

# Screening, Brief Intervention and Referral to Treatment: implications of SAMHSA's SBIRT initiative for substance abuse policy and practice

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## ABSTRACT

**Aims** This paper describes the major findings and public health implications of a cross-site evaluation of a national Screening, Brief Intervention and Referral to Treatment (SBIRT) demonstration program funded by the US Substance Abuse and Mental Health Services Administration (SAMHSA). **Methods** Eleven multi-site programs in two cohorts of SAMHSA grant recipients were each funded for 5 years to promote the adoption and sustained implementation of SBIRT. The SBIRT cross-site evaluation used a multi-method evaluation design to provide comprehensive information on the processes, outcomes and costs of SBIRT as implemented in a variety of medical and community settings. **Findings** SBIRT programs in the two evaluated SAMHSA cohorts screened more than 1 million patients/clients. SBIRT implementation was facilitated by committed leadership and the use of substance use specialists, rather than medical generalists, to deliver services. Although the quasi-experimental nature of the outcome evaluation does not permit causal inferences, pre–post differences were clinically meaningful and statistically significant for almost every measure of substance use. Greater intervention intensity was associated with larger decreases in substance use. Both brief intervention and brief treatment were associated with positive outcomes, but brief intervention was more cost-effective for most substances. Sixty-nine (67%) of the original performance sites adapted and redesigned SBIRT service delivery after initial grant funding ended. Four factors influenced SBIRT sustainability: presence of program champions, availability of funding, systemic change and effective management of SBIRT provider challenges. **Conclusions** The US Substance Abuse and Mental Health Services Administration's Screening, Brief Intervention and Referral to Treatment (SBIRT) demonstration program was adapted successfully to the needs of early identification efforts for hazardous use of alcohol and illicit drugs. SBIRT is an innovative way to integrate the management of substance use disorders into primary care and general medicine. Screening, Brief Intervention and Referral to Treatment implementation was associated with improvements in treatment system equity, efficiency and economy.

**Keywords** Alcohol, brief intervention, drugs, referral, SBIRT, screening, substance abuse, tobacco.

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## INTRODUCTION

The modern history of addiction science follows an exponential growth curve in terms of its infrastructure, human capital and scientific accomplishments [1]. Despite the steady and incremental growth of research output during the past 50 years, only a few specific examples of scientific accomplishments have been translated into clinical practice and health policy in ways that have changed the course of the disease burden attributable to alcohol and drugs. The development of opioid substitution treatment is one such example. Where a public health impact has been demonstrated, as in the case of the global tobacco

epidemic, the recent decline in tobacco smoking in the developed countries [2] has had more to do with policies justified by scientific evidence (e.g. taxes and availability restrictions) than to clinical interventions derived from research (e.g. nicotine replacement therapy).

Nevertheless, addiction science has progressed significantly in terms of its methods, theories and cumulative findings, to the point where it can boast of some significant accomplishments in the public health imperative to translate research into clinical practice and health policy. One such accomplishment is Screening, Brief Intervention and Referral to Treatment (SBIRT). In this paper we trace the development of SBIRT from its conceptual underpinnings

in the 1980s to the implementation of large-scale national dissemination projects 35 years later, and use the findings of a unique evaluation of the US Substance Abuse and Mental Health Services Administration (SAMHSA) SBIRT program to illustrate one of the most successful examples of translational research in the history of addiction science.

## A BRIEF HISTORY OF SBIRT

SBIRT can trace its conceptual origins to the disease concept of alcoholism, which promoted the idea that alcohol dependence was a physical, psychological and behavioral condition rather than a moral failing [3]. As the disease concept gained acceptance within medicine, psychiatry and popular culture, a complementary, if not rival, concept was advanced, i.e. that there was a need to 'broaden the base' of treatment for alcohol problems to include screening for risk factors and brief interventions for hazardous and harmful drinkers [4].

This shift in focus was facilitated by the development of new concepts by the World Health Organization (WHO), such as hazardous and harmful drinking, and a refinement of the traditional dependence concept from a medical 'disease' to a psychiatric and behavioral 'disorder' [5]. Once it became evident that not all alcohol problems were the manifestation of a clinical syndrome called alcoholism, the stage was set for the incorporation of the disease concept into a broader spectrum of alcohol-related problems that could be addressed from a public health perspective. In 1982, the World Health Organization (WHO) began to develop an international screening test for hazardous and harmful drinkers, and to evaluate how these patients could be managed in primary health-care settings [6]. That project produced the Alcohol Use Disorders Identification Test (AUDIT), which has become the most widely used alcohol screening test in the world, in part because of an impressive science base that now includes more than 350 scientific papers [7]. The validation work for the AUDIT was followed by a 10-nation study to test the effectiveness of brief intervention (BI) [8], which showed that clinically meaningful changes in patients' drinking behavior could be produced with a small investment of time and clinical resources.

As indicated by numerous systematic reviews published (e.g. [9–12]), the WHO program on alcohol SBI was part of a broader clinical research trend that has now matured to the point where national implementation programs are being disseminated and evaluated in a variety of different countries [13–16]. The findings suggest that general practitioners may not be the most appropriate vehicle for delivering early intervention with at-risk drinkers. With this realization, many other ways to reach high-risk drinkers have been developed, including new

technologies (e.g. internet-based e-health programs) and the training of other members of the health-care team, from nurses to health educators. In Latin America, demonstration programs implemented in São Paulo, Curitiba [17], Juiz de Fora [18] and Ribeiro Preto [19] indicate that large-scale training programs can be combined successfully with clinical guidelines, health policy changes and feedback from evaluation research. Research suggests that such programs not only change the attitudes, knowledge and confidence of health workers, but they are also capable of reaching large numbers of at-risk drinkers.

Responding to the need for a coordinated effort to promote the widespread adoption of SBIRT in the United States, SAMHSA's Center for Substance Abuse Treatment (CSAT) initiated the SBIRT program in 2003 with cooperative agreements to its first cohort of grant recipients, six states (California, Illinois, New Mexico, Pennsylvania, Texas, Washington) and one Tribal Council (based in Anchorage, Alaska). SAMHSA awarded 5-year grants to promote the adoption and sustained implementation of SBIRT in a variety of medical settings. The goals were to expand the continuum of care for all substance use disorders, not just alcohol disorders, and to integrate substance abuse treatment and early intervention into the traditional medical care system. One distinguishing feature of the SAMHSA program was the mandate to include a brief treatment (BT) option in the continuum of SBIRT services in addition to referrals to more intensive specialty substance abuse facilities [20].

SAMHSA also funded a cross-site evaluation of its programs so that SBIRT implementation, outcomes and sustainability could be examined. This evaluation used a multi-method approach to provide comprehensive information on the processes, outcomes and costs of SBIRT as implemented in a variety of settings with diverse populations. The process evaluation examined the implementation of SBIRT and documented program content. The outcome evaluation evaluated the impact of SBIRT interventions on patients. The economic evaluation estimated the costs of delivering SBIRT services. Finally, a system-wide analysis drew upon the three evaluation components and other data sources to evaluate the effects of the SAMHSA SBIRT grant program on the treatment system as a whole [21].

SAMHSA continued to fund successive cohorts of grant recipients, and a second contract was awarded to the cross-site evaluation team for an investigation of the third cohort of SBIRT programs. Cohort 3 included three states (Georgia, Missouri, West Virginia) and one Tribal Council (based in Fairbanks, Alaska), which were awarded grants in 2008. Findings from the cross-site evaluations of cohorts 1 and 3 are included in the research papers in this Supplement: five are based on cohort 1 and four on cohort

3 data. In the remainder of this paper, we summarize the evaluation findings and focus on their implications for health policy, clinical practice, intervention research and public health.

### **PROGRAM IMPLEMENTATION: SBIRT BY THE NUMBERS**

As described by Bray *et al.* [21], SBIRT programs in the two evaluated SAMHSA cohorts screened more than 1 million patients (cohort 1 = 528 036; cohort 3 = 489.396). More than one in five (22.4 %) screened positive in cohort 1 and slightly more than one in 10 (11.1%) did so in cohort 3. Those served tended to be middle-aged (mean age of 43.6 and 44.1 years, respectively), and more likely to be female (56.2%, 55.9%) than male. SBIRT participants tended to be white (47.7%; 65.6%); however, disproportionate numbers of minority patients were also included. Approximately one in four of those in both cohorts were black (26.2%; 23.3%), and more than a quarter in cohort 1 (28.2%) described themselves as Hispanic. The most common type of substance use reported among those who screened positive was alcohol consumption (74.4%; 80.0%). Illicit drug use was reported less commonly, but was still highly prevalent (41.8%; 45.8%); almost one-third (30.0%; 32.1%) were dual substance users (alcohol and illicit drugs). These descriptive data, collected from very large numbers of participants, indicate that SBIRT is capable of reaching a broad range of patients, and identifying substance users whose consumption of alcohol and other drugs is likely to present health risks to the individual and significant health-care costs to the system of medical services, if substance abuse were not addressed.

In addition to descriptive statistics, conceptual modeling and implementation research are critically important in the diffusion of innovations in health care. SBIRT programs, including those funded by SAMHSA, vary considerably in service delivery processes, types of performance sites, provider attributes, patient/client characteristics and management approaches. Heretofore there has been no widely accepted conceptual framework to inform SBIRT translational research. The SBIRT Program Matrix was developed by Del Boca *et al.* [20] to fill this void. This model provides a template for identifying, classifying and organizing the naturally occurring communalities and differences within and across programs, and for investigating factors associated with implementation success and patient/client treatment outcomes.

Applying this model, Vendetti *et al.* [22] used a mixed-method approach to study implementation barriers and facilitators in SAMHSA's cohort 1 programs, as well as changes that occurred over time ('model migration'), partly in response to operational challenges. Whereas, historically, SBI programs tended to recruit on-site medical

staff to conduct services [in-house generalist (IHG) model], Vendetti *et al.* [22] found that the programs tended instead to hire specifically trained health educators (in-house specialist, IHS) or to contract services through independent addiction treatment agencies (contracted specialist, CS) to provide the expanded continuum of SBIRT services. Although four programs used IHG models for some pre-screening and other SBIRT functions, all cohort 1 programs migrated toward CS models to increase screening rates and reduce the burden on medical staff. Acceptance of the CS approach was enhanced when SBIRT staff members were well integrated into their host settings. Although this model provides a useful public health approach in high-volume settings, it may not be ideal in lower volume venues, because there may be insufficient patient flow to support SBIRT specialists [23].

To study implementation barriers and facilitators, Vendetti *et al.* [22] analyzed staff interview responses, provider survey data and extensive program documentation. Six domains in which conditions might help or hinder program operation were identified: committed leaders; intra-and inter-organizational communication/collaboration; provider buy-in and model acceptance; contextual factors (e.g. patient/client populations); quality assurance (e.g. staff training, monitoring); and grant requirements (e.g. screening quotas, data collection mandates).

In addition to the increased tendency to use specialist providers, the cohort 1 programs also migrated away from reliance on full-length screening instruments and adopted shorter pre-screening item sets that could be administered quickly to large numbers of patients at intake. To improve efficiency further, questions regarding alcohol and drug use were often embedded into a broader screening approach that included multiple risk factors (e.g. comorbid psychiatric disorders). To maximize population reach, programs focused increasingly on high-volume emergency department settings. Another innovation was to reduce the need for external referrals by developing onsite and telephonic service delivery capabilities, especially for BT.

### **METHODOLOGICAL INNOVATIONS**

To learn how best to plan, implement and reimburse SBIRT services, it is important that all aspects of the program be measured as accurately as possible. In addition to the mixed-method approach used in the cross-site evaluation, several innovative methodological approaches were developed to collect critical program data.

One such method is the SBIRT Checklist for Observation in Real Time (SCORE), a protocol for assessing adherence to evidence-based SBIRT service delivery. In addition to supporting the feasibility and criterion validity of the

SCORE, Vendetti *et al.* [24] found that SAMHSA cohort 3 providers tended to adhere to evidence-based protocols, an important condition for investigating program effectiveness. Using the SCORE, 76 providers were observed performing 388 services in emergency departments/trauma centers (ED/TC), hospital out-patient/ambulatory clinics (OP) and hospital in-patient (IP) settings. Motivational interviewing elements were documented in 61% of observed BIs, and elements summarized by the FRAMES (Feedback, Responsibility, Advice, Menu, Empathy, Self-efficacy) acronym [25], an essential component in most SBIRT protocols, were highly prevalent. All six FRAMES elements were utilized in 40% of observed BIs, and an additional 32% contained five. The most widely utilized elements were empathy (97% of sessions), feedback (85%) and self-efficacy (80%).

The potential utility of the SCORE is twofold. First, effective SBIRT implementation requires routine monitoring of providers and feedback to prevent drift. SCORE procedures are similar to 'shadowing', which is often used to evaluate provider performance. The SCORE offers a structured method for this activity that can be used for immediate feedback. Secondly, the SCORE offers considerable promise as a tool for program evaluation and implementation science [20]. The SCORE proved sensitive to differences in service component utilization among the four cohort 3 programs. Additionally, despite variations in patient volume and flow, as well as the urgency of patients' presenting problems, medical setting differences in adherence were limited. These results suggest that SBIRT providers can contend well with the fast-paced conditions in ED/Ts and exhibit levels of adherence comparable to those observed in other settings.

A second, related, methodological innovation was the use of trained observers to measure the duration of SBIRT activities in real time during ongoing work shifts. Using a protocol developed by the cross-site evaluation team, direct observations of staff activity, including service delivery sessions (e.g. screenings, BIs), were conducted during site visits to the cohort 3 programs. Cowell *et al.* [26] used the timing data to estimate the number and type of staff required to provide services. Overall, providers spent 42% of their time in support activities (e.g. reviewing the patient's chart, locating the patient, writing case-notes) and only 13% actually performing clinical services, a finding that has implications for the financial sustainability of SBIRT programs. The mean time to deliver a pre-screen was 1:19 (minutes : seconds); a full screen, 4:28; and a BI, 6:51. Service duration and support time estimates varied by medical setting. In addition to providing data for the SAMHSA evaluation, the timing protocol can be used to generate data to improve the management of health-care resources, such as patient scheduling and staffing.

## PATIENT OUTCOMES

Was SBIRT associated with reductions in substance use? This is often the first question asked by policymakers, providers and program administrators. The answer depends in part upon the research described above, which suggests that the SAMHSA programs were implemented with sufficient adherence to evidence-based practice to serve as a viable test of SBIRT effectiveness.

Aldridge *et al.* [27] took advantage of the extensive baseline, discharge and 6-month substance use outcome data collected by SAMHSA to re-evaluate the results of a prior study of the cohort 1 programs [28]. The results of the previous study were largely positive, but it did not employ appropriate statistical methods to assess patient improvements. Multi-level modeling statistics were applied by Aldridge *et al.* to matched patient samples to account for the clustering of observations and to explore possible bias from sample selection and attrition. Without a control group, screening and assessment alone may produce changes; there is also the possibility of regression to the mean [29]. Aldridge *et al.* addressed these issues by comparing SBIRT patient/client outcomes to the results for treated groups in previous randomized clinical trials.

Although smaller than those reported previously, pre-post differences were clinically meaningful and statistically significant for almost every measure of substance use. Model-adjusted means indicated that heavy drinking declined by 72% and illicit drug use by 80%. Greater intervention intensity was associated with larger decreases in substance use. Further, estimates of reductions were within the ranges of those from prior clinical trials. Thus, although causality cannot be inferred, the results provide additional support for SBIRT's effectiveness in reducing alcohol and other drug use.

In addition to the fundamental question of SBIRT effectiveness, the evaluation focused upon the relative effectiveness of BI and BT. In the SBIRT service continuum, BT is a distinct option that differs from BI; it was designed to provide a more intensive level of care than BI, while offering a more flexible, accessible and convenient service than traditional out-patient therapy [20]. Aldridge *et al.* [30] adopted a propensity score framework used commonly in comparative effectiveness research to evaluate the impact of recommendations to BT compared with BI in cohort 1. Although the differences were not significant for measures of alcohol use, BT had a greater impact in reducing the frequency of illicit drug use. This finding is consistent with the literature, showing that BI is primarily effective with alcohol abusers. Moderator analyses revealed that the effects for illicit drug use were attributable primarily to reductions among more severe patients. According to the investigators, BT may represent a key

component in the continuum of care between lower-risk BI patients and patients who require referral to specialty treatment.

### Economic issues

Is SBIRT an economically viable strategy to reduce substance use and its associated harms? In their cost-effectiveness analysis (CEA) of SBIRT services in ED/T and OP settings, Barbosa *et al.* [31] compared BI with BT in SAMHSA's cohort 3 programs. Both BI and BT were associated with beneficial outcomes, but the cost of SBIRT was significantly higher for patients for whom BT was recommended. BT would be cost-effective if the decision-maker was willing to pay \$8.90 for a 1 percentage-point reduction in the probability of using any alcohol. For five other outcomes BT was less effective and more costly, and BI would be a better use of resources. Barbosa *et al.* [31] concluded that brief intervention was more cost-effective than brief treatment.

### Sustainability

Sustainability is a key issue in the evaluation of the SAMHSA SBIRT program for good reasons. First, SAMHSA demonstration projects operated within states and Tribal Councils for 5 years, enough time to become established, find a feasible *modus operandi* and demonstrate worth. Ideally, the programs could then sustain themselves through alternative sources of funding, or become integrated sufficiently with the established health-care system so that the SBIRT services continued uninterrupted. Under these circumstances, as Singh *et al.* [32] note, research into the factors that facilitate or impede the SBIRT sustainability following the cessation of start-up funds becomes all the more important. Their study used qualitative data from interviews with key SBIRT program staff representing six of the seven SAMHSA cohort 1 programs. All six remained operational at the time interviews were conducted, 6–18 months post-funding. Sixty-nine (67%) of the original performance sites adapted and redesigned SBIRT service delivery after initial grant funding ended. An additional 19 sites began operation after external support was no longer available, bringing the total number of operational sites post-funding to 88.

Interviewed program staff identified four factors that influenced SBIRT sustainability: presence of program champions, availability of funding, systemic change and effective management of SBIRT provider challenges. To sustain services, successful programs made a range of adaptations to SBIRT components, modified SBIRT protocols, accessed multiple funding sources and worked to maximize facilitators and overcome barriers to develop new SBIRT models that met their needs and could be

supported. These findings suggest that, with some modifications, SBIRT can be sustained after an initial period of external funding has ended.

Another critical aspect of sustainability is the financing of SBIRT services. Because of the unique features of the US health-care system, it is important to study how SBIRT programs can be sustained by health insurance payments in different medical settings (e.g. ED/TC versus OP) and under differing staffing models (e.g. IHG versus CS). Based on cohort 1 data, Cowell *et al.* [23] used a simulation to model conditions under which SBIRT would be self-sustaining when relying upon public and private insurance reimbursements that cover only some patients. SBIRT could be sustained through health insurance in OP and ED/TC settings in most staffing mixes, but a patient flow larger than the national average may be needed to sustain SBIRT in hospital in-patient settings. The fact that settings with higher patient flow are more likely than those with low flow to be financially viable is an important piece of information for the planning of future SBIRT services, in that high-volume venues are not only more cost-effective, but are also places where most patients are likely to receive their health care in the future.

### System-wide effects

A critical system-wide change that is needed to support the adoption and sustainability of SBIRT, particularly in countries such as the United States, is insurance coverage for SBIRT. Hinde *et al.* [33] focused on the effects of SBIRT federal funding and state-level institutional constraints on the state-level activation of SBIRT Medicaid reimbursement codes. Although the findings apply primarily to the United States, the institutional framework is relevant to other countries, especially those with centralized health care systems. Federal SBIRT grant funding did not affect significantly the likelihood of activating Medicaid reimbursement codes, which would have provided a way to sustain this innovation once grant funding ceased. As expected, states controlled by political parties that favor subsidized health care were more likely to activate the codes. Federal block grant funding was a strong disincentive to activating the SBIRT reimbursement codes, while more direct federal SBIRT support had no detectable effects. The study points to the importance of larger systems-level factors, such as political climate, economic conditions and substance abuse treatment priority, in the implementation of public health measures.

## CONCLUSIONS AND POLICY IMPLICATIONS

SAMHSA's two cohorts of SBIRT programs screened more than 1 000 000 patients during 5 years of funding, and

substantial numbers of patients received recommendations for intervention or treatment. It is highly unlikely that this would have occurred in the absence of SBIRT. The impressive population reach of the SBIRT programs is attributable in part to the flexibility in program design and variety of implementation models available to the SAMHSA grant recipients.

The outcome findings showed significant reductions in substance use, but with several caveats that raise questions about the optimal ways to proceed with SBIRT as a public health program. One approach would be to focus more upon the mechanisms of SBIRT delivery, including clinical skills and provider training, to improve individual outcomes. Another is to consider SBIRT as part of a larger public health initiative designed to reduce population rates of substance-related problems. This approach would focus more upon systems-level issues such as referral to treatment for the more severe cases, as well as social marketing of SBIRT services and interventions through social media and community-based information sources.

The results of the cross-site evaluation indicate that the SAMHSA SBIRT programs were evidence-based and well integrated within medical and specialty treatment systems, and that they produced alterations in the major components of systems of care (facilities, tasks and linkages). Further, SBIRT implementation was associated with improvements in treatment system equity, efficiency and economy.

Equity refers to equal access to services for population subgroups, particularly those who suffer from health disparities. Socio-economic status, geographic location and cultural factors often influence access to care [34]. SBIRT enhances system equity by extending services to the uninsured and underinsured, to ethnic minorities and to those living in rural areas. By offering services in high-volume medical settings, patients with a wide variety of co-occurring physical and mental health problems can also be reached.

Efficient systems of care provide the best combination and quality of services for meeting population needs. Treatment services for substance use problems are typically fragmented, with both personal and societal costs and consequences [34]. Ideally, services should be integrated with continuity of care from one type of specialized service to another, so that patients are assigned to the least intensive level of care that suits their needs. SBIRT attempted to maximize efficiency and effectiveness, and to minimize cost, by providing a wide range of services, including less intensive services, to meet the needs of individuals at each point along the substance use risk continuum. SAMHSA SBIRT programs were well integrated with local specialty treatment systems, as well as within their host medical settings, resulting in smooth transitions along the continuum of care. Efficiency was enhanced further by situating SBIRT

services in high-volume health-care settings, such as emergency departments, and by establishing partnerships with community agencies.

Economy is the use of available resources to minimize the cost of substance use disorders for populations [34]. Efficient systems serve more people at lower cost. For many substance-dependent individuals, evidence-based brief treatments are as effective as more intensive inpatient therapies [35]. A large number of SBIRT patients took advantage of the BT option; in many cases, these were individuals who may not have achieved success in traditional specialty treatment programs or may not have been able to afford the time or money required for these services.

As indicated in the Introduction to this Supplement [21], SAMHSA's SBIRT program was part of a broader social movement that has now matured to the point where national implementation programs are being advanced in countries such as Brazil, the United Kingdom and the United States [11]. SAMHSA's SBIRT program is one of the largest dissemination efforts of its kind, with 29 states (four of which received two rounds of support), two tribal councils and one US territory now having been funded to implement demonstration programs. At the time of writing, more than 2 million patients have been screened throughout the United States, and approximately 20% have received interventions because of their screening results.

Within this context, the findings from the two cohorts of SAMHSA grant recipients with a combined total of 11 multi-site programs demonstrates the value of conducting systematic evaluation research along multiple dimensions: process, outcome and economic. It also demonstrates the value of mixed methods that provide both qualitative and quantitative data, as well as individual and system level data. Finally, it shows the value of studying implementation, costs and outcomes across multiple settings and implementation models.

It was only in the past decade that practice-oriented 'translational' research began to facilitate the transfer of the emerging scientific findings to patient care. Looking at the record of SAMHSA'S SBIRT program, the field of addiction research can point to a clear example of how new technologies and concepts, supported by clinical research, have begun to put alcohol- and drug-related health risks on the agenda of mainstream health practitioners for the first time.

#### **Declaration of interests**

None.

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