

# Electronic forms of alcohol screening and brief intervention

## What reviews tell us

*23 September 2011  
INEBRIA Conference, Boston, USA*

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# Outline

- Why e-SBI ?
- Review of reviews
- Implications and future directions

## Global alcohol-attributable fractions for injury

	15-29 yrs		30-44 yrs		45-59yrs	
	Female	Male	Female	Male	Female	Male
<b>MVTCs</b>	.09	.32	.14	.36	.12	.09
<b>Poisoning</b>	.16	.26	.11	.15	.12	.16
<b>Falls</b>	.10	.20	.10	.21	.11	.21
<b>Drowning</b>	.18	.24	.23	.29	.24	.29
<b>Other unintentional</b>	.16	.26	.17	.27	.15	.23
<b>Self-inflicted</b>	.07	.14	.07	.15	.06	.11
<b>Homicide</b>	.19	.25	.20	.25	.21	.26
<b>Other intentional</b>	.14	.19	.15	.19	.16	.20

Source: Rehm J, et al, 2003 *Addiction* 98:1209-28

“It is unlikely that there is any other risk factor that accounts for so many preventable injuries” (Pless, 2000, p.76)

**Gentilello et al. Alcohol interventions in a trauma center as a means of reducing the risk of injury recurrence.  
*Annals of Surgery 1999;230(4):473-83.***

- 2524 trauma patients screened with GGT and SMAST
- 1153 screened positive (46%)
- 396 to control, 366 randomized to brief intervention
- “a single motivational interview with a psychologist trained in the use of brief interventions” (30 minutes)
- At 12 months:
  - Intervention group: - 22 drinks / week
  - Control group: - 7 drinks / week

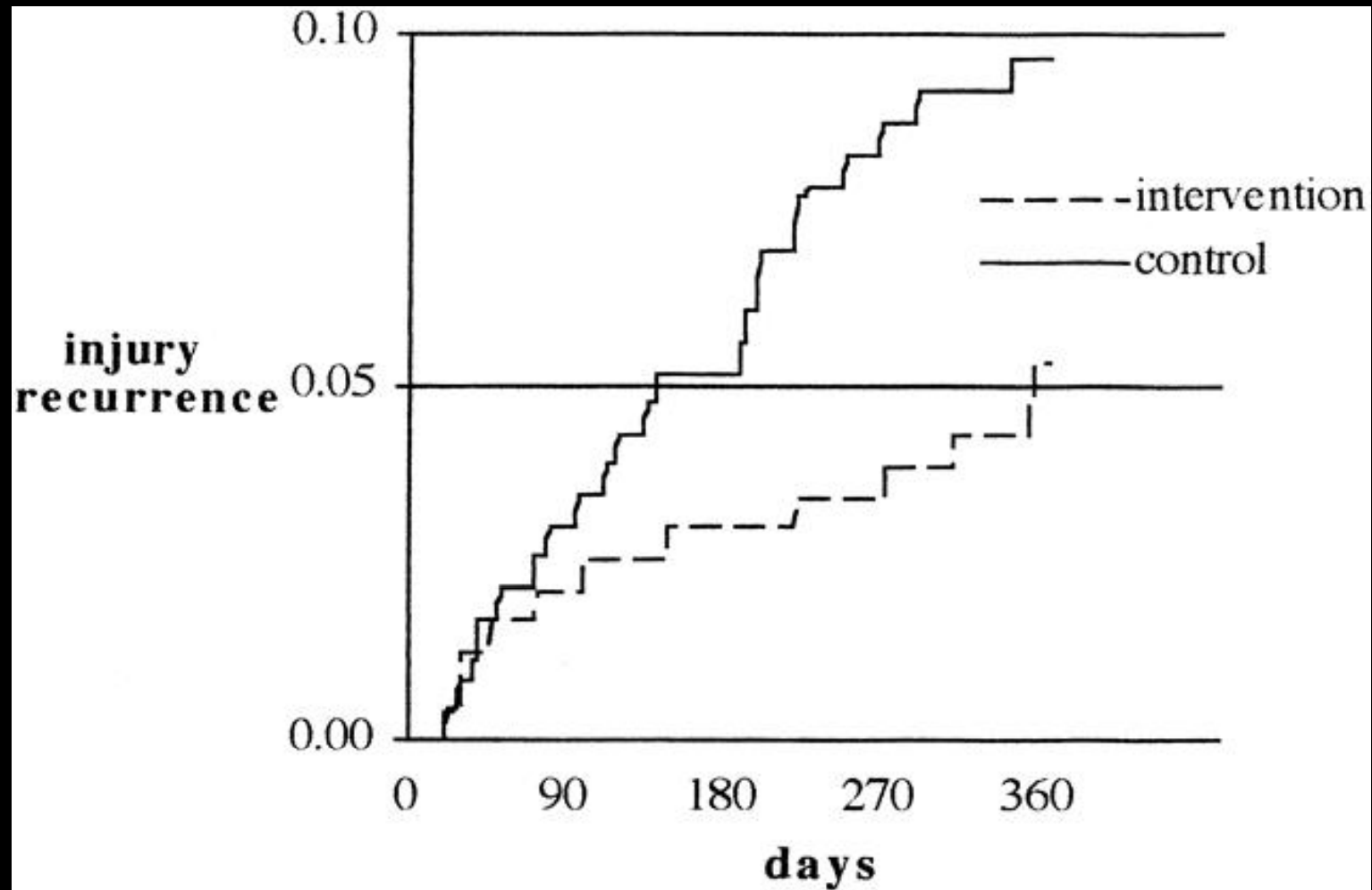


Figure 2. Risk of repeat injury requiring treatment in the Harborview Medical Center Emergency Department or admission to the trauma center. The analysis is for King County residents at 1 year follow-up and controls for gender, SMAST score, age, injury intent, and injury severity score (hazard ratio 0.53, 95% CI 0.26-1.07).



1st Year Relationships Last

Yeah right.  
Tui

Tui

15 21  
MONDAY NIGHT BINGO  
Starts at 8pm  
Free to play  
RTD Special  
\$3 and up  
\$3 COCKTAILS

FIGHT ROSE TUESDAY  
POOL COMP  
STARTS 8pm  
FREE POOL  
\$3 COCKTAILS

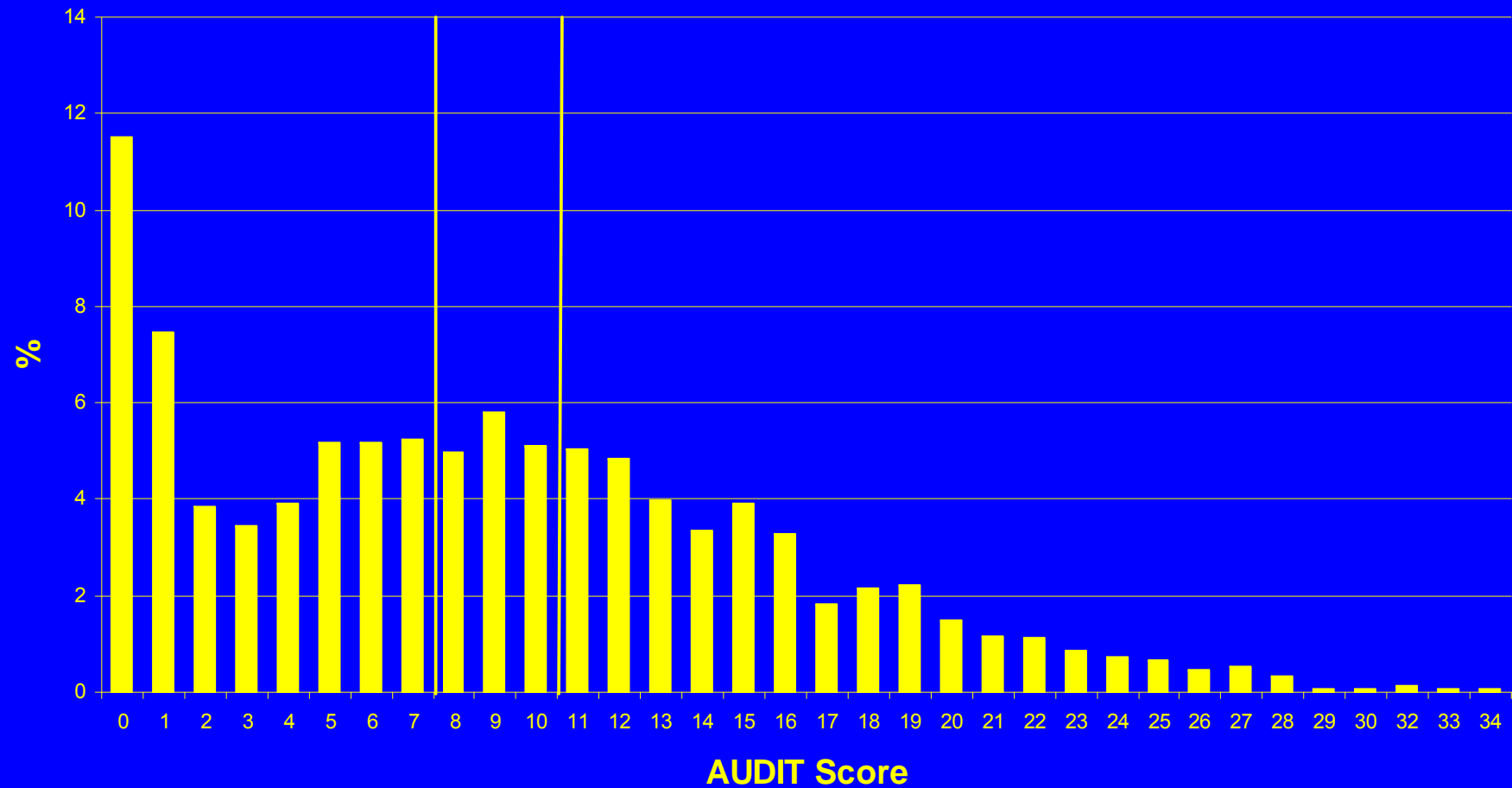
FRIDAY NIGHT LIGHTS  
\$5 SHOT OF THE WEEK  
\$5 DRINK OF THE WEEK  
LIVE ACOUSTIC SET  
\$3 COCKTAILS 6-9pm

Saturday session  
\$3 DOUBLE 8-11  
RBND POWER HOUR 8-11  
LOADS OF DOLLARS ON ALL DRINKS

229 S.O. Order  
210 RTD Fruit Buckets  
212 RTD Beer Special. Food & a Drink 12-3pm

Waste Management  
477-1700

## AUDIT scores of a New Zealand Tertiary Student Sample (N=1529)



Kypri K, Langley JD, McGee R, Saunders JB, Williams S. High prevalence, persistent hazardous drinking among New Zealand tertiary students. *Alcohol* 2002;37(5):457-64.

University Student Health Service: >42,000 consultations with >10,000 students per year (2/3 of student population)





# Advice from the gurus

SBI trial for university student hazardous drinkers ?

1999: Saunders, Heather, and Marlatt

*“I’d rather publicly admit I had a drinking problem than admit I was seeing a counsellor”*

24 year-old male student in focus group discussion on screening and brief intervention (2000)

# Providing Personalized Assessment Feedback for Problem Drinking on the Internet: A Pilot Project\*

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**ABSTRACT.** *Objective:* This project developed an Internet program that conducts a brief assessment of an individual's drinking habits and then provides normative feedback comparing the user's drinking to that of others of the same gender and age group. The Internet program, "Try Our Free Drinking Evaluation," was based at the Addiction Research Foundation Internet web site (now at <http://notes.camh.net/efeed.nsf/newform>). *Method:* A voluntary survey linked to the participant's feedback summary collected respondents' impressions of the program. *Results:* During the trial period, the site received approximately 500 hits

per month. While the feedback was generally well received, the weekly summary format was less credible to those individuals who drink less than once per week or whose consumption varies a great deal over time. *Conclusions:* Given these pilot results indicating that there is an audience for Internet-based interventions, the next step is to evaluate whether receiving such personalized feedback materials on the Internet leads to any change in drinking behavior by participants (*J. Stud. Alcohol* 61: 794-798, 2000)

THERE IS convincing evidence that self-help materials can help problem drinkers (e.g., Agostinelli et al., 1995; Heather et al., 1990; Koski-Jännes, 1995; Miller and Muñoz, 1982; Sanchez-Craig et al., 1996; Sitharthan et al., 1996). The next step towards promoting the use of these interventions is to explore ways to increase their availability. Such efforts follow logically from the Institute of Medicine's recommendation to broaden the base of treatment and to provide a wide array of services for people with alcohol-related problems (Institute of Medicine, 1990). The Internet is one tool that can be used to improve the accessibility of self-help interventions. The pilot project discussed here is an Internet program that conducts a brief assessment of the individual's drinking habits and then provides normative feedback comparing the participant's drinking to others of the same gender and age group. Normative feedback has been theorized to increase motivation for change (Agostinelli and Miller, 1994; Miller and Rollnick, 1991) and has been found to promote behavior change in drinkers (Agostinelli et al., 1995) and smokers (Curry et al., 1991, 1992). The Internet program,

"Try Our Free Drinking Evaluation," was mounted on the Addiction Research Foundation Internet web site (now at <http://notes.camh.net/efeed.nsf/newform>). This article provides details of the drinking self-evaluation program and reports on the preliminary evaluation of the feedback service.

## Method

### Baseline survey

On contacting the Internet site, participants are asked to fill out a brief, anonymous survey about their drinking. The survey consists of 21 questions:

1. The first 10 items constitute the Alcohol Use Disorders Identification Test (AUDIT; Babor et al., 1989; Saunders et al., 1993), used to assess severity of alcohol problems. The measure, while brief, distinguishes between social and problem drinkers (Conigrave et al., 1995; Fleming et al., 1991; Seppä et al., 1995), which is of key importance as participants include a wide range of drinkers.
2. Respondents' drinking is assessed using the period-specific normal week approach (Kühnorn and Leifman, 1993; Romelsjö et al., 1995). This method of collecting drinking data asks respondents for their alcohol consumption during a typical week in the last year (i.e., usual number of drinks on each day of a typical week).
3. Six psychosocial consequence items commonly used in general population surveys (e.g., Canada's Alcohol and Other Drugs Survey, 1994 [CADS; Statistics Canada, 1994]) ask whether in the past 12 months respondents felt that alcohol had a harmful effect on their friendships/social life, physical health, home life or marriage, work, studies, or employment opportunities, financial position, or outlook on life (happiness).

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\*National Institute on Alcohol Abuse and Alcoholism grant AA11700-01 and Veterans Affairs Mental Health Strategic Health Group supported Keith Humphreys' contribution to this project.

<sup>†</sup>Address correspondence to John A. Cunningham, Centre for Addiction and Mental Health, 33 Russell Street, Toronto, Ontario M5S 2S1, Canada (email: [John.Cunningham@camh.net](mailto:John.Cunningham@camh.net)). Keith Humphreys is with the Center for Health Care Evaluation, Veterans Affairs and Stanford University Medical Centers, Menlo Park, CA. Anja Koski-Jännes is with Järvenpää Addiction Hospital and University of Helsinki, Helsinki, Finland.

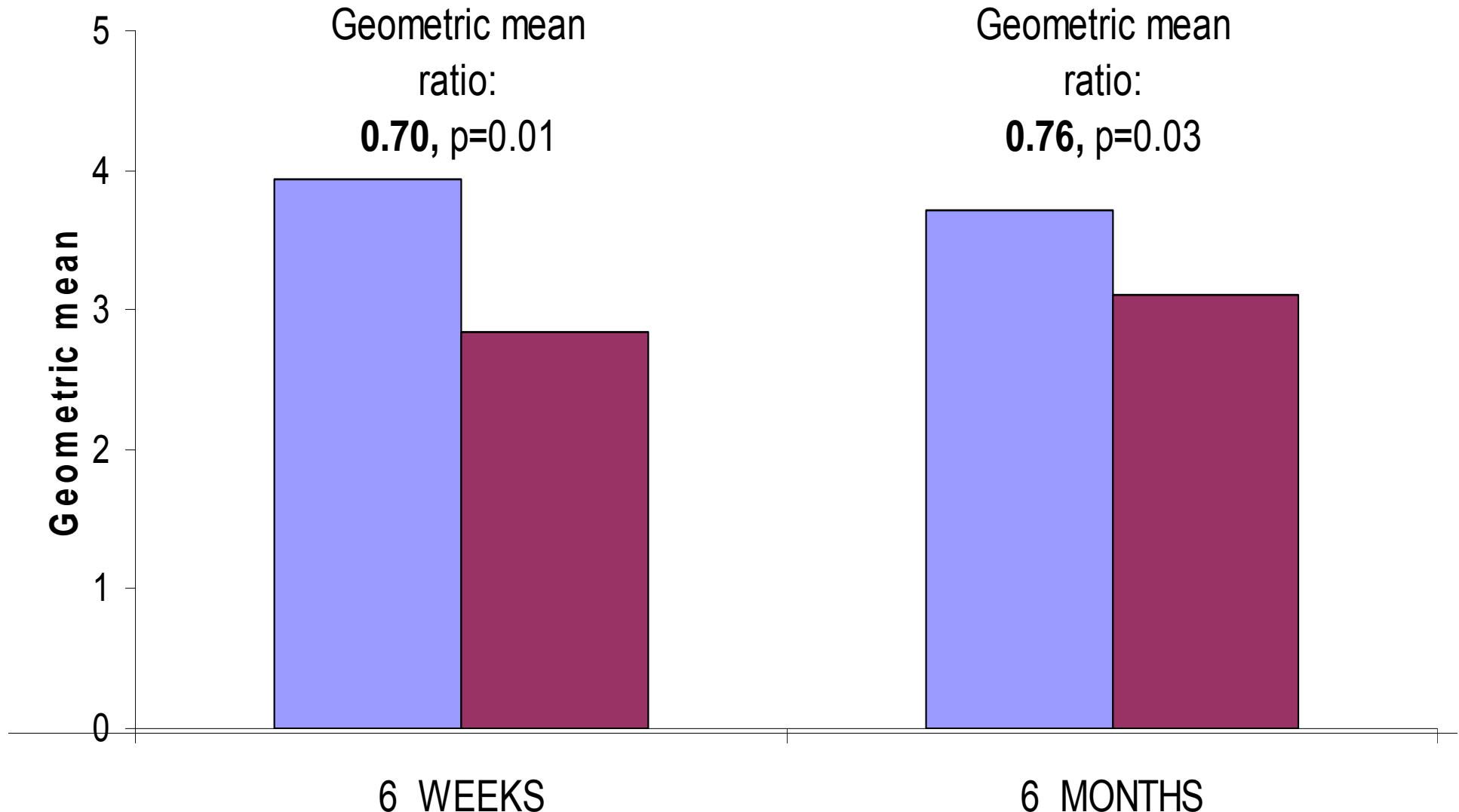
## Electronic Screening and Brief Intervention (e-SBI)



Kypri K, Saunders JB, Gallagher SJ. Acceptability of various brief intervention approaches for hazardous drinking among university students. *Alcohol Alcohol* 2003;38(6):626-8.



# Personal, social, sexual, and legal problems (# of problems last 4 weeks)

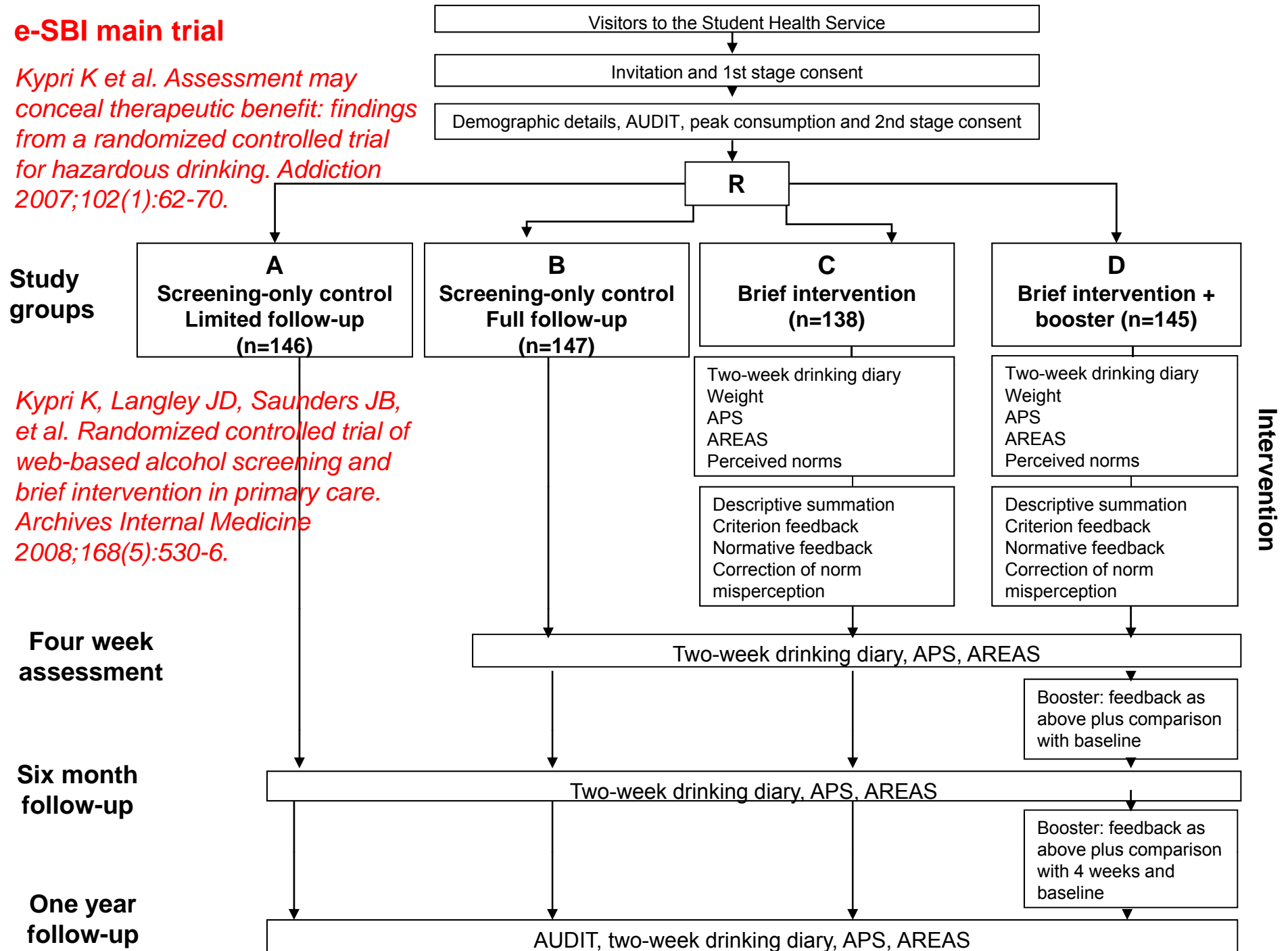


Kypri K, Saunders JB, Williams SM, McGee RO, Langley JD, Cashell-Smith ML, et al. Web-based screening and brief intervention for hazardous drinking: a double-blind randomized controlled trial. *Addiction* 2004;99(11):1410-7.

## e-SBI main trial

*Kypri K et al. Assessment may conceal therapeutic benefit: findings from a randomized controlled trial for hazardous drinking. Addiction 2007;102(1):62-70.*

*Kypri K, Langley JD, Saunders JB, et al. Randomized controlled trial of web-based alcohol screening and brief intervention in primary care. Archives Internal Medicine 2008;168(5):530-6.*



### PAST & CURRENT DRINKING

#### Standard Drinks Guide



=1

Spirit Shot/Nip (30ml)  
Port/Sherry (60ml)  
Full Strength Beer (Middy)



=1.5

Full Strength Beer (375ml)



=1.5

Pre-Mix Drinks (375ml)  
Champagne (170ml)  
Wine (150ml)



=0.8

Light Beer (375ml)

Now we'd like to ask some questions about your past alcohol use.

Please tick the box that relates best to your answer using the definitions of Standard Drinks on the left as a guide.

1. How often do you have a drink containing alcohol?

Once a week

2. How many Standard Drinks containing alcohol do you have on a typical day when you are drinking?

12

3. How often do you have six or more Standard Drinks on one occasion?

Weekly

4. How often during the last year have you found that you were not able to stop drinking once you had started?

Monthly

Kypri K, Hallett J, Howat P, et al.  
Randomized controlled trial of proactive  
web-based alcohol screening and brief  
intervention for university students.  
*Archives of Internal Medicine*  
2009;169(16):1508-14.

Feedback

Facts

Tips

Support

Thanks for completing the survey John.

Here you will find some feedback based on the answers you have provided as well as some other information on staying safe whilst drinking which you may find useful.

### YOUR ALCOHOL USE

0-7

Moderate  
Drinking

8-14

Hazardous  
Drinking

15-19

Harmful  
Drinking

20-40

Alcohol  
Dependence

Some of the questions you answered regarding your drinking come from the Alcohol Use Disorders Identification Test, a questionnaire developed by the World Health Organisation to determine whether a person's drinking might be becoming problematic.

**Your AUDIT score was 19**

MODERATE DRINKING (0-7)  
Low risk of alcohol related harm.

HAZARDOUS DRINKING (8-14)  
High risk of experiencing alcohol related harm and some people in this range may already be experiencing significant harm.

HARMFUL DRINKING (15-19)  
A person scoring in this range will already be experiencing significant alcohol related harm.

The main way to reduce your risk level (and AUDIT score) is to reduce the number of drinks you consume per occasion. You may like to check out the [tips](#) section for ideas on reducing your consumption.

ALCOHOL DEPENDENCE (20-40)  
A person scoring in this range may be alcohol dependent and advised to have a clinical assessment of their drinking.

## Full of promise

“While the literature on internet-based substance use interventions is sparse and flawed, the potential impact of effective intervention is considerable. On the basis of the limited research available it is reasonable to suggest that a demand for such interventions exists and there is a likelihood that they would be as effective as those delivered by therapists for the majority of less severely dependent clients”

Copeland J, Martin G. Web-based interventions for substance use disorders: a qualitative review. *J Subst Abuse Treat* 2004;26(2):109-16.



# AIM

- To provide an overview of the effectiveness of electronic interventions for unhealthy alcohol consumption (inclusive definition of e-SBI or e-BI) via published systematic reviews\*

# Co-investigators

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*John Cunningham PhD*

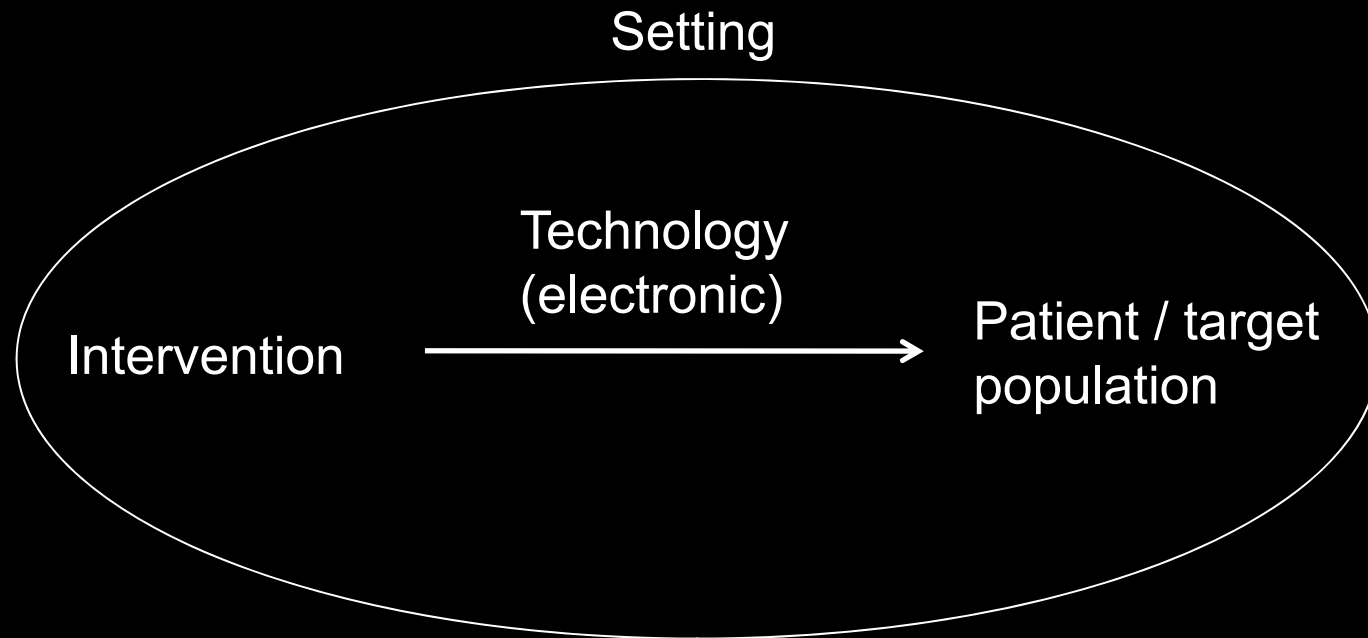
CAMH and University of Toronto

# What is e-SBI / e-BI?

Any psychological intervention of relatively short duration (<30 mins?) involving an electronic medium of communication, including:

- Telephone
  - ~ Landline: conversation, interactive voice recognition
  - ~ Mobile/cellular phone: conversation, SMS, MMS
  - ~ Smart phone (via cellular network or Internet)
- Computer
  - ~ Stand alone
  - ~ Local Area Network
  - ~ Internet: e-mail, WWW, Text based Chat, VOIP (e.g., Skype), Twitter

# Conceptual framework



evidence?

# Review questions

1. Which types of e-SBI are effective?  
e.g., normative feedback vs personalised advice;  
single vs multi-dose? what is the duration of the  
effect?
2. Does the technology make a difference to outcome?  
e.g., web versus telephone
3. In which patient / population groups does e-SBI work?  
e.g., young people vs older people; less versus more  
severe drinking problems
4. In what settings is e-SBI effective?  
e.g., healthcare vs other settings

# METHOD

1. Systematic identification of review articles
2. Evaluation of reviews
3. Analysis and summary of findings

Research article

Open Access

## Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews

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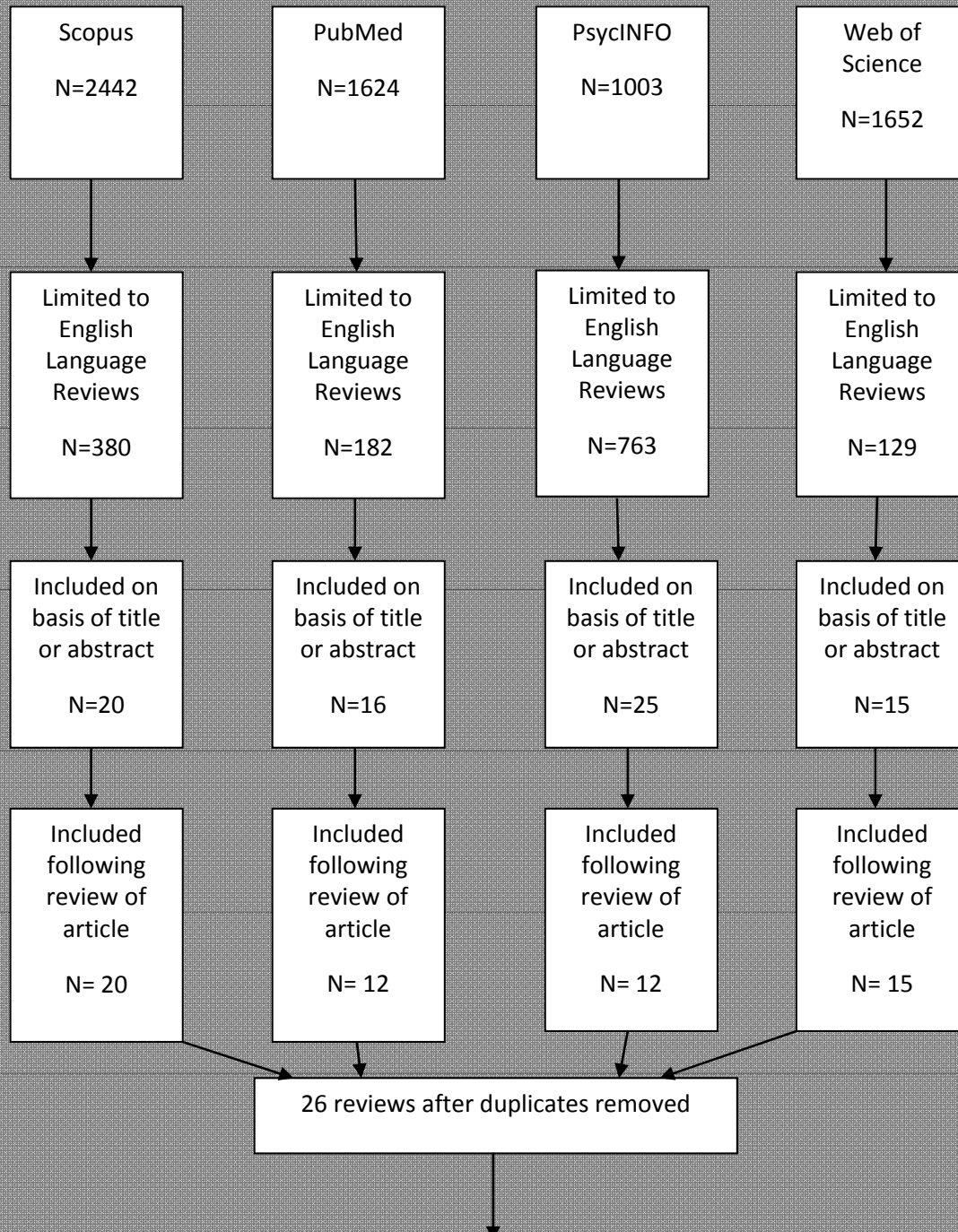
**Table 2: AMSTAR is a measurement tool created to assess the methodological quality of systematic reviews.**

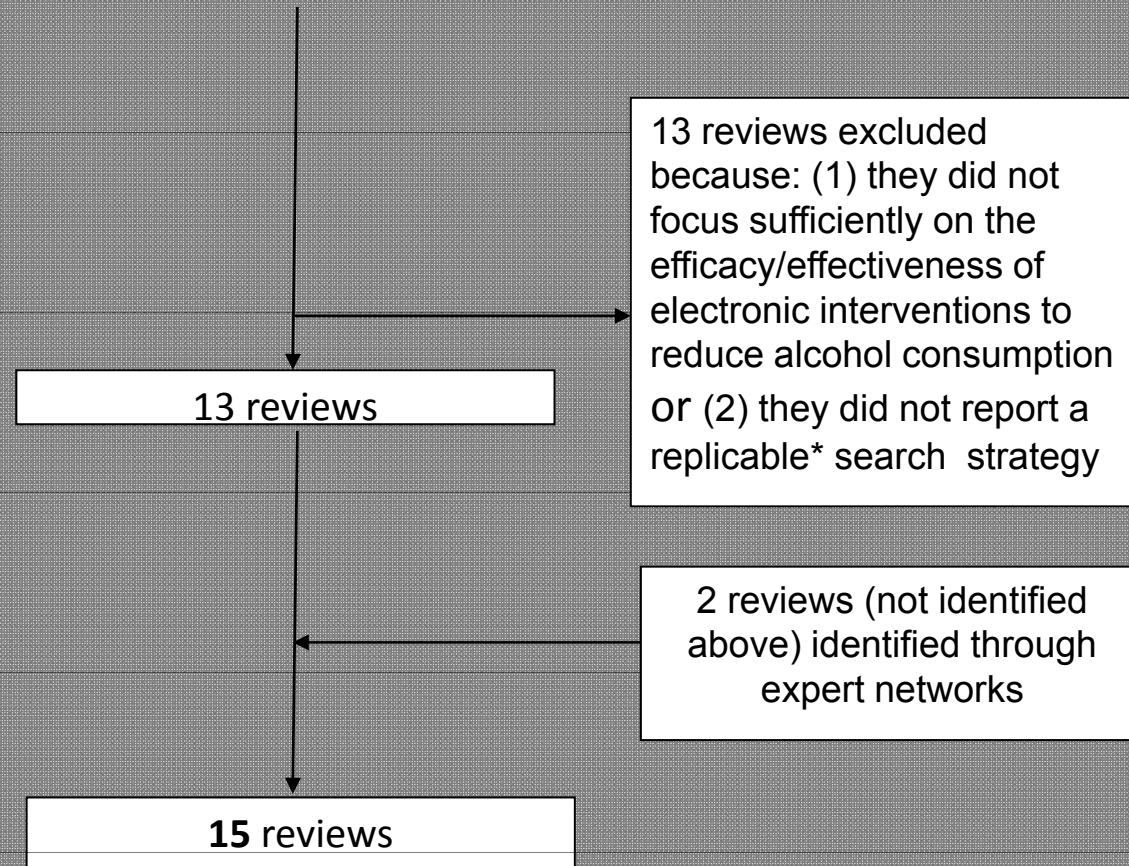
<b>1. Was an 'a priori' design provided?</b> The research question and inclusion criteria should be established before the conduct of the review.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Can't answer <input type="checkbox"/> Not applicable
<b>2. Was there duplicate study selection and data extraction?</b> There should be at least two independent data extractors and a consensus procedure for disagreements should be in place.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Can't answer <input type="checkbox"/> Not applicable
<b>3. Was a comprehensive literature search performed?</b> At least two electronic sources should be searched. The report must include years and databases used (e.g. Central, EMBASE, and MEDLINE). Key words and/or MESH terms must be stated and where feasible the search strategy should be provided. All searches should be supplemented by consulting current contents, reviews, textbooks, specialized registers, or experts in the particular field of study, and by reviewing the references in the studies found.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Can't answer <input type="checkbox"/> Not applicable
<b>4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?</b> The authors should state that they searched for reports regardless of their publication type. The authors should state whether or not they excluded any reports (from the systematic review), based on their publication status, language etc.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Can't answer <input type="checkbox"/> Not applicable
<b>5. Was a list of studies (included and excluded) provided?</b> A list of included and excluded studies should be provided.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Can't answer <input type="checkbox"/> Not applicable
<b>6. Were the characteristics of the included studies provided?</b> In an aggregated form such as a table, data from the original studies should be provided on the participants, interventions and outcomes. The ranges of characteristics in all the studies analyzed e.g. age, race, sex, relevant socioeconomic data, disease status, duration, severity, or other diseases should be reported.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Can't answer <input type="checkbox"/> Not applicable
<b>7. Was the scientific quality of the included studies assessed and documented?</b> 'A priori' methods of assessment should be provided (e.g., for effectiveness studies if the author(s) chose to include only randomized, double-blind, placebo controlled studies, or allocation concealment as inclusion criteria); for other types of studies alternative items will be relevant.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Can't answer <input type="checkbox"/> Not applicable
<b>8. Was the scientific quality of the included studies used appropriately in formulating conclusions?</b> The results of the methodological rigor and scientific quality should be considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Can't answer <input type="checkbox"/> Not applicable
<b>9. Were the methods used to combine the findings of studies appropriate?</b> For the pooled results, a test should be done to ensure the studies were combinable, to assess their homogeneity (i.e. Chi-squared test for homogeneity, $I^2$ ). If heterogeneity exists a random effects model should be used and/or the clinical appropriateness of combining should be taken into consideration (i.e. is it sensible to combine?).	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Can't answer <input type="checkbox"/> Not applicable
<b>10. Was the likelihood of publication bias assessed?</b> An assessment of publication bias should include a combination of graphical aids (e.g., funnel plot, other available tests) and/or statistical tests (e.g., Egger regression test).	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Can't answer <input type="checkbox"/> Not applicable
<b>11. Was the conflict of interest stated?</b> Potential sources of support should be clearly acknowledged in both the systematic review and the included studies.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Can't answer <input type="checkbox"/> Not applicable



# Search

- Scopus, PubMed, PsychINFO, and Web of Science.
- Search terms:
  - (1) alcohol *or* drink\* *and*
  - (2) intervention\* *or* education\* *or* counsel\* *and*
  - (3) web *or* internet *or* online *or* electronic *or* tele *or* technol\*.
- All searches limited to English language reviews.
- They had to report a replicable search strategy
- They had to have a sufficient focus on electronic intervention and alcohol consumption outcomes (i.e. have reviewed >1 such paper)
- Consultation with expert networks for anything we might have missed





# 2007

1. Carey, K. B., L. A. J. Scott-Sheldon, et al. (2007). Individual-level interventions to reduce college student drinking: A meta-analytic review. *Addictive Behaviors* 32(11): 2469-2494. USA C MA
2. Zisseron RN, Palfai T, Saitz R. 'No-contact' interventions for unhealthy college drinking: efficacy of alternatives to person-delivered intervention approaches. *Subst Abus* 2007;28(4):119-31. USA C

# 2008

3. Bewick B, et al. (2008). The effectiveness of web-based interventions designed to decrease alcohol consumption - A systematic review. *Preventive Medicine* 47(1): 17-26 UK e SR
4. Elliott J, Carey KB, Bolles JR (2008). Computer-based interventions for college drinking: A qualitative review. *Addictive Behaviors* 33(8): 994-1005. USA e C
5. Havard A, Shakeshaft A, Sanson-Fisher R. (2008). Systematic review and meta-analyses of strategies targeting alcohol problems in emergency departments: Interventions reduce alcohol-related injuries. *Addiction* 103(3): 368-376. Aust SR MA
6. Portnoy D, Scott-Sheldon LA, Johnson BT, Carey MP (2008). Computer-delivered interventions for health promotion and behavioral risk reduction: A meta-analysis of 75 randomized controlled trials, 1988-2007. *Preventive Medicine* 47(1): 3-16. USA e MA

# 2009

7. Moreira M, Smith, L. A. Foxcroft, D. (2009). Social norms interventions to reduce alcohol misuse in University or College students. *Cochrane Database of Systematic Reviews* (3). UK C SR MA
8. Carey K, Scott-Sheldon LA, Elliott JC, Bolles JR, Carey MP (2009). Computer-delivered interventions to reduce college student drinking: A meta-analysis. *Addiction* **104**(11): 1807-1819. USA e C MA
9. Riper H, van Straten A, Keuken M, Smit F, Schippers G, Cuijpers P. Curbing problem drinking with personalized-feedback interventions: a meta-analysis. *Am J Prev Med* 2009;36(3):247-55 Neth MA

# 2010

10. Khadjesari Z, Murray E, Hewitt C, Hartley S, Godfrey C. (2011). Can stand-alone computer-based interventions reduce alcohol consumption? A systematic review. *Addiction* **106**(2): 267-282. [UK](#) [e](#) [SR](#) [MA](#)
11. Rooke S, Thorsteinsson E, Karpin A, Copeland J, Allsop D (2010). Computer-delivered interventions for alcohol and tobacco use: A meta-analysis. *Addiction* **105**(8): 1381-1390. [Aust](#) [e](#) [MA](#)
12. Tait, R. J. and H. Christensen (2010). Internet-based interventions for young people with problematic substance use: a systematic review. *Medical Journal of Australia* **192**(11 Suppl): S15-21. [Aust](#) [e](#) [SR](#) [MA](#)
13. Webb L, Joseph J, Yardley L, Michie S (2010). Using the Internet to Promote Health Behavior Change: A Systematic Review and Meta-analysis of the Impact of Theoretical Basis, Use of Behavior Change Techniques, and Mode of Delivery on Efficacy. *J Med Internet Res* **12**(1): e4. [UK](#) [e](#) [SR](#) [MA](#)
14. White A, Kavanagh D, Stallman H, Klein B, Kay-Lambkin F, Proudfoot J, Drennan J, Connor J, Baker A, Hines E, Young R (2010). Online alcohol interventions: A systematic review. *Journal of Medical Internet Research* **12**(5): e62p.1-e62p.12. [Aust](#) [e](#) [SR](#)

# 2011

15. Riper H, Spek V, Boon B, Conijn B, Kramer J, Martin-Abello K, Smit F (2011). Effectiveness of E-self-help interventions for curbing adult problem drinking: a meta-analysis. *J Med Internet Res*, 13(2):e42. [Neth e MA](#)



# Summary

USA	5	(4 incl Carey)
UK	4	
Australia	4	
Netherlands	2	(Riper et al)

10 reviews focussed on e-interventions

5 reviews focussed solely on college students

7 papers described themselves as Systematic Reviews  
(all in UK or Australia)

10 papers with meta-analyses

## Review traditions

- Medicine and Public Health → Cochrane Reviews: “systematic reviews of primary research in human health care and health policy, and are internationally recognised as the highest standard in evidence-based health care”
  - ~ Formally assess risk of bias arising from: sequence generation, allocation concealment, blinding, incomplete outcome data, selective outcome reporting and other issues.
  - ~ Often followed by meta-analysis
- Social sciences: identify literature (sometimes systematic and replicable, often not), conduct meta-analysis

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	Year of primary study	KK check if RCT: 08SEP11	Carey et al. (2007)	Zisseron (2007)	Bewick et al. (2008)	Elliot et al (2008)	Havard et al (2008)	Portnoy et al. (2008)	Carey et al. (2009)	Moreira et al. (2009)	Riper et al. (2009)	Rooke et al. (2010)	Tait & Christensen (2010)	Webb (2010)	White et al. (2010)	Khadjesari et al. (2010)	Riper et al (2011)	
1	Allison (2002)	2002	y						1									1
2	Barnett, N. P., Murphy, J. G., Colby, S. M., & Monti, P. M. (2007).	2007	y			1			1			1				1		4
3	Bersamin, M., Paschall, M. J., Feamow-Kenney, M., & Wyrick, D. (2007)	2007	y					1	1				1					3
4	Bewick B. M., Trusler K., Barkham M., Hill A. J., Cahill J., Mulhern B. (2008)	2008	y									1	1		1	1		4
5	Boon (2006) - Unpublished Findings	2006	y								1							1
6	Boon (2008) - Unpublished Findings	2008	y								1							1
7	Boon B, Huiberts A. (2006)	2006	y														1	1
8	Boon B, Risselada A, Huiberts A, Riper H, Smit F. (2011)	2011	y														1	1
9	Butler and Correia (2008/9)	2009	y						1									1
10	Carey K. B., Henson J. M., Carey M. P., Maisto S. A. (2009)	2009	y						1									1
11	Chiauzzi, E., Green, T. C., Lord, S., Thum, C., & Goldstein, M. (2005)	2005	y	1		1	1		1			1	1	1	1	1		9
12	Cunningham JA, Wild TC, Cordingley J, van Mierlo T, Humphreys K. (2009)	2009	y												1		1	2
13	Dimeff & McNeely (2000)	2000	y	1			1		1									3
14	Donohue B., Allen D. N., Maurer A., Ozols J., DeStefano G. (2004)	2004	y	1			1		1			1				1		5
15	Doumas D.M., Anderson L. L. (2008/9)	2009	y						1									1
16	Doumas D. M., Hannah E. (2008)	2008	y								1	1	1		1	1	1	6
17	Doumas D. M., Haustveit T. (2008)	2008	reference						1							1		2
18	Doumas DM, McKinley LL, Book P. (2009)	2009	y						1			1		1				3
19	Finfeld-Connet D., Madsen R. (2008)	2008	y								1							1
20	Hedman A. S. (2007)	2007	y													1		1
21	Hester, R. K., & Delaney, H. D. (1997)	1997	y					1			1				1	1	1	4
22	Hester RK, Delaney HD, Campbell W, Handmaker N. (2009)	2009	y											1				1
23	Hester, R.K., Squires, D.D., & Delaney, H.D. (2005).	2005	y					1								1	1	3
24	Hunt W. M. (2004)	2004	y						1							1		2
25	Hustad JT, Barnett NP, Borsari B, Jackson KM. (2010)	2010	y											1				1
26	Kramer J, Riper H, Lemmers L, Conijn B, van Straten A, Smit F. (2009)	2009	y														1	1
27	Kypri K, Hallett J, Howat P, McManus A, Maycock B, Bowe S, et al. (2009)	2009	y								1				1			2
28	Kypri K., Langley J. D., Saunders J. B., Cashell-Smith M. L., Herbison P. (2008)	2008	y						1	1		1			1	1		5
29	Kypri K., McAnally H. M. (2005)	2005	y	1		1	1		1			1		1		1		7
30	Kypri, K., Saunders, J. B., Williams, S. M., McGee, R. O., Langley, J. D., Cashe	2004	y	1		1	1		1	1	1	1	1			1		10
31	Lau-Barraco C., Dunn M. E. (2008)	2008	y						1							1		2
32	Leffingwell T. R., Leedy M. J., Lack C. W. (2005)	2005	y						1									1
33	Lewis M. A., Neighbors C. (2007)	2007	y				1		1	1		1				1		5
34	Lewis M. A., Neighbors C., Oster-Aaland L., Kirkeby B. S., Larimer M. E. (200	2007	y						1	1	1	1				1		5
35	Matano, R. A., Koopman, C., Wanat, S. F., Winzelberg, A. J., Whitsell, S. D., V	2007	y												1	1		2
36	Michael M. E. (2000)	2000	reference						1									1
37	Mignogna J. (2007)	2007	y						1									1
38	Miller E.T. (2000)	2000	y						1									1
39	Moore, M. J., Soderquist, J., & Werch, C. (2005)	2005	y	1		1	1		1	1		1	1	1	1			9
40	Neighbors, C., Larimer, M. E., & Lewis, M. A. (2004)	2004	y	1			1		1	1		1	1			1		7
41	Neighbors, C., Lee, C. M., Lewis, M. A., Fossos, N., & Walter, T. (2009)	2009	y						1			1	1		1			4
42	Neighbors, C., Lewis, M. A., Bergstrom, R. L., & Larimer, M. E. (2006)	2006	y	1			1		1	1	1	1				1		7
43	Neumann T., Neuner B., Weiss-Gerlach E., Tonnesen H., Gentilello L. M., We	2006	y						1							1	1	3
44	Paschall M. J., Bersamin M., Fearnow-Kenney M., Wyrick D., Currey D. (20	2006	y				1					1		1		1		4
45	Reis, J., Riley, W., Lokman, L., & Baer, J. (2000)	2000	reference				1											1
46	Riper, H., Kramer, J., Smit, F., Conijn, B., Schippers, G., & Cuijpers, P. (2008)	2008	y									1		1	1	1	1	5
47	Saitz, R., Paifai, T. P., Freedner, N., Winter, M. R., Macdonald, A., Lu, I., et al	2007	y	1			1			1				1				4
48	Schinke, S. P., Schwinn, T. M., Di Noia, J., & Cole, K. C. (2004)	2004	y						1			1						2
49	Schinke, S. P., Schwinn, T. M., & Ozanian, A. J. (2005)	2005	y						1									1
50	Thombs, Olds, Osborn, Casseday, Glavin, & Berkowitz (2007)	2007	y											1				1
51	Walters S. T., Vader A. M., Harris T. R. (2007)	2007	y	1			1			1	1	1	1	1	1	1		10
52	Walters ST, Vader AM, Harris TR, et al. (2009)	2009	y									1	1					2
				10		4	14		10	27	6	8	22	9	9	14	23	9

# Primary studies by year of publication



# Review findings

- Summary of overall effect sizes
- Answers to specific questions
- Methodological issues

## Effect sizes for reviews of e-SBI

### *Volume of alcohol consumed*

Review	Effect Size for contrast with non-intervention <i>d / g / SMD</i>	Authors' conclusion
Portnoy et al 2008	0.24	"Computer-delivered interventions can lead to improved ...outcomes at first post-intervention assessment"
Carey et al 2009	0.15	"Computer-delivered interventions reduce the quantity and frequency of drinking among college students"
Tait et al 2010	0.12	"Based on findings largely from tertiary students, web interventions targeting alcohol-related problems have an effect about equivalent to brief in-person interventions"
Rooke et al 2010	0.22	Minimal contact internet interventions "may represent a cost-effective means of treating uncomplicated substance use and related problems"
Riper et al 2011	0.39	"E-self-help interventions without professional contact are effective in curbing adult problem drinking in high-income countries"
Moreira et al 2009	0.35	Web feedback probably effective in reducing alcohol misuse
Webb et al 2010	0.14	"Small...effects were observed for Internet-based interventions that targeted only...alcohol consumption"
Khadjesari et al 2010	Mean diff =26 g*	Computerised interventions more effective than minimally active comparator groups. (Note analytic issues)

# Which types/features of e-SBI are effective?

- Normative feedback
  - ~ Yes:  $d = 0.21$ , No:  $d = 0.19$ ,  $p=0.80$  (Rooke et al)
  - ~ Personalised feedback with normative feedback versus without,  $\beta=0.09$ ,  $p=0.22$  (Riper et al 2009)
- Provision of feedback on problems less effective
  - ~  $\beta = -0.63$ ,  $p < 0.01$  (Carey et al 2009)
- Chat
  - ~ Yes:  $d = 0.12$ , No:  $d = 0.22$ ,  $p=0.17$  (Rooke et al)
- Number of sessions
  - ~ Single:  $g = 0.27$ , Multiple:  $g = 0.61$ ,  $p=0.04$  (Riper et al 2011)
  - ~ Greater dose  $\rightarrow$  larger effects:  $\beta = 0.83$ ,  $p < 0.01$  (Portnoy et al)

# Does the technology make a difference to outcome?

- Web:  $d = 0.18$  vs off-line:  $d = 0.27$ ,  $p = 0.22$  (Rooke et al 2010)
- Human interaction > computer alone  
~  $\beta = 0.53$ ,  $p = 0.02$  (Carey et al 2009)
- Commercially available program less effective  
~  $\beta = -0.47$ ,  $p = 0.04$  (Carey et al 2009)



# In which patient / population groups does e-SBI work?

- College students vs non-students (Khadjesari et al)
  - ~ College - Mean difference = 19 g ethanol
  - ~ Others - Mean difference = 115 g ethanol,  $p < 0.001$

Confounded by help-seeking status?

Note: No formal comparisons of help seekers (web browsers) versus non- help seekers (e.g., who are sent an e-mail and invited to be screened) *a la* Moyer et al 2002

# In what settings is e-SBI effective?

- Home:  $g = 0.47$  vs Research setting, health centre, workplace:  $g = 0.39$ ,  $p=0.63$  (Riper et al 2011)
- Home:  $d = 0.20$  vs Research setting:  $d = 0.25$ ,  $p=0.92$  (Rooke et al 2010)
- On-site vs off-site,  $\beta=0.04$ , ns (Portnoy et al)

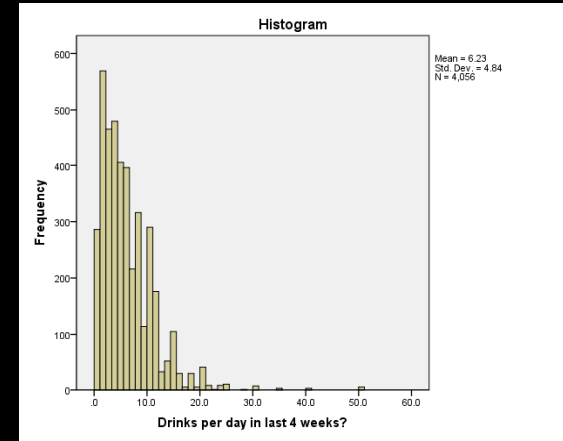
Note: Few trials of non-helpseekers outside tertiary education setting

# **Methodological questions addressed via meta-analysis**

**Table 2.** Effect sizes of e-interventions for problem drinking versus control conditions

Studies	Number of Comparisons	Hedges' g	95% CI	<i>P</i>
All studies <sup>a</sup>	9	0.44	0.29-0.50	
All studies, outliers excluded <sup>a</sup> [53,54]	7	0.39	0.23-0.57	
<b>Type of treatment<sup>b</sup></b>				.04
e-personalised normative feedback	4	0.27	0.11-0.43	
e-self-help	3	0.61	0.33-0.90	
<b>Type of analysis<sup>b</sup></b>				.60
Intention-to-treat	3	0.37	0.21-0.54	
Completers-only	4	0.48	0.11-0.86	
<b>Type of venue<sup>b</sup></b>				.63
Home	2	0.47	0.25-0.69	
Research, health centre, or workplace setting	5	0.39	0.15-0.63	
<b>Sample size<sup>b</sup></b>				.43
Small	3	0.36	0.19-0.52	
Large	4	0.52	0.14-0.91	
<b>Type of control condition<sup>b</sup></b>				
Alcohol leaflet	4	0.35	0.21-0.48	.33
Assessment only	1	0.12	-0.84 to 1.07	
Waitlist control	2	0.77	0.19-1.34	

# Distributional assumptions

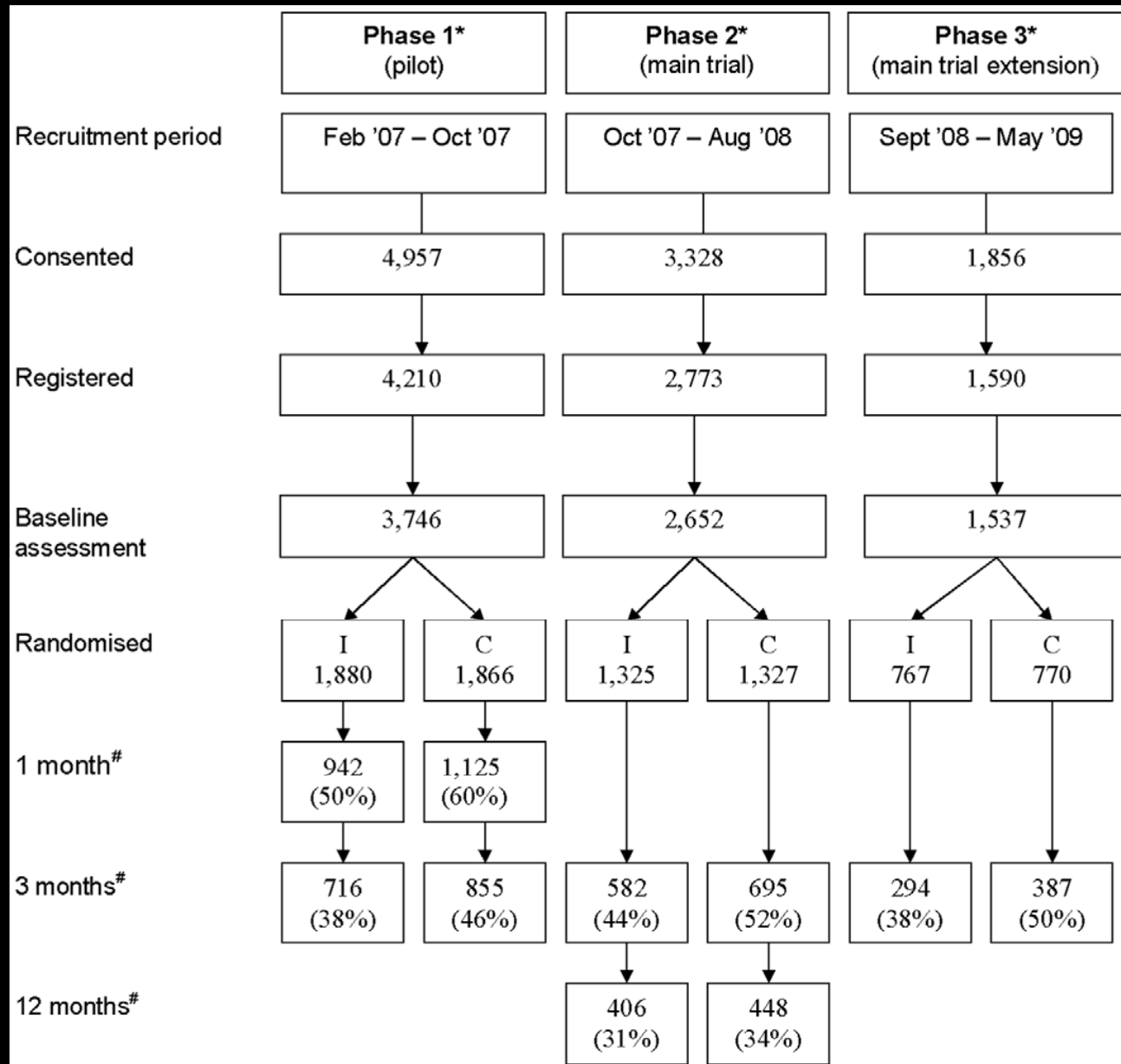


- Bewick et al: lack of accounting for skewed distributions
- Count distributions [Poisson if  $SD < \text{Mean}$ ; Negative Binomial (over-dispersed Poisson) if  $SD > \text{Mean}$ ]
- Khadjesari et al compared studies using “appropriate measures of central tendency, given the distribution of the data, with those that did not (i.e. means in the presence of skew)”
  - ~ 5 studies (n=994), all in tertiary students: no sig diff between computerised intervention and minimally active comparator in alcohol consumed per week

## Recent large RCTs (not yet reviewed)

- Wallace P, Murray E, McCambridge J, Khadjesari Z, White IR, Thompson SG, et al. (2011) On-line randomized controlled trial of an internet based psychologically enhanced intervention for people with hazardous alcohol consumption. *PLoS One*;6(3):e14740.
- Neighbors C, Lewis MA, Atkins DC, Jensen MM, Walter T, Fossos N, et al. (2010) Efficacy of web-based personalized normative feedback: a two-year randomized controlled trial. *J Consult Clin Psychol*;78(6):898-911.

## DYD Trial; Wallace et al 2011 (help seekers)



**Table 1.** Reported alcohol consumption in last week (units)<sup>#</sup> by randomised group.

Time point**	Geometric mean (SD)*		Adjusted ratio (intervention: control) of geometric means (95%CI) <sup>§</sup>
	Intervention	Control	
Baseline (n = 7,935)	46.3 (31.8)	45.7 (30.6)	-
1 month (n = 2,067)	27.1 (23.1)	27.1 (22.5)	0.98 (0.90 to 1.07)
3 months (n = 3,529)	26.4 (23.0)	25.6 (21.5)	1.03 (0.97 to 1.10)
12 months (n = 854)	22.0 (20.0)	23.5 (21.0)	0.99 (0.85 to 1.15)

<sup>#</sup> 1 unit = 8g of ethanol.

\*Approximate SD back-calculated from the log scale.

\*\*See Figure 1 for the data contributing to each time point.

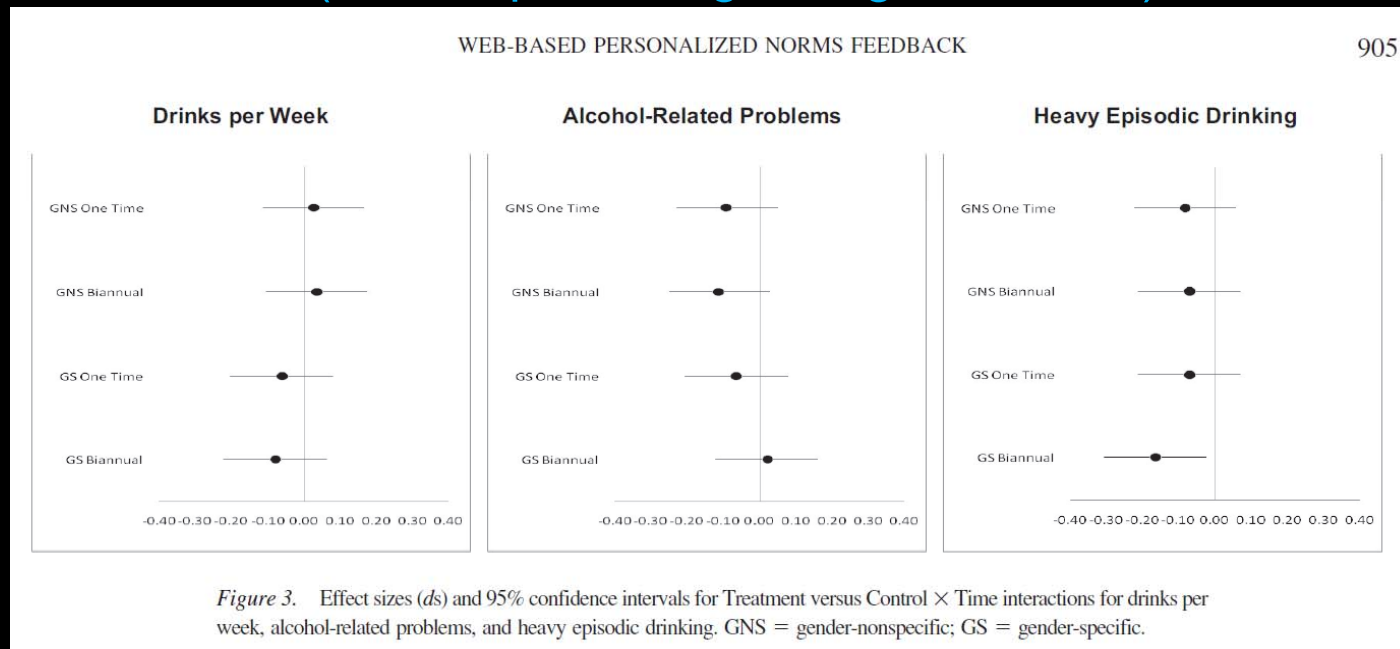
<sup>§</sup>Adjusted for baseline alcohol consumption, AUDIT-C, age, sex, education, self efficacy and EQ5D.

doi:10.1371/journal.pone.0014740.t001

Wallace P, Murray E, McCambridge J, Khadjesari Z, White IR, Thompson SG, et al. (2011) On-line randomized controlled trial of an internet based psychologically enhanced intervention for people with hazardous alcohol consumption. *PLoS One*;6(3):e14740.



## Neighbors et al 2010 (non-help-seeking college students)



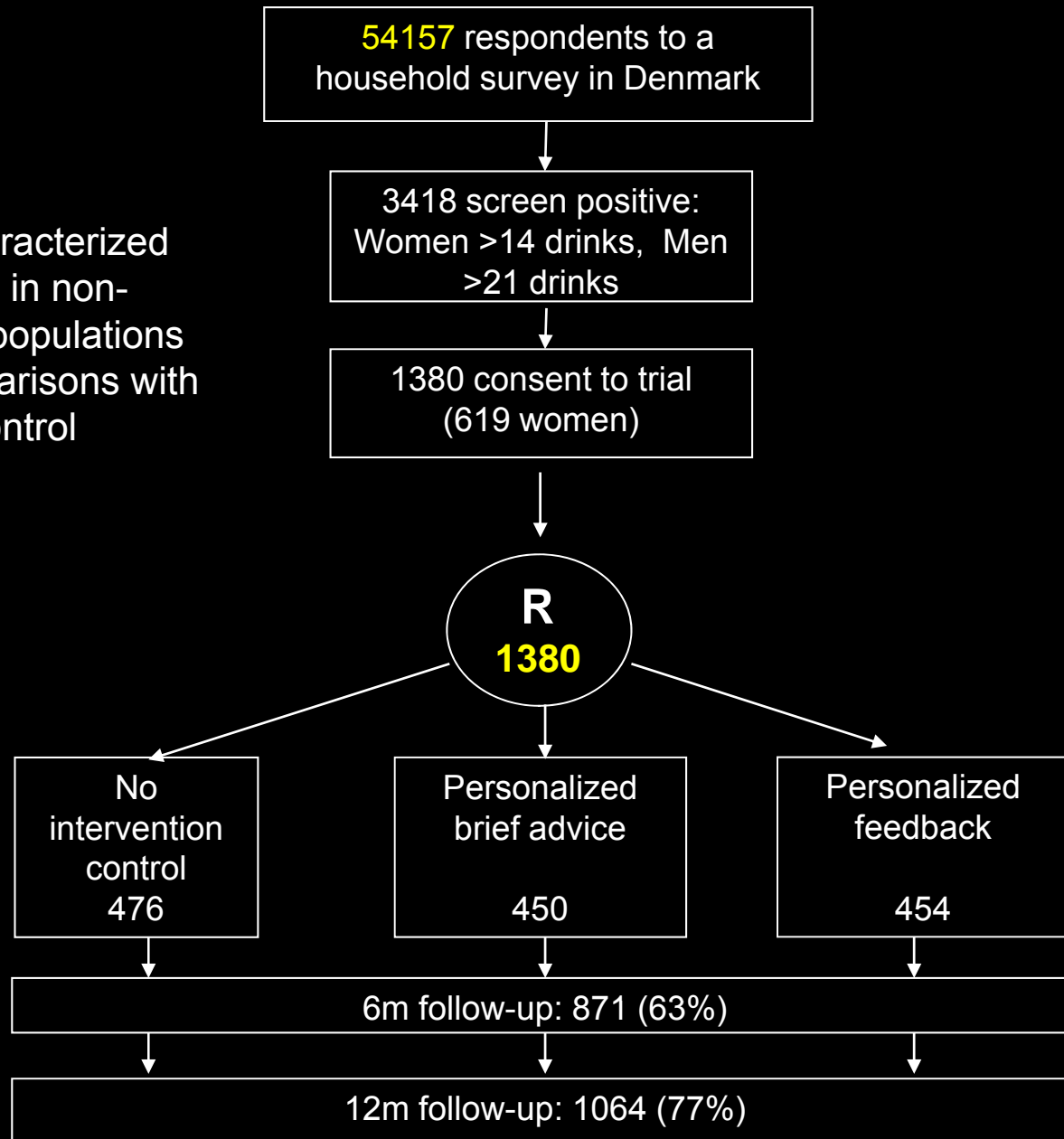
- “Relative to control, gender-specific biannual PNF was associated with reductions over time in weekly drinking ( $d$  **0.16**, 95% CI [0.02, 0.31]), and this effect was partially mediated by changes in perceived norms.”
- “For women, but not men, gender-specific biannual PNF was associated with reductions over time in alcohol-related problems relative to control ( $d$  **0.29**, 95% CI [0.15, 0.58])”

# Complete but yet to be published large RCTs

- Hansen A, Becker U, Nielsen A, Grønbæk M, Tolstrup J & Thygesen L (under review). Internet-based brief personalized feedback intervention in a Non-Treatment Seeking Population of Heavy Drinkers: a randomized controlled trial.
- Moreira T, Foxcroft DR. The effectiveness of brief personalized normative feedback in reducing alcohol-related problems amongst university students: protocol for a randomized controlled trial. *BMC Public Health* 2008;8:113.
- Kypri K, McCambridge J, Cunningham J, Vater T, Bowe S, De Graaf B, Saunders JB & Dean JI (2010). Web-based alcohol screening and brief intervention for Maori and non-Maori: the New Zealand e-SBINZ trials. *BMC Public Health*, 10:781

## Hansen et al (under review)

“...existing research...characterized by few studies in non-student adult populations and few comparisons with appropriate control groups.”



## Personalized normative feedback for university students in UK and Portugal

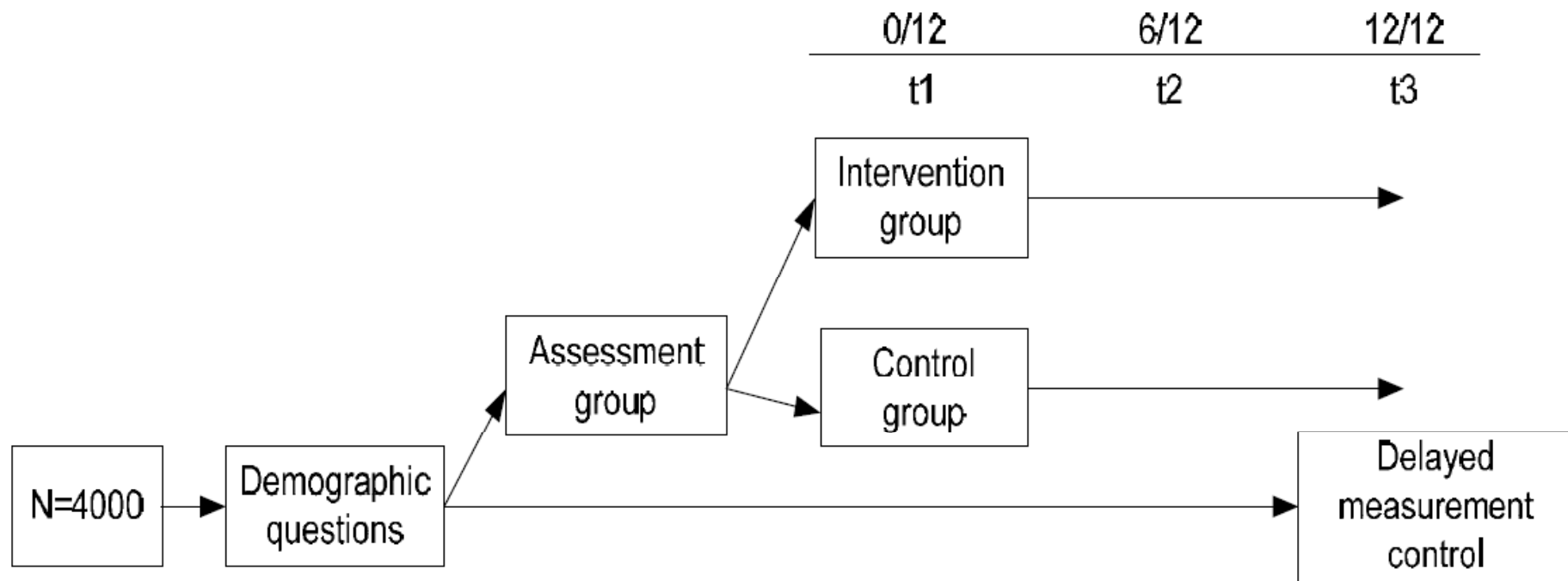


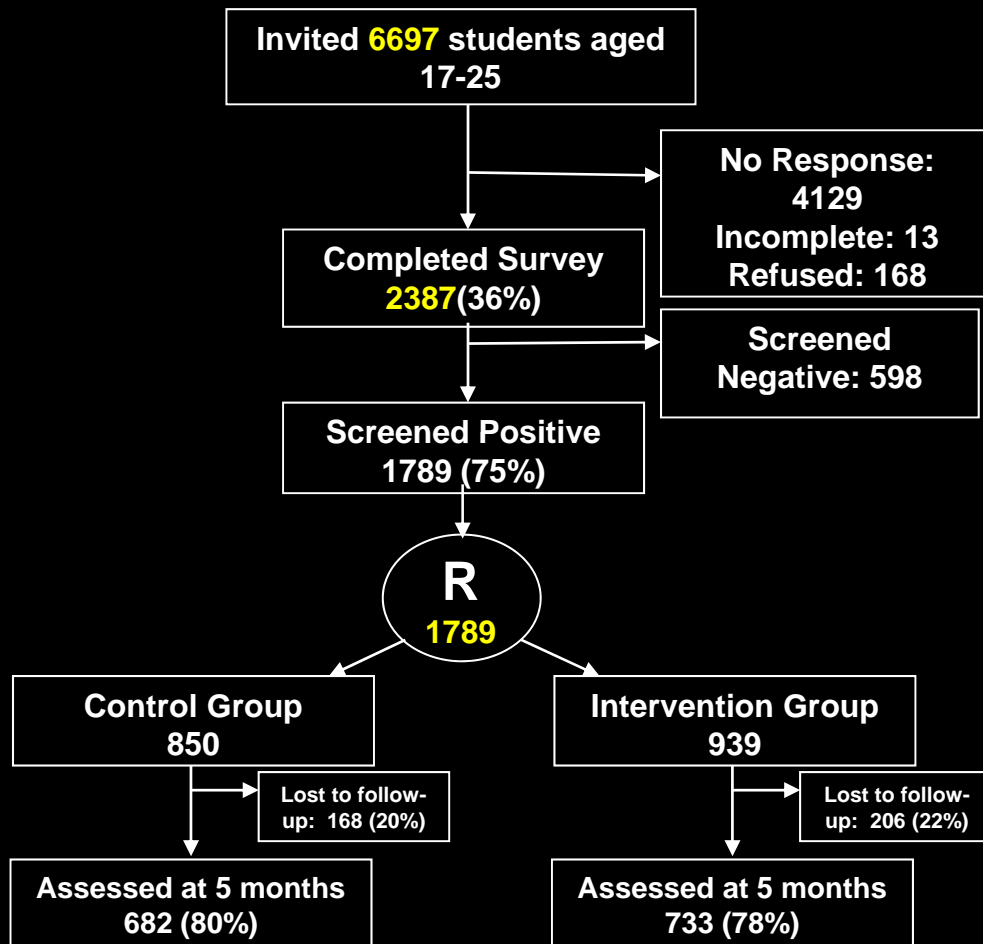
Figure 1  
Solomon Three Group design (for each country).

Moreira T, Foxcroft DR. The effectiveness of brief personalized normative feedback in reducing alcohol-related problems amongst university students: protocol for a randomized controlled trial. *BMC Public Health* 2008;8:113.

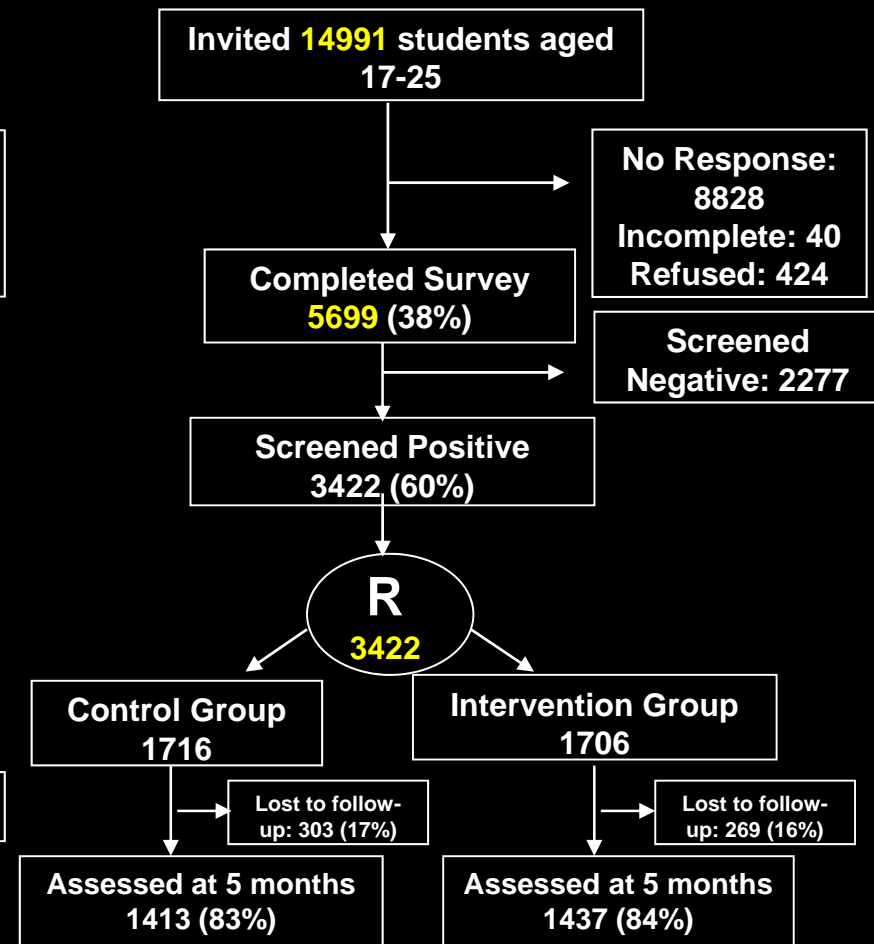
# The e-SBINZ trials 2010

Funded by the Alcohol Advisory Council

## Maori



## Non-Maori



Kypri K, McCambridge J, Cunningham J, Vater T, Bowe S, De Graaf B, Saunders JB & Dean JI (2010). Web-based alcohol screening and brief intervention for Maori and non-Maori: the New Zealand e-SBINZ trials. *BMC Public Health*, 10:781

# Summary: 1 (effects)

- Small effects for non-helpseekers receiving personalised feedback (mainly college students):
  - ~ Cohen's  $d = 0.10$  to  $0.30$
  - ~ Unclear whether normative feedback is critical
  - ~ Scalability is key (Tait & Christensen 2010)
- Mixed results for helpseekers
  - ~ Large effects in some studies, no effects in others; heterogeneous set of studies; not enough trials for firm conclusions. How do we reconcile the null findings of the DYD trial with BSCPWIN ? Differences in population, personal contact?
- Repeated doses > single dose
- Location of intervention doesn't seem to matter
- Evidence base less developed and patchy but similar to that for SBI

## Summary: 2 (methodology)

- Analyses of RCTs need to improve (e.g., count models for count data; principled sensitivity analyses for effects of missing data in an ITT framework)
  - ~ White IR, Horton NJ, Carpenter J, Pocock SJ. (2011) Strategy for intention to treat analysis in randomised trials with missing outcome data. *BMJ*, 7;342:d40
- Systematic reviews could be stronger

# Summary: 3 (what the reviews don't tell us)

- e-SBI widely claimed to be cheap but is it cost effective? (McCambridge et al 2010)

Limitations of self report remain unresolved:

- Not specifically addressed in any review because no studies used objective measures to allow comparison
- Objective measures impracticable in most e-SBI contexts
- Yes, computerised completion is better than other modalities but it remains plausible that those in the intervention group (blind or unblind) are still more likely to under-report because of SDB
- Service utilisation - are the effects of e-SBI large enough to be measurable in a trial or via archival data?
- Need for work on SDB – how much of the small e-SBI effects might it explain ? (can we induce SDB experimentally?)



# FUTURE DIRECTIONS

What represents innovation in the e-SBI field?

- More technology?
  - ~ e.g., “Utilising social media to challenge pluralistic ignorance” ?
  - ~ “Alcohol screening and brief intervention via smart phones”

# Or doing older things well?

- Widely accessible technology (e.g., phone, web)
  - ~ Ensure equity of access (HOAP)
- Non-college youth and adolescents (e.g., in secondary schools)
- Low and middle income countries (Riper 2011)
  - ~ Low cost, cell phones common in some LMICs, web access increasing along with drinking
- Large, simple trials: sound design and implementation: minimise attrition, analysis appropriate to distributions, better reporting
- Cost effectiveness studies
- Release the elephant in the room: self-reported outcomes
- High quality systematic reviews

**e.g.,**

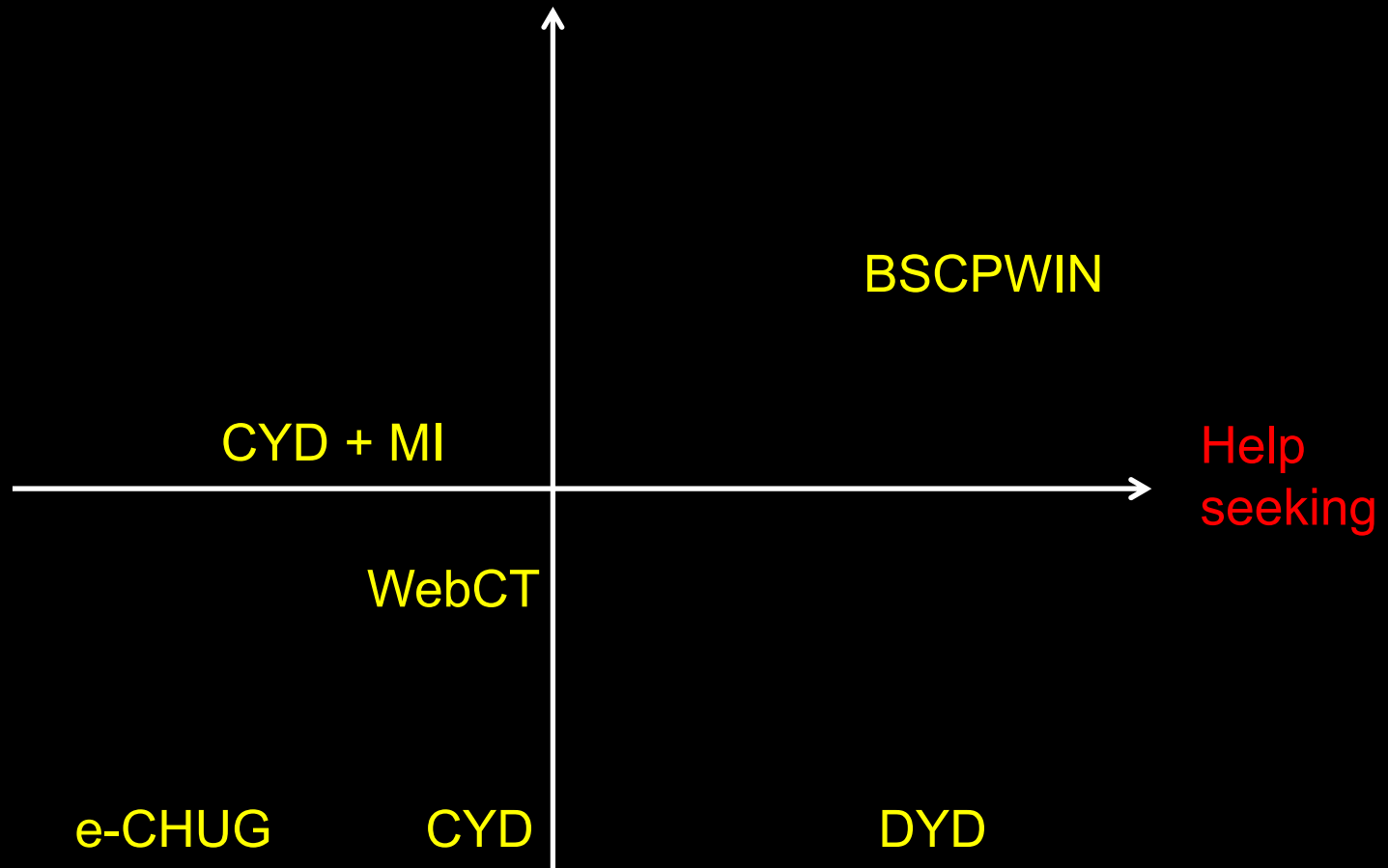
- e-Screening in primary care followed by telephone brief intervention with follow-up sessions and/or help-line or web support?
- e-SBI for hospital outpatients
  - ~ Enriched population
  - ~ “Captive”
  - ~ 2/3 with web access
- SMS alcohol screening and cell phone based motivational interviewing in India

**THANK YOU**



**Newcastle, Australia**

Degree of  
practitioner  
involvement



# Neighbors et al 2010 (non-help-seekers)

2 (GSF) x 2 (Dose) + control

GSF=gender-specific feedback  
GNSF=gender-nonspecific feedback

