Comparative Performance of the AUDIT-C in Screening for DSM-IV and DSM-5 Alcohol Use Disorders*

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Abstract

Objective—Under the proposed DSM-5 revision to the criteria for alcohol use disorder (AUD), a substantial proportion of DSM-IV AUD cases will be lost or shifted in terms of severity, with some new cases added. Accordingly, the performance of the AUDIT-C in screening for DSM-IV AUD cannot be assumed to extend to DSM-5 AUD. The objective of this paper is to compare the AUDIT-C in screening for DSM-IV and DSM-5 AUD.

Methods—Using a broad range of performance metrics, the AUDIT-C was tested and contrasted as a screener for DSM-IV AUD (any AUD, abuse and dependence) and DSM-5 AUD (any AUD, moderate AUD and severe AUD) in a representative sample of U.S. adults aged 21 and older and among past-year drinkers.

Results—Optimal AUDIT-C cutpoints were identical for DSM-IV and DSM-5 AUD: 4 for any AUD,   3 or   4 for abuse/moderate AUD and   4 or   5 for dependence/severe AUD. Screening performance was slightly better for DSM-5 severe AUD than DSM-IV dependence but did not differ for other diagnoses. At optimal screening cutpoints, positive predictive values were slightly higher for DSM-5 overall AUD and moderate AUD than for their DSM-IV counterparts. Sensitivities were slightly higher for DSM-5 severe AUD than DSM-IV dependence. Optimal

screening cutpoints shifted upwards for past-year drinkers but continued to be identical for DSM-IV and DSM-5 disorders.

Conclusions—Clinicians should not face any major overhaul of their current screening procedures as a result of the DSM-5 revision and should benefit from fewer false positive screening results.

Keywords

AUDIT-C; screening; alcohol use disorder; DSM-IV; DSM-5

1. Introduction

The AUDIT-C, comprising the first three questions of the Alcohol Use Disorders Identification Test (Saunders et al., 1993), is a brief screener for alcohol use disorder (AUD) commonly used in general medical and emergency department settings. Its screening utility has been demonstrated among patients in Veterans Affairs (Bush et al., 1998; Bradley et al., 2003), primary care (Aertgeerts et al., 2001; Gual et al., 2002; Gordon et al., 2001; Bradley et al., 2007), emergency department (Kelly et al., 2009), occupational care (Kaarne et al., 2010), and prenatal (Burns et al., 2010) settings, as well as in the general population (Dawson et al., 2005a, 2005b; Nayak et al., 2009; Rumpf et al., 2002). It also shows promise for telephone screening (McPherson et al., 2010), and its screening performance approaches that of the full AUDIT (Aeertgeerts et al., 2001; Gordon et al., 2001; Nayak et al., 2009; Rumpf et al., 2002).

No study to date has evaluated the AUDIT-C with respect to the proposed DSM-5 criteria for AUD (http://www.dsm5.org), which differ in several ways from the DSM-IV criteria (American Psychiatric Association, 1994). Under the proposed revision, the criterion of alcohol-related legal problems has been dropped, and a new craving criterion has been added. DSM-IV abuse and dependence are based on separate sets of diagnostic criteria, with endorsement of 1 of four abuse criteria required for an abuse diagnosis and 3 of seven dependence criteria required for a dependence diagnosis. In contrast, all 11 DSM-5 criteria apply towards a unitary construct of AUD, with endorsement of 2–3 criteria representing moderate AUD and 4 criteria representing severe AUD. Accordingly, cases of AUD have been gained, lost and shifted in terms of severity (Agrawal et al., 2011; Dawson et al, under review). As per Supplementary Table 1[1], 3.3% of individuals negative for any DSM-IV AUD qualify for DSM-5 moderate AUD; these comprise former diagnostic orphans (Hasin and Paykin, 1998) who endorsed two of the DSM-IV dependence criteria (or one plus craving). Only 58% of individuals with DSM-IV abuse are classified with the corresponding DSM-5 diagnosis of moderate AUD; 36% who endorsed a single DSM-IV abuse criterion (or two including legal) do not qualify for any DSM-5 AUD, and 6.0% whose DSM-5 criteria count reaches 4+ by combining former abuse and dependence criteria and craving qualify for DSM-5 severe AUD. Finally, 19.5% of individuals with DSM-IV dependence, those with just three dependence criteria, no abuse criteria (or legal only) and no craving, are downshifted into DSM-5 moderate rather than severe AUD. As a result, the performance of the AUDIT-C in screening for DSM-IV AUD cannot be assumed to extend to DSM-5 diagnoses.

In light of the widespread use of the AUDIT-C, it is of critical importance to clinicians to document its screening ability for DSM-5 AUD. This analysis was designed to provide this missing information. It utilizes data from a representative sample of the U.S. adult

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[*]Supplementary material can be found by accessing the online version of this paper at http://dx.doi.org and by entering doi:…

population to compare the relationship of the AUDIT-C with DSM-IV and DSM-5 AUD in the total population and among past-year drinkers who consumed any alcohol in the year preceding alcohol screening.

2. Methods

2.1 Sample

This study uses data from Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), the 3-year follow-up of a nationally representative sample of U.S. adults 18 and older living in households and noninstitutional group quarters, originally interviewed in 2001–2002. At the 2004–2005 Wave 2 follow-up, 34,653 of the 43,093 Wave 1 respondents were reinterviewed, 86.7% of those eligible for reinterview, for a cumulative response rate of 70.2% (Grant et al., 2003a, 2007). Informed consent was obtained after potential respondents were informed in writing about the nature of the survey, uses of the survey data, voluntary nature of participation and confidentiality of identifiable survey information. The research protocol received full ethical review and approval.

The overlap of NESARC respondents positive for both DSM-IV and DSM-5 AUD necessitated a split-sample design to compare AUDIT-C screening performance for DSM-IV and DSM-5 AUD using statistical tests designed for independent samples. After excluding individuals with missing data for AUDIT-C items (<0.5% of the total population), the screener was evaluated with respect to DSM-IV AUD among respondents with even case identification numbers (n = 17,225 including 10,944 past-year drinkers) and DSM-5 AUD among respondents with odd case identification numbers (n = 17,311 including 11,116 past-year drinkers).

2.2 Measures

All AUD diagnoses were based on the Alcohol Use Disorder and Associated Disabilities Interview Schedule (Grant et al., 2001). Past-year DSM-IV dependence required endorsement of 3 of seven dependence criteria (tolerance, withdrawal/relief of withdrawal, drinking more/longer than intended, persistent desire/unsuccessful attempts to reduce drinking, excessive time spent drinking, important activities given up, continued drinking despite physical/psychological problems); abuse required endorsement of 1 of four abuse criteria (failure to fulfill role obligations, recurrent hazardous drinking, recurrent alcohol-related legal problems, continued drinking despite interpersonal problems) and the absence of dependence. Any DSM-IV AUD refers to abuse or dependence. The DSM-IV AUD diagnoses are highly reliable, kappa = .74 for past-year AUD (Grant et al., 2003b). The 11 DSM-5 criteria for AUD consisted of craving and all of the DSM-IV abuse and dependence criteria listed above other than legal problems. Past-year DSM-5 moderate AUD required endorsement of 2–3 criteria; severe AUD required 4 criteria. Any DSM-5 AUD includes moderate and severe AUD.

The AUDIT-C score (0 to 12 in the total population and 1 to 12 among past-year drinkers) was calculated from responses to three questions regarding past-year consumption for all types of alcohol combined: 1) overall frequency of drinking, 2) usual quantity of drinks and 3) frequency of drinking 5+ drinks. The scoring of these questions and their differences relative to standard AUDIT-C items are presented in detail elsewhere (Dawson et al., 2005b). Briefly, although the AUDIT-C scoring conventions were followed as closely as possible, a few differences in the NESARC version were unavoidable: a) the NESARC identified nondrinkers from a separate screening question rather than a "never" response to question 1; b) the NESARC offered more frequency response categories and ordered them with higher frequencies at the top rather than bottom of the list; c) the NESARC's

combination of "3 to 4 times a week" in a single category meant that individuals drinking four times a week got a score of 3 rather than 4 points for question 1; and d) question 3 asked frequency of drinking 5+ rather than 6+ drinks.

2.3 Analysis

Sensitivity, specificity and positive predictive values (PPV) were based on weighted crosstabulations of diagnoses with AUDIT-C score cutpoints (3, 4, etc.) using SUDAAN (Research Triangle Institute, 2008), which uses Taylor series linearization to adjust variance estimates for complex, multistage sample designs. At any given cutpoint, sensitivity is the proportion of individuals with positive outcomes whose screener scores were the cutpoint, and specificity is the proportion of individuals with negative outcomes whose screener scores were < the cutpoint. PPV is the proportion of individuals with screener scores the cutpoint who had positive outcomes. Positive likelihood ratios (PLR), i.e., sensitivity divided by 1 minus specificity, were calculated for each cutpoint (Simel et al., (1991). SAS Version 9.2 (SAS Institute, Inc., 2008) was used to estimate areas under the curve (AUC) and standard errors for plots of sensitivity versus 1 minus specificity at each screener cutpoint (Swets and Pickett, 1982). Differences in sensitivity, specificity, PPV and AUC were tested for significance (p<.05 and p<.005) using t-tests for independent samples; since the confidence intervals for PLRs are symmetrical around their natural logs, we used t-tests for differences of their logged values (Simel et al., 1991).

3. Results

AUDIT-C screening performance was similar for DSM-IV and DSM-5 AUD in the total population. A cutpoint of 4 optimized the combined values of sensitivity and specificity for the diagnosis of any AUD under both the DSM-IV and DSM-5, and AUC values were virtually identical, 0.914 and 0.915 (left panel of Table 1). However, at this optimal cutpoint, the PPV was significantly higher for DSM-5 than DSM-IV AUD, 36.9%, versus 33.7%. When comparing DSM-IV abuse and DSM-5 moderate AUD (middle panel), a cutpoint of 3 maximized combined sensitivity and specificity for both diagnoses, but at specificity levels that fell short of 70%; thus a cutpoint of 4 might be considered preferable. AUC values were comparable, 0.870 and 0.871, but PPV were greater with respect to the DSM-5 diagnosis at cutpoints of both 3 and 4. For DSM-IV dependence and DSM-5 severe AUD (right panel), cutpoints of 4 and 5 both performed well, the former favoring sensitivity and the latter favoring specificity. At both cutpoints, sensitivity was significantly higher for severe AUD than dependence; however, at the lower cutpoint of 4, the PPV was higher for dependence. The overall screening performance was superior for severe AUD, with an AUC of 0.935 compared to 0.923 for dependence.

Among past-year drinkers, specificity and AUC values for the AUDIT-C declined substantially relative to the total population (Table 2). Since AUD diagnoses and positive screens are limited to past-year drinkers regardless of whether assessed in the total population or not, there was no change in sensitivity and PPV. For any DSM-IV and DSM-5 AUD (left panel), cutpoints of 4 and 5 yielded similar combined sensitivity and specificity, the former favoring sensitivity and latter favoring specificity. These cutpoints also were optimal for DSM-IV abuse and DSM-5 moderate AUD. For DSM-IV dependence and DSM-5 severe AUD, a cutpoint of 5 optimized combined sensitivity and specificity. As in the total population, the AUC was significantly greater for DSM-5 severe AUD than DSM-IV dependence, 0.896 versus 0.876.

4. Discussion

The AUDIT-C cutpoints that optimally screen for DSM-IV AUD will also optimize screening for DSM-5 AUD; thus, clinicians should not face any major overhaul of their current screening procedures as a result of the revision. However, the AUDIT-C will do a somewhat better job of screening for DSM-5 than DSM-IV disorders, yielding slightly higher PPV for any AUD and moderate AUD and slightly higher sensitivity and AUC for severe AUD. Thus, clinicians should benefit from fewer false positive screening results.

Why might screening performance differ for DSM-IV and DSM-5 AUD? It could reflect a difference in the severity of the disorders. Assuming the AUDIT-C is a scaled marker of latent AUD severity, then at any given cutpoint a more severe disorder increases the likelihood that affected individuals will screen positive (higher sensitivity), whereas a milder disorder is more likely to be present among individuals with positive screens (higher PPV). Thus the higher sensitivity for DSM-5 severe AUD could reflect its being slightly less prevalent (i.e., more severe) than DSM-IV dependence, 3.9% versus 4.4%, and the higher PPV for DSM-5 moderate and any AUD could reflect their being slightly more prevalent (i.e., milder) than their DSM-IV counterparts, 10.8% and 6.9% versus 9.7% and 5.3%. Alternatively, the pooling of abuse and dependence criteria under the DSM-5 may have yielded diagnoses more strongly associated with consumption, the basis of the AUDITC, as prior analyses have shown that the AUD criteria most strongly associated with drinking quantity and frequency comprised a mixture of abuse and dependence criteria (Dawson et al., 2010).

A limitation of this study is that the AUDIT-C questions were embedded in a larger series of consumption questions, potentially affecting recall. They also differed slightly from the original AUDIT-C in the range of response options and in asking about the frequency of drinking 5+ rather than 6+ drinks; however, 5+ U.S. drinks at 12–14g ethanol each have about the same ethanol content as 6+ drinks containing 10g each, the drink size assumed by the original AUDIT (Saunders et al, 1993). Also, NESARC responses were anonymous, which may yield more complete reporting of consumption that would be obtained in clinical settings. Although these limitations suggest the need for caution in extrapolating the optimal cutpoints to other populations, they should not affect the comparison of the AUDIT-C performance for screening DSM-5 versus DSM-IV AUD. Subgroup (e.g., gender-specific) analyses, although of considerable importance to clinicians, lay beyond the scope of this brief report. These will be addressed in forthcoming analyses.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Table 1

Performance of the AUDIT-C in screening for DSM-IV and DSM-5 alcohol use disorders: U.S. adults 21 years of age and older

	Any DSM-IV AUD				DSM-IV Abuse				DSM-IV Dependence			
	% Sens.	% Spec.	%PPV[a]	PLR[b]	% Sens.	% Spec.	%PPV[a]	PLR[b]	% Sens.	% Spec.	%PPV[a]	PLR[b]
N of cases	1,534	15,691	Variable[c]	17,225	817	16,408	Variable[c]	17,225	717	16,508	Variable[c]	17,225
AUDIT-C score												
1	100.0 (0.0)	37.8 (0.7)	14.7 (0.4)	1.6	100.0 (0.0)	36.0 (0.7)	7.8 (0.3)	1.6	100.0 (0.0)	35.8 (0.7)	6.9 (0.3)	1.6
2	98.2 (0.4)	60.5 (0.7)	21.0 (0.6)	2.5	97.3 (0.7)	57.6 (0.6)	11.1 (0.5)	2.3	99.1 (0.3)	57.4 (0.7)	9.9 (0.5)	2.3
3	92.8 (0.8)	72.2 (0.6)	26.4 (0.8)	3.3	90.4 (1.3)	69.0 (0.6)	13.7 (0.6)	2.9	95.4 (0.9)	68.8 (0.6)	12.7 (0.6)	3.1
4	82.6 (1.1)	82.6 (0.4)	33.7 (1.0)	4.7	77.7 (1.7)	79.2 (0.5)	16.9 (0.7)	3.7	88.3 (1.4)	79.3 (0.5)	16.8 (0.8)	4.3
5	70.2 (1.3)	90.8 (0.3)	45.0 (1.3)	7.6	62.7 (1.8)	87.5 (0.4)	21.4 (1.0)	5.0	78.9 (1.9)	87.9 (0.4)	23.6 (1.2)	6.5
6	59.0 (1.5)	94.0 (0.3)	51.3 (1.5)	9.8	49.9 (1.9)	91.0 (0.3)	23.1 (1.2)	5.5	69.3 (2.1)	91.6 (0.3)	28.2 (1.3)	8.3
7	45.1 (1.6)	96.0 (0.2)	54.7 (1.7)	11.3	35.0 (2.1)	93.5 (0.3)	22.6 (1.5)	5.4	56.5 (2.4)	94.3 (0.3)	32.0 (1.6)	9.9
8	33.8 (1.5)	97.8 (0.2)	62.4 (2.1)	15.4	24.5 (1.9)	95.8 (0.2)	24.0 (1.9)	5.8	44.5 (2.4)	96.6 (0.2)	38.4 (2.0)	13.1
9	18.0 (1.2)	99.2 (0.1)	69.4 (3.0)	22.5	9.6 (1.3)	97.9 (0.2)	19.8 (2.5)	4.6	27.5 (2.1)	98.7 (0.1)	49.6 (3.1)	21.2
10	13.7 (1.2)	99.4 (0.1)	70.8 (3.5)	22.8	6.8 (1.2)	98.4 (0.1)	18.7 (2.8)	4.3	21.5 (2.1)	99.1 (0.1)	52.1 (3.6)	23.9
11	4.1 (0.6)	99.9 (0.0)	82.2 (5.4)	41.0	1.5 (0.5)	99.6 (0.1)	15.8 (5.1)	3.8	7.1 (1.2)	99.8 (0.0)	66.5 (6.9)	35.5
AUC	.914 (.003)				.870 (.004)				.923 (.004)			

	Any DSM-5 AUD				DSM-5 Moderate AUD				DSM-5 Severe AUD			
	% Sens.	% Spec.	%PPV[a]	PLR[b]	% Sens.	% Spec.	% PPV[a]	PLR[b]	% Sens.	% Spec.	% PPV[a]	PLR[b]
N of cases	1,776	15,535	Variable[c]	17,311	1,149	16,162	Variable[c]	17,311	627	16,684	Variable[c]	17,311
AUDIT-C score												
1	100.0 (0.0)	37.8 (0.8)	16.3 (0.5)*	1.6	100.0 (0.0)	36.3 (0.8)	10.7 (0.4)**	1.6	100.0 (0.0)	35.0 (0.7)	5.7 (0.3)**	1.5
2	98.4 (0.4)	60.1 (0.7)	23.0 (0.7)*	2.5	97.6 (0.6)	57.7 (0.7)	14.9 (0.5)**	2.3	99.8 (0.2)	55.9 (0.7)	8.1 (0.4)**	2.3
3	93.3 (0.8)	72.1 (0.6)	28.9 (0.8)*	3.3	90.7 (1.1)	69.3 (0.6)	18.3 (0.7)**	3.0	98.4 (0.5)**	67.5 (0.6)	10.6 (0.5)*	3.0
4	84.3 (1.1)	82.5 (0.4)	36.9 (1.0)*	4.8	78.9 (1.4)	79.4 (0.5)	22.6 (0.8)**	3.8	94.6 (1.0)**	78.0 (0.5)	14.3 (0.7)*	4.3
5	69.1 (1.3)	91.2 (0.3)	48.7 (1.3)*	7.9	60.9 (1.7)	88.1 (0.3)	28.0 (1.1)**	5.1	84.6 (1.9)*	87.3 (0.3)	20.7 (1.1)	6.7
6	56.0 (1.4)	94.1 (0.2)	53.7 (1.5)	9.5	46.4 (1.8)	91.4 (0.3)	29.1 (1.3)**	5.4	74.0 (2.1)	91.2 (0.3)	24.6 (1.3)	8.5

	Any DSM-IV AUD				DSM-IV Abuse				DSM-IV Dependence			
	% Sens.	% Spec.	%PPV[a]	PLR[b]	% Sens.	% Spec.	%PPV[a]	PLR[b]	% Sens.	% Spec.	%PPV[a]	PLR[b]
7	45.1 (1.4)	96.2 (0.2)	59.1 (1.8)	11.9	34.8 (1.7)	93.8 (0.3)	29.8 (1.6)**	5.6	64.6 (2.3)*	93.9 (0.3)	29.3 (1.6)	10.6
8	33.1 (1.4)	97.7 (0.2)	63.1 (2.0)	14.4	23.9 (1.6)	95.7 (0.2)	29.9 (2.0)*	5.6	50.3 (2.3)	96.1 (0.2)	33.3 (1.9)	13.4
9	16.9 (1.0)	99.1 (0.1)	69.7 (3.0)	18.8**	9.7 (1.2)	97.9 (0.2)	26.1 (2.9)	4.6	30.4 (2.0)	98.5 (0.1)	43.6 (3.2)	21.6
10	13.1 (0.9)	99.5 (0.1)	75.5 (3.5)	26.2*	6.8 (1.0)	98.5 (0.1)	25.6 (3.4)	4.5	25.0 (1.9)	99.0 (0.1)	49.9 (4.0)	24.1
11	4.7 (0.6)	99.9 (0.0)	87.0 (5.8)	47.0	2.2 (0.6)	99.5 (0.1)	26.8 (6.4)	4.4	9.5 (1.40)	99.8 (0.1)	60.2 (7.3)	40.5
AUC	.915 (.003)				.871 (.004)				.935 (.004)*			

Note: Figures in parentheses are standard errors of estimates. Values of 0.0 denote standard errors <.05. Shaded cells denote recommended cutpoints for outcome in question.

** Significantly different (p<.005) from corresponding value for DSM-IV diagnosis

* Significantly different (p<.05) from corresponding value for DSM-IV diagnosis

[a] Positive predictive value

[b] Positive likelihood ratio

[c] N differs for each row, based on n of cases with AUDIT-C score in question (decreasing from 10,994 for scores 1 to 73 for scores 11)

Table 2

Performance of the AUDIT-C in screening for DSM-IV and DSM-5 alcohol use disorders: Past-year drinkers 21 years of age and older

	Any DSM-IV AUD				DSM-IV Abuse				DSM-IV Dependence			
	% Sens.	% Spec.	%PPV[a]	PLR[b]	% Sens.	% Spec.	%PPV[a]	PLR[b]	% Sens.	% Spec.	%PPV[a]	PLR[b]
N of cases	1,534	9,410	Variable[c]	10,944	817	10,127	Variable[c]	10,944	717	10,227	Variable[c]	10,944
AUDIT-C score												
1	100.0 (0.0)	0.0 (0.0)	14.7 (0.4)	1.0	100.0 (0.0)	0.0 (0.0)	7.8 (0.3)	1.0	100.0 (0.0)	0.0 (0.0)	6.9 (0.3)	1.0
2	98.2 (0.4)	36.5 (0.7)	21.0 (0.6)	1.5	97.3 (0.7)	33.8 (0.6)	11.1 (0.5)	1.5	99.1 (0.3)	33.6 (0.6)	9.9 (0.5)	1.5
3	92.8 (0.8)	55.3 (0.7)	26.4 (0.8)	2.1	90.4 (1.3)	51.5 (0.7)	13.7 (0.6)	1.9	95.4 (0.9)	51.5 (0.7)	12.7 (0.6)	2.0
4	82.6 (1.1)	72.0 (0.6)	33.7 (1.0)	3.0	77.7 (1.7)	67.5 (0.6)	16.9 (0.7)	2.4	88.3 (1.4)	67.8 (0.6)	16.8 (0.6)	2.7
5	70.2 (1.3)	85.2 (0.5)	45.0 (1.3)	4.7	62.7 (1.8)	80.4 (0.6)	21.4 (1.0)	3.2	78.9 (1.9)	81.2 (0.6)	23.6 (1.2)	4.2
6	59.0 (1.5)	90.4 (0.4)	51.3 (1.5)	6.1	49.9 (1.9)	85.9 (0.5)	23.1 (1.2)	3.5	69.3 (2.1)	87.0 (0.5)	28.2 (1.3)	5.3
7	45.1 (1.6)	93.6 (0.3)	54.7 (1.7)	7.0	35.0 (2.1)	89.8 (0.4)	22.6 (1.5)	3.4	56.5 (2.4)	91.2 (0.4)	32.0 (1.6)	6.4
8	33.8 (1.5)	96.5 (0.3)	62.4 (2.1)	9.7	24.5 (1.9)	93.4 (0.4)	24.0 (1.9)	3.7	44.5 (2.4)	94.7 (0.3)	38.4 (2.0)	8.4
9	18.0 (1.2)	98.6 (0.2)	69.4 (3.0)	12.9	9.6 (1.3)	96.7 (0.2)	19.8 (2.5)	2.9	27.5 (2.1)	97.9 (0.2)	49.6 (3.1)	13.1
10	13.7 (1.2)	99.0 (0.1)	70.8 (3.5)	13.7	6.8 (1.2)	97.5 (0.2)	18.7 (2.8)	2.7	21.5 (2.1)	98.5 (0.2)	52.1 (3.6)	14.3
11	4.1 (0.6)	99.8 (0.1)	82.2 (5.4)	20.5	1.5 (0.5)	99.3 (0.1)	15.8 (5.1)	2.1	7.1 (1.2)	99.7 (0.1)	66.5 (6.9)	23.7
AUC	0.857 (.005)				0.789 (.007)				0.876 (.006)			

	Any DSM-5 AUD				DSM-5 Moderate AUD				DSM-5 Severe AUD			
	% Sens.	% Spec.	%PPV[a]	PLR[b]	% Sens.	% Spec.	%PPV[a]	PLR[b]	% Sens.	% Spec.	%PPV[a]	PLR[b]
N of cases	1,776	9,340	Variable[c]	11,116	1,149	9,967	Variable[c]	11,116	627	10,489	Variable[c]	11,116
AUDIT-C score												
1	100.0 (0.0)	0.0 (0.0)	16.3 (0.5)*	1.0	100.0 (0.0)	0.0 (0.0)	10.7 (0.4)**	1.0	100.0 (0.0)	0.0 (0.0)	5.7 (0.3)**	1.0
2	98.4 (0.4)	35.8 (0.7)	23.0 (0.7)*	1.5	97.6 (0.6)	33.6 (0.7)	14.9 (0.5)**	1.5	99.8 (0.2)	32.1 (0.6)	8.1 (0.4)**	1.5
3	93.3 (0.8)	55.2 (0.7)	28.9 (0.8)*	2.1	90.7 (1.1)	51.8 (0.6)	18.3 (0.7)**	1.9	98.4 (0.5)**	50.0 (0.6)	10.6 (0.5)*	2.0
4	84.3 (1.1)	71.9 (0.6)	36.9 (1.0)*	3.0	78.9 (1.4)	67.7 (0.6)	22.6 (0.8)**	2.4	94.6 (1.0)**	66.1 (0.6)*	14.3 (0.7)*	2.7
5	69.1 (1.3)	85.8 (0.4)	48.7 (1.3)*	4.9	60.9 (1.7)	81.3 (0.5)	28.0 (1.1)**	3.3	84.6 (1.9)*	80.5 (0.5)	20.7 (1.1)	4.3
6	56.0 (1.4)	90.6 (0.4)	53.7 (1.5)	6.0	46.4 (1.8)	86.5 (0.4)	29.1 (1.3)**	3.4	74.0 (2.1)	86.4 (0.4)	24.6 (1.3)	5.4

	Any DSM-IV AUD				DSM-IV Abuse				DSM-IV Dependence			
	% Sens.	% Spec.	%PPV[a]	PLR[b]	% Sens.	% Spec.	%PPV[a]	PLR[b]	% Sens.	% Spec.	%PPV[a]	PLR[b]
7	45.1 (1.4)	93.9 (0.3)	59.1 (1.8)	7.4	34.8 (1.7)	90.2 (0.4)	29.8 (1.6)**	3.6	64.6 (2.3)*	90.7 (0.4)	29.3 (1.6)	6.9
8	33.1 (1.4)	96.2 (0.3)	63.1 (2.0)	8.7*	23.9 (1.6)	93.3 (0.4)	29.9 (2.0)*	3.6	50.3 (2.3)	93.9 (0.3)	33.3 (1.9)	8.2
9	16.9 (1.0)	98.6 (0.2)	69.7 (3.0)	12.1	9.7 (1.2)	96.7 (0.2)	26.1 (2.9)	2.9	30.4 (2.0)	97.6 (0.2)	43.6 (3.2)	12.7
10	13.1 (0.9)	99.2 (0.1)	75.5 (3.5)	16.4*	6.8 (1.0)	97.6 (0.2)	25.6 (3.4)	2.8	25.0 (1.9)	98.5 (0.2)	49.9 (4.0)	16.7**
11	4.7 (0.6)	99.9 (0.1)	87.0 (5.8)	47.0**	2.2 (0.6)	99.3 (0.1)	26.8 (6.4)	3.1*	9.5 (1.4)	99.6 (0.1)	60.2 (7.3)	23.8
AUC	0.858 (0.005)				0.791 (0.006)				0.896 (0.006)*			

Note: Figures in parentheses are standard errors of estimates. Values of 0.0 denote standard errors <.05. Shaded cells denote recommended cutpoints for outcome in question.

**
Significantly different (p<.005) from corresponding value for DSM-IV diagnosis

*
Significantly different (p<.05) from corresponding value for DSM-IV diagnosis

[a]Positive predictive value

[b]Positive likelihood ratio

[c]N differs for each row, based on n of cases with AUDIT-C score in question (decreasing from 7,308 for scores ≥ 1 to 73 for scores ≥ 11)