Published in final edited form as:

Traffic Inj Prev. 2019 ; 20(1): 15–22. doi:10.1080/15389588.2018.1528500.

Estimating Resource Utilization Demands in Implementing Statewide Screening, Brief Intervention, and Referral to Treatment for Alcohol Impaired Drivers

Charles W. Mathias^{1,2,*}, Tae-Joon Moon¹, Tara E. Karns-Wright¹, Nathalie Hill-Kapturczak¹, John D. Roache^{1,3,4}, Jillian Mullen⁵, and Donald M. Dougherty^{1,3}

¹Department of Psychiatry The University of Texas Health Science Center at San Antonio San Antonio, TX ²Center for Research to Advance Community Health (ReACH) The University of Texas Health Science Center at San Antonio San Antonio, TX ³Institute for Integration of Medicine and Science The University of Texas Health Science Center at San Antonio San Antonio, TX ⁴Department of Pharmacology The University of Texas Health Science Center at San Antonio San Antonio, TX ⁵EASL International Liver Foundation Geneva, Switzerland

Abstract

Objectives: The Alcohol Use Disorders Identification Test (AUDIT) is used to assess the level of alcohol use/misuse and to inform the intensity of intervention delivered within Screening, Brief Intervention, and Referral to Treatment (SBIRT) programs. Policy initiatives are recommending delivery of SBIRT within healthcare settings to reduce alcohol misuse and prevent alcohol impaired driving. Recent reports are considering extending delivery of SBIRT to criminal justice settings. One consideration in implementing SBIRT delivery is the question of resource utilization; the amount of effort required in delivering the four different intensities of intervention in SBIRT: Alcohol Education, Simple Advice, Brief Counseling and Continued Monitoring, and Brief Counseling and Referral to Specialist (from least to most intense in terms of delivery time, the skill level of provider, and personnel resources).

Methods: In order to inform expectations about intervention intensity, this manuscript describes the AUDIT scores from 982 adults recently arrested for alcohol impaired driving. The distribution of scores is extrapolated to state rates for individuals arrested for alcohol impaired driving by intervention level.

Results: While Alcohol Education was the most common intervention category, about one-quarter of the sample scored in a range corresponding with the more intensive interventions using the Brief Counseling, Continued Monitoring for ongoing alcohol use, and/or Referral to Specialist for diagnostic evaluation and treatment.

*Corresponding author: Charles W. Mathias, Ph.D. Associate Professor, Department of Psychiatry, The University of Texas Health Science Center at San Antonio, NRLC MC 7793; 7703 Floyd Curl Drive, San Antonio, TX 78229-3900, USA. Mathias@uthscsa.edu Phone (210) 567-2730; Fax (210) 567-2748.

There are no conflicts of interest to declare.

Conclusions: This manuscript provides local distribution of AUDIT scores and state estimates for the number of individuals scoring in each level of risk (AUDIT Risk Zone) and corresponding intervention type. Routine criminal justice practice is well positioned to deliver alcohol screening, education, simple advice, and continued alcohol monitoring, making delivery of SBIRT feasible for the majority of alcohol impaired drivers. Challenges to implementing the full range of SBIRT services are: resource demands of brief counseling, identifying the appropriate providers within criminal justice context, and availability of community providers for referral to diagnostic and specialty care. Solutions may vary by state due to differences in population density and incidence rates of alcohol impaired driving.

Keywords

alcohol; driving while intoxicated; driving under the influence; AUDIT; SBIRT

INTRODUCTION

The frequency and consequences of alcohol impaired driving justify expanding efforts focused on preventing alcohol misuse among roadway users. Alcohol impaired driving offenses are variously codified as driving under the influence, driving while impaired, or driving while intoxicated in state laws, and for the sake of brevity will be referred to as DWI throughout this manuscript. In the United States, DWI remains one of the most frequent reasons for arrest, trailing only: property crimes, drug violations, thefts, and minor assaults (FBI 2015). These frequent DWI offenses result in high costs; an estimated \$44 billion annually (NHTSA 2016). Further, this is an offense that incurs consequences for both the alcohol impaired driver and broader society; of the over 10,000 deaths from drunk driving annually, 38% of fatalities are someone other than the alcohol-impaired driver (NHTSA 2017). Given the significant financial and societal consequences, law enforcement, legal, traffic engineering, policy, and healthcare communities are working together on DWI prevention efforts. Prevention efforts have focused on addressing alcohol misuse in the general population as a means to reduce alcohol harms, including DWI (NASEM 2018). These interventions extend beyond just specialty care for alcohol use disorder. While alcohol use disorder is over-represented among those with DWI convictions compared to the general population, the majority of those with DWI do not meet full diagnostic criteria for alcohol use disorder (Lapham et al. 2001). Therefore interventions are needed that address the full range of alcohol misuse among drivers, not just those with alcohol use disorder.

Screening, Brief Intervention, and Referral to Treatment (SBIRT) is an approach for assessing and intervening across the wide range of alcohol use and misuse. Universal screening quantifies severity of alcohol use problems and this determines the intensity of intervention aimed at motivating reduced alcohol use (Babor and Higgins-Biddle, 2001). To expand the reach of prevention services, SBIRT is being recommended for use beyond specialty (i.e. psychiatry) healthcare settings; two of the common contexts for delivery of SBIRT are primary care and emergency medicine (Kaner et al. 2018). SBIRT delivered within primary care can be a primary prevention effort to detect and intervene prior to the patient experiencing negative consequences associated with alcohol use. In emergency medicine it is more typically a secondary prevention effort, where patients are identified as

needing intervention because alcohol was a factor contributing to their need for emergency care. Across these diverse primary and secondary prevention settings, there is a moderate net benefit for SBIRT in reducing unhealthy alcohol use (for review and meta-analyses see Kaner et al. 2018; USPSTF, 2018).

Considerable effort has been exerted to developing SBIRT programming as a targeted prevention effort for addressing alcohol harms such as drunk driving. The recent National Academies of Science report *Getting to Zero Alcohol-Impaired Driving Fatalities: A Comprehensive Approach to a Persistent Problem* (NASEM 2018) promotes delivery of SBIRT within healthcare settings as one of a portfolio of approaches for addressing DWI. This consensus report was preceded by states efforts to incorporate SBIRT into their programming for mitigating DWI offenses (e.g. *Florida*, Florida Impaired Driving Coalition, 2017; *Michigan*, Bryant et al. 2014; *Montana*, Bryant et al. 2016; *South Carolina*, South Carolina Department of Public Safety, 2017; *Texas*, Texas A&M Transportation Institute, 2016; *Washington*, Washington Traffic Safety Commission, 2013). Policy experts are evaluating the many, varied, practical considerations of implementing SBIRT in healthcare as a DWI prevention strategy. To address some of these questions, the National Highway Traffic Safety Administration has partnered with health provider groups to develop and disseminate guidelines addressing practical considerations for implementing SBIRT programs in healthcare settings (e.g. American Public Health Association 2008; American College of Surgeons 2007). Moving beyond traditional healthcare, there are emerging efforts developing SBIRT services within the criminal justice system (Lerch et al. 2017; Mullen et al. 2015a; Prendergast et al. 2017). Delivery of SBIRT among those arrested for DWI is similar to the secondary prevention approach of emergency medicine. However, subgroup analyses beyond primary care and emergency medicine settings are limited (Kaner et al. 2018). For example, the effectiveness of SBIRT for reducing alcohol misuse in the DWI context has not been reported from any randomized- clinical trials that we are aware of. Besides effectiveness, extending SBIRT delivery beyond healthcare settings to the criminal justice context raises further questions about implementation; a primary concern being resource utilization demands of its delivery.

Identifying rates of alcohol risks and accompanying intervention intensities would inform expectations on resource utilization costs of delivering SBIRT for DWI in criminal justice settings. SBIRT involves delivering increasing intensities of intervention (in terms of delivery time, the skill level of provider, and personnel resources) for those scoring higher on the alcohol screening assessment. The Alcohol Use Disorders Identification Test (AUDIT) is one commonly used instrument for SBIRT screening, which includes guidelines from the World Health Organization on intensity of interventions that corresponds with the severity of alcohol misuse (i.e., Babor and Higgins-Biddle 2001; Babor et al. 2001). Depending on the severity of alcohol misuse identified during AUDIT screening, intervention is delivered in increasing intensity ranging from: Alcohol Education, Simple Advice, Brief Counseling and Continued Monitoring, and Brief Counseling and Referral to Specialist (Babor et al. 2001). This manuscript describes: (a) the distribution self-reported AUDIT scores among adults recently arrested for DWI and the corresponding intensity of intervention; (b) estimated state rates for individuals arrested for DWI by intervention

intensity; and (c) interpretation of resource demands on criminal justice delivery of SBIRT given these rates.

METHODS

Participants

Participants were adults who had been arrested for a driving while intoxicated (DWI) offense from a large metropolitan county in South Texas. In our local jurisdiction, adults report to pretrial orientation for instruction on the conditions of bond supervision while awaiting trial or final adjudication of their DWI case. At this pretrial orientation, members of the treatment team advertised the opportunity to participate in an alcohol assessment, education, and intervention program. Interested parties were informed that this intervention was conducted by a team from an academic medical center and all procedures were voluntary, confidential, and separate from their criminal justice supervision requirements. All participants provided informed consent to treatment prior to assessment. The AUDIT assessment was collected within 8 days (median) of pretrial orientation. Inclusion criteria were: adults (ages 18–65) who were recently arrested for a DWI charge. While not an inclusion criterion, the orientation program served those at low-to-moderate criminal risk (Texas Risk Assessment System; Lovins et al. 2017) and a high proportion of the population were low-income and/or uninsured. Because of disposition of DWI charges within our local pretrial system, 1st offenses or those with 4 DWI's are managed in other parts of the judicial system. Consequently, the population from which this sample was drawn was composed of drivers receiving their 2nd or 3rd DWI arrest; these make up the majority (66%) of DWI arrests in the county where this data was collected (Mathias et al. 2014).

Alcohol Use Disorders Identification Test

Participants completed the 10-item Alcohol Use Disorders Identification Test (AUDIT; Saunders et al. 1993). The AUDIT includes questions about hazardous alcohol use (items 1–3), alcohol dependence symptoms (items 4–6), and harmful alcohol use (items 7–10). Items are scored on a 5-point scale (0–4) and summed to a total AUDIT Score. Higher scores reflect greater severity of alcohol risk/harm and a cut-off scores of 8 are typically interpreted as hazardous drinking (Saunders, et al. 1993). Scores are categorized into Risk Zones that are used to determine the intensity of intervention delivered as part of an SBIRT procedure: AUDIT Scores 0–7 = *Zone I* Alcohol Education; Scores 8–15 = *Zone II* Simple Advice; Scores 16–19 = *Zone III* Brief Intervention and Continued Monitoring; and Scores 20–40 = *Zone IV* Brief Intervention and Referral to Specialist for Diagnostic Evaluation and Treatment (from Babor and Higgins-Biddle 2001; Box 6, p. 22). The AUDIT has demonstrated robust psychometric properties, supporting its construct validity, criterion validity, test-retest reliability, and internal consistency (for review of its psychometric properties, see Reinert and Allen 2007).

Ethics Approval

Analyses of local rates of AUDIT Risk Zone scoring were conducted for the purpose of sustainability planning of resource utilization in disseminating the local program for state-level delivery of SBIRT. Data from this project involved analyses of de-identified electronic

health record information of patients who consented to receive alcohol assessment and intervention as part of their participation in an alcohol treatment clinic. Our local institutional review board determined this use of data is not regulated as research as defined by DHHS regulations at 45 CFR 46 and FDA regulations at 21 CFR 56.

Data Analyses

Descriptive characteristics of AUDIT scores are reported for men, women, and the full sample. AUDIT Risk score is summarized as the proportion of cases in each of the four AUDIT Risk Zones and their corresponding intervention types (from Babor and Higgins-Biddle 2001). These proportions are then used to extrapolate state rates of AUDIT Risk Zones as a proportion of overall DWI arrests (arrest rates from FBI, 2016). Preliminary administration time estimates were based on the AUDIT manual (Babor et al. 2001) and cost estimates were based on reimbursement rates for delivery of SBIRT (i.e. Medicaid rate, SAMHSA, 2017): Zone I = 5 min at \$24, Zone II = 10 min \$48, and Zones III 10 min \$48, and IV = 30 min \$96). Statistical analyses were conducted using IBM SPSS Statistics version 25 (IBM Corp. 2017; IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.).

RESULTS

The sample was composed of 780 men and 202 women. The average age of participants was 39 years ($SD = 11.2$, 95% CI = 38.99–40.69); and it was a Hispanic majority sample (Hispanic = 78%; White = 13%; Black = 4%; more than 1 race = 4%; other = 1%).

The distribution of AUDIT scores, separately for men and women, are displayed in Figure 1. Across the full sample, the average AUDIT score was 10.9 ($SD = 7.7$, 95% CI = 10.18–11.19) and the median score was 9 (corresponding to Risk Zone II). There was no significant difference in average AUDIT scores by Sex ($t_{980} = 0.18$, $P = .859$; Men $M = 10.9$, $SD = 7.6$, 95% CI = 10.20–11.31; Women $M = 11.0$, $SD = 8.2$, 95% CI = 9.24–11.56).

The proportion of the sample by AUDIT Risk Zone and Intervention Intensity are reported in Table 1. While the Zone I (low risk) was the most common risk category, AUDIT scores of 8 or greater are interpreted as hazardous drinking (Saunders et al. 1993) and the majority of the sample (58.6%) scored in this range. About one quarter (25.5%) of the sample scored in Zones III or IV, corresponding to delivery of the more intensive interventions using the brief intervention approach with ongoing alcohol monitoring and/or referral to specialty care. There was no significant difference in AUDIT Risk Zone scores by Sex ($\chi^2 = 2.07$, $P = .559$).

A preliminary estimate of administration time and cost is calculated for the State of Texas, where the local AUDIT scores were collected. Time and cost estimates for delivery to the 67,950 arrested for DWI in Texas = 51,589 hours administration time and \$1,639,138. Time and cost by AUDIT Risk Zone are: Zone I = 28,131 arrest, 11,253 hours, and \$140,650; Zone II = 22,491 arrests, 17,993 hours, and \$1,079,568; Zone III = 6,728 arrests, 5,383 hours, and \$100,920; and Zone IV = 10,600 arrests, 16,960 hours, and \$318,000.

Extrapolated rates of AUDIT Risk Zone and corresponding Intervention Intensity are reported separately by State in Table 2. Extrapolating our local rates to the 841,400 national DWI arrests (FBI, 2016), would result in the following number of cases by AUDIT Risk Zone and corresponding Intervention Intensity: $n = 348,340$ Zone I Alcohol Education, $n = 278,503$ Zone II Simple Advice, $n = 83,299$ Zone III Brief Intervention and Continued Monitoring, and $n = 131,258$ Zone IV Brief Intervention and Referral to Specialist for Diagnostic Evaluation and Treatment.

DISCUSSION

This manuscript describes local rates and state estimates for the number of individuals scoring in each AUDIT Risk Zone and corresponding intervention intensity as recommended by the World Health Organization (Babor and Higgins-Biddle 2001). This provides an initial basis for feasibility planning for implementing universal delivery of SBIRT for DWI at the state level within the criminal justice system. The following sections interpret resource demands on the criminal justice system that result from the observed rates of AUDIT Risk Zone scoring from our local DWI sample.

Feasibility of Universal SBIRT for DWI

Screening & Simple Advice: If our local estimates generalize to SBIRT delivery in the criminal justice context, the majority of DWI cases would be intervened on with low-intensity intervention. Notably from our local rates, AUDIT Zone I was the most common risk category and combined, Zones I and II account for 75% of cases. Both the alcohol education (AUDIT Risk Zone I) and simple advice focused on the reduction of hazardous drinking (AUDIT Risk Zone II) can be delivered quickly (as little as 5 minutes) and require relatively less training for personnel to competently deliver compared to the more demanding brief counseling. Alcohol education focuses on defining limits of safe versus harmful alcohol use, while simple advice provides feedback that the individual is exceeding safe limits, advises on the harms of risky drinking, encourages action to stop or reduce alcohol use, and elicits the individual's goals to change their alcohol use (Babor and Higgins-Biddle 2001). Given the rates scores in Risk Zones I and II, the large majority of DWI cases are expected to benefit from these simple interventions. Because alcohol education and simple advice are designed to increase the motivation to reduce drinking and are intended to be delivered soon after the onset of alcohol-related problems (Babor et al. 2001) these will have greatest impact for those with their first DWI arrest and early in their contact with the criminal justice system.

Brief Counseling: The higher AUDIT Risk Zones demand more intensive brief counseling intervention. One-quarter of DWI cases score in a range that guidelines recommend delivery of brief counseling and ongoing monitoring of alcohol use (Zone III) or brief counseling with referral for diagnostic assessment and specialty care (Zone IV; Babor and Higgins-Biddle, 2001). This poses challenges to implementing universal delivery of SBIRT for DWI. Qualitatively, brief counseling interventions is a conversation that involves: (1) presenting AUDIT screening results; (2) providing information and health advice on the risks/consequences for that AUDIT Risk Zone and recommendations for reducing alcohol

use; (3) soliciting feedback on the individuals reaction to this information; (4) assisting the individual in identifying their own goals to change alcohol use; and (5) recommending strategies for achieving alcohol reduction goals and encouragement. Brief counseling differs from simple advice in that it provides strategies to change alcohol attitudes, addresses problems underlying harmful alcohol use, and relies more heavily on empathetic listening and motivational interviewing skills for successful implementation (Babor and Higgins-Biddle 2001).

Given the complexity involved in brief counseling, the intensity of this intervention is greater in terms of time and resources for delivery. Delivery time of brief interventions can easily take up to 30 min (commercial healthcare and Medicare billing codes offer two durations for reimbursements: 15–30 min and greater than 30 min SBIRT encounters; SAMHSA 2017). In addition to the administration time, the style of conversation for delivering the brief counseling requires more intensive training. For instance, a minimum of 4 hours training is required for healthcare providers to be eligible to bill for delivery of SBIRT (TMHP 2018). One of the demanding components in delivery of brief counseling is the lengthy training to gaining mastery of the non-judgmental, motivational interviewing language used to elicit readiness to reduce alcohol use. Motivational interviewing is a style of communication utilizing supportive affirmation, empathetic reflections, and summarizing client statements to engender behavior change (Kohlwes and Cornett 2015). For law enforcement officers relying on a directive “command voice” communication style in their routine encounters with those arrested for DWI (Terrill et al. 2003), the motivational interviewing approach may feel unnatural or even inappropriate. Acceptability for this approach may be greater among law enforcement officers who have already experienced other programs for verbal interactions tools, such as *Crisis Intervention Team* training (Canada et al. 2012). Ability to separately use both authoritative and empathetic language techniques is a recognized officer practice (referred to as code-switching; Barker et al. 2008). The demands posed by the brief counseling intervention will likely be the most challenging hurdle in implementing SBIRT for criminal justice settings. There are other approaches to brief intervention (e.g. Brief Negotiation Interview, D’Onfrio et al. 2005; FLO, Dunn et al. 2010) designed to simplify adoption and delivery within healthcare settings. However, their efficacy is likely accompanied by resource demands similar to that of motivational interviewing, including: ensuring delivering the key components of the conversation, adequate training and quality assurance of providers, and documentation of fidelity of treatment delivery (Miller and Rollnick 2014).

Alcohol Monitoring: Besides brief intervention, the higher AUDIT Risk Zones correspond with ongoing monitoring of alcohol use. In healthcare settings, this may be accomplished through follow-up appointments and self-report assessment to verify that the brief intervention goals are being met or to detect if continued heavy drinking is occurring thus requiring further intervention (American College of Surgeons 2007; American Public Health Association 2008). Within the criminal justice arena, this may look quite different. In this context, a host of objective measures are used to monitor and detect ongoing alcohol use, including: breathalyzers, urinalysis, blood assay, vehicle interlock devices, and transdermal alcohol monitors. These are routinely used both as part of pretrial bond

conditions and during probation/community supervision. Because this is a part of the typical experience following DWI arrest, the ongoing monitoring for alcohol use is seemingly the most feasible component of SBIRT for implementation in the criminal justice context and even superior to procedures routinely used within general healthcare settings.

Referral to Specialist: Finally, those scoring in highest Risk Zone (IV) are recommended for receipt of brief counseling followed by referral to diagnostic and specialty care for alcohol dependence (Babor and Higgins-Biddle, 2001). Provisions for diagnostic and specialty intervention are limited in general, more so in certain communities. Barriers to alcohol treatment include: resources (e.g., access to care, financial/health insurance, time) and expectations (stigma, appraisal of effectiveness, privacy concerns; (Cohen et al. 2007; Schober and Annis 1996; Tucker et al. 2004). In some contexts, referral to alcohol treatment may be one component of pretrial diversion or post-adjudication mandates. Lack of sufficient community providers that are able to deliver alcohol dependence care is a barrier to implementation of SBIRT that criminal justice jurisdictions often have little control over.

Identifying Providers for Universal SBIRT for DWI

Capacity for delivering SBIRT in healthcare settings has been promoted by the National Highway Traffic Safety Administration through support of physician groups' SBIRT implementation training guidance (e.g. American College of Surgeons 2007; American Public Health Association 2008). Similarly, state alcohol-impaired driver plans also focus on SBIRT delivery in healthcare and higher educational settings (e.g. *Florida*, Florida Impaired Driving Coalition 2017; *Montana*, Bryant et al. 2016; *Washington*, Washington Traffic Safety Commission 2013). This is a potentially valuable approach for primary prevention of alcohol-impaired driving because it is likely to contact a much larger population than the minority of cases detected with DWI arrest (Higgins-Biddle and Dilonardo 2013).

Once an individual has been detected driving under the influence of alcohol, the arrest itself presents another valuable secondary prevention opportunity for intervening on problematic alcohol use. DWI arrests specifically identify those who are using alcohol in a manner that presents an immediate danger to themselves and society. Yet this may be a missed opportunity if SBIRT is restricted to delivery in traditional healthcare settings. We have found that those arrested for DWI are unlikely to have been receiving treatment for their alcohol misuse, are less likely than the general population to have health insurance coverage, and most do not have a primary care provider (Mullen et al. 2015b). Given these outcomes, they may be relatively less likely to come into contact with SBIRT in traditional healthcare settings; approaches delivering this intervention after DWI arrest address this gap. Some municipalities are recognizing this opportunity for detection and intervention for problem drinkers by implementing SBIRT within: county jail encounters (Los Angeles County; Prendergast et al. 2017), and during pretrial (Mullen et al. 2015a) or probation (Lerch et al. 2017) supervision settings. SBIRT delivery after DWI arrest presents a secondary prevention opportunity for reaching those not screened in a traditional healthcare setting. However, it also raises other barriers, such as the potential for under-reporting severity of alcohol misuse. Real or perceived consequences for admitting to alcohol problems after arrest for DWI may lead respondents to deny or diminish their self-reported alcohol use. Previous

literature has documented under-endorsement of substance use when screening was administered by a correctional officer, as compared to administration by someone viewed as not affiliated with the jail (Proctor et al. 2011). Our local rates of AUDIT scores were collected under this latter context. The implication is that our estimated level of intervention intensity may be higher than that detected if SBIRT delivery relies on criminal justice providers.

While this is promising on the local level, states' impaired driving plans must consider broader implementation strategies that take into account the scope of resources, limitations, and diverse needs across the state. Beyond local projects implementing SBIRT, some state alcohol-impaired driver plans are encouraging programming linking SBIRT services directly for alcohol within traffic safety and/or law enforcement contexts (e.g. *Michigan*: Bryant et al. 2014; *South Carolina*: South Carolina Department of Public Safety 2017; *Texas*: Texas A&M Transportation Institute, 2016). The challenge will be how to develop a universal method for SBIRT delivery across the state for alcohol-impaired drivers. For states with a low incidence of DWI, like Alaska and Delaware, the number of individuals is small enough that a centralized provider for SBIRT would be a feasible strategy. This would limit the training demands and increase the likelihood of standardization in the delivery of SBIRT. For high incidence states like California and Texas, a more distributed delivery system will be necessary, which will require consideration of differences in rural versus urban communities. Some of the issues to consider include: identification and training of providers within traffic safety or law enforcement, ensuring standards of care for non-healthcare providers delivering SBIRT, record keeping, developing a provider contact for those requiring referral to diagnostic and specialty care, as well as privacy and confidentiality concerns.

Limitations

As with any attempt to use data to inform practice, this project is not without its limitations. First, this report focuses narrowly on rates of alcohol screening and estimation of intervention intensity extrapolated to state rates to inform resource utilization demands of delivering SBIRT in criminal justice settings. Interpretation of these findings must acknowledge the broader array of efforts for preventing DWI. Of the prevention approaches reviewed in the recent update to the NHTSA *Countermeasures That Work*, SBIRT received the highest ratings for effectiveness, was judged to be moderate cost and a short implement duration (Richard et al. 2018). Yet this is only one available approach; other prevention efforts include public education campaigns, responsible beverage service programs, alternative transportation, and designated drivers. Beyond prevention, there are also considerable and effective deterrents involving enforcement, adjudication, and sanctions (Richard et al. 2018). SBIRT is not being described here as the sole solution for DWI, but one of a portfolio of approaches that together can simultaneously be brought to bear to reduce DWI. The relative contribution of SBIRT in reducing DWI or alcohol use for these recently arrested for DWI would be informed by randomized clinical trials testing of efficacy.

A second limitation is that, this manuscript is descriptive in nature and extrapolates local data from a large metropolitan county in South Texas to state-level rates. Local data was representative to those arrested for 2nd or 3rd DWI and rates may not generalize to those arrested for first DWI or those with more than 3 DWI arrests. Third, recruitment did not rely on a population-based representative sampling methodology. Fourth, there were substantially more men than women in this sample, although the observed gender ratio is similar to DWI arrest rates at the state level in Texas (ages 21–64 DWI arrests = 57,345; 77.6% men and 22.4% women; TXDPS 2016) and across the United States of America (all ages - driving under the influence arrests = 675,960; 75.2% men and 24.8% women; FBI, 2015). Finally, the scope of this manuscript was to provide an estimate of demand for different intensities of intervention based on AUDIT scores for the purpose of sustainability planning. It is not intended to provide evidence on efficacy of SBIRT or state rates of alcohol use disorder. Preliminary estimates of administration time were based on AUDIT manual times, but may vary depending on the skill of the provider delivering the intervention, intervention context, and fail to take into account other time commitments like provider training and follow-up necessary for higher Risk Zones. Cost estimates were based on Medicaid reimbursement rates which may not reflect actual cost incurred in providing intervention in criminal justice settings. Both time and cost estimates should be interpreted with caution, and are included as an initial estimate based on our local observed rates of AUDIT Risk Zone scoring.

This manuscript provides local rates and state estimates for the number of individuals scoring in each AUDIT Risk Zone and corresponding intervention type. Routine criminal justice practice is well positioned to deliver alcohol screening, education, simple advice, and continued alcohol monitoring, making delivery of SBIRT feasible for the majority of alcohol impaired drivers. Challenges to implementing the full range of SBIRT services are: resource demands of brief counseling, identifying the appropriate providers within criminal justice context, and availability of community providers for referral to diagnostic and specialty care. Solutions may vary by state due to differences in population density and incidence rates of alcohol impaired driving. SBIRT is a strategy that holds promise for reducing alcohol harms across the spectrum of alcohol misuse. While traditionally delivered in healthcare settings as a population-level prevention strategy, DWI arrest represents an opportune secondary prevention mechanism to identify those who may benefit from SBIRT services. Delivery of SBIRT in criminal justice contexts for those arrested for DWI may be an important adjunct to approaches relying on screening and brief interventions in general healthcare settings.

ACKNOWLEDGMENTS

Participant assessment and sustainability planning was supported by the Texas Medicaid 1115 Waiver program DHHS 085144601.2.6. Funding from the National Institutes of Health [award numbers R01AA014988; T32DA031115; and UL1TR001120] supported development of knowledge and expertise for articulating the policy implications for Screening Brief Intervention and Referral to Treatment for alcohol impaired drivers. Authors are solely responsible for the manuscript, which does not necessarily represent the official views of the National Institutes of Health or the Texas Health and Human Services Commission. Funders had no role in the design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication. Dr. Donald M. Dougherty acknowledges support from the William and Marguerite Wurzbach Distinguished Professor endowment.

We gratefully acknowledge the technical contributions of: Dr. Stacy Ryan for clinical support; Philip Brink and Cecily Lawrence for data management; and Sergio Arambula, Luisana Campos, Stephanie Garcia, Dominic Gomez, Sebastian Mounetou, Sanjuana Rodriguez, Thalia Rodriguez, Isabela Santos, and Javier Torres for data collection.

REFERENCES

- American College of Surgeons. Alcohol Screening and Brief Intervention (SBI) for Trauma Patients: Committee on Trauma Quick Guide. Joint report from the American College of Surgeons Committee on Trauma, the National Center for Injury Prevention and Control, the National Institute on Alcohol Abuse and Alcoholism, the Center for Substance Abuse Treatment, and the National Highway Traffic Safety Administration; 2007 Available at: <https://www.facs.org/~media/files/quality%20programs/trauma/publications/sbirtguide.ashx>.
- American Public Health Association. Alcohol Screening and Brief Intervention: A Guide for Public Health Practitioners. Washington DC: National Highway Traffic Safety Administration, U.S. Department of Transportation; 2008.
- Babor TF, Higgins-Biddle JC. Brief Intervention for Hazardous and Harmful Drinking A Manual for use in Primary Care. World Health Organization; 2001 WH0/MSD/MSB/01.6b Available at: <http://whalibdoc.who.int/hq/2001/WH0MSDMSB01.6b.pdf?ua=1&ua=1>.
- Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG. AUDIT: The Alcohol Use Disorders Identification Test Guidelines for Use in Primary Care. 2nd ed. World Health Organization; 2001 WH0/MSD/MSB/01.6b Available at: <http://whalibdoc.who.int/ha/2001/WH0MSDMSB01.6a.pdf?ua=1&ua=1>.
- Barker V, Giles H, Hajek C, Ota H, Noels K, Lim TS, Somera L. Police-civilian interaction, compliance, accommodation, and trust in an intergroup context: International data. *J International and Intercultural Comm*. 2008;1(2):93–112.
- Bryant SN, Holestine L, Lillis R., Smith R, Woodward T. State of Montana Impaired Driving Program Assessment. 2016 Available at: <http://www.mdt.mt.gov/visionzero/docs/Montana-Impaired-Driving-Assessment-Report.pdf> Accessed March 22, 2018
- Bryant SN, Lillis RP, Grube KL, Holestine L, Iverii S. Impaired Driving Assessment Program. Lansing, MI: State of Michigan Technical Assessment Team 2014 Available at: https://www.michigan.gov/documents/msp/MichiganImpairedDrivingAssessmet_Final_2014_460152_7.pdf.
- Canada KE, Angell B, Watson AC. Intervening at the entry point: Differences in how CIT trained and non-CIT trained officers describe responding to mental health-related calls. *Community Ment Hlt J*. 2012;48(6):746–755.
- Cohen E, Feinn R, Arias A, Kranzler HR. Alcohol treatment utilization: Findings from the national epidemiologic survey on alcohol and related conditions. *Drug Alcohol Depend*. 2007;86(2):214–221. [PubMed: 16919401]
- D’Onofrio G, Pantalon MV, Degutis LC, Fiellin DA, O’Connor PG (2005b) Development and implementation of an emergency practitioner-performed brief intervention for hazardous and harmful drinkers in the emergency department. *Acad Emerg Med* 2005;12(3):249–256. [PubMed: 15741590]
- Dunn CW, Huber A, Estee S, Krupski A, O’Neill S, Malmer D, Ries R. Screening, brief intervention, and referral to treatment for substance abuse: A training manual for acute medical settings. 2010 Available at <https://www.dshs.wa.gov/sites/default/files/SESA/rda/documents/research-4-83C.pdf> Accessed July 21, 2018.
- FBI - Federal Bureau of Investigation. Table 33: Ten-Year Arrest Trends, by Sex, 2005–2015. United States Department of Justice, Crime in the United States 2015 Washington, DC: 2015 Available at: <https://ucr.fbi.gov/crime-in-the-u.s/2015/crime-in-the-u.s-2015/tables/table-33>.
- FBI - Federal Bureau of Investigation. Table 22: Arrests by State, 2016. United States Department of Justice, Crime in the United States 2016 Washington, DC 2016 Available at: <https://ucr.fbi.gov/crime-in-the-u.s/2016/crime-in-the-u.s-2016/tables/table-22>.
- Florida Impaired Driver Coalition. Impaired Driving Strategic Plan 2017 – 2019. Tallahassee, FL: Florida Department of Transportation 2017 Available at: <http://www.flimpaireddriving.com/pdf/405d%20Florida%20Statewide%20Impaired%20Driving%20Strategic%20Plan.pdf>.
- Higgins-Biddle J, Dilonardo J Alcohol and Highway Safety: Screening and Brief Intervention for Alcohol Problems as a Community Approach to Improving Traffic Safety. Washington, DC: National Highway Traffic Safety Administration 2013.

- Kaner EFS, Beyer FR, Muirhead C, Campbell F, Pienaar ED, Bertholet N, Daeppen JB, Saunders JB, Burnand B. Effectiveness of brief alcohol interventions in primary care populations. *Cochrane Database Syst Rev*. 2018;2 Art. No.: CD004148 DOI: 10.1002/14651858.CD004148.pub4.
- Kohlwes J, Cornett P. Screening for alcohol misuse; veterans speak! *J Gen Intern Med*. 2015;30(8):1054–1055. [PubMed: 25900538]
- Lapham SC, Smith E, C'de Baca J, Chang I, Skipper BJ, Baum G, Hunt WC. Prevalence of psychiatric disorders among persons convicted of driving while impaired. *Arch Gen Psychiatry*. 2001;58(10):943–949. [PubMed: 11576032]
- Lovins BK, Latessa EJ, May T, Lux J. Validating the Ohio risk assessment system community supervision tool with a diverse sample from Texas. *Corrections*. 2017;3;1–17.
- Mathias CW, Ryan SR, Mullen J, Lake SL, Brown PC, Adams V, Villafranca C, Dougherty DM. Problem identification and community assessment of DWI needs for Bexar County, Texas. Report for Center for Medicare & Medicaid Services project 085144601.2.6. 2014.
- Miller WR, Rollnick S. The effectiveness and ineffectiveness of complex behavioral interventions: Impact of treatment fidelity. *Contemp Clin Trial*. 2014;37:234–241.
- Mullen J, Ryan SR, Mathias CW, Dougherty DM. Feasibility of a computer-assisted alcohol screening, brief intervention and referral to treatment program for DWI offenders. *Addict Sci Clin Pract*. 2015a;10(1):1–10.
- Mullen J, Ryan SR, Mathias CW, Dougherty DM. Treatment needs of driving while intoxicated offenders: The need for a multimodal approach to treatment. *Traffic Inj Prev*. 2015b;16(7):637–644. [PubMed: 25664371]
- NASEM - National Academies of Sciences, Engineering, and Medicine. Getting to Zero Alcohol-Impaired Driving Fatalities: A Comprehensive Approach to a Persistent Problem. Washington, DC. 2018.
- NHTSA - National Highway Traffic Safety Administration. Traffic safety facts: Alcohol-impaired driving. Washington DC.; U.S. Department of Transportation 2017.
- Prendergast ML. A randomized study of the use of screening, brief intervention, and referral to treatment (SBIRT) for drug and alcohol use with jail inmates. *J Subst Abuse*. 2017;74:54–64.
- Proctor SL, Hoffman NG, Corwin CJ. Response bias in screening county jail inmates for addictions. *J Drug Issues*. 2011;117–134.
- Reinert DF, Allen JP. The alcohol use disorders identification test: An update of research findings. *Alcohol Clin Exp Res*. 2007;31(2):185–199. [PubMed: 17250609]
- Richard CM, Magee K, Bacon-Abdelmoteleb P, Brown JL. NHTSA Countermeasures that work: A highway safety countermeasure guide for state highway safety offices (9th Ed.); 2018. DOT HS 812 478th
- SAMHSA - Substance Abuse and Mental Health Services Administration. Coding for Screening and Brief Intervention Reimbursement. Rockville, MD 2017 Available at: <https://www.samhsa.gov/sbirt/coding-reimbursement> Accessed March 6, 2018.
- Saunders JB, Aasland OG, Babor TF, Fuente JRDL, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. *Addiction*. 1993;88(6):791–804. [PubMed: 8329970]
- Schober R, Annis HM. Barriers to help-seeking for change in drinking: A gender-focused review of the literature. *Addict Behav*. 1996;21(1):81–92. [PubMed: 8729710]
- South Carolina Department of Public Safety. Target Zero Traffic Deaths: A Goal We Can All Live With South Carolina's Highway Safety Plan FFY 2018. Blythewood, SC: the Office of Highway Safety and Justice Programs, South Carolina Department of Public Safety 2017 Available at: <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/southcarolinafy2018hsp.pdf> Accessed March 22, 2018.
- Terrill W, Paoline EA, Manning PK. Police culture and coercion. *Criminology*. 2003;41(4):1003–1034.
- TMHP - Texas Medicaid and Healthcare Partnership. Texas Medicaid Provider Procedures Manual: Volume 2 Providers Handbooks. 2018 Available at: <http://www.tmhp.com/ManualsPDF/TMPPM/TMPPMLivingManualCurrent/2MedSpecsandPhysSrvs.pdf> Accessed March 6, 2018.

- Tucker J, Vuchinich R, Rippens P. A factor analytic study of influences on patterns of help-seeking among treated and untreated alcohol dependent persons. *J Subst Abuse Treat.* 2004;26(3):237–242. [PubMed: 15063919]
- TXDPS - Texas Department of Public Safety. Crime in Texas: The Texas Crime Report for 2016. Available at: <http://www.dps.texas.gov/administration/crimerecords/pages/crimestatistics.htm> Accessed January 20, 2018
- Texas A&M Transportation Institute. 2017 Texas Impaired Driving Plan. College Station, TX: Texas A&M Transportation Institute Available at: <https://www.dyingtodrink.org/wp-content/uploads/2017/09/FY-2017TexasImpairedDrivingPlan.pdf>.
- USPSTF - U.S. Prevention Services Task Force. Draft Recommendation Statement - Unhealthy Alcohol Use in Adolescents and Adults: Screening and Behavioral Counseling Interventions. 2018 Available at: <https://www.uspreventiveservicestaskforce.org/Page/Document/draft-recommendation-statement/unhealthy-alcohol-use-in-adolescents-and-adults-screening-and-behavioral-counseling-interventions> Accessed July 1, 2018.
- Washington Traffic Safety Commission. Washington Impaired Driving Strategic Plan: Report for the Washington Impaired Driving Advisory Council. Washington Traffic Safety Commission 2013 Available at: <http://wtsc.wa.gov/wp-content/uploads/dlmuploads/2015/03/2013-WA-Impaired-Drivmg-Strategic-Plan.pdf> Accessed March 22, 2018.

Figure 1.

The distribution of AUDIT scores, separately for men and women. Y-axis reflects the proportion of men ($\square$; $n = 780$) and women ($\blacksquare$; $n = 202$), while the X-axis reflects AUDIT Score. Dashed lines reflect demarcation between AUDIT Risk Zones.

Table 1.

Distribution of AUDIT Scores by Risk Level, Intervention, and Sex.

AUDIT Score	Risk Level	Intervention	Men <i>n</i> = 780 % (<i>n</i>)	Women <i>n</i> = 202 % (<i>n</i>)	Total <i>n</i> = 982 % (<i>n</i>)
0–7	Zone I	Alcohol Education	40.6 (317)	44.6 (90)	41.4 (407)
8–15	Zone II	Simple Advice	34.1 (266)	29.2 (59)	33.1 (325)
16–19	Zone III	Brief Counseling and Continued Monitoring	10.0 (78)	9.4 (19)	9.9 (97)
20–40	Zone IV	Brief Counseling and Referral to Specialist	15.3 (119)	16.8 (34)	15.6 (153)

AUDIT Score, Risk Level, and Intervention corresponds to World Health Organization guidelines (Babor et al 2001, p. 22, Box 6).

Table 2.

State Driving Under the Influence Arrest Rates^a and Estimates of AUDIT Risk Zones.

State	AUDIT Risk Level				State	Arrests <i>n</i>	AUDIT Risk Level				Arrests <i>n</i>	AUDIT Risk Level			
	Zone I <i>n</i>	Zone II <i>n</i>	Zone III <i>n</i>	Zone IV <i>n</i>			Zone I <i>n</i>	Zone II <i>n</i>	Zone III <i>n</i>	Zone IV <i>n</i>		Zone I <i>n</i>	Zone II <i>n</i>	Zone III <i>n</i>	Zone IV <i>n</i>
Alabama	8,126	3,364	2,690	804	1,268	Montana	4,392	1,818	1,454	435	685				
Alaska	3,063	1,268	1,014	303	478	Nebraska	6,948	2,876	2,300	688	1,084				
Arizona	23,498	9,728	7,778	2,326	3,666	Nevada	10,660	4,413	3,528	1,056	1,663				
Arkansas	6,703	2,775	2,218	664	1,046	New Hampshire	4,874	2,018	1,613	483	760				
California	129,752	53,717	42,948	12,846	20,241	New Jersey	22,745	9,416	7,529	2,252	3,548				
Colorado	23,364	9,673	7,733	2,313	3,645	New Mexico	6,178	2,558	2,044	612	964				
Connecticut	8,533	3,533	2,824	845	1,331	New York	29,238	12,105	9,677	2,895	4,561				
Delaware	355	147	118	35	55	North Carolina	30,380	12,577	10,056	3,008	4,739				
Florida	35,042	14,507	11,599	3,469	5,467	North Dakota	5,725	2,370	1,895	567	893				
Georgia	18,939	7,841	6,269	1,875	2,954	Ohio	15,060	6,235	4,985	1,491	2,349				
Hawaii	5,929	2,455	1,962	587	925	Oklahoma	12,200	5,051	4,038	1,208	1,903				
Idaho	6,195	2,565	2,051	613	966	Oregon	14,282	5,913	4,727	1,414	2,228				
Illinois	2,929	1,213	969	290	457	Pennsylvania	44,111	18,262	14,601	4,367	6,881				
Indiana	13,492	5,586	4,465	1,336	2,105	Rhode Island	2,719	1,126	900	269	424				
Iowa	9,836	4,072	3,256	974	1,534	South Carolina	15,947	6,602	5,278	1,579	2,488				
Kansas	5,923	2,452	1,961	586	924	South Dakota	7,196	2,979	2,382	712	1,123				
Kentucky	16,901	6,997	5,594	1,673	2,637	Tennessee	22,563	9,341	7,468	2,234	3,520				
Louisiana	7,587	3,141	2,511	751	1,184	Texas	67,950	28,131	22,491	6,728	10,600				
Maine	5,834	2,415	1,931	578	910	Utah	8,713	3,607	2,884	863	1,359				
Maryland	17,809	7,373	5,895	1,763	2,778	Vermont	1,474	610	488	146	230				
Massachusetts	9,008	3,729	2,982	892	1,405	Virginia	20,084	8,315	6,648	1,988	3,133				
Michigan	27,571	11,414	9,126	2,730	4,301	Washington	23,209	9,609	7,681	2,298	3,621				
Minnesota	19,196	7,947	6,354	1,900	2,995	West Virginia	4,427	1,833	1,465	438	691				
Mississippi	7,160	2,964	2,370	709	1,117	Wisconsin	24,795	10,265	8,207	2,455	3,868				
Missouri	19,729	8,168	6,530	1,953	3,078	Wyoming	3,056	1,265	1,011	303	477				

^a arrest rates from *Arrests by State* from FBI 2016.

AUDIT Risk Zones correspond to the following AUDIT Scores and Intervention Intensities: Zone I = AUDIT scores 0–7 Alcohol Education; Zone II = AUDIT scores 8–15 Simple Advice; AUDIT scores 16–19 Brief Counseling and Continued Monitoring; and Zone IV AUDIT scores 20–40 = Brief Intervention and Referral to Specialist (from Babor and Higgins-Biddle 2001).

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript