

# The development of new alcohol screening and assessment measures for young people

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SSA SOCIETY FOR THE  
STUDY OF  
ADDICTION

# Why needed?

- Expert guidance (NICE, 2010) and recent reviews have highlighted the pressing need for a reliable and valid, age appropriate alcohol screener for young people.
- NICE public health guidance 24 states under recommendations for research:

*“Which screening tool should be considered as the 'gold standard' for assessing the drinking behaviour of those under the age of 18?” (p.43)*

# Programme Aim

- To develop psychometrically validated alcohol criterion measures for young people aged 15 to 17.
- Stage 1: Systematic Review
- Stage 2: Instrument Development
- Stage 3: Instrument Testing
- Stage 4: Instrument Roll out

# Stage 1: SR

- Systematic review to evaluate the validity of available instruments for screening and assessing alcohol consumption or problems in young people aged 24 and under.
- Highlight the best performing measures for screening and assessment based on psychometric properties and validation studies supporting their use.

# Quality Thresholds

Predictive  
Validity  $>0.7$   
(AUC, Sen  $>0.8$ )

Internal  
Reliability  
 $>0.8$

Test-retest  
Reliability  
 $>0.7$

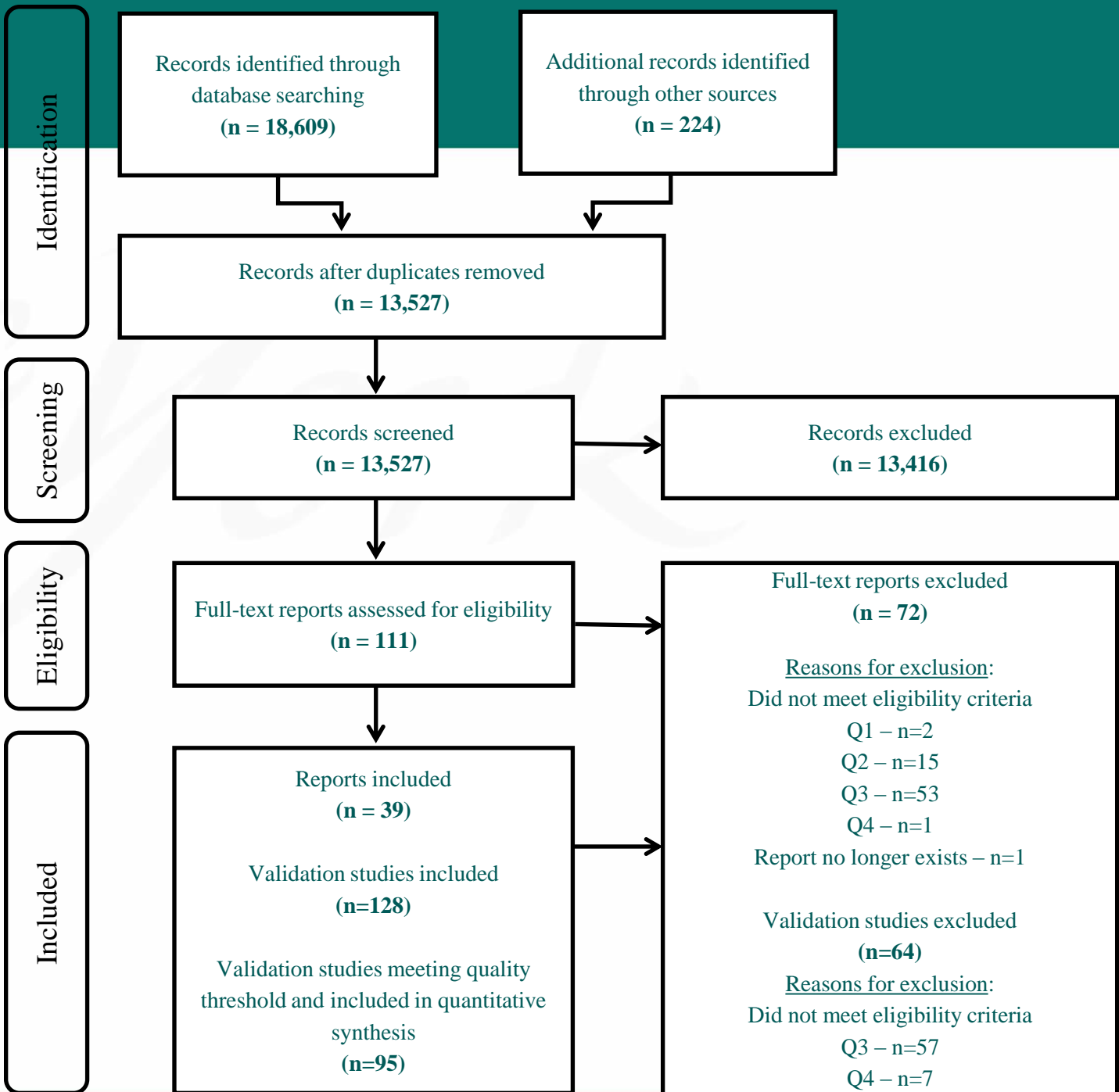
# Quality Assessment

- Only studies meeting those thresholds are assessed for quality using modified:
- COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN).
- A QUality Assessment tool for Diagnostic Accuracy Studies (QUADAS-2).

## For further details:

Toner, P., Boehnke, J.R., & McCambridge, J. (2017). A systematic review of alcohol screening and assessment measures for young people: a study protocol. *BMJ Open*, 1-5. DOI: 10.1136/bmjopen-2017-016406

<https://www.addiction-ssa.org/symposium/presentation/capturing-youth-drinking-whats-been-done-and-what-needs-to-be-done-in-psych>





# Screening Measures

Dichotomous Measures	Validation Studies (under thresholds)	Reference tests (for studies under thresholds)	Validation Studies (over thresholds)	Reference tests (for studies over thresholds)
Alcohol Use Disorders Identification Test (AUDIT): Items 1-10	2	1 CAPS:SE; 1 CAPS:CS	10	8 DSM; 1 DDQ; 1 TLFB
Modified Alcohol Use Disorders Identification Test (AUDIT): Items 1-10	0		2	2 DSM
Alcohol Use Disorders Identification Test - Consumption (AUDIT-C): Items 1-3	0		10	6 DSM (4 same report); 2 DDQ (2 same report); 1 CAPS:SE, 1 CAPS:CS
Modified Alcohol Use Disorders Identification Test (AUDIT): C subscale: Items 1-3	0		1	1 DSM
Alcohol Use Disorders Identification Test (AUDIT): Items 4-10	0		2	1 CAPS:SE, 1 CAPS:CS
Alcohol Use Disorders Identification Test (AUDIT): Items 4,5,6,7,8,10	0		4	4 DSM (same report)
Modified Alcohol Use Disorders Identification Test (AUDIT): Items 4-10	0		1	1 DSM
Fast Alcohol Screening Test (FAST): Items 3,5,8,10	0		1	1 DSM

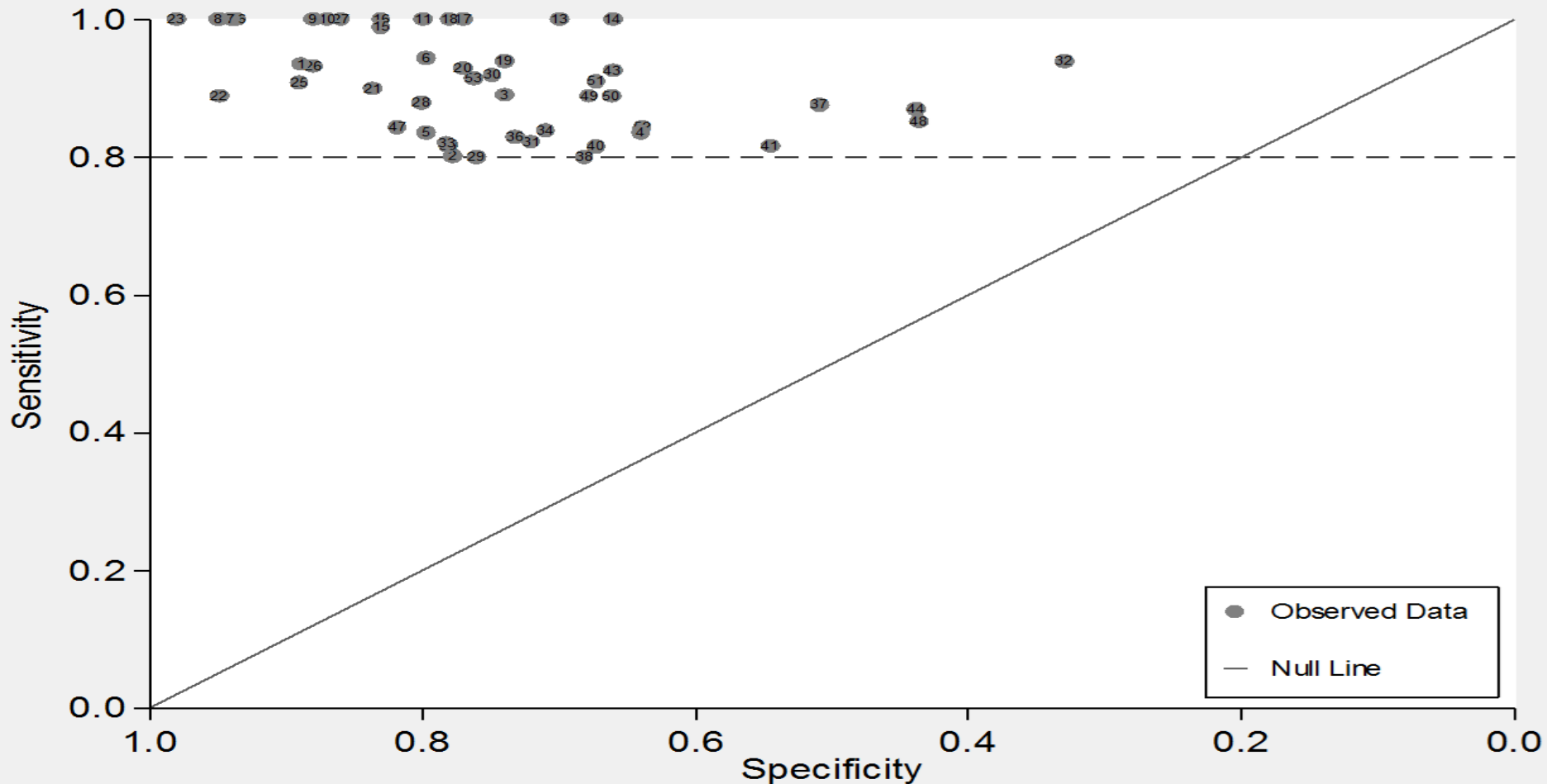


# Screening Measures

Dichotomous Measures	Validation Studies (under thresholds)	Reference tests (for studies under thresholds)	Validation Studies (over thresholds)	Reference tests (for studies over thresholds)
Alcohol Change Index (ACI)	3	1 AUDIT; 1 CAPS:SE; 1 CAPS:CS	0	
Alcohol Frequency	0		12	12 DSM (7 same report & 3 same report)
Alcohol Quantity	0		10	10 DSM (7 same report & 3 same report)
Binge Drinking	2	1 CAPS:SE; 1 CAPS:CS	2	1 AUDIT; 1 MmMAST
Heavy Drinking (QFI)	4	1 AUDIT; 1 CAPS:SE; 1 CAPS:CS; 1 MmMAST	0	
HED Frequency	2	2 DSM	5	5 DSM (5 same report)
Peak Drinking (RD)	1	1 MmMAST	0	
Quantity-Frequency (QF)	0		3	3 DSM (3 same report)
Timeline Follow-Back (TLFB)	1	1 AUDIT	0	

# Diagnostic Meta-analysis

- 53 independent samples available for the analysis (n=186,609) - 14% of participants screened positive on reference tests.



# Diagnostic Meta-analysis

- Clearly shows the selection effect for the sensitivities (e.g. Sen = .93 – 1; Chung et al., 2012 provided 14 independent samples); the specificities show a wide range of values (e.g. Spec = .33; Cook et al., 2005 lowest value).
- Quality benchmark – based on the sample of selected studies, new screening instruments should reach **a minimal sensitivity of .95 and minimal specificity of .74.**

# Assessment Measures

Continuous Measures	Validation Studies (under thresholds)	Reference tests (for studies under thresholds)	Validation Studies (over thresholds)	Reference tests (for studies over thresholds)
Alcohol Misuse Items	0		1	1 AUDIT
The Alcohol Problems Scale (APS)	1	1 AUDIT-C	1	1 AUDIT
The Academic Role Expectations and Alcohol Scale (AREAS)	0		2	1 AUDIT; 1 AUDIT-C
College Alcohol Problems Scale (CAPS)	0		1	1 DSM
Leeds Dependence Questionnaire (LDQ)	0		1	1 AUDIT
Rutgers Alcohol Problem Index (RAPI)	5	1 DSM; 3 DDQ; 1 DDQ-R	2	1 DSM; 1 AUDIT
The Severity of Dependence Scale (SDS)	0		1	1 AUDIT
Young Adult Alcohol Consequences Questionnaire (YAACQ)	0		4	1 RAPI; (1 AUDIT; 1 YAAPST; 1 YAAPST- D same report)
Brief Young Adult Alcohol Consequences Questionnaire (B-YAACQ)	2	1 DDQ-R; 1 TLFB	4	2 AUDIT; 1 AUDIT-PC; 1 RAPI
Young Adult Alcohol Problems Screening Test (YAAPST)	0		1	1 DSM

# Reliability Meta-analysis

- 20 independent samples available for the analysis (n=12,760), 11 for assessment and 9 for screening instruments.
- Data analysed with mixed model controlling for clustering by study.

	Estimate	Confidence Interval	Transformed Estimate
All reliabilities	.582	[.554, .610]	.803
Screening	.567	[.530, .604]	.818
Assessment	.602	[.560, .644]	.782

# Summary

- Two contrasting literatures – volume and strength of evidence much superior for screening measures – work to determine whether other items add anything to AUDIT-C.
- Limited and weak evidence for assessment measures – qualitative information on item content required to augment existing items.

# Stage 2: Development

- Item pool - Index tests which surpassed quality thresholds in multiple validation studies were selected.
- Candidate items were extracted from these index tests with the following exceptions:
  - Duplicate item content;
  - Items demonstrating: low item-to-total correlations ( $r < .30$ ), low factor/component loadings ( $h < .30$ ), or items that have been shown to reduce scale reliability;
  - Items showing differential item functioning in relation to age, gender and ethnicity;
  - Level of item endorsement (above 0.9 or below 0.1) and relevance to a youth population/UK context.



# Qualitative sample

- 44 semi-structured interviews with young people aged 14-17 who drank alcohol in the last six months (26 male, 18 female, average age 16.3).
- Recruited from a range of settings e.g. College, Community, Youth Offending, Pupil Referral Units, Care Hostels.
- 19 interviews focused on screening items and 25 interviews examined assessment items (had to have at least 2 drinking days in the last six months).

# Analysis

- Interviews were digitally recorded (with permission) and fully transcribed.
- Preliminary Analysis – to establish the item content for the pilot instrument. Based on which items and response formats preferred and key questions /phrases mentioned by the young people.
- Content analysis – counts for items endorsed, item clarification.
- Thematic analysis – item refinement, item formation.

# Content Analysis - Screening

Drinking 1 - Set 2	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
1	X		X	X							✓		✓						
2	X		✓	✓	✓	✓			✓		✓	✓	✓		✓	✓	✓		✓
3	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	X		✓	✓	✓
4	✓	✓	✓	X	X	✓	✓	✓		X	X	✓		✓	X		X		✓
5	✓	✓	X	X							X				X				X

- 2) How many days have you had a drink with alcohol in the last month?
- 3) How many days have you had a drink with alcohol in the last three months?

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
Any alcohol	Alcoholic drink/beverage/Any alcohol	Any alcohol	Any alcohol	Alcoholic drink/Any alcohol - could get confused with having a dessert	Alcoholic drink	Alcoholic drink/Any alcohol	Alcoholic drink	Drink because people know the questionnaire is about alcohol	Alcoholic drink	Drink	Any alcohol	Do not have a preference drink is fine	Alcoholic drink/Any alcohol	Containing alcohol/Any alcohol	Any alcohol	Drink or Alcoholic drink	No preference	Alcoholic drink

How many days did you drink any alcohol in the last month?

How many days did you drink any alcohol in the last three months?

# Content Analysis - Assessment

Drinking 2 - Set 3	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225
6	✓		✓				✓	✓	✓	✓				✓	✓		✓								✓
7	✓		✓				✓	✓	✓	✓					✓		✓		✓		✓	✓			✓

6) Have you felt sick after drinking?

7) Have you thrown up after drinking?

203	205	214	217	219
Would change the question - have you thrown up while drinking - after makes it sound like the next morning	If you've thrown up, you'd have felt sick	I would keep 6 and maybe 7, they can be two separate things, but being sick in general you can throw up as well	You could combine them	You could group them together about the ill effects of drinking

**Have you felt sick or thrown up from drinking?**

*I mean I feel like the other ones were a bit more like what were your experiences while drinking? And these are a bit more like oh, we're here to help. But number two I'd probably rephrase to have you unexpectedly done something while you were drinking? Because a lot of times people don't have expectations for other people while they're drunk. But a lot of times you have your own expectations. So I'd probably say something like have you ever surprised yourself while drunk by doing something unexpected. (221, Female, 17)*

**Have you surprised yourself while drinking by doing something unexpected?**

# Pilot Instrument

- *Alcohol Consumption*
  - How many days did you drink any alcohol in the *last month*?
- *Intoxication*
  - Have you felt sick or thrown up from drinking?
- *Regular drinking*
  - Did you regularly drink alcohol during weekends?
- *Regretted behaviour*
  - Have you said or done embarrassing things when drinking?
- *Impact on school/college/work*
  - Have you missed school, college or work because of drinking, a hangover, or an illness caused by drinking?
- *Link with mental health*
  - Have you felt stressed, anxious or depressed after drinking?
- *Dependence*
  - Did the prospect of missing out on drinking make you feel anxious or annoyed?

# Stage 3: Testing

- Five random item order versions (14 screening items, 50 assessment items) of the pilot instrument were compared with the AUDIT as a reference standard with 277 young people aged 15 to 17.
- Total sample n=438 – 104 18 year olds, 57 diversion questionnaires.
- Made pragmatic decision to include 18 year olds who were part of the same year/peer group. Perform DIF/non variance testing 15-17 v 18, whether items translate across age boundary – guided by what items work best for 15-17 year olds.



# Initial Results

- 369 (96.9%) questionnaires eligible for further quantitative analysis.
- Sample: 50% female; 95% White; 97% attending school or college.
- How 14 new screening items perform against AUDIT  $\geq 8$  criterion.

# Screening

Item Number	AUC
2	0.69
3	0.76
4	0.78
5	0.69
6	0.77
7	<b>0.83</b>
8	<b>0.86</b>
9	0.74
10	0.75
11	0.37
12	0.69
13	0.67
14	<b>0.85</b>
15	<b>0.88</b>

**8** On the days that you drank any alcohol during the last three months, what was the highest number of drinks you had?

**15** During the last three months, on how many days did you have six or more drinks on the same occasion?

# Assessment

- 50 assessment items were tested.
- Factor Analysis – Item pool is dominated by a strong first dimension (eigenvalue = 19.63).
- Item 16 had smallest loading on that factor:  

16	Did you mostly drink shots or spirits when drinking?
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- Items are largely connected and likely to form an item bank.
- Parallel analysis - may be up to five dimensions, explore whether distinct.
- Internal reliability of item pool ( $\alpha = .97$ ; scaled estimate for 10 items: .87).

# Next steps

- Identify candidate screening and assessment items for roll out instrument based on quantitative and qualitative information from stage 3.
- Stage 4 recruitment of 300 young people in a range of settings, including online version of instrument and a test re-test reliability sub-sample.
- Confirmatory analysis of roll out instrument to arrive at a new item bank and instrument for assessing alcohol use and problems in young people.