National Institute of Justice

Improving Arrestee Drug Abuse Monitoring Data Collection — Papers and Presentations From 2010 Planning Meetings

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Improving Arrestee Drug Abuse Monitoring Data Collection — Papers and Presentations From 2010 Planning Meetings

In 2010, NIJ and the Bureau of Justice Statistics held a series of meetings to identify ways to improve cost-efficiency through survey techniques that enhance data quality and information utility.

The following papers and presentations are from those meetings with federal staff and other topic experts:

- **Arrestee Drug Abuse Monitoring: Design, Execution and Extensions (Presentation)**
  Abt Associates, Inc.

- **An Overview of San Diego's Substance Abuse Monitoring Program and Law Enforcement's Need and Use of Local Information (Paper)**
  Cynthia Burke, Ph.D., San Diego Association of Governments, and Sergeant Darrell Williams, San Diego Police Department

- **Drug Use Among San Diego Arrestees (Presentation)**
  Cynthia Burke, Ph.D., Criminal Justice Research Division, San Diego Association of Governments

- **Operational and Quality Issues with Computer Assisted Interviewing for ADAM (Paper)**
  David Cantor, Westat and Joint Program in Survey Methodology, University of Maryland

- **Operational and Quality Issues with Computer Assisted Interviewing for ADAM (Presentation)**
  David Cantor, Westat and Joint Program in Survey Methodology, University of Maryland

- **What Difference Does It Make? Patterns in Drug-related Emergency Department Visits From DAWN (Presentation)**
  Elizabeth H. Crane, Ph.D., M.P.H., Drug Abuse Warning Network, Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration

- **Advantages & Disadvantages of Drug Testing in Alternative Matrices (Presentation)**
  Marilyn A. Huestis, Ph.D., Chief, Chemistry & Drug Metabolism, Intramural Research Program of the National Institute on Drug Abuse, National Institutes of Health

- **Arizona Arrestee Reporting Information Network (Presentation)**
  Charles M. Katz, Ph.D., Arizona State University

- **Demonstrating the Utility of ADAM's Drug Use Calendar Data: A Group-based Trajectory Analysis of Crack Cocaine Use Among Adult Male Arrestees (Paper)**
  Brad A. Myrstol, University of Alaska Anchorage

- [Arrestees' Drug Use Trajectories: Using the ADAM Drug Use Calendar to Model Patterns of Illicit Drug Use (Presentation)](#)
  Brad A. Myrstol, University of Alaska Anchorage

- [Assessing Dependence, Comorbidity, and Trauma (Paper)](#)
  Roger H. Peters, Ph.D., University of South Florida

- [ADAM: Statistical Issues Related to Prevalence Estimates and Trends (Paper)](#)
  William Rhodes, Abt Associates, Inc.

- [ADAM: Statistical Issues Related to Prevalence Estimates and Trends (Presentation)](#)
  by William Rhodes, Abt Associates, Inc.

- [Female Offender Drug Use and Related Issues (Paper)](#)
  by Michele Staton-Tindall, University of Kentucky

- [Collecting Sensitive Information from Drug Users (Paper)](#)
  Travis Wendel and Ric Curtis, Department of Anthropology, John Jay College of Criminal Justice

- [Collecting Sensitive Information from Drug Users (Presentation)](#)
  Travis Wendel and Ric Curtis, Department of Anthropology, John Jay College of Criminal Justice

- [The Use of Bureau of Economic Analysis (BEA) Areas and Regions for Representing Geographic Variation (Paper)](#)
  Ronald Wilson and Timothy Brown, Mapping and Analysis for Public Safety Program, National Institute of Justice

- [The Use of Bureau of Economic Analysis Regions for Representing Geographic Variation (Presentation)](#)
  Ronald Wilson and Timothy Brown, Mapping and Analysis for Public Safety Program, National Institute of Justice

- [Drug Abuse Warning Network: Data and Reporting (Paper)](#)
  Al Woodward, Ph.D., M.B.A.

Arrestee Drug Abuse Monitoring (ADAM)

Design, Execution and Extensions

April 15, 2010

From Insight to Impact – Worldwide

Abt Associates Inc.

Abt Associates' ADAM Team

- The Abt Associates team designed ADAM's instrumentation, sampling design, estimation, and general protocol. The Abt team implemented and managed ADAM from 2000-2001 and from 2007-present.

- Senior staff
  - Dana Hunt (Project Director)
  - Meg Chapman (Deputy Director)
  - William Rhodes (Research Director)
  - Ryan Kling (Senior Statistician)
  - Sarah Jalbert (Analysis Manager)

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Purpose of this Presentation

- The Arrestee Drug Abuse Monitoring (ADAM) survey was operational in 2000-2003 and 2007-present. Data come from two sources:

  – A survey of arrestees within 48 hours of arrest about drug use, drug markets, drug and mental health treatment.

  – Uses a bioassay to test for recent drug use

- The purpose of this presentation is:

  – To explain how ADAM operates

  – To discuss design considerations

    - Instrumentation

    - Sampling, data collection and analysis

  – To identify ways of improving the ADAM program

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Outline of Presentation

- The ADAM survey

  - The purpose

  - Instrumentation

  - The sample

  - Weighting

  - Estimation

  - Reporting

- Design Considerations

  - Why did we use an unconventional sampling procedure?

  - Why did we use model-based estimation procedures?

- Future Considerations

The ADAM Survey

The ADAM Survey: Purpose

- The principal purpose of ADAM is to estimate the prevalence and trends in drug use and related behaviors among arrestees

- The secondary purpose is monitor drug market practices.

- However, ADAM is a research platform with potential to answer other policy-relevant questions:

  – ADAM interviews a hard-to-reach population of special interest to the CJS.

  – ADAM interviews a hard-to-reach population not readily covered in general population surveys or by surveys of already adjudicated offenders.

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Comparing ADAM Respondents to Adult Mean Answering the National Survey on Drug Use and Health

- ADAM reaches drug users omitted by the NSDUH: Depending on the site anywhere from 2 to 29 percent of arrestees in the 10 ADAM sites in 2008 lacked stable housing in the 30 days prior to arrest and would have been ineligible for the NSDUH.

- Arrestees are willing to answer drug use questions, while truthfulness rates in the NSDUH may be near 20 percent.

- ADAM provides a concentrated survey of chronic drug users.

  - In 2008 from 7-23 percent of arrestees admitted to crack use in the prior 30 days compared to 0.3 percent of males over 18 in 2008 NSDUH.

  - In ADAM in 2008 from 17 to 44 percent of arrestees tested positive for cocaine, indicating use just in the past few days.

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The ADAM Survey: Instrumentation (See the Handout)

- We designed the ADAM instrument using NIJ input, focus groups, cognitive laboratory testing and limited validation with administrative records. ONDCP added a few questions on methamphetamine manufacture which have since been removed for 2010-forward.

- The instrument has a four principal sections:

  - Questions about age, education, employment, insurance coverage, lifetime arrest, lifetime drug and mental health treatment experiences.

  - Questions about age at first use of a range of drugs including alcohol

  - Questions about current drug use (past 3 days, 7 days, 30 days and 12 months) and current market behaviors

  - Questions about experience during the previous year (the calendar) that captures arrests, treatment admissions, housing stability, etc..

- Interviews request a urine specimen that is tested by a contractor lab for recent use of ten illegal drugs; over 85 percent of the sample provides a sample

The ADAM Survey: Administration

- ADAM is administered twice per year (two 14 day periods one in each of Q2 and Q3) by teams of professional interviewers.

- Urine specimens are sent directly to a contractor laboratory that returns results to Abt Associates.

- We acquire booking records for the interview period

- Abt Associates:

    - Cleans the data

    - Matches the interviews, drug tests and booking records

    - Performs diagnostic testing to assure adherence to study protocols

    - Documents and prepares data for analysis and storage.

    - Prepares annual reports.

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The ADAM Survey: Selecting Counties and Sampling Booking Facilities

- From 2000-2003, NIJ purposefully selected 39 counties to continuously participate in ADAM; from 2007-2010, ONDCP purposefully selected 10 of the original 39 counties to participate in ADAM from 2007-2010.

- Within each county:

  – We sampled arrestees within a single booking facility when there is a single central booking facility.

  – We sampled within a stratified sample of facilities where given a small number of booking facilities

  – We sampled from a stratified cluster sample given many booking facilities.

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The ADAM Survey: Sampling Arrestees

- Booking facilities are dynamic with arrestees transitioning in and out during each 24 hour period.

- Within each sampled booking facility, we sample from a "stock" and "flow" of offenders.

  - The flow of offenders comprised everyone who was booked during the interviewers' eight hour work day.

  - The stock of offenders comprised everyone who was booked during the previous 24-8=16 hours.

  - Sampling rates were set proportional to the size of the stock and flow.

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The ADAM Survey: Replacing Missing Interviews

- Those who refused or were unavailable for an interview were replaced with a nearest neighbor in booking time and the reason for refusal recorded. Refusals happened because:

    - Some sampled arrestees refused.

    - Some were too intoxicated or deemed by police to be too dangerous and could not be interviewed.

    - Some were not in the facility any longer because of administrative proceedings (at arraignment or transferred) or because they had been released from jail pending trial.

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The ADAM Survey: Imputing Missing Urine Specimens

- Arrestees were sometimes unwilling or unable to provide a urine specimen. We imputed non-responses using two procedures (2007-2010 only):

  – In all but one county, we used a Bayesian logic to impute missing values and adjust standard errors.

  – In Washington, D.C., we used administrative records to estimate the rate of positive urine tests.

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The ADAM Survey: Weighting

- We used post stratification (based on propensity scores since 2007) to estimate sampling probabilities. This was done by:

  - Matching respondents to a census of booking data (all arrested during the 24 hour period), which were available weeks after the survey, and

  - Using logistic regression to estimate the sampling probabilities, and

  - Treating the inverse of the sampling probability as the weight.

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The ADAM Survey: Estimation

- Weights provided the means to compute basic descriptive statistics.

- Additionally, ONDCP instructed us to estimate trends

- Trends required special attention for two reasons:
  - Annualization was required for trend estimation because for 2000-2003 ADAM collected data for each of four quarters; for 2007-2010 ADAM II collected for two quarters, and drug use sometimes follows annual cycles.

  - Other adjustments were necessary to account for changes in booking practices that otherwise would have causes spurious changes in trends

- Thus ADAM applies model-based estimation.

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Design Considerations: Summary

In the abstract:

– ADAM seems like a standard problem for sampling and inference.

– In reality, ADAM requires accommodations for the constraints imposed by criminal justice operations.

– The following slides posit a hypothesized ideal and explain why ADAM fails to meet that ideal.

– The following slides juxtapose the ideal and explain our accommodations for reality.

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Design Considerations: Computer Assisted Interviewing (Ideal)

- Assertion 1: ADAM uses a paper and pencil interview. It would be more efficient to use a computer assisted interview procedures.

Design Considerations: Computer Assisted Interviewing (Reality)

- Computer assisted interviewing is impractical in the settings provided by booking facilities because in a review of facilities under ADAM we found that the majority of Sheriffs would not allow laptop computers into their facilities.

- There is some risk with considering booking facilities to be like jails (especially since some booking facilities are within jails) or prisons , i.e., where the sample is post adjudication

  - Jails and prisons offer relatively secure settings where computers can be used.

  - Booking facilities are chaotic. For security reasons, Sheriffs will not allow electronic equipment into their facilities. Although things may change, and some jails may provide exceptions, ADAM is likely to be limited to paper-and-pencil forms.

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Design Considerations: Sampling Counties (Ideal)

- Assertion 2: An ideal ADAM program would start with a random sample of counties across the United States.

- In theory it would not be difficult to sample counties. Presumably the counties would be stratified because drug use is regional. Possibly the counties would be stratified to meet other goals such as including large and small urban areas.

- Sample allocation would depend in part on the research question.

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Design Considerations:
Sampling Counties (Reality)

- Some sheriffs will decline to participate. This may be because the Sheriff distrusts researchers, but often it is based on pragmatic reasons: The booking facilities cannot accommodate the requirements of an ADAM program. A sampler might replace jails that refuse, but replacements may differ substantially from refusals given the reasons for refusals.

- The cost of negotiating for access is high and the process will be convoluted. We can describe our experiences.

- The cost of conducting ADAM in some counties is excessively high and likely to result in that county being dropped from the sample. This point is best discussed in a subsequent slide.

- Overall, we advocate for random selection of counties, but we observe that random selection will be difficult and uncertain because of fundamental constraints imposed by sampling arrestees.

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Design Considerations:
Sampling Booking Facilities (Ideal)

- Assertion 3: ADAM should select a random sample of booking facilities within each sampled county. There are three situations.

  - Some counties have a single booking facility. There is no sampling problem.

  - Some counties have a few booking facilities. Again there is no sampling problem: all are included.

  - Some counties have many booking facilities (hundreds in some Texas counties). A stratified cluster sample is appropriate.

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Design Considerations:
Sampling Booking Facilities (Reality)

- It is difficult to get a true census of all booking facilities as some counties book some offenders in one location and other offenders in another location.

- The same arrestee may be booked sequentially into two facilities.

- Some facilities book few individuals, and for them sampling arrestees is prohibitively expensive.
  - Sometimes it is best to exclude those small facilities from the sample at the expense of small bias, but reduced standard errors.
  - Some counties have nothing but small booking facilities
    - Such counties might be excluded from ADAM
    - But this means that ADAM is limited to urban counties.

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Design Considerations: Sampling Arrestees (Ideal)

- Assertion 4: Within a jail, ADAM should sample arrestees so that every arrestee has approximately the same probability of being included in the sample.

  - Presume that an interviewer will work for a contiguous eight-hour period every work day. Recognizing this constraint, a sampler might divide the day into three eight-hour periods, sample the eight-hour periods proportional to size (number of bookings during that period), and then have the interviewer select a systematic sample within each period.

Design Considerations: Sampling Arrestees (Reality)

- One difficulty is that recruiting interviewers to work eight hour shifts that change from day-to-day is unrealistic. The problem is compounded because some of the shifts would be during unreasonable working hours.

- Another more significant difficulty is that Sheriffs will not allow such a sampling plan because it is too disruptive of their daily operations. Practically the Sheriffs dictate an acceptable eight-hour period.

- Still another problem is that the flow of arrestees is so small during some work shifts that interviewers would be idle for substantial periods.

Design Considerations: Sampling Arrestees (ADAM's Approach)

- When an interviewer arrives at the jail, he or she identifies everybody who was booked during the last sixteen hours. This is the *stock*. The interviewer selects every n[th] arrestee from the stock.

- When the interviewer finishes with the stock, he or she identifies the arrestee who was arrested most recently. That is, the interviewer samples systematically from the *flow*.

- The size of the samples from the stock and flow are set proportional to size based on historical stock and flows.

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Design Considerations:
Trend Analysis (Ideal)

- Assertion 5: Trend statistics should be meaningful indications of changes in drug use.

    - This ideal seems obvious, but in fact, *the ADAM program did not produce trend statistics prior to 2007.*

    - The concept of a trend is murky if the policy question is whether people involved with the CJS are using more or fewer drugs.

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Design Considerations:
Trend Analysis (Reality)

- Trend statistics are deceptively difficult.

  – One problem is that to produce trend statistics for 2000-2003 and 2007-2009 the ADAM data have to be annualized.

  – A second problem is that booking practices changes over time in specific counties. Because drug use is demonstrably sensitive to charge, changes in arrest practices will lead to spurious changes in apparent drug use.

  – Consequently, since 2007 ADAM has relied on model-based estimation; it relies on model-based estimation more heavily than do other prominent surveys such as the NSDUH and MTF.

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ADAM as a Research Platform

- Although ADAM II reports descriptive statistics about arrestees, the focus is on prevalence and trends in drug use, a focus that is consistent with ONDCP's mission.

- ADAM can answer other policy-relevant questions:

  - ADAM currently incorporates a calendar of events in the lives of drug user during the year before their arrests. These data are not currently used.

  - ADAM currently contains a brief screener for drug and alcohol abuse and dependence. These data are currently not used.

  - ADAM incorporates a battery of questions about market behaviors. These data are important to other ONDCP projects but only summary statistics are reported in ADAM.

  - ADAM could be used to address other research questions (see the next slide).

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ADAM as a Research Platform: Possibilities

- The ADAM interview requires twenty minutes on average, so there is some latitude for adding addenda.

- Possible topics:
  - Use of guns
  - Public health topics
    - Physical health
    - Mental health

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Selected Research Studies Using ADAM Data

- NIDA (2009) Epidemiological Trends in Drug Abuse: Proceedings of the Community Epidemiology Work Group.

- Rhodes, Callahan, Hunt, Luallen and Subramanian. (2008) What America's Users Spend on Illegal Drugs: 1988-2006. Report for ONDCP.

- Rhodes, Kling and Johnston. (2007) *Using Booking Data to Model Drug User Arrest Rates: A Preliminary to Estimating the Prevalence of Chronic Drug Use*. Journal of Quantitative Criminology.

- Rhodes, Hunt, Chapman, Kling, Fuller and Dyous. (2007) Using ADAM Data to Investigate the Effectiveness of Law Enforcement. Report for NIJ.

- Katz, Webb and Decker. (2005) Using the Arrestee Drug Abuse Monitoring (ADAM) Program to Further Understand the Relationship between Drug Use and Gang Membership. Justice Quarterly.

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Paper — An Overview of San Diego's Substance Abuse Monitoring Program and Law Enforcement's Need and Use of Local Information

Cynthia Burke, Ph.D., San Diego Association of Governments
Sergeant Darrell Williams, San Diego Police Department

Background

While a number of measures of self-reported drug use are collected at the national level, only one — the Arrestee Drug Abuse Monitoring (ADAM) program — supplemented self-report information with an objective measure of recent use — urinalysis — among a high-risk population. Implemented by the National Institute of Justice (NIJ) in 1987 as the Drug Use Forecasting (DUF) program, this cross-site data collection effort, which involved conducting interviews with arrestees recently booked into local detention facilities, was discontinued in 2004. At that time, there were a total of 40 national sites and the data were utilized across the country by prevention providers, treatment staff, law enforcement, and epidemiologists to track drug use trends among a high-risk population.

San Diego County was one of the original sites for the program and one of the few that conducted interviews with juveniles, as well as adults. The site coordinators analyzed and distributed the results for a local audience that eagerly utilized the information as part of their prevention and intervention efforts. For example, these data have been used by the San Diego County Methamphetamine (Meth) Strike Force (a multidisciplinary group of public health, law enforcement, judicial, treatment, prevention, and intervention agencies that meets on a quarterly basis to share information regarding current efforts to address meth use) for the past 12 years as indicators on its annual report card that tracks meth use and the effect it has on the community. More recently, the data have also been actively utilized by the region's newly formed Oxy Task Force. Because of this support, when federal funding ended, local stakeholders, including law enforcement and the County of San Diego, stepped up to provide the resources necessary to maintain the project. As such, San Diego County was the only ADAM site able to continue data collection uninterrupted.

With the new funding sources, the name of the San Diego program was changed to Substance Abuse Monitoring, or SAM, but the essential nature of the program, including conducting interviews and urinalysis with a sample of adult (both male and female) and juvenile arrestees, continued, although on an abbreviated schedule. In addition, a meth addendum continued to be administered to arrestees who reported any meth use in the past 30 days and a gang addendum has been conducted since 2008 with arrestees who report any previous gang affiliation. Each interview instrument is reviewed on an annual basis with input from the project's Local Coordinating Council (LCC), which is composed of law enforcement, prevention, public health, and treatment professionals, that meet on a quarterly basis.

Data summaries are prepared annually via one-page CJ Faxes and short CJ Bulletins that highlight key findings and are easily accessible for busy policy makers and practitioners. In 2006, an additional new dissemination channel was made available with aggregate data from 2004 to the present posted to the Web (www.sandag.org). Between 2008 and 2009, 7 CJ Bulletins, 7 CJ Faxes, and over a dozen media stories highlighted the results from this project, and presentations were made quarterly to professional organizations, public officials, and community groups.

Current Methodology

Individuals arrested within the past 48 hours and booked into one of four local detention facilities in 6 of the 12 months in are eligible for study participation. As previously noted, data collection was shortened from a quarterly to bi-annual schedule due to resource availability.

Beginning in 2004, for the three adult facilities, probability sampling has been used in which all arrestees booked within the previous 24 hours are identified, the total number is divided by the number of interviews that are expected to be completed (approximately 16 for adult males and 12 for adult females per evening), and every nth arrestee is selected. If a selected individual is no longer available, then the individual who preceded him/her on the list is selected. This sampling method differs somewhat from the procedures used as part of the national protocol which involved two separate but concurrent interview shifts. However, they are similar in that both ensure all inmates had an equal opportunity of participating in the study, regardless of what time of day they are arrested or where they were housed when the interviews were being conducted. At the juvenile facility, due to smaller numbers, all eligible youth are approached for study participation, both prior to and after 2003.

Once an individual is selected, s/he was escorted from the cell and brought to the interview location. Before the interview begins, the purpose is explained to the arrestee, in either English or Spanish, including that his/her responses are voluntary and confidential. In order to protect client confidentiality, beginning in 2004, no names are recorded on any paperwork that leaves the facility, information from individuals not interviewed is not collected, and no information regarding the time of arrest or booking or the arrestee's exact date of birth is maintained. Once informed consent is obtained, the interview is conducted. In exchange for their participation, interviewees are offered a small meal or food item.

In 2008, a total of 790 adult arrestees and 164 youth were interviewed as part of the SAM program. Of those interviewed 767 adults and 159 youth (both 97%) provided a viable urine sample and completed the entire interview. Additional analyses revealed that a willingness to provide a urine sample was not significantly related to the arrestee's gender, ethnicity, age, or highest charge at arrest. Data for 2009, which is currently being analyzed, includes interviews with 766 adults and 154 juveniles.

Recent Data Results

As previously described, data for the SAM project are summarized in short easy-to-read research bulletins and one-page summaries that are disseminated annually and available on the SANDAG Web site. The following bullets highlight some of the key findings discussed in the most recent publications.

- In 2008, 58 percent of female and 57 percent of male adult arrestees tested positive for an illegal drug, the lowest rate for both genders since 2000. In 2009, the positive rate remained unchanged for males, but increased to 65 percent for females. About half of juveniles test positive for an illegal drug each year, including 53 percent in 2009.

- Meth remains the drug of choice for many arrestees, following marijuana. While there was a spike in use in 2005, a number of indicators show that fewer arrestees are using it, that it is more expensive, and that it is harder to obtain. Despite the perception among some local professionals that an increase in heroin

use would follow the spikes in meth use, or that meth use is increasing among African-American arrestees, the SAM data have not shown either to be the case.

- Additional questions pertaining to the illegal use of prescription drugs have been added to the interview due to increased concern at a number of levels. Recent analyses show that about one-third of adult arrestees have used prescription drugs illegally and that OxyContin is most frequently cited as a drug that was used in the past year. Arrestees who use prescription drugs illegally are also more likely to have used other illicit substances and most likely to report they got it from a friend, rather than from the internet or through doctor shopping.

- Drug market questions show how arrestees obtain drugs in different ways. Heroin users are less likely to obtain the drug through noncash means, more likely to travel further to purchase it and to have a regular source, and buy it more frequently, compared to those obtaining other substances. Arrestees who obtain crack are more likely to get it in the central area of the county, to do so outside, and to make more than one purchase in one day.

- Around one in three adult arrestees have been in some type of formal drug treatment program. In 2008, 38 percent of the individuals who tested positive for any drug had received drug treatment previously and 73 percent of those who had previously received treatment were positive for any drug, supporting the view that relapse is part of recovery. Less than one in five (15%) arrestees reported that they had previously sought treatment, but it was unavailable.

- Adult arrestees who reported having a mental health diagnosis were significantly more likely to have a history of drug use and prior justice and social system contact — highlighting the needs of dually diagnosed clients and how important addressing these needs are for local stakeholders.

- Patterns of juvenile behavior related to justice system contact are highlighted in a number of venues and forums to inform public policy, including the need to focus on truancy reduction, given the high rate reported by these youth; the early initiation of gateway drug use and the use of multiple substances; the perception by many that marijuana is less harmful than tobacco; the familial cycle of justice system contact with many parents of these youth having drug use and criminal justice contact histories themselves; and the need to be aware of issues at home for girls with justice system contact who have lengthy histories of running away.

- Data regarding the characteristics of this population, including the high percentage with histories of homelessness and visits to the emergency room for drug-related incidents, are highlighted as part of community presentations to educate citizens about the needs of this population and how not addressing underlying risk factors can increase the chances of recidivism and cost tax payers more in the long run.

Making Research Findings Relevant to Law Enforcement

Over the years, SANDAG has worked closely with law enforcement in San Diego County on the ADAM/SAM project, as well as other efforts. In nurturing these relationships, SANDAG has made it a priority to keep a reciprocal dialogue and information exchange in place so that research priorities are informed from practitioners in the field and research findings are translated into practice in an effective manner. Examples of how SANDAG ADAM/SAM information and other data have been utilized recently to impact public policy and practice include:

- Information distributed by SANDAG was instrumental in the development and implementation of the Landlord Tenant Training Program which has been used county wide since its inception in September 1996. Hundreds of property owners and property management companies have been trained in its use. The program has been used by numerous law enforcement agencies throughout the United States.

- Project Safe Neighborhoods (PSN), a federally funded grant, has been using SANDAG information (i.e., crime statistics, crime trends, percentage increases of gang crimes in geographical areas) for several years. The PSN Executive Committee, a compilation of multijurisdictional law enforcement agencies and community groups, relies on SANDAG information to formulate ways to best place assets to deter gang activity.

- The East County Gang Commission is a group of individuals brought together at the request of the County Board of Supervisors from law enforcement agencies, the District Attorney's Office, and school district officials to develop ideas on how to deter rising gang activity. The County Board of Supervisors used information supplied by SANDAG which showed a rising trend of gang activity occurring in their districts. With SANDAG's information, the commission was able to propose and solicit funding for the formation of the East County Gang task Force in 2004.

- SANDAG released a study in 2009 which identified the prostitution of children and youth in the county of San Diego on behalf of the ACTION Network (Against Child Trafficking and the prostitution of teens in our neighborhoods Network). The ACTION Network is a group of 50 agencies that are currently fighting human trafficking and the commercial sexual exploitation of children. This study was able to quantify a significant growing issue for the region and justify the need for additional resources.

- The recent SANDAG report on "Twenty Five Years of Crime in the San Diego Region: 1985 through 2009" has proved to be a valuable resource to the San Diego Police Departments Crime Analysis Unit. With recent budget cuts and downsizing within the department, the Crime Analysis Unit has relied on the assistance and information supplied by SANDAG.

Summary/Conclusion

Despite current economic concerns, the support the SAM program has received in San Diego County appears relatively stable at this time, reflecting the fact that the effort provides useful and timely information to stakeholders at a variety of levels. In 2010, a priority effort will involve investigating new ways to share the information with officers on the street and agency staff who work directly with clients, ensuring information is provided to those who may be less aware of it and its implications.

Substance Abuse Monitoring (SAM)

- **Funded by the National Institute of Justice since 1987**

- **Locally funded beginning in 2004**

- **Interviews with adults and juveniles booked into detention facilities**

- **Urinalysis identifies recent drug use**

- **Platform for other research**

SAM Provides Valuable Information

- One of ten indicators for the Meth Strike Force Report Card

- Demonstrates severity of problem in San Diego County

- Measures change over time and can be tied to other changes in the community

- Data shared through CJ Bulletins and CJ Faxes

2008 Juvenile Arrestee Drug Use in the San Diego Region

July 2009

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2008 Adult Arrestee Drug Use in the San Diego Region

September 2009

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Methamphetamine Use by Adult and Juvenile Arrestees in 2008

December 2009

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Gang Involvement Among San Diego County Arrestees in 2008

October 2009

Cynthia Burke, Ph.D.
Division Director

A SANDAG CJ BULLETIN

TACKLING THE MISUSE OF PRESCRIPTION DRUGS

A growing concern in recent years is the misuse of prescription drugs (e.g., painkillers, sedatives, and tranquilizers). The most recent National Survey on Drug Use and Health (NSDUH) reports that in 2007, 6.9 million people (or 2.8% of the population) 12 years of age and older had taken prescription type drugs for non-medical purposes in the past year. The NSDUH also reveals it was most often a friend or family member who provided the medication[1].

Although arrestees are a higher risk population, soon to be released 2009 preliminary data from SANDAG's Substance Abuse Monitoring (SAM) program reveal that more than two in five (42%) adult and over one-quarter (28%) of juvenile arrestees have abused a prescription type drug in their lifetime (Figure 1). When adult arrestees who reported receiving medication without a legitimate prescription were further asked how they obtained the drug, almost all (95%) said they received or purchased the medication from another person as opposed to using a fake prescription (3%), stealing from another person (2%), or stealing from a pharmacy (1%).

Figure 1
TWO IN FIVE ADULT AND ONE IN FOUR JUVENILE ARRESTEES REPORT MISUSE OF PRESCRIPTION DRUGS
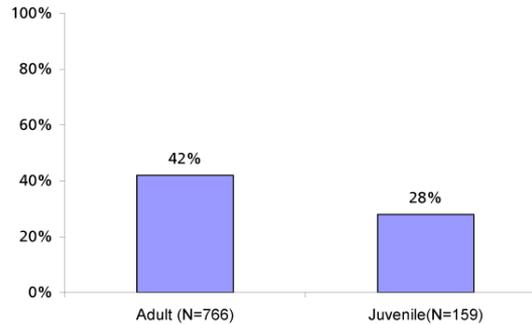
SOURCE: SANDAG; Substance Abuse Monitoring Program, 2009

These national and local data highlight the ease by which individuals acquire prescription drugs without a prescription, making accessibility a unique problem to prescription drug misuse. Locally, San Diego County has taken an active role in combating this problem. As part of their prevention efforts on April 17, 2010, the San Diego County Sheriff's Department and the Oxycontin Task Force will hold their second "Prescription Drug Take Back Day" event. This event raises awareness of nonmedical prescription drug use, offers information on treatment, and provides a safe place to dispose of unused pharmaceuticals. At last year's event, over 300 pounds of unneeded prescription drugs were received for proper disposal. For more details about the event, please visit the Oxycontin Task Force Facebook page at http://www.facebook.com/pages/San-Diego-CA/Oxy-Task-Force/101481557734.

[1] Substance Abuse and Mental Health Services Administration (2008). **Results from the 2007 National Survey on Drug Use and Health: National Findings**. On-line at http://www.oas.samhsa.gov/nsduh/2k7nsduh/2k7Results.pdf

SAN DIEGO ARRESTEES LESS LIKELY TO USE MARIJUANA AND COCAINE, BUT MORE LIKELY TO USE METHAMPHETAMINE

The Office of National Drug Control Policy (ONDCP) recently released its 2008 Arrestee Drug Abuse Monitoring (ADAM II) program report on drug trends among a few select communities across the nation[1]. ADAM II is a continuation of the original ADAM project, which was funded by the National Institute of Justice (NIJ) to collect and analyze drug use data among arrestees in 35 sites across the nation. NIJ terminated the program in 2003 and ONDCP revived a scaled-down version in 2006, concentrating on male arrestees and implementing data collection in ten sites throughout the nation. Although San Diego County is not one of the new ADAM II sites, through the generosity and foresight of local funders[2], it was the only ADAM site to maintain the project uninterrupted since 2003, renaming it the Substance Abuse Monitoring (SAM) program and expanding the scope to include issues of local concern. Because SAM continues to implement the same rigorous data collection methodology as ADAM, results from San Diego can be compared to the ADAM II sites. This is one of the first opportunities since the termination of ADAM to examine San Diego in relation to other major metropolitan areas.

In comparison to the other ten sites, San Diego had the second lowest percentage of offenders testing positive for at least one drug (57%), with the low being 49 percent in Washington, D.C. and the high 87 percent in Chicago (Table 1). In terms of specific drugs, San Diego had the lowest or one of the lowest recent usage rates for cocaine and marijuana, and the percent positive for heroin was somewhere in the middle compared to other jurisdictions. Not surprisingly, although meth use has continued to spread across the country, usage remained the highest in western parts of the United States, with San Diego having the second highest rate, following Sacramento.

Table 1
MALE ARRESTEES IN SAN DIEGO DIFFER IN DRUG USAGE COMPARED TO ADAM II SITES

	Any Drug	Marijuana	Meth	Cocaine	Opiates
Atlanta, GA	60%	32%	.4	41%	2%
Charlotte, NC	69%	51%	.5%	30%	1%
Chicago, IL	87%	49%	.4%	44%	29%
Denver, CO	68%	42%	3%	33%	4%
Indianapolis, IN	64%	46%	2%	21%	5%
Minneapolis, MN	65%	48%	2%	23%	6%
New York, NY	69%	42%	.1%	30%	7%
Portland, OR	64%	41%	15%	21%	8%
Sacramento, CA	78%	47%	35%	17%	4%
Washington, D.C.	49%	31%	2%	27%	12%
San Diego, CA	**57%**	**36%**	**20%**	**8%**	**7%**

SOURCES: ONDCP ADAM II 2008 Annual Report; SANDAG SAM 2008 data

To learn more about SAM, visit SANDAG's Web site at www.sandag.org/cj.

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RESEARCH FINDINGS FROM THE CRIMINAL JUSTICE RESEARCH DIVISION

Volume 11 Issue 10

## ONE IN THREE ADULT ARRESTEES ALSO ARRESTED AS A JUVENILE

Recent data from SANDAG's Substance Abuse Monitoring (SAM) program illuminates the slippery slope between juvenile delinquency and future adult criminal behavior. Interviews with adults booked into local detention facilities show that 33 percent reported having ever been arrested as a juvenile (not shown). In addition, these arrestees had more serious histories of drug use, mental health issues, and criminal behavior than arrestees who did not have this juvenile justice system contact. As Figure 1 shows, individuals arrested as a juvenile were more likely to have ever received mental health and/or drug treatment, visited an emergency room because of their drug use, and tested positive for multiple drugs at arrest. They also started using gateway drugs, such as alcohol and marijuana, at an earlier age (15.9 and 13.5, respectively) compared to those individuals that had never been arrested as a juvenile (17.94 and 15.49, respectively) (not shown). Additionally, adults arrested as juveniles have had lengthier involvements with the criminal justice system, were more likely to report gang involvement, and had previously served time in jail and/or prison (Figure 2).

Figure 1
INDIVIDUALS ARRESTED AS JUVENILES HAVE MORE MENTAL HEALTH AND DRUG ABUSE ISSUES
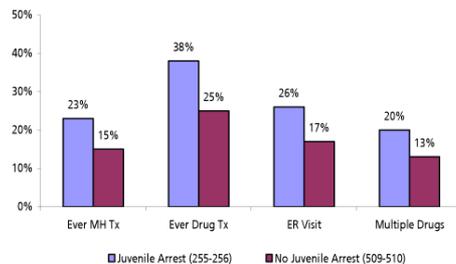
SOURCE: SANDAG; Substance Abuse Monitoring Program, 2009.

Figure 2
ARRESTEES WITH JUVENILE RECORDS HAVE ENGAGED IN MORE CRIMINAL ACTIVITY
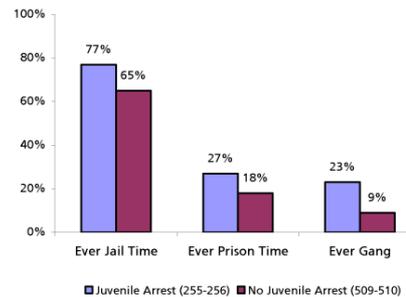
SOURCE: SANDAG; Substance Abuse Monitoring Program, 2009.

These data not only illustrate the link between juvenile delinquency and later involvement in the adult system, but highlight the greater level of need (e.g., drug and mental health problems) by arrestees with juvenile records. While the economic downturn has not had a noticeable impact on crime rates to date, it may eventually, as juvenile and adult prevention and rehabilitation programs are significantly reduced.

To learn more about the characteristics of recent arrestees into local detention facilities and current crime rates, visit www.sandag.org/cj to view the series of SAM bulletins and the 2009 Mid-Year Crime Bulletin.

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CRIMINAL JUSTICE RESEARCH

RESEARCH FINDINGS FROM THE CRIMINAL JUSTICE RESEARCH DIVISION

Volume 11 Issue 5

THE UNKNOWN COST AND FUTURE OF METH USE IN THESE UNCERTAIN ECONOMIC TIMES

Two recent studies released by CASA at Columbia University[1] and RAND[2] highlight the costly toll substance use has had on local and national budgets. CASA conservatively estimated that in 2005, state governments spent approximately 15 percent of their budgets (19% of California's) on substance abuse and its damages, for a total of $467.7 billion nationally. When the lens is turned on methamphetamine (meth) specifically, the costs are also staggering with the nation spending an estimated $23.4 billion in 2005. Closer examination of these expenditures reveals that only about two percent of each of these budgets (overall and meth alone) was spent on prevention, with the majority consumed by addressing the negative consequences of drug use (e.g., loss of life, criminal justice costs).

San Diego County has a long and dubious history with meth. However, perseverance, commitment, and aggressive action on the part of the alcohol and drug treatment community, law enforcement, and policy makers have resulted in positive outcomes. Data collected through SANDAG's Substance Abuse Monitoring (SAM) program show that meth use among arrestees (a strong indicator of meth trends) in San Diego County has been on the decline for both adults and juveniles since a peak in 2005 (21% and 46%, respectively). In 2008, 24 percent of adults and 10 percent of juveniles tested positive for meth (Figure 1)[3].

Table 1
METH USE AMONG SAN DIEGO COUNTY ARRESTEES SHOWS A DOWNWARD TREND
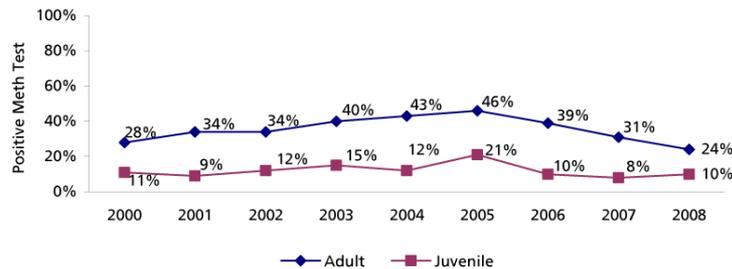
SOURCE: SANDAG; Substance Abuse Monitoring Program 2008 data.

Rather than a cause for celebration, these data sound a warning of what lies ahead as decision makers are forced to make difficult budget-related decisions. Without a legislative mandate, prevention and intervention programs are often the first to be dismantled during tight fiscal times. Combating meth use and production requires constant vigilance. Time will reveal what impact fewer resources will have on this fight.

[1] Author (2009). *Shoveling up II: The Impact of Substance Abuse on Federal, State, and Local Budgets.* Available at www.casacolumbia.org/absolutenm/articlefiles/380-ShovelingUpII.pdf
[2] Nicosia, N., Pacula, R., Kilmer, B., Lundberg, R., & Chiesa, J. (2009) *The Economic Costs of Methamphetamine use in the United States.* available at available at www.rand.org/pubs/monographs/2009/RAND_MG829.pdf
[3] 2008 SAM data will be available through a series of SANDAG bulletins to be released between July and August 2009.

2009 Samples

- **766 adults**
  - 495 males and 271 females
  - Average age 32.7 (18-69)
  - 37% arrested for drug offense
- **154 juveniles**
  - 120 males and 34 females
  - Average age 15.8 (12-18)
 - 6% arrested for drug offense

# Half or More of Arrestees Test Positive for an Illicit Substance
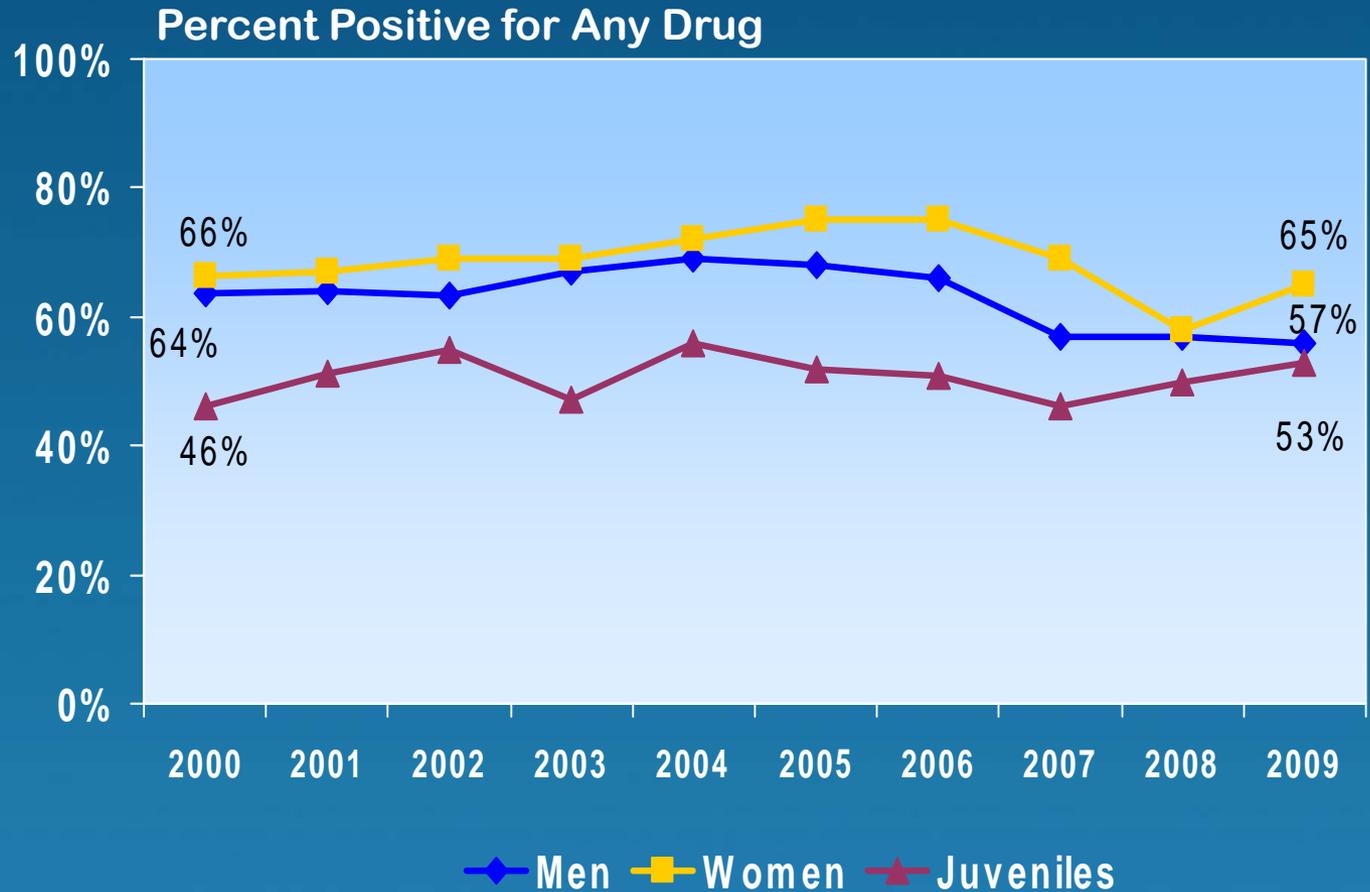
Percent Positive for Any Drug

Men — Women — Juveniles
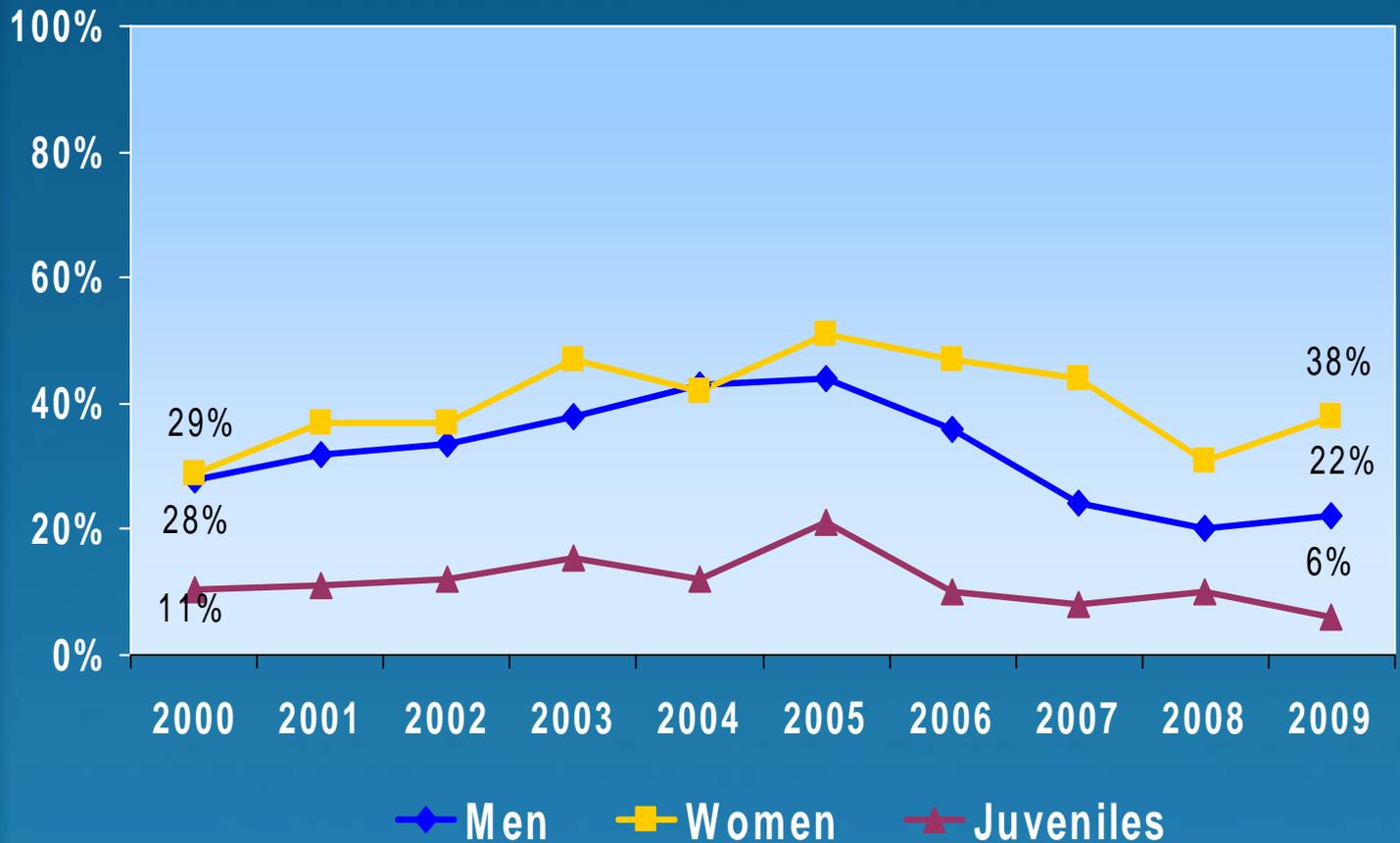
Meth Harder to Obtain and More Expensive

Percent Reporting that Meth

Quality is Worse — 51%, 50%
Price is Higher — 29%, 67%
Is Harder to Obtain — 17%, 33%

Legend: Quality is Worse, Price is Higher, Is Harder to Obtain

12
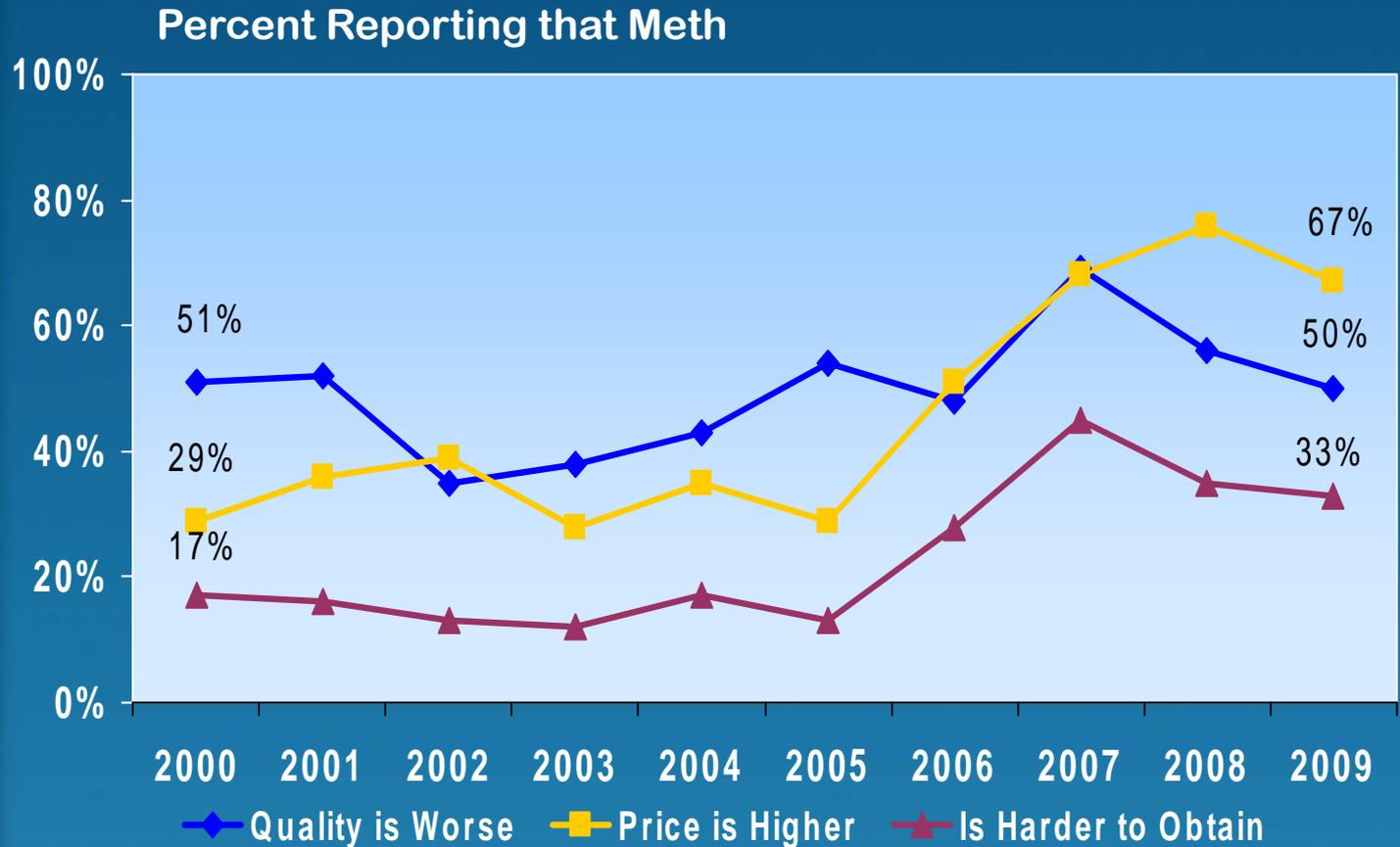
# Drug Market Questions Show Where Different Drugs Are Obtained

Percent of Adults Respondents Describing Where They Obtain

Bar chart showing Same MSA vs Different MSA percentages:

Drug	Same MSA	Different MSA
Marijuana	73%	27%
Meth	64%	36%
Cocaine	63%	37%
Crack	71%	29%
Heroin	48%	52%

■ Same MSA ■ Different MSA
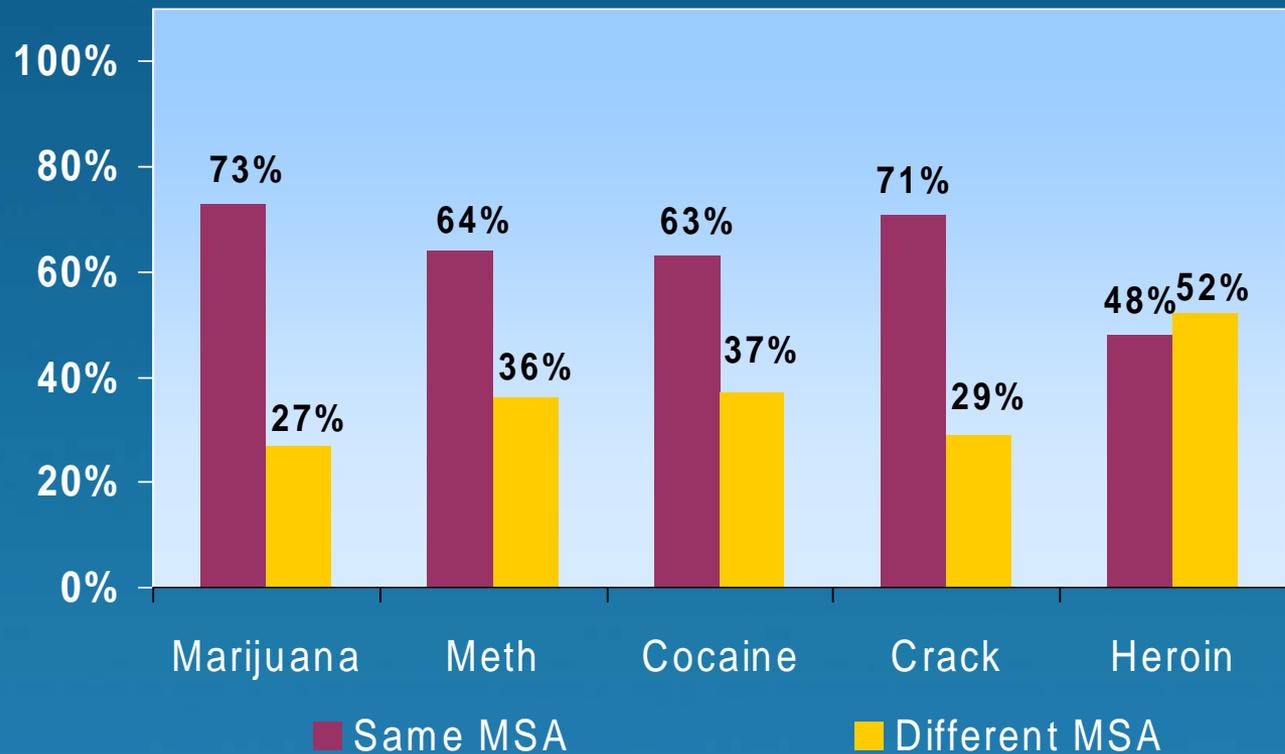
Juveniles Perceive Different Risks of Using Different Drugs
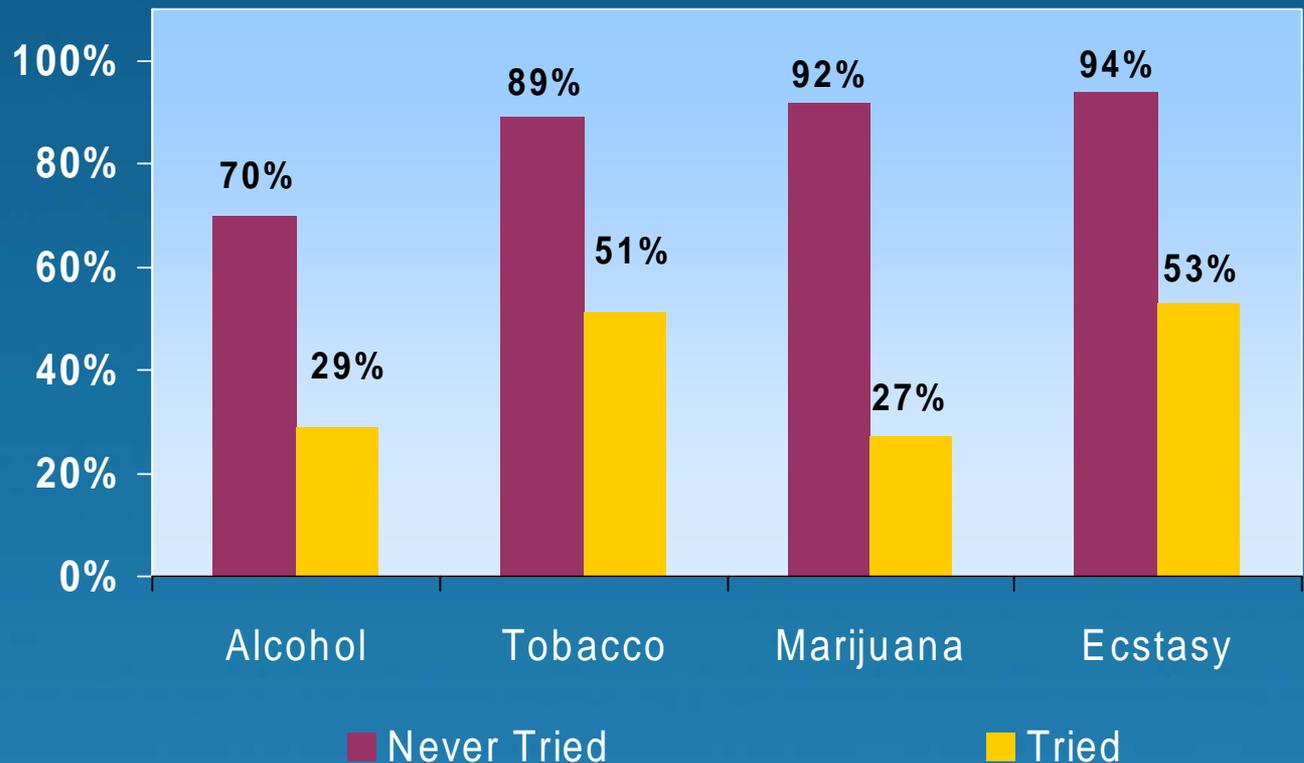
Use of Illicit Drugs and Prescription and Other Medication Related (Adults)

Percent Who Ever Used Illicit Drug

Bar chart showing percent who ever used illicit drug, comparing Medication Abuse and No Medication Abuse groups:

- Marijuana: Medication Abuse 42%, No Medication Abuse 27%
- Meth: Medication Abuse 29%, No Medication Abuse 21%
- Heroin: Medication Abuse 11%, No Medication Abuse 4%

Legend: ■ Medication Abuse ■ No Medication Abuse
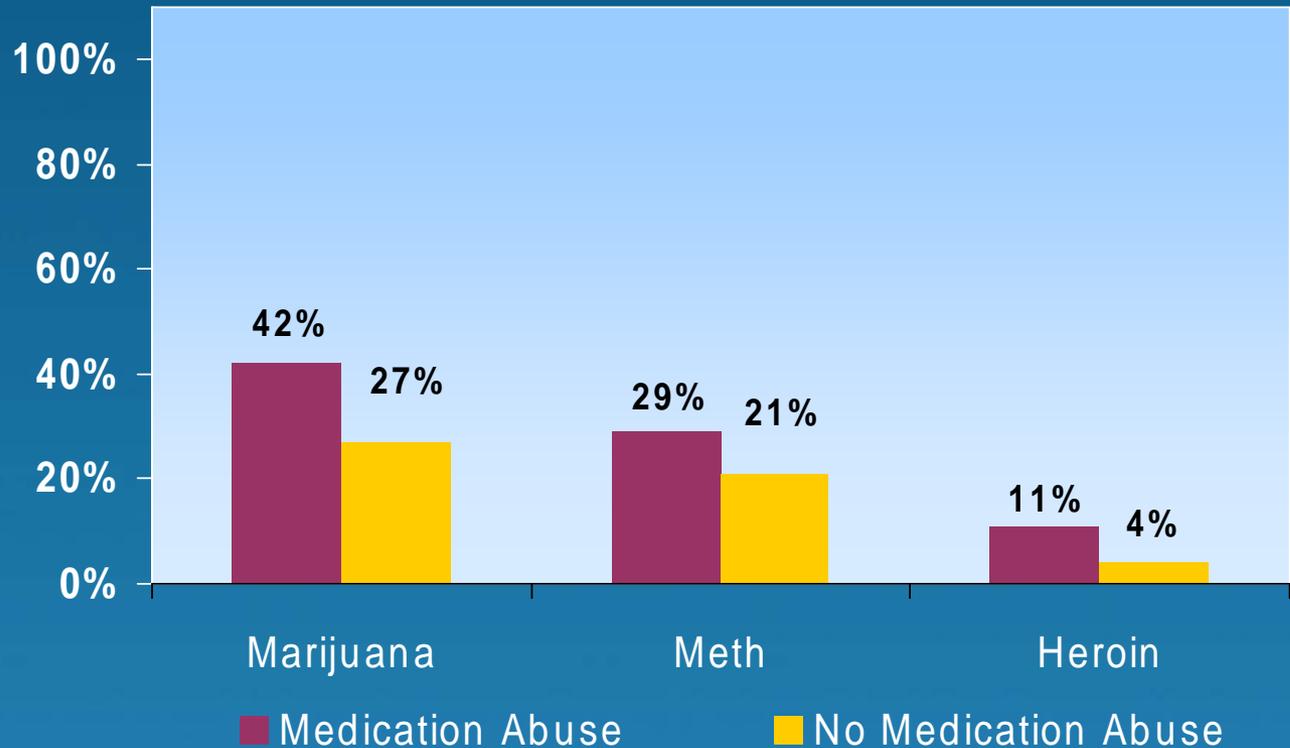
Use of Illicit Drugs and Prescription and Other Medication Related (Juv)

Percent Who Ever Used Illicit Drug

Bar chart showing percent who ever used illicit drug by Medication Abuse (maroon) and No Medication Abuse (yellow):

- Meth: Medication Abuse 47%, No Medication Abuse 11%
- Cocaine: Medication Abuse 47%, No Medication Abuse 16%
- Mushrooms: Medication Abuse 47%, No Medication Abuse 4%
- Ecstasy: Medication Abuse 67%, No Medication Abuse 15%

Legend: ■ Medication Abuse   ■ No Medication Abuse
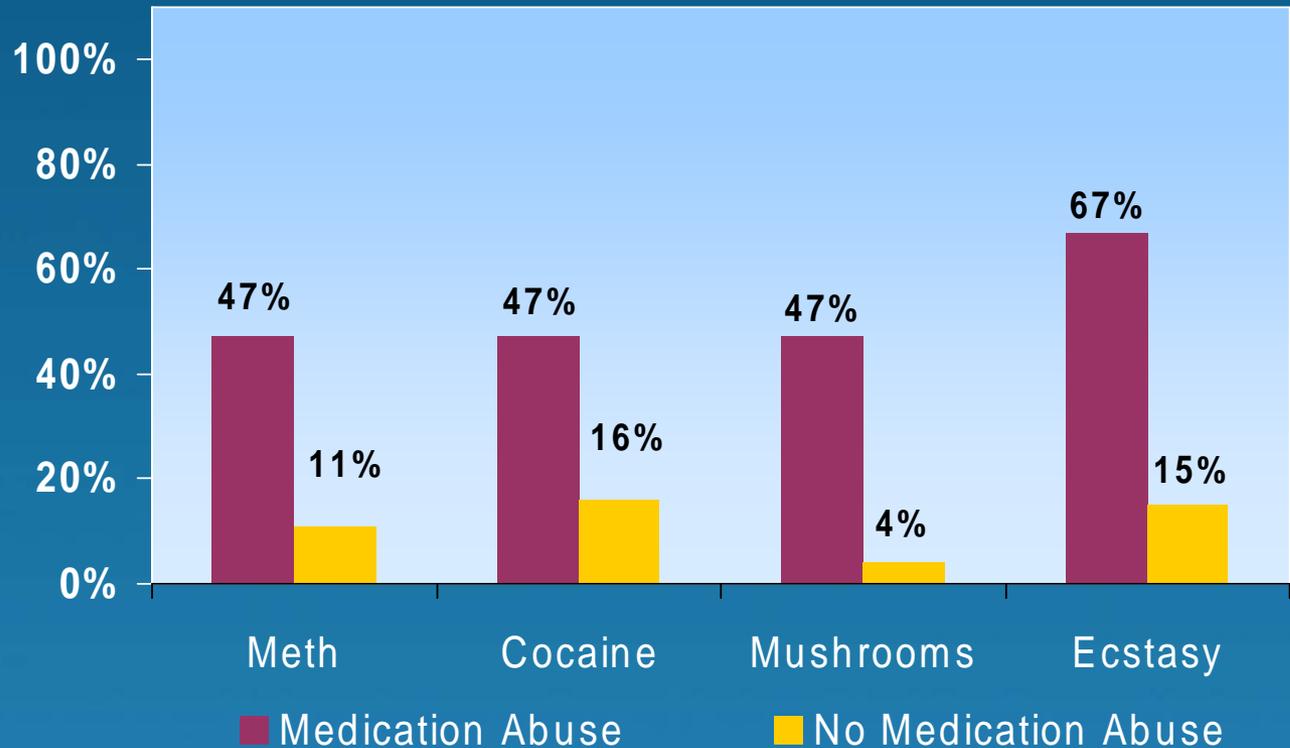
Drug Use Varies by Arrestee Characteristic, Including Age

Percent Positive by Age
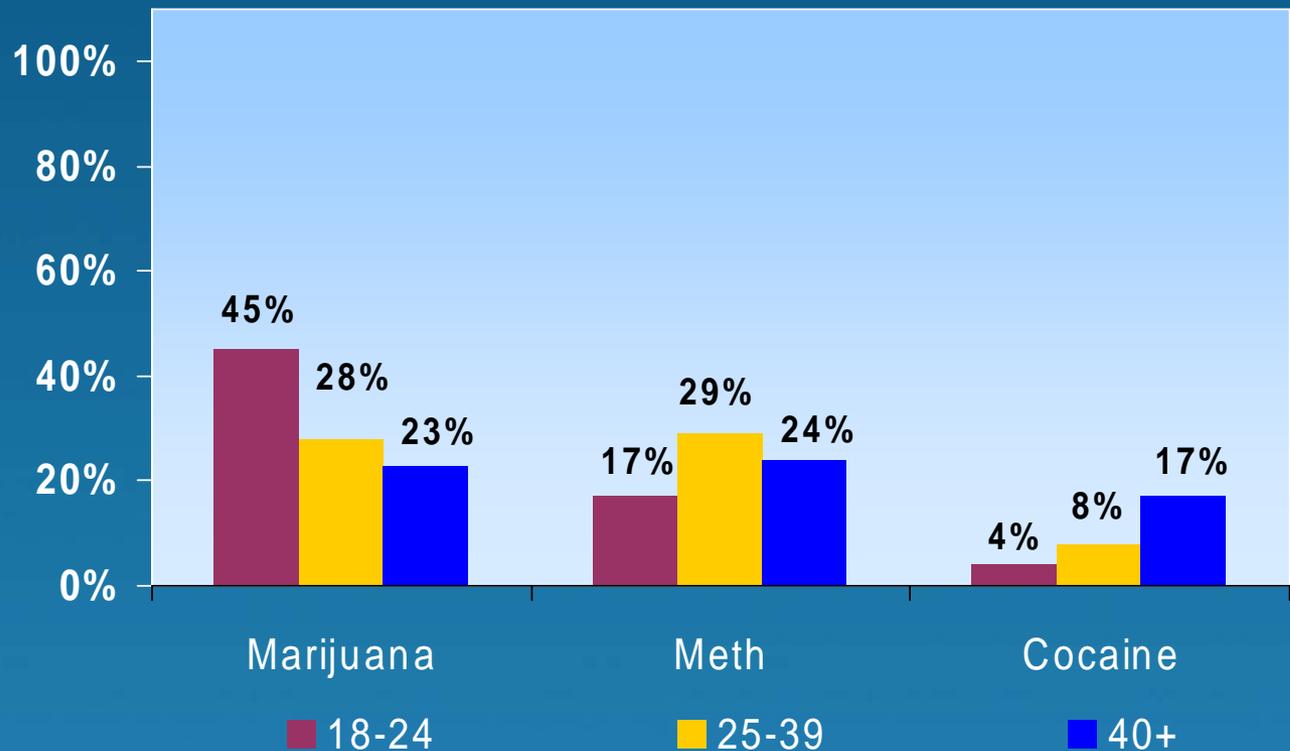
Gang Involvement

- 46% of juveniles, 13% of adults reported membership or association

- 53% report family member association

- 71% say they plan on ending association eventually

- More likely to have used and sold drugs

Other Adult Statistics

- 44% ever homeless
- 39% had driver vehicle under influence in past year
- 33% had juvenile justice contact
- 30% had received treatment before
- 20% previous mental health diagnosis
- 20% visited ER for drug-related incident

Other Juvenile Statistics

- **91% report previous truancy**

- **66% of females and 37% of males have run away from home**

- **60% have parents who have been arrested and booked**

- **46% report parental alcohol and/or other drug use**

- **36% report previous family CPS contact**

Paper — Operational and Quality Issues with Computer Assisted Interviewing for ADAM

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Joint Program in Survey Methodology, University of Maryland

In this paper, we discuss the use of computer assisted interviewing technologies for the Arrestee Drug Abuse Monitoring (ADAM) survey. Currently, ADAM is collected using a paper and pencil instrument (PAPI). The discussion below provides an overview of the advantages and disadvantages of using a computer assisted methodology with respect to five areas: (1) cost, (2) data quality, (3) timeliness, (4) survey management, and (5) logistics.

The computer assisted interviewing (CAI) technologies that are seem most relevant to for ADAM are computer assisted personal interviewing (CAPI) and computerized self-administered interview. CAPI applications involve an interviewer administering the survey from a portable computer of some type (laptop, tablet computer; PDA). The self-administered interviews could take several forms. A computer assisted self-interview (CASI) has the respondent reading the question from the computer screen and entering answers directly into the computer. An audio-CASI (ACASI) provides headphones to the respondent who is able to listen to recordings which read the questions as well. Interactive voice response (IVR) administers the interview over the telephone using a computer program that administers the questions using recorded voices.

Cost

For an ongoing program like ADAM, there are cost savings and additional costs associated with CAI. One source of cost savings is the reduction of data processing costs. The use of a computer eliminates the need for data entry (either manual or scanning). The use of CAI will significantly reduce, but not totally eliminate, data editing after the data are captured. Editing is reduced because of the automation of the skip patterns. The ADAM instrument has a significant number of skip patterns, including the use of the event history calendar (EHC), which inevitably leads to data that need review and alignment. Related to this is the elimination of the need for interviewers to conduct any post-interview edits. In most PAPI surveys, the interviewers need to spend time reviewing their markings on the questionnaire after the interview. This activity is minimized with CAI. A second source of savings is the elimination of the need to mail hardcopy questionnaires. Interviewers will electronically transmit data to the home office on a regular (probably daily) basis.

There are two major sources of additional expenditures associated with CAI. One is the investment in the hardware. This includes the initial purchase and continued maintenance of the machines. Each interviewer and supervisor needs their own machine. There has to be a significant number of backup machines that can replace machines that have problems during the field period. Along with the machines, there is a need for systems personnel to

support the field staff. A second cost is the specification, programming and testing of the program. This is a one- time cost incurred whenever a new set of questions are in the field. A third additional expenditure is training staff to use the machines (e.g., use of sample management system; navigation around the instrument; transmission of data after interview). This is an additional set of modules to the training program that would not be necessary if a paper instrument were being used.

There are no precise figures on the relative costs of CAI vs PAPI surveys. The comparisons are difficult to make because conversion to CAI typically introduces new capabilities and complexities that can be handled by the technology. An important consideration for an ongoing program, like ADAM, is the amortization of the fixed development and hardware costs. CAPI offers much clearer cost savings if machines and computer programs are used for extended periods of time. A second important offset to these additional expenditures is the amount of data that is being collected. As the number of interviews increases, the greater the savings on data capture and editing costs. When CAPI was first being adopted by different survey programs, several organizations reported the reduction in costs as being an important reason for making the change (Martin and Manners, 1995; Rothschild and Wilson, 1987; Baker, Bradburn, and Johnston, 1995). Whether these savings would apply for ADAM depends on the overall sample size and the extent of savings that would be realized by data capture, reduction in transmission, and editing.

Data Quality

There are a number of features related to CAI that have effects on data quality.

Control over the interviewing process

There are at least three features of CAI that should improve data quality by increasing control over the interviewing process. Relative to an interviewer administered paper survey (as ADAM is currently), CAI increases control over the sequence the questions are asked. With a paper survey, the interviewer has the ability to move through the instrument in any order. This is generally not viewed as a positive influence on quality because interviewers can then take shortcuts by not asking all questions. This can be particularly important if the questions are a series of items asking about specific behaviors, such as in several item-sets on the ADAM II instrument (e.g., S1, S4, S10, S13, S16, S19, MU36 a-n). One purpose of using lists like this is to prevent respondents' prematurely ruling out the occurrence of an event ("failure of metamemory"). However, in the interest of completing the interview, interviewers might be inclined to skip items if the respondent reports not engaging in any of the behaviors before they are actually asked the questions. Evidence that automation may have effects like this was found in tests related to the National Crime Victimization Survey (Hubble and Wilder, 1988).

Imposing structure on a CAI may negatively affect data quality when it is important to give the interviewer flexibility to navigate questions. The event history calendar is a procedure that does require this type of flexibility. The interviewer is trained to probe based on what the respondent might say to different items. It may also be the case that when working with arrestees situations may arise when it is difficult to work in a specific question order. Interviewers may need the flexibility to skip around the questionnaire.

This raises the question of whether it is possible to use an event history calendar (EHC) with a CAI application. As noted above, the EHC is a relatively unstructured protocol. In addition, it relies on filling out a hardcopy version of a calendar. There are now a number of applications that have used a computerized version of the EHC. For example, Belli et al. (2007) found an EHC administered as part of a computer assisted telephone interview was very effective in collecting information when compared to a more standard set of question lists. The Census Bureau is now in the process of implementing a CAPI version of the EHC for the Survey of Income and Program Participation. What remains relatively unknown is how computerization affects the effectiveness of the EHC vis-à-vis a paper version of the same protocol.

The structure imposed by the CAI has the effect of eliminating the need for interviewers to manually navigate skip patterns on the questionnaire. The automation of skip patterns reduces the amount of missing data that results from interviewers failing to follow some of the skips. Theoretically, this frees up the interviewer to concentrate on working with the respondent. This advantage tends to be more important at the beginning of the field period, when interviewers are learning the skips. For the current ADAM II instrument, this learning curve could be significant, given the dependencies many of the questions have on prior answers.

A third feature of CAI that affects control over the interviewing process is the availability of paradata that can be collected as part of the case management and survey interview. Paradata refers to information that is collected about the data collection process. This might include, for example, the number of times the interviewer attempted to complete an interview with a particular respondent, the amount of time the survey (or particular sections) took to administer and even the keystrokes interviewers used when entering the information. Timing information can be especially helpful because it provides a measure of how much time interviewers are spending on particular items/questions. If they are rushing through certain sections, timings can provide a window into this. Similarly, keystroke files can provide some indication of how often interviewers have to back up, erase, or re-do answers. This can help monitor the performance of particular items on the questionnaire.

Collecting sensitive information

The use of CAI introduces the possibility of using a self-administered questionnaire, such as CASI, ACASI or perhaps even IVR. Self-administration has been found to elicit better quality data for sensitive or illegal behavior (Tourangeau and Smith, 1998). Using a self-administered paper survey may not be possible, given the skip patterns involved on the questionnaire. However, it is not clear the effects of self-administration generalize to the unique situation of interviewing booked arrestees. The studies that have found self-administration is optimal have been conducted with general population samples. Offender samples, in general, may not have the same inhibitions related to reporting drug use or other criminal behavior. For example, the original offender studies conducted by RAND found, if anything, that some offenders tend to overreport their criminal activities (Blumstein et al., 1986). There is the immediate legal threat related to their arrest which

may inhibit reporting. If a self-administered survey were to be used for ADAM, some type of experimental test would be needed to assess its effects on data quality.

Many of the analytic uses of the ADAM interview are related to the details associated collected about drug use and offending. For example, the ADAM interview collects information on the types of drugs offenders had been using prior to arrest, how they were using them, dependence on drugs/alcohol and how the drugs were obtained. Respondents may be more willing to report these details with a self-administered questionnaire, although it is not clear from existing research. These items are amenable to a CASI or ACASI application. The program could guide the respondent through relevant skip patterns, which would be difficult in a self- administered paper questionnaire. However, it is questionable if the EHC could be done as a self-administered application. It may be possible, again using the computer's routing and visual features. However, this would require significant development. At least one recent attempt to conduct a EHC with a paper self-administered version would indicate that it would still require some intervention by an interviewer to assist in the process (Cotugno, 2010).

Online edits

The accuracy of the data for CAI applications has been found to be comparable to manual key -entry or scanning (Dielman and Couper, 1995; Lepkowski et al., 1998). A CAI application offers a way to check the plausibility of values during the interview. Plausibility includes whether data are within realistic ranges and whether there is consistency between questions. When responses do not seem acceptable, the program can alert the respondent and ask for either clarification or a corrected value. This can be done in either an interviewer or a self-administered mode.

Timeliness

In terms of timeliness, a CAI application requires more up front planning and testing. The program has to be specified by designers, the programmers have to implement those specifications and the programs have to be tested. This lead time increases as the complexity of the program increases, as well as when an audio component is involved (i.e., ACASI, IVR). The opposite is the case for data production and file creation. The use of CAI greatly increases the speed with which data-sets can be created and analyzed. It is even possible to analyze data, at least in its raw form, within days of receiving it from the field. This provides a capability to track interviewer performance on the questionnaire (e.g., using the para-data referred to above), as well as tracking results related to the questionnaire items.

This capability requires careful planning. Survey designers have to decide early on the specifications for the program, which would be translated for programming. In addition, there needs to be careful planning of the transmission protocols used by the interviewers. The transmission needs to be relatively easy to implement, support has to be provided to deal with problems and, most importantly, careful attention to the security of the transfer has to be considered.

Survey Management

CAI applications have management systems that can administer sample cases to interviewers. This is a powerful tool for tracking the disposition of particular cases. For example, electronic records can be maintained to keep track of contact attempts (including time and date) and detailed disposition codes. This also makes it relatively easy to transfer cases to different interviewers. For ADAM, this capability would have to be integrated into the sampling methodology. Since the sample is not defined until just prior to interviewing, it would be necessary to have a procedure that enters either the frame or the actual sample case on a flow basis. This type of updating has been done when sampling and interviewing youth in residential placement (Sedlak, 2008; Beck et al., 2010). However, in these cases, the ability to collect the sample data can be planned a day in advance. This may not be possible, if the ADAM sample needs to be drawn just prior to interviewing.

ADAM also requires data be collected from administrative files which is used to fill out the face sheet. The collection of these data could also be computerized. Interviewers would enter the information into the computer, rather than filling out the face sheet by hand. This could then be incorporated as part of the interview record or kept separate if that is necessary for confidentiality reasons.

A final capability of a CAI application is the ability to distribute survey instruments electronically to interviewers. This might be in the form of an update to the programmed instrument or the addition of a new module.

Survey Logistics

The application of CAI to ADAM is subject to the relatively unpredictable, and sometimes chaotic, atmosphere of a booking facility. The above discussion has already mentioned the possible complication with respect to drawing the sample. Facilities will vary by how they will provide the sample and it is not clear how this might fit into using a computer application. A second question is whether there is the physical space needed to use a laptop. Is there somewhere that the computer can be set up? Lightweight laptops, as well as tablet computers, can be designed to be used without requiring a flat surface (e.g., on the doorstep of a house). This would accommodate doing the survey, in the worst case, while standing in front of the holding cell. A related question is access to a power source. It is preferable to be able to draw power from an electric outlet, rather than use the computer battery. This eliminates the possibility that the computer will run out of power. The worst case scenario would be to use the battery, but in most cases it should be possible to use extension cords, strategically placed and hidden, to accommodate most facilities.

Security of the machines is also a concern that facility administrators, and project staff, voice when using computers around offenders. The extreme concern is that the respondent will intentionally break the machine. Less extreme concerns relate to the security of the machines when they are not being used by staff.

To our knowledge, there is very little extant experience with using CAI in the context of

interviewing arrestees in a booking facility. The one application we are aware of is the Substance Abuse Need for Treatment among Arrestees (SANTA), a study sponsored by CSAT. This study used CAPI to interview arrestees in booking facilities. We do not know many of the details of this implementation, but it would be useful to follow-up with the sponsors to get more details, if CAI applications are being considered for ADAM. It is the case that CAI applications have been used when conducting group administrations among juveniles in residential placement (Sedlak, 2008) as well as individual interviews with juveniles in residential placement and adult prisoners (Beck et al., 2008, 2010). These applications faced some of the same challenges as noted above, such as possible damage to equipment, security, sampling updates and power sources. All of these were successfully overcome through customization of the computer systems, as well as creative solutions to accommodate the physical layout of the buildings.

References

Baker, R.P., N.M. Bradburn, and R. Johnson. (1995). "Computer Assisted Personal Interviewing: An Experimental Evaluation of Data Quality and Survey Costs." *Journal of Official Statistics* 11: 415-434.

Beck, A., and P. Harrison. (2008). "Sexual Victimization in Local Jails Reported by Inmates, 2007." *BJS Bulletin,* Bureau of Justice Statistics, U.S. Department of Justice, NCJ 221946.

Beck, A., P. Harrison, and P. Guerino. (2010). "Sexual Victimization in Juvenile Facilities Reported by Juveniles, 2008-09." *BJS Bulletin,* Bureau of Justice Statistics, U.S. Department of Justice, NCJ 228416.

Belli, R.F., L.M. Smith, P.M. Andreski, and S. Agrawal. (2007). "Methodological Comparisons between CATI Event History Calendar and Standardized Conventional Questionnaire Instruments." *Public Opinion Quarterly* 71: 603–622.

Blumstein, A., J. Cohen, J.A. Roth, and C.A. Visher (eds.). (1986). *Criminal Careers and "Career Criminals."* Washington, DC: National Academies Press.

Cotugno, M.Z. "Creating a Self-Administered Questionnaire." Poster presented at the 2010 annual convention of the American Association for Public Opinion Research, Chicago, IL, May 12-15, 2010.

Dielman, L., and M. Couper. (1995). "Data Quality in CAPI Surveys: Keying Errors." *Journal of Official Statistics* 11: 141-146.

Hubble, D., and B.E. Wilder. (1988). "Preliminary Results from the National Crime Survey CATI Experiment." *Proceedings of the American Statistical Association: Survey Methods Section*, New Orleans, LA.

Lepkowski, J., S. Sadosky, and P. Weiss. (1998). "Mode, Behavior, and Data Recording Error" in M. Couper, R. Baker, J. Bethlehem, C. Clark, J. Martin, W. Nicholls II, and J. O'Reilly (eds.), *Computer Assisted Survey Information Collection* (pp. 341-356)*. New York: Wiley.

Martin, J., and T. Manners. (1995). "Computer Assisted Personal Interviewing in Survey Research" in R.M. Lee (ed.), *Information Technology for the Social Scientist* (pp. 51-72)*.* London: UCL Press.

Rothschild, B.B., and L.B. Wilson. (1988). "Nationwide Food Consumption Survey 1987: A Landmark Person Interview Survey Using Laptop Computers*." Proceedings of the Fourth Annual Research Conference.* Washington, DC: U.S. Bureau of the Census, U.S. Department of Justice.

Sedlak, A. (2008). "Introduction to the Survey of Youth in Residential Placement." *Juvenile Justice Bulletin,* Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice.

Tourangeau, R., and T.W. Smith. (1998). "Collecting Sensitive Information with Different Modes of Data Collection" in M. Couper, R.P. Baker, J. Bethlehem, C. Clark, J. Martin, W.L. Nicholls II, and J.M. O'Reilly, *Computer Assisted Survey Information Collection* (pp. 431–454). New York: John Wiley & Sons, Inc.

Operational and Quality Issues with Computer Assisted Interviewing for ADAM

David Cantor

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OJP Offender Drug Abuse Monitoring Program,
BJS-NIJ Expert Topic Meeting, May 27, 2010

Application of Technology for ADAM

- Computer Assisted Personal Interview (CAPI).
  - Use of laptop by Interviewer to administer the questionnaire
  - Use of notebook/PDA
- Computer Assisted Self-Interviews
  - Without Audio (CASI)
  - With Audio (ACASI)
  - On telephone (IVR)

Implications of Switching to Computer Assisted Interviewing (CAI)

- Cost
- Data quality/accuracy
- Timeliness
- Survey Management
- Logistics

Cost of Computer Assisted Interviewing

- Lower costs
  - More efficient interviewer operations
  - Data entry
  - Data transmission
  - Data editing

- Higher costs
  - Hardware investment
  - Programming and testing
  - Training and field maintenance

Cost - Evidence and net effects

- No good empirical evidence on "apples to apples" comparisons of cost
- ADAM related considerations
  - Data entry and editing with paper version
  - Data transmission
  - Programming and testing
  - Repeated applications allow amortization

Data Quality

- Greater control over the data collection process

- Collection of sensitive data (CASI; ACASI; IVR)

- Online edits

Data Quality - Greater Control

- Interviewers are forced to move through all screens
- Skip patterns are controlled by the computer
  - This could be significant for ADAM, given current paper version
- Increased monitoring capability – collection of para-data

Example of a list to be read

Secondary Drug Use
0=NO
1=YES

Now I'd like to ask you about your use of other drugs, including prescription drugs. As I read down the list, please tell me if you used any of these drugs in the past 3 days.

MU36. In the past 3 days, did you use any:

DRUG:

a)	Methadone;	_____
b)	Amphetamines like Benzedrine, Dexedrine, or Ritalin, sometimes called "bennies" or "dex," not including methamphetamine;	_____
c)	Barbiturates like Seconal, sometimes called "blues" or "reds";	_____
d)	Tranquilizers or sedatives like Xanax, Valium, Rohypnol, sometimes called "tranqs" or "roofies";	_____
e)	Any of the following painkillers: Codeine, Dilaudid, Vicodin, OxyContin, or Percocet;	_____
f)	Darvon;	_____
g)	Demerol, Fentanyl;	_____
h)	Ecstasy, MDMA;	_____
i)	PCP, Angel Dust;	_____
j)	LSD, Acid;	_____
k)	Any other hallucinogen like mescaline or magic mushrooms;	_____
l)	Inhalants like glue, paint, aerosols, "poppers";	_____
m)	Anti-depressants like Zoloft, Prozac, or Paxil; or,	_____
n)	Any other drugs?	_____
	OTHER [SPECIFY] _____	_____

Example of ADAM Skip Patterns

Applications of CAI with Event History Calendar

- Belli (2007) used calendar for CATI application
- Other surveys have used calendar for CAPI applications
  - Census Bureau is currently implementing it for the Survey of Income and Program Participation

Example of CATI Screen

Belli, R.F., Smith, L.M., Andreski, P.M. and S. Agrawal (2007) "Methodological Comparisons Between CATI Event History Calendar and Standard Conventional Questionnaire Instruments." Public Opinion Quarterly 71: 603-622

Collection of Para-data

- Para-data – Information about the survey process. Examples include:
  - Number of attempts to complete the interview
  - The amount of time to complete interview (and sections of interview)
  - Audit trails – what keystrokes were used?

- Provides ability to:
  - Assess interviewer performance (provides feedback/added control)
  - Pinpoint troublespots of the questionnaire

Collection of sensitive information

- Self-administration collects superior data for sensitive information (Tourangeau and Smith, 1998).
  - No tests for arrestees
- Some evidence that computer is better than paper (but not strong)
- CASI-related methods provide much more flexibility than paper, self-administered

Mean Number of Opposite-Sex Sex Partners in Past Year (Log Transformed)
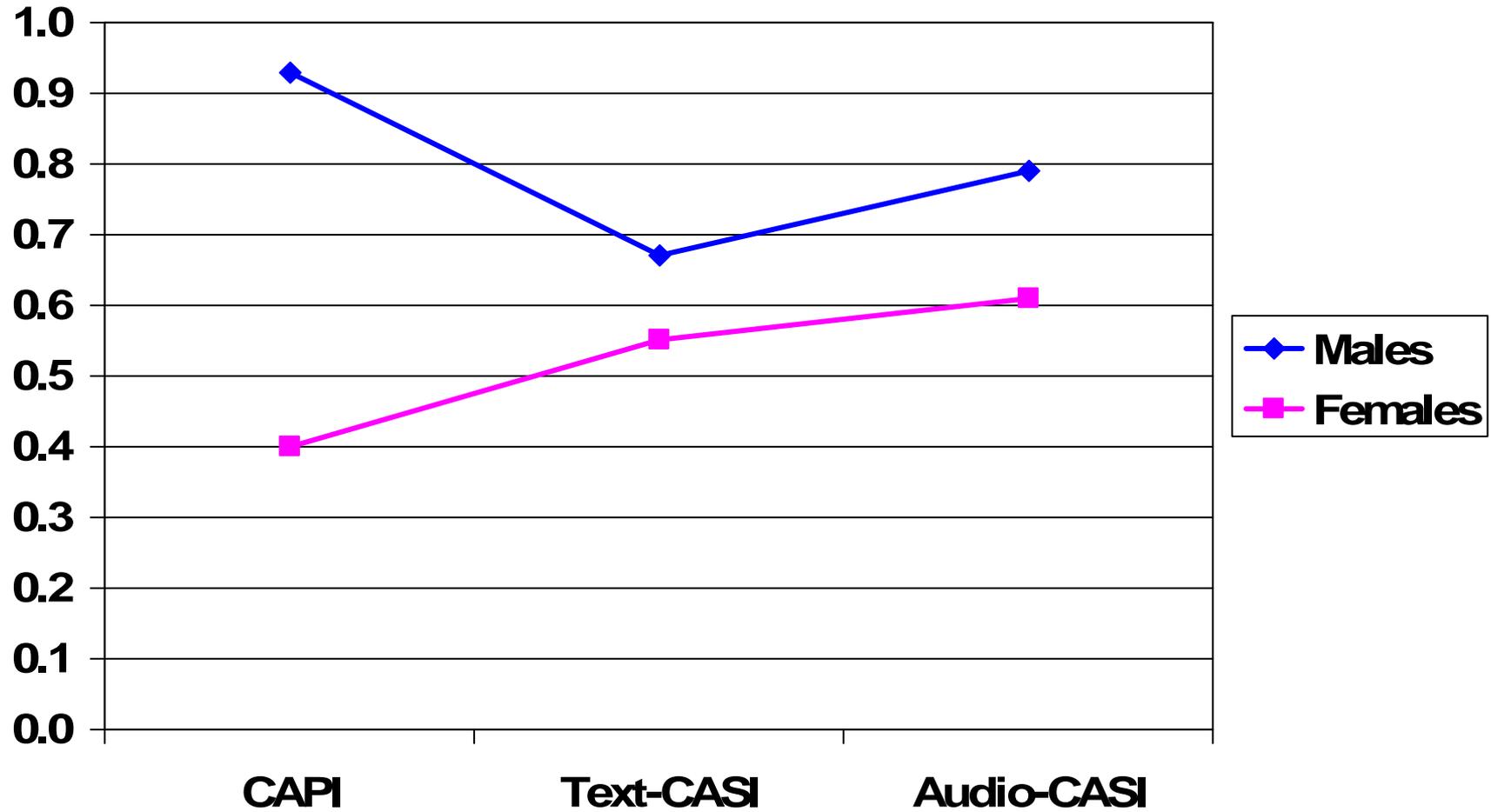
Effect of Audio-CASI on Substantive Responses

- Turner et al. (1998)
- National Survey of Adolescent Males
- Percent reporting male-male sexual contact by self-administered method

Legend: Paper SAQ, ACASI

Categories (x-axis): Insertive oral sex, Receptive oral sex, Insertive anal sex, Receptive anal sex
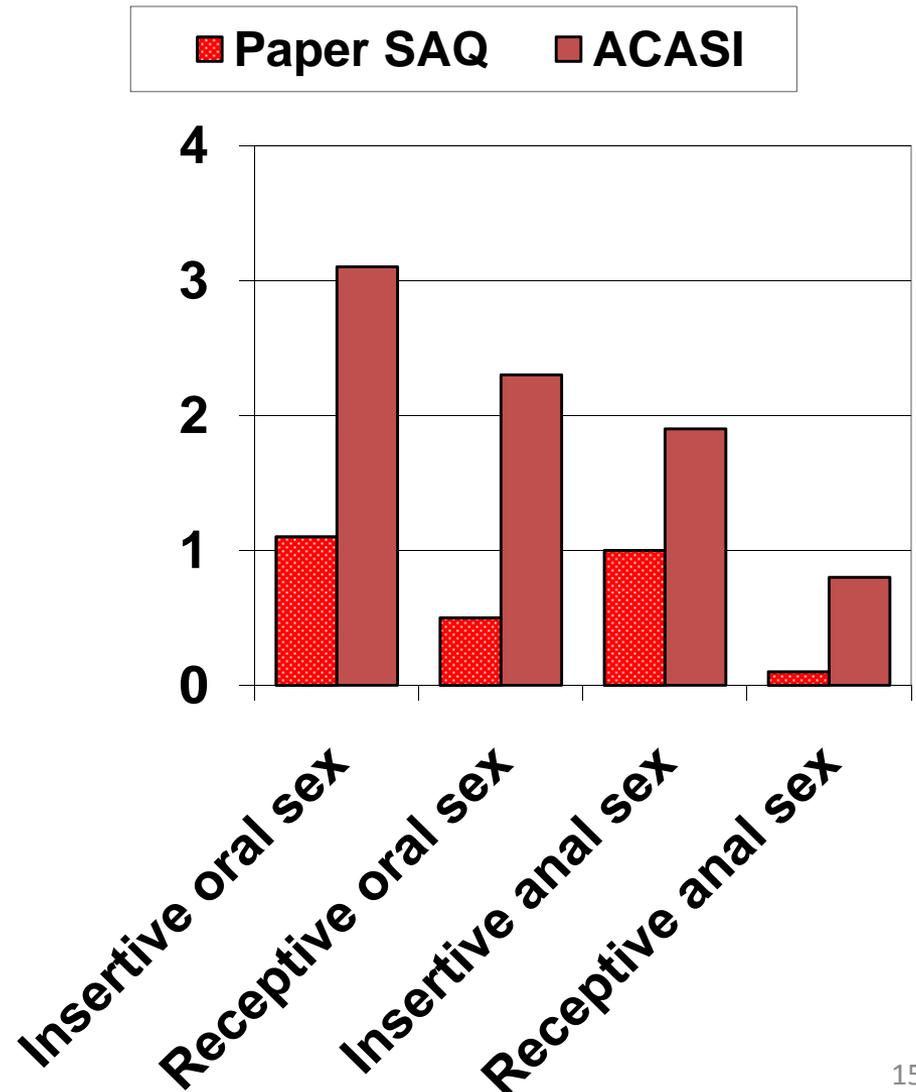
Can CASI be used for ADAM?

- Significant development is needed if event history calendar is used (Cotugno, 2010)
- Without EHC, application is more realistic
  - National Inmate Survey (NIS)
  - National Survey of Youth in Custody
- Do results generalize to arrestees?
- How important is higher reporting vs use of EHC for details?

Data Quality – Online Edits

- Data entry is very accurate (Dielman and Couper, 1995; Lepkowski, et al., 1998)

- Range checks for implausible values

- Cross question checks to assess consistency of answers

Timeliness

- Interviewers transmit data on a regular basis (e.g., daily)
  - Protocol is easy to implement
  - Interviewers have to be trained and to troubleshoot (e.g., call help line)
  - Security of transmission
- Data are available for analysis quickly
- Ability to review data received and provide feedback to interviewer/supervisor

Survey Management

- Sample and case management
- Provides flexibility for bringing in other data/applications
  - Bring in data for pre-fills (ADAM facesheet)
  - Use lists or other data-bases while interviewing (drug lists)
- Allows designer to modify and disseminate new modules quickly

Logistics

- Facility acceptance
- Sampling process
- Security of machines
- Power source
- Ability to set up machine
- Other?

Similar applications?

- CSAT use for Substance Abuse Need for Treatment among Arrestees (SANTA)
- SYRP and NSYC
- NIS
- Others?

Thank-you
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What Difference Does It Make? Patterns in Drug-related Emergency Department Visits from DAWN

Elizabeth H. Crane, Ph.D., M.P.H.
Drug Abuse Warning Network
Center for Behavioral Health Statistics and Quality, SAMHSA

BJS-NIJ Expert Topic Meeting II, Washington, DC August 5, 2010

Disclosure Information

Elizabeth Crane, Ph.D., M.P.H.

Drug Abuse Warning Network, SAMHSA

I have no financial or other disclosures

Drug Abuse Warning Network

- Public health surveillance system
- Direct review of emergency department (ED) patient records
- ED visits related to drugs
  - Direct cause or contributing factor
  - 4 million drug-related visits in 2008

SAMHSA / CBHSQ

What Drugs are Covered?

- All types of drugs
  - Illegal drugs
  - Prescription and OTC pharmaceuticals
  - Dietary supplements
  - Non-pharmaceutical inhalants
- Alcohol-in-combination (any age)
- Alcohol alone (age < 21)

DAWN Emergency Department Component

- Data collected from non-Federal general hospitals with full-time EDs (24/7)
- Statistical sample
  - Nationally representative
  - 12 oversampled metropolitan areas/subareas
- ED visit counts from hospitals are used to produce estimates

Metropolitan Areas in DAWN Emergency Department Component
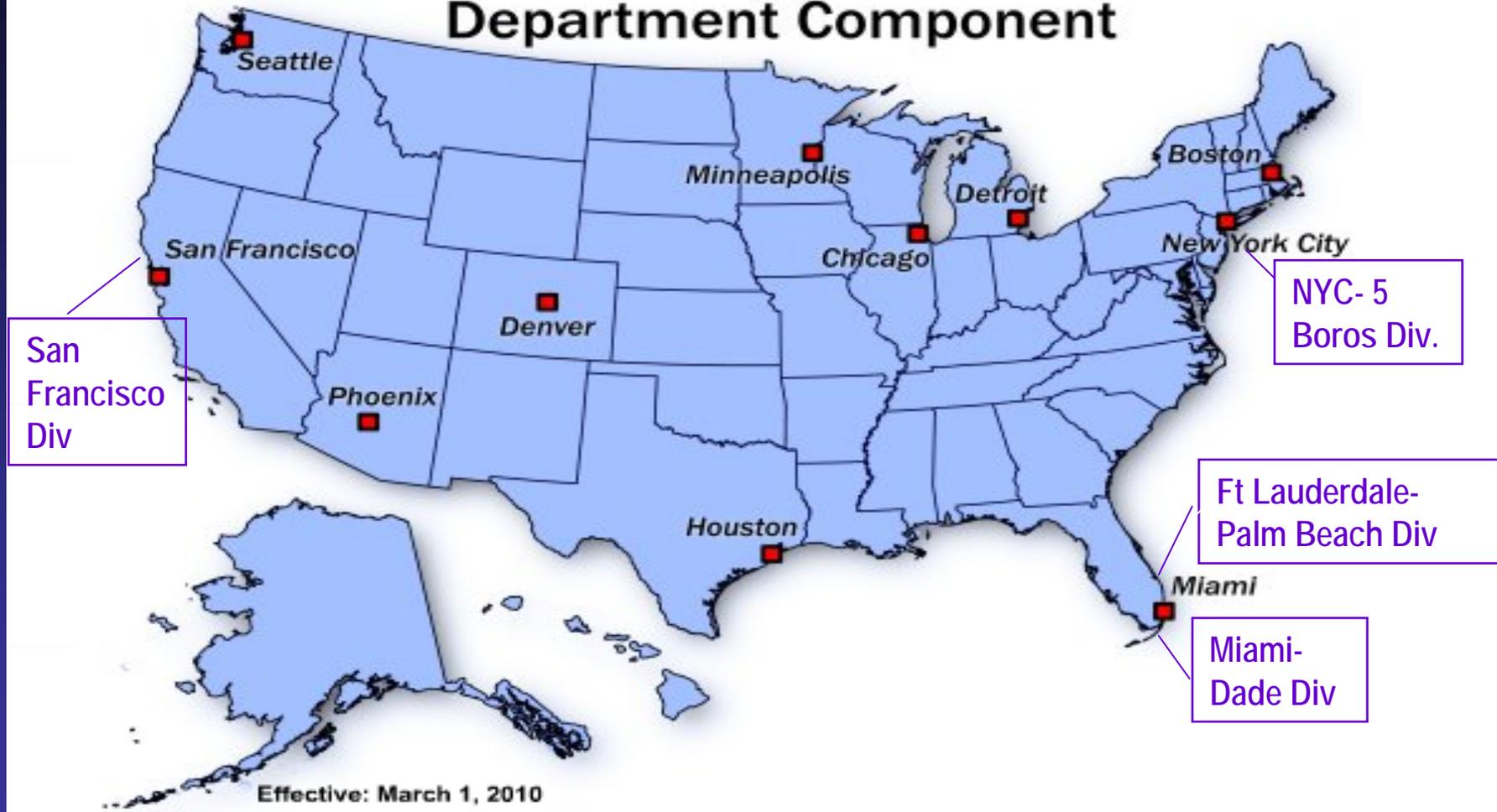
DAWN Emergency Department Component

- ED visits involving recent drug use
- All motives
  - Drug misuse/abuse
  - Nonmedical use of pharmaceuticals
  - Underage drinking
  - Drug-related suicide attempts
  - Seeking detox
  - Adverse reactions
  - Accidental ingestion
  - Malicious poisoning

Analytic Categories in this Presentation

- For illicit drugs
  - Includes all ED visits that involved an illicit drug, regardless of the reason for the ED visit.

- For pharmaceuticals
  - ED visits that involved the nonmedical use of a pharmaceutical

Nonmedical Use of Pharmaceuticals (NMUP) – Definition

- Taking a higher than prescribed or recommended dose of a pharmaceutical

- Taking a pharmaceutical prescribed for another individual

- Drug-related assault of the patient by another individual

- Substance abuse involving pharmaceuticals

National Trends, 2004 - 2008

Drug-related ED Visits – Nation, 2008

- Over 4.3 million drug-related ED visits
    - 73% increase from 2004 to 2008
    - 27% increase from 2006 to 2008

- Almost 2 million involved drug misuse/abuse (46% of total visits)
- Almost 1 million involved NMUP (22% of total visits)

Note: Trends were analyzed by comparing 2008 with 2004, 2006, and 2007 only.

SAMHSA / CBHSQ

Trends in ED Visits by Adults[+] – 2004 compared to 2008

- Total of all illicit drugs stable
  - Cocaine, marijuana, heroin: stable

- Nonmedical use of pharmaceuticals increased 91%
  - Narcotic pain relievers increased 112%
  - Benzodiazepines increased 92%

[+]Ages 21 and older

ED Visits involving Selected Illicits and NMU Pharmaceuticals, Adults⁺– Nation, 2004 - 2008

Source: DAWN Estimates, 2009

SAMHSA / CBHSQ
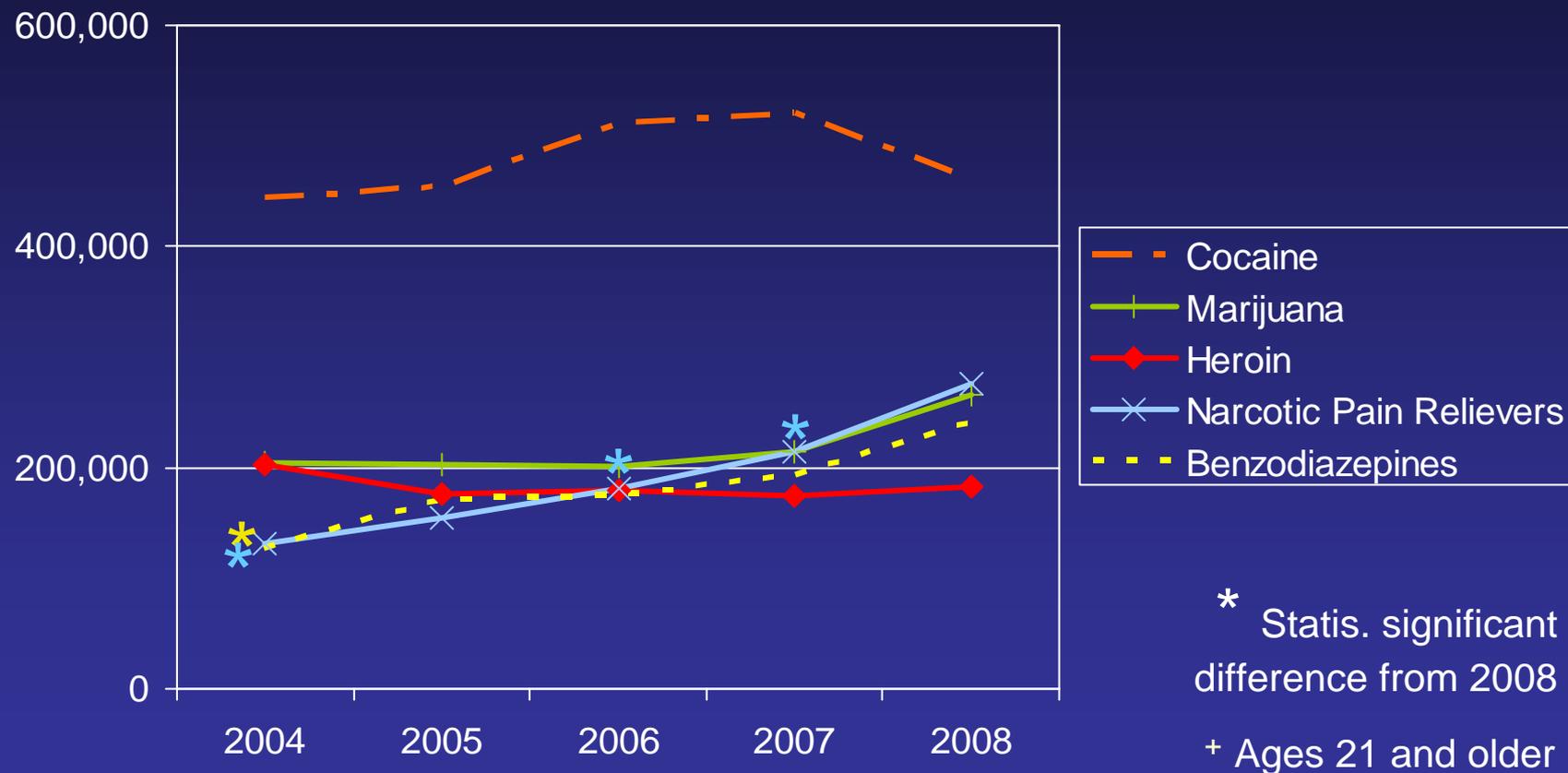
Metropolitan Areas, 2004 - 2008

ED Visits involving Cocaine – Adults⁺, 2004 - 2008

Legend:
- NYC
- Boston
- Detroit
- Miami
- Denver
- Phoenix

* Statis. significant difference from 2008

⁺Ages 21 and older

SAMHSA / CBHSQ
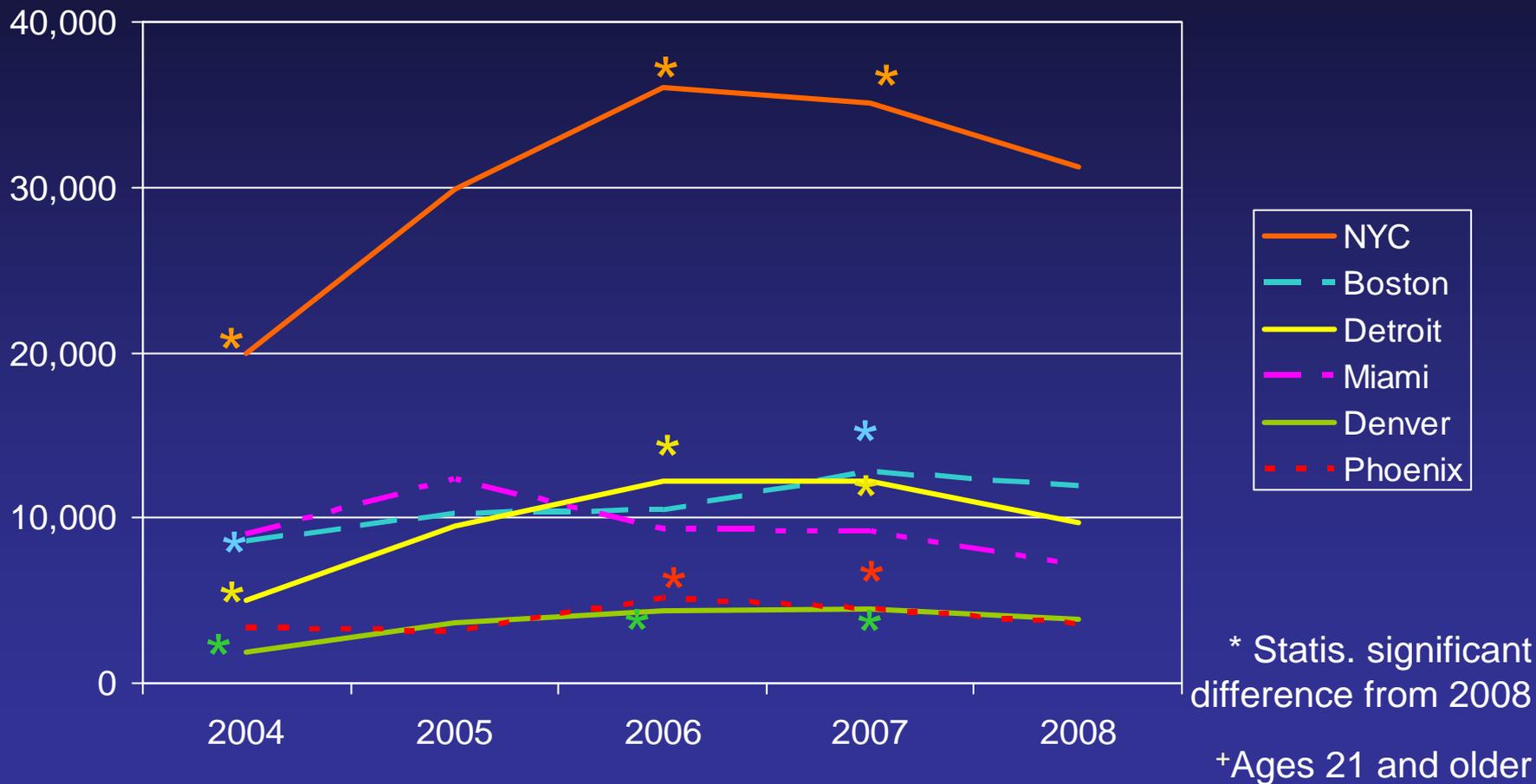
Rates of Cocaine-related ED Visits for Adults[+] by Metro Area – 2008

Metro Area	Rate
NYC	510
Chicago	444
Miami	405
Houston	387
Detroit	307
San Francisco Div	286
Seattle	284
Boston	262
Ft Lauderdale	235
Minn-St Paul	221
Denver	218
Nation	212
Phoenix	119
San Diego	62

Rate: ED Visits per 100K population

[+]Ages 21 and older
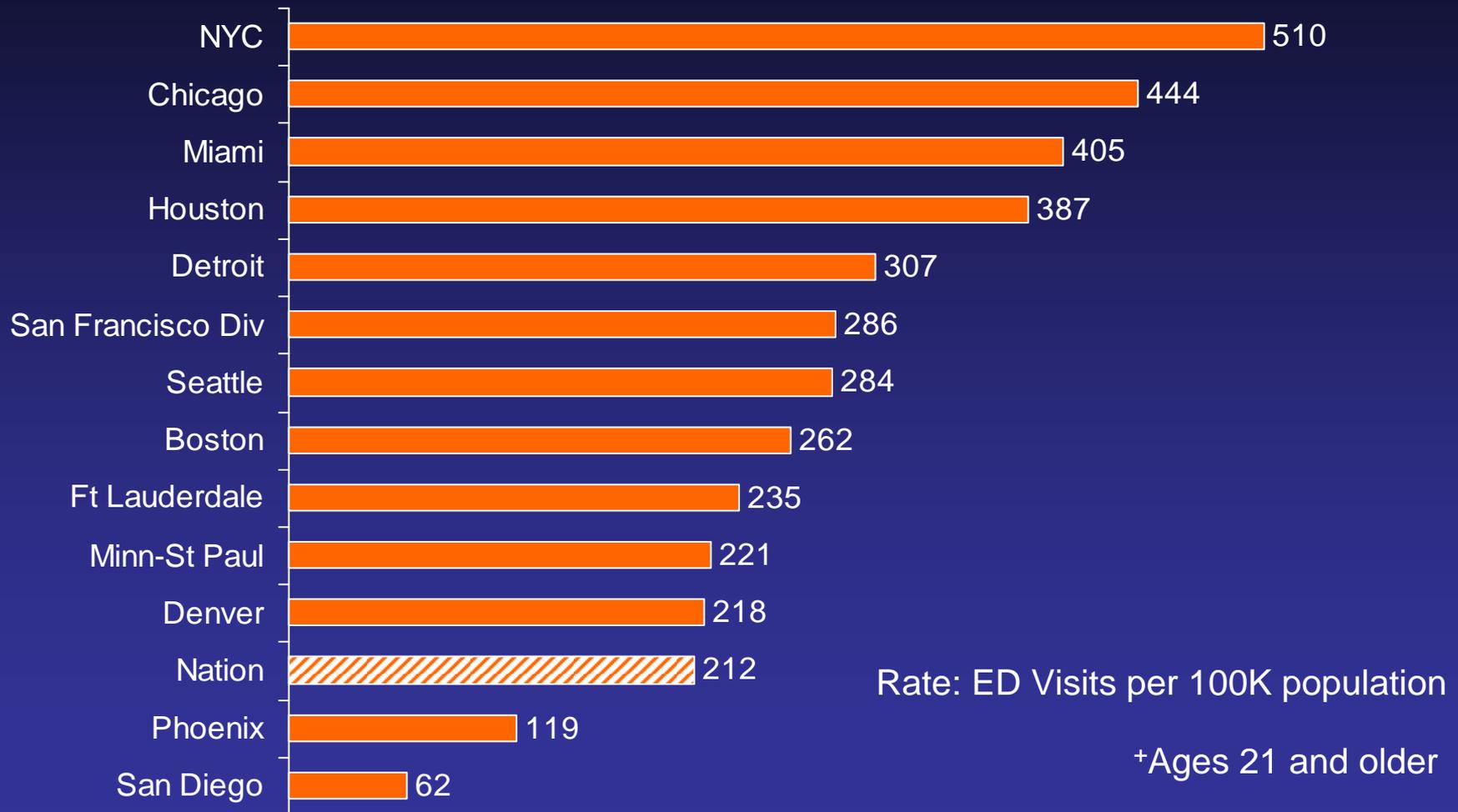
Rates of Cocaine-related ED Visits by Sex (all ages) – Selected Metro Areas, 2008

Rate: ED Visits per 100K population

- NYC: Male 588, Female 186
- Chicago: Male 429, Female 214
- Miami: Male 458, Female 176
- Detroit: Male 293, Female 163
- Boston: Male 383, Female 188
- Nation: Male 205, Female 114
- Phoenix: Male 122, Female 61
- San Diego: Male 62, Female 32

Legend: Male, Female

SAMHSA / CBHSQ

Rates of Cocaine-related ED Visits by Age Group – New York City, 2008

- 18 to 20: 105
- 21 to 24: 249
- 25 to 29: 433
- 30 to 34: 472
- 35 to 44: 933
- 45 to 54: 853
- 55 to 64: 207
- 65 and over: 16

Rate: ED Visits per 100K population

SAMHSA / CBHSQ
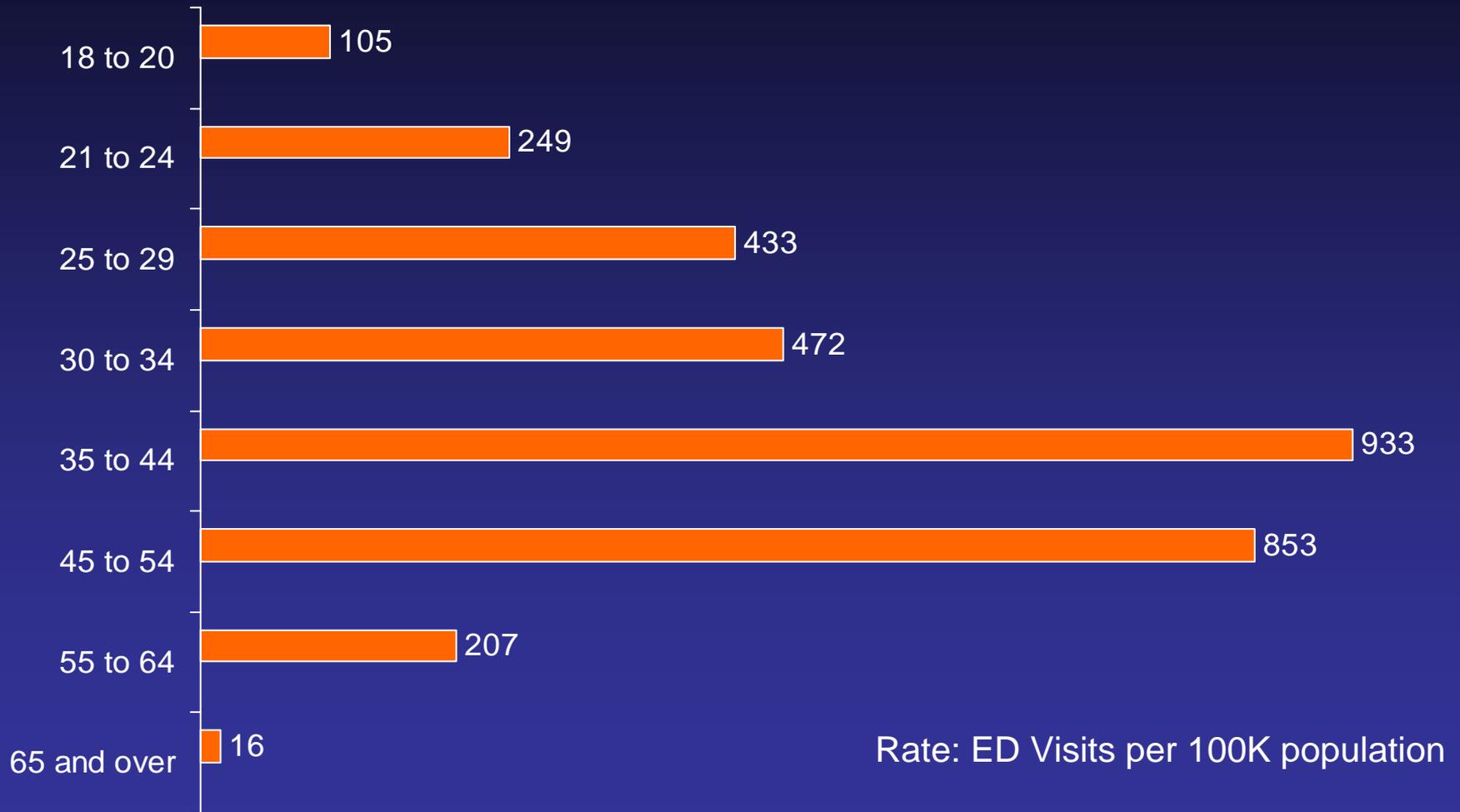
Rates of NMU Narcotic Pain Reliever ED Visits for Adults[+] by Metro Area – 2008
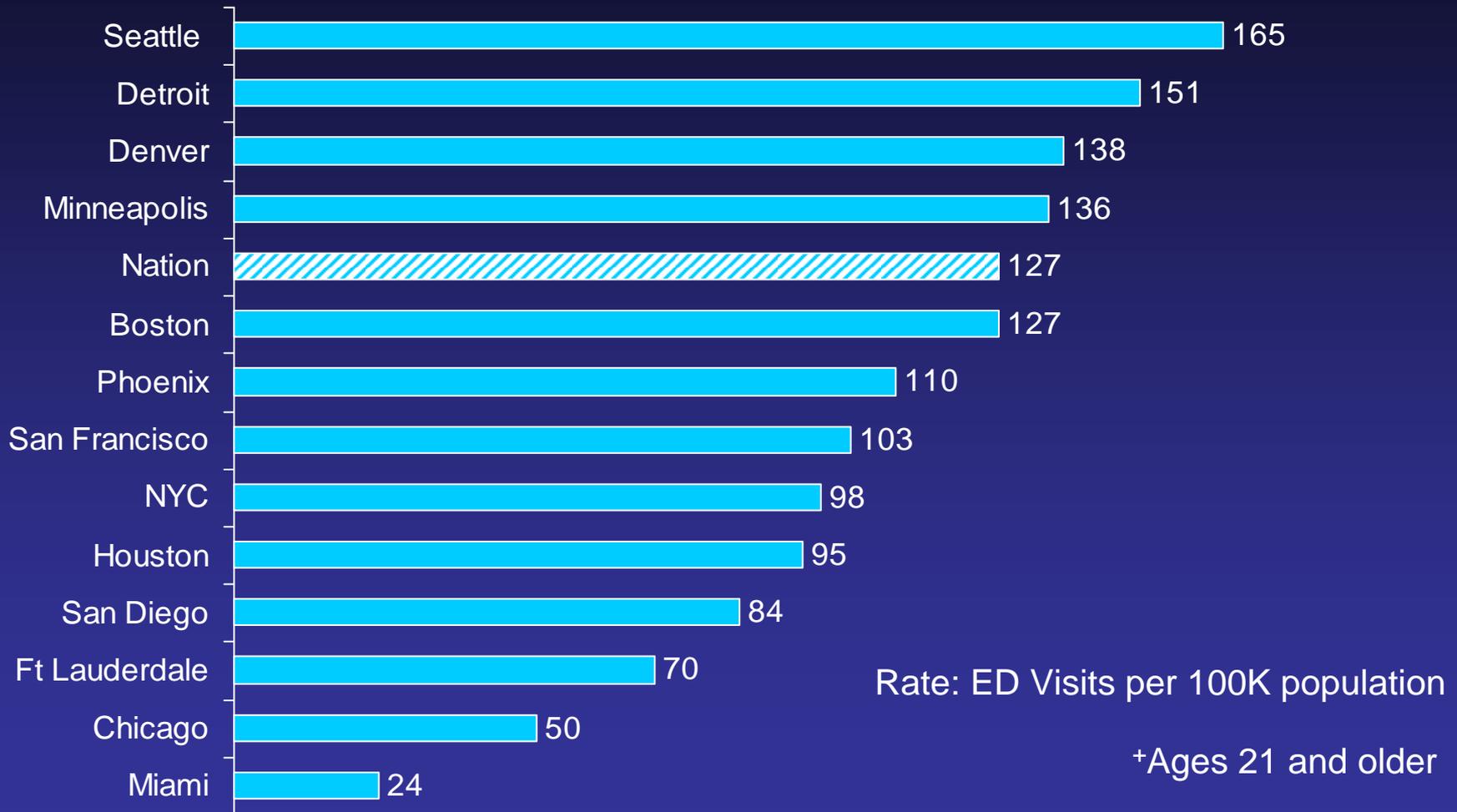
Metro Area	Rate
Seattle	165
Detroit	151
Denver	138
Minneapolis	136
Nation	127
Boston	127
Phoenix	110
San Francisco	103
NYC	98
Houston	95
San Diego	84
Ft Lauderdale	70
Chicago	50
Miami	24

Rate: ED Visits per 100K population

[+]Ages 21 and older

Rates of NMU Narcotic Pain Reliever ED Visits by Sex (all ages) – Selected Metro Areas, 2008

Metro Area	Male	Female
NYC	101	49
Chicago	40	37
Miami	20	19
Detroit	117	118
Boston	112	89
Nation	101	101
Phoenix	78	90
San Diego	59	65

Rate: ED Visits per 100K population

Rates of NMU Narcotic Pain Reliever ED Visits by Age Group – New York City, 2008

Age Group	Rate
18 to 20	40
21 to 24	42
25 to 29	89
30 to 34	82
35 to 44	139
45 to 54	167
55 to 64	82
65 and over	21

Rate: ED Visits per 100K population

Source: DAWN Estimates, 2009

SAMHSA / CBHSQ
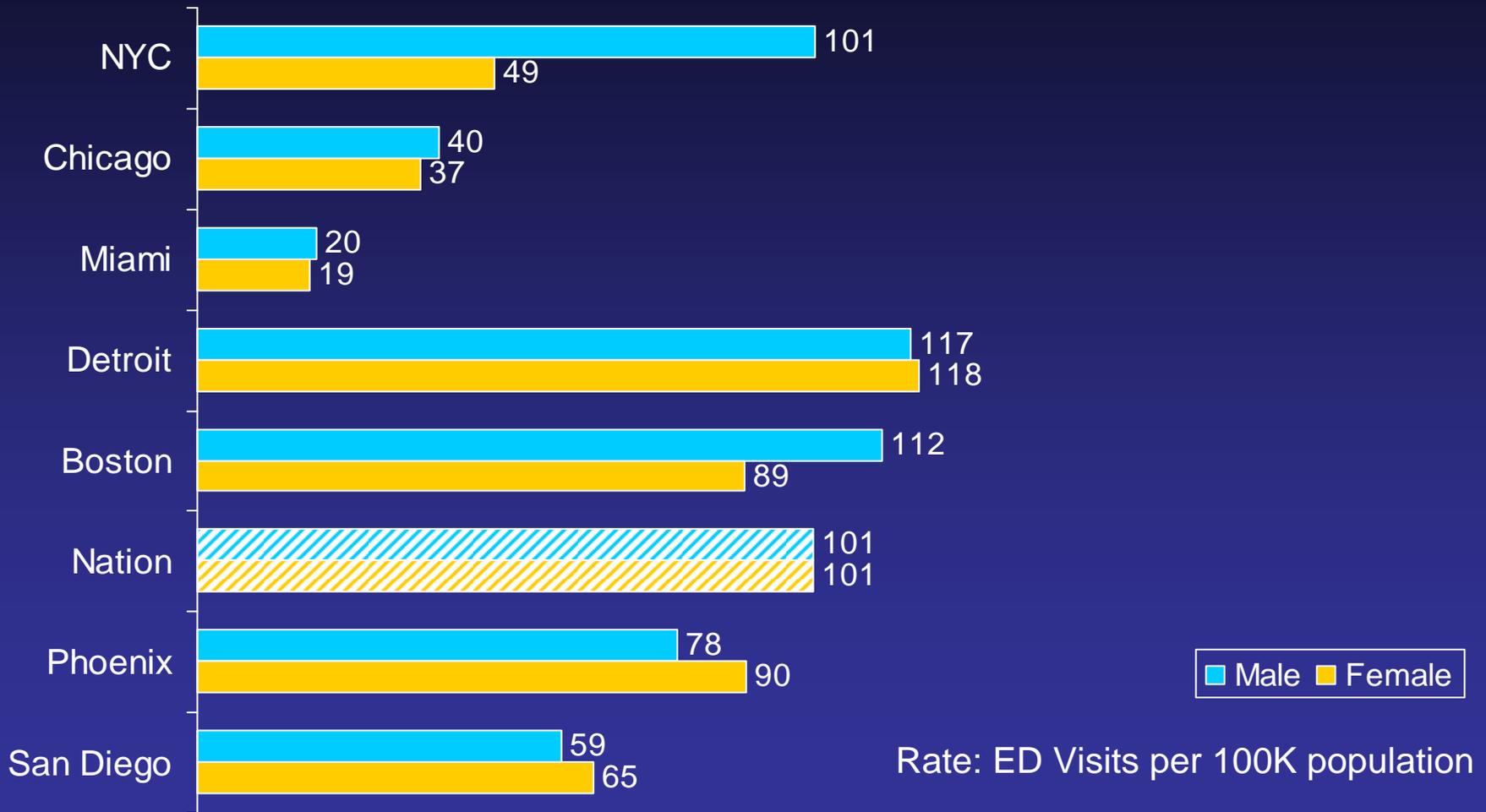
ED Visits involving Selected Illicits and NMU Pharmaceuticals, Adults+ – NYC, 2004 - 2008

Legend:
- – · Cocaine
- — Marijuana
- — Heroin
- – Narcotic Pain Relievers
- ··· Benzodiazepines

* Statis. significant difference from 2008

+Ages 21 and older

SAMHSA / CBHSQ
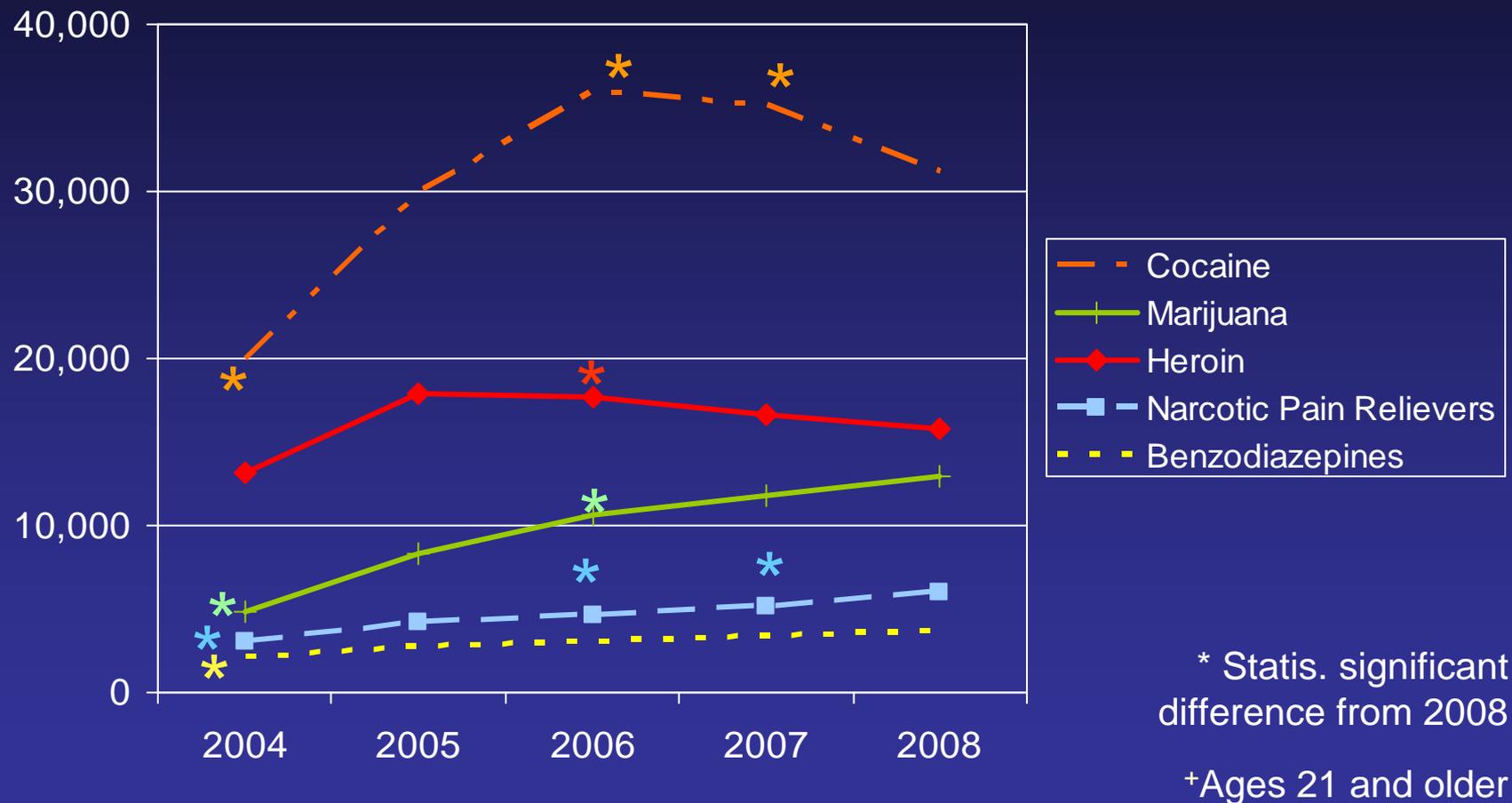
ED Visits involving Selected Illicits and NMU Pharmaceuticals, Adults⁺ – Detroit, 2004 - 2008

* Statis. significant difference from 2008

⁺Ages 21 and older

SAMHSA / CBHSQ
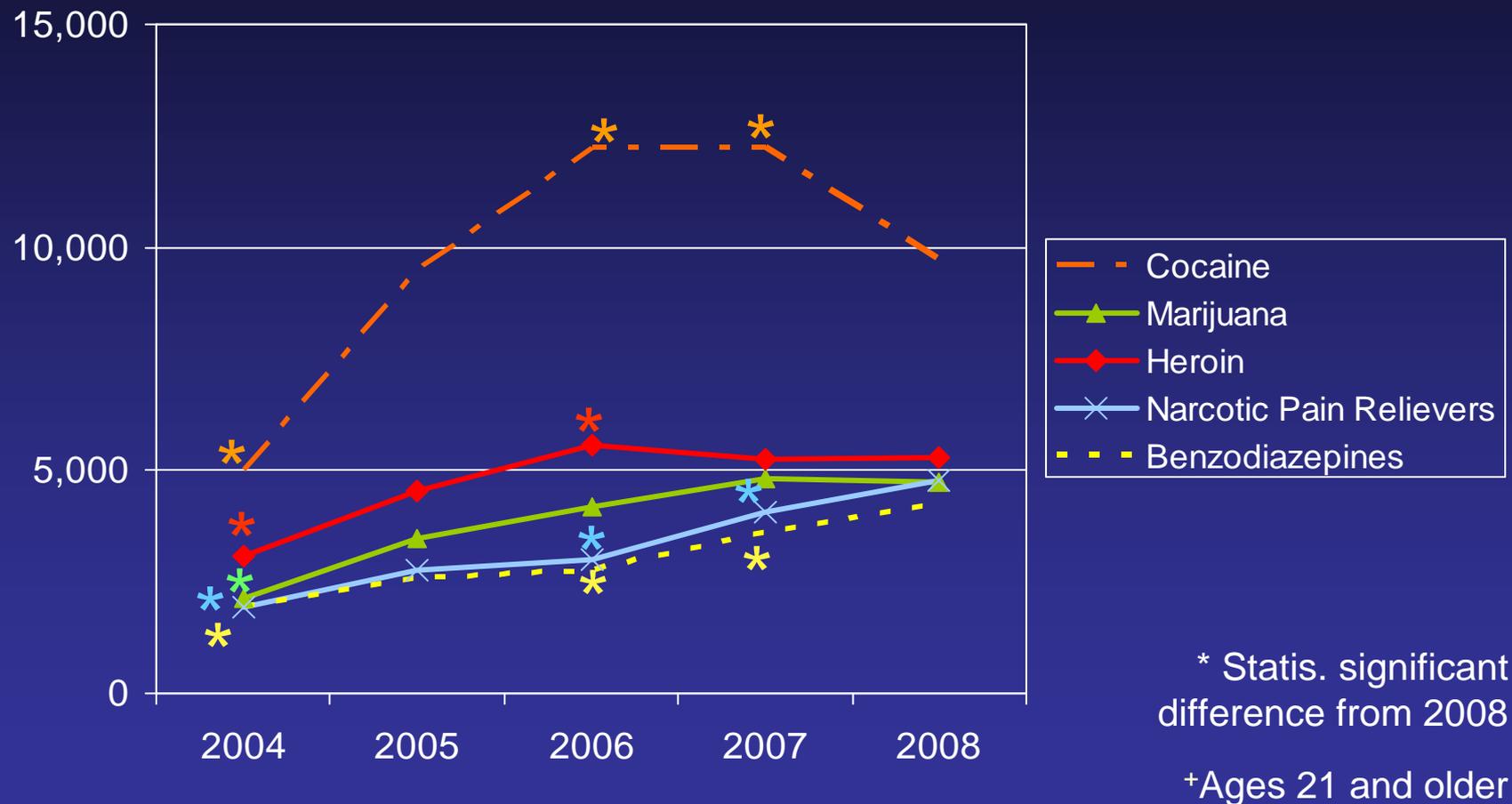
ED Visits involving Selected Illicits and NMU Pharmaceuticals, Adults+ – Phoenix, 2004 - 2008

Legend:
- Cocaine
- Marijuana
- Heroin
- Narcotic Pain Relievers
- Benzodiazepines

* Statis. significant difference from 2008

+Ages 21 and older

Source: DAWN Estimates, 2009

SAMHSA / CBHSQ
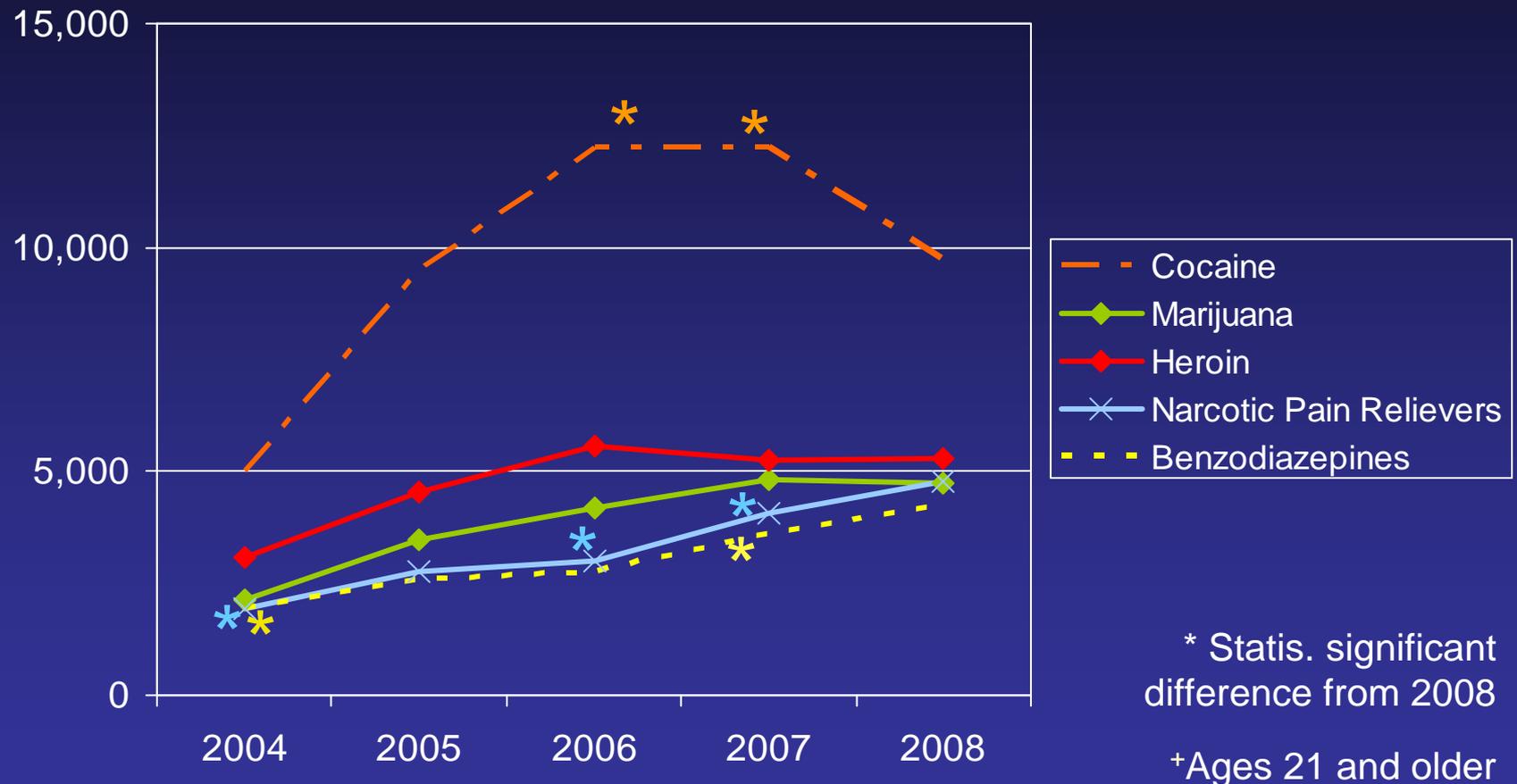
ED Visit Rates for Cocaine and for NMU Narcotic Pain Relievers for Adults[+] – Miami and Fort Lauderdale, 2008

Miami
405
24

Ft Lauderdale
235
70.2

Cocaine Narcotic pain relievers

Rate: ED Visits per 100K population

[+]Ages 21 and older

Source: DAWN Estimates, 2009
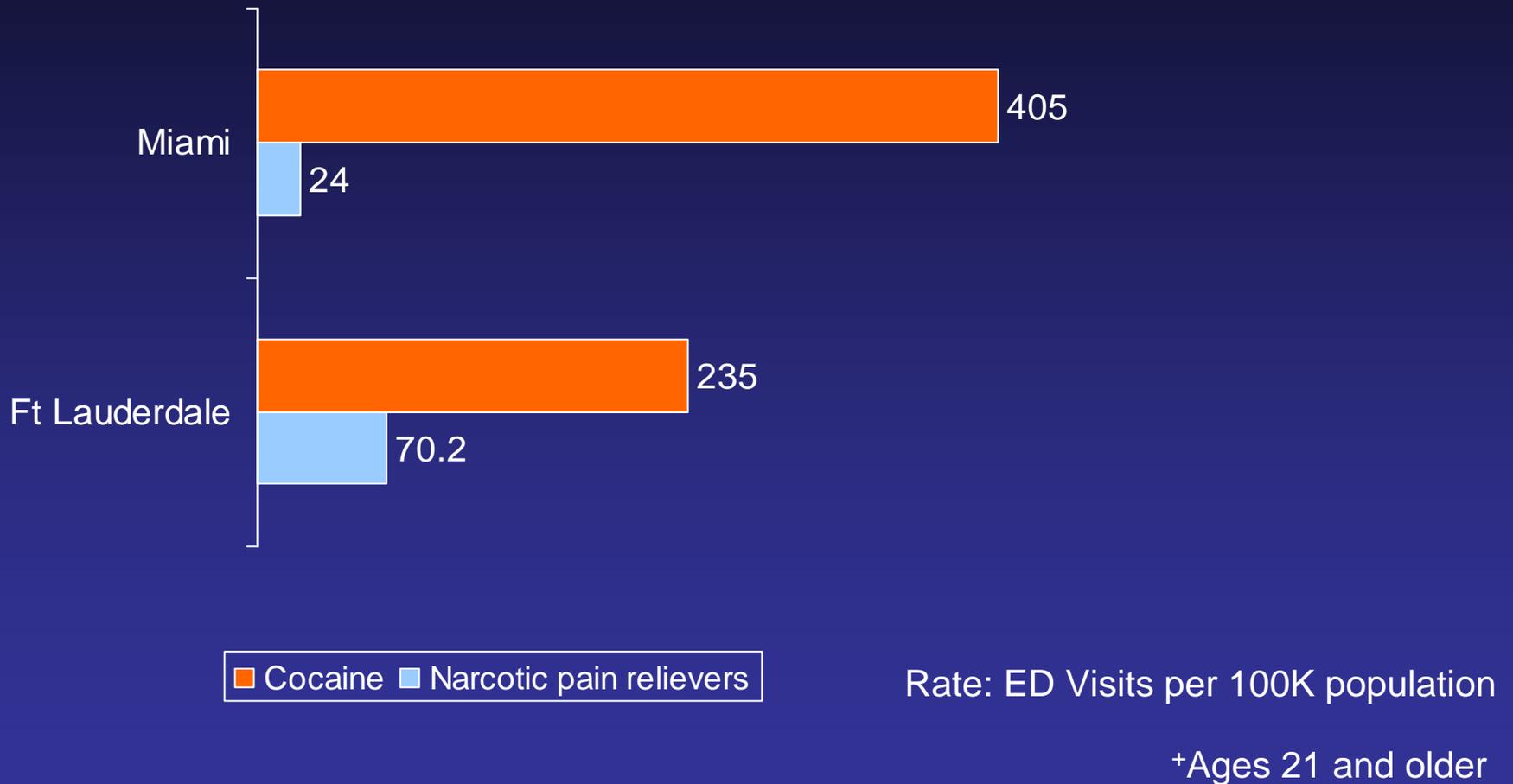
Summary

- Nationally, cocaine, heroin, marijuana stable from 2004-2008

- Cocaine had overall increase from 2004 to 2008 in selected metros, but it has also decreased since 2006 in those areas

- Narcotic pain relievers, benzodiazepines increasing nationally and for the selected metropolitan areas

Summary, cont.

National rates are just that—national. There is variation between the metropolitan areas

- – Rates of cocaine ED visits for adults ranged from 62 per 100,000 pop. in San Diego to 510 per 100,000 in NYC
- – Rates of NMU narcotic pain reliever visits ranged from 24 per 100k pop. in Miami to 165 per 100k in Seattle

Summary, cont.

- Cocaine is still the leading drug in misuse/abuse ED visits for adults
- Emergence of nonmedical use of pharmaceuticals at both the national level and for the selected metropolitan areas
  - NMU pharmaceuticals account for half of the misuse/abuse ED visits among adults nationally
  - In selected metros, narcotic pain relievers and benzos are catching up with heroin and marijuana
- For NMU narcotic pain relievers and benzos, rates are similar for males and females—unlike what we're used to seeing for the major illicit drugs

DAWN

DRUG ABUSE WARNING NETWORK

Home
About DAWN
Publications
Detailed Tables
- **National**
- **Metro Areas**

Collecting the Data
Joining DAWN
- **Emergency Departments**
- **Medical Examiners**

PRINT PAGE

File Types:
Use **Adobe Acrobat Reader** to view PDFs

Detailed Tables: Metropolitan Area Estimates, Drug-Related Emergency Department Visits for 2004–2008

Select a metro area and an analytic category for emergency department tables.

Select a metro area:

- ○ Boston
- ○ Chicago
- ○ Denver
- ○ Detroit

- ○ Houston
- ○ Miami-Dade
- ○ Miami-Fort Lauderdale

- ○ Minneapolis
- ○ New York-5 Boroughs
- ○ Phoenix

- ○ San Diego
- ○ San Francisco
- ○ Seattle

Select an analytic category:

- ○ All Misuse and Abuse
- ○ Illicits (excluding alcohol)
- ○ Nonmedical Use of Pharmaceuticals
- ○ All Alcohol
- ○ Underage Drinking

- ○ Suicide Attempts
- ○ Seeking Detox
- ○ Adverse Reactions
- ○ Accidental Ingestions
- ○ All Visits

Drug Abuse Warning Network

DAWNinfo.samhsa.gov

Advantages & Disadvantages of Drug Testing in Alternative Matrices

Marilyn A. Huestis, Ph.D.
Chief, Chemistry & Drug Metabolism, IRP
National Institute on Drug Abuse
National Institutes of Health

OJP Offender Drug Abuse Monitoring Program
BJS-NIJ Expert Topic Meeting II
Washington, DC August 5, 2010

NIDA NATIONAL INSTITUTE ON DRUG ABUSE

Chemistry & Drug Metabolism

◆ Employ chemical & toxicological tools to address human drug abuse

◆ Our clinical research focuses on behavioral & physiological toxicities of drug use

◆ Identify & quantify biomarkers of drug use in complex biological matrices

◆ Correlate with drug's pharmacodynamic effects

◆ Provide framework for understanding mechanisms of drug action & toxicity, & for interpreting drug test results in individuals

Drug Effects & Detection Times

Intoxication
Impairment
Under Influence
Blood
Oral Fluid
Urine
Sweat

Hair

Minutes   Hours   Days   Weeks   Months   Years
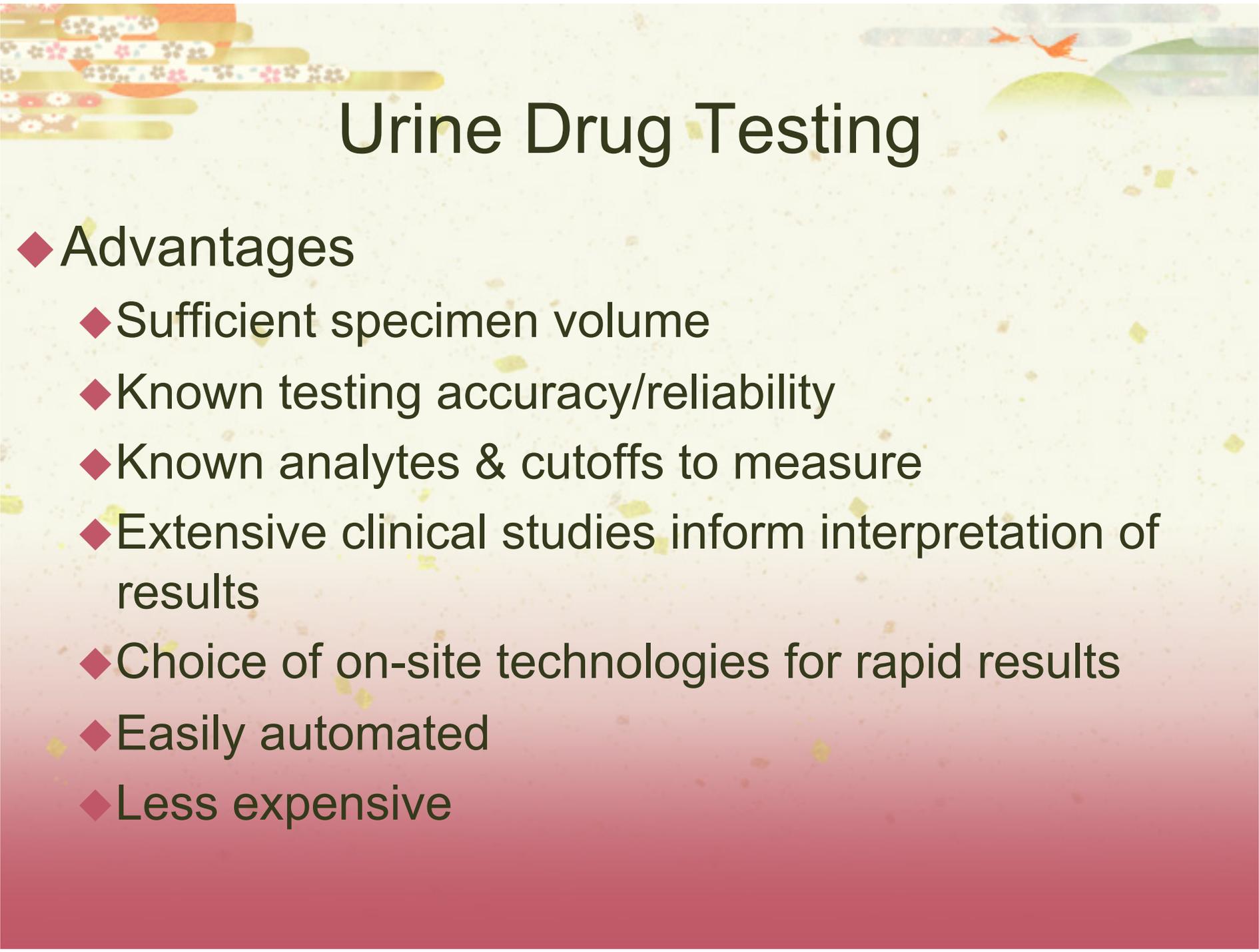
Urine Drug Testing

◆Advantages

  ◆Sufficient specimen volume

  ◆Known testing accuracy/reliability

  ◆Known analytes & cutoffs to measure

  ◆Extensive clinical studies inform interpretation of results

  ◆Choice of on-site technologies for rapid results

  ◆Easily automated

  ◆Less expensive

Urine Drug Testing

- Disadvantages
  - Collection difficult
    - Same gender collection
    - Considered invasion of privacy
    - Donors may be unable to provide specimen (Shy bladder)
  - Ease of adulteration & dilution with chemicals or simply excess water
  - Measure of exposure only
  - Not correlated with pharmacodynamic effects
  - Difficult to differentiate new drug exposure from residual drug excretion
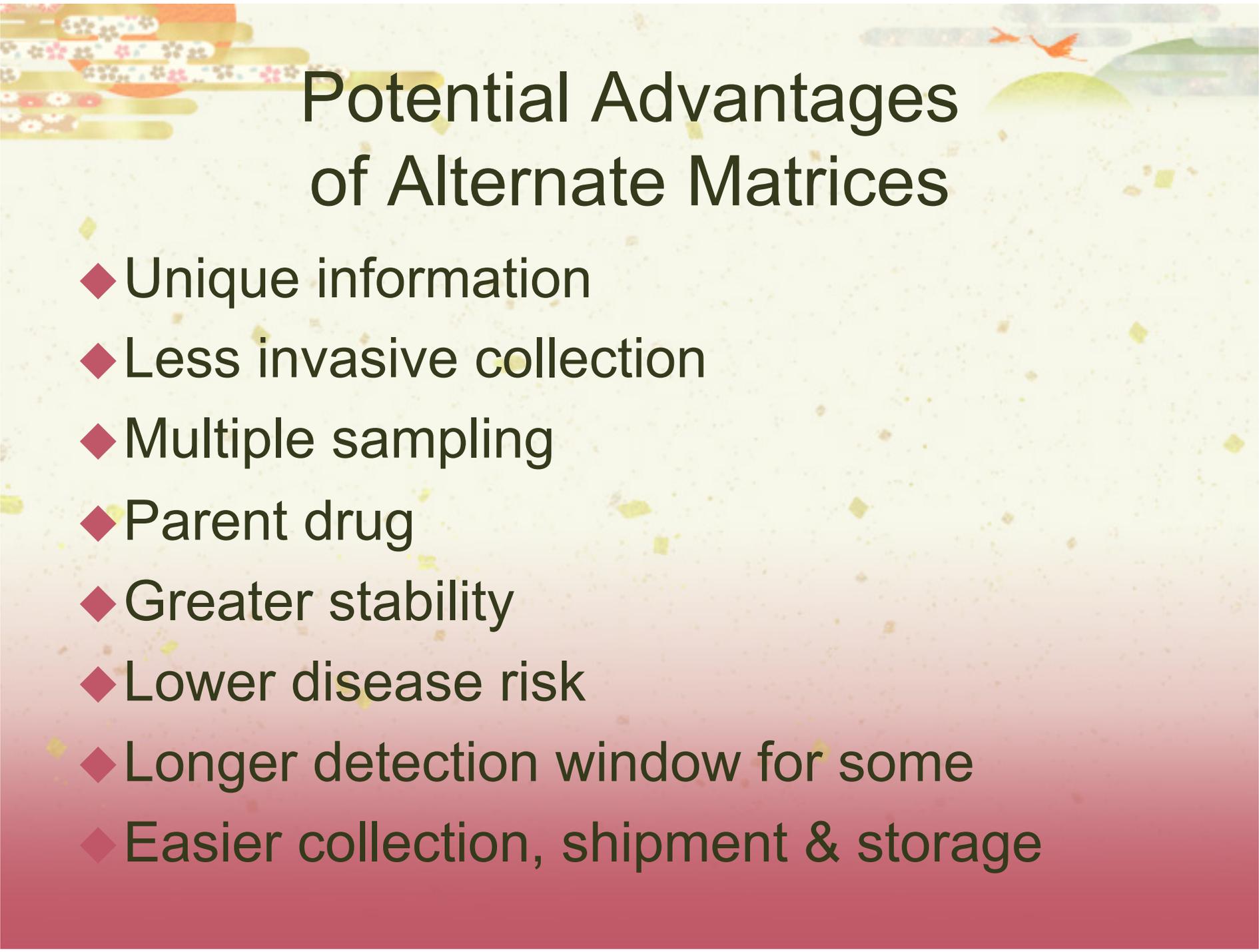
Potential Advantages
of Alternate Matrices

◆ Unique information

◆ Less invasive collection

◆ Multiple sampling

◆ Parent drug

◆ Greater stability

◆ Lower disease risk

◆ Longer detection window for some

◆ Easier collection, shipment & storage

Oral Fluid (Saliva)

Mean Plasma Methamphetamine & Amphetamine After Single Oral 10 or 20 mg Methamphetamine Dose (N = 5)
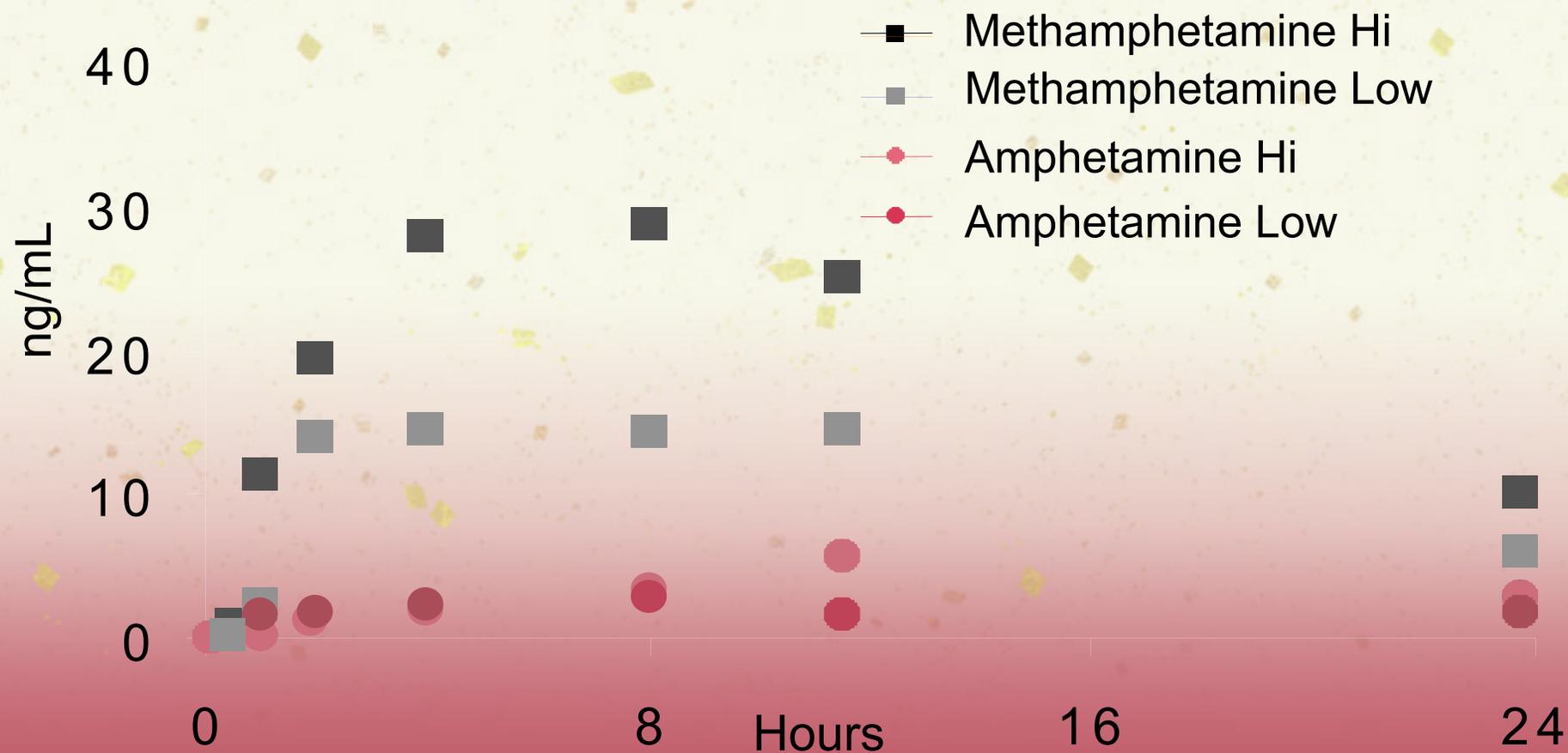
Mean Oral Fluid Methamphetamine & Amphetamine After Oral 10 or 20 mg Methamphetamine Dose (N = 5)
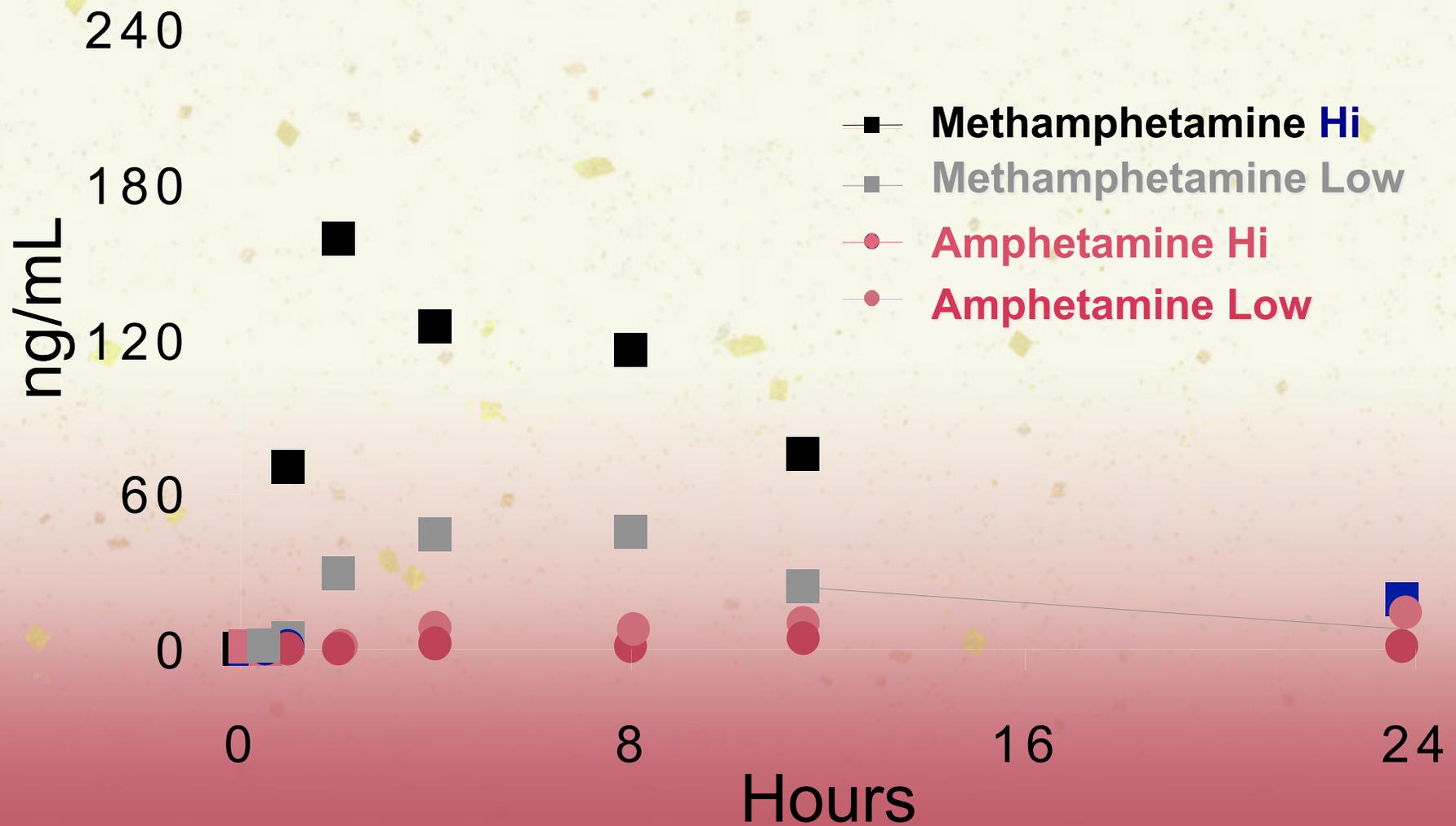
Methamphetamine Cmax in Oral Fluid & Plasma
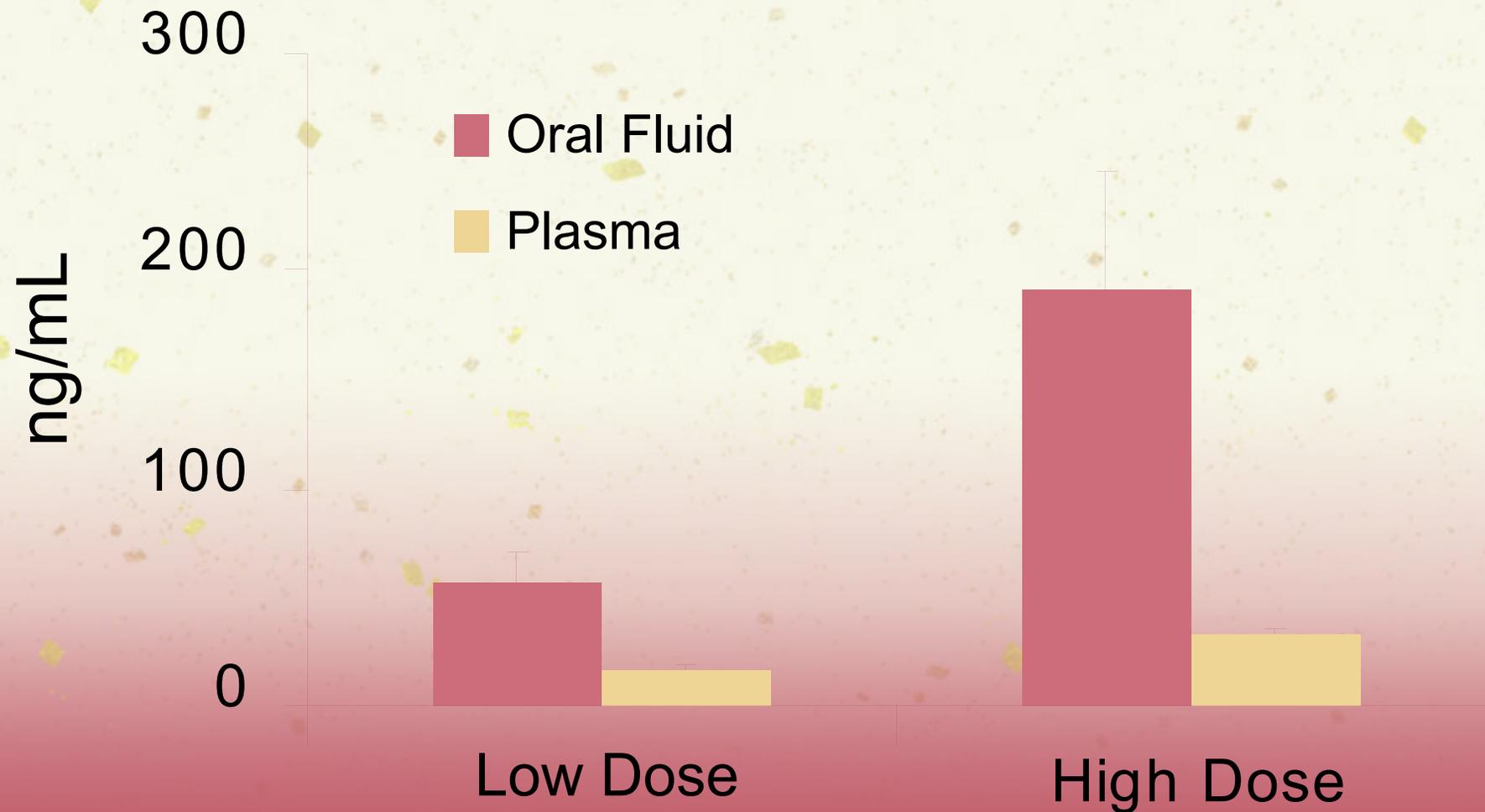
Methamphetamine Detection Times in Oral Fluid & Urine After 10 & 20 mg MAMP

■ Oral fluid (cutoffs 50 Meth/2.5 Amp)

□ Urine (cutoffs 500Meth/200 Amp)
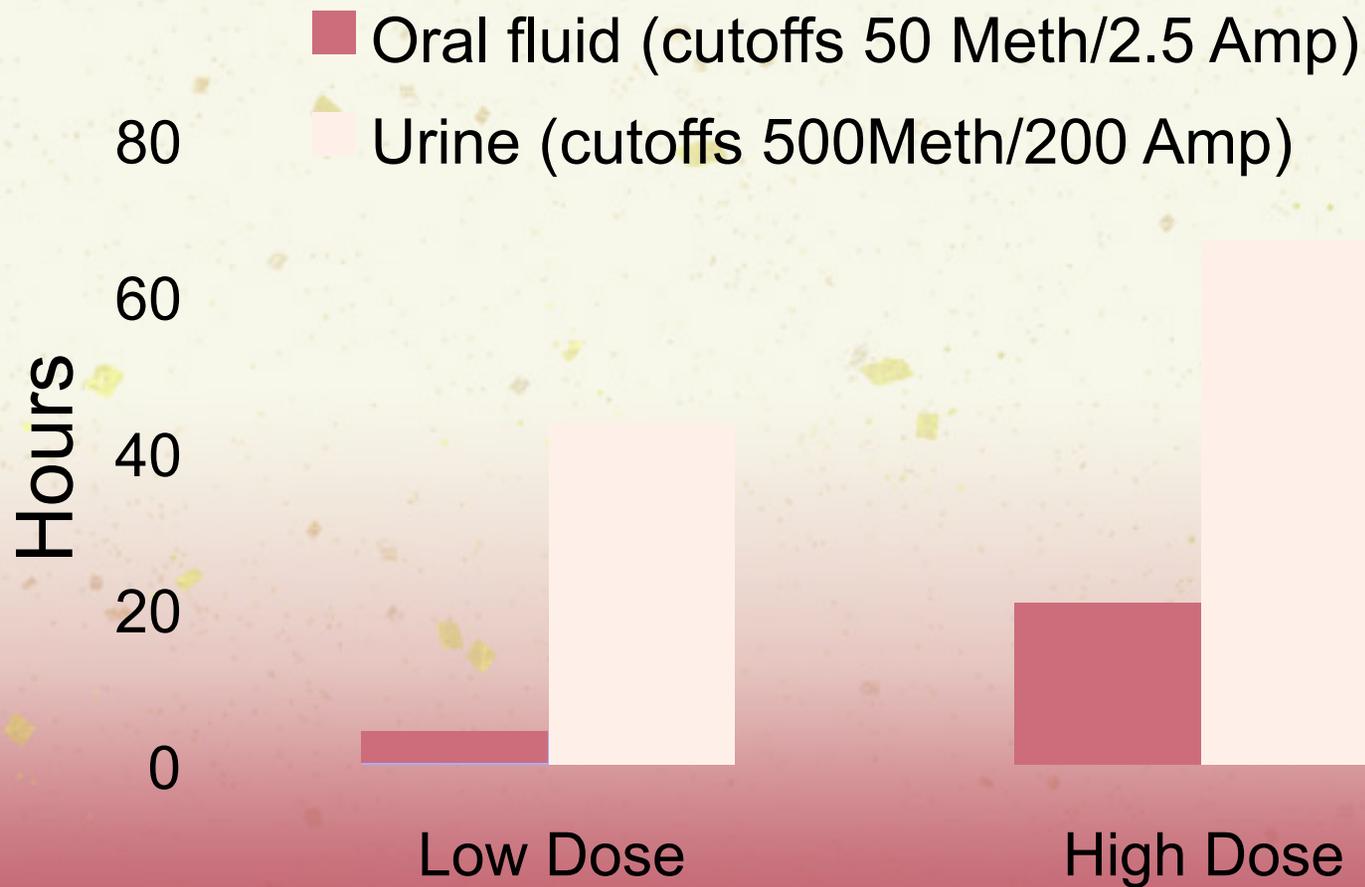
Cocaine
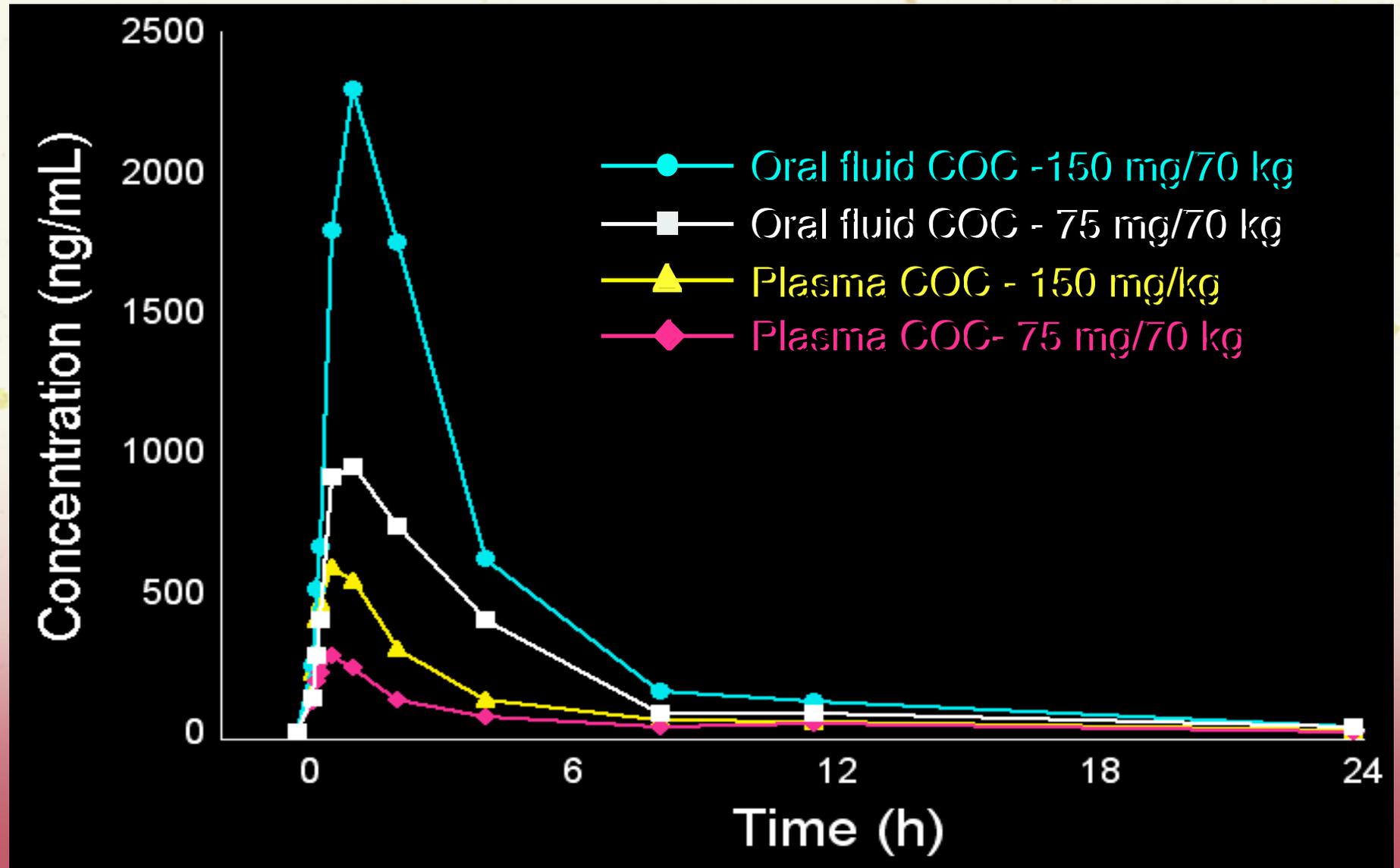
Benzoylecgonine
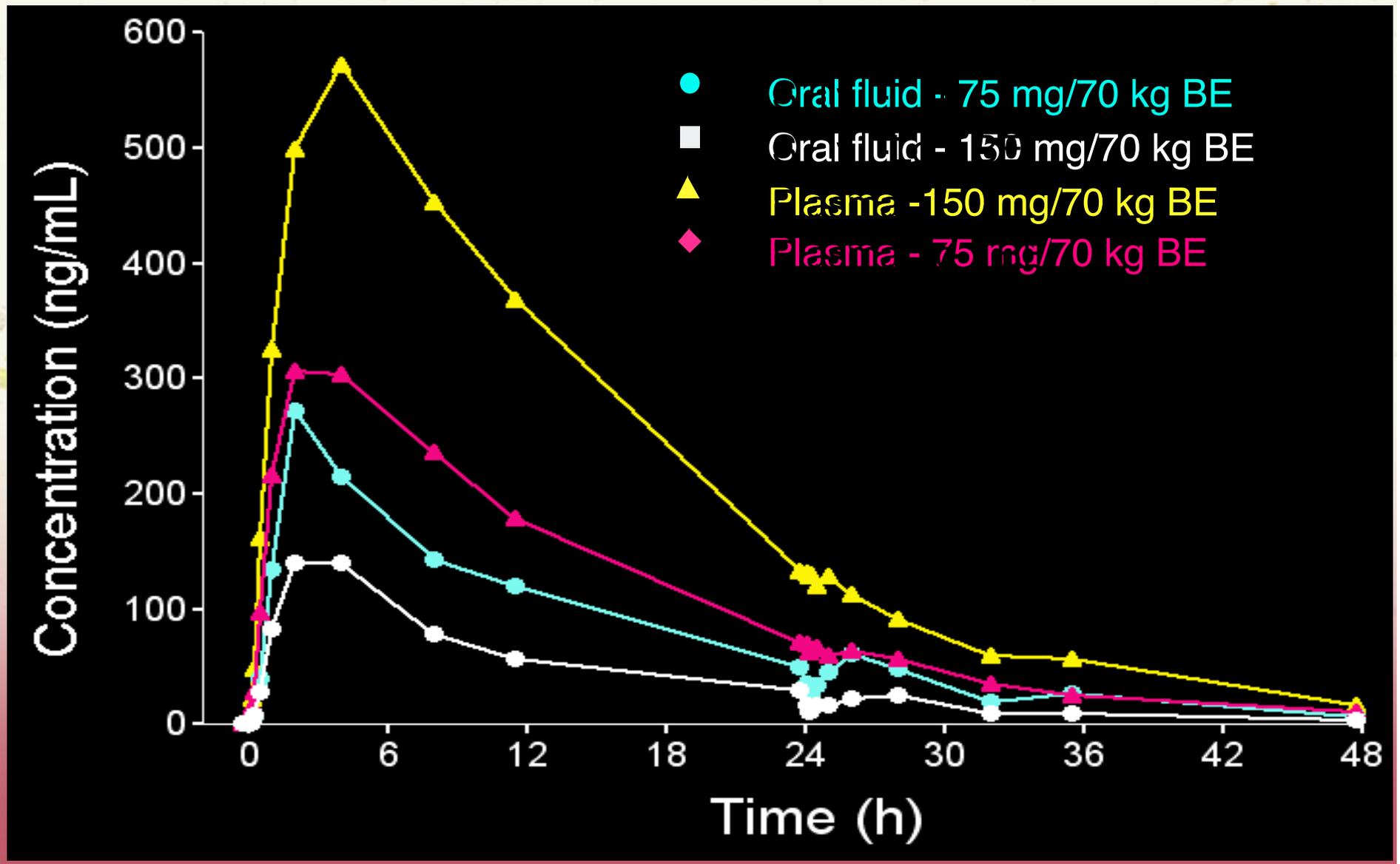
Controlled Codeine Administration
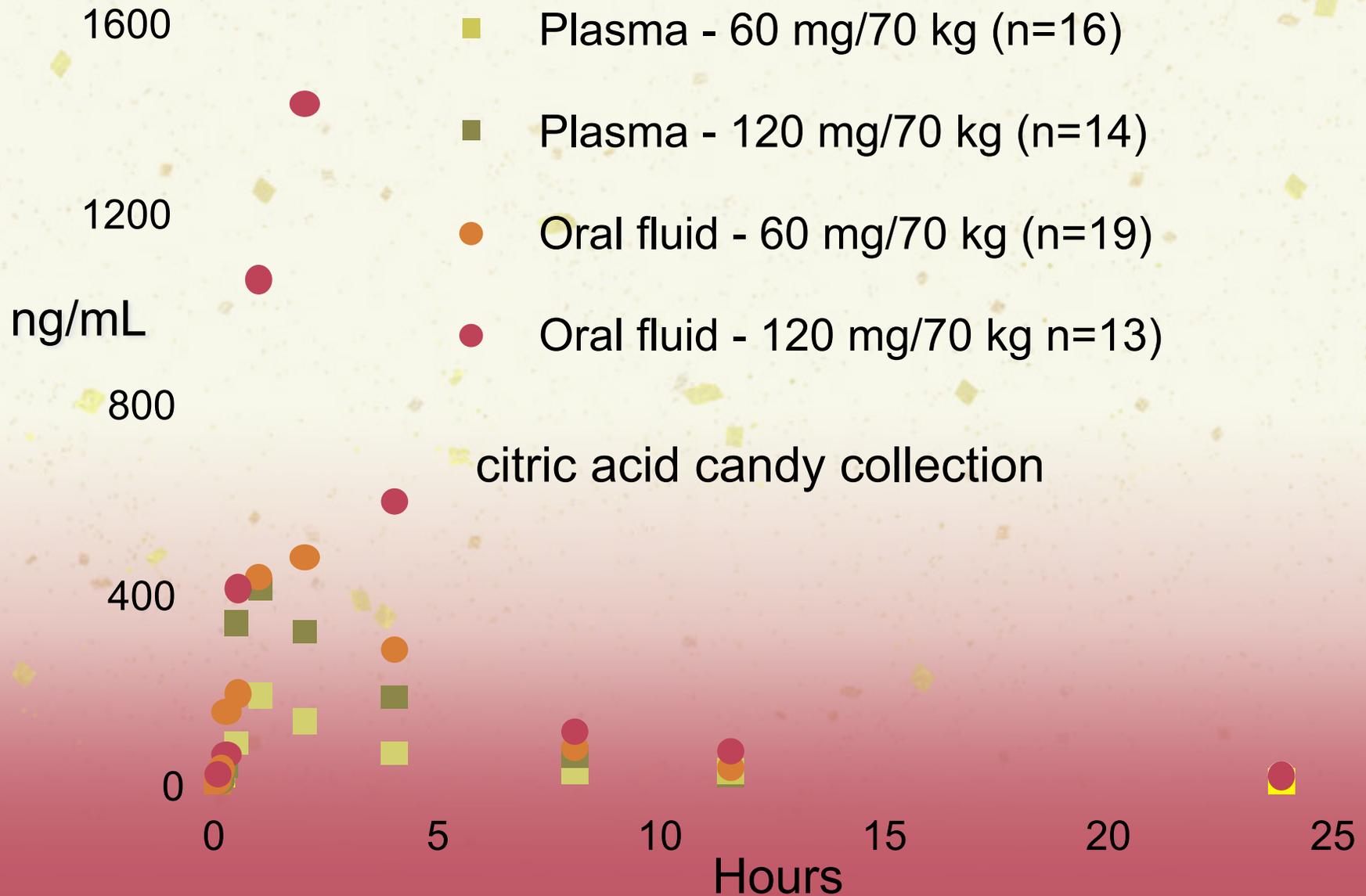
Opiates

- Presley et al FSI 2003
  - Tested 77,218 workplace oral fluid specimens
  - 66.7% of opiate positive tests positive for 6AM
  - 6AM stabilized in acidic pH oral fluid
  - Mean morphine 755 ± 201 ng/mL, 6AM 416 ± 148 ng/mL, codeine 196 ± 36 ng/mL
- Finding heroin, 6AM, &/or acetylcodeine identifies heroin usage
- Rohrig & Moore JAT 2003
  - Eating poppy seeds & morphine-containing foodstuffs produced positive oral fluid morphine at 40 ng/mL for ~ 1 h

Oral Fluid & Plasma THC & Urine THCCOOH After Smoking a 3.55 % THC Cigarette
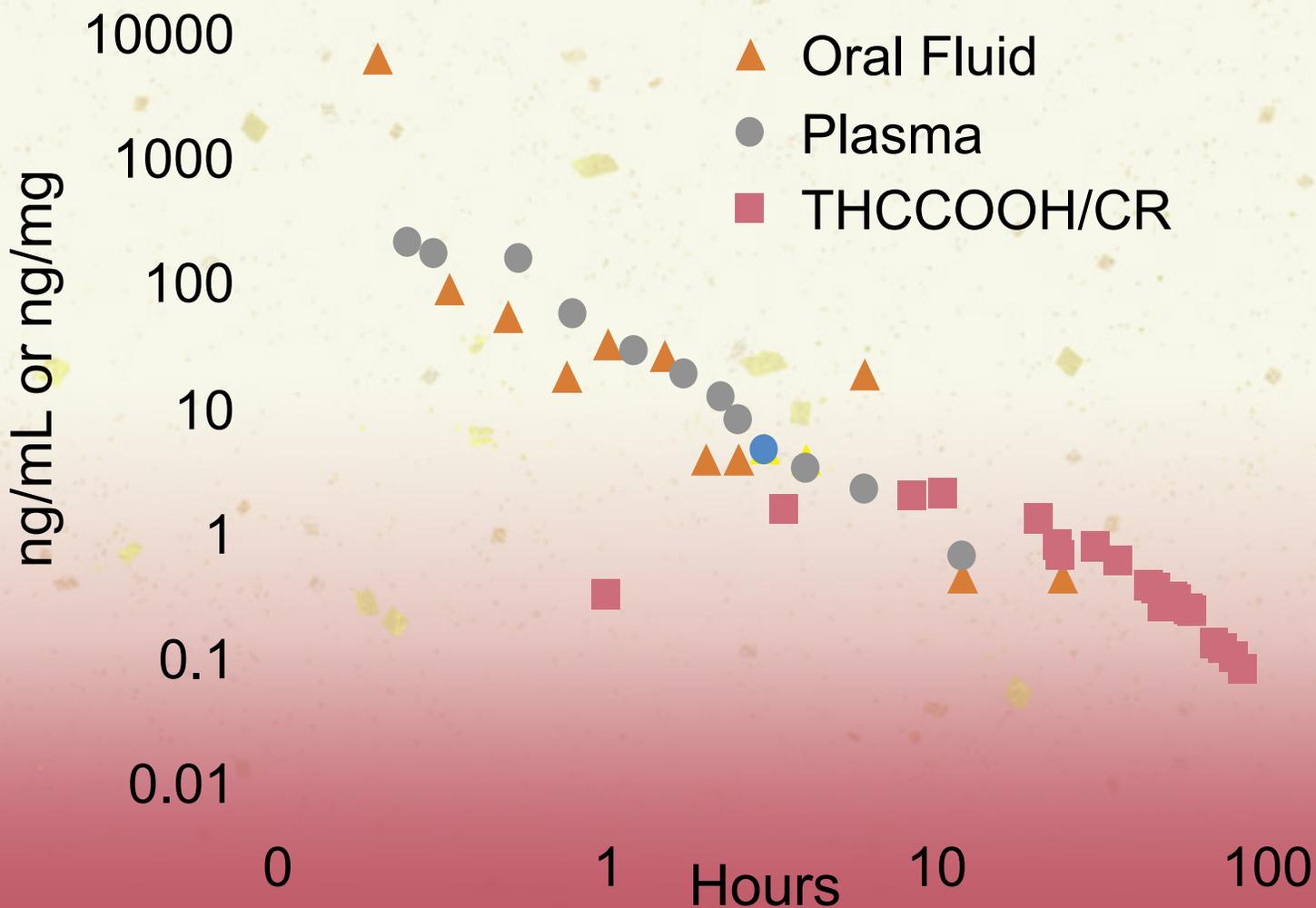
Oral Fluid Testing

◆ Strengths:

  ◆ Observed, non-invasive collection

  ◆ More difficult to adulterate

  ◆ Gender neutral specimen collection

  ◆ Basic drugs concentrate in lower pH of oral fluid as compared to blood

  ◆ May correlate with plasma concentrations

  ◆ Reflects more recent drug use (cutoff dependent)

  ◆ On-site technology being developed

Oral Fluid Testing

- Limitations:
  - Specimen volume
    - Generally low, especially after stimulant use
    - Many devices have Unknown volume collected
  - Drug adsorption to collection device
  - Elution buffer
    - Differential drug recovery
    - Dilutes oral fluid reducing sensitivity
    - May interfere with LCMS techniques
  - Potential for passive contamination from smoked & oral drugs

Sweat Testing

Cocaine Secretion
in PharmChek Sweat Patches

N = 7

ng/patch
± SEM

cutoff ▶

180
160
140
120
100
80
60
40
20
0

No drug
detected

No drug
detected

No drug
detected

| 0-6 | 6-13 | 13-20 | 20-28 | 28-34 | 34-42 | 42-48 | 48-55 | 55-62 | 62-68 |

Days

75 mg/70 kg COC HCl

150 mg/70 kg COC HCl
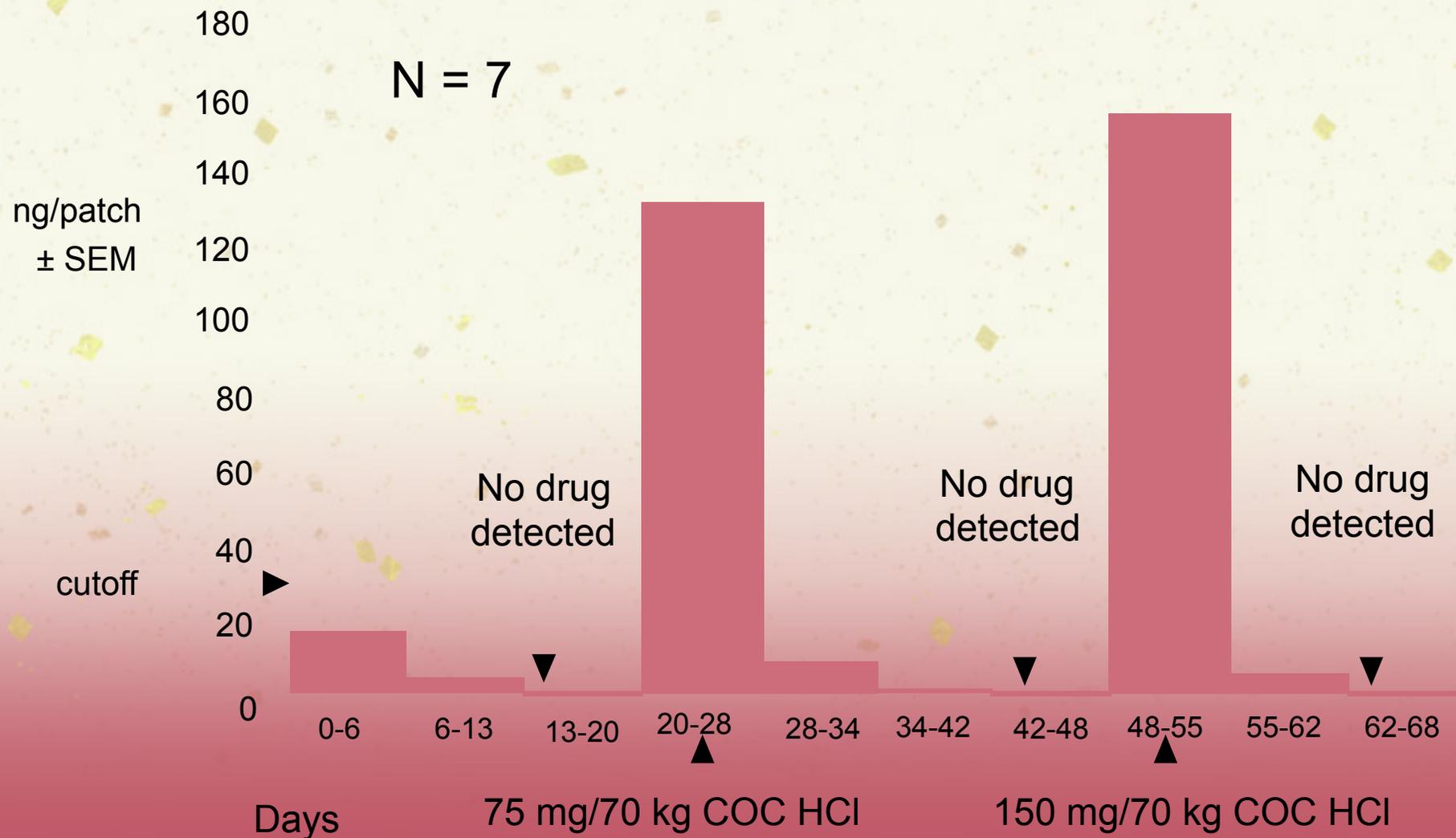
Variable Cocaine Concentrations in Sweat
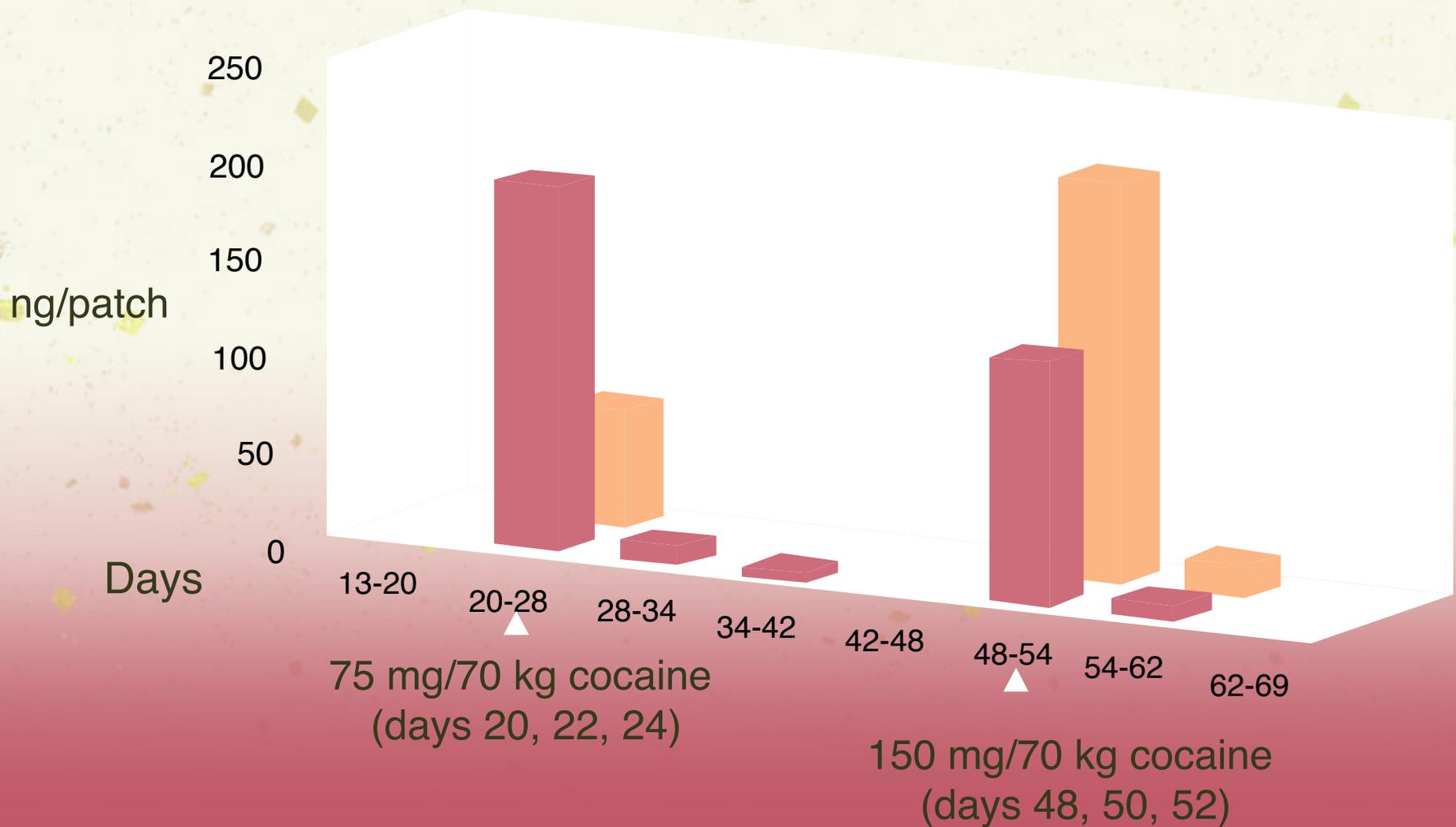
78% Opiate Positive Sweat Patches After Heroin Self-Administration Positive for Heroin &/or 6-AM

Heroin (H)
6-Acetylmorphine (6-AM)
Morphine (M)
Codeine (C)

N = 369
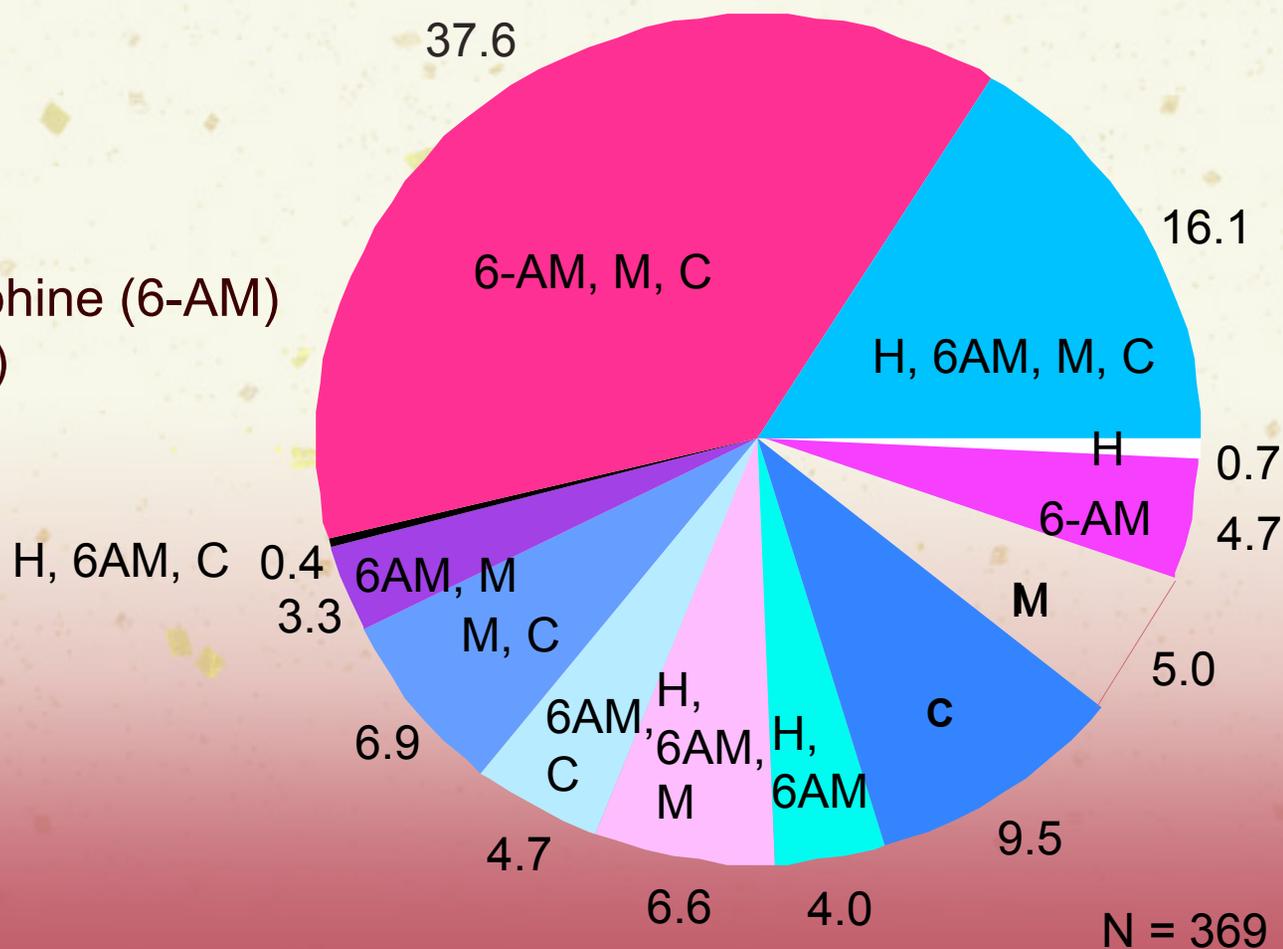
Cannabinoids in Sweat

◆ Sweat

　　◆ THC present at low ng/patch concentrations

　　◆ Extraction efficiency low from patch

　　◆ Unknown drug reabsorption through skin

　　◆ Almost no controlled drug administration data

　　　　◆ After oral 14.8 mg THC per day for 5 days, no positive sweat patches
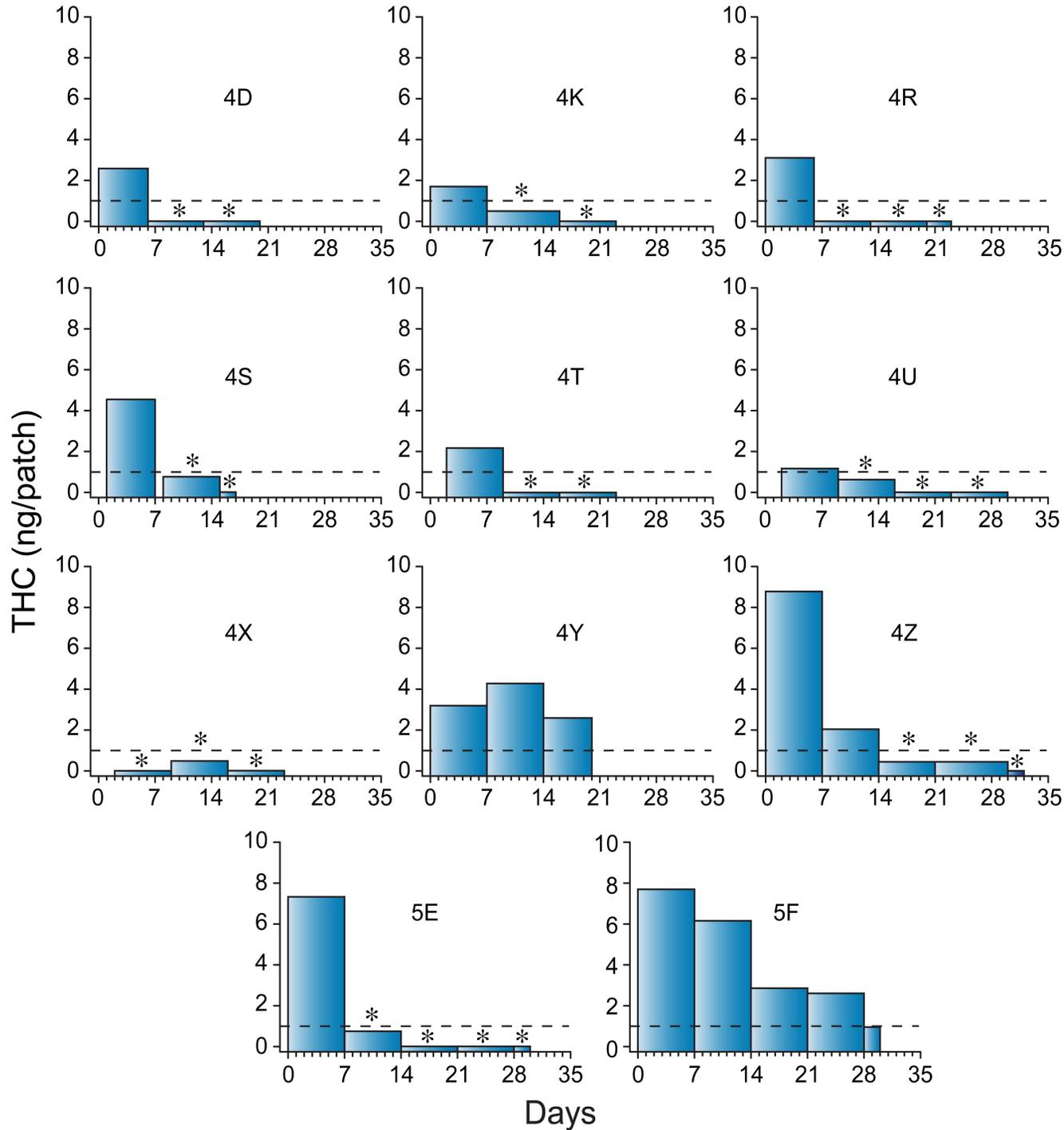
THC sweat excretion in 11 heavy cannabis users during abstinence with 24 h monitoring

Dashed line indicates 1.0 ng/patch cutoff proposed by SAMHSA

* Negative sweat patch at LOQ of 0.4 ng/patch.

Sweat Testing

◆ Advantages

   ◆ Convenient & less invasive method for monitoring drug use

   ◆ Window of detection ≥ urine testing (dependent upon drug class)

   ◆ Cumulative measure of exposure

   ◆ Presence of parent drug (heroin, 6AM)

   ◆ Difficult to adulterate specimen
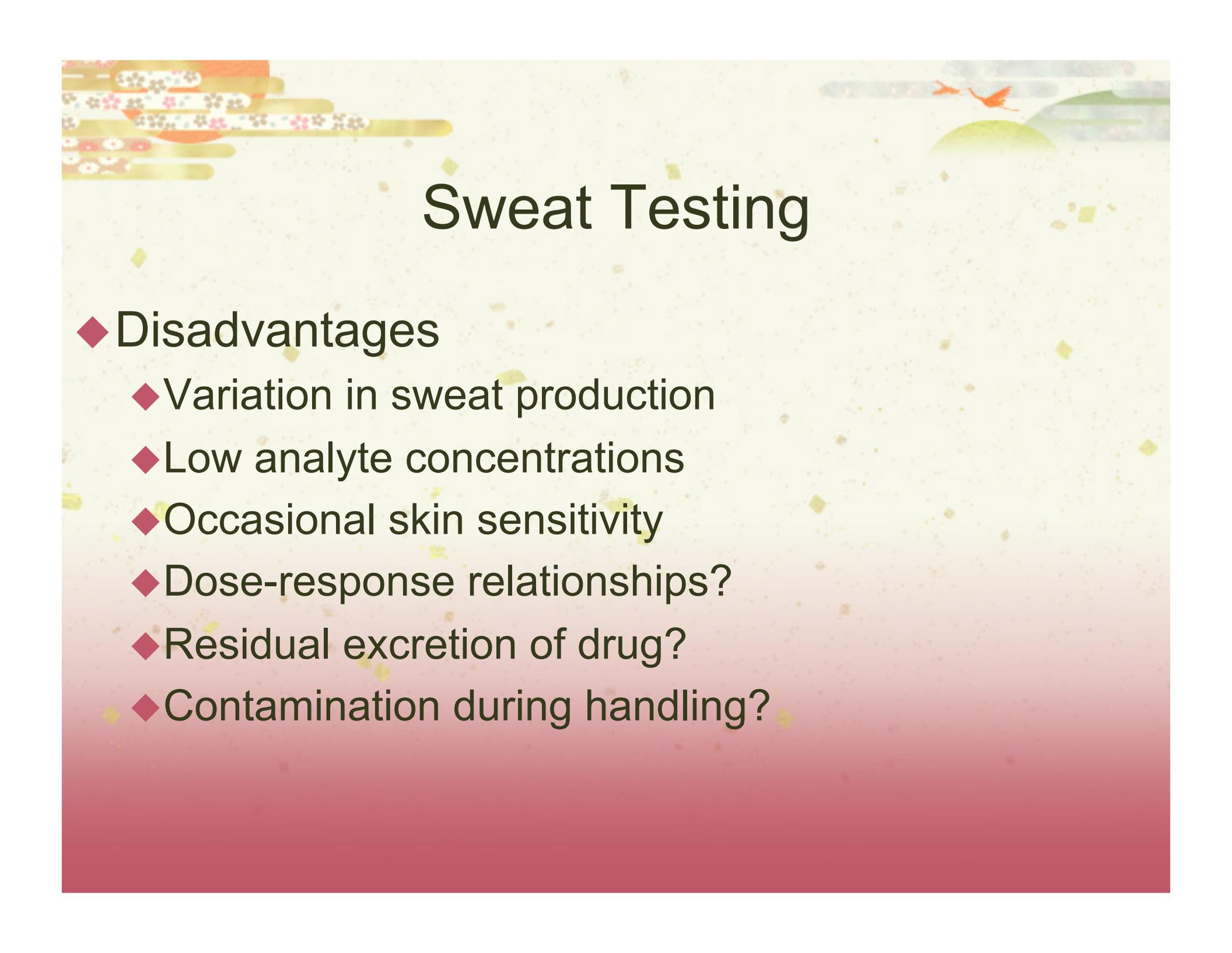
Sweat Testing

◆ Disadvantages

  ◆ Variation in sweat production

  ◆ Low analyte concentrations

  ◆ Occasional skin sensitivity

  ◆ Dose-response relationships?

  ◆ Residual excretion of drug?

  ◆ Contamination during handling?

Hair
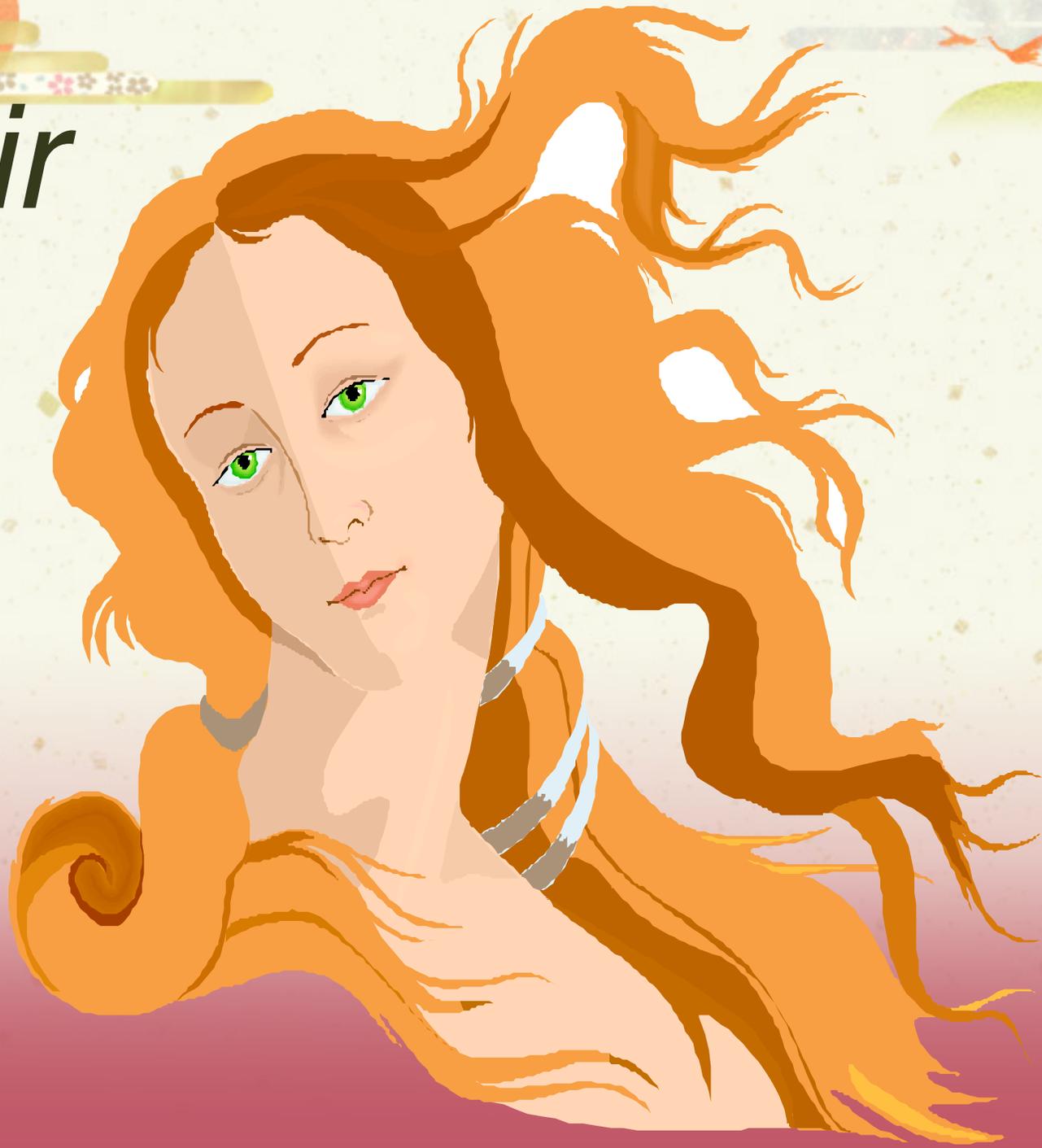
Multiple Sources of Drugs in Hair

External contamination
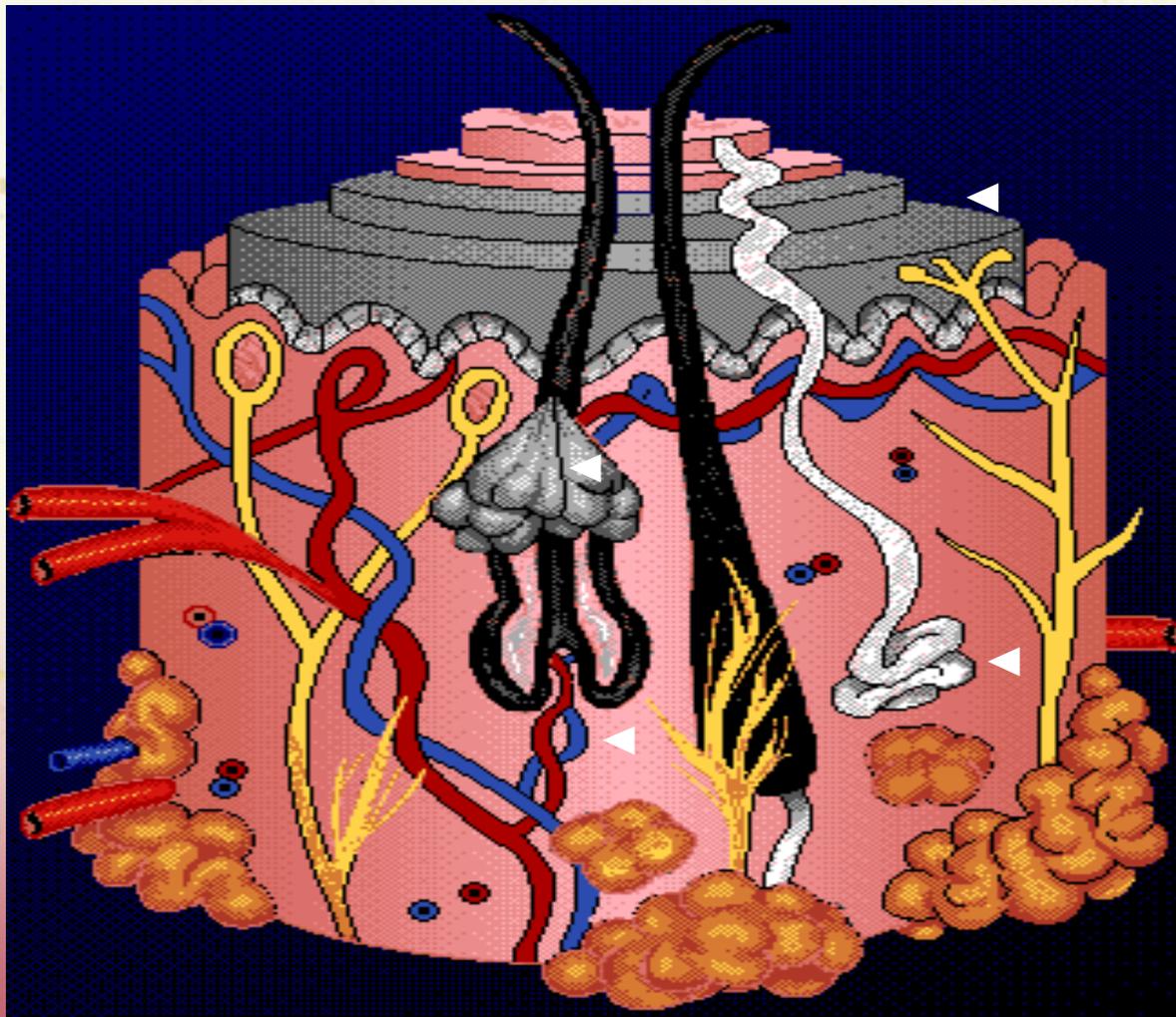
Skin

Sebum

Sweat
Blood

Unanswered Questions

◆ Color bias: melanin content affects drug deposition?

◆ Dose-concentration relationships?

◆ Minimum dose for drug detection?

◆ Are externally applied drugs removed by washing?

◆ Does segmental analysis reflect drug use history?

◆ Are there specific biomarkers that eliminate concern about external contamination of hair?

   ◆ Cocaethylene, norcocaine, benzoylecgonine (BE), BE/cocaine ratio

   ◆ Recent evidence that these biomarkers present in both US Pharmacopeia & street cocaine

D5Cocaine Time Course in Human Hair
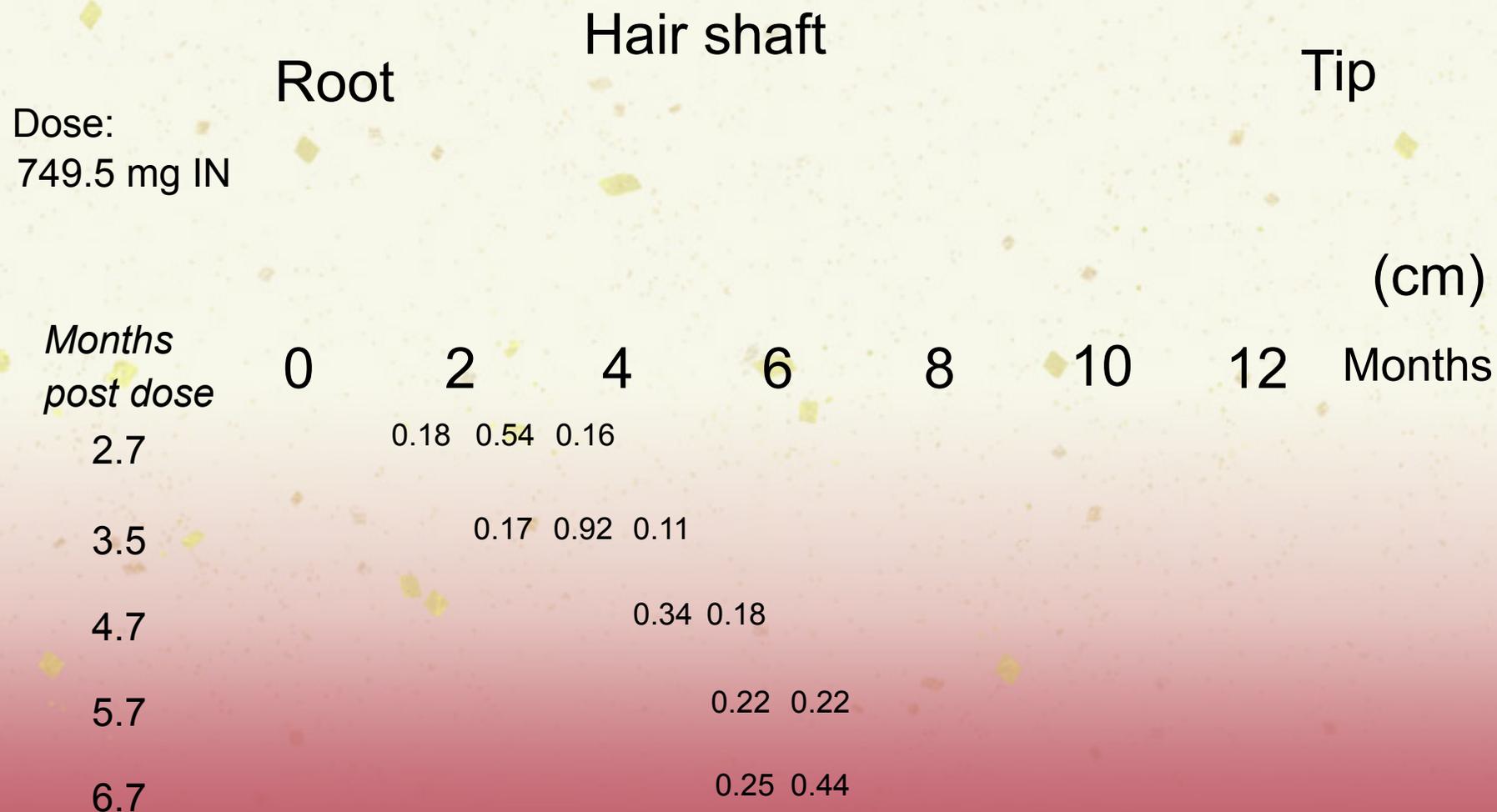
Hair shaft

Root

Tip

Dose:
749.5 mg IN

(cm)

Months post dose	0	2	4	6	8	10	12	Months
2.7		0.18	0.54 0.16					
3.5		0.17	0.92 0.11					
4.7			0.34	0.18				
5.7			0.22	0.22				
6.7			0.25	0.44				

In Vitro vs In Vivo
Codeine Incorporation Into Rat Hair
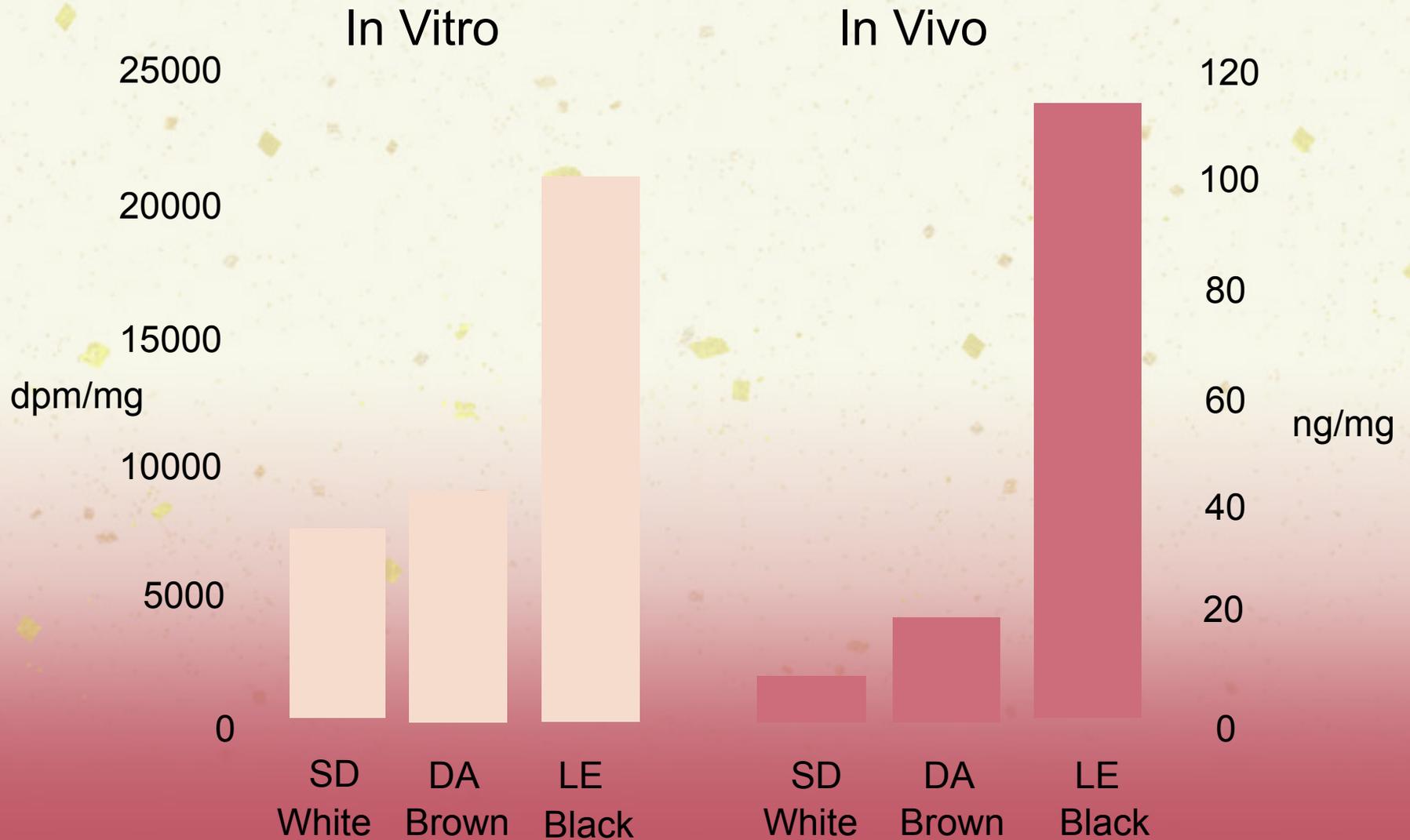
Cannabinoids in Hair

◆ Non-daily cannabis users (N = 33)
(1 - 5 joints or blunts per week)
  ◆ 30% cannabinoid screen pos ≥ 5 pg/mg
  ◆ 72.7% THC ≥ 1 pg/mg
  ◆ 80% THCCOOH ≥ 0.1 pg/mg

◆ Daily cannabis users (N = 20)
  ◆ 65% cannabinoid screen pos ≥ 5 pg/mg
  ◆ 60% THC ≥ 1 pg/mg
  ◆ 80% THCCOOH ≥ 0.1 pg/mg

Cannabinoids in Hair

◆ Hair

　　◆ Least sensitive matrix for cannabis detection

　　◆ Almost no controlled drug administration data

　　◆ Potential for contamination from cannabis smoke requires measurement of THCCOOH by tandem mass spectrometry

Advantages of Hair Testing

◆ Large window of drug detection

◆ Brief periods of abstinence will not alter test outcome

◆ Hair is easy to collect, handle & store

◆ Collection less invasive than urine collection

◆ Retesting can be accomplished

◆ Adulteration of hair test may be more difficult or more apparent

Disadvantages of Hair Testing

◆ Hair melanin concentration affects drug incorporation of basic drugs (color bias?)

◆ Poor incorporation of neutral & acidic drugs: low concentrations (pg/mg)

◆ Possibility of environmental contamination from smoked drugs

◆ Recent drug use not detected

◆ Expensive, frequently requires tandem mass spectrometry, highly trained analysts

◆ Few controlled studies to guide interpretation

Quest Diagnostics Drug Testing Index Data To Be Released After August 20 Represent >500,000 tests in 2009

% Positive Opiates Workplace Testing Pre-employment

	2005	2006	2007	2008	2009
COD	0.22	0.19	0.16	0.19	0.18
MOR	0.34	0.30	0.29	0.31	0.32
HC	0.69	0.70	0.79	0.78	0.78
HM	0.37	0.38	0.48	0.50	0.47
OXYC	0.56	0.64	0.88	0.83	1.00

% Positive Opiates Post-accident Positivity Rates

	2005	2006	2007	2008	2009
COD	0.36	0.31	0.30	0.34	0.46
MOR	1.0	0.90	1.0	1.2	1.2
HC	2.3	2.1	2.9	3.2	3.7
HM	1.2	1.2	1.8	2.2	2.3

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◆ Clinical staff

◆ CDM Staff

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   ◆ Dave Darwin, BS   Tsadik Abraham, MS

   ◆ Robert Goodwin OD, PhD

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  ◆ Takeshi Saito, Ph.D.   Won Kyong Yang, Ph.D.

  ◆ Stephane Pirnay, Ph.D.   Bruno de Martinis, Ph.D.

  ◆ Garry Milman, Ph.D.   Marta Concheiro, Ph.D.

◆ **Past & Current Doctoral Students**

  ◆ Rich Gustafson, Ph.D.   Riet Dams, Ph.D.

  ◆ Robin Choo, Ph.D.   Erin Kolbrich Spargo, Ph.D.

  ◆ Sherri Kacinko, Ph.D.   Gene Schwilke

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Arizona Arrestee Reporting Information Network

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From DUF to AARIN

- **DUF (1987-1997)**
  - Drug Use Forecasting (DUF) Program
  - NIJ funded in 12-23 cities
- **ADAM (1997-2003)**
  - Arrestee Drug Abuse Monitoring Program
  - 38 cities across the US, and 7 foreign countries
  - ASU team operated Maricopa and Pima sites
- **AARIN (2007-present)**
  - Locally initiated by Maricopa County based on NIJ's ADAM Program
  - Began data collection January 2007

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AARIN

- **Maricopa County has re-initiated data collection, as of January 2007**
  - Funded by Maricopa County
- **Data collection sites:**
  - 4th Avenue Jail
  - Glendale PD
  - Mesa PD
  - South East Juvenile Complex
  - Durango Juvenile Detention Facility
- **We have recently experienced budget cut backs**
  - 4th Avenue only-3 times a year

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Program in Brief

A Monitoring System
- trends and prevalence rates
- special populations

A Research Platform
- supplemental questionnaires
- longitudinal evaluations & program planning
- enforcement, treatment, and prevention strategies

A Policy Tool
- rapid information turn-around
- evidence-based policymaking

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Sampling Strategy

Probability sample

- Probability sample of bookings

Why does this matter?

- Known sampling properties for:
  - trends
  - prevalence estimates
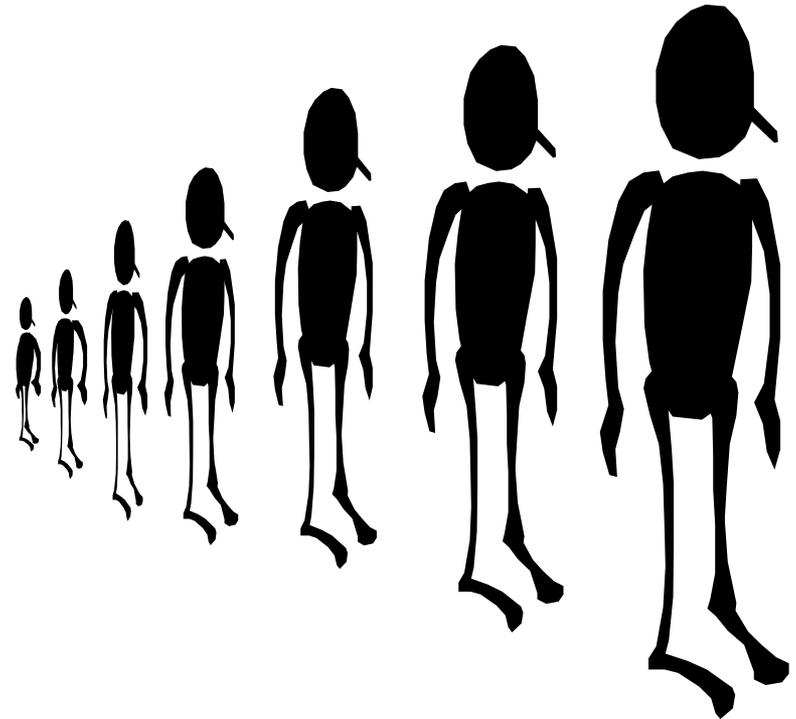
Core Interview Instrument 15-20 minutes

- **Demographics**
  - Age, race/ethnicity, education, employment, housing
- **Drug Use**
  - 8 specific drugs, 2 alternate "other" drugs
- **Treatment**
  - Substance abuse and mental health
- **Prior arrests and incarceration**
- **Firearms**
- **Gangs**
- **Victimization**
- **Immigration and Naturalization**
- **Veteran Status**

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Addenda Instruments

Current & Previously Used AARIN Addenda:

- Co-Occurring Disorders – 1q-4q2007
- Drug Market – 1q-4q2008
- Methamphetamine - 1q-4q2008
- Veterans - 1q-4q2009
- Gangs – 1q2009-current
- Criminal History & Activity – 3q2009-current
- Prescription Drugs – 1q-2q2010
- Police Contact – 3q2010-current

Other AARIN Addenda:

- Firearms
- Gambling
- Mental Health
- Other Drug Use
- Drug Use, Lifestyle, and Treatment
- Court Processes
- Domestic Violence
- Health & Relationships
- HIV
- Syringe & Intravenous Drug Use

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Voluntary Drug Testing

- Urine Specimens
  - self-administered
  - no observation
  - shipped daily to central laboratory

- Drug Panel
  - Four Schedule I drugs: marijuana, cocaine, methamphetamine, and heroin; plus alcohol

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Survey Instrument Design and Data Management

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- Instruments are designed using the most advanced software and hardware for creating, scanning, and managing both Optical Mark Read (OMR) and Optical Character Recognition (OCR).

Customized, machine scan-able instruments that not only decrease costs and turn-around time for data entry and processing over traditional methods, but also provides 99.9% data entry read accuracy.

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Today's Topics

- **Trends in drug use and emerging problems**

- **Veterans in the Criminal Justice System**

- **Criminal Involvement - Type & Frequency**

- **Prescription Drugs**

- **Illegal Immigrants**

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Longitudinal Trends and the Identification of an Increase in Opiate Use

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Opiate Use on the Rise?

- **Opiates? – Heroin and many common prescription pain relievers, such as:**
  - Vicodin, OxyContin, codeine, Demerol, and Darvon
- **Anecdotal support that opiate use was on the rise in Arizona generally, and Maricopa County specifically got us wondering…**
  - Was opiate use on the rise?
  - If so, we should be seeing it in the arrestee population.
- **Overall, arrestees were reporting use and testing positive for opiates at slightly higher rates, but not significantly different than typical trends.**
- **Closer examination started to reveal a few differences.**

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Opiate Use by Race / Ethnicity

Percent of Arrestees Testing Positive for Opiates by Race/Ethnicity and Quarter, 2000-2009
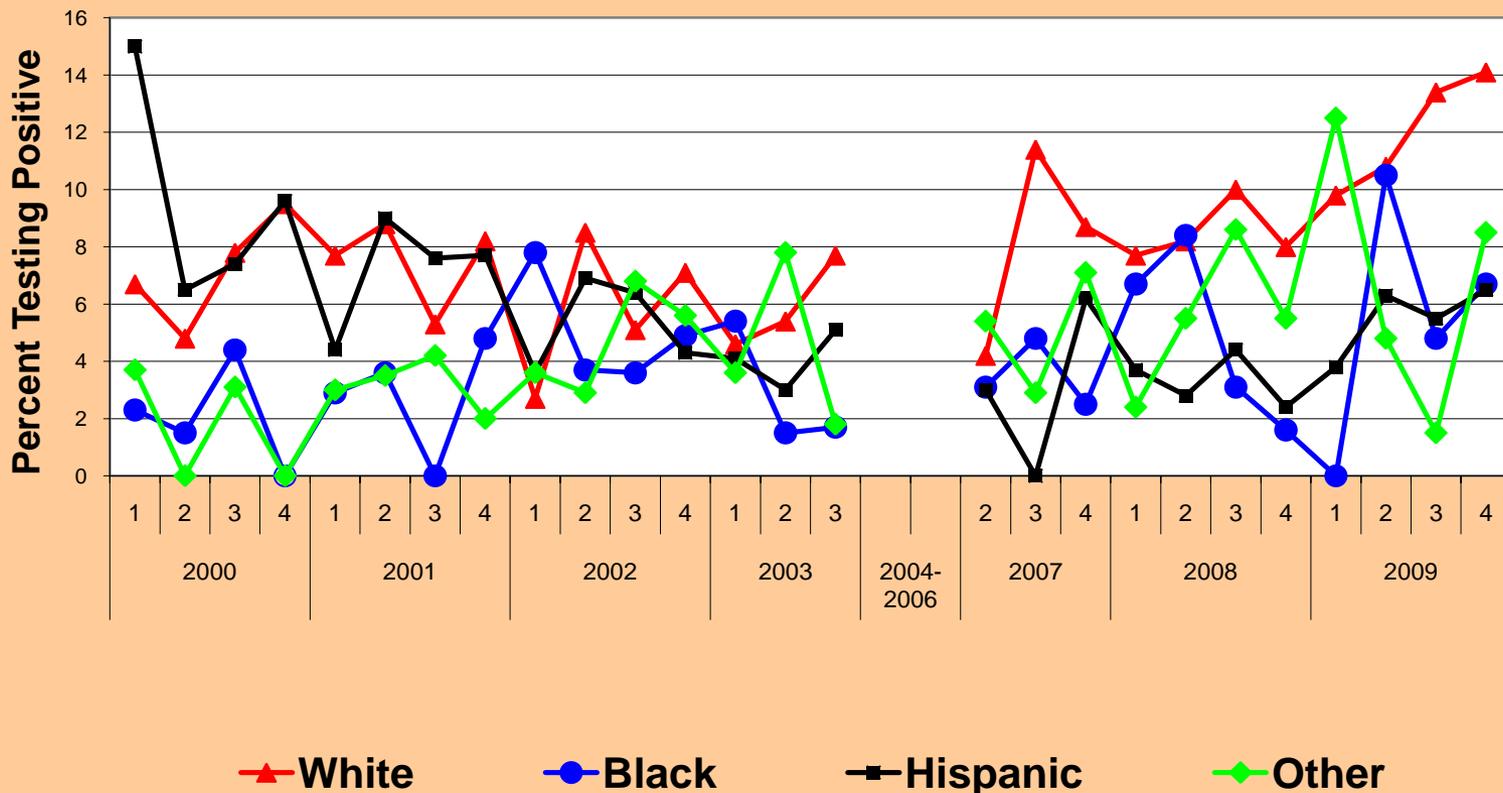
Opiate Use by Charge Type

Percent of Arrestees Testing Positive for Opiates by Charge Type and Quarter, 2000-2009
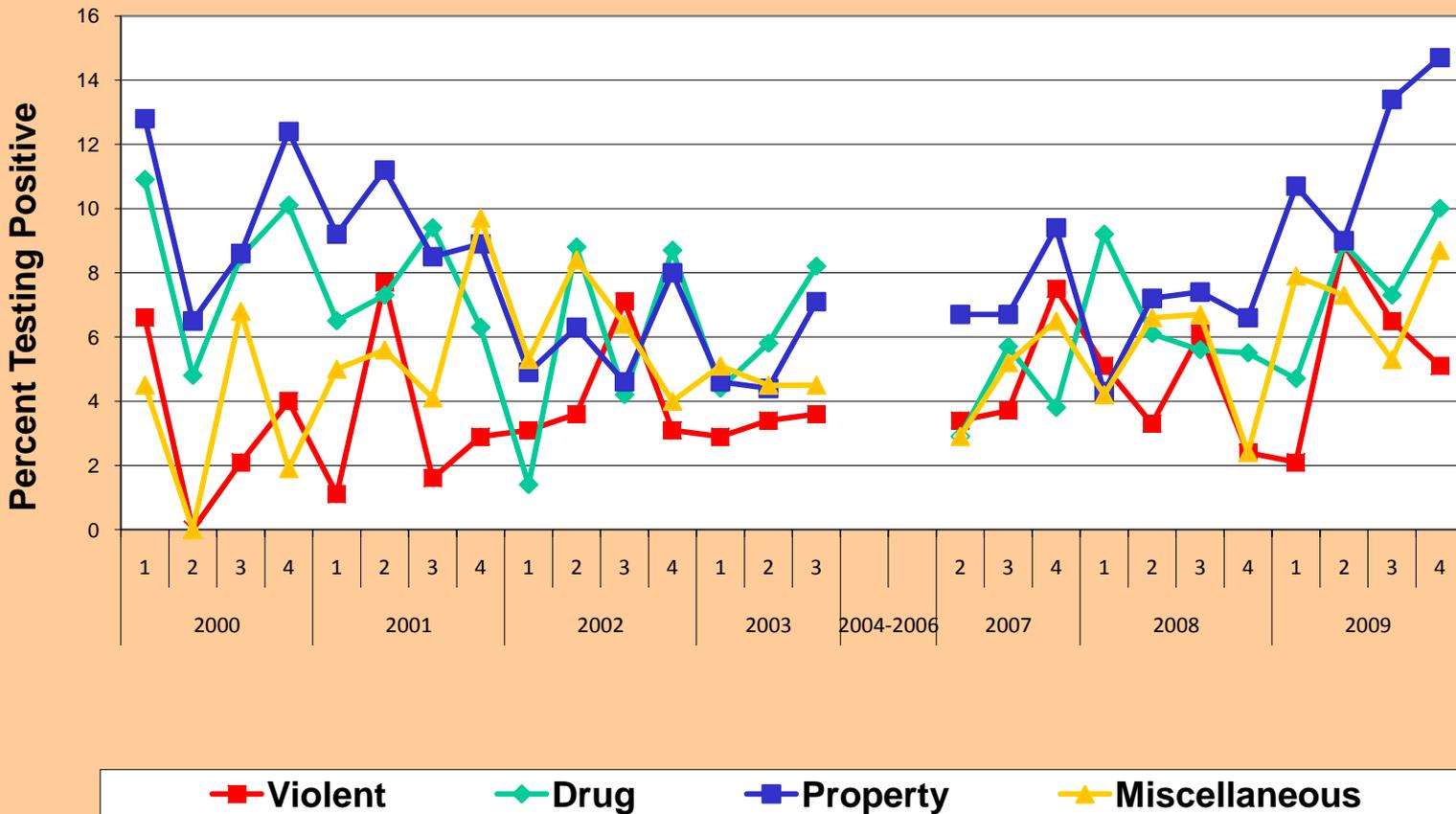
Opiate Use – Alarming Increase

Percent of Arrestees Testing Positive for Opiates, by Quarter 2000-2009
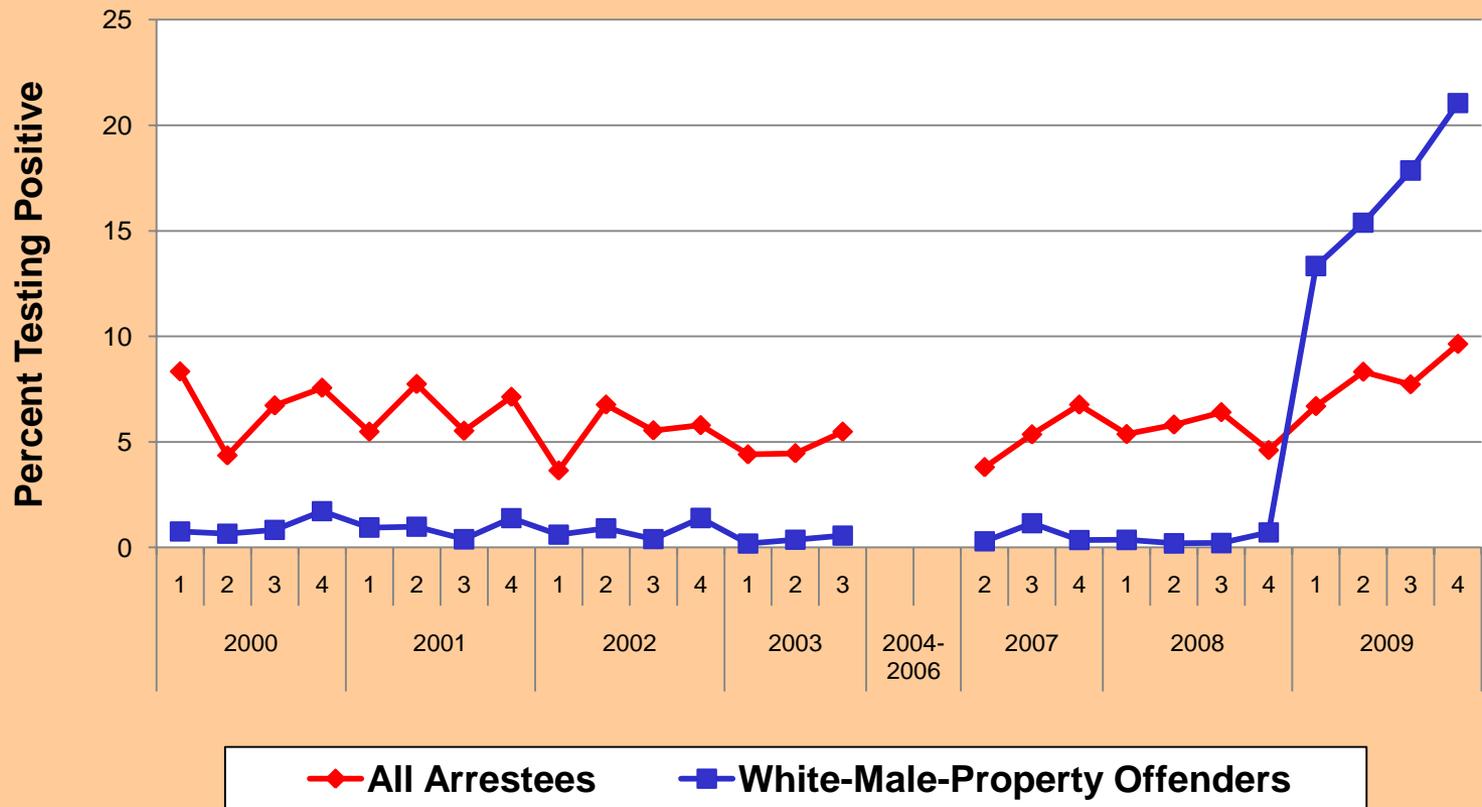
Percent of Arrestees Testing Positive for Opiates by Arrest Location Zip Code

Percentage of Arrestees Testing Positive for Opiates in Maricopa County by Arrest Zip Code

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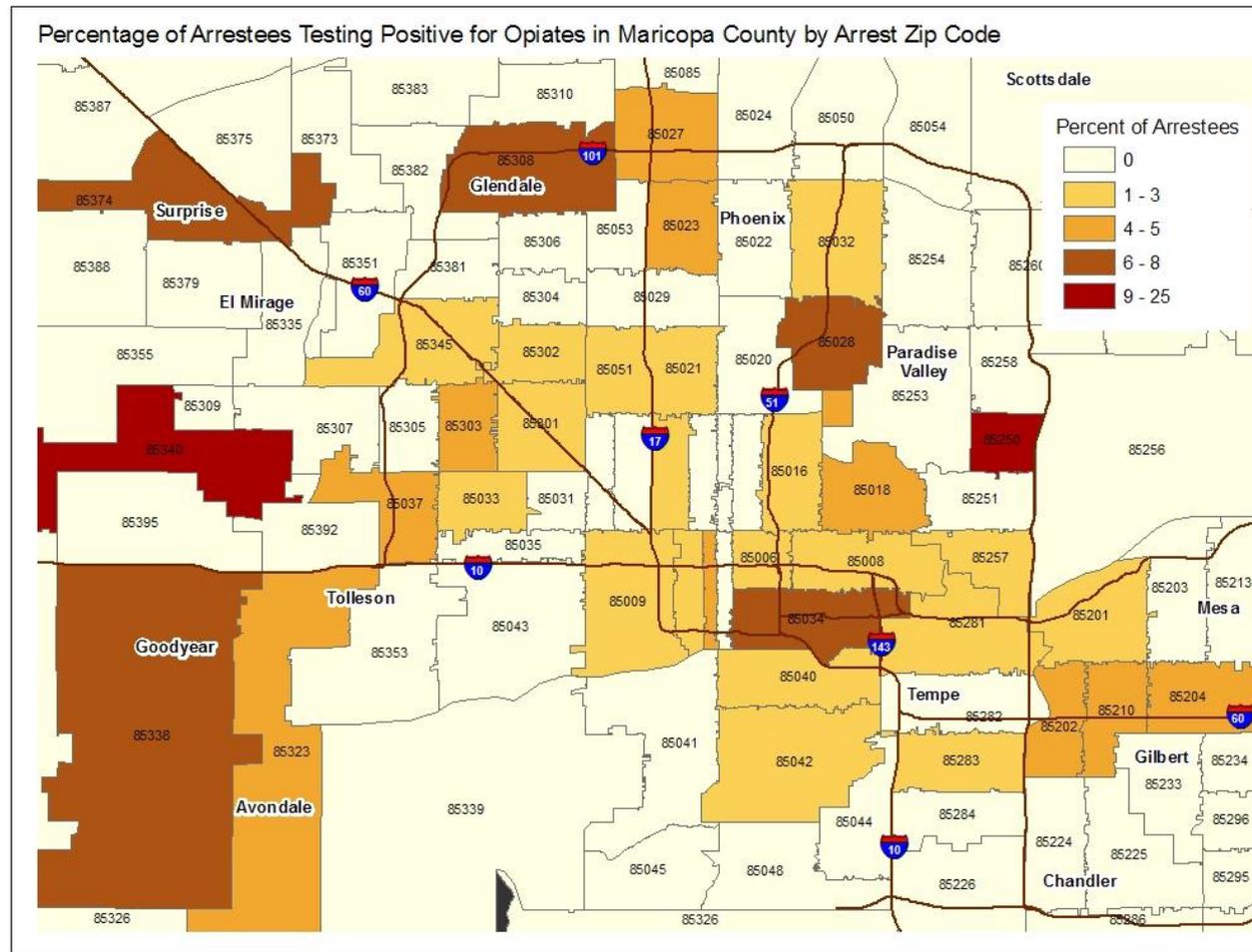
Percent of Arrestees Testing Positive for Opiates by Home Zip Code

Percentage of Arrestees Testing Positive for Opiates in Maricopa County by Home Zip Code

Percent of Arrestees
- 0
- 1 - 6
- 7 - 10
- 11 - 20
- 21 - 33
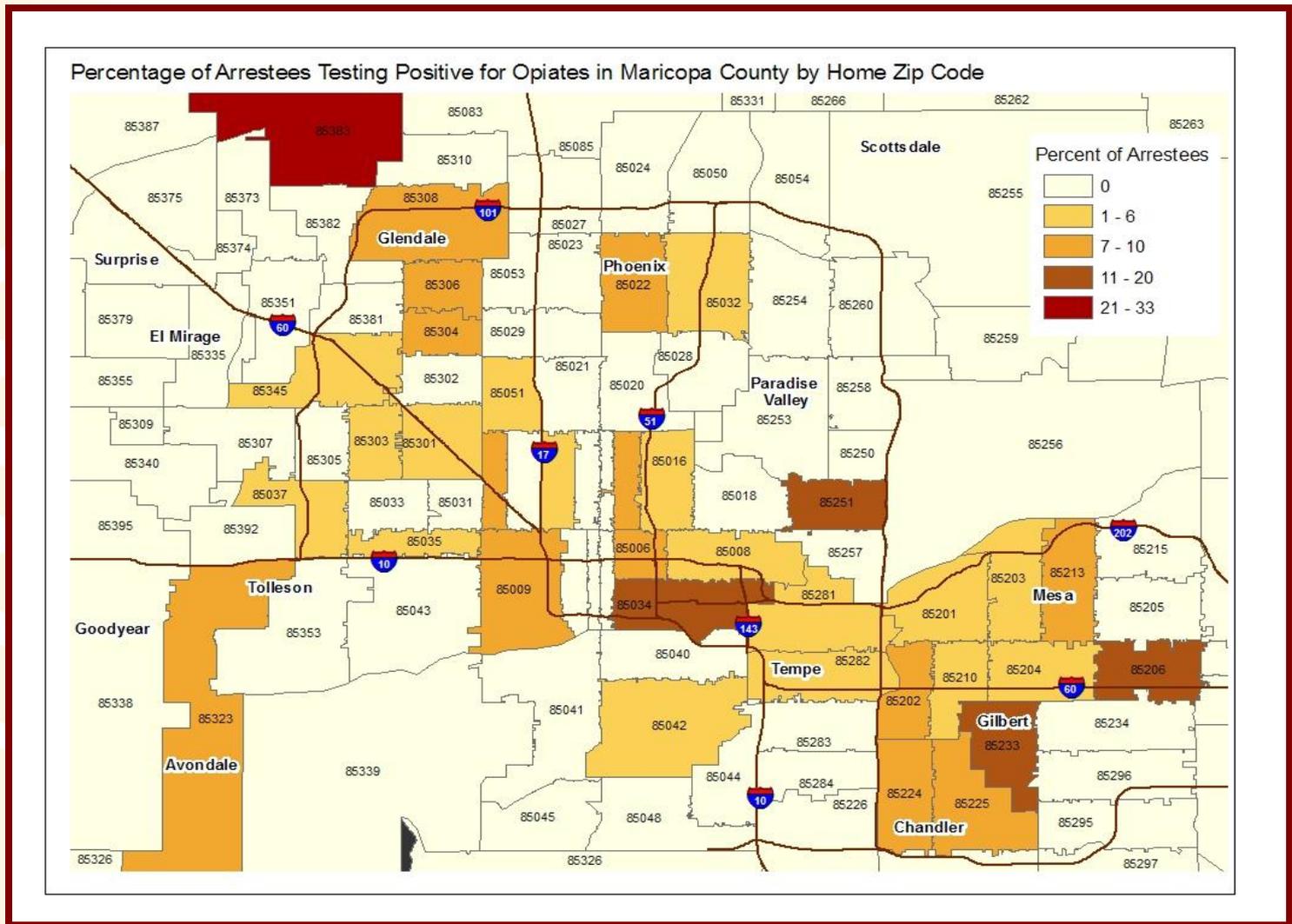
Implications

- **Certain Maricopa County arrestees are more likely to use opiates –**
  - Specifically white male property offenders.
- **Particular areas of the valley see disproportionate arrests for these individuals:**
  - Scottsdale (85250)
  - Phoenix (85028, 85034, & 85340)
  - Glendale (85308)
- **The residential address for these arrestees differs:**
  - Scottsdale (85251), Phoenix (85034), Mesa (85206), Gilbert (85233), and Glendale (85383)
- **Glendale Police Dept. – Current Investigation**

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Report on Veterans among Maricopa County Arrestees

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Rationale for Concern

- **Very Little Information Available on Vets in the CJ system**
  - Most recent national data from 2001 -state and federal only
  - Few (if any) recent studies on local level

- **What is on the horizon?**
  - End of ops and troop withdrawal OIF/OEF (by 8/2011)
  - OIF/OFE "signature" injuries: TBI, PTSD
    – Potential link between combat-related injuries/ problems and justice system involvement
  - Veterans Treatment Courts – 30 and counting (6/2010)

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The AARIN Veterans Addendum

- **Veterans Addendum**
  - Added in 2009 as a threshold instrument
  - Series of basic questions:
    - Nature of service: branch, OIF/OEF, length and discharge
    - Service-related problems: physical injury, PTSD, other mental health issues, substance abuse
    - Core instrument variables as well
  - Not a mental health assessment tool
  - Descriptive effort to paint a picture of:
    - The prevalence of vets in the arrestee population
      - 6.3% (n=132) of 2,102 respondents
    - The nature of their problems

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Major Findings

- **Veterans – 6.3% of arrestees**
  - 2,102 interviewed in 2009 … 130,000 booked (1.6%)
  - 132 vets interviewed represent 1.6% of all vets booked … as many as 8,000 vets booked in 2009

- **Many suffering from problems (physical, PTSD, Mental health, substance use) that are likely service-related (52% at least one problem)**
  - Mental health problems more common among OIF/OEF vets than other vets

- **Veteran arrestees different from non-veterans**
  - Older, male, white, more education
  - More violent offenses, more hard drug use (crack, opiates)

Preliminary Report on Self-Reported Criminal Involvement among Arrestees

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Criminal Involvement Addendum

- **The addendum consists of 23 types of criminal activity.**
  - Respondents are asked whether they engaged in the crime in the past 12 months, and if so how many times.
  - They are then asked if they have been arrested for the crime in the past 12 months, and if so, how many times.
- **Examples of the questions:**
  - Have you written/drawn graffiti on school property, neighborhood houses/walls, stores, etc.?
  - Have you destroyed property worth LESS than $250?
  - Have you destroyed property worth MORE than $250?
  - Have you robbed someone by force or threat of force using a weapon?
  - Have you sold or made drugs?

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Percent of Arrestees Reporting Committing and Being Arrested for the Six Top Offenses
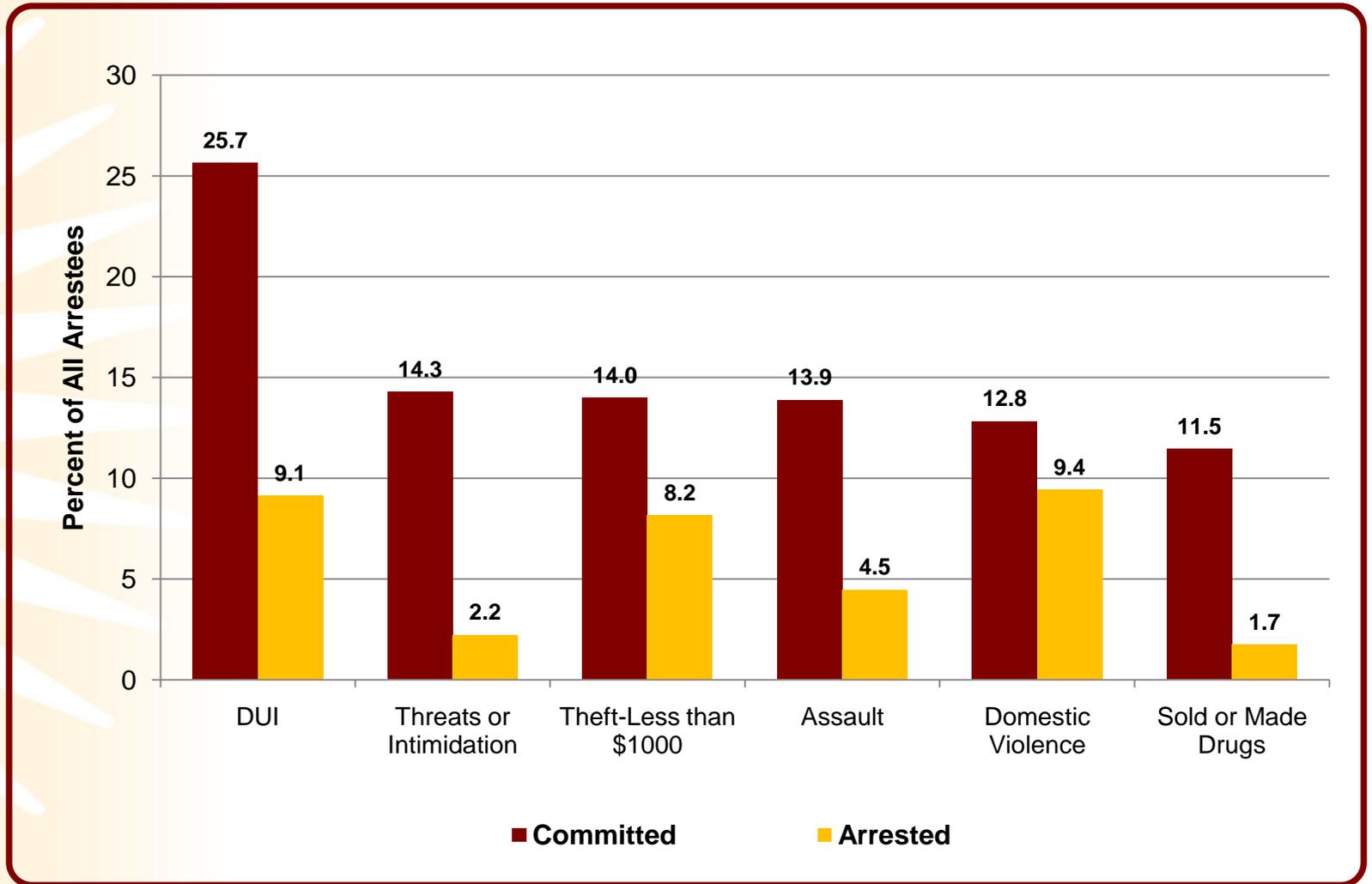
Conclusions

- **Drive drunk, Get Nailed!**
  - Ya, right!
- **Domestic Violence**
  - Things are moving in the right direction.

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Preliminary Report on Self-Reported Prescription Drug Use

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AARIN Prescription Drug Addendum

- **Administered during 1st & 2nd quarter 2010**
- **Questions related to:**
  - Specific prescription drugs used
  - History of prescription drug use
  - Selling and sources of prescription drugs
  - Reasons for use
- **Gain better understanding of characteristics of prescription drug use among arrestees**

Background Characteristics by Drug Use Type

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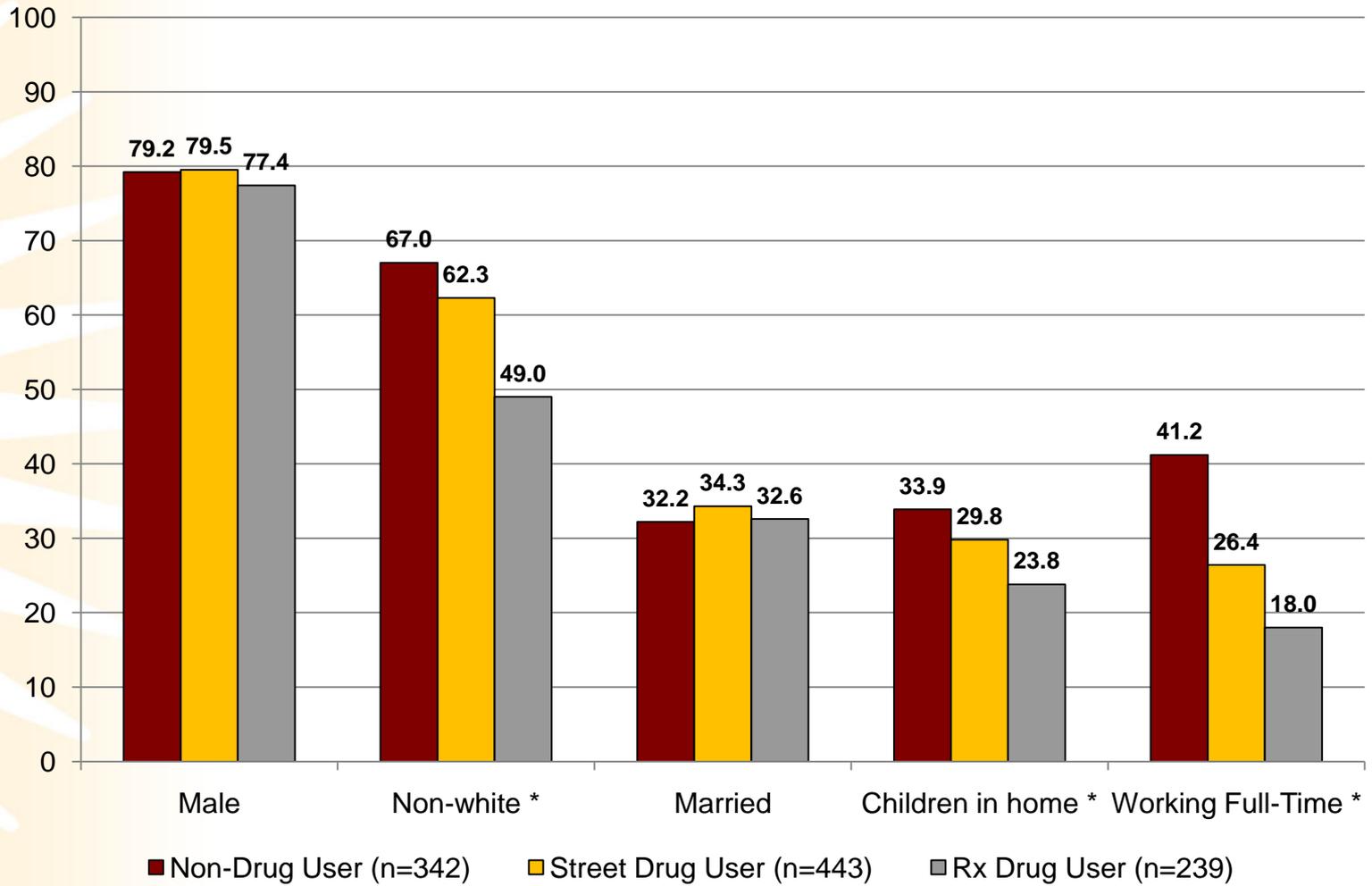
Behavioral Characteristics by Drug Use Type

Center for Violence Prevention and Community Safety
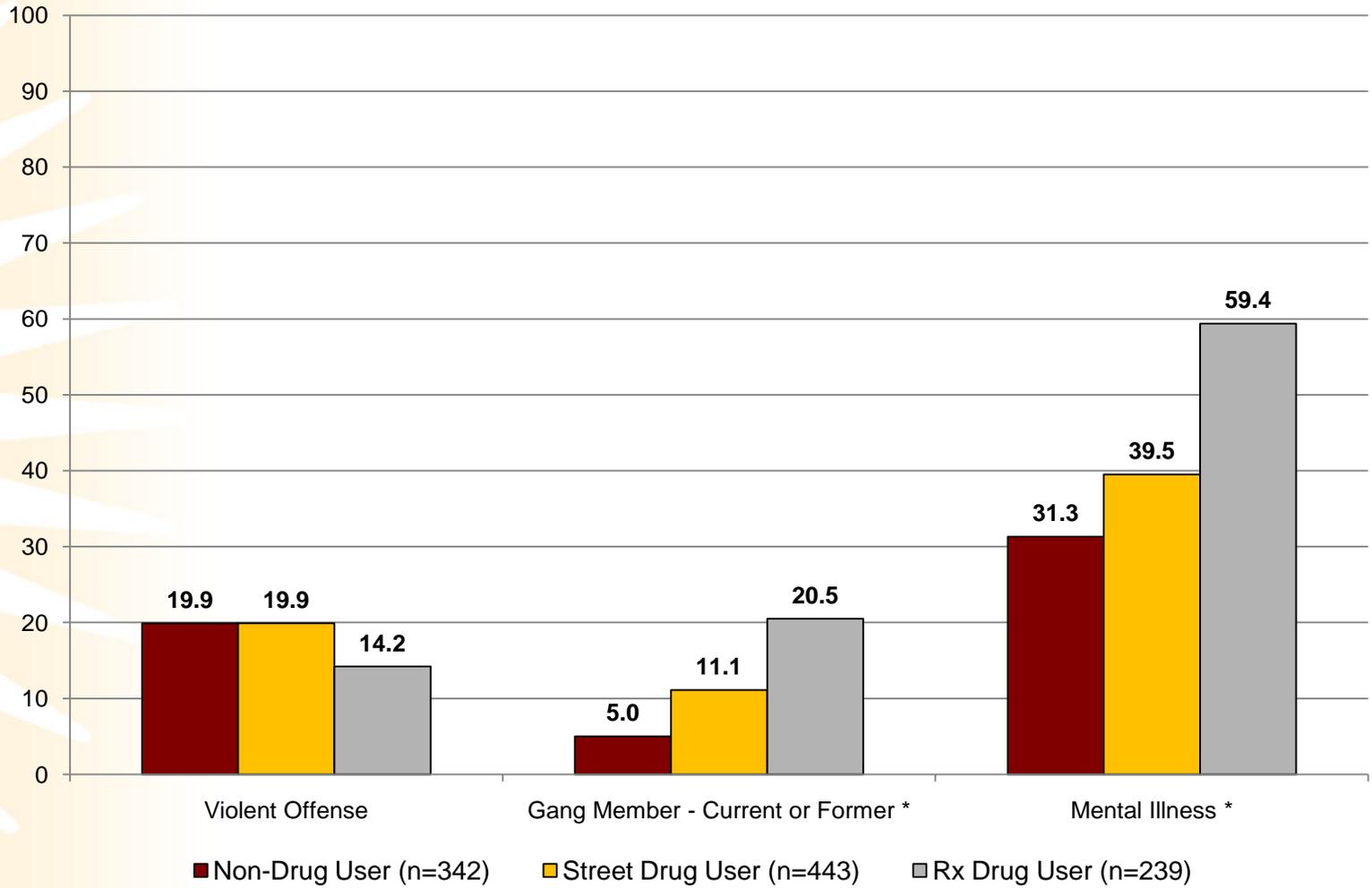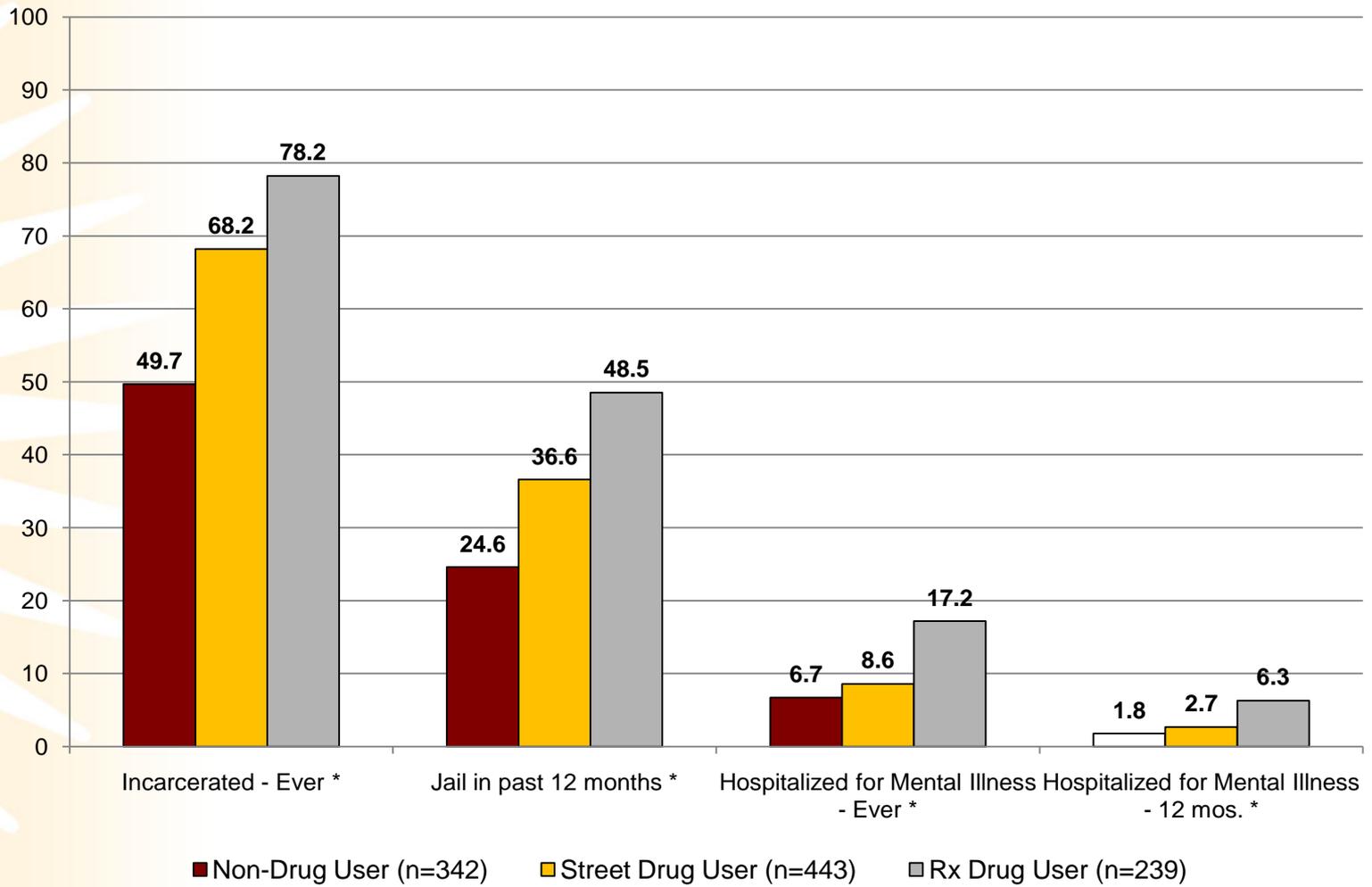
Location of Last Rx Drug Acquisition by Type of Place

Chart data:
- Private Residence: 52.7
- Streets or Outdoors: 16.3
- Work, School or Other: 5.5
- Pharmacy or ER: 4.1
- Public Building: 4.1

■ Rx Drug User (n=239)

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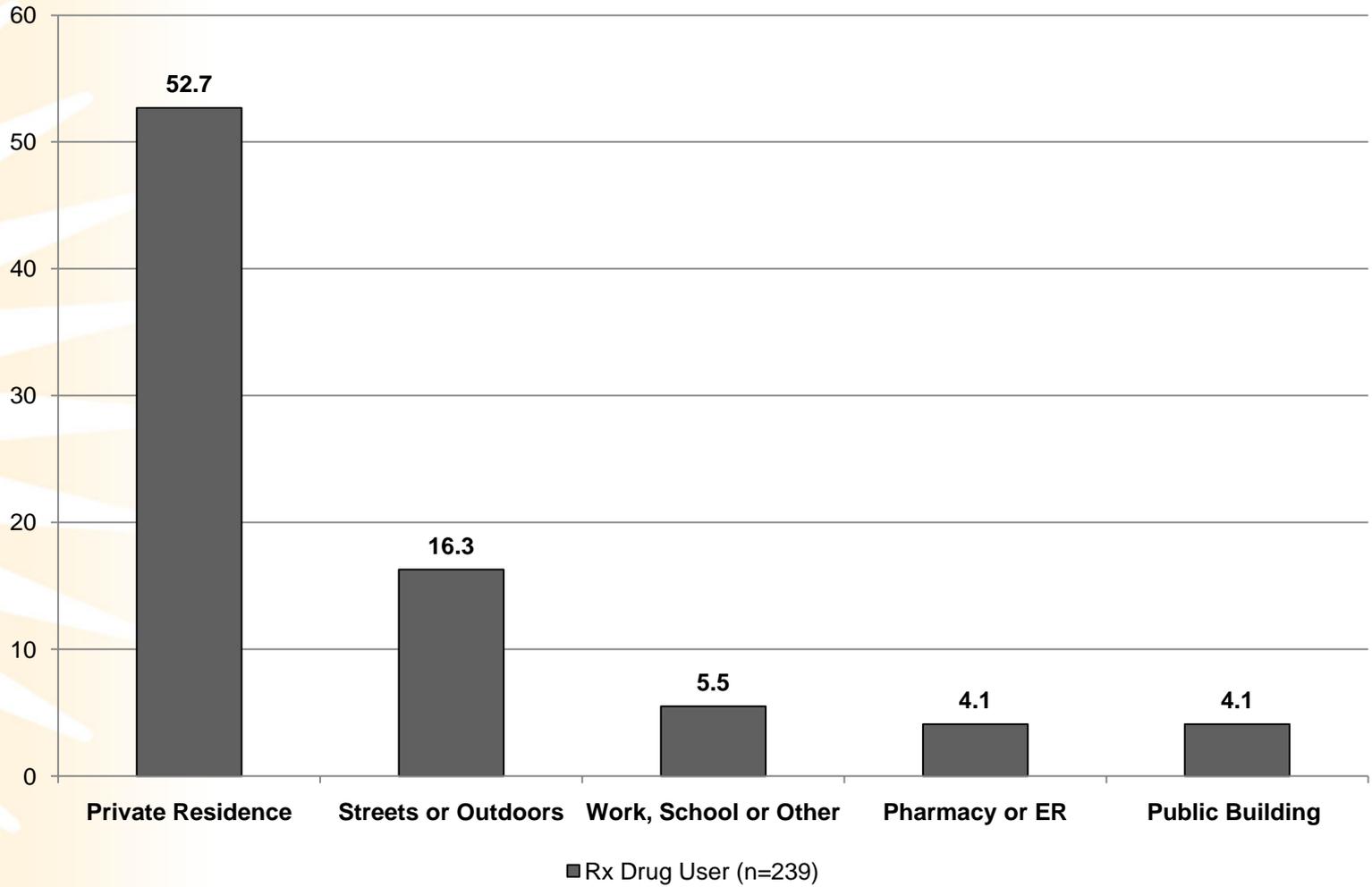
Reasons Why People Use Prescription Drugs

Percent Agree or Strongly Agree

Bar chart "Percent Agree or Strongly Agree":
- More acceptable *: 65.7
- Less stigma: 59.8
- Less risk of arrest: 49.4
- Behave normally *: 49.0
- Easier to obtain: 47.3
- Feel better *: 41.1
- Safer: 39.7
- Less addictive: 20.5

■ Rx Drug User (n=239)

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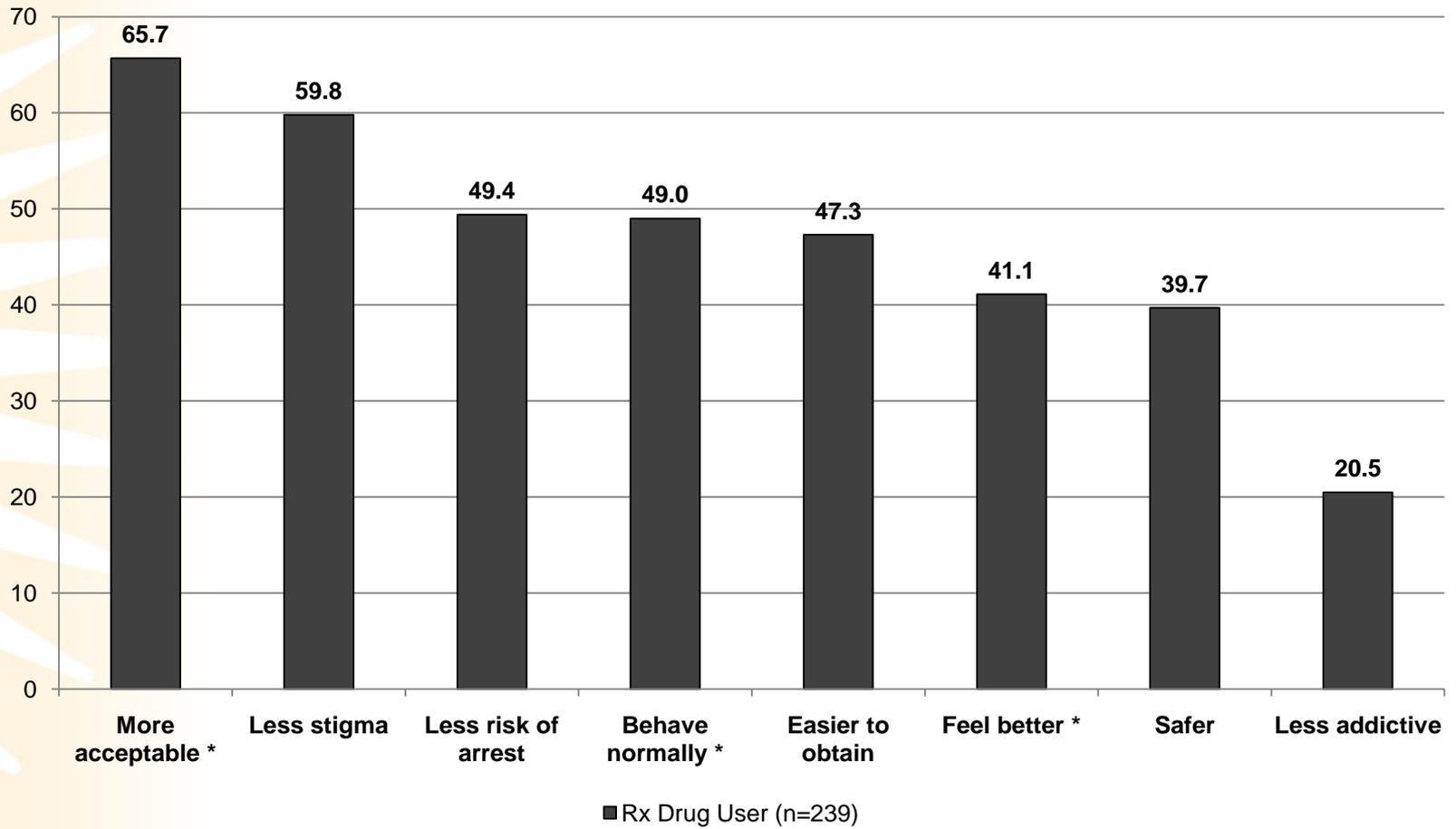
Conclusions

- **Prescription drugs are dangerous like any other drug**

- **Users have lots of problems-mental illness, gang membership, incarceration**

- **Available on the street and from dealers**

- **People think they are more acceptable, less risk for arrest**

- **Illegal use of prescription drugs is a problem and needs to be taken seriously by everyone- government, pharmacies, doctors, law enforcement, parents, patients…**

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Examining the Relationship between Drug Use and Criminal Aliens

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Present Study

1) Examine whether there are differences in drug use between US citizens, illegal aliens, and legal aliens

2) If there are differences, whether there is variation by drug type.

Our measure of citizenship

- **If they self-reported that they were US citizens through birth they were coded as US citizens.**
- **If no, asked "How did you enter the United States?"**
  - Legal aliens: entered with immigrant visas, admitted as a refugee seeking asylum, or entered with student, work or long term visas.
  - Illegal aliens: entered the US with non-immigrant visas and overstayed or that entered the US without documents

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Key Findings

- **There is a sizeable population of illegal aliens among recently booked arrestees in Maricopa County– 12%.**

  - Population is large enough to explore differences in patterns of drug use among illegal aliens, legal aliens, and US citizens.

  - This is likely not the case in most jurisdictions (allows us to make a unique contribution to the lit on criminal offending and immigration)

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Key findings, continued

- **Illegal aliens differ in a number of notable ways across demographics and background characteristics:**
  - Almost exclusively male and Hispanic
  - Younger
  - Employed
  - Living with a spouse
  - Fewer prior arrests
  - Less like to have been arrested for violence
    - But more likely to be arrested for offenses involving alcohol (3-4 x U.S. citizens) (DUI's)
  - Less likely to receive income from illegal activities

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Findings, continued

- **Illegal aliens are also distinct because of their patterns of drug use.**
  - Illegal aliens are less likely to report and test positive for any drug use (consistent with prior research).
  - Illegal aliens use <u>marijuana</u> and <u>meth</u> significantly <u>less</u> often (self report and UA).
  - Illegal aliens use <u>powder cocaine</u> <u>more</u> often (self report and UA (includes crack))
- **Paradox: despite their lower levels of drug use, they are more likely to have been arrested on drug charges**

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Findings: continued

- **Even when controlling for immigration status, a number of other background and demographic factors predict drug use – well supported in prior research.**
  - Sex (males use marij, females use meth)
  - Race/Ethnicity (whites use meth; Blacks use crack/marij)
  - Low education
  - Unemployment
  - Prior criminal history

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Implications

- There is a sizeable population of illegal aliens among recently booked arrestees in Maricopa County– 12%.

- Illegal immigrants are less likely to be involved in violence, but more likely to be involved in alcohol related offenses (i.e., DUI).

- Our findings are generally consistent with prior research on the relationship between illegal immigrants and drugs and crime.

  - Caveat: cocaine use.

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Implications, continued

- **Despite lower drug use (generally), illegal aliens are twice as likely to have been arrested on drug charges. May be explained by:**

    - illegal aliens use drugs that are more likely to lead to arrest.

    - law enforcement efforts that target illegal immigration (they work harder to find illegal aliens, and since they are not as likely to engage in other crime, they are arrested on drug charges)

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Demonstrating the Utility of ADAM's Drug Use Calendar Data:
A Group-based Trajectory Analysis of Crack Cocaine Use Among Adult Male Arrestees

Brad A. Myrstol, University of Alaska Anchorage

The purpose of this paper is to demonstrate the utility of the drug use calendar data collected by the *Arrestee Drug Abuse Monitoring* (ADAM) program. The paper begins with a brief description of the major drug use data collection systems currently in use in the United States. This is followed by an overview and discussion of the development of the *Drug Use Forecasting* (DUF) program and subsequent transition to ADAM, with particular attention paid to the inclusion of a drug use calendar in the ADAM redesign. The paper concludes with the presentation of results from an analysis of crack cocaine use from a sample of adult male arrestees interviewed in 2000. A group-based trajectory analysis shows there is substantial heterogeneity in crack cocaine use levels among adult male arrestees in the year preceding arrest, that individual use trajectories cluster into distinctive trajectory groups, and that there are a variety of drug use trajectory groups in the population of crack users who are arrested and booked into local jails. In addition, the analysis highlights several social, demographic and behavioral factors that may influence the probability of trajectory group membership.

A Brief Description of Drug Use Data Collection Programs in the U.S.

In the United States, a tremendous amount of resources are expended to monitor illicit drug use and gauge its consequences — particularly crime. Among the most widely known drug use research programs are the *National Survey on Drug Use and Health* (NSDUH) and the *Drug Abuse Warning Network* (DAWN), both of which are funded by the Substance Abuse and Mental Health Services Administration, the *Monitoring the Future* study (MTF) which is funded by the National Institute on Drug Abuse and the *National Youth Survey* (NYS) which is funded through a partnership of the National Institute of Mental Health and the National Institute of Justice. The NSDUH targets civilian, non-institutionalized Americans aged 12 or older, while DAWN collects data on all drug-related visits to hospital emergency departments and drug-related deaths investigated by medical examiners and coroners. MTF collects annual data from nationally representative samples of 8th, 10th and 12th graders enrolled in public and private schools. The NYS collects information on both conventional and deviant behavior (including drug use) from a nationally representative of American youth (who are now adults) first recruited into the study when they were between the ages of 11 and 17 in 1976. In combination these studies collect drug use information from a wide variety of populations; however, with the exception of the NYS, none of these studies collect data from members of the military, transient/homeless persons, or institutionalized populations — those in jails, prisons, and mental hospitals. These sampling exclusions are particularly important because of the heightened risk of drug use (and addiction) among jail and prison inmates, as well as those suffering from mental illness.

Filling the void for those incarcerated in jails and prisons are two research programs administered by the Department of Justice: the *Survey of Inmates in Local Jails* (SILJ) and the *Survey of Inmates in State and Federal Correctional Facilities* (SISFCF). The SILJ collects data from a representative sample of persons held in U.S. jails, including both pre-trial detainees and convicted offenders. The SISFCF surveys nationally representative samples of inmates in state and federal prisons. Each asks inmates a variety of questions about their drug use prior to arrest and subsequent incarceration, including lifetime use, past-month use and whether or not they were under the influence when they committed the offense for which they are incarcerated. The data collected from these two studies has long served as the foundation for the study of the drug use–crime nexus in the United States.

Drug Use Forecasting

In 1987 the National Institute of Justice initiated the *Drug Use Forecasting* (DUF) program to complement the other drug use monitoring systems then in use. Like the SILJ, the intent of the DUF program was to gather drug use information from those held in jails. Jails are a particularly important site for the study of the drug use because of the wide variety of at-risk persons who enter them. Unlike prisons, which house convicted felons almost exclusively, jails are populated mostly by people who commit minor offenses: misdemeanants and local ordinance violators.

While they are typically portrayed as primarily crime control institutions, in practice jails serve a significant role as institutions of community social control tasked with managing society's "rabble" — community members who are viewed by the mainstream as bothersome and unseemly because of their unconventional behavior and appearance (Fitzpatrick & Myrstol, 2008; Irwin, 1985). Because they serve in this role, jails are particularly useful sites for capturing information on the drug use behaviors marginalized populations — like the homeless — that are at heightened risk of drug use and abuse.

The DUF program made a number of significant methodological and substantive contributions to the study of drug use among jail inmates. First, because DUF participants were interviewed within 48 hours of arrest (hence a sample of "arrestees" rather than "inmates"), the program was able to capture drug use information from low-level offenders — like the homeless — who are usually released shortly after booking, and are therefore systematically excluded from other studies of jail populations. Second, DUF was designed to provide local prevalence estimates of illicit drug use. This was a particularly important innovation because it provided local stakeholders within each study catchment area — law enforcement, substance abuse treatment and social service providers — with timely, detailed drug use information that could be used to develop locally relevant prevention and treatment programs. The third major innovation of the DUF program was its collection of multiple waves of data at each research site each year, which enabled it to closely monitor local drug use trends among the arrestee population and more quickly detect sudden changes in drug use patterns. The fourth, and perhaps most significant innovation of the DUF

program, was the inclusion of truly objective measure of drug use. In addition to asking arrestees to self-report drug use, DUF interviewers asked each respondent to provide a urine sample which was analyzed for the presence of drug metabolites. Each sample collected was screened for the presence of 10 drugs, but the program focused primarily on the "NIDA-5" drugs of cocaine, marijuana, amphetamines, opiates and phencyclidine. This advance is especially notable because unlike all of the other drug use data collection systems that relied exclusively on self-reported drug use, urinalysis provided a measure of drug use that was not subject to intentional deception on the part of arrestees. In addition, because each arrestee's self-reported drug use could be compared with their urinalysis results, this methodology provided a means to cross-validate arrestees' self-reports.

Despite these innovations, the DUF program suffered from a number of methodological problems. The most significant issue was the DUF sampling procedure. Instead of using a probability-based sampling methodology, each DUF site employed a convenience sampling procedure. As a result, the data collected had poor external validity - that is, they were not generalizable. A second set of difficulties facing DUF was a lack of standardized data collection procedures, which negatively impacted the reliability of the data collected across sites. There was significant variation across sites with respect to: defining the geographic unit ("catchment area") for booking facilities; inclusion/exclusion criteria for respondent participation; and privacy of interview areas. Ultimately, the inability of the DUF program to provide scientifically valid and reliable drug use data to local policy makers and treatment providers led to its redesign in 1998, when DUF was transformed into ADAM (Arrestee Drug Abuse Monitoring).

Arrestee Drug Abuse Monitoring

On the surface ADAM closely resembled DUF. Just as it had for DUF, ADAM data collection took place in jails, and the information collected still originated in face-to-face interviews and voluntary urine specimens. But there were dramatic differences with respect to the procedures for selecting arrestees and collecting the data. The most significant changes were the development of data collection procedures that would be common to all sites, and the adoption of probability-based sampling plans for each research site designed to account for variations in the size and structure of local criminal justice systems, the flow of arrestees through booking facilities, and the types of offenses for which people were arrested.

In addition to these methodological changes, ADAM included considerable substantive changes as well. Most notably, the questionnaire was expanded to cover not only recent drug use behaviors, but also arrestees' prior criminal justice experiences, their exposure to various forms of substance abuse and mental health treatment, an assessment of substance abuse and dependence risk, and the dynamics of local drug markets. Finally, although program was not designed to provide nationally representative estimates of arrestee drug use, the number of ADAM sites was increased to 35 from the 24 sites included in DUF to provide a more comprehensive assessment for the United States. As initially proposed, the ADAM program was to

include a total of 75 research sites across the United States. In 2003 when the ADAM program was suspended, there were 39 sites participating.

The ADAM Drug Use Calendar

One of the most important substantive and methodological innovations included in the ADAM redesign was the addition of a drug use calendar. Calendaring is a technique researchers use to aid respondents with the accurate recall of events over an extended period of time. It accomplishes this by dividing a recall period (for ADAM, 12 months) into "conceptually manageable units" (for ADAM, one-month segments), and then anchoring memory around inter- connected real-life events occurring within each of these units. Examples of the sort of significant life events used as memory anchors were: birthdays; deaths; marriages; separations/divorces; secular and religious holidays; and other miscellaneous events such as the purchase of a new car or starting a new job. Using this methodology, ADAM collected month-by-month data on: housing; inpatient and outpatient substance abuse treatment; mental health hospitalization; arrests; incarceration; and, the level of alcohol and drug use from arrestees for the 12-month period preceding arrest (see Figure 1).

Figure 1. Sample ADAM Drug Use Calendar (Adapted from Original)

The drug use calendar was administered to all respondents who reported using illicit drugs within the past year. At the outset, respondents were shown the calendar, provided a brief explanation of its content and how information would be recorded in it, and encouraged to actively participate in its completion. Then, arrestees were asked to describe any significant life events that happened to them in the preceding year. Interviewers recorded respondents' recollections in the calendar and these events were used as reference points by respondents to aid with the recall of their drug use for each of the 12 months preceding arrest. For each drug used in the past year, arrestees were first asked if they used 12 months previously (for example, if an arrestee was arrested in May of 2000, they would be asked if they used that drug in June of 1999). If an arrestee responded in the affirmative, they were then asked to provide their best estimate of the frequency of their drug use that month (0 = *None*; 1 = *1 day/week, 1-7 days/month*; 2 = *2-3 days/week, 8-12 days/month*; 3 = *More than 3 days/week, 13-30 days/month*). Interviewers would then proceed to ask arrestees about their use for each month leading up to their current arrest, using the respondent's critical life events to anchor their memory and assist with recall. This sequence was followed for each drug the respondent reported using within the 12-month period preceding their arrest.

Demonstrating the Utility of the ADAM Drug Use Calendar

The argument being put forth here is that one of the most significant methodological and substantive contributions ADAM makes to the study of the drug use–crime connection is its use of a drug use calendar, which provides for the collection of detailed month-by-month data on the frequency and intensity of arrestee drug use for the entire 12-month period preceding arrest.

Collection of these data is important for advancing the scientific understanding of the link between drug use and crime because they permit a dynamic analysis of the relationship, and consequently it has the potential to dramatically alter current understandings of the connection between drug use and crime. With some notable exceptions (e.g. Elliott, Huizinga, & Menard, 1989; Huizinga, Menard, & Elliott, 1989; Menard, Mihalic, & Huizinga, 2001), much of the research examining the link between drug use and crime has been myopic in its approach because of an overly narrow view that tends to limit its focus to drug use within the context of a criminal event, rather than viewing drug use as a phenomenon with a history, a behavior that changes and evolves over time. As a result, there has been a tendency to over-simplify not only the nature of drug use, but also the relationship between drug use and criminal offending.

A developmental approach on the other hand, explicitly recognizes that an individual's use of drugs, like other behaviors, varies over time and attempts to understand how these larger developmental patterns (called "trajectories") influence criminal offending. What follows is a demonstration of a developmental approach to the analysis of the ADAM drug use calendar data. The data used come from the ADAM program, and are limited to the year 2000. That year, a total of 35 sites located in 26 states and the District of Columbia participated in the study. A total of 21,161 adult male arrestees were interviewed, 32.7 percent (n = 7,160) of whom reported lifetime use of crack cocaine. Just under 20 percent (n = 4,170) reported using crack cocaine at least once during the 12-month period preceding their arrest. A total of 369 cases

were removed from the sample prior to the analysis because of missing values in the drug use calendar. The final sample size was 3,801 adult males who reported using crack cocaine in the year prior to their arrest.

A group-based modeling approach (see: Nagin, 1999; 2005) was used to explore the drug use trajectories of this sample of arrestees. This analytic method assumes the following: (1) the development of drug use varies between individuals over time; (2) the drug use trajectories of individuals may cluster into distinctive groups; and (3) if there are distinctive drug use trajectory groups, there will be a mixture of them within the population. The group-based approach accomplishes two important analytic tasks. First, it determines if there is, in fact, heterogeneity in the developmental trajectories within this sample of crack cocaine-using arrestees. To the extent that crack cocaine use patterns vary, and that these variations have differential effects on the probability of criminal offending, this is an essential step in understanding the link between crack cocaine use and crime. Second, if the procedure results indicate that there are distinct trajectory groups, the probability of membership in each trajectory group will be computed for every individual in the sample. These probabilities can then be used to assign individuals to groups. Once that is accomplished, demographic and behavioral profiles of group members can be used as an initial foray into the identification of factors that may influence membership in trajectory groups.

Figure 2. Crack Cocaine Trajectory Groups
Male Arrestees (n = 3,801)
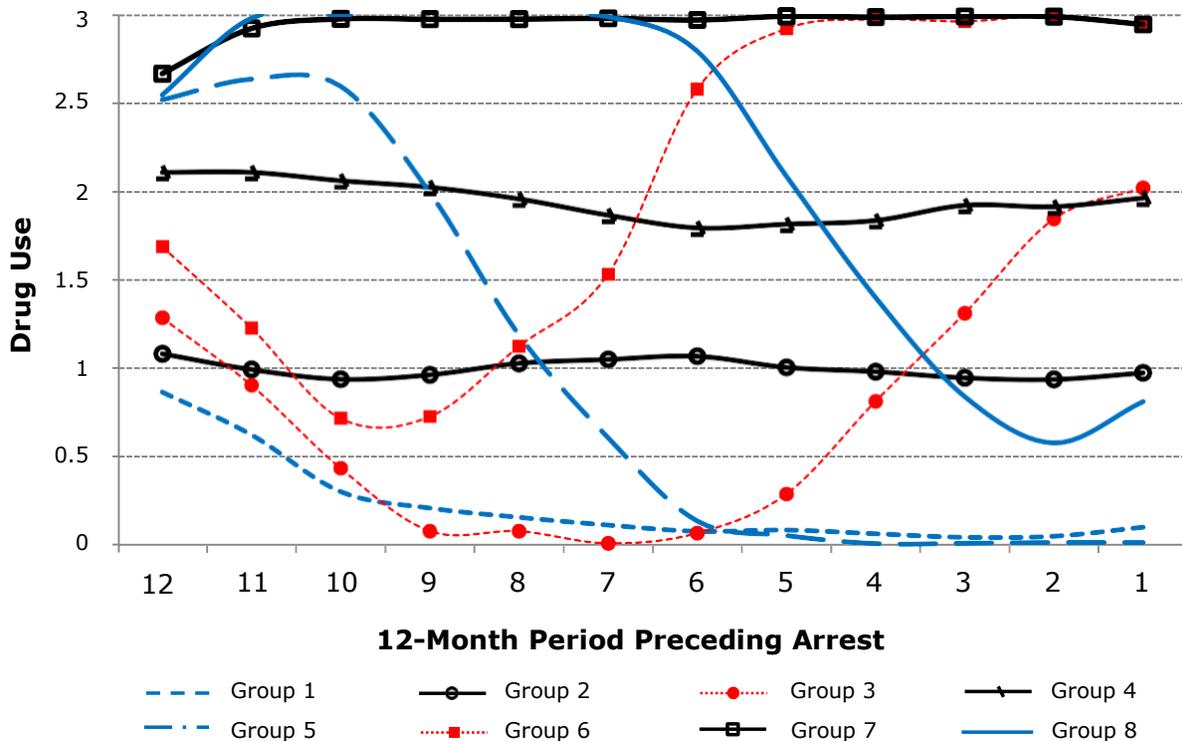
Figure 2 presents the results of the trajectory group analysis. (Figures 3, 4, and 5 present the same results, but highlight groups according to one of three trajectory shapes: "stable," "declining" and "escalating.") A total of eight trajectory groups emerged from the calendar data. Three of these groups (#2, #4, #7; see Figure 3) demonstrated considerable stability in their level of crack cocaine use in the year preceding arrest, and comprised approximately 61 percent of the total sample (28%, 14% and 19%, respectively). Members of Group #2 used crack cocaine at a rate of 1-7 days per month; members of Group #4 reported using between 8-12 days per month; and members of Group #7 consistently used crack cocaine anywhere from 13 to 30 days out of each month.

Figure 3. Crack Cocaine Trajectory Groups: Stable Trajectory Groups
Male Arrestees (n = 3,801)
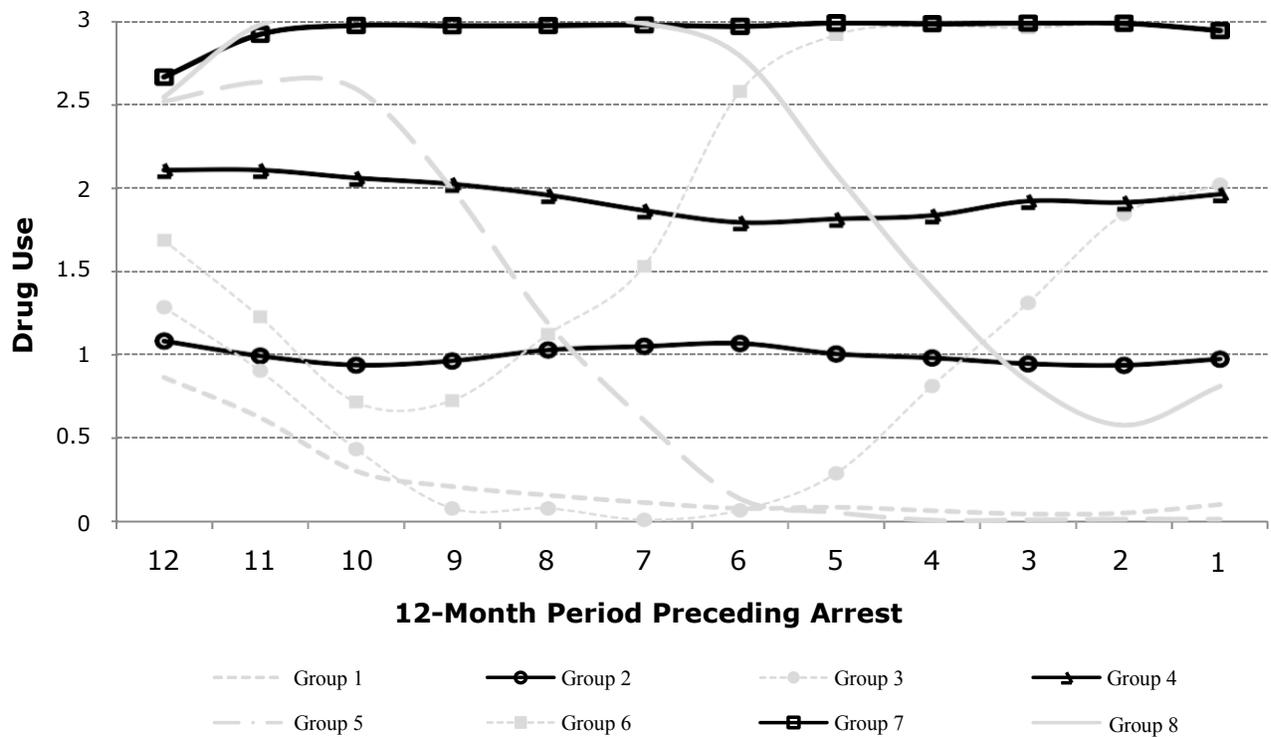
Three additional groups (#1, #5, #8; see Figure 4, next page) demonstrated declining trajectories over the one year period prior to arrest. Members of Group #1, which was the largest of these three groups (23% of the sample), began the year using crack cocaine 1-7 days per month but quickly desisted. Group #5 on the other hand (5% of sample), began the year using crack cocaine at pace of nearly every other day, and Group #8 reported using even more frequently than that. Approximately 10 months prior to arrest, Group #5 members' use levels decline to near-zero very rapidly, converging with Group #1 desisters approximately 5 months prior to arrest. In contrast, Group #8 users (3% of sample) persisted using at a rate of at least 13 days out of every month until roughly six months prior to arrest. At that point they, too, initiated a rapid desistance process. At two months prior to arrest, members of Group #8 were using at a rate of less than one day a week; their use level rebounded to roughly one day a week during the last month, when they were arrested. These groups constituted slightly less than a third of the sample (23%, 5%, and 3% respectively).

Figure 4. Crack Cocaine Trajectory Groups: Declining Trajectory Groups
Male Arrestees (n = 3,801)

Finally, two groups of respondents demonstrated dramatic escalations in crack cocaine use in the months leading up to their arrest (see Figure 5, next page): Group #3 (4% of sample) and Group #6 (3% of sample). Both groups began the year using crack cocaine approximately 6- 9 days per month, and then declined rapidly. Roughly nine months prior to their arrest, Group #6 members' use levels began an equally rapid ascent, using at a frequency of at least 13 days per month roughly four months prior to arrest. The use levels of Group #3 members also increased rapidly, but the increase began about three months later than that of Group #6 and peaked at a significantly reduced use level, between 8-12 days per month.

These results reveal that there is, in fact, considerable heterogeneity in the use trajectories of adult male arrestees who use crack cocaine. Put another way, these data show that crack cocaine use provides multiple pathways to arrest and jail. The findings presented above also suggest that there are three major groups of crack cocaine users: (1) those that used at a consistent level over time, at varying intensities; (2) those whose use was on the wane prior arrest; and (3) those that dramatically escalated the frequency of their use in the weeks and months prior to arrest.

Figure 5. Crack Cocaine Trajectory Groups: Escalating Trajectory Groups
Male Arrestees (n = 3,801)

Table 1 presents results from the second stage of the analysis, the construction of demographic and behavioral profiles of crack use trajectory groups. The intent of this analysis is to offer at least a preliminary answer to the question, "Do members of these trajectory groups differ in measurable ways?" The answer is "Yes."

These data show that members of the "stable" trajectory groups, particularly those in Group #2 and Group #4, are notably older than crack users with escalating or desisting trajectories. Members of the stable crack trajectory groups are also disproportionately Black/African American. Members of trajectory Group #7, which were those that used crack most heavily, are also disproportionately unemployed and homeless. Notably, unemployment and homelessness were also concentrated among the two groups of "desisting" crack cocaine users who reported heavy use for at least a portion of the preceding year (Group #5 and Group #8). Other than the higher-than-average number of Black/African American members, members of the "escalating" groups were not markedly different from crack cocaine users in general – a finding that may, in itself, be notable. Lastly, results of the social-demographic profile analysis show that education and marital status do not differ between any of the eight trajectory groups.

Table 1. Socio-demographic, Current Charge, and Other Drug Use Behaviors
by Crack Cocaine Trajectory Groups

		STABLE GROUPS			ESCALATING GROUPS		DESISTING GROUPS		
Characteristics	**Total**	#2	#4	#7	#3	#6	#1	#5	#8
Age (mean)	36.3	55.1	56.1	38.1	34.0	36.3	34.2	36.0	36.3
Black/Af. American (%)	48.2	44.8	63.1	64.0	48.7	53.5	30.0	46.8	45.6
Unemployed (%)	38.7	32.5	38.2	47.5	38.7	42.6	36.7	44.8	43.9
Homeless last month (%)	16.8	13.7	15.0	22.3	11.3	16.4	16.1	22.2	21.9
Divorced/Separated (%)	24.1	25.2	20.5	25.7	24.0	25.4	24.0	22.3	23.7
L/T High School (%)	28.8	29.6	30.1	30.6	23.3	32.0	27.1	23.2	29.8
Current Charges									
Any felonies (%)	46.5	42.7	48.3	47.0	52.7	48.4	44.7	51.6	65.8
Any misdemeanors (%)	56.2	58.9	54.0	56.0	48.7	50.0	59.3	50.0	46.5
Any violent offenses (%)	16.7	18.2	15.0	12.8	14.7	15.6	19.2	18.6	16.7
Any property offenses (%)	24.4	18.9	28.6	27.6	26.0	28.7	22.4	32.0	29.8
Any drug offenses (%)	29.0	28.1	32.9	33.1	28.0	26.2	25.3	25.3	29.8
Any order maint. off. (%)	12.1	13.7	12.6	12.9	12.7	7.4	10.4	9.8	10.5
Any Prob/Parole viol. (%)	7.7	6.1	5.8	5.1	10.7	8.2	11.1	11.3	10.5
Other Drug Use									
Teen onset (%)	25.7	24.7	21.9	24.9	36.0	26.2	29.3	23.7	21.0
At-risk: Dependence (%)	78.7	72.8	82.9	89.3	87.3	85.8	68.1	89.6	92.1
Positive U/A: Cocaine (%)	76.4	69.8	89.1	92.4	72.8	74.6	58.0	90.8	92.7

Additional differences emerge upon examination of the charges leveled against members of each trajectory group. Charging differences are clustered among arrestees with desisting trajectories of crack use, in particular. Members of Group #5 and Group #8 were arrested at markedly higher rates for felonies and property crimes, but lower-than-average rates of misdemeanors. It also appears that those with declining rates of crack cocaine use were more likely to be jailed for probation or parole violations. Arrestees who were members of the two escalating trajectory groups were less likely than others to be jailed for misdemeanors; members of Group #3 were more likely to be charged with one or more felonies. Members of Group #6 were much less likely than others to be arrested for order maintenance offenses. Notably, arrestees in the three stable trajectory groups did not display distinct offending patterns. Also of note, trajectory group membership appears to be unrelated to the probability that an individual was arrested for violent or drug offenses.

The last set of variables examined included age of onset, risk of drug dependence and a positive urinalysis result for cocaine. In general, there was little variation in age of onset across drug use trajectory groups. The one exception was for members of Group #3, who were much older than others, on average, when they began using crack cocaine. Disproportionate numbers of this group, along with members of Group #5, Group #6, Group #7 and Group #8 displayed behaviors indicating an elevated risk of drug dependence. The notable exception to this trend was Group #1. Large majorities of every trajectory group tested positive for cocaine. That being said, distinguishable patterns emerged. Group #4 and Group #7, the two stable trajectory groups with the highest average use levels, were more likely to test positive. Likewise, the two desisting trajectory groups that started out with high use levels at the beginning of the year (Group #5 and Group #8) were also more likely to return a positive urinalysis for cocaine. In contrast, members of Group #1 and Group #2 were much less likely to test positive. Both escalating trajectory groups had average rates of positive urinalysis results.

Summary

The analyses presented above demonstrate one way data from the ADAM drug use calendar can be used to advance our understanding of the relationship between drug use (crack cocaine, specifically) and crime. These data enable researchers to approach the study of the drug use–crime connection in a different way. By analyzing drug use as a dynamic process that evolves over time, researchers can go beyond the limitations of traditional correlational analyses and begin examining the ways in which broader patterns of drug use influence the nature of criminal offending.

Results show that there is substantial heterogeneity in crack cocaine use levels among adult male arrestees in the year preceding arrest, that individual use trajectories cluster into distinctive trajectory groups, and that there are a variety of drug use trajectory groups in the population of crack users who are arrested and booked into local jails. The analysis also revealed that the eight distinct drug use

trajectory groups fell under three umbrella categories: (1) those whose crack cocaine use level remained relatively constant over the entire year preceding arrest, although at different levels; (2) those whose crack cocaine use level declined in the months leading up to their arrest; and (3) those whose crack cocaine use escalated dramatically in the weeks and months prior to arrest. These findings suggests that it may be inappropriate to apply overly simple, binary distinctions such as "user" and "non-user," as the developmental patterns of drug use are highly variable and complex.

This analysis also suggests that there may be social and demographic factors that influence the probability that an arrestee will fall into a distinct cocaine use trajectory group. Factors such as age, race, unemployment and homelessness were all found to be associated with membership in certain trajectory groups. Developmental patterns of crack cocaine use were also found to be associated with the types of charges filed against arrestees, as well as risk of drug dependence and probability of testing positive for cocaine.

References

Elliott, D.S., Huizinga, D., & Menard, S. (1989). *Multiple Problem Youth: Delinquency, Substance Use, and Mental Health Problems*. New York: Springer-Verlag.

Fitzpatrick, K.M., & Myrstol, B. (2011). The jailing of America's homeless: Evaluating the rabble management thesis. *Crime & Delinquency, 57,* 271-297.

Huizinga, D., Menard, S., & Elliott, D.S. (1989). Delinquency and drug use: Temporal and developmental patterns. *Justice Quarterly, 6,* 419-455.

Irwin, J. (1985). *The Jail: Managing the Underclass in American Society*. Berkeley, CA: University of California Press.

Menard, S., Mihalic, S., & Huizinga, D. (2001). Drugs and crime revisited. *Justice Quarterly, 18,* 269-299.

Nagin, D.S. (1999). Analyzing developmental trajectories: A semiparametric, group-based approach. *Psychological Methods, 4,* 139-157.

Nagin, D.S. (2005). *Group-based Modeling of Development*. Cambridge, MA: Harvard University Press.

Arrestees' Drug Use Trajectories

Using the **ADAM** Drug Use Calendar to Model Patterns of Illicit Drug Use

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Toward a developmental perspective

THE DRUG–CRIME CONNECTION

UAA Justice Center
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Drug Use – Criminal Behavior

- Robust association between drug use and crime
- How do we explain the association?
  1. Drug use causes crime
  2. Crime causes drug use
  3. Drug use–crime correlation is spurious

  4. Drug use–crime mutually reinforcing

- At a minimum >>> complex relationship

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Developmental Trajectories

- Great deal of drug use–crime research is correlational
  - Cross-sectional, binary indicators of use correlated with criminal behavior
    - Prior drug use (ever, past-year, past-month)
    - Intoxication (under the influence when offense occurred)
- Phenomena don't just "happen" all of a sudden
  - Most social, behavioral, biological processes **evolve over time** (Nagin, 2005)
- Developmental approach conceptualizes drug use in terms of an evolving pattern of behavior
  - Examine the relationship between <u>developmental of drug use</u> and criminal offending, not drug use per se

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Adult male crack cocaine users

AN EXAMPLE

Data

- Arrestee Drug Abuse Monitoring program (2000)
  - 35 sites (26 states + D.C.)
  - **Adult Males** (n=21,161)
    - "Ever used CRACK COCAINE?"
      - 32.7% (n=7,160) "Yes"
    - "Used CRACK COCAINE in past 12 months?"
      - 19.7% (n=4,170) "Yes"
    - Level of use, each month, past 12 months
      - Values: 0-3
      - Cases with missing values dropped
      - 17.9% (n=3,801) of adult male sample
        - » 53.1% of male arrestees who have used crack cocaine in lifetime
        - » 91% of male arrestees who have used crack cocaine past year

[LABEL			CALENDAR												
			12	11	10	9	8	7	6	5	4	3	2	1	
HOLIDAYS															
BIRTHDAYS															
OTHER EVENTS															
HOUSING STATUS			H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11		
IN-PATIENT		T1	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16 T17
OUT-PATIENT		T2	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27	T28	T29	T30 T31
MENTAL HEALTH		T3	T32	T33	T34	T35	T36	T37	T38	T39	T40	T41	T42	T43	T44 T45
ARREST		C1	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
JAIL PRISON		C2	C16	C17	C18	C19	C20	C21	C22	C23	C24	C25	C26	C27	C28
ALCOHOL	S1	S2	S3	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	**LEVELS**
MARIJUANA	S4	S5	S6	S33	S34	S35	S36	S37	S38	S39	S40	S41	S42	S43	**ALCOHOL** (5+ drinks/day)
CRACK/ROCK COCAINE	S7	S8	S9	S44	S45	S46	S47	S48	S49	S50	S51	S52	S53	S54	**DRUGS** (any use)
POWDER COCAINE	S10	S11	S12	S55	S56	S57	S58	S59	S60	S61	S62	S63	S64	S65	0 = NONE
HEROINE	S13	S14	S15	S66	S67	S68	S69	S70	S71	S72	S73	S74	S75	S76	1= 1day/wk (1-7 days/mo)
METHAMPHETAMINE	S16	S17	S18	S77	S78	S79	S80	S81	S82	S83	S84	S85	S86	S87	2= 2-3 days/wk (8-12 days/mo)
OTHER DRUG	S19	S20	S21	S88	S89	S90	S91	S92	S93	S94	S95	S96	S97	S98	3= >3 days/wk (13-30 days/mo)

S20a: [SPECIFY OTHER DRUG]
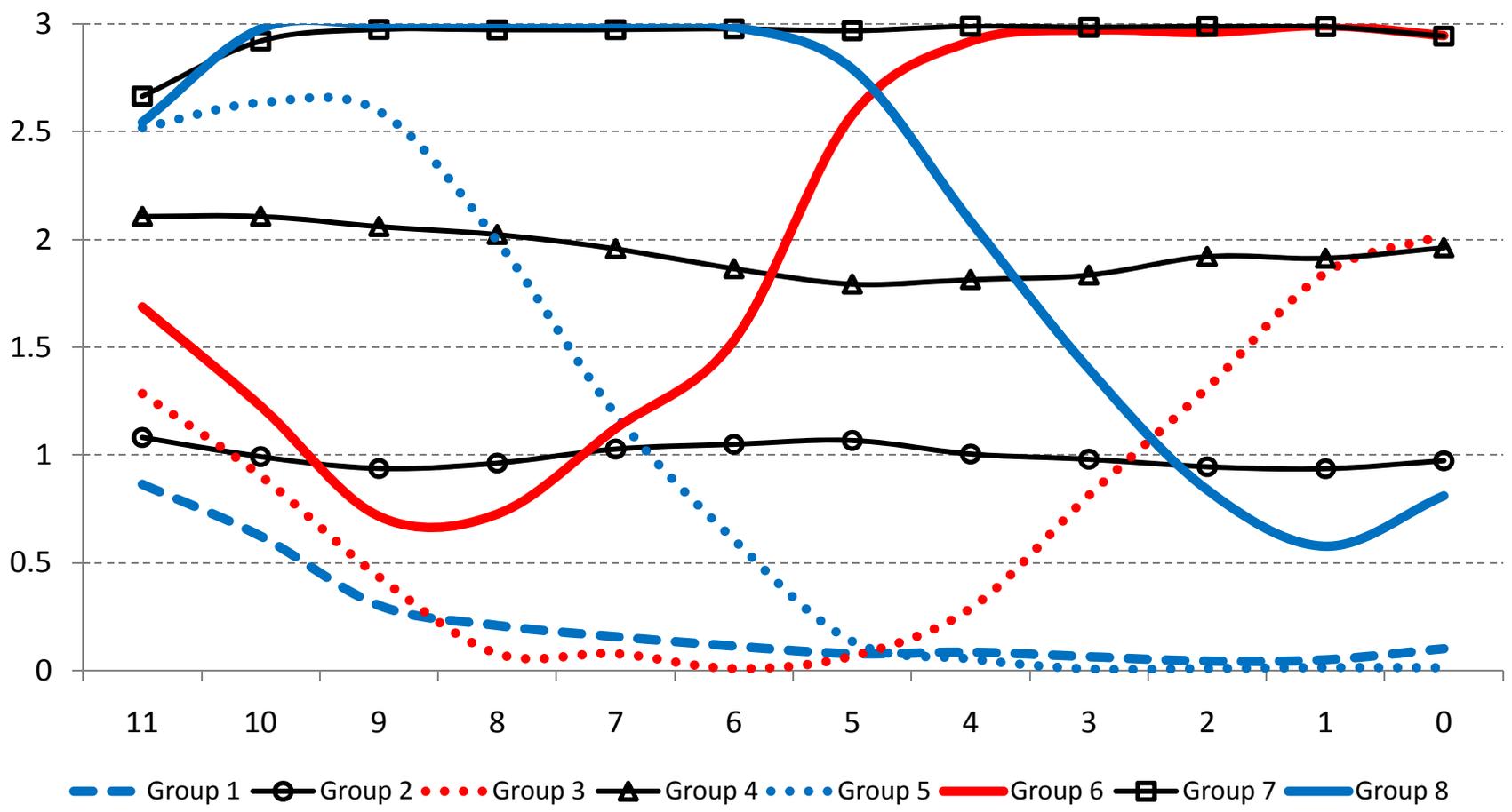
Drug Use Trajectories of Male Arrestees
Crack Cocaine

Drug Use Trajectories of Male Arrestees
Crack Cocaine

Group 1   Group 2   Group 3   Group 4   Group 5   Group 6   Group 7   Group 8

28.0%   14.1%   19.5%

9

Drug Use Trajectories of Male Arrestees
Crack Cocaine

Group 1   Group 2   Group 3   Group 4   Group 5   Group 6   Group 7   Group 8

4.0%   3.2%

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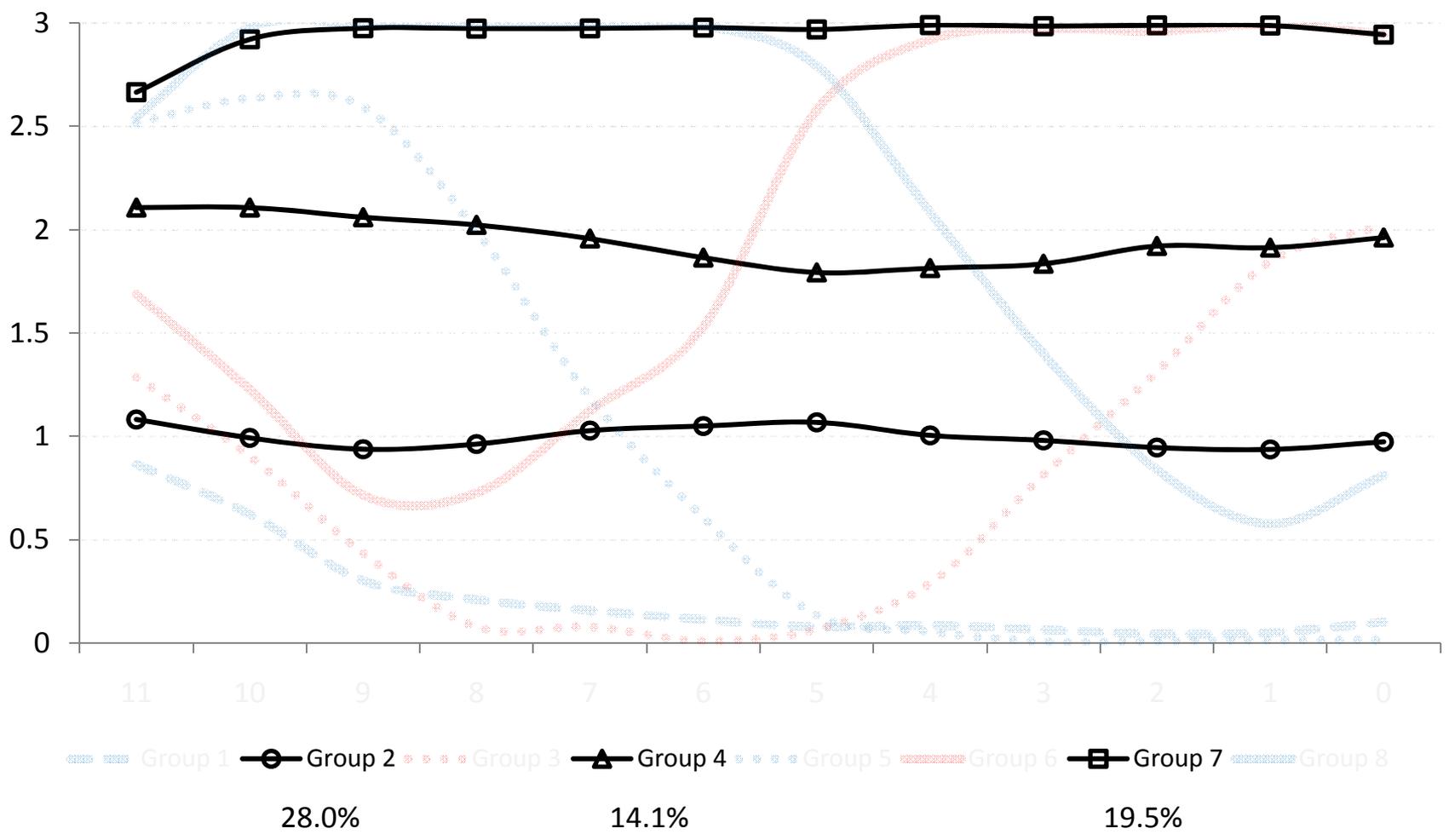
Drug Use Trajectories of Male Arrestees
Crack Cocaine
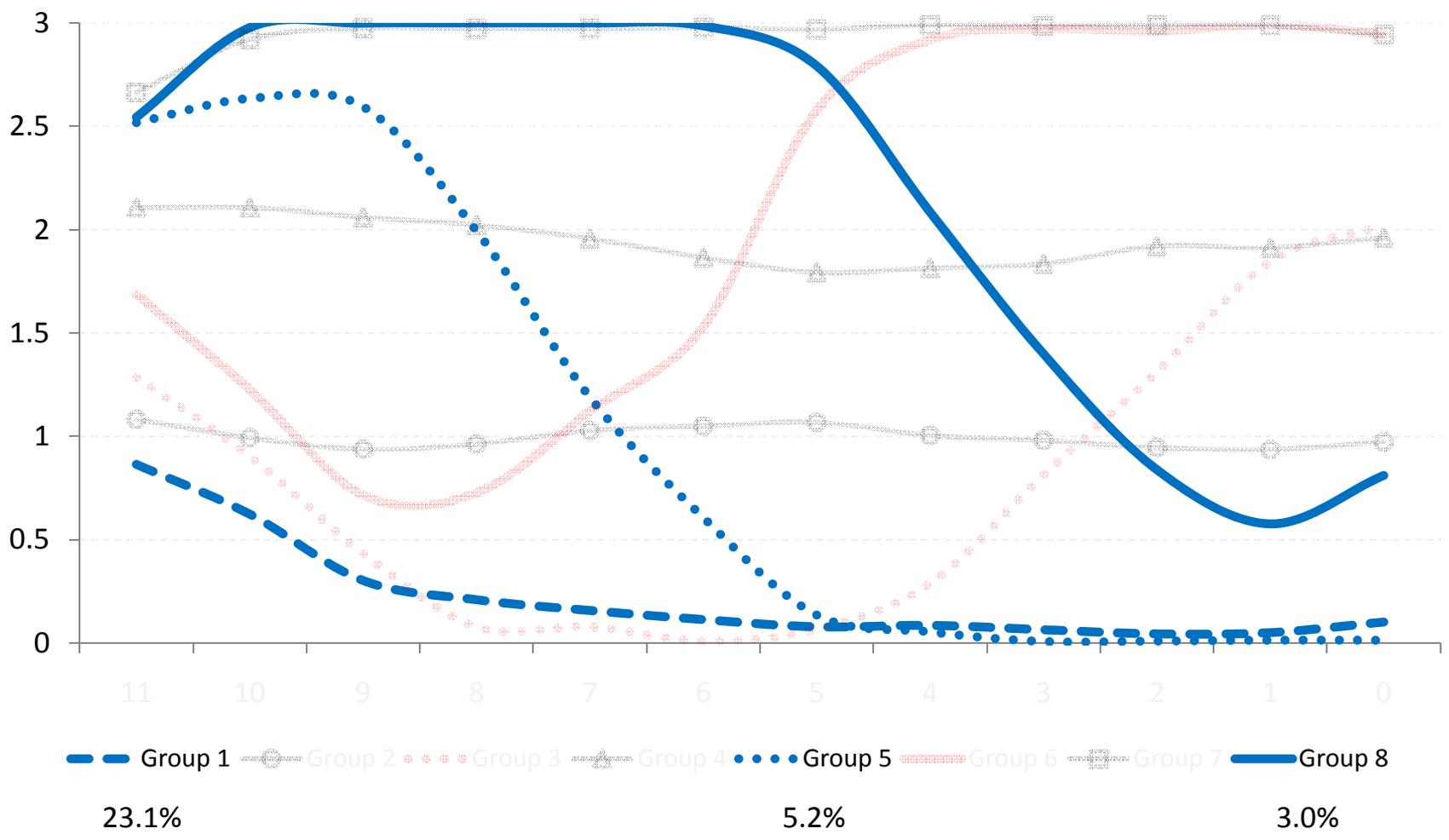
Socio-Demographic Profiles
Trajectory Group Members

CHARACTERISTICS	TOTAL	Stable Groups			Escalating Groups		Desisting Groups		
		#2	#4	#7	#3	#6	#1	#5	#8
Age (mean)	36.3	55.1	56.1	38.1	34.0	36.3	34.2	36.0	36.3
Black/Af. Amer. (%)	48.2	44.8	63.1	64.0	48.7	53.5	30.0	46.8	45.6
Unemployed (%)	38.7	32.5	38.2	47.5	38.7	42.6	36.7	44.8	43.9
Homeless (%)	16.8	13.7	15.0	22.3	11.3	16.4	16.1	22.2	21.9
Div./Sep. (%)	24.1	25.2	20.5	25.7	24.0	25.4	24.0	22.3	23.7
L/T High School (%)	28.8	29.6	30.1	30.6	23.3	32.0	27.1	23.2	29.8

Offending Profiles
Trajectory Group Members

CHARACTERISTICS	TOTAL	Stable Groups			Escalating Groups		Desisting Groups		
		#2	#4	#7	#3	#6	#1	#5	#8
Felonies (%)	46.5	42.7	48.3	47.0	52.7	48.4	44.7	51.6	65.8
Misdemeanors (%)	56.2	58.9	54.0	56.0	48.7	50.0	59.3	50.0	46.5
Violent (%)	16.7	18.2	15.0	12.8	14.7	15.6	19.2	18.6	16.7
Property (%)	24.4	18.9	28.6	27.6	26.0	28.7	22.4	32.0	29.8
Drug (%)	29.0	28.1	32.9	33.1	28.0	26.2	25.3	25.3	29.8
Order Maint. (%)	12.1	13.7	12.6	12.9	12.7	7.4	10.4	9.8	10.5
Pro./Par. violation (%)	7.7	6.1	5.8	5.1	10.7	8.2	11.1	11.3	10.5

Drug Use Behavior Profiles
Trajectory Group Members

CHARACTERISTICS	TOTAL	Stable Groups			Escalating Groups			Desisting Groups		
Teen onset (%)	25.7			24.9	36.0					
Dependence (%)	78.7			89.3	87.3	85.8	68.1	89.6	92.1	
Positive U/A (%)	76.4	69.8	89.1	92.4	72.8		58.0	90.8	92.7	

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Paper — Assessing Dependence, Comorbidity, and Trauma

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Importance of Jail Screening for Mental and Substance Use Disorders

An increasing number of persons in jails have mental and/or substance use disorders. The most recent study of mental disorders in jails (Steadman et al., 2009) indicates that 15% of males and 31% of females have a major mental disorder – rates far surpassing those in the general population. Approximately three quarters of offenders have a diagnosable substance abuse or dependence disorder (Bureau of Justice Statistics, 2006; Peters et al., 1998). Given these findings, 10% of male inmates and 20% of female inmates in jail are estimated to have co-occurring mental and substance use disorders (CODs). A significant number of inmates also have a history of trauma related to past sexual, physical, or emotional abuse (Lewis, 2006; Zlotnick et al., 2008), and prevalence rates of trauma and Post-Traumatic Stress Disorder (PTSD) are significantly higher among inmates than in the general population (Steadman et al., 2009).

The presence of mental disorders or CODs among jail inmates increases the risk for subsequent arrest (Monahan et al., 2001, 2005). Once arrested, these inmates are more likely to be incarcerated, remain in jail significantly longer than other offenders (Bureau of Justice Assistance, 2006; Peters, Sherman, & Osher, 2008), and to rapidly cycle between the justice system and other social service systems. Persons exiting jails with mental disorders and CODs have high rates of homelessness, hospitalization, medical problems, relapse to substance abuse, suicide, and difficulties related to transportation and financial/social supports (Chandler et al, 2004; Osher, 2006; Peters & Bekman, 2007). This population also experiences poor outcomes in traditional mental health and substance abuse treatment services, and often requires specialized treatment and supervision (Sacks et al., 2004; Sacks & Ries, 2005).

Early identification of inmates with mental disorders, trauma history, and CODs is necessary to provide effective triage to specialized services in jails and prisons and to provide successful reintegration to the community. Screening and assessment can help to stabilize psychiatric symptoms, reduce behavioral problems in jail and prison, identify treatment and other service needs to be addressed at the time of pre-trial release and sentencing, and to establish eligibility for jail diversion programs (Osher, Steadman, & Barr, 2003). Screening and assessment are also essential to reentry planning that occurs during incarceration (Peters & Bekman, 2007). Without early identification while in jail, inmates with mental disorders and CODs are unlikely to engage in treatment services following release from custody, and are more likely to relapse to drugs or alcohol, and to experience recurrence of psychiatric symptoms and criminal recidivism. Failure to identify prior trauma can lead to inappropriate diagnosis and services, and can also undermine involvement in treatment, supervision, and reentry planning.

Content of Screening for Mental and Substance Use Disorders

The ADAM II data collection protocol features a 20-25 minute interview and a voluntary drug screen for 10 different substances (Office of National Drug Control Policy, 2009). The interview includes queries for drug use in the past year and in the past month, days per month of drug use during the past year, injection of drugs, place of drug purchase, and

method of transaction for drug purchases. Interview queries also address lifetime and past year involvement in drug treatment and mental health treatment, and "nights" of treatment during the last year. A drug use calendar is administered to all respondents who report illicit drug use in the past year. This approach uses milestone events in the respondent's history as anchors to collect data on substance abuse, criminal justice involvement, participation in treatment services, and housing.

While the existing ADAM interview is relevant and useful, several additional content areas should be considered for inclusion in a newly configured Offender Drug Abuse Monitoring (ODAM) data collection protocol to more comprehensively address mental health and substance abuse issues. This data (new content items are described in the following section) would provide potentially valuable insights regarding the severity of mental health and substance abuse problems among U.S. inmate populations, and may have significant implications for policy and practice related to behavioral health services in jails and prisons, reentry planning services, and community-based services for offenders. Specifically, this new mental health screening data would address the need for screening and assessment, acute care (e.g., suicide prevention), psychotropic medications/psychiatric consultation, and for intensive mental health services in correctional and community-based (e.g., reentry/ diversion) settings. In addition, the new substance abuse screening data would address the need for screening and assessment and for intensive substance abuse services in correctional and community-based settings.

The combined set of new items would also allow for analysis of the interaction of substance abuse and mental health problems over the course of the previous year; and trajectories of mental health treatment, substance abuse treatment, and arrest during this period as they're affected by drug/alcohol use, psychotropic medication use, peak(s) in mental health problem severity and in substance abuse problem severity, and participation in various types of other treatment services. Augmented screening items would also allow for examination of the relationship between mental health problem severity and type of substances used during the past 3 years, and accuracy in self-reporting substance abuse by mental health problem severity and substance abuse problem severity,

The following new content areas are recommended for inclusion in the ODAM data collection protocol, while recognizing the limited time availability for data collection at participating jail sites:

- Severity of mental health problems

- History of suicidal behavior, including recent suicidal thoughts and behavior

- History of psychotropic medication use (past, current)

- Other collateral indicators of mental health treatment needs (e.g., from friends or family)

- Current symptoms of trauma and PTSD

- Dates of involvement in mental health treatment during the past year (e.g., admission dates and length of participation), periods of psychotropic medication use during the past year, and point(s) of peak mental health problems

- Severity of substance abuse problems

- Other collateral indicators of substance abuse treatment needs (e.g., from friends or family)

- Dates of involvement in substance abuse treatment during the past year (e.g., admission dates and length of participation), and point(s) of peak substance abuse problems.

To enhance the accuracy of ODAM data, queries related to mental health problems should be staged to follow the compilation of other less intrusive information (e.g., substance abuse problems; Peters, Bartoi, & Sherman, 2008). Information related to mental disorders, trauma, and substance use disorders may be compiled through interview and/or self-administered screening instruments. Most screening instruments may also be administered via computer. The rationale for addressing each of the new content areas in the ODAM data collection protocol is discussed in the following sections, which also provide recommendations for data collection procedures and specific screening instruments.

Recommendations for Augmented Screening of Mental Disorders

The ODAM data collection protocol would benefit from a measure of <u>mental health problem severity</u>. This information would more accurately describe inmates' mental health treatment needs along a problem severity continuum (e.g., mild, moderate, severe) and would supplement existing information related to the history of mental health treatment. A brief objective screening instrument would be the most efficient method of gathering mental health problem severity information, and one of the following instruments is recommended for this purpose:

- *Brief Jail Mental Health Screen* (BJMHS; Steadman et al., 2005; 2007): An 8-item public domain screen examining current symptoms of major mental disorders, current medication use, and lifetime history of psychiatric hospitalization; and requiring approximately 3-5 minutes to administer.

- *Mental Health Screening Form-III* (MHSF-III; Carroll & McGinley, 2001): An 18-item public domain screen that examines current and past symptoms of major mental disorders, and requires approximately 15 minutes to administer.

Both instruments can be self-administered or provided during an interview, and yield an easily interpretable score on a continuous numerical scale. Thresholds or 'cut-off' scores are available which signify high severity of mental health problems. The BJMHS and MHSF have very acceptable psychometric properties for use with offender populations.

Augmented mental health screening should also include queries (administered either by self-report or interview) for <u>history of past and current suicidal behavior</u> and for <u>past and current use of psychotropic medication</u>. This information would help to determine the need for acute mental health care needs in jails, prisons, and community/reentry settings. Use of psychotropic medications is a frequently used proxy to estimate the prevalence of mental disorder, when a formal diagnostic assessment is not conducted. One supplementary indicator of mental health problem severity and need for treatment would consist of a probe (administered either by self-report or interview) asking whether <u>friends or family have ever indicated that the person needed mental health treatment</u>.

Another recommended area for augmented mental health screening is <u>current symptoms of trauma and PTSD</u>. This information is highly relevant in identifying needs for specialized (e.g., gender-specific) mental health services in jails and prison, and for triage to services and supervision during community reentry. A brief objective screening instrument would be the most efficient method of gathering information related to trauma and PTSD, and one of the following instruments is recommended for this purpose:

- *Primary Care PTSD Screen* (PC-PTSD; Prins et al., 2004): A 4-item public domain screen developed for use in primary health care settings and the VA system. This instrument examines symptoms of PTSD in the past month and requires approximately 2 minutes to administer.

- *PTSD Checklist – Civilian Version* (PCL-C; Weathers et al., 1991): A 17-item screen for diagnostic symptoms of PTSD. The PCL-C examines symptoms occurring in the past month that are commonly experienced in response to stressful life events, and requires approximately 8-10 minutes to administer.

Both instruments can be self-administered or provided during an interview, yield an easily interpretable score on a continuous numerical scale, provide threshold or 'cut-off' scores signifying high severity of trauma/PTSD symptoms, and have very acceptable psychometric properties.

A final recommendation for enhancing screening of mental disorders is to incorporate several new mental health items within the drug use calendar interview. Using specific anchors (e.g., holidays, birthdays) within the existing calendaring approach implemented to assess drug use, the interview would assess <u>dates of involvement in outpatient and inpatient mental health treatment</u> during the past year. This would yield an estimate of the duration of treatment and start and end dates of treatment. The calendaring interview would also identify <u>'peak' periods of mental health problem severity</u> during the past year, and beginning and ending dates of <u>psychotropic medication use</u>.

Recommendations for Augmented Screening of Substance Use Disorders

The ODAM data collection protocol would benefit from a measure of <u>substance abuse problem severity</u>. This information would more accurately describe inmates' substance abuse treatment needs along a problem severity continuum (e.g., mild, moderate, severe) and would supplement existing information related to the history of drug treatment. A brief objective screening instrument would be the most efficient method of gathering mental health problem severity information, and one of the following instruments is recommended for this purpose:

- *Simple Screening Instrument* (SSI; Center for Substance Abuse Treatment, 1994): A 16-item public domain screen that examines symptoms of substance dependence experienced during the past 6 months, and that requires approximately 5-10 minutes to administer.

- *Texas Christian University Drug Screen-II* (TCUDS-II; Simpson & Knight, 1998): A 15-item public domain screen that examines substance dependence within the past 12 months, based on the DSM diagnostic criteria. The TCUDS-II includes probes for frequency of substance use, history of treatment, substance dependence, and motivation for treatment; and requires approximately 5-10 minutes to administer.

Both instruments can be self-administered or provided during an interview, and yield an easily interpretable score on a continuous numerical scale. Thresholds or 'cut-off' scores are available which signify high severity of substance use problems. The TCUDS-II and SSI have very acceptable psychometric properties for use with offender populations, and were found to be the most effective among several comparable screens used to detect substance use disorders among offenders (Peters et al., 1998).

One supplementary indicator of substance abuse problem severity and need for treatment would consist of a probe (administered either by self-report or interview) asking whether friends or family have ever indicated that the person needed substance abuse treatment.

A final recommendation for enhancing screening of substance use disorders is to incorporate several new items within the drug use calendar interview. Using specific anchors (e.g., holidays, birthdays) within the existing calendaring approach implemented to assess drug use, the interview would assess dates of involvement in substance abuse treatment (outpatient, inpatient) during the past year. This would yield an estimate of the duration of treatment and start and end dates of treatment. The calendaring interview would also identify 'peak' periods of substance abuse problem severity during the past year.

References

Bureau of Justice Statistics. (2006). Special report: *Mental Health Problems of Prison and Jail Inmates*. Washington, DC: U.S. Department of Justice.

Carroll, J.F., & McGinley, J.J. (2001). A screening form for identifying mental health problems in alcohol/other drug dependent persons. *Alcoholism Treatment Quarterly*, *19*(4), 33-47.

Center for Substance Abuse Treatment. (1994). *Simple Screening Instruments for Outreach for Alcohol and other Drug Abuse and Infectious Diseases*. Treatment Improvement Protocol (TIP) Series, #11. Rockville, MD: U.S. Department of Health and Human Services.

Chandler, R.K., Peters, R.H., Field, G., & Juliano-Bult, D. (2004). Challenges in implementing evidence-based treatment practices for co-occurring disorders in the criminal justice system. *Behavioral Sciences and the Law*, *22*(4), 431-448.

Lewis, C. (2006). Treating incarcerated women: Gender matters. *Psychiatric Clinics of North America*, *29*(3), 773-789.

Monahan, J., Steadman, H., Robbins, P., Appelbaum, P., Banks, S., Grisso, T., Heilbrun, K., Mulvey, E., Roth, L., & Silver, E. (2005). An actuarial model of violence risk assessment for persons with mental disorders. *Psychiatric Services*, *56*(7), 810-815.

Monahan, J., Steadman, H., Silver, E., Appelbaum, P., Robbins, P., Mulvey, E., Roth, L., Grisso, T., & Banks, S. (2001). *Rethinking Risk Assessment: The MacArthur Study of Mental Disorder and Violence*. New York: Oxford University Press.

Office of National Drug Control Policy. (2009). *ADAM II: 2008 Annual Report*. Washington, DC.

Osher, F.C. (2006). *Integrating Mental Health/Substance Abuse Services for Justice-Involved Persons with Co-occurring Disorders.* Delmar, NY: National GAINS Center.

Osher, F., Steadman, H.J., & Barr, H. (2003). A best practice approach to community reentry from jails for inmates with co-occurring disorders: The APIC model. *Crime and Delinquency*, *49*(1), 79-96.

Peters, R.H., Bartoi, M.G., & Sherman, P.B. (2008). *Screening and Assessment of Co-occurring Disorders in the Justice System*. Delmar, NY: The National GAINS Center.

Peters, R.H., & Bekman, N.M. (2007). Treatment and reentry approaches for offenders with co-occurring disorders. In R.B. Greifinger, J. Bick, & J. Goldenson (Eds.), *Public Health Behind Bars: From Prisons to Communities* (pp. 368-384). New York: Springer Publishers.

Peters, R.H., Greenbaum, P.E., Edens, J.F., Carter, C.R., & Ortiz, M.M. (1998). Prevalence of DSM-IV substance abuse and dependence disorders among prison inmates. *American Journal of Drug and Alcohol Abuse*, *24*(4), 573-587.

Peters, R.H., Sherman, P.B. & Osher, F.C. (2008). Treatment in jails and prisons. In K.T. Mueser & D.V. Jeste (eds.), *Clinical Handbook of Schizophrenia* (pp. 354-364). New York: Guilford Press.

Prins, A., Ouimette, P., Kimerling, R., Cameron, R.P., Hugelshofer, D.S., Shaw-Hegwer, J., Thrailkill, A., Gusman, F.D., & Sheikh, J.I. (2004). The Primary Care PTSD Screen (PC–PTSD): Development and operating characteristics. *International Journal of Psychiatry in Clinical Practice, 9*(1), 9-14.

Sacks, S., & Ries, R.K. (eds.). (2005). *Substance Abuse Treatment for Persons with Co-occurring Disorders.* Center for Substance Abuse Treatment, Treatment Improvement Protocol (TIP) Series 42. DHHS Publication No. (SMA) 05-3922. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Sacks, S., Sacks, J.Y., McKendrick, K., Banks, S., & Stommel, J. (2004). Modified TC for MICA offenders: Crime outcomes. *Behavioral Sciences and the Law, 22*(4), 477-501.

Simpson, D.D., & Knight, K. (1998). *TCU data collection forms for correctional residential treatment.* Fort Worth: Texas Christian University, Institute of Behavioral Research. Available at http://www.ibr.tcu.edu.

Steadman, H.J, Osher, F.C., Robbins, P.C., Case, B., & Samuels, S. (2009). Prevalence of serious mental illness among jail inmates. *Psychiatric Services*, *60*(6), 761-765.

Steadman, H.J., Scott, J.E., Osher, F., Agnese, T.K., & Robbins, P.C. (2005). Validation of the Brief Jail Mental Health Screen. *Psychiatric Services, 56*(7), 816-822.

Steadman, H.J., Robbins, P.C., Islam, T., & Osher, F.C. (2007). Revalidating the Brief Jail Mental Health Screen to increase accuracy for women. *Psychiatric Services*, *58*(12), 1598-1601.

Weathers, F.W., Huska, J.A., & Keane, T.M. (1991). *PCL-C for DSM-IV.* Boston: National Center for PTSD, Behavioral Science Division.

Zlotnick, C., Clarke, J.G., Friedmann, P.D., Roberts, M.B., Sacks, S., & Melnick, G. (2008). Gender differences in comorbid disorders among offenders in prison substance abuse treatment programs. *Behavioral Sciences and the Law*, *26*(4), 403-412.

ADAM: Statistical Issues Related to Prevalence Estimates and Trends

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The Arrestee Drug Abuse Monitoring (ADAM) program is (A) a probability-based survey of (B) individuals[1] shortly after they were arrested and booked (C) during a purposively selected two-week period (D) within purposively selected counties throughout the United States. ADAM questions arrestees about drug use and related behaviors and obtains a bioassay used to test for recent drug use. ADAM data are used to estimate (1) prevalence and (2) trends in populations of interest. This briefing summarizes ADAM's sampling and estimation methodology. It also discusses some current and potential uses for ADAM data.

What Can ADAM Estimate?

From the above definition (D), ADAM produces local area estimates because the survey is done in purposively selected counties. This is not a limitation to the methodology because ADAM could randomly sample from an expanded number of counties leading to national probability-based estimates. In practice it would be difficult to sample in small counties because of costs and there may be an appreciable refusal rate in large counties because some sheriffs will deny admission to booking facilities.

From (C), ADAM samples from two-week periods. In the original version of ADAM (2000-2003), the sample was repeated quarterly, and in the current version (2007-), the sampling is biannual. The convention has been to treat the two-week period as if it had been selected randomly. Current estimation methodology annualizes (to account for possible yearly cycles in drug use) but does not account for sampling variation from week-to-week. In practice the days could be randomly selected, but this would be expensive and sheriffs may preclude interviewing during specific periods.

From (B), ADAM interviews individuals who are *booked*. Many suspects are arrested but not booked, and many are booked but not arrested, so the term *Arrestee* Drug Abuse Monitoring is potentially misleading. There is an advantage to surveying those who were recently booked, as a bioassay is confirmatory of recent drug use, and early identification of study subjects is more inclusive and less selective than a survey of suspects/offenders selected after the sieve of criminal justice processing. A disadvantage is that sampling and interviewing in booking facilities raises logistical problems.

From (A), ADAM is a random sample of arrestees booked within a county. The sample has been designed to minimize standard errors. It leads to probability-based estimates.

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[1] ADAM is a sample of bookings rather than individuals. We assume saying that this is a *sample of individuals* causes no confusion.

Sampling, Weighting and Estimation

This section discusses ADAM's sampling, weighting and estimation procedures. This discussion is short and intended to raise issues that might be discussed at greater length.

Sampling

Where necessary, ADAM samples booking facilities within a county. For many counties, there is a single booking facility, so sampling is unnecessary. In many other counties there are just a few booking facilities, so a stratified sample is practical. In some counties, there are many booking facilities, and ADAM is designed to use a stratified cluster sample. In practice, the stratified cluster sample was never fully implemented. It is difficult logistically when booking facilities are very small; costs are high when there are few bookings per interviewer; and with exceptions (i.e. Los Angeles) selection bias is likely small because the omitted booking facilities account for a small proportion of bookings.

Within each booking facility, interviewers work an eight-hour day that does not vary from day-to-day. More rigorous sampling plans (such as randomly selecting the eight-hour period) were rejected as impractical. Given the fixed eight-hour period, interviewers sample from the stock of offenders who were booked during the previous sixteen hour period (that is, between interviewer work shifts) and interviewers sample from a flow of offenders booked when interviewers are stationed at the booking facility. Sampling is proportional to size, and the sample is roughly balanced so that sampling probabilities fall within a narrow range.

The above describes an ideal. Given the nature of booking processes, arrestees are often unavailable for an interview, and of course some refuse to be interviewed. ADAM replaces arrestees who are unavailable or who refuse with nearest neighbors in booking time. It is sometimes necessary to modify the sampling design to sample at central booking facilities, which are jails that serve as collection points for suspects booked into local facilities and then transferred to the central facility for processing. Almost every ADAM sites requires special design considerations.

Weighting

Several weeks after the interviews have been completed, sheriffs provided a census of booking records. ADAM matches the interviews with the booking records providing a basis for poststratification.

The current version of ADAM uses the matched interviews/census data to estimate propensity scores. Propensity score estimation accounts for the major factors that explain variations in sampling probabilities: type of charge, resources available for interviewing relative to the size of the stock and flow, and so on. The inverse of the estimated propensity scores are treated as weights.

Comment on Weighting

The prevalence of drug use varies with factors that might affect sampling probabilities, including the charge. Therefore a convenience sample leads to biased estimates of drug

use. Probability-based sampling/estimation distinguishes ADAM from its predecessor: the Drug Use Forecasting (DUF) survey.

Some have noted that ADAM data lead to similar estimates whether the data are weighted or not weighted. The observation risks confusing an issue: Weighting does not make much difference because the ADAM sample is balanced. That is, given the sampling design, sampling probabilities and hence weights vary modestly. This is why weighted and not weighted estimates are so much alike.

However, this does not mean that sampling is irrelevant. Indeed, this assertion is demonstrably wrong because (1) offenders with serious charges are more likely to be available for interviewing, and (2) drug use varies with offense charge. A convenience sample would produce biased estimates. A *good* sampling design matters by providing a balanced sample.

Estimation

Simple estimation uses weights. For example, an analyst can estimate the proportion of the booking population who tested positive for cocaine. This would be a simple problem except that many study subjects either cannot provide a urine specimen or they refuse. ADAM uses imputation procedures based on Bayesian logic. At the core of this logic, almost all the respondents answer the question about recent drug use. Assuming that drug test results are missing at random conditional on reports of recent drug use, ADAM imputes drug test results and adjusts standard errors accordingly.

Trend estimation is more difficult. There are two problems. The first is that drug use behavior appears to follow yearly cycles in some counties. This is troublesome because the early ADAM data (2000-2003) are from four quarters per year while the later ADAM data (2007 -) are from two quarters per year. The second problem is that arrest, booking and processing practices change over time.[2] This is troublesome because trends in drug use get confounded with trends in arrest, booking and processing practices.
ADAM estimates regressions where test results are conditioned on charge, quarter and continuous time. Trend estimates hold charge and quarter constant.

ADAM reports refer to this process of conditioning as *annualization*, although from the above discussion the adjustments account for more than annual cycles. Annualization affects both prevalence estimates and trends. See the annual report for details. Estimation is further complicated by ONDCP instructions to fix past estimates when new estimates are reported. See the methodology report for an explanation.

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[2] Arrest practices sometimes change over time. An illustration is Giuliani's decision to have New York police arrest people for public order violations. Pretrial release practices change over time. An illustration is police gaining the authority to cite suspects without booking them. Consequently, the population surveyed by ADAM changes over time. This is of little consequence if the objective is literally to estimate prevalence and trends in drug use among arrestees, but it is important if the objective is to distinguish drug use per se from changes in administrative procedures.

Inferences from ADAM Data

Since 2007, ADAM has provided prevalence estimates and annualized yearly trends for drug use and other behaviors for the counties included in the ADAM program. See the annual report for details.

Generalizing ADAM to Broader Populations

Rhodes, Kling and Johnston (2007) have argued that ADAM generalized to a larger population of chronic drug users in the county. Although the methodology is complicated, the logic is simple. Let P_i represent the propensity score for the ith respondent in the ADAM survey. Then $1/P_i$ is a suitable weight for estimating prevalence for the two-week sampling period. Suppose there were two administrations of ADAM per year and that the two-week periods are representative of the bracketing six-month periods. Then a weight of $4/(52P_i)$ is a suitable weight for estimating the number of substance abusers in the arrestee population for the year. Finally let Q_i represent the predicted arrest rate during the past year for the ith respondent conditional on offender characteristics. Then $1/(52P_iQ_i)$ is a suitable weight for estimating the number of chronic substance abusers in the county. Of course, to apply this weighting scheme, an analyst requires an estimate of Q_i. Rhodes, Kling and Johnston (2007) provide details.

Therefore ADAM can be used to estimate the number of chronic drug users in a county. The estimate is model-based and not as neat as simple estimates from a probability-based survey. However, no one has yet devised a probability-based survey of the general population that provides an acceptable estimate of the prevalence of chronic drug abuse.

Using model-based procedures to estimate the number of chronic drug users in a county does not deal with the problem that the current version of ADAM is a purposeful sample of just ten counties, so an analyst cannot produce justifiable national estimates. However, this current limitation to ADAM could be eliminated with a larger probability-based sample of counties. The earlier version of ADAM had (at some time) forty-one large counties including some counties that paid for their own ADAM programs. Using the data from these large counties, we have used ratio-estimation procedures (by combining ADAM and TEDS data) to derive national estimates of the number of chronic drug users, how much they spend on drugs, and the total amount of drugs that they use. These estimates enter into two reports for the Office of National Drug Control Policy – one providing consumption-based estimates and the other providing supply-based estimates – that are currently being prepared for a general audience.

Using ADAM to Study Other Policy Questions

ADAM is referenced as a survey of drug use among arrestees, but it is more than a survey of drug use. The ADAM instrument was carefully crafted and tested to address other issues. Except for questions that the NSDUH asks marijuana users, ADAM is the only repeated survey that questions respondents about recent drug market behaviors: How much they spend on drugs, how they buy them, and so on. These estimates are central to ONDCP's estimates of expenditures, but furthermore, market-based questions

would seem to be an untapped source of intelligence for evaluating enforcement practices.

Although informed by other drug abuse research, ADAM's calendar is an innovative way to capture significant events that happened in the last year for a population that is repeatedly involved with the CJS. Significant events include arrests, treatment admissions, hospital admissions, homelessness, and so on. We used ADAM calendar data for a HRSE/HAB study that required understanding insurance among individuals with HIV/AIDS. Nevertheless, with some exceptions (including a discussion as part of this meeting), ADAM's calendar data are underutilized.

More importantly, perhaps, ADAM provides a research platform for studying other behaviors of interest to both criminal justice and public health. Nothing prevents adding occasional addenda questions to ADAM, and in fact this was done in the earlier version of ADAM to study the possession of weapons.

Conclusions

We understand that NIJ/BJS are contemplating major changes to the ADAM program. One possible change is to sample *sentenced* offenders in jails and prisons. An advantage is that a jail/prison-based sampling frame would lead to national estimates for prevalence and trends at (presumably) a lower cost than expanding the number of ADAM sites. There are disadvantages that can be encapsulated as: Estimates based on jail/prison populations do not estimates what is of greatest interest to public policy.

ADAM is advantageous because it captures drug users who are more representative of chronic users in the community. Frankly, estimating the prevalence of drug use among those involved with the criminal justice system does not justify a large-scale repeated survey. For the past twenty years, illegal drug use has been prevalent among individuals processed by the CJS, and it seems of marginal value to repeatedly affirm this observation. More important is that drug use by arrestees is a reflection of drug use among a larger population of chronic drug users, who are underrepresented by conventional surveys, including the NSDUH. An ADAM sample based on bookings better reflects the population of ultimate interest than would a survey of a sentenced population.

ADAM is advantageous because it captures *recent* behaviors. This is most apparent when asking arrestees about drug market activity. A sample of sentenced offenders can only report historical behaviors – those behaviors that happened before incarceration. The period between arrest and conviction is so unusual as to be uninteresting given the research questions, so practically a survey of the sentenced population would ask about a distant period before the offender was arrested, not a desirable feature of a survey where recall may be a problem. Furthermore, there is no ready confirmatory test for truthfulness given

the limits of hair bioassay. Finally, a prison-based survey would not be especially timely because it would capture historical rather than current use and market activity.

Jails and prisons provide an attractive environment for survey research. The environments are stable and sampling is relatively straightforward. In contrast to many jail settings, computerized interviewing seems feasible and desirable. However, **we urge NIJ/BJS to decide on research questions first and then decide on methodology**. The latter should not determine the former.

Finally, over the last decade, we have been disappointed that ADAM has received so little funding for methodological development. Perhaps the new sponsorship by BJS and NIJ will rectify that deficiency. We have already seen a solicitation for a BJS fellowship to work on ADAM-related problems, and today's meeting further demonstrates a desire to advance ADAM-based methodology.

ADAM: Statistical Issues Related to Prevalence Estimates and Trends

William Rhodes

Thursday, May 27, 2010

Summary of Presentation

- Define ADAM as a survey:
  - Instrumentation: What is asked?
  - Sampling
  - Weighting
  - Estimation
  - Who is represented by ADAM?
- Looking to the future
  - Weaknesses of ADAM
  - Strengths of ADAM
  - Recommendations to BJS/NIJ
- Addendum: Some current uses of ADAM data

ADAM: The Survey

ADAM is

(A) a probability-based survey of

(B) individuals shortly after they were arrested and booked

(C) during repeated but purposively selected two-week periods

(D) within purposively selected counties throughout the United States.

Instrumentation: What is Asked?

ADAM asks about:

- Self-Reports of:
  - Short- and long-term drug use
  - Recent drug market activity
  - Salient events in the user's history (calendar)
- A bioassay (urine test) for identifying recent illegal drug use

The Sample

- Counties are selected purposively
- Two-week periods are selected purposively
- Booking facilities are selected randomly
  - Single booking facility
  - Stratification of booking facilities
  - Stratified cluster sample of booking facilities
- Arrestees are sampled systematically
  - From a stock of individuals who remain in custody
  - From a flow of individuals being booked
- Almost every ADAM site poses some special problems.

The Weighting Process

ADAM uses poststratification

- Analysts match interviews with a census of booking records.

- Analysts estimate propensity scores from the matched records.

- The inverse of the propensity scores are used as weights.

What is Estimated?

- Prevalence
- Annualized trends (2000-2003 and 2007-)
  - Annualized trends control for yearly cycles of drug use.
  - Annualized trends control for:
    - Exogenous changes in arrest practices
    - Exogenous changes in detection practices

What Population is Represented?

- ADAM represents individuals booked in the **county** during the **two-week periods**.
- By convention ADAM is treated as representing individuals booked during the year.
- As a policy tool, ADAM is treated as representing trends by individuals involved with the CJS.
  - By logical extension, ADAM is treated as representing local trends in drug use.
  - Through modeling, ADAM represents all chronic drug users in a county.

Weaknesses of Design

- To derive national estimates, the sample of counties must be expanded and selected randomly, but:
  - Probably only practical for urban counties
  - Some urban counties pose logistical problems
  - Some sheriffs will refuse
- Booking facilities are chaotic places to interview often precluding (for security reasons) the use of computer assisted interviewing.

Strengths of the Design

- Samples nearest the population of policy interest.
- Confirmatory test for recent drug use.
- Respondents were recently on the street:
  - Their responses are timely for evaluation.
  - Recall periods are limited to days/last month/last year.
- Survey users could add policy-relevant questions.
  - Public health questions
  - Criminal justice questions

Looking Forward: Recommendations

- First decide the research questions.

- Second decide the survey and estimation methodologies for answering those questions.

Current Use of ADAM Data

- Estimate the number of chronic drug users in the US.
- Estimate the amount that they spend on illegal drugs.
- Estimate the tonnage of illegal drugs that they use.
- Confirm prevalence estimates of intelligence-based production potential for cocaine, heroin, methamphetamine and marijuana.
- Evaluate the effectiveness of enforcement initiatives on drug markets.
- Understand more about drug-use careers.

Paper — Female Offender Drug Use and Related Issues

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Introduction

Women represent the fastest growing segment of the criminal justice system (PEW Center, 2008) increasing 757% between 1977 and 2004, a rate nearly 2 times the percent increase in the male offender population (Frost, Green, & Pranis, 2006). The number of women involved in the US criminal justice system doubled during the 1990s (Beck, 2000). An estimated 68 in every 100,000 U.S. women are serving time in a state or federal prison (Sabol, West, & Cooper, 2009), with increased rates to one in every 100 among black women in their late 30s (PEW Center, 2008). Women currently represent about 7% of the overall state and federal prison population and 24% of individuals on community supervision (Glaze & Bonczar, 2009).

Substance use and abuse have been consistently reported as major contributing factors in the increasing population of women offenders (e.g., Greenfield & Snell, 1999; Staton-Tindall, et al., 2007). Some have argued that increased attention to substance users during the late 1980s and 1990s during the war on drugs had particular adverse consequences for women (e.g., Chesney-Lind & Pasko, 2004; Covington & Bloom, 2003). A majority of women offenders have a history of drug use and drug-related offenses. Therefore, with the growing number of women offenders, there is increased need to target national surveys on incidence and prevalence of substance use during arrest for this population. Through developing interest by the Bureau of Justice Statistics (BJS) and the National Institute of Justice (NIJ) regarding the Office of Justice Program's (OJP's) Offender Drug Abuse Monitoring (ODAM) program to target arrestees, the purpose of this brief report is to discuss the importance of inclusion of female offenders in this initiative. The following objectives will guide this brief paper: 1) Describe characteristics of female offenders; 2) Discuss the importance of gender-specific data collection; 3) Discuss data collection strategies for working with female offenders; and 4) Review considerations for special populations of female offenders.

Characteristics of Female Offenders

A 2003 National Institute of Corrections report indicated that women offenders are likely to be disproportionately women of color and be between 30 and 35 years old. They are likely to have limitations in education and employment, a drug-related offense, a history of substance use and abuse, complicated family situations, a history of abuse and trauma, and physical and mental health problems (Bloom, Owen, & Covington, 2003; Covington, 2007). While these data date back nearly a decade, current research and clinical literature supports that these trends sustain over time. This section overviews the literature on female offenders to describe their specific needs which can influence decisions about data collection and monitoring of this population.

Much of what we know about female offenders is drawn from samples of incarcerated women in prisons and jails. Substance use and abuse have been consistently reported as major contributing factors in the increasing population of women offenders (e.g., Mullings, Pollock, & Crouch, 2002; Staton-Tindall et al., 2007). In fact, a large number of women offenders, reported as high as 98%, have a history of substance abuse, and nearly half of incarcerated women indicate that they were under the influence of alcohol or drugs at the time of their offense (Greenfeld & Snell, 1999; Cotton-Oldenburg, et al., 1999). A survey of male and female offenders indicated that a higher percentage of females reported drug use

including lifetime use, regular use, and use at the time of their offense compared to male offenders (Greenfeld & Snell, 1999).

While this data is convincing and suggests that substance use is a considerable problem for female offenders, these studies overlook the larger population of women who have contact with law enforcement or are arrested for charges that ultimately do not result in incarceration. This population also continues to rise with female arrestees increasing 11.6% in the past 10 years compared to a 3.1% decrease in the number of male arrestees (US Department of Justice, 2009). The Arrestee Drug Abuse Monitoring [ADAM] 2000 Annual Report is one of few existing sources of information on substance use among female offenders at the time of arrest. ADAM data indicated that 63% of females tested positive for at least one illicit substance — a rate similar to the 64% of males who tested positive (Taylor, Newton, & Brownstein, 2003). Gender differences were noted in that females were more likely to test positive for cocaine compared to males who most commonly reported marijuana use. In addition, female arrestees were more likely than males to report heavy drinking or binge alcohol use. Gender differences were also noted in the 2000 ADAM report for risk for drug dependence with 42% of females being at risk compared to 37% of male arrestees.

Gender-Specific Data Collection

The literature on gender differences on the deleterious consequences of substance use for women compared to men is informative when considering alternative data collection and monitoring strategies for offenders. For example, one pioneer study showed that women are more susceptible than men to the adverse effects of alcohol due to a decreased level of the metabolizing enzyme, gastric alcohol dehydrogenase (Lieber, 1993). The physical health consequences of alcohol and drug use are often more severe for women than for men. In addition to physical health consequences, the following sections describe unique characteristics of female offenders with an eye to targeting data collection instruments.

Mental Health

Women offenders experience a variety of mental health issues, commonly including depression and anxiety (e.g., Sacks, 2004; Staton-Tindall, Leukefeld, & Webster, 2003). About 1 in 4 female state prisoners reported being prescribed medication for a psychological or emotional problem during their incarceration (Greenfeld & Snell, 1999) and nearly two-thirds of incarcerated women reported lifetime psychiatric disorders (Jordan, et al., 1996). Other studies indicate that women in drug treatment programs tend to report co-occurring mental health issues including high levels of psychological distress, increased incidence of trauma and abuse, and a propensity for diagnosable disorders, including post-traumatic stress disorder (PTSD) (Sacks, 2004). A recent report noted that while female inmates are only slightly more likely than males to have a substance use disorder (66.1% vs. 64.3%), they are significantly more likely to experience co-occurring substance use and mental health issues compared to males (40.5% vs. 22.9%) (CASA, 2010).

Victimization and Violence

It has been consistently shown that a high percentage of incarcerated women have histories of victimization with one study finding more than half of a sample of female inmates reported ever being sexually abused and nearly three-quarters reported ever being physically abused in their lifetimes (Staton-Tindall, et al., 2007). A history of abuse and victimization is disproportionate for female offenders – female inmates were 7 times more likely to have experienced sexual abuse and 4 times more likely to have experienced physical abuse compared to male offenders (CASA, 2010). Histories of abuse and victimization are very closely tied to entry into criminal activity among women offenders

(Chesney-Lind & Pasko, 2004; DeHart, 2008), to mental health problems, particularly PTSD (i.e., Heckman, Cropsey, & Olds-Davis, 2007; Pico-Alfonso, et al., 2006), and to substance use as a self-medicating coping strategy (Covington, 1998; Staton, Leukefeld, & Logan, 2001).

HIV and STDs

Women offenders have a number of health problems which are related to their risky drug use and sexual behavior prior to incarceration. Sexually transmitted diseases (STDs) including chlamydia, human papillomavirus, herpes simplex, cystic and mymatic conditions, dysmenorrhea, and chronic pelvic inflammation are more common among female prisoners than the general population (Hammett & Harmon, 1999). One of the most prevalent STD health concerns for incarcerated women is HIV. A higher percentage of incarcerated women (1.9%), compared to men (1.5%), are diagnosed as HIV positive (Maruschak, 2009). Thus, HIV and related risk behaviors are serious health concerns for women offenders and a focus on risky sexual and drug use behaviors should be included in drug monitoring strategies.

Children and Parenting

Estimates indicate that more than two-thirds of incarcerated women have a child under age 18 and about 5% were pregnant at the time of incarceration (Greenfeld & Snell, 1999). Due to being separated from their children, women offenders need services to deal with the potential effects of the separation on their relationship (Coll et al., 1998). Dealing with involuntary separation from their children has increased consequences for incarcerated drug-abusing women. There are also consequences of the drug-using lifestyle and criminal activity on children including increased exposure to trauma and violence that need to be considered in working with female offenders (Staton-Tindall, Sprang, & Clark, *in press*).

These unique issues among female offenders argue for inclusion of gender-specific measures in ODAM, and suggest that the selection of data collection instruments be developed for and used with women. The Center for Substance Abuse Treatment (CSAT, 2009) lists the following as necessary when assessing or screening women, which also have implications for data collection among women arrestees:

- Substance abuse and any immediate risks related to serious intoxication or withdrawal
- Past and present mental disorders, including posttraumatic stress disorder (PTSD) and other anxiety and mood disorders
- Past and present history of violence and trauma, including sexual, emotional, and physical
- Health screenings, including HIV/AIDS, hepatitis, and STDs
- Pregnancy considerations and parenting
- Immediate risks for self-harm, suicide, and violence.

Data Collection Strategies

In addition to an emphasis on gender-specific measures for data collection, a focus on female offenders may also require modifications to data collection strategies targeted for ODAM. Special attention should be given in the study design to the number of female offenders in varying levels of criminal justice supervision. The 2000 ADAM report notes a number of limitations in reporting female arrestee date. Most notably, not all women selected for inclusion in the sample could be interviewed. For example, in Albuquerque, 32% of the 164 women selected were not interviewed – they were not available, not asked, or declined.

Refusal rates ranged from none to 39% with an overall average refusal rate of 17%. ADAM analysis focused the final report on data from sites where at least 50 women were interviewed to avoid presenting findings that might be misleading due to small sample sizes. This strategy suggests that a different sampling strategy should be considered for ODAM implementation in order to attain a more broadly representative sample of female offenders. Because this may mean additional resources for fewer participants per site compared to male arrestees, technologies such as videoconferencing or self-administered Computer Assisted Program Interview (Baker, Bradburn, & Johnson, 1995) designs should be considered.

Female offenders may respond differently to study designs which are developed for and used with male offenders. One national study on correctional administrators and supervisors found that 80% believed that different management strategies were needed for females compared to males, primarily related to interpersonal skills and communication (Schram, Koons-Witt, & Morash, 2004). Acknowledgement of the importance of interpersonal skills and communication is consistent with earlier work on the value that women place on relationships (Covington, 1998; Staton-Tindall, et al., 2007) and has implications for the inclusion of women in ODAM. These strategies may involve training for data collectors on the potential sensitivity of gender-specific issues and the importance of building rapport. Women offenders may also be less trusting of data collection staff if they perceive that their responses to questions may have negative consequences, especially around custody issues of their children. Communication about the purpose of the data collection and its intended use may be particularly relevant in facilitating more accurate reporting among female offenders. When possible with literacy rates, self-administered data collection for women may also be considered to increase confidentiality of responses (CSAT, 2009).

Special Populations of Female Offenders

In addition to gender-specific considerations in data collection instruments and strategies, it is important to note that individual difference factors also play an important role. Data collection strategies may need to be altered in order to be specific to certain subgroups of female offenders. Subgroups of female offenders may be defined by culture. Culture — viewed differently than race or ethnicity — may include any specific beliefs or traditions that can influence or change interpretation of data collection instruments or data collection procedures. Therefore, data collectors should also be trained to be culturally sensitive when working with female offenders (CSAT, 2009). This may also have relevance for study design in that traditional approaches to large national datasets are typically targeted at large, metropolitan areas — which may limit representativeness of rural offenders. Data from a Kentucky sample indicated that while drug use patterns did not differ significantly for rural and urban female offenders, their opportunities for services and treatment were considerably different (Staton-Tindall et al., 2007). Other subgroups of female offenders may be defined through cognitive limitations — those who have learning disabilities or literacy challenges which may influence their engagement in data collection. Working with this group may require additional explanation of study purpose and use of study data.

Summary and Recommendations

This brief report suggests that the number of female offenders continues to grow, and substance use is a major contributing factor to both the commission of crimes and to sentencing for criminal offenses. Much of what we know about female offenders has been learned through research with samples of incarcerated women — missing a large population of women who encounter criminal justice authorities through arrest and sentencing. Targeting data collection and monitoring at the time of arrest has important implications for detection of substance use and related problems earlier in the criminal justice continuum.

This, in turn, may lead to increased opportunities for resources and services to intervene in the cycle of drug use and crime. While we have learned a great deal about the unique characteristics of female offenders over the past two decades, much more research is needed to develop, implement, and test effective prevention and treatment interventions for this population. Inclusion of measures that inform the female perspective and strategic data collection points through ODAM provide a tremendous opportunity to advance the state of knowledge on female offenders.

The following recommendations are forwarded for consideration in the inclusion of female offenders in the ODAM initiative:

- *Study design:* Studies of female offenders at the time of arrest are limited and should be a focus of future research. Study designs should be mindful of the disproportionate number of female offenders and make sure that sampling strategies are representative.

- *Measures:* Female offenders face increased biopsychosocial consequences of drug and alcohol abuse, and gender-specific measures should be included in national datasets. Data collection tools designed specifically for women are limited, suggesting that data monitoring systems must be intentional about selecting appropriate measures. Data collection instruments targeting female substance-using offenders should include an emphasis on physical and mental health, abuse and trauma, and parenting issues.

- *Approaches:* Data collection teams should be mindful of the need for rapport, interpersonal skills, and communication in order to build trust when with working with female offenders. Women value relationships, and a relational approach to data collection is critical.

- *Analysis:* Analytic strategies should be mindful of individualized needs among female offenders which may influence data collection and interpretation such as culture and cognitive functioning.

References

Baker, R.P., Bradburn, N.M., & Johnson, R. (1995). Computer Assisted Personal Interviewing: An experimental evaluation of data quality and survey costs. *Journal of Official Statistics, 11*, 415-434.

Beck, A.J. (2000). *Prison and Jail Inmates at Midyear 1999*. U.S. Department of Justice, Bureau of Justice Statistics. NCJ.181643. Retrieved May 16, 2010 from http://bjs.ojp.usdoj.gov/content/pub/pdf/pjim99.pdf.

Bloom, B., Owen, B., & Covington, S. (2003). *Gender-responsive strategies: Research, practice, and guiding principles for women offenders.* NIC018017. Washington, DC: U.S. Department of Justice, National Institute of Corrections.

[CASA] Center on Addiction and Substance Abuse. (2010). *Behind Bars II: Substance Abuse and America's Prison population*. Retrieved May 13, 2010 from http://www.casacolumbia.org/templates/publicationsreports.aspx.

Center for Substance Abuse Treatment [CSAT]. (2009). *Substance abuse treatment: Addressing the specific needs of women*. Treatment Improvement Protocol (TIP) Series 51. HHS Publication No. (SMA) 09-4426. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Chesney-Lind, M., & Pasko, L.J. (2004). *The Female Offender: Girls, Women, and Crime*. Thousand Oaks, CA: Sage, Inc.

Coll, C.G., Surrey, J. L., Buccio-Notaro, P., & Molla, B. (1998). Incarcerated mothers: Crimes and punishment. In C. G. Coll, J. L. Surrey, & K. Weingarten (Eds.), *Mothering against the odds: Diverse voices of contemporary mothers* (pp. 255-274). New York: Guilford Press.

Cotton-Oldenburg, N.U., Jordan, K., Martin, S.L., & Kupper, L. (1999). Women inmates' risky sex and drug behaviors: Are they related? *American Journal of Drug and Alcohol Abuse, 25,* 129-149.

Covington, S.S. (1998). Women in prison: Approaches in the treatment of our most invisible population. *Breaking the Rules: Women in Prison and the Feminist Theory, 21,* 141155.

Covington, S.S. (2007). Women and the criminal justice system. *Women's Health Issues, 17*, 180-182.

Covington, S., & Bloom, B. (2003). *Gendered justice: Women in the criminal justice system*. In Bloom (Ed.), *Gendered Justice: Addressing Female Offenders*. Durham, NC: Carolina Academic Press.

DeHart, D.D. (2008). Pathways to prison: Impact of victimization in the lives of incarcerated women. *Violence Against Women, 14(12*), 1362-1381.

Frost, N.A., Greene, J., & Pranis, K. (2006). *Hard Hit: The Growth in the Imprisonment of Women, 1977-2004.* The Punitiveness Report, Institute on Women & Criminal Justice.

Glaze, L.E., & Bonczar, T.P. (2009). Probation and parole in the United States, 2008. US Department of Justice, Bureau of Justice Statistics. NCJ228230. Retrieved May 6, 2010, from http://bjs.ojp.usdoj.gov/content/pub/pdf/ppus08.pdf.

Greenfield, L., & Snell, L. (1999). W*omen Offenders*. (NCJ Publication No. 75688). Washington, DC: Bureau of Justice Statistics.

Hammett, T.M., & Harmon, P. (1999). Sexually transmitted diseases and hepatitis: Burden of disease among inmates. In T.M. Hammett, P. Harmon, & L.M. Maraschak (Eds.), *1996-1997 Update: HIV/AIDS, STDs, and TB in Correctional Facilities* (NCJ Publication No. 157642, pp. 35-37). Washington, DC: U.S. Department of Justice.

Heckman, C.J., Cropsey, K.., & Olds-Davis, T. (2007). Posttraumatic stress disorder treatment in correctional settings: A brief review of the empirical literature and suggestions for future research. *Psychotherapy: Theory, Research, & Practice, 44*, 4653.

Jordan, B.K., Schlenger, W. E., Fairbank, J.A., & Caddell, J.M. (1996). Prevalence of psychiatric disorders among incarcerated women. *Archives of General Psychiatry, 53*, 513-519.

Lieber, C.S. (1993). Women and alcohol: Gender differences in metabolism and susceptibility. In Gomberg, E.S.L., Nirenberg, T.D. (Eds.), *Women and substance abuse* (pp. 1-17). Westport, CT: Ablex Publishing.

Maruschak, L.M. (2009). *HIV in Prisons, 2007-08.* (Publication No. NCJ 228307). Washington, DC: U.S. Department of Justice, Bureau of Justice Statistics.

Mullings, JL, Pollock, J., Crouch, BM (2002). Drugs and criminality: Results from the Texas women inmates study. *Women & Criminal Justice, 13(4),* 69-96.

PEW Center (2008). *One in 100: Behind Bars in America 2008*. Retrieved May 10, 2010 at www.pewcenteronthestates.org.

Pico-Alfonso, M.A., Garcia-Linares, M.I., Celda-Navarro, N., Blasco-Ros, C., Echeburua, E., & Martinez, M. (2006). The impact of physical, psychological, and sexual intimate male partner violence on women's mental health: Depressive symptoms, post-traumatic stress disorder, state anxiety, and suicide. *Journal of Women's Health, 15,* 599-611.

Sabol, W.J., West, H.C., & Cooper, M. (2009). *Prisoners in 2008.* U.S. Department of Justice, Bureau of Justice Statistics. NCJ 228230. Retrieved May 6, 2010 from http://bjs.ojp.usdoj.gov/content/pub/pdf/p08.pdf

Sacks, J.Y. (2004). Women with co-occurring substance use and mental disorders (COD) in the criminal justice system: A research review. *Behavioral Sciences & the Law, 22,* 449-466.

Schram, P.J., Koons-Witt, B.A., & Morash, M. (2004). Management strategies when working with female prisoners. *Women & Criminal Justice, 15(2*), 25-50.

Staton, M., Leukefeld, C., & Logan, T.K. (2001). Health service utilization and victimization among incarcerated female substance users. *Substance Use & Misuse, 36*, 701-716.

Staton, M., Leukefeld, C., & Webster, J.M. (2003). Substance use, health, and mental health: Problems and service utilization among incarcerated women. *International Journal of Offender Therapy and Comparative Criminology, 47,* 224-239.

Staton-Tindall, M., Duvall, J.L., Leukefeld, C., & Oser, C.B. (2007). Health, mental health,

substance use, and service utilization among rural and urban incarcerated women. *Women's Health Issues*, *17,* 183-192.

Staton-Tindall, M., Royse, D., & Leukefeld, C. (2007). Substance use, criminality, and social support: An exploratory analysis with incarcerated women. *American Journal of Drug & Alcohol Abuse, 33*, 237-243.

Taylor, B.G., Newton, P.J., & Brownstein, H.H. (2003). Drug use among female arrestees. In *Arrestee Drug Abuse Monitoring (ADAM) 2000 Annual Report*. Washington, DC: National Institute of Justice. Retrieved May 13, 2010 from http://www.ojp.usdoj.gov/nij/topics/drugs/adam.htm.

U.S. Department of Justice (2009). *Crime in the United States, 2008.* Federal Bureau of Investigation, Uniform Crime Reports. Retrieved May 14, 2010, from http://www.fbi.gov/ucr/cius2008/arrests/index.html.

Collecting Sensitive Information from Drug Users

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Abstract: This paper addresses the issue of how to approach gathering sensitive data in less-than-ideal circumstances. We discuss the challenges presented in gathering data about drug use and drug market participation among arrestees, and will suggest strategies to overcome these challenges. Themes include the importance of participants' understanding that the research is not part of their individual criminal case and overcoming skepticism that this is really so, the need to hire culturally appropriate interviewers for populations likely to be found among local arrestees, and the importance of appropriate cultural competence training for staff in relevant areas including local drug market conditions, typical local criminal income generation strategies, and other factors relevant to arrestees' lives.

Introduction: The Challenges of Gathering Data from Arrestees

Drawing on data from studies of past efforts to gather data from drug-using arrestees and the authors' many years gathering similar data in the context of ethnographic and survey-based studies, we describe and discuss the challenges of gathering data from recently-arrested drug users, and present some approaches and strategies to effectively gathering this sensitive data in less-than-ideal circumstances. All drug users have every reason to lie about their use in most contacts with strangers (outside the context of immediate drug use) because of the informal and formal sanctions against drug use; recently arrested drug users have of course just been forcefully reminded of the latter.

All studies of drug use or other illegal behavior struggle with the issue of study participants under-reporting (and sometimes, over-reporting) illegal or socially-sanctioned behaviors (see, e.g., Copes and Hochstetler 2010, Del Boca and Noll 2000). Gathering data about drug use and drug market participation among arrestees is a particularly difficult challenge. In examining Arrestee Drug Abuse Monitoring (ADAM) data as to the accuracy of arrestees' self reports as to their criminal justice histories, Johnson et al. (2005) found that "[a]rrestee self-reports are shown to substantially agree with official record data for the majority of arrestees ... ." They further note that "it appears that ... faulty memory and limitations associated with the official records, rather than outright deception by respondents, likely accounts for the lack of *precise* accuracy [emphasis added]" in ADAM participants' disclosure of their criminal justice histories. This stands in marked contrast to disclosures of drug use by the same populations.

ADAM participants were far less forthcoming as to their drug use. By far the most comprehensive analysis of ADAM data found, in reviewing other studies of ADAM data, that "disclosure rates on the order of one half are not uncommon" (Golub et al 2005). Disclosure of drug use in ADAM varied substantially by drug type, data-collection site, race, and top charge (in the specific case of methamphetamine use) (Golub et al 2005). Below, we summarize the findings of this study as to factors influencing willingness to disclose drug use:

- **Drug type:** Arrestees were most forthcoming about marijuana use, followed by methadone. Cocaine/crack, heroin, and methamphetamine use were disclosed by about half of those who tested positive for use of those substances. PCP had very low disclosure rates. This probably reflects arrestees' assessment of the varying levels of both stigma and criminal justice consequences associated with marijuana and methadone on the one hand, and cocaine/crack, heroin, and methamphetamine on the other hand. Marijuana use is the subject of comedy on TV shows and in Hollywood films, and often associated with considerably more lenient penalties than other drug offenses, while methadone is dispensed legally as a form of drug treatment. The use of cocaine/crack, heroin, and methamphetamine is highly stigmatized by society generally (there is no equivalent of Cheech and Chong for any of these substances, for example), and, often, by drug users and drug market participants themselves, and all these substances are also subject to severe criminal justice penalties.

- **Data-collection site:** Site was the largest factor associated with variation in drug-use disclosure with all drugs, except for methamphetamine where it was the second largest factor, with arrest top charge the largest factor. Golub et al. assume that this variation is due to some geographically-varying willingness to disclose drug use. If this variation is in fact due to variations in data-gathering procedures, this offers hope of improving the willingness to disclose accurate data as to drug use and drug market participation.

- **Race:** White arrestees were much more likely to disclose recent use of methamphetamine than were black arrestees and somewhat more likely to disclose use of marijuana, cocaine/crack, and heroin. This discrepancy might be accounted for if black participants used methamphetamine without knowing they were doing so. In a recent study of methamphetamine use (Wendel et al., in press), many participants who use both methamphetamine and cocaine said that they believe most or all cocaine currently available in New York City contains amphetamine. If black users of cocaine or crack are also unwitting consumers of cocaine, this might account for the discrepancy. Golub et al. recognize that unwitting use might account for low disclosure rate with regard to PCP, but don't raise this issue with regard to cocaine use.

- **Top charge:** "Arrestees charged with drug offenses ... were generally more likely than those charged with less serious offenses to disclose recent use of each drug except methadone. Arrestees for property index offenses ... had higher disclosure rates than those charged with less serious offenses for each drug except PCP ... and methadone. Arrestees for violent index offenses ... had comparable rates as those charged with less serious offenses for each drug except PCP ..."

Strategies to Overcome These Challenges

Golub et al. (2005), in response to their finding that arrestee willingness to disclose accurate information as to recent drug use varies so widely across a variety of the factors they measured, make two points. First, they recommended reliance on urinalysis and other methods (see, e.g., Bookman, 2010) over self-reports: "we strongly advocate that researchers use biological indicators of recent drug use whenever possible," echoing Ronald Reagan's famous aphorism "Trust, but verify." Second, they argue, self-report data is useful, despite the identified limitations, provided that future research develops a model of non-disclosure rates and factor this into analyses, or limit self-report data to analyses of

"comparisons in use across drugs and subpopulations ... [or] studies of drug use characteristics such as variation in frequency of use or mode of consumption."
They point out that the former approach of factoring in disclosure rates is complicated by the numerous factors which affect disclosure rates in their analysis, especially location, which implies the need for numerous local studies of factors influencing variation in disclosure rates. This is likely to be prohibitively expensive. As they point out, "[s]elf-reported rates of drug use simultaneously reflect the underlying rate of use and the rate of disclosure ..." (Golub et al., 2005).

In this section, we present strategies intended to increase the rate of disclosure of illicit drug use by arrestees, based on our experience gathering data from drug users (see, e.g., Wendel et al., in press; Curtis, 2010; Wendel et al., 2003; Wendel and Curtis, 2000; Curtis and Wendel, 2007, 2000; Curtis, Wendel, and Spunt, 2001) and our review of the relevant literature.

1. Participants Should Understand That the Research Is Not Part of Their Criminal Case

This is by far the most likely reason for nondisclosure; it is impossible to overstress the importance of participants' understanding that the research is not part of their individual criminal case. Arrestees who have been recently Mirandized will have been reminded that anything they say may be used against them in court; in any case, popular culture has ingrained these words in the popular consciousness. If arrestees believe that the questions they answer will affect their criminal case, they would be foolish indeed to disclose any illegal activities of which the authorities appear to be unaware.

Recent arrestees fall into two major categories, each with characteristics that can be used to the researchers' advantage: those who have never or rarely been arrested and are scared, and those who have often been arrested and are bored. This distinction is important: recall that in Golub et al.'s (2005) study of ADAM data "[a]rrestees that did not report having had a prior arrest were substantially less likely to disclose use of each drug ... except for methadone and PCP ... " Those who are scared because they have little experience with arrest and the criminal justice system are likely to welcome the opportunity to talk to a neutral party (likely the first person they have encountered since arrest who is not devoted to their incarceration). Those whose extensive experience of the criminal justice system has made them less fearful of the immediate consequences of arrest are also aware of the fact that there is a great deal of waiting in their immediate future. In each case, however, the desired effect will only occur if arrestees are confident that disclosure will not be prejudicial to their criminal case.

Data-gathering staff should take care that their interactions with law enforcement and corrections staff take place "at arms' length." Where research staff frequently interact with the same law enforcement and corrections personnel in the course of data-gathering over many years, they may develop a natural friendliness as a social lubricant. This should be carefully avoided. This recommendation, so simple to state, is likely to be very difficult to put into practice, because of the strong informal social pressures to be friendly to people one frequently encounters in a work context. The recommended "arms' length" strategy may cause study personnel to be perceived as difficult by law enforcement and corrections personnel, or even to passive or active obstruction of data-gathering activities.

The trade-off is, of course, between more easily gathering less-accurate data, or the more desirable reverse of this.

Of course, there are some simple methods that can somewhat overcome fears that study staff are agents of law enforcement: study staff should wear prominent identification stating their research affiliation (this is likely to be required in most correctional facilities), and should dress and otherwise present themselves in a way that connotes "civilian" identity (see the following two recommendations). Clipboards are a useful "prop" in conveying a researcher identity in our experience.

Overcoming skepticism that it is really true that disclosure of drug use will have no criminal justice consequences will be easier if study interviewers are culturally appropriate and have received cultural competence training (our following two recommendations). This is because arrestees' perceptions of the researchers' intent will be influenced by a variety of cues; to the extent that data-gathering staff exhibit appropriate cultural cues, they will be perceived as "not the police" and will be able to gather more accurate data, because arrestees will be less likely to fear their answers will be used against them.

2. Interviewers Should Be Culturally Appropriate For Local Arrestee Populations

Another overlapping factor that will have a big impact on participants' willingness to accurately disclose their drug use and drug market participation will be their perception of the interviewers (Copes and Hochstetler 2010, Lord and Brennan 2005, Morselli and Tremblay 2010). Projects that seek to gather accurate data from arrestees need to hire culturally appropriate interviewers for populations likely to be found among local arrestees, and ensure that data-collection staff present themselves in a culturally appropriate manner such that local arrestee populations are most likely to trust them. This cultural appropriacy can be defined along a number of axes: race/ethnicity, age, class, and more "cultural" factors, for example, clothing associated with "hip hop" or "outlaw" country and western music might be appropriate in particular local contexts. The interviewers should be people the interviewees will feel comfortable talking to.

This is not to suggest that staff must always be of the same race/ethnicity, age, class, or wear the same shoes as the local arrestee population, but simply to state the fact that these are factors that will influence the accuracy of the data gathered.

3. Interviewers Should Be Given Appropriate Cultural Competence Training

Staff who ask about drug use and drug market participation in a neutral and nonjudgmental manner will gather the most accurate data. A major potential reason for nondisclosure of drug use by arrestees discussed briefly by Golub et al. (2005) is stigma around drug use generally, or around particular consumption practices (e.g., injection, or the greater stigma attached to smoking cocaine ("crack") versus sniffing cocaine). This is one area where appropriate cultural competence training for staff can make a difference in disclosure rates. This may be particularly important with staff who are themselves former or recovering drug users. Of course, almost tautologically, such persons are likely to fit the recommendation that interviewers be persons who are culturally acceptable to local arrestee populations, but the training of staff who are former or recovering drug users needs to emphasize that data collection and treatment/recovery both involve disclosures about drug use but in very

different contexts, and that expressing (even or especially in nonverbal cues) personal views about the negative consequences of drug use will limit interviewees' willingness to disclose.

Data gathering staff should be very familiar with local slang and terminology used by drug users. For example, in a recent study of HIV rates among high-risk populations, we asked injection drug users in New York City about use of a variety of drugs. Hispanic injectors who recently migrated from Puerto Rico were very unlikely to report that they had ever injected ketamine or even ever heard of it, but very likely to disclose use of "*sueña de mono*" ("monkey's dream") or "*anestesia de caballo*" ("horse anesthesia"), two slang terms common in Puerto Rico for varieties of heroin cut with ketamine.

Similarly, familiarity with local drug market conditions and sales methods, drugs available, units of sale and typical packaging and the like will go far to convince drug users that they are talking to someone who "knows what time it is" and is thus worth talking to, and perhaps even worth telling the truth to.

Another topic interviewers should be familiar with is typical local criminal income generation strategies and the terminology associated with them. For example, in New York City, "jostling" means picking pockets or purses on the subway (from the charge), while "breaking bottles" refers to a recently popular hustle where the hustler contrives to bump into an affluent tourist and drop a gift-wrapped bottle of expensive liquor, breaking it, setting up a demand that the mark compensate the hustler for the value of the broken "gift" (which is in fact a bottle from a bar garbage can refilled with tea or water and a small amount of liquor for the smell).

Cultural competence training should also include training about other factors relevant to arrestees' lives, including local social welfare and income-maintenance programs that many arrestees rely upon, local places and events impacting communities with high rates of arrest and the like. The goal is simply to maximize the interviewers' familiarity with the social worlds inhabited by the interviewees: the fewer things the interviewer needs to have explained, the more likely the interviewee is to trust him/her, and thus provide accurate data about illegal acts.

Summary/Conclusion

Gathering accurate data about drug use and local drug market conditions among arrestees presents considerable methodological challenges; the most overcomeable of these may be improving participants' willingness to truthfully disclose drug use. We have presented strategies for increasing the likelihood that arrestees will do so, based in our experience in gathering data among drug users, and analysis of the correlates of nondisclosure in the ADAM program.

References

Brookman, Fiona. 2010. Beyond the interview: complementing and validating accounts of incarcerated violent offenders. In Wim Bernasco (Ed.), *Offenders on Offending: Learning About Crime From Criminals.* Devon: Willan Publishing.

Copes, H. and A. Hochstetler. 2010. Interviewing the incarcerated: pitfalls and promises. In Wim Bernasco (Ed.), *Offenders on Offending: Learning About Crime From Criminals.* Devon: Willan Publishing.

Curtis R and T Wendel. 2000. Toward the Development of a Typology of Illegal Drug Markets. In M Natarajan and M Hough (eds.), *Illegal Drug Markets: From Research to Policy, Crime Prevention Studies*, Vol 11. New York: Criminal Justice Press.

Curtis R., T. Wendel, and B. Spunt. 2001. *We Deliver: The Gentrification of Drug Markets on Manhattan's Lower East Side*. Washington, D.C.: National Institute of Justice.

Curtis, R. 2010. Getting good data from people that do bad things: effective methods and techniques for conducting research with hard-to-reach and hidden populations. In Wim Bernasco (Ed.), *Offenders on Offending: Learning About Crime From Criminals.* Devon: Willan Publishing.

Curtis, R., and Wendel, T. 2007. "You're Always Training The Dog": Strategic Interventions To Reconfigure Drug Markets. *Journal of Drug Issues, 37*(4): 867-891.

Del Boca, F., and Noll, J. 2000. Truth Or Consequences: The Validity Of Self-Report Data In Health Services Research On Addictions. *Addiction 95*(Supplement 3): S347-60.

Golub, A., H. Liberty and B. Johnson. 2005. The Variation in Arrestees' Disclosure of Recent Drug Use Across Locations, Drugs, and Demographic Characteristics. *Journal of Drug Issues 35*(4): 917–940.

Johnson, B., A. Taylor and A. Golub. 2005. Research Note: How Accurate Are Arrestees' Self-Reports Of Their Criminal Justice Histories? *Journal of Justice Research and Policy 7*(1): 81-102.

Lord, V., and P. Brennan. 2005. The Effects Of Interviewer Characteristics On Arrestees' Responses To Drug-Related Questions. *Applied Psychology in Criminal Justice 1*(1): 36-55.

Morselli, C., and P. Tremblay. 2010. Interviewing and validity issues in self-report research with incarcerated offenders: the Quebec inmate survey. In Wim Bernasco (Ed.), *Offenders on Offending: Learning About Crime From Criminals.* Devon: Willan Publishing.

Wendel, T., R. Rothchild, R. Curtis, K. Corcoran, T. Hanlin, B. Eng, and M. Zedeck. 2003. Heroin Cut With Morphine?: An Ethnographic-Forensic Chemistry Case Study. *Addiction Research and Theory*, 11, 5, 349-366.

Wendel, T., B. Khan, K. Dombrowski, R. Curtis, K. McLean, and E. Misshula. In press. *The Dynamics of Retail Methamphetamine Markets in New York City*. Washington, DC: National Institute of Justice.

Wendel, T., and R. Curtis. 2000. The Heraldry of Heroin: "Dope Stamps" and the Dynamics of Drug Markets in New York City. *Journal of Drug Issues*, 30(2).

Collecting Sensitive Information from Drug Users

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Introduction

- We describe the challenges of gathering data from recently-arrested drug users

- We present some approaches and strategies to effectively gathering this sensitive data in less-than-ideal circumstances.

- This presentation & paper draw on data from studies of past efforts to gather data from drug-using arrestees and the authors' many years gathering similar data in the context of ethnographic and survey-based studies

The challenge

- All drug users have every reason to lie about their use in most contacts with strangers because of the informal and formal sanctions against drug use

- Recently arrested drug users have just been forcefully reminded of the latter

Variations in disclosure I

- All studies of illegal behavior struggle with the issue of study participants under-reporting (and sometimes, over-reporting) illegal or socially-sanctioned behaviors.

- ADAM participants were *very* accurate in reporting their criminal justice histories

  Johnson, B., A. Taylor and A. Golub. 2005. Research Note: How Accurate Are Arrestees' Self-Reports Of Their Criminal Justice Histories? *Journal of Justice Research and Policy 7*(1): 81-102.

- BUT much less accurate in disclosing their drug use

Variations in disclosure II

In the ADAM program, willingness to disclose drug use varied substantially by:

- Drug type
- Data-Collection Site
- Race
- Top Charge

Golub, A., H. Liberty and B. Johnson. 2005. The Variation in Arrestees' Disclosure of Recent Drug Use Across Locations, Drugs, and Demographic Characteristics. *Journal of Drug Issues 35*(4): 917–940.

Strategies to increase the rate of disclosure

- Arrestees' perceptions of the researchers' intent will be influenced by a variety of cues

- If staff exhibit appropriate cultural cues, they will be perceived as "not the police"

- The result will be more accurate data, because arrestees will be less likely to fear their answers will be used against them

Make it clear to arrestees that the research is not part of their criminal case

- Interactions with law enforcement & corrections staff should take place "at arms' length"
- Study staff should wear prominent identification
- Study staff should dress and otherwise present themselves in a way that connotes "civilian" identity
- Clipboards are a useful "prop"

Interviewers should be culturally appropriate For local arrestee populations

- Factors to consider:
  - Race/ethnicity
  - Age
  - Class
  - "Cultural" factors: Clothing associated with "hip hop" or "outlaw" country and western music, e.g.
- This is not to say that staff must always be of the same race/ethnicity, age, class, or wear the same shoes as the local arrestee population
- BUT they should be people the interviewees will feel comfortable talking to

It matters who's asking

Interviewers should be given appropriate cultural competence training

Staff should be very familiar with:

- *Local slang and terminology* used by drug users & sellers
- Typical *local criminal income generation strategies* and the terminology associated with them
- Other factors relevant to arrestees' lives:
  - Local social welfare & income-maintenance programs
  - Local places and events

Interviewers should be given appropriate cultural competence training

- Asking about drug activity in a *neutral and non-judgmental manner* will gather the most accurate data

- Expressing (even or especially in non-verbal cues) views about the consequences of drug use will limit interviewees' willingness to disclose

- Training is particularly important with staff who are themselves former or recovering drug users

Summary

- Gathering data about drug use from recent arrestees is challenging, because they are used to lying about drug use: they need a reason to disclose

- In ADAM, disclosure varied substantially

- Strategies for increasing disclosure:
    - Make it clear to arrestees that the research is not part of their criminal case
    - Interviewers should be culturally appropriate For local arrestee populations
    - Interviewers should be given appropriate cultural competence training

**The Use of Bureau of Economic Analysis (BEA) Areas and Regions
for Representing Geographic Variation**

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Introduction: Regional Analysis with Smaller Geographies

Geography provides a perspective that is applicable to most, if not all, social science research questions. Geography provides a framework that is integral towards capturing and understanding human activity in these disciplines.[1] Equally as important is the accurate display and visualization of the data to represent behavioral processes at work. Disciplines such as economics, political science, public health, demographics and public policy have all looked to geography as a way of better understanding human activity. Many past and current research attempts to bring a contextual understanding of why crime occurs where it does, but consideration is usually given to individual and demographic factors as explanations. Today, there is an increasing realization that contextual factors play a role in creating a more comprehensive picture of crime. This includes the Obama Administration as evident in the 2009 memo highlighting that from 2011 forward emphasis will be on place-based programs and policies[2]. Less and less policy-makers are asking for national level statistics and wanting regional and local level variation. To conduct an analysis that captures factors related to region and place requires data sets that allow for contextual factors to be merged with the long standing individual factors. This presents a more comprehensive analysis of people within places.

A Geographic Framework for the Offender Drug Abuse Monitoring (ODAM) Program

Without proper geographic representation of data much of the information intended for the audience can be lost. The United States Department of Commerce, through the Bureau of Economic Analysis (BEA), has established a micro and macro regional division of the United States that can be useful for the Offender Drug Abuse Monitoring (ODAM) project. The BEA break-down of economic areas and the states that capture those areas is relevant to this project because the areas are based on homogeneity with regard to a variety of economic and social factors[3]. Based on the principle law in geography that places that are closer in space share similar characteristics this makes them more natural. Drug markets can operate at three geographic scales, which are generally the neighborhood, metropolitan area and regional.

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[1] Wilson, R.E. (2009, August). *Geography and Crime Project: Understanding Place and Its Influence on Crime.* Briefing Paper.

[2] Developing Effective Place-Based Policies for the FY 2011 Budget: www.whitehouse.gov/omb/assets/memoranda_fy2009/m09-28.pdf.

Because the sale of illicit products share the same principles as legal products it is reasonable to assume that these markets operate within the same confines as regular economic activity areas in and between metropolitan areas in any region of the U.S. This is simply based on principles of urban geography in that any human activity follows the spatial structure of an area and the flow of resources. These spatial structures that are common and universal allow generalization, which includes an agglomeration of economies.

Furthermore, using the BEA Regions could allow for two particular opportunities to enhance the project. First is the incorporation of economic data that is often critical to understanding social structure in metropolitan areas. Second would be to conduct analysis at larger geographic scales (smaller units of analysis) that still incorporates demographic data with corresponding economic data. The BEA Regions by state are Far West, Great Lakes, Mideast, New England, Rocky Mountain, Southeast, and Southwest; see a list of which states are included into each region please refer to list at the end of this paper.
Under each of these regions are sub-regions that capture economic activity that is important for modeling the appropriate scale of effect across a metropolitan area and all the units (counties, tracts, etc…) of analysis underneath. Those sub-regions are depicted in the Johnson and Kort (2004) paper that lists the method and the resulting geographic boundaries[4]. This nesting allows for both spatial and hierarchical data analysis methods to be employed.

An important aspect for this project is that using the sub-regional boundaries a more intuitive regional strata can be formed that is more intuitive with regards to actual social and economic activity within and between metropolitan areas. Rather than be restricted to State boundaries or ad-hoc selection of counties to form major regions of the U.S., the aggregate selection of sub-regions can form regions that are likely to more realistically capture the activity being measured.

Background History of BEA Regions[5]

To understand why the BEA Regions are useful it is important to know some of the history behind their development and standardization. In the 1940's the BEA originally adopted the widely known and used Census Regions. The Census continues to use these 9 regions. From 1943 to 1955, the BEA reorganized the grouping of the multi- state regions based on a grouping established by Howard D. Odum in 1936, in *Southern Regions of the United States*. Odum's regional classification of homogeneity was based on approximately 700 economic and social factors.

In the early 1950s a Commerce Working Group was formed to help standardize the breakdown and classification of multi-state regions. The Commerce Working Group consisted of the Census, BEA (at the time OBE), and the Office of Distribution in the Commerce Department. The goal of the group was to determine and quantitatively review

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[3] Johnson, K.P., and Kort, J.R. (November 2004). 2004 Redefinition of the BEA Economic Areas.

[4] Ibid.

[5] Kort, J.R. (March 2008). "A History of the Development of BEA Regions," presentation delivered at the 47th annual meeting of the Southern Regional Science Association.

the factors used to group states. As established by the working group, the guiding principle for the grouping of states into regions was homogeneity with regard to economic and social factors. Population size in the states and regions was also factored into the analysis. It is important to note that the primary intention was to use a classification system that was to remain as objective as possible. A report was subsequently produced, and the BEA adopted the eight region break-out that was suggested by the Commerce Working Group. Today, the BEA continues to use the same regional classification of states that was established in the 1950's (with the addition of Alaska and Hawaii).

A Note on Census Regions

Even though the BEA Regions have not been updated since the 1950's, the Census Regions largely remain the same as when they were established in the 1880's. The reasoning for their break-down was to reflect the particularities of location, climate, topography, economic systems, ethnicity of settlers, and systems of local government.
Since the 1880 census some name changes have occurred, but otherwise the overall geographic breakdown has remained the same.[6] The Census Regions consist of 9 divisions (Pacific, Mountain, West North Central, East North Central, West South Central, East South Central, South Atlantic, Middle Atlantic, and New England) which were previously known as regions. Today, those 9 divisions are now components of 4 regions (West, Midwest, Northeast, and South). It has been anecdotally suggested that the reason the Census Regions have remained the same to ensure no break in a time series. Given the United States has gone through a tremendous amount of restructuring in social and economic factors it does not seem appropriate to use the Census Regions for capturing regional variation.

BEA Regions and Economic Areas

As stated above, the BEA regions were mainly based on homogeneity of states with regard to economic and social factors. It is because of the strict and objective nature of the groupings that make the BEA Regions a good site selection and analytical framework for this project. Additionally, another reason for using BEA Regions is that they are closely linked to a smaller unit of measure, BEA Economic Areas. BEA Economic Areas consist of homogenous sub-regional markets that surround metropolitan statistical areas. As with the BEA Regions, the Economic Areas are established by comparing factors such as labor, products, information, and other economics. The BEA Economic Areas also factor in local labor commuting patterns which help define the labor markets. These can be used either in conjunction with social and demographic factors at the same scale or used to account for economic processes that occur within larger geographic ranges than other social process occurring within the metropolitan area and neighborhoods. This recognizes that there are greater forces at work that have varying effects at larger scales... meaning smaller units of analysis. Finally, the definition of BEA economic areas was recently updated in 2004. To reflect current economic activity the update adjusted the areas based on economic and population changes that have occurred across the United States (2004 BEA Economic Areas redefinition paper note in footnote 2).

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[6] U.S. Census Bureau. (November 1994). Statistical Groups of States and Counties. *The Geographic Areas Reference Manual*.

It is useful to study local areas because the change that occurs in these areas is an outcome and reflection of regional, national, and world conditions as well as individual local characteristics.[7] Should there be interest in a local level analysis through the use of smaller units of analysis, such as metropolitan areas or even down to neighborhoods, then using BEA Economic Areas would be a reasonable suggestion. Using the BEA Regions in the current analysis will allow for easier use of BEA Economic Areas since they are closely related. The two geographic units are similar in the way they are formed which would allow for a multi-scale geographic analysis. By eventually incorporating mixed models of different geographic scales, such as regional and local level, the analysis will only be strengthened due to accounting for processes that occur on different scales.

Versatility of BEA Economic Areas

In regards to thematic mapping and sampling, another argument for the use of BEA Economic Areas is their versatility. Regional geographic divisions of the United States can be created with the BEA Economic Areas and be defined by the user. This customizable division allows for the creation of regional sampling areas that are not defined by state boundary lines. As previously mentioned, BEA Economic Areas are built up from metropolitan statistical areas and as a result often cross state lines. The adjustable nature of these units of analysis directly relates to their size and shape. The geographic units are small enough that regional divisions and breakdowns can be defined by the user with more detail and accuracy. Even though the resulting regional divisions may cross state boundaries, the areas are likely to be of greater utility since the regions will be more similar in make-up. Simply using regional divisions that follow state boundary lines does not this same versatility and accuracy.

Conclusion: A Site Selection Framework

This framework that accommodates site selection of metropolitan areas facilitates two significant site selection criteria. First, it provides the opportunity to select sites based on a number of criteria both geographic and substantive, such as the local need for data, a particular drug problem, dearth of federal assistance, issue-focused, or an approach based on an open call where sites are chosen based only on their desire to comport with program requirements. Second, it works to ensure there are not too many sites in the same region of the U.S. Doing so prevents overrepresentation in one geographical area that would diminish variation of regional factors that may play a role in particular drug markets. This framework, then, makes it possible to more subjectively select sites with numerous criteria and yet facilitate variation in factors that change across the U.S. Finally, the use of this framework will facilitate multi-level modeling to account for factors that at their appropriate geographic scale and their affect on units of analysis below them.

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[7] Brown, L. A. (1999). Presidential Address: Change, Continuity, and the Pursuit of Geographic Understanding. *Annals of the Association of American Geographers*, 89(1), 1-25.

BEA Regions

New England Region
- o Connecticut
- o Maine
- o Massachusetts
- o New Hampshire
- o Rhode Island
- o Vermont

Mideast Region
- o Delaware
- o District of Columbia
- o Maryland
- o New Jersey
- o New York
- o Pennsylvania

Great Lakes Region
- o Illinois
- o Indiana
- o Michigan
- o Ohio
- o Wisconsin

Plains Region
- o Iowa
- o Kansas
- o Minnesota
- o Missouri
- o Nebraska
- o North Dakota
- o South Dakota

Southeast Region
- o Alabama
- o Arkansas
- o Florida
- o Georgia
- o Kentucky
- o Louisiana
- o Mississippi
- o North Carolina
- o South Carolina
- o Tennessee
- o West Virginia

Southwest Region
- o Arizona
- o New Mexico
- o Oklahoma
- o Texas

Rocky Mountain Region
- o Colorado
- o Idaho
- o Montana
- o Utah
- o Wyoming

Far West Region
- o Alaska
- o California
- o Hawaii
- o Nevada
- o Oregon
- o Washington

# The Use of Bureau of Economic Analysis Regions for Representing Geographic Variation

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Geographic Hierarchy
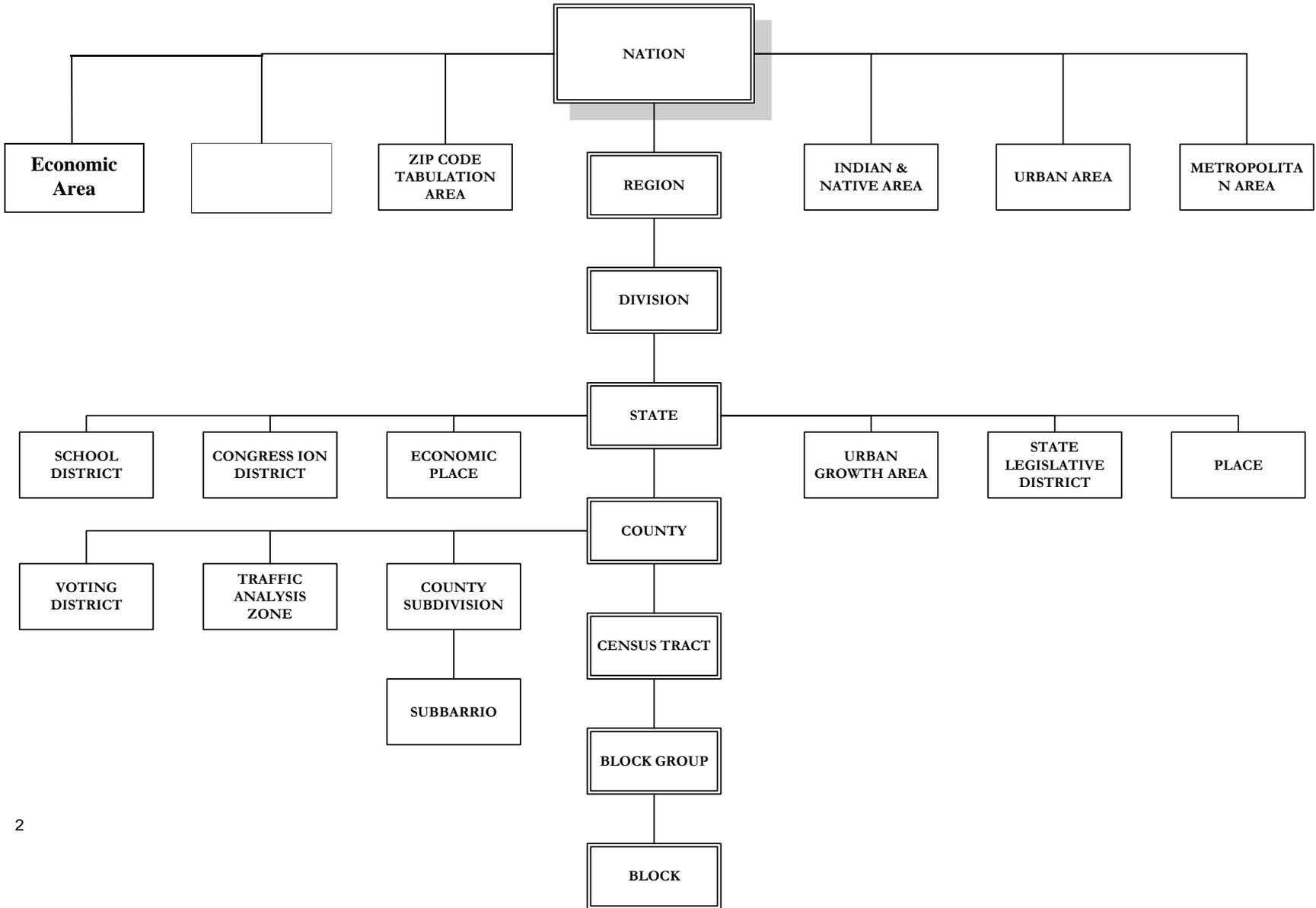
ADAM, ADAM II, and CEWG

Legend
- ◆ ADAM - Sites
- ● ADAM II - Sites
- ▲ CEWG Areas
- ▭ 8 Bureau of Economic Analysis Regions

Arrestee Drug Abuse Monitoring Program

Anchorage

0   490 Miles

New England

Seattle
Spokane
Portland

Pacific

Albany

Middle Atlantic

Minneapolis
East North Central

Detroit
Des Moines   Chicago   Cleveland
New York
Philadelphia

Mountain

West North Central

Salt Lake City

Sacramento
San Jose

Omaha

Indianapolis   Washington D.C.

Denver

Las Vegas

Albuquerque

Oklahoma City

East South Central

Charlotte

South Atlantic

San Diego   Phoenix

West South Central

Atlanta

Tucson

Birmingham

Dallas

N

Honolulu

San Antonio

Houston   New Orleans

W   E

S

0   125 Miles

Laredo

Fort Lauderdale
Miami

Legend

- • ADAM - Sites
- 🔵 ADAM II - Sites
- 🔺 CEWG Areas
- ▭ Census Divisions

0   260   520   1,040 Miles

ADAM: High Intensity Drug Trafficking Areas (HIDTA)

New England

Great Lakes

Rocky Mountain

Mideast

Seattle
Spokane
Portland
Minneapolis
Albany
Detroit
Cleveland
New York
Philadelphia
Washington D.C.

Far West

Plains

Salt Lake City
Des Moines
Omaha
Chicago
Indianapolis
Sacramento
San Jose
Denver
Las Vegas

Southeast

Charlotte
Albuquerque
Oklahoma City
Atlanta
Birmingham

Southwest

Phoenix
Tucson
Dallas
San Diego
Houston
San Antonio
New Orleans

Laredo

Fort Lauderdale
Miami

N
W — E
S

Legend

- ◆ ADAM - Sites
- ● ADAM II - Sites
- ▲ CEWG Areas
- ▭ 8 Bureau of Economic Analysis Regions

Drug Abuse Warning Network:
Data and Reporting

May 27, 2010

Disclosure Information

Al Woodward, PhD, MBA
Acting DAWN Team Leader

I have no financial or other disclosures

Drug Abuse Warning Network

- Public health surveillance system
- Direct review of emergency department (ED) patient records
- ED visits related to drugs
  - Direct cause or contributing factor
  - 4 million drug-related visits in 2008

What Drugs are Covered?

- All types of drugs
  - Illegal drugs
  - Prescription and OTC pharmaceuticals
  - Dietary supplements
  - Non-pharmaceutical inhalants
- Alcohol-in-combination (any age)
- Alcohol alone (age < 21)

DAWN Data

Trends, 2004 - 2008

Drug-related ED Visits – Nation, 2008

- Over 4.3 million drug-related ED visits
  - 73% increase from 2004 to 2008
  - 27% increase from 2006 to 2008

- Almost 2 million involved drug misuse/abuse (46% of total visits)
- Almost 1 million involved NMUP (22% of total visits)

Nonmedical Use of Pharmaceuticals (NMUP)

- Taking a higher than prescribed or recommended dose of a pharmaceutical
- Taking a pharmaceutical prescribed for another individual
- Deliberate malicious poisoning of the patient by another individual
- Substance abuse involving pharmaceuticals

Trends in Types of Drug-related ED Visits – 2004 - 2008
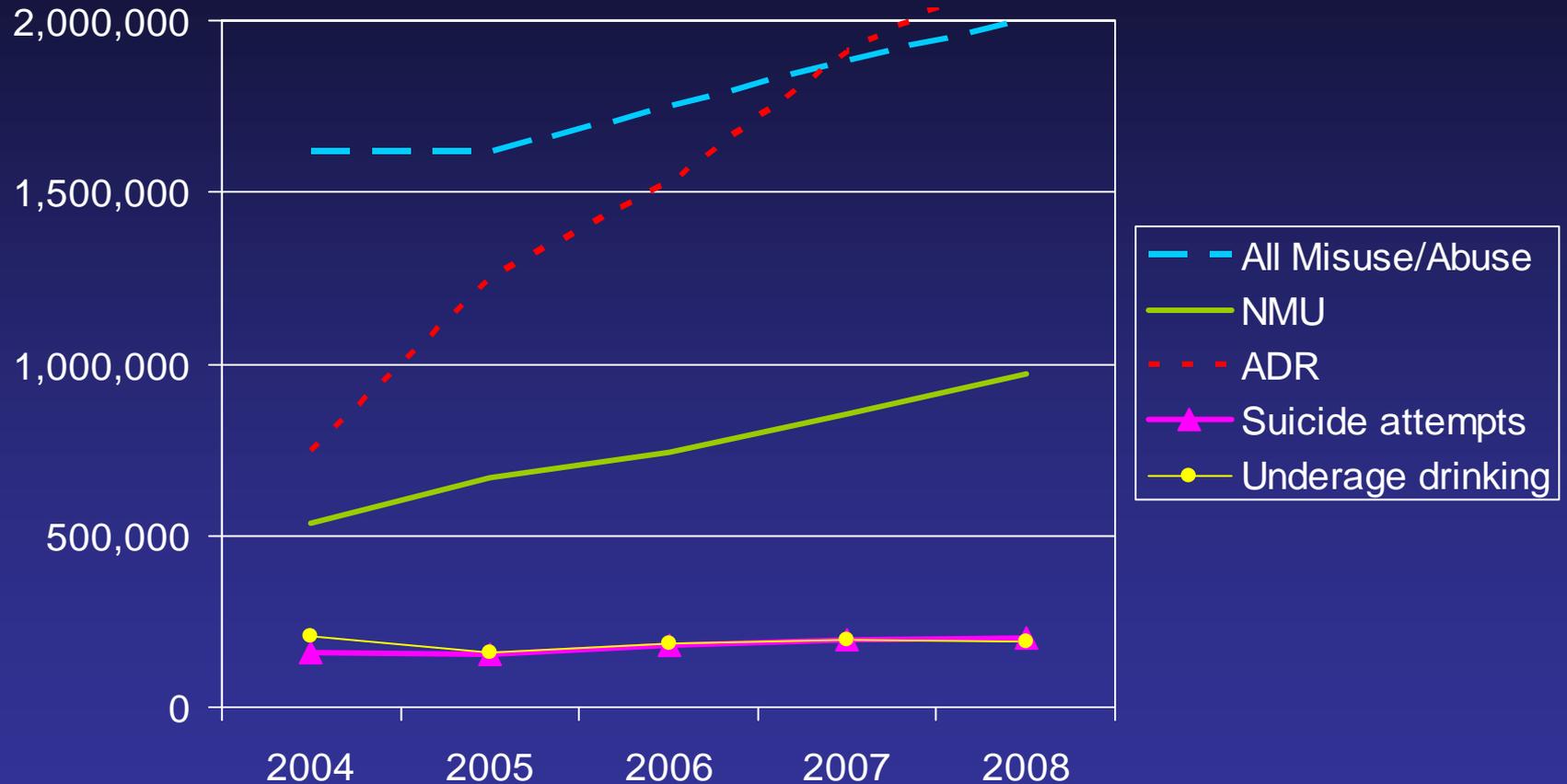
Trends for Major Illicit Drugs, ED Visits – 2004 - 2008
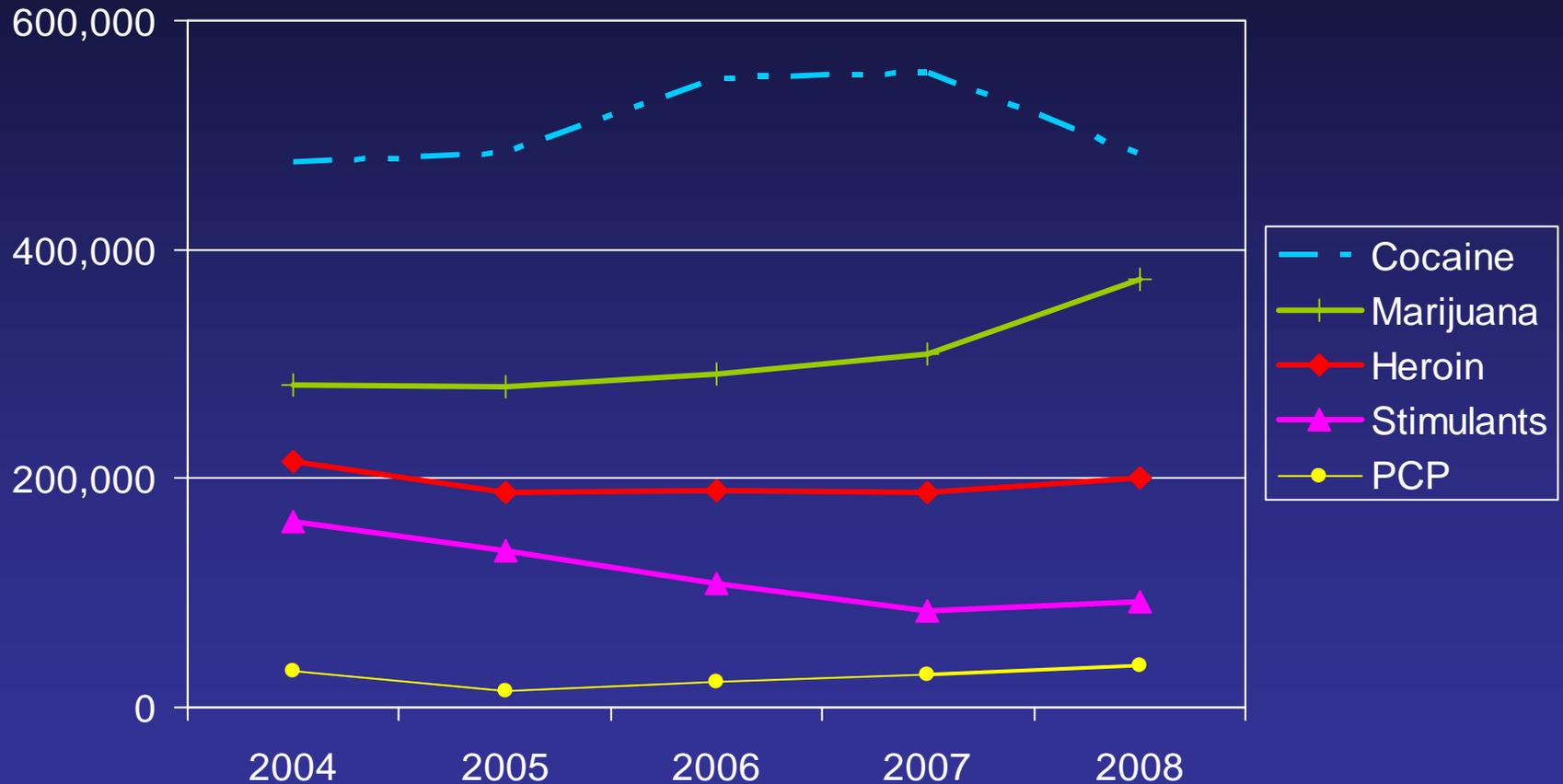
Trends for NMUP ED Visits, Selected Drug Categories – 2004 - 2008
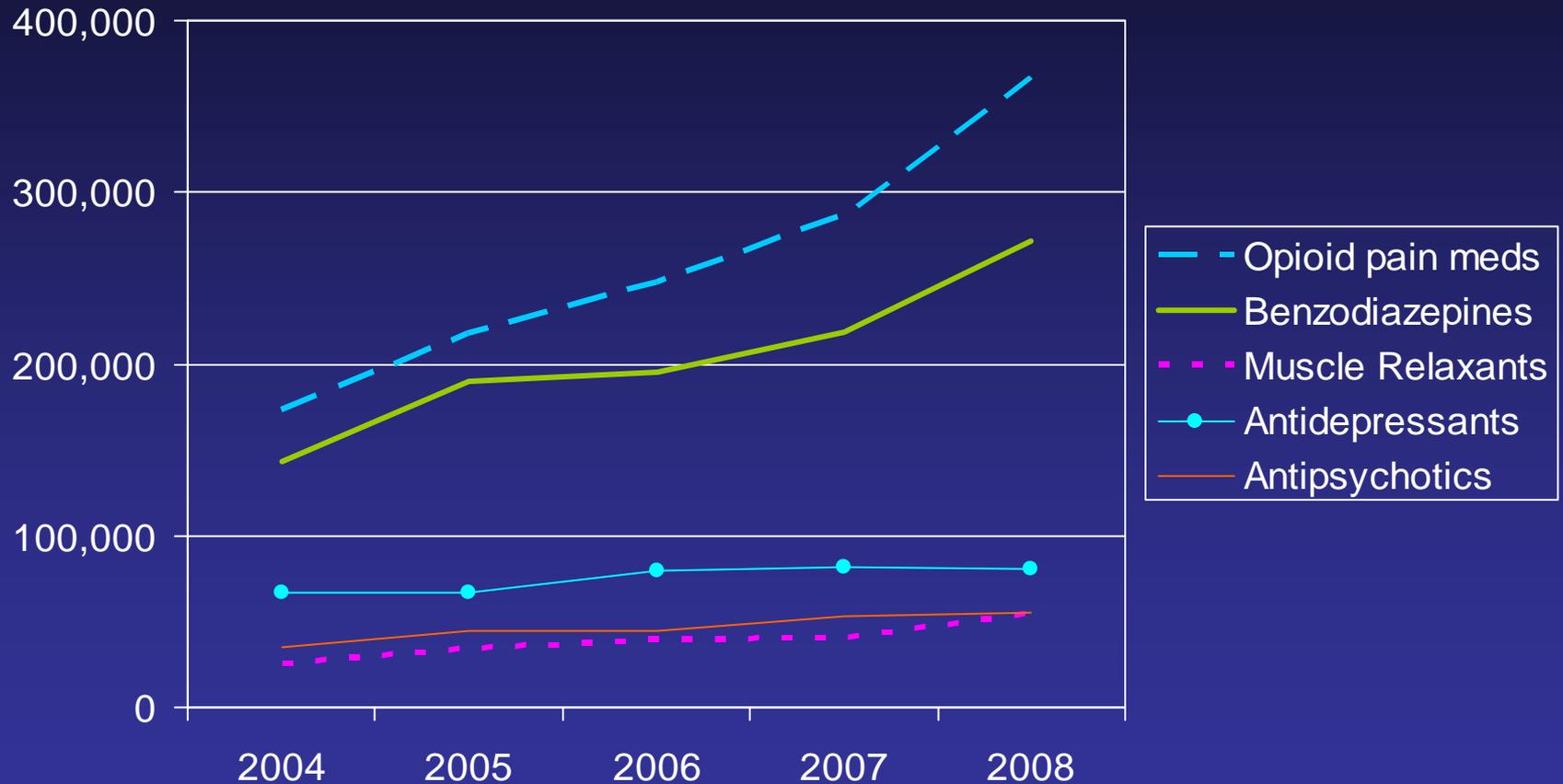
Disposition of Drug-related ED Visits

- Proxy for measuring severity
- Opportunity for intervention/prevention
- Three primary categories:
  - Treated and Released
  - Admitted to this Hospital
  - All Other Dispositions

DAWN Access to data

- http://dawninfo.samhsa.gov
- Public Use Files
- Privacy/Confidentiality & Staffing Limits