

## Supplementary Online Content

O'Connor EA, Perdue LA, Senger CA, et al. Screening and behavioral counseling interventions to reduce unhealthy alcohol use in adolescents and adults: updated evidence report and systematic review for the US Preventive Services Task Force. *JAMA*. doi:10.1001/jama.2018.12086

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**eReferences**

This supplementary material has been provided by the authors to give readers additional information about their work.

## eMethods. Literature Search Strategies for Primary Literature

### Key:

/ = subject heading

\$ = truncation

\*=truncation

ab = word in abstract

adj# = adjacent within x number of words

hw = subject heading word

id = key phrase identifier

kw = keyword

md = methodology

pt = publication type

ti = word in title

*\*Note: The scope of the review initially contained medicated-assisted therapy, which is reflected in the search strategy below.*

### Cochrane Central Register of Controlled Trials (CENTRAL)

Issue 9 of 12, September 2016

- #1 alcohol\*:ti,ab,kw near/1 (use\* or abuse\* or misuse\* or depend\* or addict\* or excess\* or harmful or risk\* or hazardous or problem\* or unhealthy):ti,ab,kw
- #2 (harmful\* or risk\* or hazardous or problem\* or binge\* or heavy or excessive or unhealthy):ti,ab,kw  
next  
drink\*:ti,ab,kw
- #3 "heavy episodic":ti,ab,kw
- #4 #1 or #2 or #3
- #5 screen\*:ti,ab,kw
- #6 assessment:ti,ab,kw next (tool\* or instrument\*):ti,ab,kw
- #7 (alcohol\*):ti,ab,kw near/5 (scale\* or inventor\* or questionnaire\* or survey\* or index\* or checklist\* or interview\*):ti,ab,kw
- #8 #5 or #6 or #7
- #9 "Alcohol Use Disorders Identification Test":ti,ab,kw
- #10 AUDIT-C:ti,ab,kw
- #11 "Alcohol Smoking and Substance Involvement Screening Test":ti,ab,kw
- #12 SASQ:ti,ab,kw
- #13 "Single Alcohol Screening":ti,ab,kw next question\*:ti,ab,kw
- #14 "National Institute on Alcohol Abuse and Alcoholism Single Item":ti,ab,kw
- #15 "NIAAA Single Item":ti,ab,kw
- #16 "Cut down Annoyed Guilty Eye-opener":ti,ab,kw
- #17 "Brief Screener for Tobacco Alcohol and other Drugs":ti,ab,kw
- #18 BSTAD:ti,ab,kw
- #19 "Comorbidity Alcohol Risk Evaluation Tool":ti,ab,kw
- #20 "Tolerance Annoyed Cut down Eye opener":ti,ab,kw
- #21 "Tolerance Worried Eye-opener Amnesia Kut down":ti,ab,kw
- #22 SMAST-AID:ti,ab,kw
- #23 "4Ps Plus":ti,ab,kw
- #24 "Substance Use Risk Profile-Pregnancy":ti,ab,kw
- #25
- #26 #4 and (#8 or #25) Publication Year from 2011 to 2016, in Trials
- #27 (sensitivit\* or specificit\*):ti,ab,kw
- #28 "predictive value":ti,ab,kw
- #29 accuracy:ti,ab,kw
- #30 false:ti,ab,kw next (negativ\* or positiv\*):ti,ab,kw

#31 (miss or error):ti,ab,kw next rate\*:ti,ab,kw  
 #32 (advice or advise\*):ti,ab,kw  
 #33 ROC:ti,ab,kw next curve\*:ti,ab,kw  
 #34 receiver:ti,ab,kw next operat\*:ti,ab,kw  
 #35  
 #36 (#4 and #8) or #25  
 #37 #35 and #36 Publication Year from 1998 to 2016, in Trials  
 #38 alcohol:ti,ab,kw near/1 reduc\*:ti,ab,kw  
 #39 alcohol:ti,ab,kw next (therap\* or treatment\*):ti,ab,kw  
 #40 controlled:ti,ab,kw next drink\*:ti,ab,kw  
 #41 naltrexone:ti,ab,kw  
 #42 revia:ti,ab,kw  
 #43 depade:ti,ab,kw  
 #44 vivitrol:ti,ab,kw  
 #45 acamprosate:ti,ab,kw  
 #46 campral:ti,ab,kw  
 #47 disulfiram:ti,ab,kw  
 #48 antabuse:ti,ab,kw  
 #49 antabus:ti,ab,kw  
 #50 counsel\*:ti,ab,kw  
 #51 behavio\*:ti,ab,kw and chang\*:ti,ab,kw  
 #52 behavio\*:ti,ab,kw and intervention\*:ti,ab,kw  
 #53 behavio\*:ti,ab,kw and modification\*:ti,ab,kw  
 #54 (motivational next interview\*):ti,ab,kw  
 #55 (cognitive next behavio\*):ti,ab,kw or cbt:ti,ab,kw  
 #56 behavio\*:ti,ab,kw and therapy:ti,ab,kw  
 #57 (brief next intervention\*):ti,ab,kw  
 #58 "self help":ti,ab,kw  
 #59 computer:ti,ab,kw next (based or mediated or assisted):ti,ab,kw  
 #60 email\*:ti,ab,kw or internet:ti,ab,kw or (text next messag\*):ti,ab,kw or web:ti,ab,kw or  
 website:ti,ab,kw  
 #61 "patient education":ti,ab,kw or "health education":ti,ab,kw or "health promotion":ti,ab,kw  
 #62 "12 step":ti,ab,kw or "twelve step":ti,ab,kw or "alcoholics anonymous" or AA:ti,ab,kw  
 #63 intervention\*:ti or psychosocial:ti  
 #64  
 #65 #4 and #64 Publication Year from 2011 to 2016, in Trials  
 #66 #26 or #37 or #65

**Ovid Medline, Ovid MEDLINE In-Process & Other Non-Indexed Citations, Ovid MEDLINE Daily Update**

1 Alcohol-Related Disorders/  
 2 Alcoholic intoxication/  
 3 Alcoholism/  
 4 Binge Drinking/  
 5 (alcohol\$ adj1 (use\$ or abuse\$ or misuse\$ or depend\$ or addict\$ or excess\$ or harmful or risk\$ or  
 hazardous or  
 problem\$ or unhealthy)).ti,ab.  
 6 ((harmful\$ or risk\$ or hazardous or problem\$ or binge\$ or heavy or excessive or unhealthy) adj  
 drink\$).ti,ab.  
 7 heavy episodic.ti,ab.  
 8 or/1-7  
 9 Mass screening/  
 10 screen\$.ti,ab.  
 11 (assessment adj (tool\$ or instrument\$)).ti,ab.

12 (alcohol\$ adj5 (scale\$ or inventor\$ or questionnaire\$ or survey\$ or index\$ or checklist\$ or  
 interview\$)).ti,ab.  
 13 Substance Abuse Detection/  
 14 or/9-13  
 15 "Alcohol Use Disorders Identification Test".ti,ab.  
 16 AUDIT-C.ti,ab.  
 17 "Alcohol Smoking and Substance Involvement Screening Test".ti,ab.  
 18 SASQ.ti,ab.  
 19 Single Alcohol Screening Question\$.ti,ab.  
 20 "National Institute on Alcohol Abuse and Alcoholism Single Item".ti,ab.  
 21 NIAAA Single Item.ti,ab.  
 22 Cut down Annoyed Guilty Eye-opener.ti,ab.  
 23 "Brief Screener for Tobacco Alcohol and other Drugs".ti,ab.  
 24 BSTAD.ti,ab.  
 25 Comorbidity Alcohol Risk Evaluation Tool.ti,ab.  
 26 Tolerance Annoyed Cut down Eye opener.ti,ab.  
 27 Tolerance Worried Eye-opener Amnesia Kut down.ti,ab.  
 28 or/15-27  
 29 clinical trials as topic/ or controlled clinical trials as topic/ or randomized controlled trials as topic/  
 30 (clinical trial or controlled clinical trial or randomized controlled trial).pt.  
 31 Random\$.ti,ab.  
 32 control groups/ or double-blind method/ or single-blind method/  
 33 clinical trial\$.ti,ab.  
 34 controlled trial\$.ti,ab.  
 35 or/29-34  
 36 8 and (14 or 28) and 35  
 37 "Sensitivity and Specificity"/  
 38 "Predictive Value of Tests"/  
 39 ROC Curve/  
 40 False Negative Reactions/  
 41 False Positive Reactions/  
 42 Diagnostic Errors/  
 43 "Reproducibility of Results"/  
 44 Reference Values/  
 45 Reference Standards/  
 46 Observer Variation/  
 47 Receiver operat\$.ti,ab.  
 48 ROC curve\$.ti,ab.  
 49 sensitivit\$.ti,ab.  
 50 specificit\$.ti,ab.  
 51 predictive value.ti,ab.  
 52 accuracy.ti,ab.  
 53 false positive\$.ti,ab.  
 54 false negative\$.ti,ab.  
 55 miss rate\$.ti,ab.  
 56 error rate\$.ti,ab.  
 57 or/37-56  
 58 (8 and 14) or 28  
 59 57 and 58  
 60 limit 59 to (english language and yr="1998 -Current")  
 61 Animals/ not (Humans/ and Animals/)  
 62 60 not 61  
 63 remove duplicates from 62  
 64 Alcohol deterrents/  
 65 (alcohol adj1 reduc\$.ti,ab.  
 66 (alcohol adj (therap\$ or treatment\$)).ti,ab.

67 controlled drink\$.ti,ab.  
 68 Naltrexone/  
 69 naltrexone.ti,ab.  
 70 revia.ti,ab.  
 71 depade.ti,ab.  
 72 vivitrol.ti,ab.  
 73 acamprosate.ti,ab.  
 74 campral.ti,ab.  
 75 Disulfiram/  
 76 disulfiram.ti,ab.  
 77 antabuse.ti,ab.  
 78 antabus.ti,ab.  
 79 Behavior Therapy/  
 80 Cognitive Therapy/  
 81 Counseling/  
 82 Directive Counseling/  
 83 Patient Education as Topic/  
 84 Risk Reduction Behavior/  
 85 Feedback, psychological/  
 86 Health education/  
 87 Health promotion/  
 88 Motivation/  
 89 Internet/  
 90 Motivational interviewing/  
 91 Persuasive communication/  
 92 Self-help groups/  
 93 Text messaging/  
 94 Therapy, computer-assisted/  
 95 (advice or advise\$.ti,ab.  
 96 counsel\$.ti,ab.  
 97 behavio?r\$ chang\$.ti,ab.  
 98 behavio?r\$ intervention\$.ti,ab.  
 99 behavio?r\$ modification\$.ti,ab.  
 100 motivational interview\$.ti,ab.  
 101 (cognitive behavio\$ or behavio\$ therapy or cbt).ti,ab.  
 102 brief intervention\$.ti,ab.  
 103 self help.ti,ab.  
 104 text messag\$.ti,ab.  
 105 (web or website).ti,ab.  
 106 (computer adj (based or mediated or assisted)).ti,ab.  
 107 12 step.ti,ab.  
 108 twelve step.ti,ab.  
 109 Alcoholics Anonymous/  
 110 alcoholics anonymous.ti,ab.  
 111 (intervention\$ or psychosocial).ti.  
 112 or/64-110  
 113 8 and 112  
 114 Alcohol-Related Disorders/dt, pc, rh, th [Drug Therapy, Prevention & Control, Rehabilitation,  
 Therapy]  
 115 Alcoholic intoxication/dt, pc, rh, th  
 116 Alcoholism/dt, pc, rh, th  
 117 Binge Drinking/dt, pc, rh, th  
 118 113 or 114 or 115 or 116 or 117  
 119 clinical trials as topic/ or controlled clinical trials as topic/ or randomized controlled trials as topic/  
 120 (clinical trial or controlled clinical trial or randomized controlled trial).pt.  
 121 Random\$.ti,ab.

122 control groups/ or double-blind method/ or single-blind method/  
 123 clinical trial\$.ti,ab.  
 124 controlled trial\$.ti,ab.  
 125 119 or 120 or 121 or 122 or 123 or 124  
 126 118 and 125  
 127 36 or 126  
 128 limit 127 to (english language and yr="2011 -Current")  
 129 Animals/ not (Humans/ and Animals/)  
 130 128 not 129  
 131 remove duplicates from 130  
 132 63 or 131

## PsycInfo

1 Alcohols/  
 2 Alcohol Abuse/  
 3 Alcohol Intoxication/  
 4 Acute Alcoholic Intoxication/  
 5 Chronic Alcoholic Intoxication/  
 6 Binge Drinking/  
 7 Alcoholism/  
 8 (alcohol\$ adj1 (use\$ or abuse\$ or misuse\$ or depend\$ or addict\$ or excess\$ or harmful or risk\$ or hazardous or problem\$ or unhealthy)).ti,ab,id.  
 9 ((harmful\$ or risk\$ or hazardous or problem\$ or binge\$ or heavy or excessive or unhealthy) adj drink\$).ti,ab,id.  
 10 heavy episodic.ti,ab,id.  
 11 or/1-10  
 12 Screening/  
 13 Health Screening/  
 14 Screening Tests/  
 15 Intake Interview/  
 16 Symptom Checklists/  
 17 Interviews/  
 18 Questionnaires/  
 19 Rating Scales/  
 20 Self Report/  
 21 General Health Questionnaire/  
 22 Computer Assisted Diagnosis/  
 23 screen\$.ti,ab,id.  
 24 (assessment adj (tool\$ or instrument\$)).ti,ab,id.  
 25 (alcohol\$ adj5 (scale\$ or inventor\$ or questionnaire\$ or survey\$ or index\$ or checklist\$ or interview\$)).ti,ab,id.  
 26 self report\$.ti,ab,id.  
 27 identif\$.ti.  
 28 or/12-27  
 29 "Alcohol Smoking and Substance Involvement Screening Test".ti,ab,tm.  
 30 AUDIT-C.ti,ab,tm.  
 31 "Alcohol Smoking and Substance Involvement Screening Test".ti,ab,tm.  
 32 SASQ.ti,ab,tm.  
 33 Single Alcohol Screening Question\$.ti,ab,tm.  
 34 "National Institute on Alcohol Abuse and Alcoholism Single Item".ti,ab,tm.  
 35 NIAAA Single Item.ti,ab,tm.  
 36 Cut down Annoyed Guilty Eye-opener.ti,ab,tm.  
 37 "Brief Screener for Tobacco Alcohol and other Drugs".ti,ab,tm.

38 BSTAD.ti,ab,tm.  
 39 Comorbidity Alcohol Risk Evaluation Tool.ti,ab,tm.  
 40 Tolerance Annoyed Cut down Eye opener.ti,ab,tm.  
 41 Tolerance Worried Eye-opener Amnesia Kut down.ti,ab,tm.  
 42 or/29-41  
 43 random\$.ti,ab,id,hw.  
 44 placebo\$.ti,ab,hw,id.  
 45 controlled trial\$.ti,ab,id,hw.  
 46 clinical trial\$.ti,ab,id,hw.  
 47 clinical trial.md.  
 48 Experiment Controls/  
 49 or/43-48  
 50 11 and (28 or 42) and 49  
 51 limit 50 to (english language and yr="2011 -Current")  
 52 Test Validity/  
 53 Test Reliability/  
 54 Interrater Reliability/  
 55 validity.ti,ab,id.  
 56 reliability.ti,ab,id.  
 57 Receiver operat\$.ti,ab,id.  
 58 ROC curve\$.ti,ab,id.  
 59 sensitivit\$.ti,ab,id.  
 60 specifict\$.ti,ab,id.  
 61 predictive value.ti,ab,id.  
 62 accuracy.ti,ab,id.  
 63 false positive\$.ti,ab,id.  
 64 false negative\$.ti,ab,id.  
 65 miss rate\$.ti,ab,id.  
 66 error rate\$.ti,ab,id.  
 67 or/52-66  
 68 (11 and 28) or 42  
 69 67 and 68  
 70 limit 69 to (english language and yr="1998 -Current")  
 71 Acamprosate/  
 72 acamprosate.ti,ab,id.  
 73 campral.ti,ab,id.  
 74 Naltrexone/  
 75 revia.ti,ab,id.  
 76 depade.ti,ab,id.  
 77 vivitrol.ti,ab,id.  
 78 Disulfiram/  
 79 disulfiram.ti,ab,id.  
 80 antabuse.ti,ab,id.  
 81 antabus.ti,ab,id.  
 82 Alcohol Rehabilitation/  
 83 Rehabilitation Counseling/  
 84 (alcohol adj1 reduc\$.ti,ab,id.  
 85 (alcohol adj (therap\$ or treatment\$)).ti,ab,id.  
 86 controlled drink\$.ti,ab,id.  
 87 Health Promotion/  
 88 Motivation/  
 89 Behavior Modification/  
 90 Behavior Change/  
 91 behavio?r\$ chang\$.ti,ab,id.  
 92 behavio?r\$ intervention\$.ti,ab,id.  
 93 behavio?r\$ modification\$.ti,ab,id.

94 behavior therapy/  
 95 cognitive behavior therapy/  
 96 cognitive therapy/  
 97 Cognitive Techniques/  
 98 (cognitive behavio\$ or behavio\$ therapy or cbt).ti,ab,id.  
 99 brief intervention\$.ti,ab,id.  
 100 Persuasive Communication/  
 101 Motivational Interviewing/  
 102 motivational interview\$.ti,ab,id.  
 103 Health Knowledge/  
 104 Health Behavior/  
 105 Health Education/  
 106 Client Education/  
 107 Feedback/  
 108 Online Therapy/  
 109 Computer Assisted Therapy/  
 110 Computer Mediated Communication/  
 111 Computer Assisted Testing/  
 112 Internet/  
 113 (computer adj (based or mediated or assisted)).ti,ab,id.  
 114 text messag\$.ti,ab,id.  
 115 email\$.ti,ab,id.  
 116 internet.ti,ab,id.  
 117 (web or website).ti,ab,id.  
 118 Self Help Techniques/  
 119 self help.ti,ab,id.  
 120 counseling/  
 121 Group Counseling/  
 122 counseling.ti,ab,id.  
 123 counselling.ti,ab,id.  
 124 Alcoholics Anonymous/  
 125 Twelve Step Programs/  
 126 alcoholics anonymous.ti,ab,id.  
 127 12 step.ti,ab,id.  
 128 twelve step.ti,ab,id.  
 129 advice.ti,ab,id.  
 130 advise\$.ti,ab,id.  
 131 (intervention\$ or psychosocial).ti.  
 132 or/71-131  
 133 11 and 49 and 132  
 134 limit 133 to (english language and yr="2011 -Current")  
 135 51 or 70 or 134

#### **PubMed, publisher-supplied**

#29 Search #28 AND publisher[sb] AND ("2011/01/01"[Date - Publication] : "3000"[Date - Publication]) AND English[Language]

#28 Search (#9 OR #26) AND #27

#27 Search random\*[tiab] OR clinical trial\*[tiab] OR controlled trial\*[tiab]

#26 Search #4 AND #25

#25 Search #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24



- #24 Search intervention\*[ti] OR psychosocial[ti]
- #23 Search "12 step"[tiab] OR "twelve step"[tiab] OR "alcoholics anonymous"[tiab]
- #22 Search "patient education"[tiab] OR "health education"[tiab] OR "health promotion"[tiab]
- #21 Search email\*[tiab] OR internet[tiab] OR text messag\*[tiab] OR web[tiab] OR website[tiab] OR computer based[tiab] OR computer mediated[tiab] OR computer assisted[tiab]
- #20 Search self help[tiab]
- #19 Search brief intervention\*[tiab]
- #18 Search motivational interview\*[tiab]
- #17 Search behavio\* therap\*[tiab]
- #16 Search cognitive behavio\*[tiab] OR cbt[tiab]
- #15 Search (behavio\* chang\*[tiab]) OR (behavio\* intervention\*[tiab]) OR (behavio\* modification\*[tiab])
- #14 Search counsel\*[tiab]
- #13 Search naltrexone[tiab] OR revia[tiab] OR depade[tiab] OR vivitrol[tiab] OR acamprosate[tiab] OR campral[tiab] OR disulfiram[tiab] OR antabuse[tiab] OR antabus[tiab]
- #12 Search controlled drink\*[tiab]
- #11 Search alcohol therap\*[tiab] OR alcohol treatment\*[tiab]
- #10 Search alcohol reduc\*[tiab] OR reduc\* alcohol[tiab]
- #9 Search #4 AND #8
- #8 Search #5 OR #6 OR #7
- #7 Search alcohol[tiab] AND (scale\*[tiab] OR inventor\*[tiab] OR questionnaire\*[tiab] OR survey\*[tiab] OR index\*[tiab] OR checklist[tiab] OR interview[tiab])
- #6 Search (assessment tool\*[tiab] OR assessment instrument\*[tiab])
- #5 Search screen\*[tiab]
- #4 Search #1 OR #2 OR #3
- #3 Search "heavy episodic"[tiab]
- #2 Search harmful drink\*[tiab] OR risky drink\*[tiab] OR hazardous drink\*[tiab] OR problem\* drink\*[tiab] OR binge drink\*[tiab] OR heavy drink\*[tiab] OR excessive drink\*[tiab] OR unhealthy drink\*[tiab]
- #1 Search alcohol use\*[tiab] OR alcohol abuse\*[tiab] OR alcohol misuse\*[tiab] OR alcohol depend\*[tiab] OR alcohol addict\*[tiab] OR alcohol problem[tiab] OR harmful alcohol [tiab] OR risky alcohol [tiab] OR hazardous alcohol [tiab] OR unhealthy alcohol [tiab] OR excess\* alcohol [tiab] OR alcoholism[tiab]

**eTable 1. Inclusion and Exclusion Criteria**

Category	Included	Excluded
<b>Aim</b>	Screening for unhealthy alcohol use and interventions for nondependent unhealthy alcohol use, with or without addressing other substances or behaviors	Studies in which the only aim is targeting another behavior (e.g., drug or tobacco use) (i.e., change in alcohol use is not a stated aim, even if it is a reported outcome)
<b>Condition</b>	<p>Unhealthy alcohol use*, including:</p> <ul style="list-style-type: none"> <li>• Risky or hazardous use: consumption of alcohol above recommended daily, weekly, or per-occasion amounts; consumption levels that increase the risk for health consequences</li> <li>• Harmful use: a pattern of drinking that is already causing damage to health; damage may be either physical (e.g., liver damage from chronic drinking) or mental (e.g., depressive episodes secondary to drinking)</li> <li>• A diagnosis of an alcohol use disorder (e.g., according to <i>Diagnostic and Statistical Manual of Mental Disorders [DSM]</i> or <i>International Classification of Diseases [ICD]</i> diagnostic systems</li> </ul>	
<b>Population</b>	<p><b>All KQs:</b> Adolescents and adults (age ≥12 years)</p> <p><b>KQs 1–3:</b> Studies whose participants are not selected on the basis of alcohol use or a related behavior or condition</p> <p><b>KQs 4, 5:</b> Studies in which at least 50% of the enrolled sample is recruited via population-based screening</p> <p><i>A priori</i> subpopulations at greater risk for unhealthy alcohol use or its consequences will be examined based on the following: age, sex, race/ethnicity, socioeconomic status, pregnancy status, concurrent unhealthy drug use, severity of disorder, and presence of comorbid mental health conditions</p>	<p>Studies limited to:</p> <ul style="list-style-type: none"> <li>• Treatment-seeking individuals (including those responding to recruitment advertising)</li> <li>• Persons with concomitant psychotic disorders (e.g., schizophrenia)</li> <li>• Persons presenting in an emergency setting for alcohol-related issues (e.g., motor vehicle injury)</li> <li>• Other groups not generalizable to primary care (e.g., psychiatric inpatients, persons who are court-mandated to treatment, incarcerated persons)</li> <li>• <b>KQs 4, 5:</b> Persons with dependent alcohol abuse (or studies in which &gt;50% of the enrolled sample is persons with dependent alcohol use)</li> </ul>
<b>Screening</b>	<p><b>KQs 1, 3:</b> Screening for alcohol use using a brief standardized instrument or set of questions that is conducted in person or via telephone, mail, or electronically</p> <p><b>KQ 2:</b> Accuracy of screening instruments will be limited to the following instruments, which are most widely used and feasible for application in primary care:</p> <ul style="list-style-type: none"> <li>• National Institute on Alcohol Abuse and Alcoholism (NIAAA) single- (for adults) or two-item (for adolescents) screening test, or comparable, including the Brief Screener for Tobacco, Alcohol, and other Drugs (BSTAD) (for adolescents)</li> <li>• Alcohol Use Disorders Identification Test (AUDIT), its abbreviated version (AUDIT-C), and variants of these</li> <li>• Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) (for accuracy of detecting alcohol use only)</li> <li>• Comorbidity Alcohol Risk Evaluation Tool (CARET) (for the elderly)</li> <li>• TWEAK and T-ACE (for pregnant women)</li> </ul>	<ul style="list-style-type: none"> <li>• Studies without any screening instruments or question(s)</li> <li>• Laboratory tests</li> </ul>

Category	Included	Excluded
<b>Interventions</b>	<ul style="list-style-type: none"> <li>• Counseling designed to reduce unhealthy alcohol use, with or without referral</li> <li>• Counseling interventions can vary in their approach (e.g., 12-step program, cognitive behavioral therapy, motivational enhancement therapy), specific strategies (e.g., action plans, diaries), delivery method (e.g., face-to-face, electronic, individual, group-based), length of contact (e.g., brief, extended), and the number of contacts (e.g., single, multiple)</li> </ul>	<ul style="list-style-type: none"> <li>• Financial incentive</li> <li>• Vocational rehabilitation</li> <li>• Community-based media or policy interventions</li> <li>• Interventions to prevent initiation of use among nonusers</li> <li>• Pharmacotherapy</li> </ul>
<b>Comparators</b>	<p><b>KQs 1, 3:</b> No screening or usual care</p> <p><b>KQ 2:</b> Comparison with reference standard (i.e., structured or semistructured clinical interview)</p> <p><b>KQs 4, 5:</b></p> <ul style="list-style-type: none"> <li>• No intervention</li> <li>• Usual care</li> <li>• Waitlist</li> <li>• Attention control (e.g., intervention is similar in format and intensity but on a different content area)</li> <li>• Minimal intervention (e.g., no more than one single brief contact per year, brief written materials such as pamphlets)</li> </ul>	Active intervention (e.g., comparators with a reasonable expectation of affecting change in alcohol consumption)
<b>Setting</b>	<p><b>KQs 1–3:</b> Population-based screening that takes place in a setting that is applicable to primary care, including: primary care clinics; prenatal clinics; obstetrics/gynecology clinics; specialty medical treatment settings (e.g., diabetes management, dialysis clinics); research clinics/office, home, or other community settings, including electronic or computer-based screening</p> <p><b>KQs 4, 5:</b> Interventions in a screen-detected population that take place in a traditional primary care setting or one that is applicable to or referable from primary care, including: primary care clinics; prenatal clinics; obstetrics/gynecology clinics; school health clinics; behavioral/mental health clinics; substance abuse treatment centers; research clinics/office, home, or other community settings, including electronic or computer-based interventions. Screening to identify eligible participants must take place in broad-based, general settings comparable to primary care with a defined population (e.g., primary care clinic, Special Supplemental Nutrition Program for Women, Infants, and Children [WIC], college freshman orientation)</p>	Screening that takes place in: <ul style="list-style-type: none"> <li>• Behavioral/mental health clinic</li> <li>• Substance abuse treatment center</li> <li>• Emergency department/trauma center</li> <li>• Worksites, including occupational screening</li> <li>• Inpatient/residential facility</li> <li>• Other institutions (e.g., correctional facility)</li> </ul>
<b>Outcomes</b>	<p><b>KQs 1a, 4a:</b></p> <ul style="list-style-type: none"> <li>• Alcohol use (<b>required</b>), self-report and/or biologic measures, including: <ul style="list-style-type: none"> <li>○ Frequency and/or quantity of alcohol use</li> <li>○ Abstinence (use/no use)</li> <li>○ Severity of alcohol use disorder (reported as an index measured by a standardized questionnaire, such as the Short Inventory of Problems, Addiction Severity Index, or the Severity of Dependence Scale)</li> <li>○ Meeting criteria for alcohol use disorder</li> </ul> </li> <li>• Other risky behaviors (e.g., other drug use, risky sexual behaviors)</li> </ul> <p><b>KQs 1b, 4b:</b></p> <ul style="list-style-type: none"> <li>• All-cause mortality</li> <li>• Alcohol-related mortality (intentional and unintentional)</li> <li>• Alcohol-related morbidity (e.g., mental health symptoms/disorders; alcohol-related liver problems, including fatty liver disease, alcoholic hepatitis, and alcoholic cirrhosis; cancer; cardiovascular disease, such as cardiomyopathy; neuropathy; cognitive impairment; gastritis; gastric ulcers; pancreatitis; anemia; injuries, assaults, and accidents; visits to emergency department and inpatient stays)</li> </ul>	<ul style="list-style-type: none"> <li>• Attitudes, knowledge, and beliefs related to alcohol use</li> <li>• Intention to change behavior</li> <li>• Intervention participation/compliance</li> <li>• Alcohol use initiation</li> </ul>

Category	Included	Excluded
	<ul style="list-style-type: none"> <li>• Obstetrical/perinatal/neonatal outcomes (e.g., perinatal mortality, preterm labor/delivery, low birth weight, placental abruption, intrauterine growth restriction, preeclampsia, antepartum or postpartum hemorrhage, gestational hypertension, decreased neonate length/head circumference, neonate neurobehavioral effects, congenital anomalies, neonatal abstinence syndrome, neonatal intensive care unit admission, decreased length of neonate hospitalization, fetal alcohol spectrum disorders)</li> <li>• Quality of life</li> <li>• Alcohol-related problems, such as legal problems, social and family relations, employment, and school/educational outcomes</li> </ul> <p><b>KQ 2:</b> Sensitivity and specificity or data to calculate one or both</p> <p><b>KQs 3, 5:</b></p> <ul style="list-style-type: none"> <li>• Serious harms at any time point after the screening or intervention began (e.g., death, seizure, cardiovascular event, or other medical issue requiring urgent medical treatment; serious obstetrical/perinatal/neonatal complication attributable to included medications)</li> <li>• Demoralization due to failed quit attempt</li> <li>• Stigma, labeling, and/or discrimination</li> <li>• Privacy issues (e.g., insurability status)</li> <li>• Job loss</li> <li>• Interference with the doctor-patient relationship</li> </ul>	
<b>Outcome assessment timing</b>	At least 6 months after baseline measurement (except for studies in pregnant women, for which shorter followup times will be included)	
<b>Study design</b>	<p><b>KQs 1, 3:</b> Studies that compare individuals who receive screening with those receiving no screening or usual care, including randomized, controlled trials and nonrandomized controlled trials</p> <p><b>KQ 2:</b> Studies of screening accuracy reporting sensitivity and specificity compared with a structured or semistructured clinical interview</p> <p><b>KQs 4, 5:</b> Randomized, controlled trials and nonrandomized controlled trials</p>	Prospective and retrospective cohort studies, case control studies, time series studies, before-after studies with no comparison group, cross-sectional studies, case studies, case series, and editorials/commentaries
<b>Country</b>	Studies conducted in countries categorized as “Very High” on the 2014 Human Development Index (as defined by the United Nations Development Programme)	Studies conducted in countries that are not categorized as “Very High” on the 2014 Human Development Index
<b>Publication date</b>	Studies whose primary results were published from 1985 to present	Studies whose primary results were published prior to 1985
<b>Publication language</b>	English	Languages other than English
<b>Quality</b>	Fair or good quality	Poor quality (according to design-specific USPSTF criteria)

<sup>a</sup> According to the American Society of Addiction Medicine

**Abbreviations:** KQ = Key Question; USPSTF = U.S. Preventive Services Task Force

**eTable 2. Quality Assessment Criteria**

Study Design	Adapted Quality Criteria
Randomized and non-randomized controlled trials, adapted from the U.S. Preventive Services Task Force methods <sup>1</sup>	<p><b>Bias arising in the randomization process or due to confounding</b></p> <ul style="list-style-type: none"> <li>• Valid random assignment/random sequence generation method used</li> <li>• Allocation concealed</li> <li>• Balance in baseline characteristics</li> </ul> <p><b>Bias in selecting participants into the study</b></p> <ul style="list-style-type: none"> <li>• CCT only: No evidence of biased selection of sample</li> </ul> <p><b>Bias due to departures from intended interventions</b></p> <ul style="list-style-type: none"> <li>• Fidelity to the intervention protocol</li> <li>• Low risk of contamination between groups</li> <li>• Participants were analyzed as originally allocated</li> </ul> <p><b>Bias from missing data</b></p> <ul style="list-style-type: none"> <li>• No, or minimal, post-randomization exclusions</li> <li>• Outcome data are reasonably complete and comparable between groups</li> <li>• Reasons for missing data are similar across groups</li> <li>• Missing data are unlikely to bias results</li> </ul> <p><b>Bias in measurement of outcomes</b></p> <ul style="list-style-type: none"> <li>• Blinding of outcome assessors</li> <li>• Outcomes are measured using consistent and appropriate procedures and instruments across treatment groups</li> <li>• No evidence of inferential statistics</li> </ul> <p><b>Bias in reporting results selectively</b></p> <ul style="list-style-type: none"> <li>• No evidence that the measures, analyses, or subgroup analyses are selectively reported</li> </ul>
Test accuracy studies, adapted from QUADAS-2 <sup>2, 3</sup>	<p><b>Patient Selection</b></p> <ul style="list-style-type: none"> <li>• Was a consecutive or random sample of patients enrolled?</li> <li>• Did the study avoid inappropriate exclusions?</li> </ul> <p><b>Index Test</b></p> <ul style="list-style-type: none"> <li>• Were the index test results interpreted without knowledge of the reference standard results?</li> <li>• If a threshold was used, was it prespecified or was a range of values presented?</li> </ul> <p><b>Reference Standard</b></p> <ul style="list-style-type: none"> <li>• Is the reference standard likely to correctly classify the target condition?</li> <li>• Were the reference standard results interpreted without knowledge of the index test?</li> <li>• Were staff trained in the use of the reference standard?</li> <li>• Was fidelity of the reference standard monitored or reported?</li> </ul> <p><b>Flow and Timing</b></p> <ul style="list-style-type: none"> <li>• Was there an appropriate interval between the index test and reference standard?</li> <li>• Did all patients receive a reference standard?</li> <li>• Did all patients receive the same reference standard?</li> <li>• Were all patients included in the analysis?</li> </ul>

<sup>a</sup> Good quality studies generally meet all quality criteria. Fair quality studies do not meet all the criteria but do not have critical limitations that could invalidate study findings. Poor quality studies have a single fatal flaw or multiple important limitations that could invalidate study findings. Critical appraisal of studies using *a priori* quality criteria are conducted independently by at least two reviewers. Disagreements in final quality assessment are resolved by consensus, and, if needed, consultation with a third independent reviewer.

**eTable 3. Summary Study Population Characteristics for Key Questions 4 and 5**

Population	No. studies	No. randomized	No. (%) good quality	No. (%) conducted in U.S.	Other countries represented	No. (%) in primary care	Median % followup (range)	No. (%) in previous review	No. (%) studies majority non-White <sup>a</sup>	No. (%) studies majority Low SES <sup>b</sup>	Average baseline alcohol use <sup>c</sup> (no. studies reporting)
<b>All populations</b>	<b>68</b>	<b>36,528</b>	<b>10 (15)</b>	<b>41 (60)</b>		<b>42 (62)</b>	<b>82 (59-100)</b>	<b>19 (28)</b>	<b>11 (16)</b>	<b>12 (18)</b>	<b>Drinks/week: 16 (44) HUE/week: 1.8 (16)</b>
<i>Adolescents</i>	2	588	1 (50)	1 (50)	SWL	1 (50)	96 (93-98)	0 (0)	1 (50)	0	<i>Drinks/week: 12 (1) HUE/week: 0.4 (1)</i>
<i>Adults (Non-pregnant/postpartum)</i>	55	33,662	9 (16)	30 (55)		32 (58)	82 (59-96)	17 (31)	4 (7)	5 (9)	<i>Drinks/week: 16 (40) HUE/week: 2.0 (14)</i>
Young adults	22	14,214	4 (18)	15 (68.2)	AUS, CAN, NLD, NZL, SWE, SWL	4 (18)	84 (65-90)	4 (18)	0	0	Drinks/week: 11 (17) HUE/week: 2.6 (8)
Adults	29	16,944	3 (10)	12 (41)	AUS, CAN, DEU, DNK, ESP, FIN, GBR, NLD	24 (83)	77 (59-96)	11 (38)	4 (14)	5 (17)	Drinks/week: 22 (20) HUE/week: 1.0 (5)
Older adults	4	2504	2 (50)	3 (75)	GBR	4 (100)	88 (83-92)	2 (50)	0	0	Drinks/week: 14 (3) HUE/week: 1.0 (1)
<i>Pregnant/postpartum</i>	11	2278	0	10 (91)		9 (82)	81 (63-100)	2 (18)	6 (55)	7 (64)	<i>Drinks/week: 6 (3) HUE/week: 0.8 (1)</i>
Pregnant women	9	1920	0	8 (89)	NLD	8 (89)	81 (63-100)	1 (11)	5 (56)	6 (67)	Drinks/week: 1.8 (2) HUE/week: NR (0)
Postpartum women	2	358	0	2 (100)	--	1 (50)	79 (70-88)	1 (50)	1 (50)	1 (50)	Drinks/week: 8 (1) HUE/week: 0.8 (1)

<sup>a</sup> Assuming studies not reporting race/ethnicity were majority White

<sup>b</sup> Assuming studies not reporting SES are not majority low SES; Low SES defined as >50% uninsured, Medicaid, Annual income <\$15,000, or on public assistance or >20% homeless

<sup>c</sup> Weighted by n randomized

<sup>d</sup> Among studies conducted in the U.S. (k=39)

**Abbreviations:** AUS = Australia; CAN = Canada; DEU = Germany; DNK = Denmark; ESP = Spain; FIN = Finland; GBR = Great Britain; HUE = heavy use episodes; NLD = Netherlands; No. = number; NZL = New Zealand; RCT = randomized controlled trial; SWE = Sweden; SES = socioeconomic status; SWL = Switzerland; WIC = Women, Infants, and Children

**eTable 4. Positive and Negative Predictive Values for a Range of Sensitivity and Specificity Based on U.S. Prevalence of Unhealthy Alcohol Use<sup>4</sup>**

Target population	Condition	No. with condition, in thousands	Condition, %	PPV 70/80 <sup>a</sup>	PPV 80/90 <sup>a</sup>	PPV 90/90 <sup>a</sup>	NPV 70/80 <sup>a</sup>	NPV 80/90 <sup>a</sup>	NPV 90/90 <sup>a</sup>
Adolescents	Heavy use episode, past month	1,214	4.9	15.3	29.2	31.7	98.1	98.9	99.4
	Heavy drinking, past month	191	0.8	2.7	6.1	6.8	99.7	99.8	99.9
	AUD, current	488	2.0	6.7	14.0	15.5	99.2	99.5	99.8
Adults (18+ years)	Heavy use episode, past month	64,113	26.2	55.4	74.0	76.2	88.2	92.7	96.2
	Heavy drinking, past month	16,098	6.6	19.8	36.1	38.9	97.4	98.4	99.2
	AUD, current	14,569	6.0	18.3	33.8	36.5	97.7	98.6	99.3
Young adult (18-25 years)	Heavy use episode, past month	13,258	38.4	68.6	83.3	84.9	81.0	87.8	93.5
	Heavy drinking, past month	3,500	10.1	28.2	47.3	50.3	96.0	97.6	98.8
	AUD, current	3,684	10.7	29.5	48.9	51.9	95.7	97.4	98.7
Middle adults (26+ years)	Heavy use episode, past month	50,855	24.2	52.8	71.9	74.2	89.3	93.4	96.6
	Heavy drinking, past month	12,598	6.0	18.3	33.8	36.5	97.7	98.6	99.3
	AUD, current	10,885	5.2	16.1	30.5	33.1	98.0	98.8	99.4
Older adults (65+ years)	Heavy use episode, past month	4,664	9.7	27.3	46.2	49.2	96.1	97.7	98.8
	Heavy drinking, past month	1,117	2.3	7.6	15.8	17.5	99.1	99.5	99.7
	AUD, current	754	1.6	5.4	11.5	12.8	99.4	99.6	99.8
Pregnant women	Heavy use episode, past month	98	4.3	13.6	26.4	28.8	98.3	99.0	99.5
	Heavy drinking, past month	21	0.9	3.1	6.8	7.6	99.7	99.8	99.9
	AUD, current	<sup>b</sup>	<sup>b</sup>	NA	NA	NA	NA	NA	NA

<sup>a</sup> Sensitivity/Specificity

<sup>b</sup> Data not available

**Abbreviations:** AUD = alcohol use disorder; NA = not applicable; NPV = negative predictive value; PPV = positive predictive value



**eTable 5. Study and Population Characteristics for Key Question 2, by Population**

Target pop	Author, year	Quality rating <sup>a</sup>	Cou ntry	Recruit. setting	Brief population description	N scree ned	Avera ge age	% Femal e	Race/ Ethnicity	SES	Screening tests
Adolescents	Chung, 2012 <sup>5</sup>	Good	US	Communi ty-based	Adolescents, age 12-18 years	166,165	NR	48.6	White: 62.3 Black: 14.7 Hispanic: 16.5	NR	5+ drinks Frequency Quantity
	Clark, 2016 <sup>6</sup>	Good	US	Primary care	Adolescents, age 12-20 years, living in rural Pennsylvania	1193	15.3	57	White: 93.4 Black: 1.3 Hispanic: 4.5	NR	Frequency Quantity Quant x Freq
	D'Amico, 2016 <sup>7</sup>	Good	US	Primary care	Adolescents, age 12-18 years	1573	15.5	57.5	White: 14.7 Black: 26.7 Hispanic: 51.4	NR	AUDIT Youth Screen
	Gryczynski, 2015 <sup>8</sup>	Fair	US	Primary care	Adolescents, age 12-17 years	525	NR	54	White: <1 Black: 93 Hispanic: 3	97% enrolled in school	ASSIST
	Harris, 2016 <sup>9</sup>	Good	US	Primary care	Adolescents, age 12-17 years	136	15.0	54.4	White: 18.4 Black: 27.9 Hispanic: 24.3	58% college graduate parent	Frequency
	Kelly, 2014 <sup>10</sup>	Fair	US	Primary care	Adolescents, age 12-17 years	525	NR	54.5	White: 0.8 Black: 92.8 Hispanic: NR	97.5% enrolled in school	Youth Screen
	Knight, 2003 <sup>11</sup>	Good	US	Primary care	Adolescents, age 14-18 years	538	16	68.4	White: 24.2 Black: 50.6 Hispanic: 18.8	NR	AUDIT

Target pop	Author, year	Quality rating <sup>a</sup>	Cou ntry	Recruit. setting	Brief population description	N scree ned	Avera ge age	% Femal e	Race/ Ethnicity	SES	Screening tests
	Levy, 2016 <sup>12</sup>	Fair	US	Other medical	Children, age 9-18 years, with Type 1 diabetes, asthma, cystic fibrosis, inflammatory bowel disease, or juvenile idiopathic arthritis	388	NR	51.5	White: 75.5 Black: NR Hispanic: NR	69.8% college graduate parent	Youth Screen
Adolescents	Rumpf, 2013 <sup>13</sup>	Fair	DEU	High School	Adolescents, age 14-18 years	225	15.5	50.7	NR	NR	AUDIT AUDIT-C
	Santis, 2009 <sup>14</sup>	Fair	CHL	High School	Students attending public school	95	15.9	44.2	NR	NR	AUDIT
Young adults	Aertgeerts, 2000	Fair	BEL	Universit y/ College	College freshmen, attending required medical examinations	3564	18	54.4	NR	NR	AUDIT
	Clark, 2016 <sup>6</sup>	Good	US	Primary care	Adolescents, living in rural Pennsylvania, age 18-20 years (this subgroup only)	251	NR	66.5	White: 93.4 <sup>b</sup> Black: 1.3 <sup>b</sup> Hispanic: 4.5 <sup>b</sup>	NR	Frequency, Quantity, Quant x Freq
	Cook, 2004 <sup>15</sup>	Good	US	Other medical	Young adults attending appointments at an urban STD clinic, age 15-24 years	358	20.6	45.0	White: 46.0 Black: 49.0 Hispanic: NR	NR	AUDIT
	DeMartini, 2012 <sup>16</sup>	Good	US	Universit y/ College	College students, psychology subject pool, age 18-25 years, current drinkers	401	19.04	54	White: 64 Black: NR Hispanic: NR	NR	AUDIT, AUDIT-C
	Kokotailo, 2004 <sup>17</sup>	Good	US	Universit y/ College	College students attending university health services	302	20.3	61.3	White: 90.1 Black: 2.0 Hispanic:	NR	AUDIT

Target pop	Author, year	Quality rating <sup>a</sup>	Country	Recruit. setting	Brief population description	N screened	Average age	% Female	Race/Ethnicity	SES	Screening tests
					appointments, age 18-23 years				2.3		
	Northrup, 2013 <sup>18</sup>	Fair	US	University/ College	White or Black non-Hispanic undergraduate college students, age 18-25 years	1500	19.4	68	White: 81 Black: 19 Hispanic: NR	NR	AUDIT, AUDIT-C
Adults	Aalto, 2009 <sup>19</sup>	Fair	FIN	Other medical	Adults participating in the FINRISK study, aged 25-64 years	1851	45.4	54.4	NR	Education, mean: 13.7 years Employed: 73.7	AUDIT, AUDIT-C, 6+ drinks, Quantity x Frequency
	Bartoli, 2016 <sup>20</sup>	Good	ITA	Other medical	Adults, age >18 years, admitted to an outpatient clinic for anxiety or depressive disorders, with past-year alcohol use	242	44.3	57.0	NR	NR	5/4+ drinks
	Boschloo, 2010 <sup>21</sup>	Fair	NLD	Community-based	Adults, age 18-65 years, participated in the Netherlands Study of Depression and Anxiety (NESDA) who either had a diagnosis of past-year depressive and/or anxiety disorder OR who did not have a diagnosis of lifetime depressive and/or anxiety disorder	2404	41.3	65.8	NR	Education in years, mean: 12.1	AUDIT

Target pop	Author, year	Quality rating <sup>a</sup>	Country	Recruit. setting	Brief population description	N screened	Average age	% Female	Race/Ethnicity	SES	Screening tests
	Bradley, 2003 <sup>22</sup>	Good	US	Other medical	Women receiving VA outpatient care, age ≥18 years	393	46	100.0	White: 69.2 Black: 12.2 Hispanic: NR	HS degree or higher: 99.5%	AUDIT, AUDIT-C, 4+ drinks, 6+ drinks
Adults	Buchsbaum, 1995 <sup>23</sup>	Fair	US	Primary care	Adults age ≥18 years, drinking within the past 30 days	155	48	44.5	NR	HS degree or higher: 27.1%  Full-time employment: 15.5% Part-time: 10.3%	Quantity
	Clements, 1998 <sup>24</sup>	Fair	US	University/College	College students enrolled in psychology courses, age 18-55 years	306	25.8	74.8	White: 60.8 Black: 24.5 Hispanic: 10.5	NR	AUDIT
	Crawford, 2013 <sup>25</sup>	Fair	US	Other medical	Adult veterans from the VA Mid-Atlantic Mental Illness Research, Education, and Clinical Center Recruitment Database	1775	37	20.3	White: 55 Black: NR Hispanic: NR	Education, average: 13 years Employed full- or part-time: 65%	AUDIT, AUDIT-C
	Dawson, 2005 <sup>26, 27</sup>	Good	US	Community-based	Adults participants in the 2001-2002 NESARC, age ≥18 years	43093			NR	NR	AUDIT-C, 5/4+ drinks. Maximum drinks

Target pop	Author, year	Quality rating <sup>a</sup>	Country	Recruit. setting	Brief population description	N screened	Average age	% Female	Race/Ethnicity	SES	Screening tests
	Dawson, 2012 <sup>28</sup>	Fair	US	Community-based	Adults, aged ≥21 years, participated in the National Epidemiologic Survey on Alcohol and Related Conditions	34,536	NR	NR	NR	NR	AUDIT-C
	Degenhardt, 2001 <sup>29</sup>	Fair	AUS	Community-based	Adult participants of WHO trial of brief alcohol use interventions, age 17-70 years	370	50.9	38.2	NR	NR	AUDIT
Adults	Foxcroft, 2015 <sup>30</sup>	Good	GBR	Primary care	Adults, age 18-35 years	420	NR	67.1	White: 86.0 Black: NR Hispanic: NR	IMD Quintile I (lowest deprivation): 53.0%	AUDIT, AUDIT-C
	Gache, 2005 <sup>31</sup>	Good	FRA, CHE	Primary care	Adults, age ≥18 years, non-abstainers	1207	43.3	51.6	NR	NR	AUDIT
	Gomez, 2005 <sup>32</sup>	Fair	ESP	Primary care	Adults, age ≥15 years	500	44	56.2	NR	NR	AUDIT, AUDIT-C, 6+ drinks
	Gomez, 2006 <sup>33</sup>	Fair	ESP	Primary care	Adults receiving primary care services, age ≥15 years	602	48.7	55.0	NR	NR	AUDIT, AUDIT-C

Target pop	Author, year	Quality rating <sup>a</sup>	Cou ntry	Recruit. setting	Brief population description	N scree ned	Avera ge age	% Femal e	Race/ Ethnicity	SES	Screening tests
	Gual, 2002 <sup>34</sup>	Fair	ESP	Primary care	Adults attending primary health care appointments, age ≥ 17 years	255	44.0	50.2	NR	Employed: 73% HS grad or higher: 39%	AUDIT, AUDIT-C
	Isaacson, 1994 <sup>35</sup>	Fair	US	Primary care	Adults, new patients at an inner-city primary care clinic	124	45	52	NR	Clinic serves a population that is predominantly of lower socioeconomic status	AUDIT
Adults	Kumar, 2016 <sup>36</sup>	Good	US	Primary care	Adults, age ≥18 years	399	46.8	48.4	White: 19.8 Black: 47.9 Hispanic: NR	HS degree or higher: 82.5%  Income <\$50,000: 79.4%  Employed, full time: 20.0% Employed, part time: 9.3%	ASSIST
	Levola, 2015 <sup>37</sup>	Fair	FIN	Other medical	FINRISK adults, age 25-60 years, reporting at least mild (BDI-SF score ≥4) or moderate (≥8) symptoms of depression;	556	44.7	57.4	NR	NR	AUDIT, AUDIT-C, 6+ drinks
	McCann, 2000 <sup>38</sup>	Fair	US	Other medical	Adults seeking evaluation for ADHD	139	36.4	30.9	White: 95.7 Black: NR Hispanic: NR	NR	AUDIT

Target pop	Author, year	Quality rating <sup>a</sup>	Cou ntry	Recruit. setting	Brief population description	N scree ned	Avera ge age	% Femal e	Race/ Ethnicity	SES	Screening tests
	McGinnis, 2013 <sup>39</sup>	Fair	US	Primary care	Male VA patients, HIV-infected patients and matched controls, at least 1 alcoholic beverage in past year	837	52	0	White: 33 Black: 53 Hispanic: 8	NR	AUDIT, AUDIT-C, 6+ drinks
Adults	McNeely, 2015 <sup>40</sup>	Good	US	Primary care	Adults, age 21-65 years	586	46	49.8	White: 18.7 Black: 50.2 Hispanic: 21.7	HS degree or higher: 84.1%  Income: <\$50,000: 79.5%	4+ drinks, 5/4+ drinks
	McNeely, 2016 <sup>41, 42</sup>	Fair	US	Primary care	Adults, aged ≥18 years	2000	46	56.2	White: 33.4 Black: 55.6	HS degree or higher: 79.8%  Unemployed: 21.0%	5/4+ drinks
	Piccinelli, 1997 <sup>43</sup>	Fair	ITA	Primary care	Adults, age 18-65 years	482	42.2	63.5	NR	HS degree or higher: 33.6%  Employed: 56.8%	AUDIT
	Rumpf, 2002 <sup>44</sup>	Fair	DEU	Communi ty-based	Adults, age 18-64 years, consuming alcohol in the past 12 months	3551	41.2	49.2	NR	HS degree or higher: 22.1%	AUDIT, AUDIT-C

Target pop	Author, year	Quality rating <sup>a</sup>	Country	Recruit. setting	Brief population description	N screened	Average age	% Female	Race/Ethnicity	SES	Screening tests
	Seale, 2006 <sup>45</sup>	Fair	US	Primary care	Adult drinkers attending primary care practices, 6+ drinks in the previous year	625	40.9	54.4	White: 60.8 Black: 38.1 Hispanic: 1.1	NR	AUDIT, AUDIT-C, 5/4+ drinks
	Smith, 2009 <sup>46</sup>	Good	US	Primary care	Adults attending a primary care clinic, age ≥18 years	286	49	54.2	White: 17.1 Black: 62.6 Hispanic: 16.1	HS degree or higher: 71.7%	AUDIT-C, 5/4+ drinks
Adults	Volk, 1997 <sup>47</sup>	Fair	US	Primary care	Adults attending primary care visits, age ≥18 years, self-identified as white, Black or Hispanic	1333	43.2	70.7	White: 38.4 Black: 35.3 Hispanic: 26.3	No more than high school degree: White: 31.1% Black: 45.2% Hispanic: 26.3%  Annual income <\$20,000 White: 36.6% Black: 68.5% Hispanic: 59.3%	AUDIT, AUDIT-C
Older adults	Aalto, 2011 <sup>48</sup>	Good	FIN	Community-based	Older adults, age 65-74 years	517	69.0	49.7	NR	NR	AUDIT, AUDIT-C, Quantity x Frequency, 6+ drinks, 4+ drinks



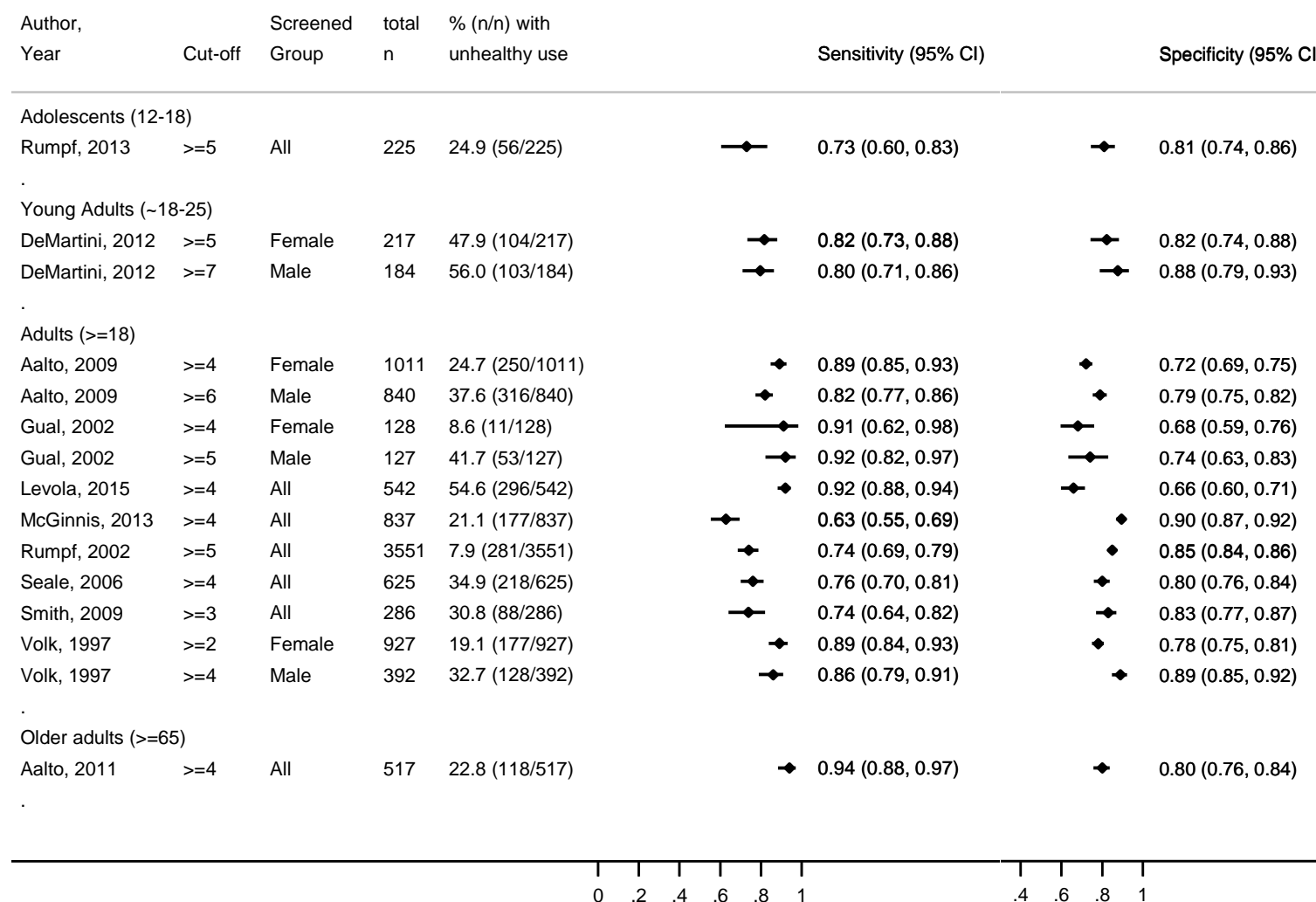
Target pop	Author, year	Quality rating <sup>a</sup>	Country	Recruit. setting	Brief population description	N screened	Average age	% Female	Race/Ethnicity	SES	Screening tests
	Dawson, 2005 <sup>26, 27</sup>	Good	US	Community-based	Adults participants in the 2001-2002 NESARC, age ≥65 years (for this subgroup only)	8666	NR	NR	NR	NR	AUDIT-C, 5/4+ drinks, Maximum drinks
Pregnant women	Bull, 1999 <sup>49</sup>	Fair	US	Primary care	Pregnant women attending prenatal appointments (mean 15.2 weeks' gestation), American Indian or carrying an American Indian baby, age 15-44 years	208	24.4	100.0	NR	NR	Quantity x Frequency
Pregnant women	Dawson, 2005 <sup>26, 27</sup>	Good	US	Community-based	Adults participants in the 2001-2002 NESARC, age ≥18 years, pregnant past-year drinkers (this subgroup only)	256	NR	100.0	NR	NR	AUDIT-C
	Lopez, 2017 <sup>50</sup>	Fair	ARG	Hospital	Postpartum women, aged 13-44 years	641	25.6	100.0	NR	≥12 years of formal education: 38%	AUDIT, AUDIT-C, T-ACE, TWEAK

<sup>a</sup> Assessed using criteria from QUADAS<sup>2, 3</sup>

<sup>b</sup> Race/ethnicity for the full sample (n=1193)

**Abbreviations:** ARG = Argentina; ASSIST = Alcohol, Smoking and Substance; AUDIT = Alcohol Use Disorders Identification Test; AUDIT-C = Alcohol Use Disorders Identification Test-Consumption; ESP = Spain; FRA = France; HS = high school; NESARC = National Epidemiologic Survey on Alcohol and Related Conditions; NR = not reported; SES = socioeconomic status; US = United States; VA = U.S. Department of Veterans Affairs

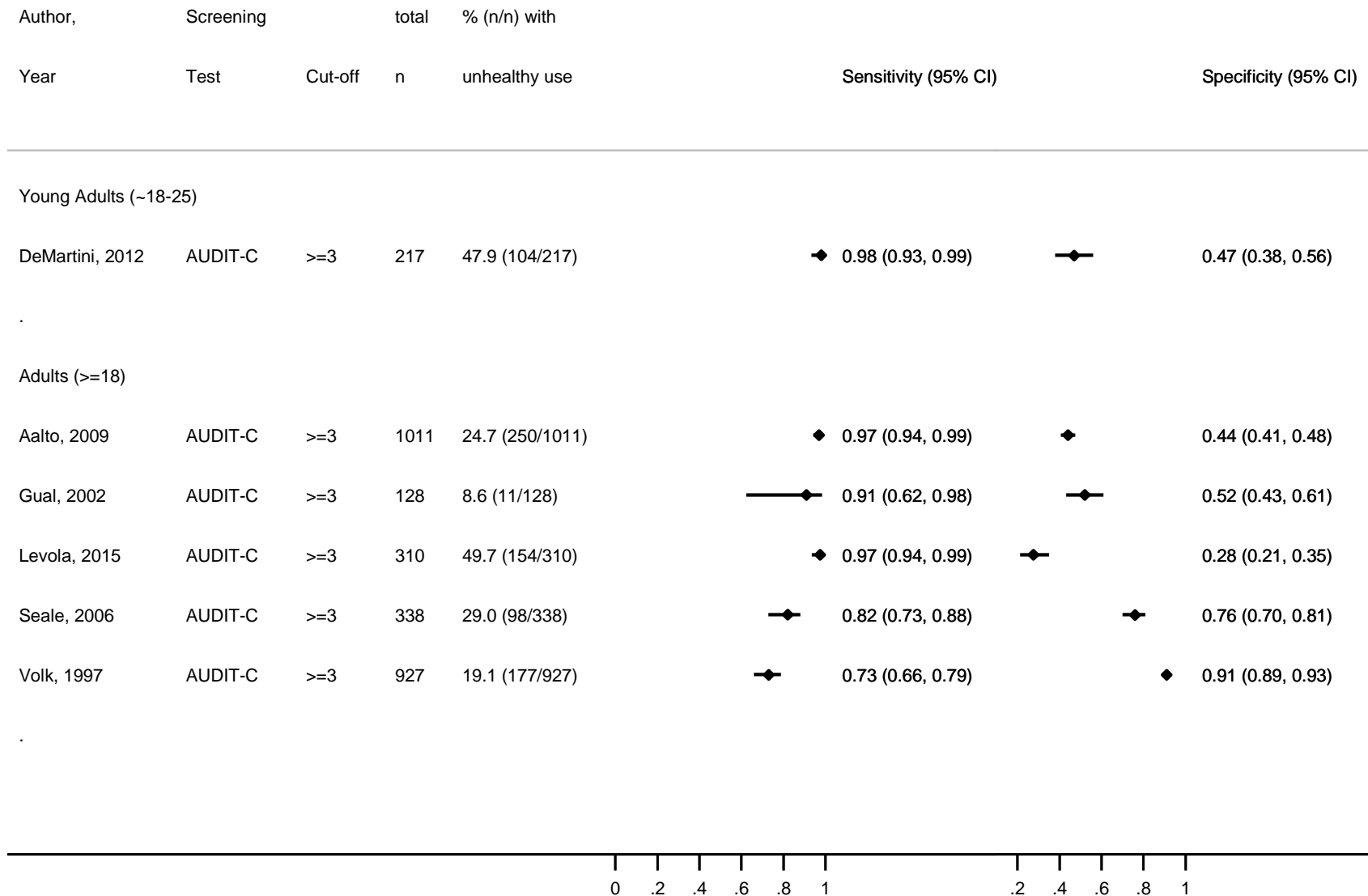
**eFigure 1. Test Accuracy of the AUDIT-C at the Optimal<sup>a</sup> Cutoff to Detect Unhealthy Alcohol Use**



<sup>a</sup> Optimal cutoffs could vary by study and were selected as the optimal cutoff by the authors or the reviewers.

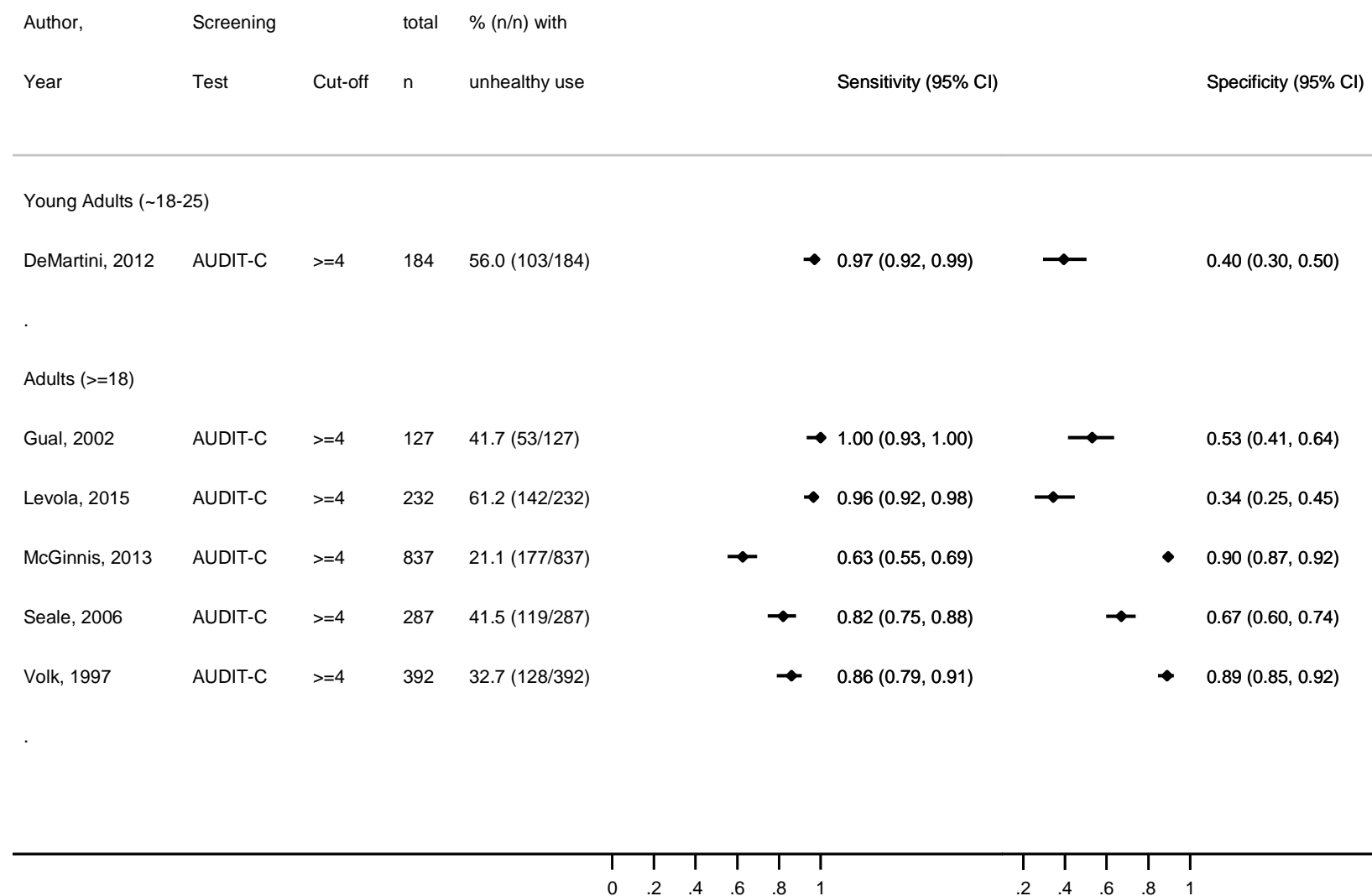
Abbreviation: CI = confidence interval

**eFigure 2. Test Accuracy of the AUDIT-C at Cutoff of  $\geq 3$  to Detect Unhealthy Alcohol Use Among Females**



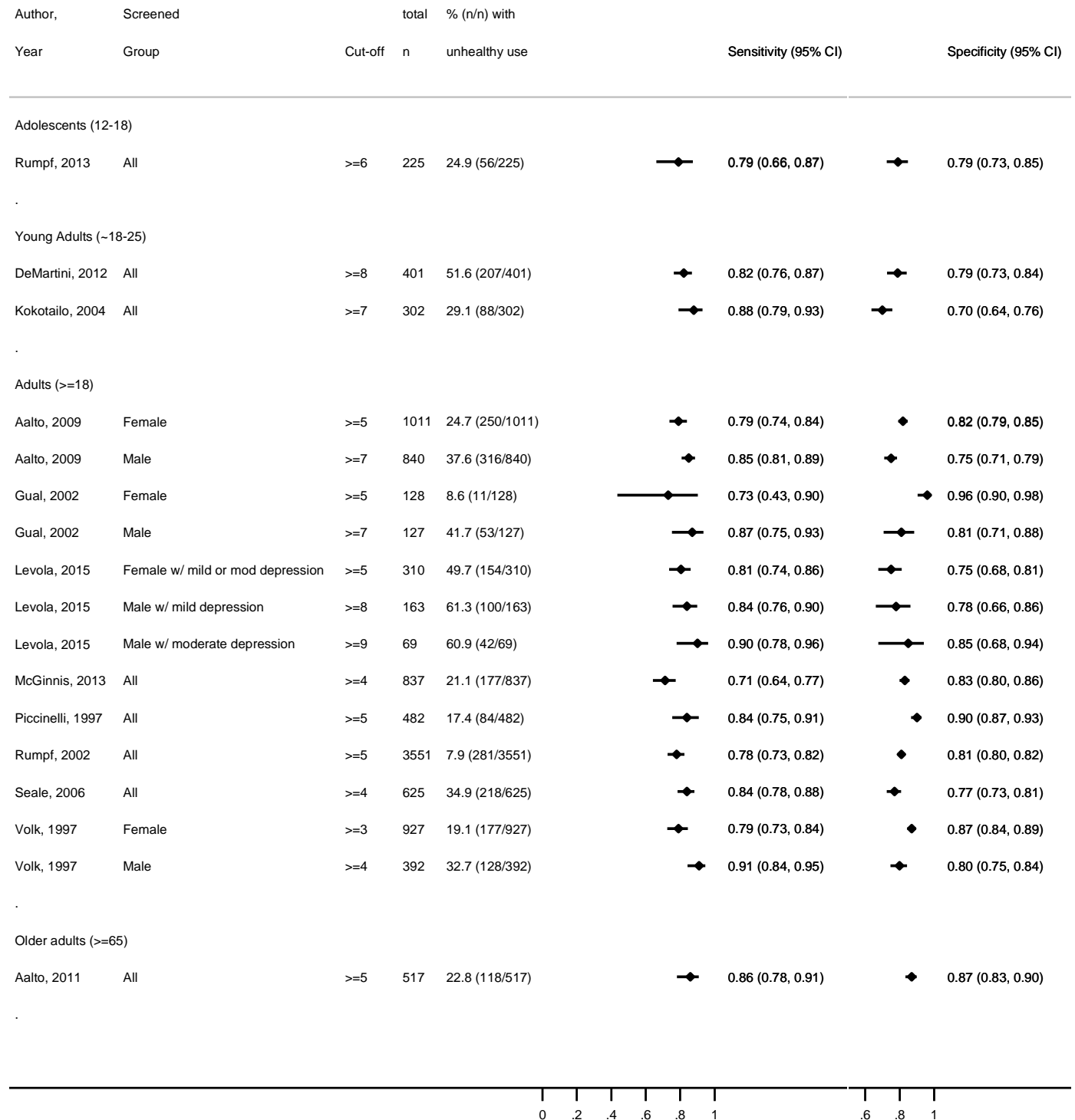
**Abbreviations:** AUDIT-C = Alcohol Use Disorders Identification Test-Consumption; CI = confidence interval

**eFigure 3. Test Accuracy of the AUDIT-C at Cutoff of  $\geq 4$  to Detect Unhealthy Alcohol Use Among Males**



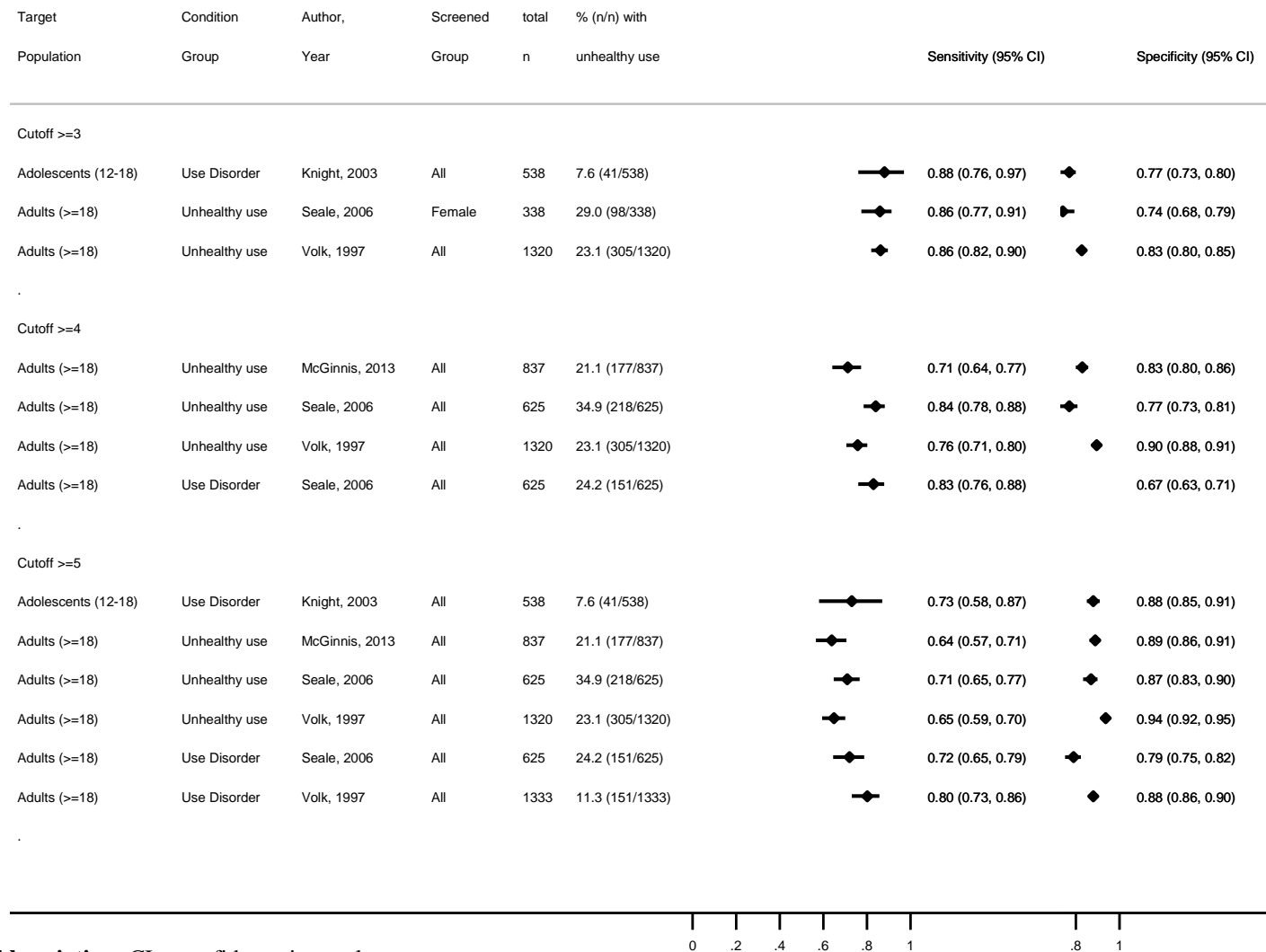
**Abbreviations:** AUDIT-C = Alcohol Use Disorders Identification Test-Consumption; CI = confidence interval

# eFigure 4. Unhealthy use, AUDIT, Cutoff ≥8, Adolescents, Young Adults, Adults, Older Adults



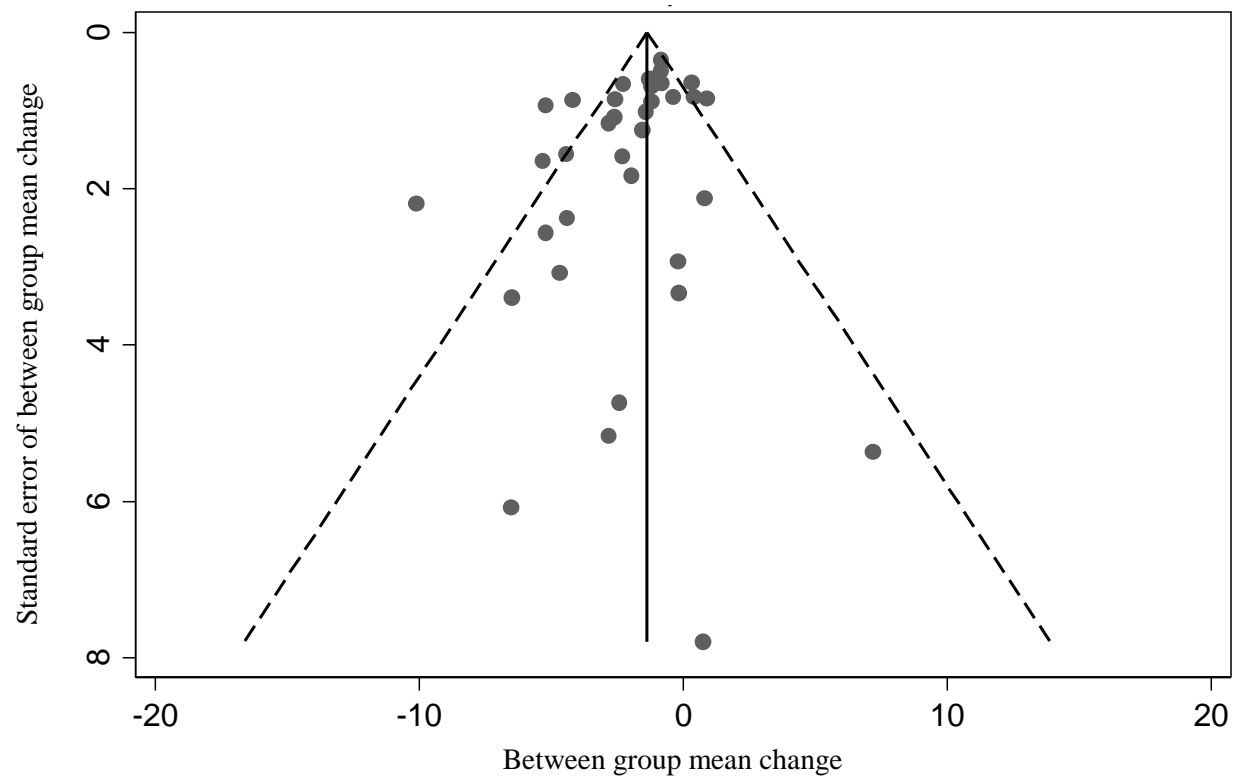
**Abbreviation:** CI = confidence interval

**eFigure 5. Test Accuracy of the AUDIT to Detect the Full Spectrum of Unhealthy Alcohol Use or Alcohol Use Disorder, at Cutoffs of  $\geq 3$ , 4, or 5, in U.S. Primary Care**

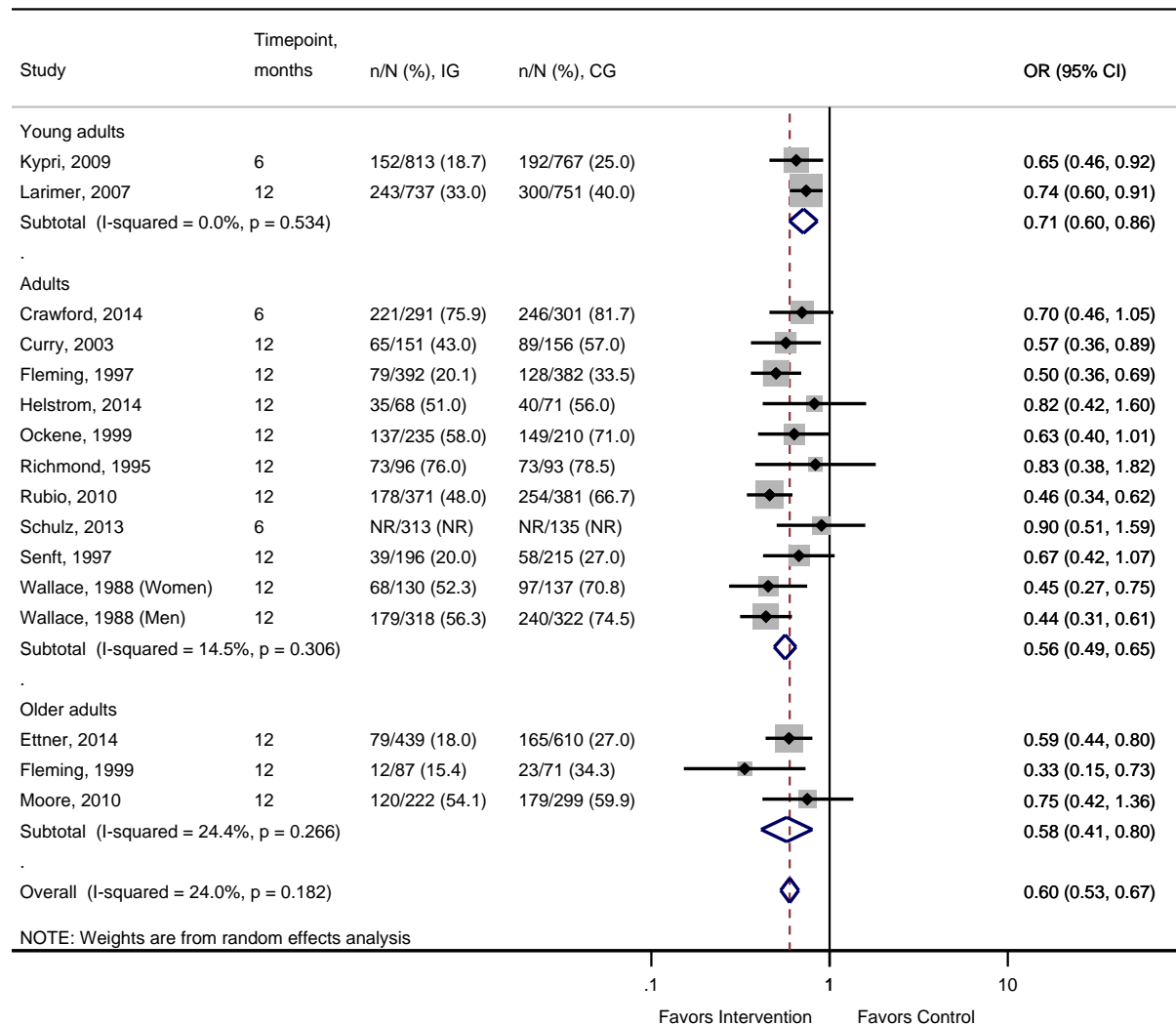


**Abbreviation:** CI = confidence interval

**eFigure 6. Funnel Plot With Pseudo 95% Confidence Limits of Between-Group Difference in Change From Baseline in Drinks per Week by its Standard Error (Key Question 4a)**



**eFigure 7. Forest Plot of Odds Ratios for Exceeding Recommended Limits (KQ4a), Comparing Alcohol Counseling Interventions and Control Groups, by Population**

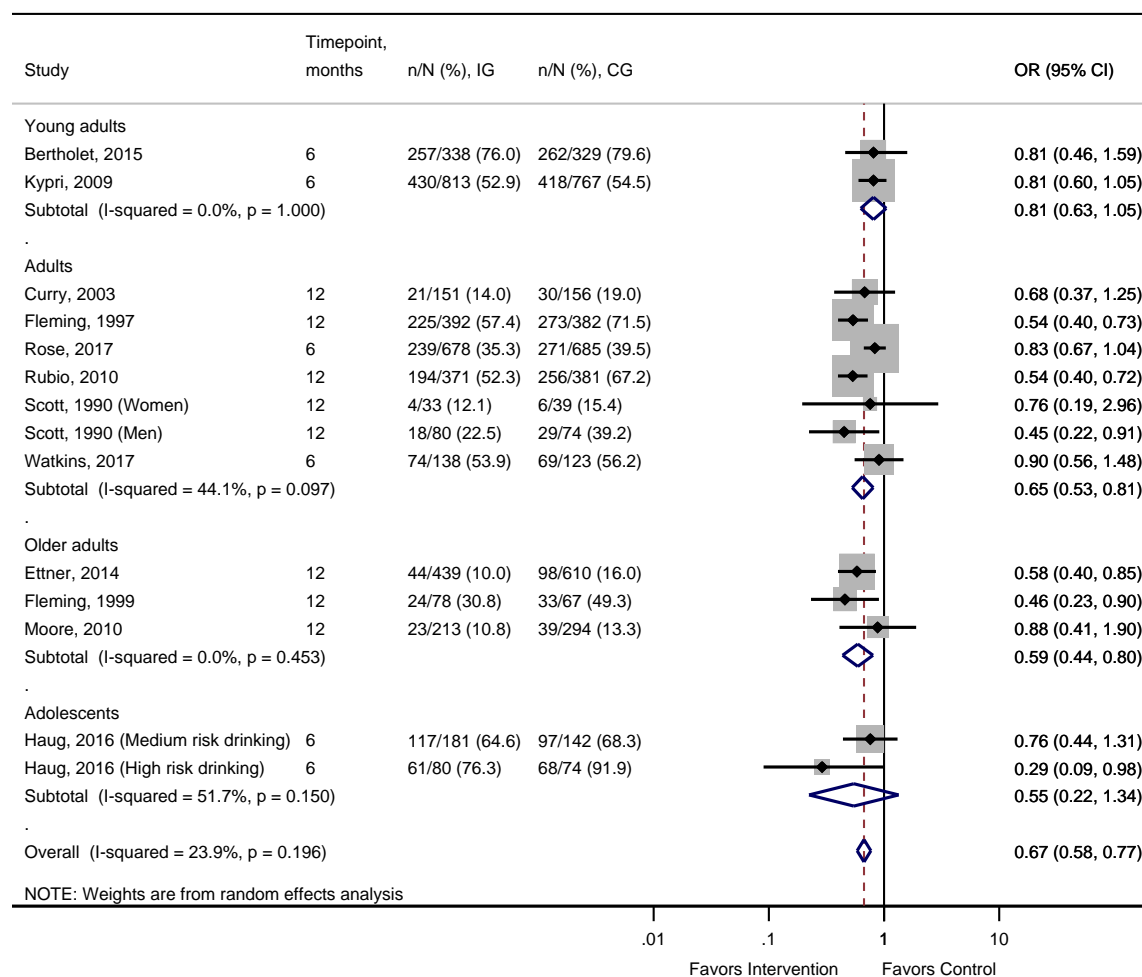


**Abbreviations:** CG = control group; CI = Confidence interval; IG = intervention group; OR = odds ratio

The size of the gray squares surrounding the point estimates indicates the relative weight of the study in the calculation of the pooled estimate.



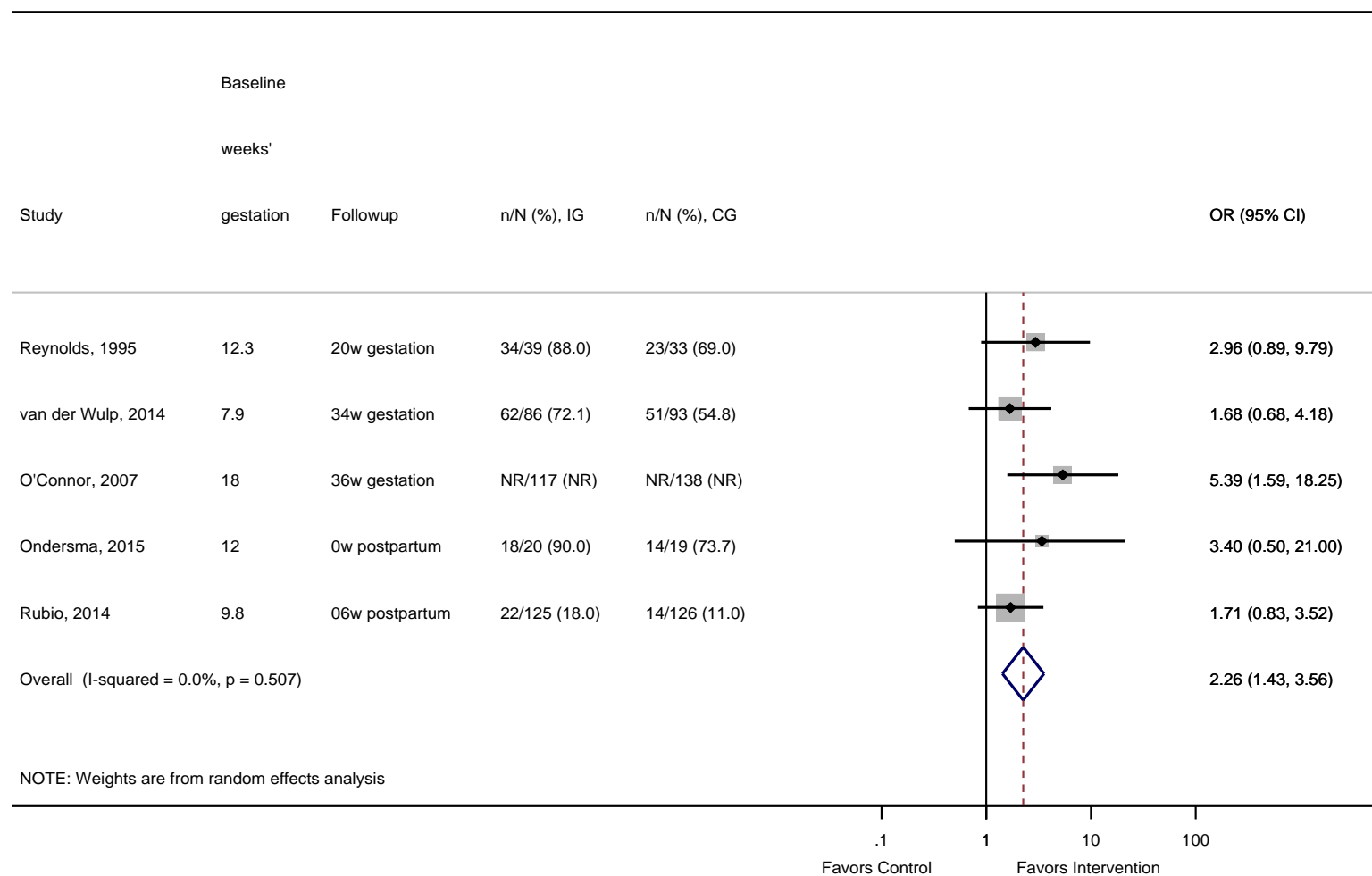
**eFigure 8. Forest Plot of Odds Ratios for Reporting a Heavy Use Episode (Key Question 4a), Comparing Alcohol Counseling Interventions and Control Groups, by Population**



**Abbreviations:** CG = control group; CI = Confidence interval; IG = intervention group; OR = odds ratio

The size of the gray squares surrounding the point estimates indicates the relative weight of the study in the calculation of the pooled estimate.

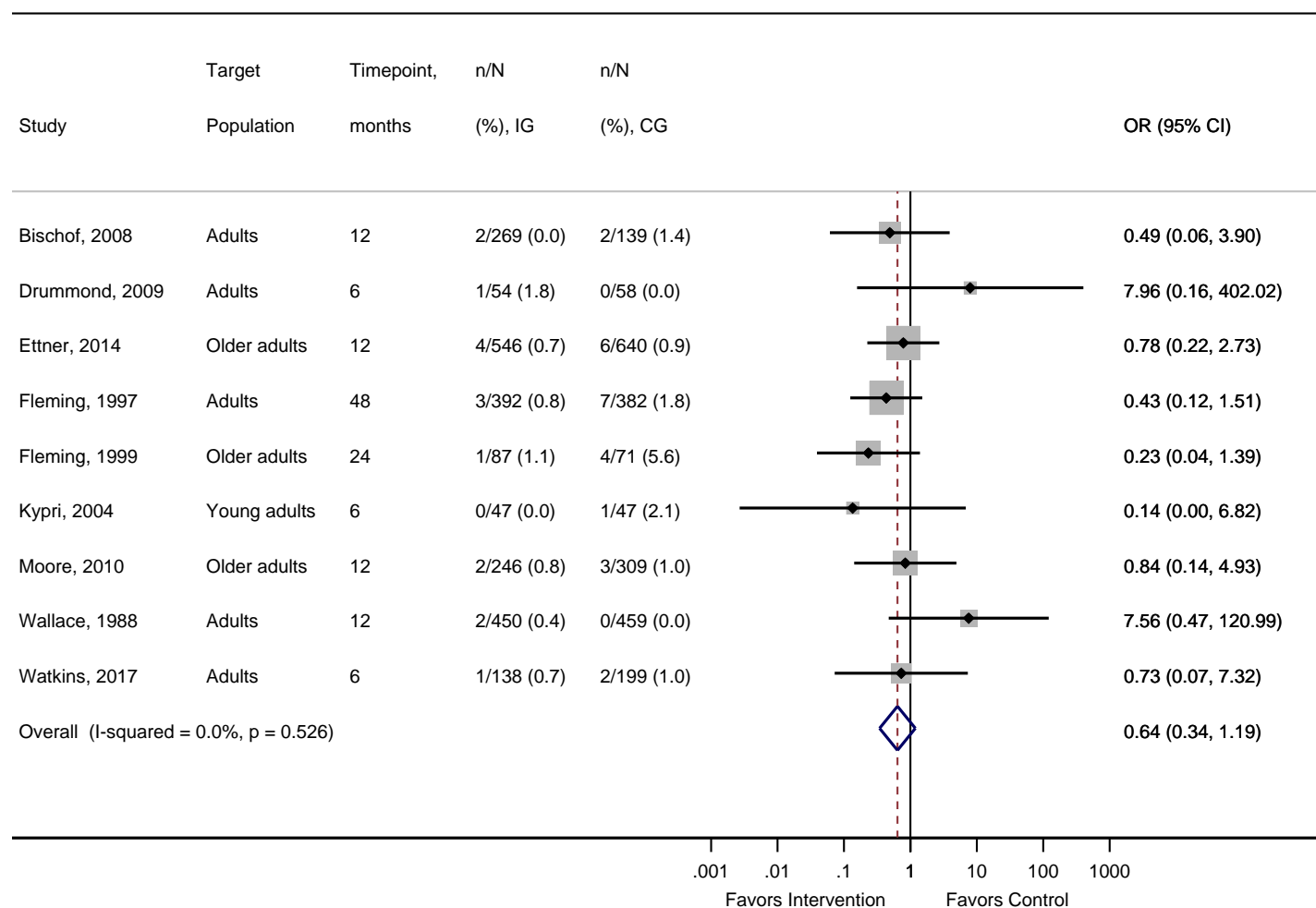
**eFigure 9. Forest Plot of Odds Ratios for Reporting Abstinence During Pregnancy (KQ4a), Comparing Alcohol Counseling Interventions and Control Groups, Among Trials in Pregnant Women**



**Abbreviations:** CG = control group; CI = Confidence interval; IG = intervention group; OR = odds ratio; w = weeks

The size of the gray squares surrounding the point estimates indicates the relative weight of the study in the calculation of the pooled estimate.

**eFigure 10. Forest Plot of Odds Ratios for Mortality (KQ4b), Comparing Alcohol Counseling Interventions and Control Groups, by Population**



**Abbreviations:** CG = control group; CI = Confidence interval; IG = intervention group; OR = odds ratio

The size of the gray squares surrounding the point estimates indicates the relative weight of the study in the calculation of the pooled estimate.

## eReferences

1. U.S. Preventive Services Task Force. U.S. Preventive Services Task Force Procedure Manual. Rockville, MD: U.S. Preventive Services Task Force; 2015. PMID.
2. Whiting P, Rutjes AW, Reitsma JB, et al. The development of QUADAS: a tool for the quality assessment of studies of diagnostic accuracy included in systematic reviews. *BMC Med Res Methodol*. 2003;3:25. PMID: 14606960. 10.1186/1471-2288-3-25
3. Whiting P, Wolff R. "Medical use of cannabinoids": In reply. *JAMA*. 2015;314(16):1751-2. PMID: 26505604. 10.1001/jama.2015.11447
4. Center for Behavioral Health Statistics and Quality. Results from the 2016 National Survey on Drug Use and Health: Detailed Tables. <https://www.samhsa.gov/data/sites/default/files/NSDUH-DetTabs-2016/NSDUH-DetTabs-2016.pdf>. Accessed October 2, 2017. PMID.
5. Chung T, Smith GT, Donovan JE, et al. Drinking frequency as a brief screen for adolescent alcohol problems. *Pediatrics*. 2012;129(2):205-12. PMID: 22218839. 10.1542/peds.2011-1828
6. Clark DB, Martin CS, Chung T, et al. Screening for Underage Drinking and Diagnostic and Statistical Manual of Mental Disorders, 5th Edition Alcohol Use Disorder in Rural Primary Care Practice. *J Pediatr*. 2016;173:214-20. PMID: 27059911. 10.1016/j.jpeds.2016.02.047
7. D'Amico EJ, Parast L, Meredith LS, et al. Screening in Primary Care: What Is the Best Way to Identify At-Risk Youth for Substance Use? *Pediatrics*. 2016;138(6). PMID: 27940696. 10.1542/peds.2016-1717
8. Gryczynski J, Kelly SM, Mitchell SG, et al. Validation and performance of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) among adolescent primary care patients. *Addiction*. 2015;110(2):240-7. PMID: 25311148. 10.1111/add.12767
9. Harris SK, Knight JR, Jr., Van Hook S, et al. Adolescent substance use screening in primary care: Validity of computer self-administered versus clinician-administered screening. *Subst Abus*. 2016;37(1):197-203. PMID: 25774878. 10.1080/08897077.2015.1014615
10. Kelly SM, Gryczynski J, Mitchell SG, et al. Validity of brief screening instrument for adolescent tobacco, alcohol, and drug use. *Pediatrics*. 2014;133(5):819-26. PMID: 24753528. 10.1542/peds.2013-2346
11. Knight J, Sherritt L, Harris S, et al. Validity of brief alcohol screening tests among adolescents: a comparison of the AUDIT, POSIT, CAGE, and CRAFFT. *Alcohol Clin Exp Res*. 2003;27(1):67-73. PMID: 12544008. 10.1097/01.ALC.0000046598.59317.3A
12. Levy S, Dedeoglu F, Gaffin JM, et al. A Screening Tool for Assessing Alcohol Use Risk among Medically Vulnerable Youth. *PloS one*. 2016;11(5):e0156240. PMID: 27227975. 10.1371/journal.pone.0156240

13. Rumpf HJ, Wohler T, Freyer-Adam J, et al. Screening questionnaires for problem drinking in adolescents: performance of AUDIT, AUDIT-C, CRAFFT and POSIT. *Eur Addict Res.* 2013;19(3):121-7. PMID: 23183686. 10.1159/000342331
14. Santis R, Garmendia ML, Acuna G, et al. The Alcohol Use Disorders Identification Test (AUDIT) as a screening instrument for adolescents. *Drug Alcohol Depend.* 2009;103(3):155-8. PMID: 19423240. 10.1016/j.drugalcdep.2009.01.017
15. Cook RL, Chung T, Kelly TM, et al. Alcohol screening in young persons attending a sexually transmitted disease clinic. Comparison of AUDIT, CRAFFT, and CAGE instruments. *J Gen Intern Med.* 2005;20(1):1-6. PMID: 15693920. 10.1111/j.1525-1497.2005.40052.x
16. Demartini KS, Carey KB. Optimizing the use of the AUDIT for alcohol screening in college students. *Psychol Assess.* 2012;24(4):954-63. PMID: 22612646. 10.1037/a0028519
17. Kokotailo PK, Egan J, Gangnon R, et al. Validity of the alcohol use disorders identification test in college students. *Alcohol Clin Exp Res.* 2004;28(6):914-20. PMID: 15201634. 10.1097/01.ALC.0000128239.87611.F5
18. Northrup TF, Malone PS, Follingstad D, et al. Using item response theory to improve alcohol dependence screening for African American and White male and female college students. *Addict Disord Their Treat.* 2013;12(2):99-109. 10.1097/ADT.0b013e3182627431
19. Aalto M, Alho H, Halme JT, et al. AUDIT and its abbreviated versions in detecting heavy and binge drinking in a general population survey. *Drug Alcohol Depend.* 2009;103(1-2):25-9. PMID: 19395203. 10.1016/j.drugalcdep.2009.02.013
20. Bartoli F, Crocamo C, Biagi E, et al. Clinical utility of a single-item test for DSM-5 alcohol use disorder among outpatients with anxiety and depressive disorders. *Drug Alcohol Depend.* 2016;165:283-7. PMID: 27318372. 10.1016/j.drugalcdep.2016.06.003
21. Boschloo L, Vogelzangs N, Smit JH, et al. The performance of the Alcohol Use Disorder Identification Test (AUDIT) in detecting alcohol abuse and dependence in a population of depressed or anxious persons. *J Affect Disord.* 2010;126(3):441-6. PMID: 20537398. 10.1016/j.jad.2010.04.019
22. Bradley KA, Bush KR, Epler AJ, et al. Two brief alcohol-screening tests from the Alcohol Use Disorders Identification Test (AUDIT): validation in a female Veterans Affairs patient population. *Arch Intern Med.* 2003;163(7):821-9. PMID: 12695273. 10.1001/archinte.163.7.821
23. Buchsbaum DG, Welsh J, Buchanan RG, et al. Screening for drinking problems by patient self-report. Even 'safe' levels may indicate a problem. *Arch Intern Med.* 1995;155(1):104-8. PMID: 7802509. 10.1001/archinte.1995.00430010112015
24. Clements R. A critical evaluation of several alcohol screening instruments using the CIDI-SAM as a criterion measure. *Alcohol Clin Exp Res.* 1998;22(5):985-93. PMID: 9726267. 10.1111/j.1530-0277.1998.tb03693.x

25. Crawford EF, Fulton JJ, Swinkels CM, et al. Diagnostic efficiency of the AUDIT-C in U.S. veterans with military service since September 11, 2001. *Drug Alcohol Depend.* 2013;132(1-2):101-6. PMID: 23465735. 10.1016/j.drugalcdep.2013.01.012
26. Dawson DA, Grant BF, Stinson FS, et al. Effectiveness of the derived Alcohol Use Disorders Identification Test (AUDIT-C) in screening for alcohol use disorders and risk drinking in the US general population. *Alcohol Clin Exp Res.* 2005;29(5):844-54. PMID: 15897730. 10.1097/01.ALC.0000164374.32229.A2
27. Dawson DA, Pulay AJ, Grant BF. A comparison of two single-item screeners for hazardous drinking and alcohol use disorder. *Alcohol Clin Exp Res.* 2010;34(2):364-74. PMID: 19951291. 10.1111/j.1530-0277.2009.01098.x
28. Dawson DA, Smith SM, Saha TD, et al. Comparative performance of the AUDIT-C in screening for DSM-IV and DSM-5 alcohol use disorders. *Drug Alcohol Depend.* 2012;126(3):384-8. PMID: 22728044. 10.1016/j.drugalcdep.2012.05.029
29. Degenhardt LJ, Conigrave KM, Wutzke SE, et al. The validity of an Australian modification of the AUDIT questionnaire. *Drug Alcohol Rev.* 2001;20(2):143-54. PMID: None. 10.1080/09595230120058533
30. Foxcroft DR, Smith LA, Thomas H, et al. Accuracy of Alcohol Use Disorders Identification Test for detecting problem drinking in 18-35 year-olds in England: method comparison study. *Alcohol Alcohol.* 2015;50(2):244-50. PMID: 25534931. 10.1093/alcalc/agu095
31. Gache P, Michaud P, Landry U, et al. The Alcohol Use Disorders Identification Test (AUDIT) as a screening tool for excessive drinking in primary care: reliability and validity of a French version. *Alcohol Clin Exp Res.* 2005;29(11):2001-7. PMID: 16340457. 10.1097/01.alc.0000187034.58955.64
32. Gomez A, Conde A, Santana JM, et al. Diagnostic usefulness of brief versions of Alcohol Use Disorders Identification Test (AUDIT) for detecting hazardous drinkers in primary care settings. *J Stud Alcohol Drugs.* 2005;66(2):305-8. PMID: 15957683. 10.15288/jsa.2005.66.305
33. Gomez A, Conde A, Santana JM, et al. The diagnostic usefulness of AUDIT and AUDIT-C for detecting hazardous drinkers in the elderly. *Aging Ment Health.* 2006;10(5):558-61. PMID: 16938691. 10.1080/13607860600637729
34. Gual A, Segura L, Contel M, et al. Audit-3 and audit-4: effectiveness of two short forms of the alcohol use disorders identification test. *Alcohol Alcohol.* 2002;37(6):591-6. PMID: 12414553.
35. Isaacson JH, Butler R, Zacharek M, et al. Screening with the Alcohol use Disorders Identification Test (AUDIT) in an inner-city population. *J Gen Intern Med.* 1994;9(10):550-3. PMID: 7823225.
36. Kumar PC, Cleland CM, Gourevitch MN, et al. Accuracy of the Audio Computer Assisted Self Interview version of the Alcohol, Smoking and Substance Involvement Screening

Test (ACASI ASSIST) for identifying unhealthy substance use and substance use disorders in primary care patients. *Drug Alcohol Depend.* 2016;165:38-44. PMID: 27344194. 10.1016/j.drugalcdep.2016.05.030

37. Levola J, Aalto M. Screening for At-Risk Drinking in a Population Reporting Symptoms of Depression: A Validation of the AUDIT, AUDIT-C, and AUDIT-3. *Alcohol Clin Exp Res.* 2015;39(7):1186-92. PMID: 26058472. 10.1111/acer.12763

38. McCann BS, Simpson TL, Ries R, et al. Reliability and validity of screening instruments for drug and alcohol abuse in adults seeking evaluation for attention-deficit/hyperactivity disorder. *Am J Addict.* 2000;9(1):1-9. PMID: 10914288. 10.1080/10550490050172173

39. McGinnis KA, Justice AC, Kraemer KL, et al. Comparing alcohol screening measures among HIV-infected and -uninfected men. *Alcohol Clin Exp Res.* 2013;37(3):435-42. PMID: 23050632. 10.1111/j.1530-0277.2012.01937.x

40. McNeely J, Strauss SM, Saitz R, et al. A Brief Patient Self-administered Substance Use Screening Tool for Primary Care: Two-site Validation Study of the Substance Use Brief Screen (SUBS). *Am J Med.* 2015;128(7):784.e9-19. PMID: 25770031. 10.1016/j.amjmed.2015.02.007

41. McNeely J, Wu LT, Subramaniam G, et al. Performance of the Tobacco, Alcohol, Prescription Medication, and Other Substance Use (TAPS) Tool for Substance Use Screening in Primary Care Patients. *Ann Intern Med.* 2016. PMID: 27595276. 10.7326/m16-0317

42. Gryczynski J, McNeely J, Wu LT, et al. Validation of the TAPS-1: A Four-Item Screening Tool to Identify Unhealthy Substance Use in Primary Care. *J Gen Intern Med.* 2017. PMID: 28550609. 10.1007/s11606-017-4079-x

43. Piccinelli M, Tessari E, Bortolomasi M, et al. Efficacy of the alcohol use disorders identification test as a screening tool for hazardous alcohol intake and related disorders in primary care: a validity study. *BMJ.* 1997;314(7078):420-4. PMID: 9040389. 10.1136/bmj.314.7078.420

44. Rumpf HJ, Hapke U, Meyer C, et al. Screening for alcohol use disorders and at-risk drinking in the general population: psychometric performance of three questionnaires. *Alcohol Alcohol.* 2002;37(3):261-8. PMID: 12003915.

45. Seale JP, Boltri JM, Shellenberger S, et al. Primary care validation of a single screening question for drinkers. *J Stud Alcohol Drugs.* 2006;67(5):778-84. PMID: 16847548. 10.15288/jsa.2006.67.778

46. Smith PC, Schmidt SM, Allensworth-Davies D, et al. Primary care validation of a single-question alcohol screening test.[Erratum appears in *J Gen Intern Med.* 2010 Apr;25(4):375]. *J Gen Intern Med.* 2009;24(7):783-8. PMID: 19247718. 10.1007/s11606-009-0928-6

47. Volk RJ, Steinbauer JR, Cantor SB, et al. The Alcohol Use Disorders Identification Test (AUDIT) as a screen for at-risk drinking in primary care patients of different racial/ethnic backgrounds. *Addiction.* 1997;92(2):197-206. PMID: 9158231. 10.1111/j.1360-0443.1997.tb03652.x

48. Aalto M, Alho H, Halme JT, et al. The Alcohol Use Disorders Identification Test (AUDIT) and its derivatives in screening for heavy drinking among the elderly. *Int J Geriatr Psychiatry*. 2011;26(9):881-5. PMID: 20661878. 10.1002/gps.2498
49. Bull LB, Kvigne VL, Leonardson GR, et al. Validation of a self-administered questionnaire to screen for prenatal alcohol use in Northern Plains Indian women. *Am J Prev Med*. 1999;16(3):240-3. PMID: 10198664. 10.1016/S0749-3797(98)00158-5
50. Lopez MB, Lichtenberger A, Conde K, et al. Psychometric Properties of Brief Screening Tests for Alcohol Use Disorders during Pregnancy in Argentina. *Revista Brasileira de Ginecologia e Obstetricia*. 2017;39(7):322-9. PMID: 28609804. 10.1055/s-0037-1603744