

# Arrestee Drug Abuse Monitoring (ADAM)

Design, Execution and Extensions

April 15, 2010

From Insight to Impact – Worldwide



# 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)

# 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

# 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

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# 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.

# 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.

# 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.

# 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.

# 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.

# 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.

# 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.

# 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.

# 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 caused spurious changes in trends
- Thus ADAM applies model-based estimation.

# 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.

# 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.

## 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.

# 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.

# 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.

# 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.

## 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  $n^{\text{th}}$  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.

# 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.

# 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.

# ADAM as a Research Platform

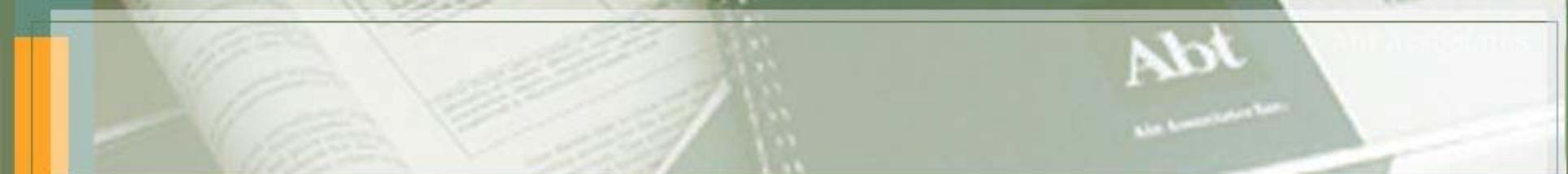
- Although ADAM II reports descriptive statistics about arrestees, the focus is on prevalence and trends in drug use, a focus that is consistent with ONDCP's mission.
- ADAM can answer other policy-relevant questions:
  - ADAM currently incorporates a calendar of events in the lives of drug user during 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).

# 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

# 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 Dyou. (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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