%	91%	80%	86%	84%
	MJARSC	49%	50%	56%	50%	52%	55%	46%	51%
	MJAHOD	59%	54%	51%	58%	58%	54%	57%	56%
6.00 Denver, CO	MJAPOS18	53%	59%	66%	66%	69%	71%	82%	67%
	MJAPOS	41%	40%	40%	42%	45%	42%	45%	42%
	MJACOP	50%	50%	48%	51%	52%	55%	53%	51%
	MJACRD	3%	2%	1%	2%	3%	2%	1%	2%
	MJAELE	18%	20%	17%	24%	27%	30%	27%	23%
	MJACRR	16%	20%	17%	16%	18%	9%	14%	16%
	MJAPID	63%	60%	50%	50%	62%	58%	50%	56%
	MJANFT	62%	58%	58%	74%	72%	77%	85%	69%
	MJANDL1	58%	60%	58%	53%	63%	60%	52%	58%
	MJANDL3	93%	91%	94%	85%	91%	93%	90%	91%
	MJARSC	40%	39%	41%	47%	48%	49%	33%	42%
	MJAHOD	51%	44%	41%	35%	39%	40%	38%	41%

Table M-6: Comparison of time trends in MARIJUANA Epidemic and drug market characteristics by ADAM II location

		YEAR							
		2000	2001	2002	2003	2007	2008	2009	Total
10.00 Indianapolis, IN	MJAPOS18	69%	73%	66%	83%	73%	73%	63%	72%
	MJAPOS	49%	50%	47%	45%	44%	46%	44%	46%
	MJACOP	65%	61%	62%	59%	67%	69%	63%	64%
	MJACRD	4%	5%	3%	5%	11%	7%	6%	6%
	MJAELE	30%	27%	32%	38%	39%	38%	42%	35%
	MJACRR	13%	10%	16%	15%	5%	12%	13%	12%
	MJAPID	68%	67%	76%	70%	77%	81%	83%	74%
	MJANFT	48%	43%	62%	73%	56%	57%	63%	57%
	MJANDL1	56%	51%	57%	63%	60%	66%	55%	58%
	MJANDL3	92%	91%	91%	91%	92%	95%	92%	92%
	MJARSC	46%	54%	57%	60%	53%	51%	56%	54%
	MJAHOD	37%	41%	35%	41%	34%	44%	44%	39%
13.00 Manhattan, NY	MJAPOS18	67%	65%	70%	75%	54%	63%	69%	66%
	MJAPOS	39%	41%	44%	43%	39%	43%	41%	41%
	MJACOP	92%	81%	80%	84%	65%	76%	73%	79%
	MJACRD	0%	1%	5%	4%	4%	5%	5%	4%
	MJAELE	8%	8%	10%	19%	25%	31%	30%	19%
	MJACRR	5%	9%	18%	13%	14%	15%	14%	12%
	MJAPID	14%	17%	21%	33%	50%	42%	42%	31%
	MJANFT	92%	77%	69%	77%	45%	61%	54%	68%
	MJANDL1	32%	47%	53%	39%	58%	60%	51%	49%
	MJANDL3	77%	88%	82%	83%	85%	89%	82%	84%
	MJARSC	72%	61%	55%	49%	43%	59%	58%	57%
	MJAHOD	76%	67%	60%	52%	53%	47%	59%	59%
Minneapolis, MN	MJAPOS18	75%	72%	80%	70%	55%	86%	85%	75%
	MJAPOS	54%	54%	54%	48%	44%	49%	47%	50%
	MJACOP	67%	65%	64%	64%	73%	69%	74%	68%
	MJACRD	3%	4%	4%	5%	3%	4%	5%	4%
	MJAELE	20%	22%	26%	32%	35%	33%	35%	29%
	MJACRR	11%	14%	14%	5%	4%	14%	9%	10%
	MJAPID	50%	46%	54%	42%	44%	44%	47%	47%
	MJANFT	61%	64%	63%	66%	56%	61%	48%	60%
	MJANDL1	45%	38%	47%	52%	42%	46%	46%	45%
	MJANDL3	75%	77%	88%	85%	83%	81%	90%	83%
	MJARSC	36%	35%	41%	39%	41%	43%	40%	39%
	MJAHOD	36%	41%	42%	32%	48%	42%	43%	41%
19.00 Portland, OR	MJAPOS18	47%	68%	56%	62%	61%	62%	64%	60%
	MJAPOS	36%	36%	37%	38%	41%	41%	38%	38%
	MJACOP	44%	52%	49%	44%	45%	48%	47%	47%
	MJACRD	3%	4%	3%	1%	3%	3%	3%	3%
	MJAELE	24%	25%	25%	20%	26%	29%	28%	25%
	MJACRR	9%	15%	13%	15%	12%	12%	9%	12%
	MJAPID	66%	67%	65%	64%	68%	70%	58%	65%
	MJANFT	73%	71%	70%	73%	63%	68%	62%	68%
	MJANDL1	68%	55%	61%	49%	54%	58%	59%	58%
	MJANDL3	89%	87%	86%	87%	89%	90%	85%	88%
	MJARSC	42%	42%	44%	43%	45%	37%	42%	42%
	MJAHOD	50%	46%	50%	54%	45%	47%	49%	49%

Table M-6: Comparison of time trends in MARIJUANA Epidemic and drug market characteristics by ADAM II location

		YEAR							
		2000	2001	2002	2003	2007	2008	2009	Total
19.50 Sacramento, CA	MJAPOS18	73%	67%	71%	79%	68%	69%	56%	69%
	MJAPOS	50%	48%	51%	49%	45%	46%	45%	48%
	MJACOP	59%	57%	57%	61%	55%	40%	44%	54%
	MJACRD	5%	6%	3%	5%	4%	1%	2%	4%
	MJAELE	29%	24%	29%	20%	28%	19%	27%	25%
	MJACRR	12%	15%	10%	14%	14%	12%	17%	14%
	MJAPID	76%	63%	66%	64%	72%	54%	67%	66%
	MJANFT	53%	53%	68%	71%	62%	60%	71%	63%
	MJANDL1	56%	49%	56%	51%	47%	52%	57%	53%
	MJANDL3	91%	87%	88%	84%	87%	84%	85%	86%
	MJARSC	47%	40%	48%	41%	39%	38%	53%	44%
	MJAHOD	57%	54%	45%	42%	45%	49%	50%	49%
24.00 Washington, DC	MJAPOS18			54%	55%	78%	35%	100%	64%
	MJAPOS			41%	37%	43%	36%	58%	43%
	MJACOP			68%	71%	65%	73%	65%	68%
	MJACRD			1%	7%	5%	2%	0%	3%
	MJAELE			13%	14%	16%	45%	6%	19%
	MJACRR			7%	19%	48%	0%	28%	20%
	MJAPID			18%	31%	39%	18%	17%	25%
	MJANFT			59%	67%	31%	28%	62%	49%
	MJANDL1			23%	44%	30%	60%	47%	41%
	MJANDL3			69%	76%	82%	100%	56%	77%
	MJARSC			28%	32%	64%	86%	36%	49%
	MJAHOD			17%	16%	44%	4%	34%	23%

Crack and powder cocaine epidemic and drug market trends

Charlotte experienced increased crack market structure in 2000-2002 with 5 variables showing substantial increases and the other 5 showing more modest increases. Chicago experienced an increase in electronic contacts (CRKELE) 2000-2007 and an increase in indoor purchases (CRKPID) during this same period. On the other hand, the percentage of users with a single dealer in Chicago declined. Manhattan experienced an increase in cocaine and crack electronic contacts (CRKELE and COCELE) along with an increase in indoor purchases for both drugs. Contrary to our hypothesis however, these increase in market structure were both accompanied by an increase in failed transactions (a decline in CRKNFT and COCNFT).

Table M-7: Comparison of time trends in CRACK and POWDER COCAINE Epidemic and drug market characteristics by ADAM II location

		YEAR							
		2000	2001	2002	2003	2007	2008	2009	Total
1.00 Atlanta, GA	COCPOS18	14%		16%	34%	17%	16%	3%	17%
	COCPOS	48%		50%	50%	47%	39%	36%	45%
	CRKCOP	85%		80%	85%	74%	89%	83%	83%
	CRKCRD	5%		11%	12%	4%	2%	6%	7%
	CRKELE	12%		20%	17%	17%	7%	15%	15%
	CRKCRR	9%		8%	15%	7%	8%	7%	9%
	CRKPID	40%		56%	46%	37%	32%	26%	40%
	CRKNFT	60%		63%	83%	60%	69%	68%	67%
	CRKNDL1	25%		24%	29%	16%	25%	30%	25%
	CRKNDL3	56%		55%	57%	41%	47%	71%	55%
	CRKRSC	53%		52%	45%	59%	58%	70%	56%
	CRKHOD	57%		46%	57%	58%	63%	74%	59%
	COCCOP	68%		67%	68%	67%	51%	58%	63%
	COCCRD	7%		11%	6%	0%	7%	6%	6%
	COCELE	16%		28%	32%	50%	7%	34%	28%
	COCCRR	11%		15%	9%	8%	17%	13%	12%
	COCPID	55%		59%	63%	83%	64%	63%	65%
	COCNFT	70%		67%	79%	67%	58%	56%	66%
	COCNDL1	48%		49%	68%	53%	44%	84%	58%
	COCNDL3	93%		90%	90%	82%	54%	93%	84%
	COCRSC	62%		61%	63%	53%	38%	80%	60%
	COCHOD	53%		36%	48%	51%	49%	29%	44%
2.50 Charlotte, NC	COCPOS18	53%	10%	19%	15%	8%	3%	5%	16%
	CRKD3018	6%	6%	2%	4%	0%	0%	2%	3%
	COCD3018	22%	7%	12%	11%	5%	6%	5%	10%
	COCPOS	44%	32%	34%	35%	39%	35%	29%	35%
	CRKD30	21%	19%	17%	17%	22%	15%	12%	17%
	COCD30	13%	10%	12%	8%	11%	10%	8%	10%
	CRKCOP	77%	77%	84%	75%	84%	87%	87%	82%
	CRKCRD	6%	12%	13%	13%	11%	6%	7%	10%
	CRKELE	18%	28%	44%	39%	38%	37%	46%	36%
	CRKCRR	4%	15%	12%	7%	9%	10%	11%	10%
	CRKPID	47%	56%	67%	59%	59%	64%	70%	60%
	CRKNFT	43%	58%	53%	64%	67%	58%	64%	58%
	CRKNDL1	20%	44%	38%	30%	26%	24%	44%	32%
	CRKNDL3	54%	77%	75%	69%	60%	67%	84%	69%
	CRKRSC	21%	52%	53%	47%	52%	49%	56%	47%
	CRKHOD	36%	40%	27%	38%	59%	44%	38%	40%
	COCCOP	53%	59%	76%	68%	83%	79%	80%	71%
	COCCRD	5%	17%	7%	9%	7%	9%	5%	8%
	COCELE	24%	24%	43%	39%	50%	45%	51%	39%
	COCCRR	36%	20%	16%	12%	6%	17%	13%	17%
	COCPID	65%	70%	71%	75%	73%	81%	67%	72%
	COCNFT	32%	45%	55%	79%	64%	55%	73%	58%
	COCNDL1	56%	77%	70%	66%	71%	65%	80%	69%
	COCNDL3	100%	97%	92%	93%	82%	93%	97%	93%
	COCRSC	65%	61%	45%	55%	57%	51%	59%	56%
	COCHOD	35%	26%	23%	20%	45%	43%	19%	30%

Table M-7: Comparison of time trends in CRACK and POWDER COCAINE Epidemic and drug market characteristics by ADAM II location

		YEAR							
		2000	2001	2002	2003	2007	2008	2009	Total
3.00 Chicago, IL	COCPOS18	14%	14%	21%	25%	19%	25%	3%	17%
	COCPOS	37%	41%	48%	51%	35%	36%	27%	39%
	CRKCOP	79%	90%	88%	85%	87%	84%	92%	87%
	CRKCRD	6%	2%	5%	6%	9%	4%	14%	7%
	CRKELE	2%	9%	15%	14%	32%	32%	29%	19%
	CRKCRR	19%	18%	13%	10%	21%	7%	12%	14%
	CRKPID	17%	19%	20%	26%	39%	30%	35%	27%
	CRKNFT	60%	73%	67%	78%	73%	69%	63%	69%
	CRKNDL1	50%	53%	34%	40%	34%	28%	39%	40%
	CRKNDL3	74%	84%	71%	76%	69%	70%	76%	74%
	CRKRSC	54%	56%	57%	59%	49%	54%	62%	56%
	CRKHOD	51%	50%	57%	66%	52%	61%	49%	55%
6.00 Denver, CO	COCPOS18	28%	22%	20%	29%	30%	28%	7%	23%
	CRKD3018	6%	7%	7%	7%	4%	7%	0%	5%
	COCD3018	11%	16%	12%	4%	15%	12%	7%	11%
	COCPOS	35%	34%	33%	38%	39%	32%	28%	34%
	CRKD30	21%	20%	18%	19%	20%	17%	15%	18%
	COCD30	13%	14%	14%	11%	15%	11%	10%	13%
	CRKCOP	63%	68%	63%	67%	78%	72%	79%	70%
	CRKCRD	4%	2%	1%	2%	4%	3%	2%	2%
	CRKELE	31%	29%	28%	33%	37%	34%	27%	31%
	CRKCRR	21%	15%	25%	21%	23%	32%	21%	22%
	CRKPID	56%	47%	41%	37%	53%	47%	31%	45%
	CRKNFT	62%	53%	68%	71%	71%	70%	84%	68%
	CRKNDL1	40%	35%	36%	34%	34%	38%	32%	36%
	CRKNDL3	79%	72%	68%	69%	77%	71%	65%	71%
	CRKRSC	49%	34%	37%	41%	53%	52%	38%	44%
	CRKHOD	53%	50%	53%	46%	39%	54%	55%	50%
	COCCOP	53%	50%	56%	57%	50%	60%	56%	55%
	COCCRD	2%	2%	2%	0%	4%	0%	0%	1%
	COCELE	24%	21%	22%	30%	32%	26%	31%	26%
	COCCRR	16%	13%	19%	15%	14%	23%	27%	18%
	COCPID	66%	59%	62%	49%	54%	43%	63%	57%
	COCNFT	59%	78%	80%	79%	72%	72%	89%	76%
	COCNDL1	49%	61%	69%	48%	67%	85%	90%	67%
	COCNDL3	81%	97%	90%	79%	83%	88%	95%	87%
	COCRSC	44%	42%	52%	68%	44%	62%	62%	53%
	COCHOD	38%	56%	26%	40%	42%	33%	42%	40%
10.00 Indianapolis, IN	COCPOS18	19%	21%	25%	21%	11%	8%	7%	16%
	COCPOS	31%	32%	35%	35%	30%	21%	21%	29%
	CRKCOP	80%	72%	79%	78%	85%	78%	66%	77%
	CRKCRD	6%	3%	6%	5%	6%	6%	6%	5%
	CRKELE	43%	36%	44%	45%	37%	46%	49%	43%
	CRKCRR	25%	18%	10%	22%	15%	23%	10%	18%
	CRKPID	69%	63%	61%	58%	63%	56%	65%	62%
	CRKNFT	70%	47%	65%	72%	55%	61%	51%	60%
	CRKNDL1	44%	37%	43%	34%	41%	35%	50%	41%
	CRKNDL3	72%	76%	78%	72%	79%	74%	80%	76%
	CRKRSC	58%	54%	67%	59%	70%	53%	63%	60%
	CRKHOD	48%	59%	42%	53%	54%	51%	38%	49%

Table M-7: Comparison of time trends in CRACK and POWDER COCAINE Epidemic and drug market characteristics by ADAM II location

		YEAR							
		2000	2001	2002	2003	2007	2008	2009	Total
13.00 Manhattan, NY	COCPOS18	7%	7%	21%	18%	10%	11%	4%	11%
	CRKD3018	5%	0%	4%	5%	2%	0%	2%	3%
	COCD3018	2%	2%	6%	5%	1%	4%	7%	4%
	COCPOS	52%	45%	49%	36%	27%	25%	28%	37%
	CRKD30	23%	23%	25%	14%	12%	8%	12%	16%
	COCD30	16%	17%	15%	9%	10%	9%	11%	13%
	CRKCOP	98%	91%	89%	90%	88%	93%	80%	90%
	CRKCRD	0%	2%	5%	5%	8%	6%	0%	4%
	CRKELE	3%	8%	12%	12%	26%	35%	35%	19%
	CRKCRR	4%	3%	13%	7%	13%	3%	5%	7%
	CRKPID	8%	20%	16%	11%	29%	28%	31%	20%
	CRKNFT	94%	77%	60%	73%	43%	35%	66%	64%
	CRKNDL1	36%	40%	38%	29%	27%	60%	33%	38%
	CRKNDL3	84%	79%	72%	72%	47%	76%	68%	71%
	CRKRSC	61%	56%	55%	45%	44%	53%	76%	55%
	CRKHOD	69%	63%	53%	52%	56%	50%	57%	57%
	COCCOP	94%	87%	81%	86%	70%	86%	79%	83%
	COCCRD	0%	3%	6%	9%	5%	0%	1%	4%
	COCELE	8%	12%	17%	27%	28%	46%	44%	26%
	COCCRR	4%	4%	12%	10%	0%	10%	5%	6%
	COCPID	17%	27%	25%	48%	43%	45%	48%	36%
	COCNFT	91%	85%	65%	72%	44%	44%	59%	66%
	COCNDL1	44%	62%	64%	48%	58%	82%	53%	59%
	COCNDL3	96%	94%	84%	92%	88%	94%	91%	91%
	COCRSC	74%	65%	65%	74%	51%	75%	74%	68%
	COCHOD	70%	48%	57%	54%	52%	52%	54%	55%
14.50 Minneapolis, MN	COCPOS18	11%	7%	7%	11%	20%	8%	3%	9%
	COCPOS	26%	28%	31%	28%	29%	22%	17%	26%
	CRKCOP	79%	74%	79%	68%	78%	89%	83%	78%
	CRKCRD	9%	3%	7%	13%	4%	2%	5%	6%
	CRKELE	21%	26%	38%	42%	40%	44%	67%	40%
	CRKCRR	16%	17%	10%	13%	11%	9%	4%	12%
	CRKPID	29%	48%	48%	44%	49%	41%	42%	43%
	CRKNFT	55%	74%	74%	65%	67%	74%	61%	67%
	CRKNDL1	45%	33%	35%	39%	33%	36%	25%	35%
	CRKNDL3	78%	66%	73%	64%	70%	65%	48%	66%
	CRKRSC	36%	33%	56%	48%	41%	45%	58%	45%
	CRKHOD	41%	43%	41%	57%	56%	44%	62%	49%

Table M-7: Comparison of time trends in CRACK and POWDER COCAINE Epidemic and drug market characteristics by ADAM II location

		YEAR							
		2000	2001	2002	2003	2007	2008	2009	Total
19.00 Portland, OR	COCPOS18	12%	16%	14%	11%	11%	15%	10%	13%
	CRKD3018	1%	11%	2%	6%	3%	2%	4%	4%
	COCD3018	6%	12%	8%	5%	14%	14%	6%	9%
	COCPOS	22%	27%	22%	30%	25%	21%	16%	23%
	CRKD30	12%	17%	15%	20%	16%	12%	11%	15%
	COCD30	8%	12%	11%	15%	12%	8%	7%	10%
	CRKCOP	75%	70%	72%	70%	81%	74%	83%	75%
	CRKCRD	2%	8%	6%	9%	3%	10%	3%	6%
	CRKELE	39%	38%	31%	30%	48%	52%	49%	41%
	CRKCRR	12%	13%	11%	13%	4%	8%	32%	13%
	CRKPID	46%	45%	32%	48%	40%	36%	61%	44%
	CRKNFT	68%	68%	63%	68%	53%	57%	62%	63%
	CRKNDL1	45%	37%	41%	44%	32%	37%	51%	41%
	CRKNDL3	62%	76%	66%	67%	56%	71%	82%	68%
	CRKRSC	54%	51%	44%	50%	46%	52%	34%	47%
	CRKHOD	47%	47%	49%	42%	44%	57%	42%	47%
	COCCOP	69%	66%	63%	63%	57%	59%	60%	62%
	COCCRD	4%	1%	4%	7%	0%	3%	7%	4%
	COCELE	42%	36%	38%	38%	39%	46%	44%	40%
	COCCRR	5%	17%	9%	8%	4%	16%	25%	12%
	COCPID	47%	40%	35%	42%	41%	58%	53%	45%
	COCNFT	79%	79%	75%	77%	64%	67%	82%	75%
	COCNDL1	66%	57%	56%	52%	55%	66%	48%	57%
	COCNDL3	82%	85%	76%	77%	89%	100%	96%	87%
	COCRSC	56%	61%	72%	61%	67%	66%	51%	62%
	COCHOD	37%	37%	34%	62%	38%	65%	31%	44%
19.50 Sacramento, CA	COCPOS18	2%	12%	8%	14%	12%	13%	4%	9%
	COCPOS	18%	18%	21%	22%	22%	18%	10%	18%
	CRKCOP	74%	78%	79%	64%	69%	72%	88%	75%
	CRKCRD	8%	11%	9%	7%	5%	1%	7%	7%
	CRKELE	24%	26%	19%	19%	20%	27%	34%	24%
	CRKCRR	17%	14%	13%	12%	20%	10%	23%	16%
	CRKPID	62%	49%	51%	56%	56%	56%	58%	55%
	CRKNFT	57%	57%	64%	76%	62%	71%	52%	63%
	CRKNDL1	29%	26%	32%	33%	43%	26%	28%	31%
	CRKNDL3	74%	66%	69%	52%	68%	70%	65%	66%
	CRKRSC	42%	38%	38%	48%	37%	45%	44%	42%
	CRKHOD	63%	47%	60%	30%	60%	38%	50%	50%
24.00 Washington, DC	COCPOS18			17%	6%	13%	0%	18%	11%
	COCPOS			28%	26%	35%	35%	22%	29%
	CRKCOP			83%	88%	80%	65%	84%	80%
	CRKCRD			10%	6%	0%	0%	0%	3%
	CRKELE			21%	7%	16%	25%	16%	17%
	CRKCRR			11%	7%	26%	15%	0%	12%
	CRKPID			36%	28%	28%	14%	9%	23%
	CRKNFT			45%	78%	61%	72%	67%	65%
	CRKNDL1			35%	15%	47%	31%	46%	35%
	CRKNDL3			82%	53%	74%	80%	65%	71%
	CRKRSC			39%	33%	47%	32%	43%	39%
	CRKHOD			46%	34%	53%	46%	26%	41%

Opiate/Heroin Epidemic and drug market trends

The use of electronic means (HERELE) for contacting dealers increased between 2003 and 2007 at three sites (Washington DC which has a particularly small sample was the exception). Indoor purchases (HERPID) also increased modestly during this period. In Manhattan a variety of additional changes occurred 2003-2007 all

indicating decreased market structure. Cash only purchases declined (HERCOP), no failed transactions declined (HERNFT), and last purchase from a regular source declined (HERRSC).

Table M-8: Comparison of time trends in Opiate/HEROIN Epidemic and drug market characteristics by ADAM II location

		YEAR							
		2000	2001	2002	2003	2007	2008	2009	Total
3.00 Chicago, IL	OPIPOS18	4%	1%	4%	10%	9%	6%	3%	5%
	OPIPOS	27%	22%	26%	25%	15%	21%	12%	21%
	HERCOP	83%	88%	89%	90%	81%	89%	83%	86%
	HERCRD	2%	2%	2%	4%	9%	5%	10%	5%
	HERELE	10%	11%	14%	12%	35%	44%	36%	23%
	HERCRR	5%	20%	8%	7%	14%	10%	10%	11%
	HERPID	19%	13%	20%	26%	44%	42%	38%	29%
	HERNFT	77%	67%	79%	82%	80%	88%	86%	80%
	HERNDL1	41%	50%	34%	36%	37%	37%	40%	39%
	HERNDL3	72%	69%	69%	68%	79%	75%	72%	72%
	HERRSC	58%	63%	69%	69%	78%	72%	77%	69%
	HERHOD	46%	58%	53%	56%	43%	57%	56%	53%
13.00 Manhattan, NY	OPIPOS18	6%	4%	11%	7%	0%	0%	6%	5%
	OPIPOS	20%	19%	15%	15%	6%	6%	10%	13%
	HERCOP	93%	96%	91%	95%	77%	81%	80%	87%
	HERCRD	0%	4%	5%	3%	19%	0%	4%	5%
	HERELE	15%	12%	16%	18%	34%	50%	50%	28%
	HERCRR	6%	6%	10%	13%	9%	0%	3%	7%
	HERPID	15%	18%	21%	34%	43%	36%	22%	27%
	HERNFT	84%	72%	72%	88%	17%	43%	62%	62%
	HERNDL1	44%	50%	48%	31%	13%	75%	37%	43%
	HERNDL3	89%	87%	79%	78%	82%	90%	76%	83%
	HERRSC	69%	66%	68%	66%	21%	65%	81%	62%
	HERHOD	64%	52%	63%	63%	53%	62%	53%	58%
19.00 Portland, OR	OPIPOS18	8%	6%	8%	10%	6%	9%	6%	8%
	OPIPOS	14%	11%	10%	15%	13%	9%	11%	12%
	HERCOP	80%	84%	70%	78%	80%	75%	83%	78%
	HERCRD	7%	2%	12%	12%	2%	15%	11%	9%
	HERELE	39%	41%	44%	36%	59%	65%	68%	50%
	HERCRR	18%	16%	9%	12%	18%	10%	21%	15%
	HERPID	36%	40%	22%	26%	41%	33%	44%	35%
	HERNFT	76%	79%	82%	67%	77%	70%	66%	74%
	HERNDL1	40%	46%	42%	31%	56%	40%	23%	40%
	HERNDL3	71%	81%	71%	66%	89%	80%	73%	76%
	HERRSC	56%	66%	73%	59%	59%	76%	81%	67%
	HERHOD	41%	52%	46%	61%	25%	51%	30%	44%
Washington, DC	OPIPOS18			0%	2%	0%	0%	0%	0%
	OPIPOS			9%	10%	11%	10%	10%	10%
	HERCOP			79%	95%	80%	21%	100%	75%
	HERCRD			0%	2%	0%	19%	0%	4%
	HERELE			31%	16%	44%	0%	0%	18%
	HERCRR			16%	22%	15%	0%	0%	11%
	HERPID			49%	10%	13%	26%	0%	20%
	HERNFT			59%	83%	87%	45%	100%	75%
	HERNDL1			35%	46%	7%	45%	45%	36%
	HERNDL3			81%	89%	41%	100%	100%	82%
	HERRSC			53%	41%	41%	26%	45%	41%
	HERHOD			21%	34%	41%	0%	45%	28%

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.

V. References

Anderson, R. M., & May, R. M. (1991). *Infectious diseases of humans: Dynamics and control*. Oxford, UK: Oxford.

Becker, H. S. (1967). History, culture, and subjective experience: An exploration of the social bases of drug-induced experiences. *Journal of Health and Social Behavior, 8*, 163-176.

Blumstein, A., & Wallman, J. (2006). *The Crime Drop in America* (revised ed.). New York: Cambridge.

Brownstein, H. H. (1996). *The rise and fall of a violent crime wave: Crack cocaine and the social construction of a crime problem*. Albany, NY: Harlow and Heston.

Brownstein, H. H., Crimmins, S. M., & Spunt, B. J. (2000). A conceptual framework for operationalizing the relationship between violence and drug market. *Contemporary Drug Problems, 27*(4), 867.

Brownstein, H. H., Mulcahy, T. J., Taylor, B. G., Fernandes-Huessy, J., & Woods, D. (2010). The Organization and Operation of Illicit Retail Drug Markets. *Criminal Justice Policy Review, 20*(10), 1-23.

Brownstein, H. H., Mulcahy, T. M., Huessy, J., & Taylor, B. G. (2009). *How are methamphetamine markets organized? An analysis based on Johnson's free-lance/business model distinction of illicit drug markets*. Paper presented at the American Society of Criminology Annual Meeting, Philadelphia.

Brownstein, H. H., & Taylor, B. G. (2007). Measuring the stability of illicit drug markets: Why does it matter? *Drug & Alcohol Dependence, 90*, S52-S60. doi: 10.1016/j.drugalcdep.2006.11.010

Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology, 78*(1), 98-104.

Curtis, R. (1998). The improbably transformation of inner-city neighborhoods: Crime, violence, drugs and youth in the 1990s. *Journal of Criminal Law & Criminology, 88*(4), 1233-1276.

Curtis, R., & Wendel, T. (2007). You're always training the dog: Strategic interventions to reconfigure drug markets. *Journal of Drug Issues, 37*(4), 867-891.

Furst, R. T., Johnson, B. D., Dunlap, E., & Curtis, R. (1999). The stigmatized image of the crack head: A sociocultural exploration of a barrier to cocaine smoking among a cohort of youth in New York City. *Deviant Behavior, 20*, 153-181.

GAO. (1993). Drug use measurement: Strengths, limitations, and recommendations for improvement. Washington, DC: U.S. General Accounting Office.

Goldstein, P. J., Brownstein, H. H., & Ryan, P. J. (1992). Drug-related homicide in New York: 1984 and 1988. *Crime and delinquency, 38*, 459-476.

Golub, A. (2005). *The Cultural/Subcultural Contexts of Marijuana Use at the Turn of the Twenty-First Century*. Binghamton, NY: Haworth.

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*.

Golub, A., & Johnson, B. D. (1994). A recent decline in cocaine use among youthful arrestees in Manhattan (1987-1993). *American Journal of Public Health, 84*(8), 1250-1254.

Golub, A., & Johnson, B. D. (1996). The crack epidemic: Empirical findings support a hypothesized diffusion of innovation process. *Socio-Economic Planning Sciences, 30*(3), 221-231.

Golub, A., & Johnson, B. D. (1997). Crack's decline: Some surprises across U.S. cities. *National Institute of Justice Research in Brief, NCJ 165707*.

Golub, A., & Johnson, B. D. (1999). Cohort changes in illegal drug use among arrestees in Manhattan: From the heroin injection generation to the blunts generation. *Substance Use and Misuse, 34*(13), 1733-1763.

Golub, A., & Johnson, B. D. (2001). The rise of marijuana as the drug of choice among youthful adult arrestees. National Institute of Justice *Research in Brief*, NCJ 187490.

Golub, A., & Johnson, B. D. (2004). How much do Manhattan arrestees spend on drugs? *Drug and Alcohol Dependence, 76*(3), 235-246.

Golub, A., & Johnson, B. D. (2005). The new heroin users among Manhattan arrestees: Variations by race/ethnicity and mode of consumption. *Journal of Psychoactive Drugs, 37*(1), 51-61.

Golub, A., Johnson, B. D., & Dunlap, E. (2005). Subcultural evolution and substance use. *Addiction Research and Theory, 13*(3), 217-229.

Golub, A., Johnson, B. D., Dunlap, E., & Sifaneck, S. (2004). Projecting and monitoring the life course of the marijuana/blunts generation. *Journal of Drug Issues, 34*(2), 361-388.

Golub, A., Johnson, B. D., Sifaneck, S., Chesluk, B., & Parker, H. (2001). Is the U.S. experiencing an incipient epidemic of hallucinogen use? *Substance Use and Misuse, 36*(12), 1699-1729.

Hamid, A. (1992). The developmental cycle of a drug epidemic: the cocaine smoking epidemic of 1981-1991. *Journal of Psychoactive Drugs, 24*(4), 337-348.

Harrison, L. D., Martin, S. S., Enev, T., & Harrington, D. (2007). Comparing drug testing and self-report of drug use among youths and young adults in the general population. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies.

Herz, D. C. (2000). Drugs in the Heartland: Methamphetamine Use in Rural Nebraska. *National Institute of Justice Research in Brief*.

Hosmer, D. W., Jr., & Lemeshow, S. (1989). *Applied logistic regression*. New York: Wiley.

Hunt, D., & Rhodes, W. (2009). Arrestee Drug Abuse Monitoring Program II in the United States, 2008: Technical Documentation Report. Retrieved 4/11/2010, from Inter-university Consortium for Political and Social Research www.icpsr.umich.edu

Hunt, D. E., Kuck, S., & Truitt, L. (2005). Methamphetamine Use: Lessons Learned, Report submitted to the National Institute of Justice. Cambridge, MA: Abt Associates.

Hunt, L. G., & Chambers, C. D. (1976). *The heroin epidemic: A study of heroin use in the U.S., 1965-1975 (Part II)*. Holliswood, NY: Spectrum.

Johnson, B. D. (2003). Patterns of drug distribution: Implications and issues. *Substance Use & Misuse, 38*, 1789-1806.

Johnson, B. D., & Golub, A. (2002). Generational trends in heroin use and injection among arrestees in New York City. In D. Musto (Ed.), *One Hundred Years of Heroin* (pp. 91-128). Westport, CT: Auburn House.

Johnson, B. D., Golub, A., & Dunlap, E. (2006). The rise and decline of drugs, drug markets, and violence in New York City. In A. Blumstein & J. Wallman (Eds.), *The Crime Drop in America* (revised ed., pp. 164-206). New York: Cambridge.

Johnson, B. D., Hamid, A., & Sanabria, H. (1992). Emerging models of crack distribution. In T. Mieczkowski (Ed.), *Drugs, Crime, and Social Policy: Research, Issues, and Concerns* (pp. 56-78). Boston: Allyn and Bacon.

Johnson, R. A., & Wichern, D. W. (1982). *Applied multivariate statistical analysis*. Englewood Cliffs, NJ: Prentice-Hall.

Johnston, L. D. (1991). Toward a theory of drug epidemics. In D. H. Donohew, H. Sypher & W. Bukoski (Eds.), *Persuasive communication and drug abuse prevention* (pp. 93-132). Hillsdale, NJ: Lawrence Erlbaum.

Jonnes, J. (2002). Hip to be high: Heroin and popular culture in the Twentieth Century. In D. F. Musto (Ed.), *One Hundred Years of Heroin* (pp. 227-236). Westport, CT: Auburn House.

Musto, D. (1993). The rise and fall of epidemics: Learning from history. In G. Edwards, J. Strang & J. H. Jaffe (Eds.), *Drugs, Alcohol, and Tobacco: Making the Science and Policy Connections*. New York: Oxford.

National Drug Intelligence Center. (2007). *National Drug Threat Assessment 2008*. Washington, DC: US Department of Justice.

National Drug Intelligence Center. (2011). *National Drug Threat Assessment 2011*. Washington, DC: US Department of Justice.

National Institute of Justice. (1996). *1995 Drug Use Forecasting: Annual Report on Adult and Juvenile Arrestees*. Washington, DC: U.S. Department of Justice.

National Institute of Justice. (2000). *ADAM: 1999 Annual Report on Drug Use among Adult and Juvenile Arrestees*. Washington, DC: U.S. Department of Justice.

National Institute of Justice. (2003a). *2000 Arrestee Drug Abuse Monitoring: Annual report*. Washington, DC: U.S. Department of Justice.

National Institute of Justice. (2003b). *Arrestee Drug Abuse Monitoring (ADAM) Program in the United States, 2001: User guide*. Washington, DC: U.S. Department of Justice.

National Institute of Justice. (2004a). *Arrestee Drug Abuse Monitoring (ADAM) Program in the United States, 2002: User guide*. Washington, DC: U.S. Department of Justice.

National Institute of Justice. (2004b). Arrestee Drug Abuse Monitoring (ADAM) Program in the United States, 2003: Codebook, Data Collection Instruments, and Other Documentation. Retrieved 4/11/2010, from National Archive of Criminal Justice Data www.icpsr.umich.edu

National Institute of Justice. (2004c). *Arrestee Drug Abuse Monitoring (ADAM) Program in the United States, 2003: User guide*. Washington, DC: U.S. Department of Justice.

NIDA. (2011). *Epidemiologic trends in drug abuse: Proceedings of the Community Epidemiology Work Group*. Bethesda, MD: National Institute on Drug Abuse.

ONDCP. (2008). ADAM II: 2007 annual report. Retrieved 4/6/10, from Office of National Drug Control Policy www.whitehousedrugpolicy.gov

ONDCP. (2009a). ADAM II: 2008 annual report. Retrieved 4/6/10, from Office of National Drug Control Policy www.whitehousedrugpolicy.gov

ONDCP. (2009b). *National drug control strategy: 2009 annual report*. Washington, DC: Office of National Drug Control Policy.

ONDCP. (2010a). ADAM II: 2008 annual report. Retrieved 4/6/10, from Office of National Drug Control Policy www.whitehousedrugpolicy.gov

ONDCP. (2010b). ADAM II: 2009 annual report. Retrieved 4/6/11, from Office of National Drug Control Policy www.whitehousedrugpolicy.gov

ONDCP. (2011). ADAM II: 2010 annual report. Retrieved 11/28/11, from Office of National Drug Control Policy www.whitehousedrugpolicy.gov

Rogers, E. M. (1995). *Diffusion of innovation* (Fourth ed.). New York: Free Press.

Sifaneck, S. J., Kaplan, C. D., Dunlap, E., & Johnson, B. D. (2003). Blunts and blowtjes: Cannabis use practices in two cultural settings and their implications for secondary prevention. *Free Inquiry in Creative Sociology, 31*, 1-11.

Taylor, B. G., & Brownstein, H. H. (2003). Toward the operationalization of drug market stability: An illustration using arrestee data from crack cocaine markets in four urban communities. *Journal of Drug Issues, 33*(1), 73-98.

Taylor, B. G., Brownstein, H. H., Mulcahy, T. J., Woods, D., Fernandes-Huessy, J., & Hafford, C. (2011). Illicit Retail Methamphetamine Markets and Related Local Problems: A Police Perspective. *Journal of Drug Issues, 41*, 327-358.

Taylor, B. G., & Costa, M. (2003). Drug markets. In National Institute of Justice (Ed.), *2000 Arrestee Drug Abuse Monitoring: Annual report* (pp. 59-91). Washington, DC: U.S. Department of Justice.

Weisheit, R., & White, W. L. (2009). *Methamphetamine: Its History, Pharmacology, and Treatment*. Center City, MN: Hazelden.

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.