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UNMET NEED FOR SUBSTANCE ABUSE TREATMENT OF ADULTS IN MASSACHUSETTS

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ABSTRACT: This article presents a methodology to estimate the size and cost of eliminating unmet need for substance abuse treatment services among adults who have clinically significant substance use disorders, and applies the approach to Massachusetts' information. Unmet treatment needs were derived using a statewide household telephone survey of 7,251 Massachusetts residents aged 19 and older conducted in 1996–1997, and an index of treatment mix and cost information from state and Medicaid financial data. The study estimates that 39,450 adult state residents (0.81% of the total sample) had a clinically significant past-year substance use disorder, but had not received treatment in the past year. Providing substance abuse treatment and outreach services to them would have required an additional cost of approximately $109 million ($17 per capita), of which the state's payer of last resort, the Massachusetts Department of Public Health Bureau of Substance Abuse Services (BSAS), would need to fund $31 million ($5 per capita). The share paid by BSAS (28%) would represent an increase of 42% over its current spending. This paper quantifies an important but sometimes overlooked objective of managed care: to improve access for substance abusers who need but do not seek treatment.

KEY WORDS: ASAM levels of care; need for treatment; substance abuse; surveys; treatment costs.

Substance use disorders in the United States are an enormous public health problem with huge economic costs (Harwood et al., 1998).

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Research on substance abuse treatment provides ample justification for providing such treatment. Studies have demonstrated the cost-effectiveness and benefits of substance abuse treatment, including reduced crime and health care costs, and increased productivity (Cartwright, 2000; Holder, 1998; Schneider Institute for Health Policy, 2001). Despite this evidence, many people with alcohol and drug use disorders do not receive the care they need (Kessler et al., 2001a, b; Narrow, Rae, Robins, & Regier, 2002). Although definitions of need and services vary, published estimates have indicated that there is a substantial national treatment gap, the term used to describe the difference between the number who need and the number who access treatment services. The 2002 National Survey of Drug Use and Health (NSDUH) estimated that only 10.3% of the 22.8 million individuals with a substance use disorder had received treatment at a specialty substance abuse facility in the past year (SAMHSA, 2003a). Other national surveys, as well as studies of the treatment gap in Maryland, New Jersey, Rhode Island, and other states and communities, have also found that large percentages of individuals with substance abuse and dependence diagnoses have not obtained treatment (Johnson, Brems, & Fisher, 1996; Mammo, 1993; McAuliffe, Breer, Ahmadifar, & Spino, 1991; Petronis & Wish, 1996). To provide services to all of the people identified in these surveys as needing treatment, substance abuse treatment services would typically have to increase 5–10 times the current service levels.

Financial constraints are among the key reasons for the large substance abuse treatment gap (Allen, 1995; Copeland, 1997; Grant, 1997; Kessler et al., 2001b; Schober & Annis, 1996). Many substance abusers have a hard time gaining access to treatment due to structural barriers, such as limited public or private funding for treatment. The financial burden of treatment falls primarily on the public sector and individual clients. More than two-thirds of the funding for alcohol and drug abuse treatment facilities comes from public sources: primarily federal, state, and local non-insurance dollars (Horgan & Merrick, 2001). In an era of state and local budget constraints, the already limited funds available for substance abuse treatment have been vulnerable to cutbacks (Boston Globe, 2003, 2004).

In response to a growing awareness of the national and state-level treatment gaps, university and government researchers have begun investigating the problem more fully, but important issues regarding measurement of unmet need and the cost implications remain to be addressed. Following the Epidemiological Catchment Area (ECA) studies of unmet treatment needs (Shapiro et al., 1985), a state-level study of unmet drug treatment needs in Rhode Island by McAuliffe et al. (1991) and a Boston-area alcohol study by Hingson, Scotch, Day, and Culbert (1980), the

Center for Substance Abuse Treatment of the Substance Abuse and Mental Health Services Administration (SAMHSA) funded the State Treatment Needs Assessment Program (STNAP) via its Division of State and Community Assistance (DSCA) in the early 1990s. STNAP featured telephone household surveys and indicator studies of substance abuse treatment gaps in all 50 states (Mammo, 1993; McAuliffe, Woodworth, Zhang, & Dunn, 2002; Petronis & Wish, 1996; Sherman, Gillespie, & Diaz, 1996). DSCA has responsibility for the Substance Abuse Prevention and Treatment (SAPT) Block Grants. DSCA's goal for STNAP was to help states develop sustainable methods of estimating treatment need and the treatment gap by state and local planning areas. These estimates are required for annual reporting and application for state receipt of SAPT Block Grant funds.

Terminating STNAP in 2002 after two rounds of funding, SAMHSA gave the National Household Survey on Drug Abuse (NHSDA, now called the National Survey on Drug Use and Health, NSDUH) the task of annually estimating unmet treatment needs for alcohol and drug use disorders nationally and for each state (SAMHSA, 2004). State-level estimates of alcohol and drug dependence rates first became available in 1999, and a year later dependence and abuse rates were published (SAMHSA, 2000; Wright, 2002).

Within 60 days of discharge, 57% of those entering detoxification/cessation services received no further treatment.

Despite the great potential advance that its estimates represent, the NSDUH's approach has several important limitations (McAuliffe & Dunn, 2004). One has been the absence of information on clinical significance in its substance diagnostic estimates. Leading psychiatric epidemiologists (Frances, 1998; Narrow et al., 2002; Pincus, Zarin, & First, 1998; Regier et al., 1998; Spitzer, 1998; Ustun & Chatterji, 1998) have concluded that the prevalence of substance use disorders overestimates the level of treatment need. Many survey respondents with diagnoses have mild or transient disorders and may recover on their own without treatment (Cunningham, 1999; Sobell, Cunningham, & Sobell, 1996; Sobell, Sobell, Toneatto, & Leo, 1993; Toneatto, Sobell, Sobell, & Rubel, 1999; Walters, 2000). Ironically, Bijl et al. (2003) found that despite the correlation between disease severity and treatment received, most treatment goes to the many minor and mild cases, and undertreatment of serious cases is greatest among poor, uneducated young males. The authors argued that outreach is needed to reduce barriers to care among serious cases. While neither telephone nor household

survey methods capture information from the homeless or from those living in institutional settings (groups known to have higher rates of substance use and treatment need), arguments in the discussion section suggest that any resulting bias is small.

Adjusting the diagnostic criteria to incorporate evidence of clinical significance, Narrow et al. (2002) lowered the rates of treatment need for substance use disorders in persons 18 to 54 years of age in the ECA studies (from 11.7% to 9.7%) and in the National Comorbidity Study (from 11.5% to 7.6%). However, the two studies' clinical significance measures have been criticized as inadequate across disorders and settings (Frances, 1998). Narrow et al. (2002) called for further research on defining and measuring treatment need.

Because these researchers generally focused on mental health rather than on substance disorders, their measures (getting treatment and a single question on interference with life or activities) were somewhat circular and especially limited with regard to the need for treatment of drug and alcohol use disorders (Narrow et al., 2002). Substance abuse treatment need is a person's requirement of professional or paraprofessional care because he or she has a substance abuse or dependence disorder, cannot recover on his or her own, and has significantly impaired functioning or is at risk of harming him or herself or others (McAuliffe & Dunn, 2004). Largely missing from the studies' measures of clinical significance were the acute and chronic effects on physical health, crime, and dangerous behaviors such as drunk driving and violent acts that are critical factors in causing people to seek substance abuse treatment. Moreover, even Narrow et al.'s (2002) lower estimates of treatment need may be unrealistically large compared to existing service levels, and the precise financial implications of the revised estimates remain unclear. No study has formally estimated the financial impact of closing the large treatment gaps identified by the surveys.

This article estimates the unmet need for substance abuse treatment services among adults in Massachusetts who had clinically significant substance use disorders as reflected by a newly developed Treatment Mix Index (TMI) based on the conceptualization of the American Society of Addiction Medicine's (ASAM) Patient Placement Criteria (McAuliffe et al., 1994). The ASAM criteria are the most widely used in clinical settings to determine medical necessity and the level of care required to treat a substance use disorder. In addition, the article presents estimates of the financial implications to Massachusetts of addressing the unmet needs of its adult residents, with projected breakdowns by payer.

METHODS

Massachusetts Treatment Needs Assessment Survey

The primary data source for estimating unmet treatment needs was the STNAP household computer-assisted telephone interview (CATI) survey. BSAS contracted with Boston University investigators and Northeast Research to direct and conduct the data collection (Hingson, 1998). The STNAP survey interviewed a statewide random-digit-dialing sample of 7,251 Massachusetts residents aged 19 and older in 1996–1997. The study did not interview persons 18 years of age because of concerns regarding the necessity of obtaining parental consent for that age cohort. The disproportional stratified design over-sampled the major cities where drug use disorders are prevalent. The response rate was 64%. Sample geographic weights were applied to the data for analysis.

Instrumentation

The National Technical Center (NTC) for Substance Abuse Treatment Needs Assessment developed the STNAP needs assessment questionnaire (McAuliffe et al., 1994). The Massachusetts version covered alcohol, marijuana, inhalants, hallucinogens, tranquilizers, sedatives, cocaine, and opiates. It contained a telephone-adapted version of the Diagnostic Interview Schedule-Substance Abuse Module (DIS-SAM; Robins, Cottler, & Babor, 1990), the widely used and extensively validated diagnostic survey instrument (Aktan, Calkins, Ribisl, Kroliczak, & Kasim, 1997; Janca, Robins, Bucholz, Early, & Shayka, 1992; Robins, Helzer, Croughan, & Ratcliff, 1981; Robins, Helzer, Ratcliff, & Seyfried, 1982; Watson, Anderson, Thomas, & Nyberg, 1992; Ustun et al., 1997). A scoring algorithm provided by the Washington University developers and adapted by the NTC identified respondents who met the American Psychiatric Association's (1987) Diagnostic and Statistical Measures, 3rd revised edition (DSM-III-R) criteria for substance abuse and dependence lifetime and at any time during the past year (McAuliffe et al., 1994). The DSM-III-R criteria for full remission from dependence are no use of the substance in six months, or some use but no symptoms in six months. Due to this six-month lag period between the last substance use and symptoms and the onset of full remission from active substance dependence, the questions about substance use and symptoms covered the past 18 months. For example, a person who last had three symptoms of dependence and used the substance 13 months prior to the interview would technically continue to have an active DSM-III-R substance dependence diagnosis during the first five months of the past year. When interviewed, that person

would therefore have met minimum qualifications for having a substance use disorder at some time during the past year.

5.3% of the sample had a substance use disorder at some point during the past 12 months, and 12% had a disorder sometime in their lives.

The TMI employed a series of questions designed by McAuliffe et al. (1994) to assess the level of care needed upon entry into treatment based on Hoffmann, Halikas, Mee-Lee, and Weedman's (1991) ASAM Patient Placement Criteria. (Readers interested in obtaining the questionnaire and a complete description of the scoring should contact William McAuliffe at *wmcauliffe@ntc.org*.) The items measured the six ASAM dimensions: acute intoxication and withdrawal potential, biomedical conditions and complications, psychiatric or behavioral conditions and complications, treatment acceptance or resistance, relapse potential, and recovery environment. Morey (1995, 1996) developed a scoring algorithm for the TMI that specified the items and standards (cutoffs) in accordance with the conceptualization of the ASAM patient placement criteria into four levels of care: Level 1, outpatient counseling; Level 2, intensive outpatient counseling and partial hospitalization; Level 3, medically monitored residential care; and Level 4, medically managed inpatient hospital treatment. The TMI scoring assumed that the person with a current diagnosis would have entered treatment when the disorder was most severe in the last year if treatment resources were readily available. The TMI was used in both determination of need and the cost implications of unmet need.

The survey questions on treatment received covered detoxification, rehabilitation, day treatment, intensive outpatient counseling, methadone maintenance, low intensity outpatient counseling, and aftercare services provided in a hospital, residential center (a facility providing residential treatment), halfway house (a residential community providing shelter), or outpatient facility. It also included substance abuse counseling obtained from a psychiatrist, psychologist, social worker, or counselor working outside of a specialty drug program, self-help meeting attendance (e.g., Alcoholics Anonymous), and faith-based substance abuse counseling. There is a growing recognition of the importance of these non-specialty and non-traditional treatment services (Kessler et al., 1999; Millman, 1998; Sturm & Sherbourne, 2001; Wu et al., 2003).

The study defined persons with unmet treatment need for clinically significant substance use disorders as those respondents who (1) met DSM-III-R diagnostic criteria for a past-year substance use disorder; (2) met TMI criteria for Level 4 hospital treatment, Level 3 residential treatment, or Level 2 intensive outpatient or day treatment following relapse from

previous treatment; and (3) had not received treatment for their drug or alcohol use disorders in the past year. While the subset of individuals needing TMI Level 2 care had less severe disorders than those meeting criteria for Levels 3 and 4, we assumed that the need for treatment was clear for TMI Level 2 cases that had relapsed following previous treatment. It is reasonable to assume that, within fiscal boundaries, the state would try to expand treatment supplies to meet the needs of these individuals with the most severe, chronic illnesses.

To determine the size of the adult population meeting these unmet treatment need criteria, the study generalized the survey rates for persons 19 and older to U.S. Census Bureau data on the Massachusetts adult population aged 18 and older.

Determining Unit Cost of the ASAM Levels of Care

The BSAS tracks admissions to substance abuse treatment facilities in Massachusetts through its Substance Abuse Management Information System (SAMIS). SAMIS gathers admissions data on all licensed facilities/programs in Massachusetts, including those receiving BSAS funding or receiving the bulk of their funding from other payers. We grouped program types listed in the SAMIS Admission Profile Report for FY 2001 into one of four ASAM levels of care. Within each ASAM level, we categorized program types as rehabilitation services, detoxification services, or support services. Support services were those services or programs that addressed clients' non-substance abuse problems, such as obtaining substance-free housing. In this analysis, the BSAS programs grouped as supportive services were primarily case management and housing programs. In this paper, we use ''treatment admissions'' to comprise admissions to either rehabilitation services (ASAM levels 1, 2, 3 or 4) or detoxification services.

We estimate that an additional $109 million ($17 per capita) would be needed to provide [adequate] substance abuse treatment to the adults in Massachusetts.

The FY 2001 SAMIS Admission Profile Report provided data on the number of programs, the number of admissions, the average units of service, and payment per unit of service by program type. However, data on average units of service or payment per unit were missing for some program types, and these data were imputed from similar programs that did provide data. For each ASAM level, we calculated the unit payment per treatment admission by summing the total payments for treatment

services, supportive services, and detoxification services, and dividing by the number of treatment admissions. Although we included costs of support services in the numerator, our denominator excluded separate admissions to supportive services, as they were adjuncts to treatment. The resulting unit cost is therefore the overall cost per treatment admission, including a prorated amount of support services with each treatment admission.

Because BSAS does not fund or license ASAM Level 4 care (medically managed inpatient treatment), we used two data sources (each containing part of the needed data) to estimate the cost of inpatient hospital admissions for substance abuse treatment in FY 2001: (1) Massachusetts FY 1996 Medicaid payment data for substance abuse treatment services (Daley, 2000), and (2) the Massachusetts Health Data Consortium's (MHDC) Massachusetts FY 2001 inpatient hospital data for substance abuse diagnostic-related groups (DRGs). We averaged the Medicaid payment per inpatient hospital day for primary alcoholics and primary drug users to obtain the average cost per inpatient admission in 1996. To adjust for inflation, we applied the Medical Services Inflation index for the Northeast Urban Area to the 1996 average cost to estimate the average payment in FY 2001, the base year for other cost analyses. We calculated inpatient hospital spending for substance abuse DRGs for three payer categories—self-pay/no charge, Medicaid/Medicare, and all other payors—using the MHDC's FY 2001 data on the number of discharge days by payor and the inflation-adjusted Medicaid payment. These steps addressed the need to report funding for ASAM Level 4 by major payers. To derive per capita amounts, we divided by the state's population of 6.35 million (U.S. Census Bureau, 2001).

The study assumed that ASAM Level 2 Intensive Outpatient was the most appropriate categorization for outpatient methadone maintenance admissions in Massachusetts due to the amount of counseling services, the typical daily dosing, long stay, and the resulting high cost of an average methadone maintenance treatment admission ($7,473). The first version of the ASAM Patient Placement Criteria (PPC), which was used in the study, did not cover methadone maintenance (Hoffmann et al., 1991).

Estimating the Additional Cost of Treatment for Those with Unmet Need

The costs of expanding services for the unmet need population included costs of expanded outreach, entry into treatment (including cessation and detoxification), and stepped-down levels of care (rehabilitation and aftercare). In order to estimate treatment costs *at entry into treatment* for those with more severe unmet need, we multiplied the number

of individuals in need of ASAM Levels 3 and 4 treatment by the average cost per Level 3 admission, and by the average Medicaid/Medicare cost per Level 4 admission, respectively. The same technique was used for the ASAM Level 2 subset. After discharge from initial treatment, clients were routinely referred to stepped-down levels of care. Because of the frequent personal, financial, organizational, and other barriers to treatment, many did not receive the full continuum of recommended treatment. We applied FY 1997 through 1999 data from the SAMIS system on publicly funded treatment admissions in Massachusetts to estimate movement from entry into treatment to other treatment services.

Providing additional services to eliminate all of the unmet need defined here would require tripling the number of residents receiving treatment.

According to this analysis, within 60 days of discharge, 57% of clients entering detoxification/cessation services received no further treatment, 29% returned for another episode of detoxification, 6% entered residential rehabilitation, 4% entered intensive outpatient care, and 4% received non-intensive outpatient treatment. The cost of the subsequent care was estimated by applying these overall percentages to the number of individuals needing treatment in Levels 2 (the subset), 3, and 4, then multiplying each number of admissions by each of the stepped-down level's average cost per admission to obtain the costs in that level, and finally summing the costs across the levels. We calculated the average cost per admission of the limited outreach services funded by BSAS in FY 2001 to be $6.03. We calculated the total estimated additional costs of treating individuals with unmet need for substance abuse treatment by summing the costs of expanded outreach, entry into treatment, and step-down continuum of care treatment.

RESULTS

Demographics

The weighted study sample was predominantly female (58.3%) and non-Hispanic White (86.5%). Hispanics and Blacks comprised 5.7% and 4.6% of the weighted sample, respectively. The mean age of respondents was 44.3 years (median was 42 years), with age ranging from 19 to 98 years. Of the respondents, 58.2% were married, and 14.6% reported annual family income of less than $20,000.

Substance Disorders and Level of Care Needed: Household Survey Analysis

Analysis indicated that 5.3% of the sample had a substance use disorder at some point during the past 12 months, and 12% had a disorder sometime in their lives. During the past year, 4.9% had an alcohol use disorder and 0.8% had a drug use disorder. In their lives, 11.2% had an alcohol use disorder, 2.6% had a drug use disorder. Among respondents with a past-year drug use disorder, 55% had a past-year alcohol use disorder as well. Similarly, 69% of respondents with a lifetime drug use disorder also met criteria for a lifetime alcohol use disorder. Males significantly exceeded females in rates of substance use disorders during the past year (8.4% versus 3.1%, $p < 0.05$) and in their lives (18.7% versus 7.1%, $p < 0.05$).

During the past year, 2.3% of the total sample received some form of substance abuse treatment, while 4.6% had received it at least once in their lives. The respondents who had ever received treatment for their substance use disorders reported one or more of the following sources: attending self-help meetings (81%); specialty providers (61%); psychologists, psychiatrists, social workers, or counselors outside of a formal treatment program (42%); and faith-based counseling (39%). The shares of survey respondents who reported each type of specialty care were: 36% detoxification, 23% residential rehabilitation, 11% halfway house, and 43% outpatient. Among respondents who received treatment in the *past year*, 82% attended self-help meetings; 37% received counseling from a psychiatrist, psychologist, social worker, or counselor outside of a substance abuse program; 23% obtained faith-based counseling; and 18% obtained counseling from a specialty substance abuse provider (hospital, residential, outpatient, or halfway house).

Among the respondents with a lifetime substance use disorder, 33% (one in three) had ever received some form of treatment. By contrast, only 0.9% (1 in 100) of those whose interview responses did not meet lifetime diagnostic criteria had obtained substance abuse treatment at some time in their lives. Despite this low rate, these respondents constituted a substantial proportion of the subjects who received treatment, because most of the survey's respondents never had a diagnosis. Of the respondents with a past-year drug or alcohol use disorder diagnosis, one in seven (14.4%) reported receiving past-year treatment, including attending Alcoholics Anonymous (AA) or receiving counseling from a clergy member. The remaining 85.6% who had a past-year disorder but did not receive treatment in the past year constituted 4.5% of the total sample (see Table 1). By the broadest definition commonly used in the literature, the 4.5% represented the prevalence of unmet need for treatment, which was nearly twice as large as the survey-estimated percentage in the total sample that received treatment in the past year.

TABLE 1
Survey Estimates of Unmet Treatment Need in Massachusetts

Unmet Need	*Weighted Percentage of Survey Respondents*	*Number of Massachusetts Residents, Aged 18 and Over*
Past-year substance use disorder but did not receive treatment in past year	4.50%	219,316
Past-year clinically significant substance use disorder but did not receive treatment in the past year	0.81%	39,450
TMI Level 4	0.30%	14,710
TMI Level 3	0.15%	7355
TMI Level 2 and prior treatment	0.36%	17,385

When clinical significance of the past-year diagnosis was a requirement of the definition of treatment need, the estimated size of the unmet need group declined substantially from that using a past-year diagnosis alone. Analysis revealed that 49% of the respondents with a diagnosis and Level 4 TMI scores, 31% of those with Level 3 TMI scores, and 39% of those with Level 2 TMI scores and treatment in prior years received treatment during the past year. Among respondents with past-year diagnoses and TMI scores of Level 1 or Level 2 with no prior treatment, 12% received treatment in the past year. The respondents with clinically significant diagnoses who did not receive treatment in the past year constituted 0.81% of the total sample. That group consisted of: (1) 0.36% of the total sample who had a diagnosis, met TMI criteria for Level 2, and had previously received treatment; (2) 0.15% who had a diagnosis and met TMI criteria for Level 3 (Medically Monitored or Residential); and (3) 0.30% who had a diagnosis and met TMI criteria for Level 4 (Medically Managed or Hospital Care).

Applying the 4.5% estimate of those meeting broadest definition of unmet need to the population of Massachusetts in 2000 (4,849,033 persons 18 and over; U.S. Census Bureau, 2001), we estimated that 219,316 adults in the state had a past-year substance use disorder but failed to receive treatment of any kind. Defining unmet need as

applying to only persons who had substance use disorders with clinical significance but had not received treatment in the past year, we found that 17,385 met criteria for TMI Level 2 and had a prior history of substance abuse. Another 7,355 adults in the state needed non-hospital residential treatment (TMI Level 3), and 14,710 adults had such severe problems that they warranted the highest TMI level of care—medically managed inpatient treatment. Taking these three groups together, we estimated that a total of 39,450 Massachusetts adults needed care for their substance use disorders in the past year and should have received some form of treatment services but did not do so.

Unit Cost by ASAM Level of Care

Average cost per admission and total cost were both estimated for each of the four ASAM levels of care, based on our groupings of BSAS programs (see Table 2). ASAM Level 1 treatment programs (non-intensive outpatient treatment) include three BSAS outpatient programs, as well as community-based case management (case management and supportive housing) as well as other housing programs. Total ASAM Level 1 costs were estimated at $17 million, with a unit cost of $497 per admission. More than half of these costs were attributed to outpatient counseling, followed by the First Offender Drunk Driving Program. Treatment costs for this level of care overwhelmed payments for supportive services: nearly $16 million were treatment-related, and treatment costs averaged $460 per admission, compared to slightly more than $1 million in support costs and a unit cost of $1,134 per admission.

Intensive outpatient and partial hospitalization (ASAM Level 2) costs were triple those of non-intensive outpatient treatment, totaling $53.2 million ($8 per capita), with a unit cost of $3,393. Methadone maintenance and related services for opiate use disorder services accounted for 35% of Level 2 admissions but 80% of total costs for that level of care. Again, the vast majority of costs were for treatment services. BSAS programs grouped under ASAM Level 2 care included six BSAS intensive outpatient programs, county corrections, narcotic treatment services (methadone maintenance), community-based case management (case management and supportive housing) and other housing programs. When we subdivided the Level 2 admissions, we found that the average cost per admission was $7,648 per methadone admission and $1062 per non-methadone admission. Longer stays in methadone maintenance account for a portion of this difference in cost.

Approximately $82 million ($13 per capita) was spent on ASAM Level 3 care in FY 2001—medically monitored inpatient (residential) care. Detoxification and cessation services accounted for slightly less than half

TABLE 2
Costs of Substance Abuse Treatment Services in Massachusetts (FY 2001)

TMI Level of Care	*Number of Admissions*	*Total Units of Service*	*Average Payment per Unit*	*Total Payment*	*Average Payment per Admission*
Level 1: Non-Intensive Outpatient Treatment					
Treatment	34,323	497,307	$31.78	$15,804,772	$460
Supportive services	1,094	58,981	$21.02	$1,239,602	$1,134
Total[a]	34,323	556,288	$30.64	$17,044,375	$497
Level 2: Intensive Outpatient and Partial Hospitalization					
Treatment	15,673	2,656,489	$19.56	$51,964,892	$3,316
Supportive services	1,095	58,987	$20.56	$1,212,814	$1,108
Total[a]	15,673	2,715,476	$19.58	$53,177,706	$3,393
Level 3: Medically Monitored Inpatient (Residential) Treatment					
Treatment	9,601	691,873	$46.94	$32,474,065	$3,382
Detoxification	5,449	54,379	$730.60	$39,729,297	$731
Supportive services	5,449	114,318	$85.50	$9,773,701	$1,794
Total[a]	15,050	860,570	$95.26	$81,977,064	$1,281
Level 4: Medically Managed (Non-Residential) Inpatient Treatment[b]					
Self-pay/no charge	2,630	9,136	$453.35	$4,141,813	$1,575
Medicaid/Medicare	7,264	25,231	$453.35	$11,438,494	$1,575
All other payors	5,147	17,880	$453.35	$8,105,913	$1,575
Total[a]	15,041	52,247	$453.35	$23,686,220	$1,575
Grand total[a]	80,087			$175,885,364	$2,196

[a]Totals include all costs and services, but average payments are based on treatment admissions only.
[b]Non-BSAS funded programs. Medicaid payment rates used as approximations for other payers.

(48.5%) of these costs, followed by treatment costs (39.6%) and 11.9% for supportive services. The unit cost per admission for ASAM Level 3 was $1,281 overall, with a unit cost per admission of $731 for detoxification and cessation services, $3,382 for rehabilitation treatment, and $1,794 for supportive services. Again, length of stay in care by days differed widely between detoxification and other services, driving the difference in costs within service Level 3.

Of the $23.7 million ($4 per capita) spent in Massachusetts for ASAM Level 4 care (medically managed), Medicaid or Medicare paid $11.4 million, the patients paid another $4.1 million out of pocket, while other payers accounted for the remainder of costs. The estimated average Medicaid payment for inpatient (Level 4) substance abuse treatment services in FY 2001 was $1,575 per admission.

Costs of Treatment for Unmet Need: All Payers

We estimate that an additional $109 million ($17 per capita) would be needed to provide substance abuse treatment to the adults in Massachusetts with substance abuse or dependence disorders who are not accessing treatment. This figure includes the costs for initial treatment, continued care after discharge from initial treatment, and outreach services.

Treatment costs for the subset needing ASAM Level 2 care totaled $61.8 million ($10 per capita). More than 95% of this total cost, or $59.0 million (almost $10 per capita), represents payment for initial treatment with the remainder for subsequent care and outreach. Initial treatment costs for individuals with unmet need for ASAM Levels 3 and 4 care total $32.6 million ($5 per capita), with more than two-thirds of costs ($23.2 million, $4 per capita) needed for those entering ASAM level 4 care. Since a portion of this group will obtain additional care after discharge from an initial treatment episode, an additional $14.4 million ($2 per capita) would be needed to provide subsequent care: $4.4 million for the group discharged from ASAM Level 3 care, and $10.0 million for those who initially needed medically-managed inpatient care.

Only $302,000 ($0.05 per capita) would be needed to fund expanded outreach services in order to encourage the severely ill individuals to obtain initial and subsequent treatment. Estimated costs of outreach to the 39,450 Massachusetts adults with unmet need are $238,000, with an extra $65,000 necessary for continued care outreach.

Costs of Treatment for Unmet Need: BSAS

We calculated a total of $175.9 million ($28 per capita) in actual spending on substance abuse treatment in Massachusetts for FY 2001 from public reporting systems. On average, 42% ($73.6 million or $12

per capita) of this $175.9 million is BSAS spending—62% of the total spent on ASAM Level 1 treatment. BSAS also funded 31% of ASAM Level 2 treatment, 56% of ASAM Level 3 treatment, and 0% of ASAM Level 4 treatment. Applying these percentages to our analysis of total additional costs of unmet need for treatment in the state (see Table 3), we projected the additional cost to BSAS would be 28% ($31 million, or $5 per capita) of the total $109 million ($17 per capita) estimate. The bulk of additional treatment costs would be covered by other payers, including private insurers and Medicaid. Even the seemingly large increase (42%) to BSAS in one year could be manageable if spread over five years. Using that approach, we estimated that the annual compound increase would be 7% per year.

DISCUSSION

This study addressed two lingering issues in the population-based study of the nationwide treatment gap. The first issue concerned the measurement of treatment need. At least as far back as the ECA study, investigators recognized that treatment need was more than just the presence of a mental health disorder, and that the prevalence rate of substance use disorders overestimated the need for substance treatment (Regier, Shapiro, Kessler, & Tube 1984; Shapiro et al., 1985). Although several studies have employed measures of clinical significance, investigators recognized the limitations of current approaches to measuring treatment need (Bijl et al., 2003; Frances, 1998; Narrow et al., 2002; Regier et al., 1998; Spitzer, 1998).

Study Limitations

The study has several limitations. Although a primary objective of the study was to address researchers' concerns about the overestimation of unmet treatment need by household surveys, there are several features of the survey that most likely lowered the study's estimate of the size of state's treatment gap. Some underreporting of substance abuse is likely to occur in substance abuse surveys, for not all respondents who use illegal drugs or use alcohol excessively are willing to admit this sensitive information in a personal interview (Colón, Robles, & Sahai, 2002; Fendrich, Johnson, Sudman, Wislar, & Spiehler, 1999). Colón et al. found that among hardcore drug users whose three-month hair tests were positive, 70% admitted their cocaine use, and 79% admitted their heroin use. Among subjects whose hair tests had been positive over even longer

TABLE 3
Cost Estimates of Substance Abuse Treatment Unmet Need in Massachusetts

Category	*Additional Cost*	*Current BSAS Share for Level*	*Projected BSAS Additional Cost*	*Projected Other Payer Additional Cost*
Initial Treatment				
TMI Level 2 Treatment (subset)	$58,984,597	31%	$18,541,079	$40,443,518
TMI Level 3 Treatment	$9,423,903	56%	$5,313,429	$4,110,473
TMI Level 4 Treatment	$23,164,792	0%	$0	$23,164,792
Subtotal	$91,573,291	26%	$23,854,508	$67,718,783
Continued Care				
TMI Level 2 initial treatment	$2,704,660	42%	$1,131,482	$1,573,178
TMI Level 3 initial treatment	$4,395,548	42%	$1,838,857	$2,556,691
TMI Level 4 initial treatment	$10,021,438	42%	$4,192,422	$5,829,016
Subtotal	$17,121,647	42%	$7,162,761	$9,958,885
Outreach				
Initial treatment: TMI Levels 2, 3, and 4	$237,846	0%	$0	$237,846
Continued care:TMI Levels 2, 3, and 4	$64,924	0%	$0	$64,924
Subtotal	$302,770	0%	$0	$302,770
Total	$108,997,708	28%	$31,017,269	$77,980,439

periods or who reported DSM-IV drug disorder symptoms, even higher shares admitted use of illegal drugs (i.e., the sensitivity was higher).

Household surveys obviously exclude populations who do not live in households (e.g., prisoners and homeless individuals), many of which are at high risk for substance use and related disorders. However, these non-household populations comprise such a small percentage of the overall population in Massachusetts that their omission is unlikely to have caused substantial downward bias (Bray, Wheeless, & Kroutil, 1996; McAuliffe, Geller, LaBrie, Paletz, & Fournier, 1998; Robins & Regier, 1991). Bray and Marsden (1999) found that homeless and institutionalized people had drug use rates five times that of the household population, but the two non-household groups made up only 0.8% of the District of Columbia Metropolitan Statistical Area's population. Consequently, the authors found that only 4% of illicit drug users would be missed by surveying only the household population. Similar differences in rates of drug use disorders among household residents, treatment patients, and prisoners were found in the ECA study (Robins & Regier, 1991). The past-year rate of drug use disorders for males living in households was 7.6 per 1,000, while the rate for the entire sample that included males in prison, mental hospitals, nursing homes, and residential treatment programs was 7.7 per 1,000. For females, the household rate and the total sample rate were identical (1.2 per 1,000).

Underestimation of the rate of substance use disorders may also occur in telephone surveys, because not all households in the state have telephones, and non-phone households are somewhat more likely than phone households to contain drug abusers (Gfroerer & Hughes, 1991). An estimated 96% of Massachusetts' households had phones in 2000, which is slightly above average for the nation as a whole (Belinfante, 2001). McAuliffe, Labrie, Woodworth, and Zhang (2003) found that the percentage of substance dependent respondents in the National Household Survey on Drug Abuse between 1995 and 1998 would be 0.4% higher if all households were surveyed instead of just households with telephones.

While addressing unmet need would increase the number of clients in treatment by only 35%, it would increase costs by almost twice as much (62%).

Finally, survey nonresponse could also lower the rates somewhat, although the evidence on this point is mixed. In a follow-up study of non-respondents in the Washington, DC metro area sample of the NHSDA, Caspar (1992) found that the rate of past-year cocaine use was

unchanged when the initial non-respondents were successfully re-contacted, interviewed, and added to the original sample. The rates of past-year marijuana and alcohol use declined. By contrast, Cottler, Zipp, Robins, and Spitznagel (1987) found in a household survey that respondents with alcohol use disorders were more difficult to interview than respondents without alcohol use disorders. The current rate of alcohol use disorders increased from 4.3% in interviews completed within nine contacts to 4.6% in interviews completed after 10 to 57 contact attempts. The STNAP fieldwork standard for the state substance abuse surveys required at least 10 initial calls and 10 callbacks to complete the interviews. The final survey response rate in the present study was 64%, which was higher than the Massachusetts response rates of 49.8% in 1999, 59.7% in 2000, 60.8% in 2001, and 62.6% in 2002 achieved by the NHSDA (Wright, 2003, 2004).

We used public prices in our cost calculations, and thus these estimates represent a lower bound, since some clients pay higher prices for privately funded substance abuse treatment. The SAMIS admissions data included admissions to all licensed substance abuse facilities in Massachusetts, including those that receive some BSAS funding. The Alcohol and Drug Services Survey estimated that 86% of facilities nationally receive some revenue from public sources (SAMHSA, 2003). In FY 1998, 100% of Massachusetts' alcohol and/or other drug treatment units in the state received some funds administered by the state substance abuse agency (www.nasadad.org). While this percentage may have dropped in the past five years, the vast majority of all substance abuse facilities in Massachusetts are represented in the SAMIS data. Although we used BSAS payment rates for the first three ASAM levels, these rates are in line with those of Medicaid and private insurers under managed care. Our estimates did not include the additional costs of related or complementary services such as employee assistance programs, prevention programs, or outreach services conducted by other state agencies. These would be necessary to fully address need for treatment in the state. Thus, our methodology had several elements that most likely limited the size of our estimates of substance abuse and dependence and unmet need for treatment in the state.

CONCLUSIONS

The present study measured clinical significance by a survey-based Treatment Mix Index (TMI) designed to operationalize the ASAM's Patient Placement Criteria, the most widely used clinical system for determining medical necessity. Much like the Diagnostic Interview Schedule (DIS), which was designed to allow lay interviewers to collect the data needed to

produce substance disorder diagnoses in accordance with DSM criteria, McAuliffe et al. (1994) developed this scale to allow lay interviewers to collect the data required to estimate the ASAM level of care needed by people with substance disorders. The combined DSM-III-R diagnosis and TMI level correlated much more strongly than the diagnosis alone with the probability of obtaining treatment in the past year.

The development of the TMI allowed the study to focus on persons most in need of treatment. The cost estimate of eliminating unmet need could be more precise because it would reflect the characteristics of those who still needed treatment, rather than those who had obtained it. In an earlier effort, McAuliffe et al. (1991) lacked this information and therefore had to assume that the mix of needed drug treatment services would be the same as Rhode Island's mix. The authors recognized that the assumption was unlikely to be entirely accurate. Consequently, McAuliffe et al. (1994) added the TMI questions to the present instrument, which was a redesign and refinement of their 1991 questionnaire. In a recent community survey of homeless adults that used the TMI, O'Toole et al. (2004) found that a much larger percentage of the respondents met criteria for Levels 3 and 4 (59% versus 16% in the present study). It is to be expected that homeless respondents would have more severe substance use disorders than household residents, although the homeless respondents were even more likely to receive treatment in those two levels of care (84%).

The survey of 7,251 respondents estimated that substantial numbers of adults had unmet need for substance abuse treatment in Massachusetts. Using the broadest definition of treatment need, which included all persons with a past-year substance use disorder but no past year treatment, the study estimated that 4.5% of adults (219,316 persons) had unmet treatment need, while 2.3% of adults (111,527 persons) had received some form of treatment in the past year. Inclusion of substance abuse counseling from psychiatrists, psychologists, and other therapists outside of a specialty substance abuse facility, as well as faith-based counseling and self-help groups, substantially increased the proportion in need who received treatment in the past year. In surveys in Rhode Island and Virginia, McAuliffe, Dunn, and Zhang (2002) and McAuliffe et al. (2001) found that adolescents were more likely to prefer providers other than those in specialty substance abuse facilities.

Providing additional services to eliminate all of the unmet need defined here would require tripling the number of residents receiving treatment, from 111,527 to over 320,000. When considering only persons having clinically significant past-year disorders as measured by the TMI scores, and prior treatment history in the least severe cases, the estimated number with unmet need was 39,450. To eliminate this

estimated unmet need, the number of adults receiving treatment annually would have to increase by 35%.

This study found that while addressing unmet need would increase the number of clients in treatment by only 35%, it would increase costs by almost twice as much (62%), reflecting that these clients require treatment at higher and therefore more costly levels of care. As the increase is primarily in the most expensive modalities of treatment, the increase in costs substantially exceeds the numbers of clients. While the projected 62% increase in cost might seem formidable, such an increase could be manageable. If spread over five years, the annual compound increase would be 10% per year. Furthermore, assuming the increase followed current patterns of financing, it would be spread over several payers. Only the 28% would need to be paid directly by BSAS. Nevertheless, it would represent a 42% increase in BSAS spending when fully implemented. If the growth were spread over five years, it would represent a growth of 7% per year. For other payers (e.g., Medicaid and private health insurance), substance abuse payments are small compared to overall payments for health care, so the absolute increases would be relatively small.

To put these results into perspective, comparative studies have found that the supply of treatment services in Massachusetts relative to need exceeds that found in other states. In 1998, Massachusetts ranked sixth in per capita state spending ($15.90) on substance abuse treatment, prevention, and research, well above the national average of $11.10 (CASA, 2001). McAuliffe and Dunn (2004) recently found that the Massachusetts substance abuse treatment rate in 1997–1999 was sixth highest in the country, as measured by a composite index of data from the Treatment Episode Data Set (TEDS) and the National Survey of Substance Abuse Treatment Services (N-SSATS). Massachusetts' treatment rate was the highest for any state in the country relative to a treatment need measure based on substance abuse mortality and arrests. This measure is affected by opiate and cocaine use disorders. The state's treatment rate was eighth highest relative to the 2000 NSDUH's substance use disorder prevalence estimates, which is affected by marijuana use disorders. Thus, closing the treatment gap in Massachusetts seems likely to be a less demanding task than in other states.

Since 1997, however, heroin and other opiate use have increased rapidly. In 2002, the NSDUH reported Massachusetts as the state with the highest illicit drug use rates in the United States. Morbidity and mortality from opioid poisonings increased significantly from 1998 through 2002, and have received considerable publicity. Meeting the demand for services related to opioid dependence currently challenges the state's treatment system.

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