



Published in final edited form as:

Addiction. 2011 November ; 106(11): 1935–1943. doi:10.1111/j.1360-0443.2011.03517.x.

DSM-IV to DSM-5: The impact of proposed revisions on diagnosis of alcohol use disorders

Arpana Agrawal, Andrew C. Heath, and Michael T. Lynskey

Washington University School of Medicine, Dept of Psychiatry, 660 S. Euclid, CB 8134, Saint Louis, MO 63110.

Abstract

Aims—To determine the prevalence of past 12 month DSM-5 alcohol use disorders (AUDs), to quantify and characterize individuals who remain stably unaffected or affected and those who diagnostically “switch” between DSM-IV and DSM-5 classifications.

Design—Data from the nationally representative Wave 2 of the National Epidemiological Survey of Alcohol and Related Conditions (NESARC) collected in 2004–2005.

Setting—General population survey.

Participants—All surveyed participants (N=34,653, aged 21 and older) and 29,993 individuals reporting lifetime alcohol use across both waves of NESARC.

Measurements—DSM-IV and DSM-5 criteria were coded using proposed guidelines.

Findings—The prevalence of DSM-5 AUDs was 10.8% with the corresponding prevalence of DSM-IV abuse/dependence being 9.7%, implying a modest 11.3% increase. Those who diagnostically switched from affected to unaffected (19.6% of DSM-IV affected) were most likely to have endorsed hazardous use, particularly due to drinking and driving while those who transitioned from unaffected to affected (3.3% of DSM-IV unaffected) were primarily DSM-IV diagnostic orphans reporting larger/longer and quit/cut-back. Dropping the legal criterion did not significantly affect the prevalence while the addition of craving also had a relatively modest impact on prevalence.

Conclusion—The proposed DSM-5 revisions successfully eliminate individuals previously diagnosed with DSM-IV alcohol abuse primarily due to hazardous use alone and incorporate diagnostic orphans into the diagnostic realm. Definitions of craving and importantly, hazardous use require considerable attention as it is likely that they will contribute to variations in reports of increased prevalence of AUDs between DSM-IV to DSM-5.

Keywords

alcohol; Alcohol Use Disorders; DSM-5; NESARC

The roots of the diagnostic classification of alcohol use disorders (AUDs) lie in the early definitions of Edwards and Gross (1) which distinguished dependence from other substance-related consequences (e.g. defined later as abuse), thus establishing the bi-axial model of AUDs which was subsequently extended to all substance use disorders (2). These early definitions have strongly influenced recent iterations of the Diagnostic and Statistical Manual’s (DSM) definition of AUDs (3). Recently, the Substance Related Disorders

Working Group of the DSM-5 taskforce proposed a series of revisions to be implemented in the diagnosis of substance use disorders for the fifth edition of the DSM (DSM-5) (www.dsm5.org). The following recommendations were made for the diagnosis of AUDs (and also apply in varying degrees to other psychoactive substances):

- a. Alcohol Use Disorder (AUD) would encompass three criteria previously attributed to DSM-IV alcohol abuse as well as the seven DSM-IV dependence criteria. There would, however, be no distinction between abuse and dependence.
- b. The ‘recurrent legal problems’ criterion from DSM-IV abuse would be excluded.
- c. Craving or a strong desire or urge to drink alcohol would be introduced as a criterion.
- d. AUDs would be diagnosed on a continuum of severity: those endorsing 0–1 criterion (of a total of 11) would be classified as unaffected, those endorsing 2–3 criteria would have a diagnosis of moderate AUD while endorsement of 4+ criteria would indicate severe AUD.

These changes (which can be found at: <http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=452>) are rooted in a growing body of psychometrics literature (4–16). Despite the appeal of a measurement scheme that has been, and continues to be, well validated by state-of-the-art statistical methods, relatively little is known of the impact of the new diagnostic scheme on diagnosis and re-diagnosis of individuals with AUDs. Importantly, this revision could lead to individuals with DSM-IV AUDs (abuse or dependence) being assigned as “DSM-5 diagnosis free” (e.g. an individual reporting one abuse criterion only would have met criteria for DSM-IV alcohol abuse but, according to DSM-5, is unaffected). On the other hand, previously unaffected individuals, particularly those endorsing 2 dependence criteria (previously described as “diagnostic orphans” (17;18)), may now be assigned to the ‘Moderate’ AUDs category. If these changes are dramatic, they may contribute to remarkable incongruence in prevalence of AUDs, their assessment, diagnosis, comparability, and, perhaps most critically, provision of treatment.

To address some of these issues, Mewton and colleagues (19) recently conducted a series of analyses using data from a large general population sample of Australian adults. In addition to examining the psychometric properties of the DSM-5 criteria (which they concluded were excellent), they reported a prevalence of 9.7% (2 or more criteria endorsed) for past 12 month DSM-5 AUDs. The corresponding past 12 month prevalence of DSM-IV abuse/dependence was 6.0%, indicating that the transition to DSM-5 resulted in a 61.7% increase in the prevalence of AUDs.

The goal of this manuscript is to characterize DSM-5 AUDs according to the proposed revisions and to examine the extent and nature of “diagnostic-switching” (i.e. moving from affected via DSM-IV to unaffected via DSM-5 and vice versa) using from the second wave of the National Epidemiological Survey on Alcohol and Related Conditions (NESARC). These analyses also follow-up the report by Mewton and colleagues (19) and identify the contributors to potential increases in AUD diagnoses between DSM-IV and DSM-5.

METHODS

Sample

NESARC(20) began as a nationally representative sample of 43,093 participants aged 18–99 years (at Wave 1) (21). Wave 1 was collected during 2001–2002 by the U.S. Bureau of the Census on behalf of the National Institute on Alcohol Abuse and Alcoholism and included data from adult, non-institutionalized U.S. citizens and non-citizens (including Alaska and

Hawaii). After complete description of the study to the subjects, informed consent was obtained. Approximately 3 years later, Wave 2 data were collected on 34,653 [including 29,993 lifetime alcohol users] of the Wave 1 subjects, reflecting a cumulative response rates of 86.7%,(22).

Assessment

The Alcohol Use Disorders and Associated Disabilities Schedule (AUDADIS-IV)(23) was used to collect interview data, in person, from all individuals. The reliability and validity of assessments from the AUDADIS-IV are good and have been discussed in detail elsewhere (23;24). At Wave 2, data were collected for individual DSM-IV criteria for AUDs and also for craving, which is a proposed addition to the DSM-5 diagnosis of AUDs. While subjects were queried about experiences since the last interview (i.e. the three year follow-up period), past 12 months reports were also available. To allow for generalizability with other published estimates, we focus here on past 12 month reports.

Measures

Four DSM-IV abuse criteria, seven DSM-IV dependence criteria and craving were defined as indicated by DSM-5 (dsm5.org) or as previously suggested by DSM-IV. To allow for future replication, the definition of each criterion is available in Supplemental Table S1.

Covariates

A range of measures of alcohol consumption, socio-demographic characteristics and indices of comorbid psychopathology and substance use disorders were used in the characterization of diagnostic switching from DSM-IV to DSM-5 diagnosis of AUDs.

Statistical Analyses

A diagnosis of past 12 month alcohol abuse and/or dependence (non-hierarchical) was based on DSM-IV criteria. Those who endorsed one or more abuse criterion were (hierarchically) diagnosed with DSM-IV alcohol abuse while those reporting three or more dependence criteria were diagnosed with DSM-IV alcohol dependence. A diagnosis of DSM-5 AUDs was made based on the proposed revisions – the sum of 11 criteria (excluding “legal problems” and including “craving”) was used to define moderate (2–3 criteria) and severe (4+) AUDs in the past 12 months. Cross-tabulations were used to compare diagnostic assignments using both sets of diagnostic schemes. All analyses were conducted in SAS v8 (25)– where appropriate, the study design of NESARC, including adjustments for weights (for Wave 1 and/or 2), primary sampling unit (PSU) and strata were included.

RESULTS

Prevalence of DSM-5 AUDs

The prevalence of past 12 month DSM-5 AUDs is presented in Table 1 for the full sample and also for the subset of individuals who reported using alcohol at least once during their lifetime (either at Wave 1 or Wave 2). The latter reflects exclusion of lifetime abstainers who can be considered “missing” or ineligible for a diagnosis of AUDs. Of the full sample, 10.8% met criteria for DSM-5 AUDs corresponding to 12.3% of lifetime alcohol users. These estimates were comparable with past 12 month DSM-IV abuse/dependence (9.7% for full sample and 11.1% of lifetime alcohol users) suggesting only a very modest (11.3% and 10.8%) increase in overall diagnoses.

Rates of Diagnostic Switching

Table 2 shows stability and change (i.e. “diagnostic-switching”) in affection status attributable to application of proposed DSM-5 revisions. Reassuringly, 96.7% of those not meeting criteria for DSM-IV abuse/dependence remained unaffected upon application of DSM-5 criteria. Likewise 80.4% of those meeting criteria for DSM-IV abuse or dependence were diagnosed with moderate or severe AUDs per DSM-5. However, 3.3% (3.9% of alcohol users) of those who did not have a DSM-IV diagnosis were diagnosed with moderate DSM-5 AUDs while 19.6% of those diagnosed with DSM-IV abuse/dependence no longer met criteria for DSM-5 AUDs.

Endorsement of criteria in those stably affected versus diagnostic switches

Based on their DSM-IV and DSM-5 diagnoses, lifetime alcohol-using individuals could be classified into four groups, as shown in Tables 3A and 3B. The largest group consisted of those who were stably unaffected and were neither diagnosed with DSM-IV nor with DSM-5 AUDs, followed by those who met criteria for AUDs using both DSM-IV and DSM-5 schemes (i.e. stably affected). These two groups showed stability while the two smaller groups represent diagnostic switching between DSM-IV and DSM-5. Table 3A and 3B summarize selected socio-demographic, drinking and psychiatric characteristics of those in these four groups. In Table 3A, we present the prevalence of individual DSM-5 criteria (and also DSM-IV legal problems) across the four groups. Of the 608 individuals who switched from “Affected” to “Unaffected”, 96.5% reported hazardous use (with 581 only reporting this criterion). A majority of these individuals (92.7%) endorsed drinking and driving. A larger number (N=989) of individuals switched from “Unaffected” to “Affected” (i.e. from no DSM-IV to a DSM-5 diagnosis). These individuals met criteria for DSM-5 moderate AUD, primarily due to the endorsement of 2 DSM-IV dependence criteria. Larger/longer (60.7%) and quit/cut back (54.0%) were the most commonly endorsed criteria. While craving was unique to DSM-5, its addition contributed to only 16.1% of switches with this percentage being further reduced when a stringent definition of craving was applied).

Characteristics of diagnostic stability and switches

Other characteristics of these groups are presented in Table 3B. Not surprisingly, lifetime alcohol users who remained stably unaffected reported the least involvement with alcohol (only 74% drank in the past 12 months), with fewer alcoholic drinks (consumed, on average 2 drinks/day) and a lower drinking frequency (0.7% drinking twice a day) while those who remained stably affected reported an average of 5 drinks/day consumed in the past 12 months. Over half of those stably affected reported weekly “risky” drinking (4+ drinks in women/5+ drinks in men), tended to report a family history of alcohol problems (43.5%) and to meet lifetime criteria for other psychiatric and substance use disorders (mean disorders 1.3).

Ideally, those switching from “Affected” to “Unaffected” should be similar to those individuals who are stably unaffected. However, this is not the case. These individuals tend to drink greater amounts and more frequently than those who remain stably unaffected – for instance, 24% of those in the Affected to Unaffected group report drinking 4+/5+ drinks/day in the past 12 months compared with only 4.3% of those who remain stably unaffected. However, the prevalence of drinking in this group is actually more comparable to the prevalence in the “Unaffected” to “Affected” group. Those transitioning from Affected to Unaffected also reported higher income (18.4%).

The deletion of legal problems

Two important changes have been implemented in DSM-5. First, the legal criterion has been suggested for exclusion. In our analyses excluding this criterion only negligibly affected the proportion of individuals diagnosed with DSM-5 AUDs as an overwhelming majority of those endorsing legal problems endorsed two or more additional symptoms. Only 157 individuals endorsed the legal criterion. Of the 2935 individuals who endorse 1 of 11 DSM-5 (excluding legal) criteria, only 8 would be diagnosed with moderate (2 symptoms) DSM-5 AUD via additional endorsement of legal problems.

The addition of craving

The second key change in DSM-5 is the inclusion of craving defined by the working group as “Craving or a strong desire or urge to use a specific substance”. In NESARC (wave 2 only), two items were used to assess craving: “wanting a drink so badly you couldn’t think about anything else” (endorsed by 183 individuals) and “feeling a very strong desire to drink” (endorsed by 889 individuals). A total of 924 individuals reported craving attributed to either of these two items, with only 35 stemming solely from endorsement of the less common item. Thus, the DSM-5 proposed phrasing of “strong desire or urge” results in the inclusion of more individuals than if “want a drink so badly” were used. However, this addition is exceedingly modest. Of the 3026 individuals who endorsed one of 10 DSM-5 criteria (i.e. not including craving), an additional 124 (4.1%) receive a diagnosis of DSM-5 AUDs due to their endorsement of craving alone.

Consistency with Mewton and colleagues

Recently, Mewton et al (19) reported that transitioning from DSM-IV (6.0%) to DSM-5 (9.7%) had contributed to a 61.7% increase in the prevalence of AUDs. In contrast, our results found a more modest increase of 11%. As our prevalence of DSM-5 AUDs (10.8%; 10.2% un-weighted) is highly comparable to theirs, we speculated that differences in DSM-IV diagnoses of abuse or dependence contributed to this difference. While our prevalence of DSM-IV dependence (4.4%, or 5% of lifetime users) is highly comparable to theirs (4.1%), our rate of hierarchically defined abuse was much higher (5.3% vs. 1.9%). While failure to fulfill role obligations (2.1% vs 1.4%), legal problems (1.1% vs 0.9%) and interpersonal conflict (1.2% vs 3.1%) were comparable across the NSMHWB and similar individuals (N=17,535, see Table S2) in NESARC, the prevalence of hazardous use was considerably higher (13.9%) in NESARC when compared to NSMHWB (2.1%).

In NESARC, we diagnosed hazardous use using three items:

- a. more than once driving a vehicle while drinking, endorsed by 1,584 individuals;
- b. more than once driving a vehicle after drinking too much, endorsed by 1,272 individuals;
- c. get into situations which increased chances of getting hurt while drinking or after drinking, endorsed by 499 individuals.

Item (c) is most comparable to the item used by Mewton et al (recurrent use in physically dangerous situations). Thus, we re-defined hazardous use using this single item and were able to approximate the prevalence of hazardous use reported in NSMHWB (2.1%) with NESARC (3.2%). Correspondingly, this recoding reduced the past 12 month prevalence of hierarchical abuse in the full sample to 1.3%, the latter being highly comparable to the report by Mewton et al. This produced a reduced DSM-IV abuse/ dependence prevalence of 5.7%, a DSM-5 AUDs prevalence of 9.4% and a corresponding increase in prevalence of AUDs from DSM-IV to DSM-5 of 65%, all of which reconcile well with Mewton et al.

It should be noted that the two items of drinking and driving (items (a) and (b)) are controversial in research and individuals who endorse these items (but not item (c)) are less likely to endorse other abuse/dependence criteria. Of those who diagnostically “switched” from being DSM-IV affected to being DSM-5 unaffected, 89.5% reported either item (a) or (b) but not (c). However, not all individuals reporting either one of the items (a) or (b), but not (c), were unaffected using DSM-5 diagnoses – in fact 60.2% of these individuals continued to meet criteria for DSM-5 AUDs.

Finally, while it was not the goal of this study to conduct psychometric (item response) modeling of the proposed DSM-5 criteria, for comparability, Supplemental Table S2 presents weighted prevalence and factor loadings for the 1 factor confirmatory factor analysis. Analyses were conducted in a subset of 17,355 subjects reporting 12 drinks in the past months and using the WLSMV estimator in MPlus (26) to allow for direct comparability with Mewton et al. Results suggest remarkable consistency across the studies in the architecture of DSM-5 AUDs.

DISCUSSION

Applying DSM-5 criteria for AUDs to a nationally representative U.S. sample resulted in a modest 11.3% increase (from 9.7% to 10.8%) in AUDs. Analyses indicated “diagnostic switching” occurred only rarely with those switching from affected to unaffected (3.3% of DSM-IV affected) primarily endorsing hazardous use and those switching from unaffected to affected (19.6% of DSM-IV unaffected) most frequently endorsing larger/longer or quit/cut back. Both groups of “diagnostic switches” represent less involved drinking with those switching from unaffected to affected drinking somewhat more frequently.

Our results diverge from those reported by Mewton and colleagues (19) – while they reported a 61.7% increase in the prevalence of AUDs using DSM-5 criteria, we find the increase to be modest. We demonstrate here that the discrepancy is likely attributable, not to DSM-5 definitions but due to the increased prevalence of DSM-IV abuse in our sample, due to items assessing drinking and driving. We also note that while the prevalence of the remaining AUD criteria were highly comparable across the samples, rates of withdrawal were considerably elevated in NESARC (3.3% vs 9.9%, reduced to 6.0% if impairment is included), which was defined by us as either (a) endorsement of 2 or more withdrawal symptoms or (b) use of alcohol or other substances for withdrawal relief. We are uncertain as to the exact phraseology of withdrawal in the NSMHWB, however as their DSM-IV prevalence of dependence was highly comparable with ours, it is unlikely that this contributed to changes. Furthermore, craving was defined by us using two items – using the more stringent (less common) of these two items provides a DSM-5 AUDs prevalence of 10.5% (9.9% un-weighted) which is nearly identical to that reported by Mewton et al.

Reiterating the dubious role of hazardous use as a diagnostic criterion, an overwhelming majority of those who switched from DSM-IV affected to DSM-5 unaffected endorsed hazardous use (27). This is also consistent with our previous publication (28), using the same dataset, demonstrating that abuse due to hazardous use represented a less severe form of alcohol abuse. Consistent with prior research, while these individuals drank more heavily and more frequently than those who remained stably unaffected, they appear to be less involved drinkers than those who remain stably affected, reflecting intermediate vulnerability.

The challenges associated with hazardous use as a diagnostic criterion are well known. For instance, Hasin & Paykin (29) found that 63.6% of those meeting criteria for current and lifetime DSM-IV abuse did so via endorsement of hazardous use alone with a substantial

majority of these respondents identifying drinking and driving as the contributing item. In addition to the general low reliability (30–32) and validity (33) of alcohol abuse, Keyes and Hasin (34) have noted that endorsement of hazardous use varies as a function of socio-economic status: individuals with a past year personal income of \$70,000+ were twice as likely to report hazardous use compared with individuals with a past year personal income of less than \$20,000. This increase was largely attributable to increased reports of drinking and driving in higher income categories – we replicate this effect as well. Babor and Caetano (35) have commented that inclusion of drinking and driving in estimates of hazardous use, and consequently abuse, inflate the combined prevalence of abuse/dependence. We note this to be the case, however, it appears to be less of a concern with DSM-5 which excludes individuals endorsing a single criterion from a diagnosis of AUDs. As regards DSM-IV, while our analyses also demonstrate that drinking and driving inflates estimates of alcohol abuse (which appears to not be the case for Mewton and colleagues (19)), we are hesitant to remove it from our operational definition of DSM-IV abuse as DSM-IV criteria do include drinking and driving as an element of hazardous use. Thus, we opt for the approach outlined by Babor and Caetano (36) and report the prevalence of hazardous use separately.

As noted here, addition or exclusion of a more frequently endorsed aspect of a criterion set (e.g. drinking and driving) can result in across-study heterogeneity. This concern is not specific to AUD diagnoses. Psychometric work on DSM-IV mania found that nuanced differences in item phraseology could produce pronounced variations in the architecture of the construct (37). For DSM-5, these challenges could be overcome with further guidance from the working group regarding how individual criteria are to be operationalized.

DSM-5 has seen two major criterion changes. First, the DSM-IV abuse criterion of recurrent legal problems was excluded due to poor discrimination (as indexed by low factor loadings) and infrequent endorsement in some populations. In this study, only eight additional subjects would be diagnosed with DSM-5 AUDs if the legal criterion had not been excluded.

Second, craving was added to the remaining 10 DSM-IV criteria, largely motivated by favorable psychometric properties of this criterion in general (38–40) and clinic populations (41). Craving is an element of the ICD-10 (42) classification, is frequently observed in clinic samples (43) and has been well documented to have biological significance (44;45). In our analyses, the inclusion of craving did not substantively contribute to diagnostic switching and the modest degree of switching was largely attributable to the less stringent item on “very strong desire to drink”. In prior analyses of a similarly large and nationally representative dataset, Keyes et al (38) defined craving using the less common “ever wanted a drink so badly” item, which yielded a comparable prevalence of 1.3%. However, as DSM-5 specifically includes “strong desire or urge” in its proposed definition of craving, we utilized both items in these analyses.

The switch from unaffected to affected was largely attributable to the reassignment of prior “diagnostic orphans” (no abuse and one or two DSM-IV dependence criteria)(46;47) to the moderately affected DSM-5 category. Not surprisingly, over 90% of these switches were due to the more commonly endorsed criteria of larger/longer or quit/cut-back, either together or with another criterion, such as tolerance. In terms of their drinking behavior, those switching from unaffected to affected reflected intermediate levels of drinking, quite similar to those switching from affected to unaffected. Consistent with their assignment to the moderately affected category of DSM-5 AUDs, they appear to be less severely affected than those who remained stably affected. The inclusion of these subjects as affected is important as several studies have indicated that diagnostic orphans are at high risk for developing

AUDs (48–52). It is noteworthy here that Martin argues that the 2+ cut-point for DSM-5 may be too lenient and produce heterogeneity in the pool of affecteds (53).

In conclusion, estimates of the prevalence of AUDs based on the DSM-5 proposed revisions appear to be largely consistent with estimates from DSM-IV while adding a small subset of less severely affected individuals who were previously classified as diagnostic orphans. While DSM-5 classification of moderate versus severe AUDs is more dimensional than DSM-IV and has the advantage of capturing individuals with fewer criteria, it is limited in distinguishing at higher levels of vulnerability. The assumption that individuals with 4+ criteria are equally affected may not be accurate and future efforts may wish to distinguish amongst those diagnosed with “severe” DSM-5 AUDs with greater refinement. In addition, our analyses underscore the importance of revisiting the definitions of certain criteria, such as hazardous use and craving. With this opportunity to clarify the content of these criteria, we may be able to improve, not only upon the scope of diagnosis of AUDs, but also individual criteria which have been known to have psychometric inconsistencies.

Acknowledgments

This study is supported by R03DA25886 (A.A.). Additional support for authors draws from K05AA17688 (ACH), DA18267 and AA11998 (MTL). The authors thank Dr. Kathleen Bucholz for her insightful comments during the development of this manuscript.

Reference List

1. Edwards GG, Gross M. Alcohol dependence: Provisional description of a clinical syndrome. *BMJ*. 1976; 1:1058–1061. [PubMed: 773501]
2. Edwards G, Gross MM, Keller M, Moser J. Alcohol-related problems in the disability perspective. A summary of the consensus of the WHO group of investigators on criteria for identifying and classifying disabilities related to alcohol consumption. *J Stud Alcohol*. 1976 Sep; 37(9):1360–1382. [PubMed: 979285]
3. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th edition, Revised ed.. Washington, DC: American Psychiatric Association; 1994.
4. Langenbucher J, Labouvie EW, Martin C, Sanjuan PM, Bavly L, Kirisci L, et al. An Application of Item Response Theory Analysis to Alcohol, Cannabis and Cocaine Criteria in DSM-IV. *J Abnorm Psychol*. 2004; 113(1):72–80. [PubMed: 14992659]
5. Nelson CB, Rehm J, Ustun TB, Grant B, Chatterji S. Factor structures for DSM-IV substance disorder criteria endorsed by alcohol, cannabis, cocaine and opiate users: results from the WHO reliability and validity study. *Addiction*. 1999 Jun; 94(6):843–855. [PubMed: 10665074]
6. Saha TD, Chou SP, Grant BF. Toward an alcohol use disorder continuum using item response theory: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Psychol Med*. 2006 Jul; 36(7):931–941. [PubMed: 16563205]
7. Borges G, Ye Y, Bond J, Cherpitel CJ, Cremonte M, Moskalewicz J, et al. The dimensionality of alcohol use disorders and alcohol consumption in a cross-national perspective. *Addiction*. 2010 Feb; 105(2):240–254. [PubMed: 20078482]
8. Proudfoot H, Baillie AJ, Teesson M. The structure of alcohol dependence in the community. *Drug Alcohol Depend*. 2006 Jan 4; 81(1):21–26. [PubMed: 16005578]
9. Bucholz KK, Heath AC, Reich T, Hesselbrock VM, Kramer JR, Nurnberger JI Jr, et al. Can we subtype alcoholism? A latent class analysis of data from relatives of alcoholics in a multicenter family study of alcoholism. *Alcohol Clin Exp Res*. 1996 Nov; 20(8):1462–1471. [PubMed: 8947326]
10. Lynskey MT, Nelson EC, Neuman RJ, Bucholz KK, Madden PA, Knopik VS, et al. Limitations of DSM-IV operationalizations of alcohol abuse and dependence in a sample of Australian twins. *Twin Res Hum Genet*. 2005 Dec; 8(6):574–584. [PubMed: 16354499]

11. Kahler CW, Strong DR. A Rasch model analysis of DSM-IV Alcohol abuse and dependence items in the National Epidemiological Survey on Alcohol and Related Conditions. *Alcohol Clin Exp Res.* 2006 Jul; 30(7):1165–1175. [PubMed: 16792564]
12. Gelhorn H, Hartman C, Sakai J, Stallings M, Young S, Rhee SH, et al. Toward DSM-V: an item response theory analysis of the diagnostic process for DSM-IV alcohol abuse and dependence in adolescents. *J Am Acad Child Adolesc Psychiatry.* 2008 Nov; 47(11):1329–1339. [PubMed: 18827724]
13. Martin CS, Chung T, Kirisci L, Langenbucher JW. Item response theory analysis of diagnostic criteria for alcohol and cannabis use disorders in adolescents: implications for DSM-V. *J Abnorm Psychol.* 2006 Nov; 115(4):807–814. [PubMed: 17100538]
14. Muthen BO, Grant B, Hasin D. The dimensionality of alcohol abuse and dependence: factor analysis of DSM-III-R and proposed DSM-IV criteria in the 1988 National Health Interview Survey. *Addiction.* 1993 Aug; 88(8):1079–1090. [PubMed: 8401162]
15. Shmulewitz D, Keyes K, Beseler C, Aharonovich E, Aivadyan C, Spivak B, et al. The dimensionality of alcohol use disorders: results from Israel. *Drug Alcohol Depend.* 2010 Sep 1; 111(1–2):146–154. [PubMed: 20537809]
16. Krueger RF, Nichol PE, Hicks BM, Markon KE, Patrick CJ, Iacono WG, et al. Using latent trait modeling to conceptualize an alcohol problems continuum. *Psychol Assess.* 2004 Jun; 16(2):107–119. [PubMed: 15222807]
17. Hasin D, Paykin A. Dependence symptoms but no diagnosis: diagnostic 'orphans' in a community sample. *Drug Alcohol Depend.* 1998 Mar 1; 50(1):19–26. [PubMed: 9589269]
18. Pollock NK, Martin CS. Diagnostic orphans: adolescents with alcohol symptom who do not qualify for DSM-IV abuse or dependence diagnoses. *Am J Psychiatry.* 1999 Jun; 156(6):897–901. [PubMed: 10360129]
19. Mewton L, Slade T, McBride O, Grove R, Teesson M. An evaluation of the proposed DSM-5 alcohol use disorder criteria using Australian national data. *Addiction.* 2010 Dec 16.
20. Grant BF, Dawson DA, Stinson FS, Chou SP, Dufour MC, Pickering RP. The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991–1992 and 2001–2002. *Drug Alcohol Depend.* 2004 Jun 11; 74(3):223–234. [PubMed: 15194200]
21. Grant BF, Stinson FS, Dawson DA, Chou SP, Ruan WJ, Pickering RP. Co-occurrence of 12-month alcohol and drug use disorders and personality disorders in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Arch Gen Psychiatry.* 2004 Apr; 61(4):361–368. [PubMed: 15066894]
22. Ruan WJ, Goldstein RB, Chou SP, Smith SM, Saha TD, Pickering RP, et al. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): Reliability of new psychiatric diagnostic modules and risk factors in a general population sample 5. *Drug Alcohol Depend.* 2008 Jan 1; 92(1–3):27–36.
23. Grant BF, Dawson DA, Stinson FS, Chou PS, Kay W, Pickering R. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): reliability of alcohol consumption, tobacco use, family history of depression and psychiatric diagnostic modules in a general population sample. *Drug Alcohol Depend.* 2003 Jul; 71(1):7–16. [PubMed: 12821201]
24. Ruan WJ, Goldstein RB, Chou SP, Smith SM, Saha TD, Pickering RP, et al. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): Reliability of new psychiatric diagnostic modules and risk factors in a general population sample 5. *Drug Alcohol Depend.* 2008 Jan 1; 92(1–3):27–36. [PubMed: 17706375]
25. SAS Institute. *SAS User Guide, Version 8.2.* Cary, NC: SAS Institute Inc.; 1999.
26. Muthen, LK.; Muthen, BO. *Mplus User's Guide.* Fifth ed.. Los Angeles, CA: Muthen & Muthen; 2007.
27. Hasin D. Classification of alcohol use disorders. *Alcohol Res Health.* 2003; 27:5–17. [PubMed: 15301396]
28. Agrawal A, Buchholz KK, Lynskey MT. DSM-IV alcohol abuse due to hazardous use: a less severe form of abuse? *J Stud Alcohol Drugs.* 2010 Nov; 71(6):857–863. [PubMed: 20946742]
29. Hasin D, Paykin A. Dependence symptoms but no diagnosis: diagnostic 'orphans' in a community sample. *Drug Alcohol Depend.* 1998 Mar 1; 50(1):19–26. [PubMed: 9589269]

30. Hasin DS, Grant B, Endicott J. The natural history of alcohol abuse: implications for definitions of alcohol use disorders. *Am J Psychiatry*. 1990 Nov; 147(11):1537–1541. [PubMed: 2221170]
31. Hasin D, Mccloud S, Li Q, Endicott J. Cross-system agreement among demographic subgroups: DSM-III, DSM-III-R, DSM-IV and ICD-10 diagnoses of alcohol use disorders. *Drug Alcohol Depend*. 1996 Jun; 41(2):127–135. [PubMed: 8809501]
32. Chatterji S, Saunders JB, Vrsti R, Grant BF, Hasin D, Mager D. Reliability of the alcohol and drug modules of the Alcohol Use Disorder and Associated Disabilities Interview Schedule--Alcohol/Drug-Revised (AUDADIS-ADR): an international comparison. *Drug Alcohol Depend*. 1997 Sep 25; 47(3):171–185. [PubMed: 9306043]
33. Hasin D, Paykin A, Endicott J, Grant B. The validity of DSM-IV alcohol abuse: drunk drivers versus all others. *J Stud Alcohol*. 1999 Nov; 60(6):746–755. [PubMed: 10606485]
34. Keyes KM, Hasin DS. Socio-economic status and problem alcohol use: the positive relationship between income and the DSM-IV alcohol abuse diagnosis. *Addiction*. 2008 Jul; 103(7):1120–1130. [PubMed: 18494841]
35. Babor TF, Caetano R. The trouble with alcohol abuse: what are we trying to measure, diagnose, count and prevent? *Addiction*. 2008 Jul; 103(7):1057–1059. [PubMed: 18554338]
36. Babor TF, Caetano R. The trouble with alcohol abuse: what are we trying to measure, diagnose, count and prevent? *Addiction*. 2008 Jul; 103(7):1057–1059. [PubMed: 18554338]
37. Agrawal A, Nurnberger JI, Lynskey MT. Item response modeling of DSM-IV mania symptoms in two representative US epidemiological samples. *Psychol Med*. 2009 Dec 2.:1–10. [PubMed: 19335938]
38. Keyes KM, Krueger RF, Grant BF, Hasin DS. Alcohol craving and the dimensionality of alcohol disorders. *Psychol Med*. 2010 May 12.:1–12.
39. de BC, van den BW, de GR, Vollebergh WA. The three year course of alcohol use disorders in the general population: DSM-IV, ICD-10 and the Craving Withdrawal Model. *Addiction*. 2006 Mar; 101(3):385–392. [PubMed: 16499511]
40. de BC, van den BW, de GR, Vollebergh WA. The craving withdrawal model for alcoholism: towards the DSM-V. Improving the discriminant validity of alcohol use disorder diagnosis. *Alcohol Alcohol*. 2005 Jul; 40(4):314–322. [PubMed: 15883129]
41. Cherpitel CJ, Borges G, Ye Y, Bond J, Cremonte M, Moskalewicz J, et al. Performance of a craving criterion in DSM alcohol use disorders. *J Stud Alcohol Drugs*. 2010 Sep; 71(5):674–684. [PubMed: 20731972]
42. World Health Organization. 10th Revision. 10th ed.. Geneva, Switzerland: 2007. International Statistical Classification of Diseases and Related Health Problems.
43. Oslin DW, Cary M, Slaymaker V, Colleran C, Blow FC. Daily ratings measures of alcohol craving during an inpatient stay define subtypes of alcohol addiction that predict subsequent risk for resumption of drinking. *Drug Alcohol Depend*. 2009 Aug 1; 103(3):131–136. [PubMed: 19443131]
44. Volkow ND, Wang GJ, Telang F, Fowler JS, Logan J, Childress AR, et al. Cocaine cues and dopamine in dorsal striatum: mechanism of craving in cocaine addiction. *J Neurosci*. 2006 Jun 14; 26(24):6583–6588. [PubMed: 16775146]
45. Childress AR, Mozley PD, McElgin W, Fitzgerald J, Reivich M, O'Brien CP. Limbic activation during cue-induced cocaine craving. *Am J Psychiatry*. 1999 Jan; 156(1):11–18. [PubMed: 9892292]
46. Hasin D, Paykin A. Dependence symptoms but no diagnosis: diagnostic 'orphans' in a community sample. *Drug Alcohol Depend*. 1998 Mar 1; 50(1):19–26. [PubMed: 9589269]
47. Pollock NK, Martin CS. Diagnostic orphans: adolescents with alcohol symptom who do not qualify for DSM-IV abuse or dependence diagnoses. *Am J Psychiatry*. 1999 Jun; 156(6):897–901. [PubMed: 10360129]
48. Martin CS, Chung T, Langenbucher JW. How should we revise diagnostic criteria for substance use disorders in the DSM-V? *J Abnorm Psychol*. 2008 Aug; 117(3):561–575. [PubMed: 18729609]

49. Pollock NK, Martin CS. Diagnostic orphans: adolescents with alcohol symptom who do not qualify for DSM-IV abuse or dependence diagnoses. *Am J Psychiatry*. 1999 Jun; 156(6):897–901. [PubMed: 10360129]
50. Hasin D, Paykin A. Dependence symptoms but no diagnosis: diagnostic 'orphans' in a community sample. *Drug Alcohol Depend*. 1998 Mar 1; 50(1):19–26. [PubMed: 9589269]
51. Ray LA, Miranda R Jr, Chelminski I, Young D, Zimmerman M. Diagnostic orphans for alcohol use disorders in a treatment-seeking psychiatric sample. *Drug Alcohol Depend*. 2008 Jul 1; 96(1–2):187–191. [PubMed: 18430524]
52. Lynskey MT, Agrawal A. Psychometric properties of DSM assessments of illicit drug abuse and dependence: results from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). *Psychol Med*. 2007 Sep; 37(9):1345–1355. [PubMed: 17407621]
53. Martin CS. The proposed 2/11 symptom algorithm for DSM-5 substance-use disorders is too lenient. *Psychol Med*. 2011; 41:1–3. [PubMed: 20624328]

Table 1

Weighted prevalence of past 12-month diagnosis of DSM-5 alcohol use disorders in 34,653 individuals and in 29,993 lifetime alcohol users from the NESARC.

<i>In the full sample (N=34,653)</i>						
	N	Unaffected (0-1 sxs)	Moderate (2-3 sxs)	Severe 4-11 sxs)	DSM-5 diagnosis	DSM-IV abuse/ dependence
Full sample	34,653	89.2	6.9	3.9	10.8	9.7
Males	14,564	84.8	9.6	5.7	15.3	14.4
20-35	3,652	73.4	15.9	10.7	26.6	23.4
36-47	3,814	84.6	10.2	5.2	15.4	15.0
48-61	3,789	88.4	7.2	4.5	11.7	11.9
62 and older	3,309	96.2	2.9	0.8	3.7	4.4
Females	20,089	93.3	4.5	2.2	6.7	5.3
20-35	5,092	87.4	8.5	4.1	12.6	10.0
36-47	5,089	92.2	4.9	2.9	7.8	6.5
48-61	4,745	95.1	3.5	1.4	4.9	3.8
62 and older	5,163	99.0	0.8	0.2	1.0	0.6
<i>In those reporting consuming at least one drink across the lifetime (waves 1 and 2, N=29,993)</i>						
	N	Unaffected (0-1 sxs)	Moderate (2-3 sxs)	Severe 4-11 sxs)	DSM-5 diagnosis	DSM-IV abuse/ dependence
Lifetime drinkers	29,993	87.7	7.9	4.4	12.3	11.1
Males	13,500	83.6	10.4	6.1	16.5	15.6
20-35	3,377	71.2	17.3	11.5	28.8	25.3
36-47	3,593	83.5	10.9	5.6	16.5	16.0
48-61	3,565	87.6	7.6	4.7	12.3	12.7
62 and older	2,965	95.8	3.3	0.9	4.2	5.0
Females	16,493	92.1	5.4	2.6	8.0	6.4
20-35	4,408	85.5	9.7	4.7	14.4	11.5
36-47	4,418	91.1	5.6	3.3	8.9	7.4
48-61	4,036	94.2	4.1	1.7	5.8	4.4
62 and older	3,631	98.7	1.1	0.3	1.4	0.9

Note: The prevalence listed here are weighted and therefore, approximately to the listed N.

Table 2

Stability of diagnosis and transitions from past 12 month DSM-IV to DSM-5 diagnostic categories (weighted %) in the full sample (N=34,653) and in lifetime alcohol users (N=29,993).

In the full sample (N=34,653)			
	Proposed DSM-5 diagnosis		
	Unaffected (0–1)	Moderate (2–3)	Severe (4+)
DSM-IV abuse (without dependence)			
Unaffected	92.2	4.1	3.7
Affected	36.0	58.0	6.0
DSM-IV dependence			
Unaffected	93.3	6.4	0.3
Affected	0.0	19.5	80.5
DSM-IV abuse/dependence			
Unaffected	96.7	3.3*	0.0
Affected	19.6*	40.5	39.9
In those reporting consuming at least one drink across the lifetime (N=29,993)			
DSM-IV abuse (without dependence)			
Unaffected	91.0	4.7	4.3
Affected	36.0	58.0	6.0
DSM-IV dependence			
Unaffected	92.3	7.3	0.4
Affected	0.0	19.5	80.5
DSM-IV abuse/dependence			
Unaffected	96.1	3.9*	0.0
Affected	19.6*	40.5	39.9

* Reflects a transition in affection status from DSM-IV to DSM-5

Table 3

A. Weighted prevalence (%) of individual past 12 month DSM-IV and DSM-5 abuse and dependence criteria based DSM-IV and DSM-5 diagnoses of alcohol use disorders in 29,993 lifetime alcohol users.				
	Remain unaffected	Remain affected	Unaffected to Affected	Affected to Unaffected
N	25,862	2,534	989	608
Failure to fulfill obligations	0.0	9.2	0.0	0.3
Interpersonal conflict	0.0	20.7	0.0	1.7
Recurrent hazardous use	0.0	70.6	0.0	96.5
- drinking and driving	0.0	62.3	0.0	92.7
- physically dangerous	0.0	19.5	0.0	7.7
Legal problems (DSM-IV only)	0.0	5.7	0.0	2.6
Tolerance	1.7	40.8	33.1	0.1
Withdrawal	1.1	46.7	26.5	0.0
Larger/Longer	2.8	74.2	60.7	0.0
Quit/cut back	2.9	56.7	54.0	0.0
Time spent	0.04	23.4	5.5	0.0
Give up activities	0.01	8.2	0.6	0.0
Physical/psychological problems	0.3	37.6	11.7	0.0
Craving (DSM-5 only)	0.4	26.4	16.1	0.1
- very strong desire	0.3	25.6	15.3	0.1
- wanting a drink so badly	0.05	6.1	1.5	0.0

B. Drinking correlates and other characteristics of 29,993 lifetime alcohol users based on their past 12 month DSM-IV and subsequent DSM-5 diagnosis of alcohol use disorders.				
	Remain unaffected	Remain affected	Unaffected to Affected	Affected to Unaffected
N	25,862	2,534	989	608
Sex (Female)	52.3	28.6 ^a	41.6	28.4 ^a
Age (20–35)	24.9	50.8 ^a	47.2 ^a	33.2
Age (36–47)	25.6 ^b	26.6 ^a	27.3 ^{a,b}	31.3 ^a
Age (48–61)	26.2	18.9 ^a	18.7 ^a	24.0
Caucasian	85.0	85.4	80.7	90.9
Living below poverty line at W2	11.0	12.6 ^a	15.2 ^a	8.3
Past year personal income (\$70,000+)	10.0 ^a	10.0 ^a	9.3 ^a	18.4
Drank at least 1 drink in past 12 months	74.2	100	100	100
Physiological dependence	-	79.2 ^a	74.1 ^a	11.7
Drank daily	6.5	25.5	18.0 ^a	16.2 ^a
Weekly drank maximum drinks/day	8.9	17.8 ^a	17.2 ^a	13.1
Weekly drank twice a day.	0.7	8.6	4.1 ^a	3.2 ^a
Weekly drank 4+/5+ drinks/day.	4.3	53.0	27.6	24.0
First degree relative has alcohol problem.	34.8 ^a	43.5	36.7 ^a	33.6 ^a

B. Drinking correlates and other characteristics of 29,993 lifetime alcohol users based on their past 12 month DSM-IV and subsequent DSM-5 diagnosis of alcohol use disorders.

	Remain unaffected	Remain affected	Unaffected to Affected	Affected to Unaffected
Mean age at 1 st drink	20.5 [8.2]	17.8 [5.0] ^a	18.3 [5.0] ^a	18.3 [5.9] ^a
Mean and range of DSM-5 criteria endorsed	0.1 [0–1]	4.1 [2–11]	2.1 [2–3]	1 [0–1]
Mean drinks/day (typical).	2.0 [1.5]	5.1 [3.4]	3.6 [2.5]	3.3 [1.8]
Mean drinks/day (max)	3.6 [3.0]	11.2 [6.8]	7.6 [4.8] ^a	7.1 [4.1] ^a
Mean DSM-IV psychiatric disorders (lifetime) [*] .	0.8 [1.3]	1.3 [1.6]	1.0 [1.6]	0.6 [1.0]
Mean DSM-IV substance use disorders (lifetime) ^{**} .	0.4 [0.9]	1.3 [1.5]	0.7 [1.0] ^a	0.6 [1.1] ^a

Note: Reported as a percentage unless otherwise noted. For means, numbers in parentheses reflect standard errors or range.

^{a,b} denotes prevalence could be equated across groups with same alphabetical superscript.

^{*} DSM-IV lifetime history of major depression, mania, panic disorder (with and without agoraphobia), social phobia, specific phobia, posttraumatic stress disorder, generalized anxiety disorder and antisocial personality disorder.

^{**} DSM-IV lifetime history of cannabis, cocaine, sedatives, tranquilizers, opiates, heroin, amphetamine, hallucinogen and other drug abuse/dependence.