Estimating Substance Abuse Treatment: A Comparison of Data from a Household Survey, a Facility Survey, and an Administrative Data Set

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1. Introduction

This paper presents an evaluation of the coverage, overlap, biases, strengths, and weaknesses of three sources of data on the receipt of substance use treatment. These data sources are managed by the Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality (CBHSQ). Substance use treatment includes treatment for alcohol, illicit drugs, or both alcohol and illicit drugs. The three data sources include the following:

- National Survey on Drug Use and Health (NSDUH),

- National Survey of Substance Abuse Treatment Services (N-SSATS), and

- Treatment Episode Data Set (TEDS).

Accurate data on treatment are needed by SAMHSA to fulfill its mission to reduce the impact of substance abuse and mental illness on America's communities. Recent data show that over 20 million people needed treatment for a substance use problem, and only 11 percent had received any treatment at a specialty substance use treatment facility within the past 12 months (CBHSQ, 2013). Key measures of interest include

- How many people need, seek, and receive substance abuse treatment

- Barriers to receiving needed care

- What substances are people treated for

- Cost, payment sources, outcomes

- Differences by State, demographics and other factors

NSDUH, N-SSATS, and TEDS each collect data related to some of these key measures. The overall objective of the analyses presented in this paper is to improve the understanding of the information on substance use treatment from

these three data sources to inform future reporting of results and uses of the data. NSDUH, TEDS, and N-SSATS differ in their intended goals and in their methods of data collection. A clear understanding of the differences between these three data systems, as well as their strengths and limitations, is necessary in order to maximize the usefulness of the systems and ensure the accurate interpretation of findings.

2. Methods

2.1 Overview of Data Sources

NSDUH is the Federal Government's primary source of information on the nature and extent of substance use and abuse in the United States. Conducted since 1971, the survey collects data by administering questionnaires to a representative sample of persons aged 12 or older at their places of residence. Data collection is currently conducted under contract with RTI International, Research Triangle Park, North Carolina.[1] Approximately 67,500 persons are surveyed each year through face-to-face interviews. Data from the survey are used extensively by policymakers and researchers to measure the prevalence and correlates of licit and illicit substance use, to identify and monitor trends in substance use, treatment need and treatment and to analyze differences in substance use patterns by population subgroups. The NSDUH also collects data on mental disorders and mental health treatment. Reports on results from NSDUH data are available on the SAMHSA Web site (http://www.samhsa.gov/data/NSDUH.aspx).

NSDUH collects information from residents of households and noninstitutional group quarters (e.g., shelters, rooming houses, dormitories) and from civilians living on military bases. The survey excludes homeless persons who do not use shelters, military personnel on active duty, and residents of institutional group quarters, such as jails and hospitals. Since 1999, the NSDUH interview has been carried out in English or Spanish using computer-assisted interviewing (CAI). Most of the questions are administered with audio computer-assisted self-interviewing (ACASI). ACASI is designed to provide the respondent with a highly private and confidential mode for responding to questions in order to increase the level of honest responses to questions about illicit drug use and other sensitive behaviors, including substance use treatment. Less sensitive items are administered by interviewers using computer-assisted personal interviewing (CAPI).

The household screening response rates for the survey years 2005 to 2010 ranged from 88.8 percent in 2010 to 91.3 percent in 2005. Interview response rates for persons aged 12 to 17 ranged from 84.8 in 2007 to 87.1 in 2005; interview response rates for persons aged 18 to 25 ranged from 79.8 percent in 2007 to 83.1 percent in 2005; and interview response rates of persons aged 26 or older ranged from 71.4 percent in 2005 to 73.5 percent in 2007.

NSDUH questions about receipt of substance use treatment are asked of all respondents who report having used alcohol or an illicit drug at least once during their lives. Illicit drugs include marijuana or hashish, cocaine (including crack), heroin, hallucinogens, inhalants, prescription drugs used nonmedically (i.e., that were not prescribed for the respondent or were taken only for the experience or feeling they caused), including pain relievers, tranquilizers, stimulants, and sedatives. Questions about substance use treatment focus primarily on treatment received within the 12 months prior to the survey interview, asking about the location at which treatment was received and whether treatment was for alcohol or illicit drug use. Other questions ask about whether respondents felt a need for treatment (for each specific substance) and if they made an effort to get treatment in the past 12 months. The specific substances for which treatment was received, whether they are currently receiving treatment for each substance, source of payment, main location, duration of treatment, and outcome of the treatment are obtained in reference to the most recent treatment episode. Finally, a separate question asks respondents whether they had been in "specialty" treatment on October 1 of the previous calendar year. Specialty treatment is defined as treatment received as a hospital inpatient, in a drug and alcohol rehabilitation facility, or in a mental health center. This definition has been used in most NSDUH reports and was designed to be comparable to the N-SSATS universe. All NSDUH estimates in this study are limited to specialty treatment. The definition of specialty treatment excludes treatment at an emergency room, private doctor's office, self-help group, prison or jail, or as an outpatient at a hospital.

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[1] RTI International is a trade name of Research Triangle Institute.

This study uses NSDUH data collected over the 6-year period from 2005 through 2010, with multiple years of data used in order to provide a sufficient sample size to produce estimates for demographic subgroups. During those years, NSDUH employed a State-based design with an independent, multistage area probability sample within each State and the District of Columbia. The 8 States with the largest populations (California, Florida, Illinois, Michigan, New York, Ohio, Pennsylvania, and Texas, which together account for about half of the total U.S. population aged 12 or older) were designated as "large sample States" and had an annual sample size of about 3,600 respondents each. For the remaining 42 States and the District of Columbia, the annual sample size was about 900 respondents per State. The design oversampled adolescents aged 12 to 17 and young adults aged 18 to 25. Approximately 406,900 completed interviews were obtained from persons aged 12 or older in the 2005 to 2010 NSDUHs.

N-SSATS is an annual census of all known drug and alcohol abuse treatment facilities in the United States. N-SSATS, along with TEDS, is part of the Behavioral Health Services Information System (BHSIS), formerly known as the Drug and Alcohol Services Information System (DASIS), a cooperative program between SAMHSA and State substance use treatment agencies to collect data on substance use services. N-SSATS data collection and analysis are currently conducted under contract with Synectics for Management Decisions, Inc., Arlington, Virginia, and Mathematica Policy Research, Inc., Princeton, New Jersey.

N-SSATS is a multi-mode (paper/Web/telephone) census designed to collect information from all facilities in the United States, both public and private, that provide substance use treatment. N-SSATS collects data on the location, characteristics, and utilization of services at public and private alcohol and drug use treatment facilities throughout the 50 States, the District of Columbia, and other U.S. jurisdictions. N-SSATS provides a mechanism for tracking the changing character and composition of the U.S. substance use treatment delivery system. The N-SSATS questionnaire covers the characteristics of the treatment facility, including client payment sources, services provided, hospital and residential capacity, as well as the number of treatment admissions in the past 12 months and a single-day client census. The objective of the census is to collect multipurpose data that can be used to

- assist SAMHSA and State/local governments in quantifying the nature and extent of services provided in State-supported and other substance use treatment facilities and in forecasting substance use treatment resource requirements;

- update SAMHSA's Inventory of Behavioral Health Services (I-BHS), formerly known as Inventory of Substance Abuse Treatment Services (I-SATS), which includes all known drug and alcohol use treatment facilities and mental health treatment facilities; I-BHS is used as a sampling frame for N-SSATS as well as other special surveys of treatment providers and their clients; and

- analyze trends in substance use treatment services and perform comparative analyses for the United States, regions of the country, States, counties, and populated areas (metropolitan statistical areas [MSAs] and core based statistical areas [CBSAs]).

Although N-SSATS is a voluntary census, response rates are consistently about 95 percent. The incentive for participation is the opportunity to be included in SAMHSA's online Substance Abuse Treatment Facility Locator and annual *National Directory of Drug and Alcohol Treatment Services*. This searchable directory of drug and alcohol treatment programs shows the location of facilities around the country that treat alcohol use and drug use problems. Reports on N-SSATS data are available on the SAMHSA Web site (http://www.samhsa.gov/data/DASIS.aspx).

This paper focuses on N-SSATS data collected in the 3-year period from 2007 through 2009. N-SSATS collects data on approximately 14,000 facilities. Information is collected at the site of delivery of services rather than according to administrative structure. A Web-based version of the paper questionnaire was introduced in 2002. Participation using the Web-based survey has increased over the years; in 2007, about 40 percent of survey responses were submitted via the Web and in 2009 about 58 percent of surveys were completed on the Web.

TEDS is a compilation of data detailing the demographic and substance use characteristics of admissions and discharges from substance use treatment. TEDS is part of the BHSIS, a cooperative program among SAMHSA and State substance abuse agencies to collect data on substance use treatment services. TEDS data collection and analysis are currently conducted under contract with Synectics for Management Decisions, Inc., Arlington, Virginia. This data collection effort was developed in response to the 1988 Comprehensive Alcohol Abuse, Drug Abuse, and Mental Health Amendments (P.L. 100-690), which established a revised Substance Abuse Prevention and Treatment Block Grant (SAPTBG) and mandated Federal data collection on clients receiving treatment for either alcohol or drug abuse. Reports on results from TEDS data are available on the SAMHSA Web site (http://www.samhsa.gov/data/DASIS.aspx?qr=t#TEDS).

The TEDS system comprises two major components—the Admissions Data Set and the Discharge Data Set—which are linked at the record level. Information on substance use treatment admissions and discharges that State administrative systems routinely collect is submitted to TEDS in a standard format by approximately 10,000 facilities, programs, or administrative units in the 50 States, the District of Columbia, and Puerto Rico.

The scope of facilities included in TEDS is affected by differences in State licensure, certification, and accreditation practices, as well as disbursement of public funds. Most State substance abuse agencies require facilities that receive any State/public funding (including Federal block grant funds) for the provision of alcohol and/or drug treatment services to report TEDS data to the State. States differ widely in the amount of public funding available for substance use treatment and in the constraints placed on the use of funds. Some State substance abuse agencies (SSA) license or monitor facilities operating in their State that do not receive any public funding and require them to report TEDS data as well. In States where not all facilities are required to report TEDS data, some facilities do so voluntarily. Facilities operated by Federal agencies (e.g., the Bureau of Prisons [BOP], the Department of Defense [DoD], and the Department of Veterans Affairs [VA]) generally do not report TEDS data to the State, although some facilities operated by the Indian Health Service (IHS) are included. Hospital-based substance use treatment facilities are frequently not licensed through the State substance abuse agency and do not report TEDS data. To the extent that hospital-based facilities do report to TEDS, the records include those from specialty substance use treatment units within hospitals. Correctional facilities (State prisons and local jails) report TEDS data in some States but not in others.

The primary goal of TEDS is to monitor the characteristics of clients admitted to planned, continuing treatment regimens. Thus, TEDS excludes early intervention and crisis intervention programs that do not lead to enrollment in continued treatment. A majority of States report data on all admissions to all eligible facilities, although some report only admissions financed by public funds.

TEDS observations represent admissions to or discharges from substance use treatment, not individuals. For example, one individual admitted to treatment twice within a calendar year would be counted as two separate admissions. For the purposes of comparability with the other data sets, we have used data from the TEDS Admission Data Set, Discharge Data Set, and the unique identifiers to produce estimates of the unduplicated number of *persons* who received treatment. Admission and discharge records linked by a unique identifier represent clients who had been both admitted and discharged. Admission records with no linked discharge should indicate that a client had been admitted but not yet discharged. However, because the discharge system was not fully operational in all States during the years examined, it was assumed that a number of these admissions had, in fact, been discharged. For each admission with no linked discharge, a probability of having been discharged was computed in order to provide estimates of unduplicated number of persons who received treatment.

The TEDS Minimum Data Set includes the following information for each admission: date of admission; type of service; age; sex; race; ethnicity; number of prior treatment episodes; education; employment status; principal source of referral; primary, secondary, and tertiary substance problems and their usual route of administration, frequency of use, and age of first use; and planned use of medication-assisted opioid therapy. Information on use of primary, secondary, and tertiary problem substances is collected for alcohol and specific illicit substances, similar to the substances reported in NSDUH.

This study focuses on TEDS data collected for the years 2007, 2008, and 2009. TEDS data used in this report are from the Admissions Minimum Data Set, a core set of data elements collected at admission by all States, and the Discharge Data Set, for which 44 States, the District of Columbia, and Puerto Rico reported clients discharged in

2007; 48 States, the District of Columbia, and Puerto Rico reported clients discharged in 2008; and 48 States, the District of Columbia, and Puerto Rico reported clients discharged in 2009. In order to establish as much comparability between TEDS and NSDUH as possible, data from Puerto Rico are not included in the estimates from TEDS shown in this report. Analyses were conducted on data from 47 States, with Alabama, Alaska, the District of Columbia, and Georgia were excluded because they submitted no or incomplete data for 1 or more of the 3 years analyzed.

2.2 Analysis Methods

The principal measures of treatment produced by the three data sets are not directly comparable. NSDUH estimates are generally presented in terms of persons receiving treatment, TEDS is typically presented as admissions or discharges, and N-SSATS primarily describes the clients in treatment on a single reference day. However, using some of the additional items captured by each of the studies and applying certain assumptions, there are measures that can be constructed for comparison across the three data systems. We chose three such measures to focus on for this study: Number of clients in treatment on a single day (available in all three studies), number of persons receiving treatment within a 12 month period (NSDUH and TEDS), and number of admissions over a 12-month period (N-SSATS and TEDS). Construction of these measures is described subsequently.

2.2.1 Single-Day Counts of the Number of Persons in Drug or Alcohol Treatment

NSDUH. For this study, two different estimates of the number of persons in specialty substance use treatment on a single day were derived from NSDUH. One estimate was based on whether a respondent reported current treatment at the time of the survey. Respondents who indicated that they had received specialty alcohol or drug treatment in the past year were asked if, at the time of the survey, they were currently receiving treatment for alcohol or drug use. The estimate used in this study only included those who reported that the main treatment location the last time they received treatment was a specialty facility. The second measure of single-day treatment counts was derived from a question in which respondents who had received drug or alcohol treatment in their lifetime were asked if they had been enrolled in a treatment program at a hospital, drug rehabilitation facility, or mental health center on October 1 of the calendar year prior to the survey. From this question, an estimate was derived of the number of persons in treatment on that specific day.

N-SSATS. The N-SSATS provides a single-day count of the number of persons in hospital inpatient, residential (nonhospital), and outpatient substance use treatment on the last working day of March of each year from 2007 to 2009 (March 30, 2007; March 31, 2008, and March 31, 2009). For outpatient clients, the count is the number of active clients; an active outpatient client is defined as someone who was seen at the facility for substance use treatment or detoxification at least once during the month of March and was still enrolled in treatment on the last working day of March. These data are based on questionnaire items directly asking about patient population counts, by drug or alcohol, or both, and by modality, on the specific reference date.

TEDS. For this report, estimates were computed for the number of clients in treatment on the last working day in March each year from 2007 to 2009 using linked admission and discharge records from TEDS data processed through October 10, 2011. The last working day of March was selected for these counts in order to be as consistent as possible with the counts provided by the N-SSATS data. Counts included total clients and the numbers of clients by use of alcohol only, drugs only, alcohol and drugs, primary alcohol/secondary drug, and primary drug/secondary alcohol. Admission records with date of admission on or after January 1, 2000, were included; codependents (persons who do not have a substance use disorder but who receive treatment because a loved one has a substance use disorder) were excluded. Data for March 30 reference dates were calculated for each year from 2000 to 2008 to check that this method yielded plausible data even when discharge records were sparse.

Estimates comprised the sum of two parts:

1. Linked records representing clients who had been both admitted and discharged. The number of clients who were admitted on or before the reference date and discharged on or after the reference date was calculated.

2. Admissions records with no linked discharge. The presence of admissions records without any linked discharge data may be because a client has been admitted and not yet discharged. However, because the discharge system was not fully operative in all States for the years we examined, it can be assumed that a number of these admissions without linked discharges had, in fact, been discharged. Therefore, a probability of having been discharged by each reference date was computed for each unlinked admission record, based on the assumption that the unlinked admission records would have the same probability of being discharged on a given day following treatment as the linked admission records. The probability of being in treatment on the reference date was calculated as 1 minus the cumulative frequency. That is, if 0.34 (34%) of clients had been discharged by day 10, then a record with date of admission 10 days before the reference date had a 1.00 - 0.34 = 0.66 (66%) chance of being in treatment on the reference date. Probabilities of being in treatment were summed for each reference date. Thus, if 100 clients were admitted 10 days before the reference date, each would have a probability of 0.66, yielding a total of 66 clients likely to be in treatment on the reference date.

2.2.2 Persons Receiving Substance Use Treatment in the Past 12 Months

NSDUH. The NSDUH measure of receipt of specialty substance use treatment in the past year is derived from a series of questions about treatment received for alcohol use or illicit drug use (including the nonmedical use of prescription type drugs) at specific types of locations during the past 12 months. Persons could report having received treatment at more than one location, and they could also report treatment that began before 12 months ago and continued into the past year, as well as treatment that is still ongoing (i.e., currently in treatment). Respondents who report treatment are asked further details about the last time they received treatment, including the specific substances for which they received treatment.

TEDS. TEDS data provide an overall count of the annual number of admissions for substance use treatment at facilities including outpatient, residential, and hospital-inpatient facilities. In addition to this direct count, estimates can be computed from the probabilities of having been discharged for (1) the total number of persons admitted to treatment in a calendar year and (2) the total number of persons who received treatment in a calendar year, including those who were admitted to treatment in a prior year. Multiple admissions linked by a single unique identifier represent one person. To eliminate multiple admissions, a person was defined as having a unique combination of State of residence, client ID, age, sex, and race/ethnicity.

For the count of the number of persons receiving treatment in the past year, records were used for persons admitted on or before Dec 31 of that year (including admissions occurring in a prior year), and discharged on or after January 1 of that year (including those still in treatment on January 1 of the next year). Each estimate is made up of 2 parts: (1) a direct count from linked admission/discharge records and (2) an estimate, based on the probability of being in treatment on Jan 1 of the given year if admitted in a different year, for those admissions not linked to discharges. This situation should indicate that a client has been admitted and not yet discharged. However, because the discharge system was not fully operative in all States for the years we examined, it can be assumed that a number of these admissions without linked discharges had, in fact, been discharged. Therefore, a probability of having been discharged by each reference date (January 1) was computed for each unlinked admission record, based on the same assumptions that were used to estimate the number of clients in treatment on a single reference date.

2.2.3 Admissions to Substance Use Treatment in the Past 12 Months

N-SSATS. N-SSATS data provide an overall count of the annual number of admissions for substance use treatment at all substance use treatment facilities that respond to the census. This estimate is based on responses to a direct question on the N-SSATS form, asking each facility to report the number of admissions in that facility for a recent 12-month period.

TEDS. TEDS data provide an overall count of the annual number of admissions for substance use treatment at facilities including outpatient, residential, and hospital-inpatient facilities, based on a count of all the submitted admission forms having the admission date during the 12-month period of interest.

3.Results

3.1 Single-Day Treatment Counts

As expected given the design and intended purpose of the TEDS, the TEDS count (532,109) was significantly lower than either the NSDUH estimate or the N-SSATS count. The NSDUH October 1 estimate (1,434,851) was the highest count, followed by the NSDUH average-day estimate (1,196,460). The N-SSATS count (1,153,617) was similar to the NSDUH average day estimate, but lower than the NSDUH October 1 estimate (Table 1).

For each of the single-day counts except the NSDUH October 1 estimate, individual single-day treatment counts were generated for alcohol only treatment, drug only treatment, and treatment for both alcohol and drugs. Among the 1,196,460 persons in treatment on an average day according the NSDUH, 36.7 percent were treated for alcohol use only, 26.3 percent were treated for drug use only, 35.2 percent were treated for both alcohol and drug use, and for 3.8 percent, this information was unknown. From N-SSATS (1,153,617 persons), 18.8 percent were treated for alcohol use only, 36.0 percent were treated for drug use only, 45.2 percent were treated for both alcohol and drug use. Among the 532,109 persons in treatment on a single day in TEDS, 19.3 percent were treated for alcohol use only, 40.9 percent were treated for drug use only, 37.4 percent were treated for both alcohol and drug use, and 2.4 percent had no reported substance use at the time of admission. A possible explanation for the disparity between the percentages of persons receiving treatment for alcohol only in the N-SSATS and TEDS single day counts (18.8 and 19.3 percent for N-SSATS and TEDS, respectively) is that the increased stigma of receiving treatment for a drug use problem relative to that of an alcohol use problem may affect self-reports in NSDUH of the focus of treatment.

There is substantial variation between single-day treatment counts/estimates across States. The TEDS count is lower than the counts from the other data systems in all 8 States examined, though not significantly so in Illinois, New York, Ohio, and Texas. New York, for example, is a state where all substance abuse treatment admissions are reported, since the New York SSA licenses both public and private treatment facilities.

3.2 Number of Persons Who Received Treatment in the Past 12 Months

The NSDUH estimate of the total count/estimate of the number of persons who received substance use treatment from specialty treatment facilities in the past year was higher than the TEDS count (2,464,150 vs. 1,928,578).

A comparison of the treatment characteristics of persons who received substance use treatment from a specialty facility in the past year also shows several differences between the two data sources (Table 2). Although the NSDUH estimate and the TEDS count reflected similar proportions of persons who received treatment in an outpatient setting (81.1 and 78.2 percent, respectively), the NSDUH estimate included a notably higher percentage of persons who received treatment in an inpatient hospital setting than the TEDS count (31.4 vs. 3.2 percent). In terms of numbers of persons, this translates to 774,093 for NSDUH and 61,382 for TEDS. The NSDUH estimate also reflected a higher percentage of persons who received treatment in a residential rehabilitation facility than the TEDS count (40.8 vs. 28.2 percent). The percentage of persons in the NSDUH estimate who were treated for marijuana use problems was lower than the corresponding percentage in the TEDS count (31.0 vs. 39.7 percent). The NSDUH estimates included higher percentages of persons treated for prescription drugs, inhalants, hallucinogens, and alcohol than did the TEDS counts (26.3 vs. 12.5 percent for prescription drugs, 6.0 vs. 0.2 percent for inhalants, 10.9 vs. 0.6 percent for hallucinogens, and 69.3 vs. 59.5 percent for alcohol). One possible explanation for the difference between the percentage of persons treated for prescription drugs reflected in the NSDUH estimate and the TEDS count is that TEDS queries treatment for methamphetamine use as a separate category, whereas NSDUH includes treatment for methamphetamine use as treatment for prescription drugs. The NSDUH estimate included a lower proportion of injection drug users than the TEDS count did (7.3 vs. 12.4 percent).

There was some variation between the treatment counts from the two data sources on several demographic characteristics (Table 2). The NSDUH estimate included a lower percentage of youths and a greater percentage of older persons. The NSDUH estimate included a higher proportion of non-Hispanic whites and lower percentages of non-Hispanic blacks and Hispanics than the TEDS count. The proportions of males and females were similar between the two data sources. The NSDUH estimate included a higher percentage of persons with more than a high

school education and a lower percentage of persons with 8 or fewer years of education than the TEDS count. Differences in the socioeconomic status of the treatment population were also evident in proportions unemployed (12.7% in 2005-10 NSDUH, 39.8% in 2009 TEDS) (CBHSQ, 2011). One possible explanation for these findings is that many States require only publicly funded facilities to report data to TEDS, and some States only require facilities to report TEDS data for patients for whom treatment is publicly funded.

In six of the eight States examined, the TEDS count of the number of persons who received substance use treatment in the past year was smaller than the NSDUH estimate (Table 3). Notable differences between the TEDS count and the NSDUH estimate were found in four States. For example, in Florida, the NSDUH estimate (138,035) was higher than the TEDS count (67,305). There were similar disparities between the NSDUH estimates and TEDS counts in Michigan (102,203 vs. 57,956), Pennsylvania (108,068 vs. 46,990), and Texas (84,936 vs. 41,930). In two States, the TEDS count was larger than the NSDUH estimate, but the disparities were not statistically significant. In New York, the TEDS count was 245,898 persons, and the NSDUH estimate was 207,852. In Ohio, the TEDS count was 105,443 persons, and the NSDUH estimate was 96,729.

3.3 Past Year Admissions

This section compares the counts of substance use treatment admissions for N-SSATS and TEDS. As noted previously, data from Alabama, Alaska, District of Columbia, and Georgia were excluded from the TEDS counts because no or incomplete TEDS data were submitted for one or more of the three years examined (2007-2009) in these areas. For the purpose of these comparisons, N-SSATS estimates were restricted to the subset of 47 States that were used to generate the TEDS counts. These counts, for 2007, 2008, 2009, and an average of the three years are presented in Table 4. The TEDS admissions count is less than 60 percent of the N-SSATS admissions count (1,953,448 vs. 3,483,632, respectively). This difference is higher when comparing all N-SSATs states (national counts) to the TEDS overall counts. This difference is seen in the individual states, with a few exceptions.

4. Conclusions

There is considerable variation between these three data sources in important factors such as coverage, methods and timing of data collection, definitions, and information captured. As a result, each of these data sources has its own strengths and limitations that must be considered when deciding which data source to use in order to address specific policy or research questions. This paper documents some of these key strengths and weaknesses, and shows how the methodological differences impact the estimates of substance use treatment from these three data sources.

Across the three measures, TEDS shows under-coverage relative to N-SSATS and NSDUH. The TEDS estimate of the single day count is only 46 percent of the N-SSATS count and 37 to 44 percent of the NSDUH estimates. The TEDS estimate of persons receiving treatment is 78 percent of the NSDUH estimate, and the count of past year admissions is only 56 percent of the N-SSATS estimate. The TEDS undercount varies by state and appears to be most severe among inpatient hospital treatment populations and among low-SES persons. N-SSATS and NSDUH estimates of the single day count are generally similar, but NSDUH shows a higher proportion of clients receiving treatment for alcohol use.

TEDS includes persons who are homeless and those who are institutionalized in treatment facilities long term, whereas homeless or institutionalized persons have less of a chance of inclusion in the NSDUH. NSDUH includes people who are treated in privately funded facilities and persons whose treatment is privately funded as well as those whose treatment was publicly funded, whereas TEDS is mainly limited to those whose treatment was publicly funded. The NSDUH questionnaire includes a great deal of information about individuals who received treatment which can be tied to other covariates collected in the survey, which allows for more specific analyses regarding coverage for different demographic groups. N-SSATS includes a census of all facilities regardless of funding.

All three data systems produce counts or estimates by State. State level analyses not only are useful to local and State officials, but also can provide policy assessments based on differing laws, policies, and conditions in States. These analyses require consistent data collection methods, definitions, and coverage across States to ensure the data are comparable. While comparability is achieved in NSDUH and N-SSATS, small sample sizes in some States is an

important limitation of NSDUH for State-level comparisons. Reporting anomalies in TEDS require extra caution in drawing conclusions about differences in treatment by State. For example,

- The number and characteristics of TEDS client records depends, to some extent, on external factors, including the availability of public funds. In States with higher funding levels, a larger percentage of the substance-abusing population may be admitted to treatment, including the less severely impaired and the less economically disadvantaged.

- The way an admission is defined may vary from State to State such that the absolute number of admissions is not a valid measure for comparing States.

- States continually review the quality of their data processing. As systematic errors are identified, revisions may be enacted in historical TEDS data files. While this system improves the dataset over time, reported historical statistics may change slightly from year to year.

- States vary in the extent to which coercion plays a role in referral to treatment. This variation derives from criminal justice practices and differing concentrations of abuser subpopulations.

- Public funding constraints may direct States to selectively target special populations, for example, pregnant women or adolescents.

Some of the basic questions about substance use treatment concern trends over time in service need or utilization. In TEDS, there are two principle sources of variations in estimates of variation over time: reporting anomalies (discussed above) and true changes in admission and discharge patterns. N-SSATS and NSDUH have relatively fewer methodological shifts or anomalies that may cause variations in the data over time. In the absence of those, differences in N-SSATS or NSDUH counts or estimates, when statistically significant and meaningful, may be expected to reflect actual changes. One limitation of NSDUH is that because it is a sample survey, trends in rare events and among subpopulations may be difficult to assess due to potentially large sampling error.

The analyses presented in this paper are a first step in developing clear guidance for future analyses to better answer some basic questions about substance use treatment, such as: how many people receive treatment in a year; how large is the gap between treatment received and treatment needed; how have the numbers of people receiving and needing treatment changed over time. The discussion and conclusions in this study are also a step toward understanding how to answer questions about the data sources, such as: why do these studies give conflicting results, and which estimate should be used to answer my question about substance use treatment.

The analysis also suggests some further work that could be done with these three data sets. Avenues of investigation could include:

- What number/proportion of the TEDS count of persons in treatment are homeless persons or persons who have been institutionalized long term, and what are the characteristics of these persons?

- Can N-SSATS and TEDS be linked at some level to quantify the extent and the nature of the under-coverage in TEDS?

- Can the N-SSATS past year admissions numbers be used to generate person-level past year treatment counts?

- Are there changes in definitions, questionnaires, and eligibility rules in these three studies that will facilitate joint analyses?

- Can admissions be estimated from NSDUH, without adding new questions?

- Are there ways of utilizing TEDS and N-SSATS to enhance the precision of NSDUH small area estimates?

- How can NSDUH and TEDS be used to enhance N-SSATS so that more informative estimates of admissions and persons receiving treatment can be made?

Finally, it is important to recognize that the nature of these data sets and how they may be used in the future will not remain constant. The movement towards more integrated care, mental health parity, and health care reform will undoubtedly lead to changing data needs and data systems. The results presented here will be valuable to policymakers and designers of data systems as the substance use treatment system evolves within the broader health care context.

5. References

Center for Behavioral Health Statistics and Quality. (2011). Treatment Episode Data Set (TEDS): 1999-2009. National admissions to substance abuse treatment services (HHS Publication No. SMA 11-4646, DASIS Series: S-56). Rockville, MD: Substance Abuse and Mental Health Services Administration. Retrieved from http://wwwdasis.samhsa.gov/teds09/teds2k9nweb.pdf

Center for Behavioral Health Statistics and Quality. (2013). Results from the 2012 National Survey on Drug Use and Health: Summary of national findings (HHS Publication No. SMA 13-4795; NSDUH Series H-46). Rockville, MD: Substance Abuse and Mental Health Services Administration.

Table 1. Single-Day Treatment Counts[1] for Alcohol or Drug Treatment Specialty Treatment and Confidence Intervals for Estimates of Single-Day Treatment Counts Overall and by Substance for Which Treatment was Received in the United States and 8 Largest States: NSDUH 2008 to 2010 Combined (October 1 and Average-Day Counts), N-SSATS 2007 to 2009 Combined (All Facilities) and TEDS 2007 to 2009 Combined

	NSDUH October 1 2008 to 2010		NSDUH Average Day 2007 to 2009[2,3] Number (95% CI)		TEDS March 30th 2007 to 2009	N-SSATS – All Facilities March 30th 2007 to 2009
	#	95% CI	#	95% CI	#	#
Any Treatment – Total						
United States	1,434,851	(1,278,112-1,610,688)	1,196,460	(1,066,843-1,341,740)	532,109	1,153,617
Eight Largest States						
California	201,700	(133,352-304,722)	152,925	(100,457-232,583)	68,868	139,043
Florida	75,198	(45,902-123,044)	85,986	(53,239-138,693)	15,646	51,470
Illinois	71,469	(44,539-114,507)	44,802	(28,032-71,538)	13,794	44,902
Michigan	57,947	(41,724-80,416)	46,804	(31,818-68,788)	12,552	42,676
New York	110,008	(66,014-182,993)	100,975	(68,315-149,107)	80,054	117,075
Ohio	50,830	(33,095-77,990)	36,628	(24,087-55,658)	25,825	36,847
Pennsylvania	53,555	(35,397-80,956)	69,628	(47,989-100,928)	20,791	47,438
Texas	66,942	(43,044-104,038)	14,796	(7,643-28,634)	7,972	40,171
Treatment Focus						
Alcohol Only	NA	NA	438,665	(354,848-542,237)	102,587	216,832
Drugs Only	NA	NA	314,806	(261,637-378,764)	217,502	414,845
Alcohol and Drugs	NA	NA	397,732	(333,100-474,879)	198,871	521,940
Alcohol Primary	NA	NA	165,571	(125,368-218,657)	86,898	NA
Drug Primary	NA	NA	228,813	(180,823-289,525)	111,973	NA
Unknown Substance	NA	NA	45,257	(29,579-69,242)	13,148	NA

NA = not available

NOTE 1: Not all States report to TEDS. Counts for NSDUH and N-SSATS do not exclude data from States not reporting to TEDS for a given year.

NOTE 2: N-SSATS collects information from public and private facilities, and includes facilities operated by Federal agencies. TEDS collects data primarily from publicly funded facilities and does not include data from federally operated facilities.

[1] Single-day treatment counts are based on a reference date of October 1 for NSDUH and March 30 for N-SSATS and TEDS. Because the reference date for NSDUH is October 1 of the prior year in other tables, for consistency across tables, N-SSATS and TEDS data are based on the data file from the previous year. NSDUH "Treatment" includes treatment received at a hospital, drug rehabilitation facility or mental health facility. Nonspecialty treatment data are excluded from total counts. NSDUH October 1 single-day treatment counts are derived from TX43. "Alcohol or drug treatment" refers to treatment for either alcohol or drugs. Individuals in treatment for alcohol only, drugs only, and both alcohol and drugs, and those for whom the substance for which they were treated is unknown are included.

[2] NSDUH average-day single-day counts are derived from the single-day question (TX07) and from the question on outcome of last treatment (TX38 where the response option is still in treatment).

[3] Data are subset to the following categories from TX25: (1) hospital as an outpatient, (2) inpatient at a residential drug or alcohol rehabilitation facility, (3) outpatient at a residential drug or alcohol rehabilitation facility, and (4) outpatient at a mental health center or facility.

Table 2. **Numbers and Percentages and Confidence Intervals of Numbers and Percentages of Persons That Received Substance Use Treatment from Specialty Treatment Programs in the Past Year in the United States: NSDUH 2005 to 2010 and TEDS 2007 to 2009**

	NSDUH 2005 to 2010 Average (All States)				TEDS 2007 to 2009 Average	
	Number (95% CI)		Percentage (95% CI)		Number	Percentage
Total	2,464,150	(2,336,545-2,598,650)	100.0	(NA)	1,928,578	100.0
Modality						
Hospital Inpatient	774,093	(717,561-832,956)	31.4	(29.1-33.8)	61,382	3.2
Residential Rehabilitation— Inpatient	1,004,459	(943,901-1,066,177)	40.8	(38.3-43.3)	543,456	28.2
Outpatient	1,999,029	(1,946,842-2,047,078)	81.1	(79.0-83.1)	1,507,988	78.2
Outpatient Rehabilitation	1,673,268	(1,612,645-1,731,535)	67.9	(65.4-70.3)	NA	NA
Mental Health Center or Facility—Outpatient	1,032,262	(970,415-1,095,160)	41.9	(39.4-44.4)	NA	NA
Substance						
Marijuana	764,690	(712,629-818,777)	31.0	(28.9-33.2)	766,433	39.7
Cocaine (including crack)	636,416	(582,894-693,043)	25.8	(23.7-28.1)	488,826	25.3
Heroin	341,168	(295,184-393,017)	13.8	(12.0-15.9)	293,395	15.2
Prescription Drugs	657,661	(608,386-709,401)	26.7	(24.7-28.8)	240,288	12.5
Methamphetamine	NA		NA		213,176	11.1
Inhalants	149,737	(125,109-178,843)	6.1	(5.1-7.3)	3,574	0.2
Hallucinogens	271,434	(239,619-306,889)	11.0	(9.7-12.5)	12,139	0.6
Alcohol	1,695,291	(1,638,653-1,749,738)	68.8	(66.5-71.0)	1,146,597	59.5
Route of Administration						
Injection	178,090	(148,707-212,739)	7.3	(6.1-8.7)	238,459	12.4
Age						
12 to 17	158,143	(143,811-173,796)	6.4	(5.8-7.1)	170,289	8.8
18 to 24	462,044	(431,746-493,952)	18.8	(17.5-20.0)	372,992	19.3
25 to 34	576,308	(526,266-629,563)	23.4	(21.4-25.5)	504,865	26.2
35 to 44	556,134	(504,025-611,948)	22.6	(20.5-24.8)	446,508	23.2
45 or Older	711,521	(645,450-781,449)	28.9	(26.2-31.7)	433,924	22.5
Race/Ethnicity						
Not Hispanic	2,153,846	(2,104,459-2,197,311)	87.4	(85.4-89.2)	1,601,402	85.3
White	1,636,071	(1,571,302-1,698,431)	66.4	(63.8-68.9)	1,135,068	60.4
Black	422,623	(371,984-478,580)	17.2	(15.1-19.4)	368,823	19.6
American Indian/Alaska Native	29,939	(21,804-41,059)	1.2	(0.9-1.7)	39,924	2.1
Asian/Pacific Islander	24,320	(14,499-40,683)	1.0	(0.6-1.7)	21,267	1.1
Two or More Races	40,892	(29,041-57,463)	1.7	(1.2-2.3)	11,031	0.6
Other	NA		NA		25,285	1.3
Hispanic or Latino	310,304	(266,839-359,691)	12.6	(10.8-14.6)	276,702	14.7
Sex						
Male	1,640,333	(1,581,404-1,697,236)	66.6	(64.2-68.9)	1,292,491	67.0
Female	823,817	(766,914-882,746)	33.4	(31.1-35.8)	635,540	33.0
Years of Education						
0 to 8 years	138,804	(115,522-166,444)	5.6	(4.7-6.8)	180,424	9.5
9 to 11 years	670,605	(616,389-727,711)	27.2	(25.0-29.5)	541,507	28.6
12 (High School/GED)	816,660	(759,160-876,277)	33.1	(30.8-35.6)	752,030	39.8
More than 12	838,081	(775,417-903,102)	34.0	(31.5-36.6)	417,619	22.1

NA = Not available.

Table 3. **Numbers and Confidence Intervals of Numbers and Percentages of Persons That Received Substance Use Treatment from Specialty Treatment Programs in the Past Year for the Eight Largest States: NSDUH 2005 to 2010 and TEDS 2007 to 2009**

State	NSDUH 2005 to 2010 Average (All States)		TEDS 2007 to 2009 Average
	Number	95% CI	Number
California	270,380	217,949-335,282	231,884
Florida	138,035	111,991 - 170,067	67,305
Illinois	95,950	79,400-115,911	69,483
Michigan	102,203	85,273-122,445	57,956
New York	207,852	168,643-256,032	245,898
Ohio	96,729	80,240-116,564	105,443
Pennsylvania	108,068	89,934-129,814	46,990
Texas	84,936	65,807-109,593	41,930

Table 4.   Substance Use Treatment Annual Admissions, by State: N-SSATS 2007 to 2009, and TEDS 2007 to 2009

	Annual Admissions	
	N-SSATS[1]	TEDS
	Average	Average
Total United States[2]	3,483,632	1,953,448
State		
Arizona	86,578	20,449
Arkansas	15,296	22,712
California	389,426	195,666
Colorado	99,529	84,391
Connecticut	69,621	46,000
Delaware	11,282	8,048
Florida	190,871	70,987
Hawaii	11,711	7,196
Idaho	12,375	5,486
Illinois	163,965	72,921
Indiana	75,643	22,036
Iowa	35,252	27,966
Kansas	35,046	16,972
Kentucky	66,244	22,566
Louisiana	44,233	25,933
Maine	24,579	15,398
Maryland	85,038	65,293
Massachusetts	148,551	86,710
Michigan	147,706	65,519
Minnesota	74,522	50,463
Mississippi	21,447	8,335
Missouri	68,998	49,667
Montana	15,025	8,169
Nebraska	25,324	16,254
Nevada	26,325	9,711
New Hampshire	11,369	6,068
New Jersey	82,909	65,067
New Mexico	43,800	11,147
New York	322,386	312,243
North Carolina	95,308	38,450
North Dakota	12,666	2,460
Ohio	120,778	105,537
Oklahoma	35,131	16,788
Oregon	69,740	51,921
Pennsylvania	163,076	69,816
Rhode Island	16,326	11,182
South Carolina	50,237	27,129
South Dakota	15,005	15,280
Tennessee	48,612	10,148
Texas	133,911	45,510

Table 4. **Substance Use Treatment Annual Admissions, by State: N-SSATS 2007 to 2009, and TEDS 2007 to 2009 (continued)**

	Annual Admissions	
	N-SSATS[1]	TEDS
	Average	Average
State (continued)		
Utah	37,281	14,541
Vermont	13,191	7,930
Virginia	68,308	31,754
Washington	102,097	39,220
West Virginia	18,799	11,117
Wisconsin	67,634	29,351
Wyoming	10,481	5,938

[1] N-SSATS annual admission counts reflect past year admissions reported on the last working day of March in the given year.

[2] Both TEDS and N-SSATS total and regional counts exclude Alabama, Alaska, District of Columbia, and Georgia, which had incomplete TEDS reporting.