

Can e-cigarettes help change smoking behaviour?

Ann McNeill

Professor of Tobacco Addiction

Institute of Psychiatry, Psychology & Neuroscience,

King's College London

Sara Hitchman, Leonie Brose

King's College London

Yes!

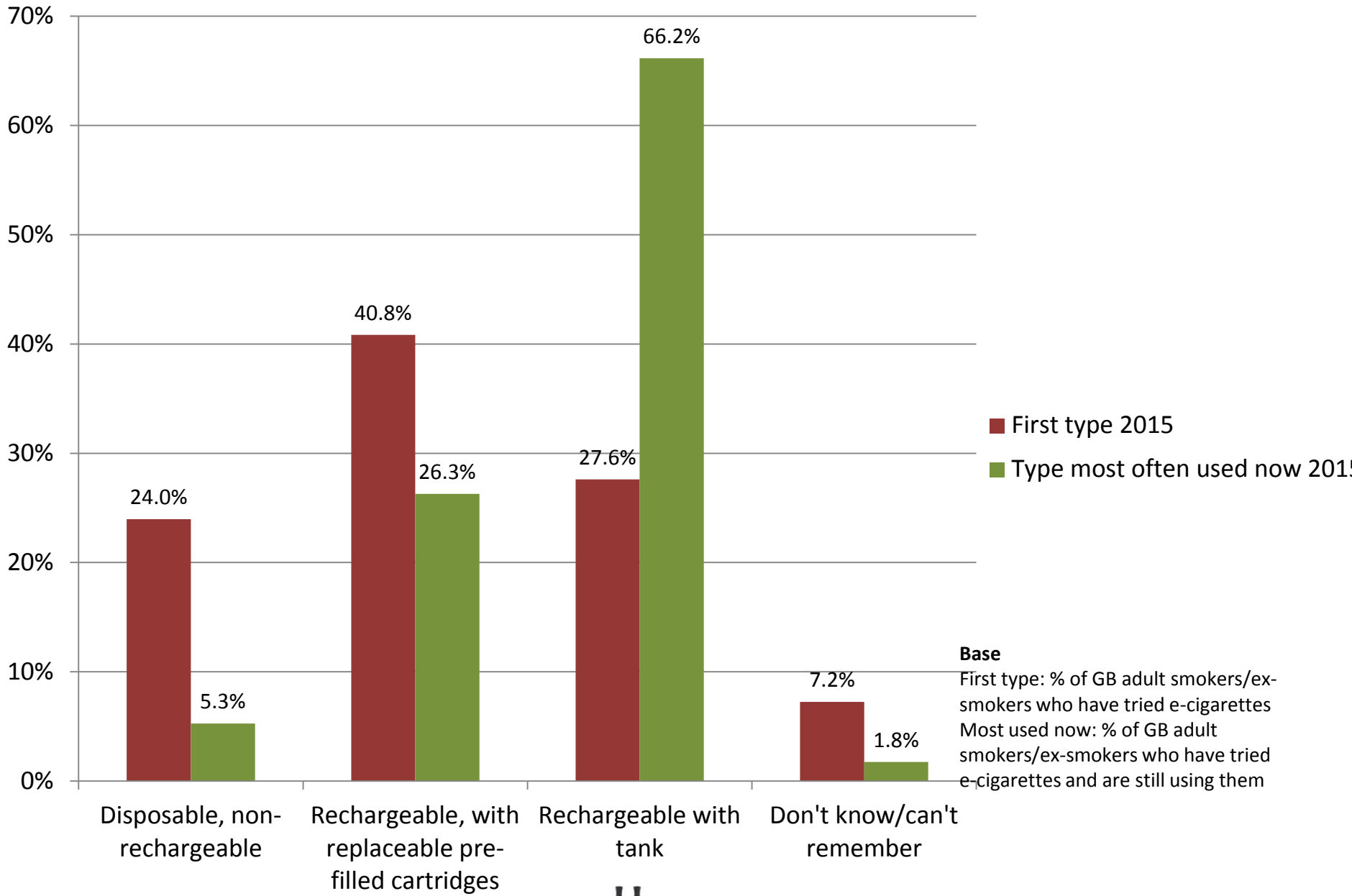
- They are a less harmful means of nicotine delivery
- Question is how can the presence of e-cigarettes on the market be optimised to help people to **stop smoking completely as quickly as possible**
- Examine the evidence base for this

Some research issues/considerations

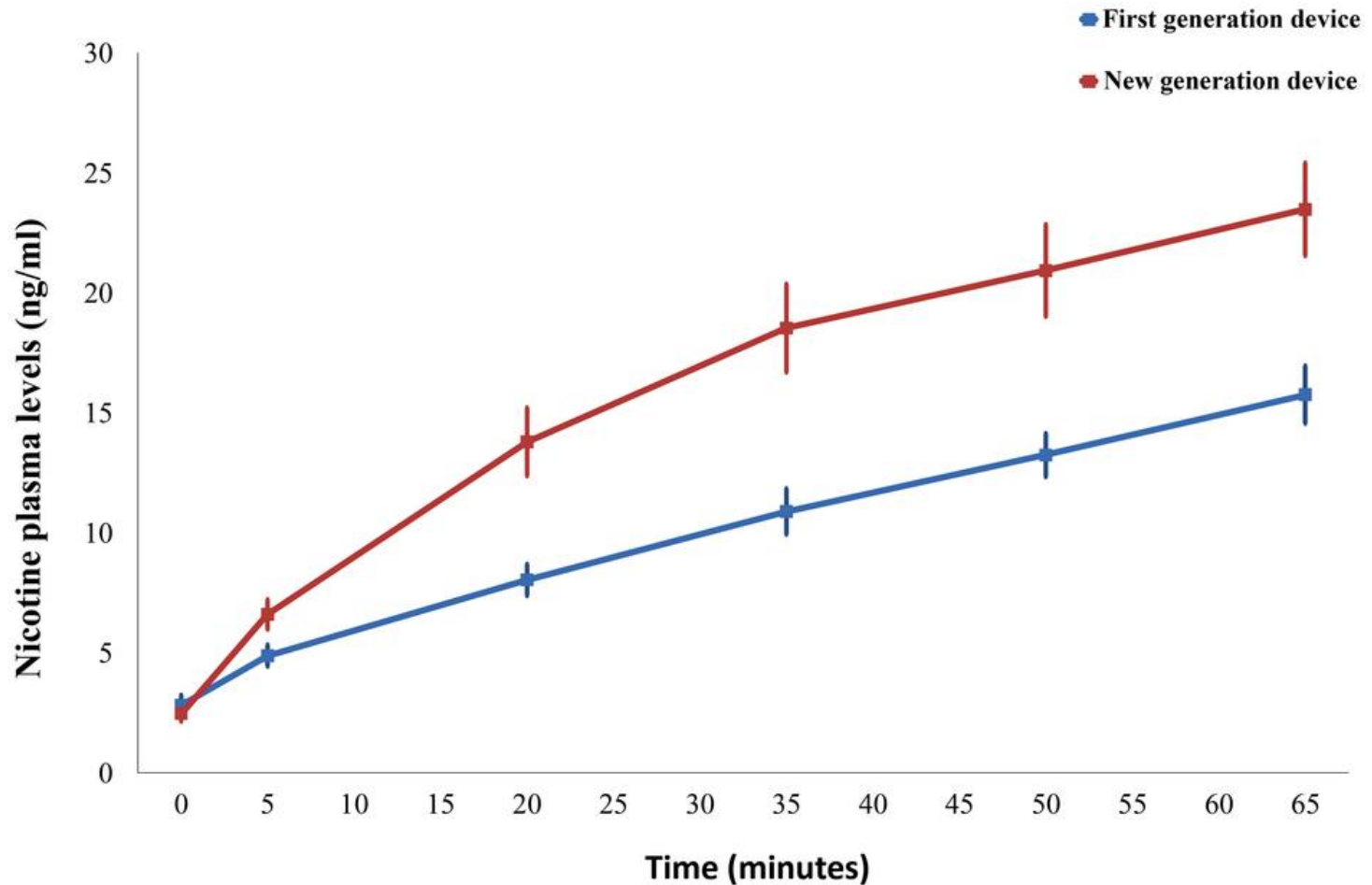
- Conventional **RCTs** take several years. 2 of the key RCTS used products with poor nicotine delivery, now obsolete
- **Observational** data therefore important & are “real-world” studies:
 - cohorts (prospective/retrospective)
 - cross-sectional designs
 - case-control studies

Some research issues/considerations

- **Motives** for using e-cigarettes can vary – not all are trying to quit
- Those who use e-cigarettes may **differ** in important ways from those who don't such as:
 - More dependent, heavier smokers
 - Had more unsuccessful quit attempts
 - May be more likely to live with smokers
- E-cigarette “**treatment failures**”
- Types of e-cigarettes: heterogeneous



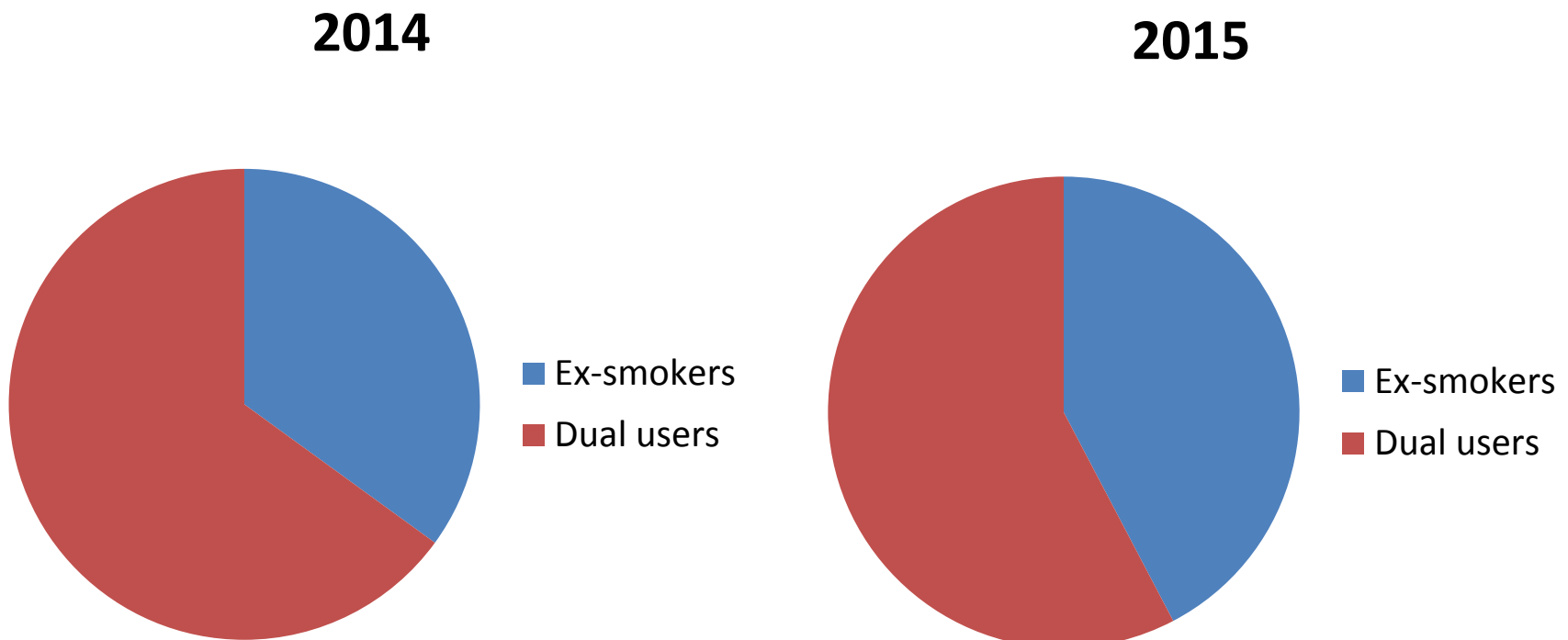
Nicotine delivery by type



Farsalinos et al, 2014

Some research issues/considerations

- * **Dose:** Measures of e-cig use/dose: ever, trial, last 30 days, experimentation, daily
- * **“Dual use”:** use alongside smoking



Cochrane review (McRobbie et al, 2014) results for cessation and reduction

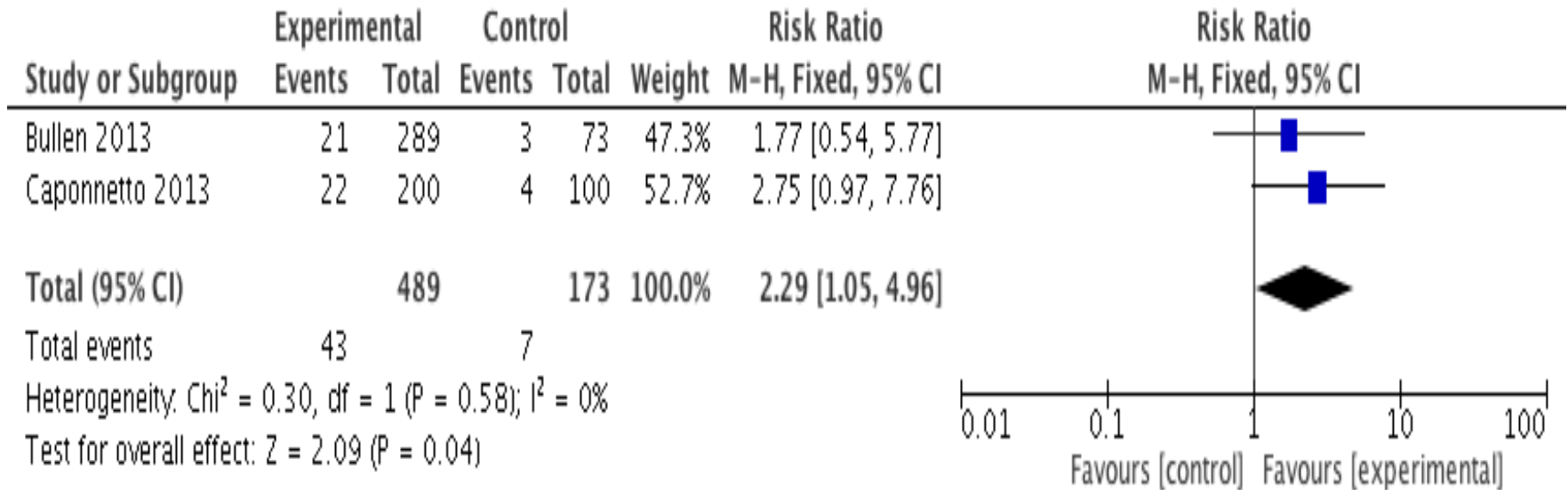
- 589 records, only a few eligible
 - 2 RCTs (both low risk of bias)
 - 6 cohort studies (varied bias risk)
- Because of small no of RCTs, low GRADE overall

2 randomised controlled trials

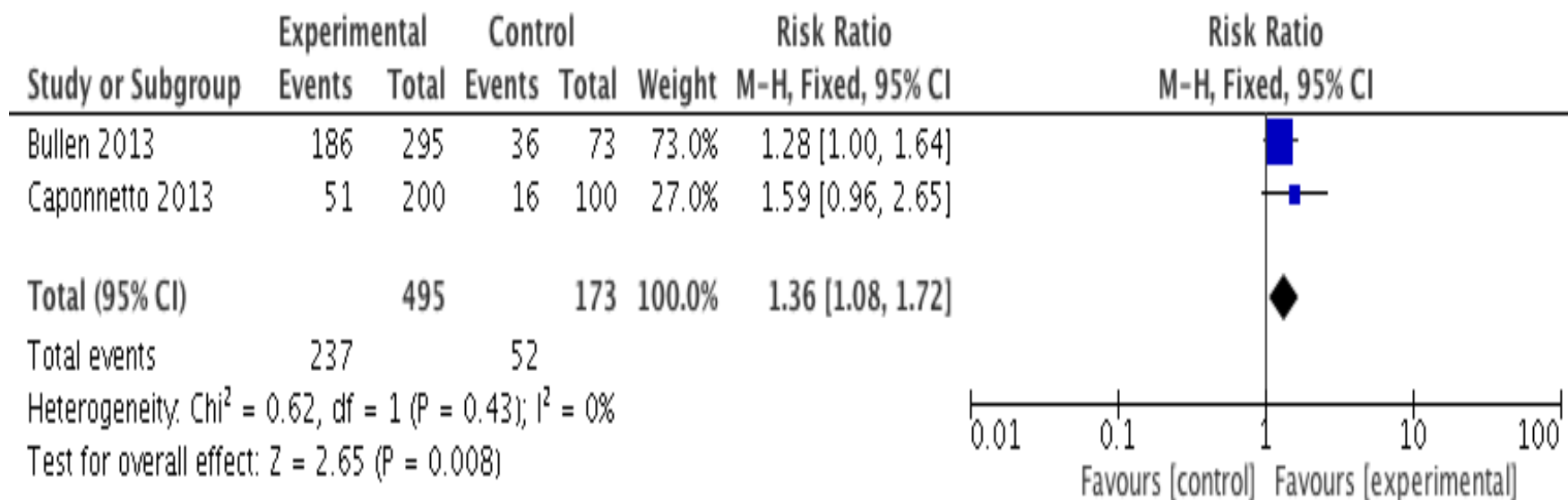
- Bullen et al 2013 – 657 highly dependent smokers **wanting to quit**, 3 treatment arms:
 - E-cigarette with nicotine • 7
 - E-cigarette without nicotine (pbo) • 6
 - 21mg/24 patches • 4All minimal support, 12 week therapy, 6M validated quit
- Caponetto et al 2013 - 300 highly dependent smokers **not intending to quit**, 3 treatment arms:
 - E-cigarette with nicotine • 13
 - E-cigarette reduction nicotine dose • 9
 - E-cigarette without nicotine (pbo) • 4All minimal support, 12M validated quit (6-12 months)

Poor delivery products, now obsolete

Nicotine e-cigarette vs placebo e-cigarette: smoking cessation



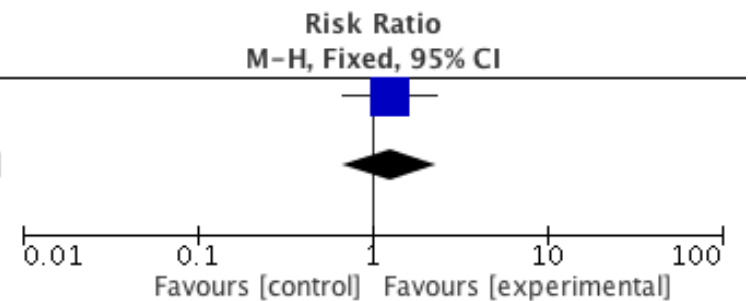
Nicotine e-cigarette vs placebo e-cigarette: smoking reduction



Nicotine e-cigarette vs nicotine patch

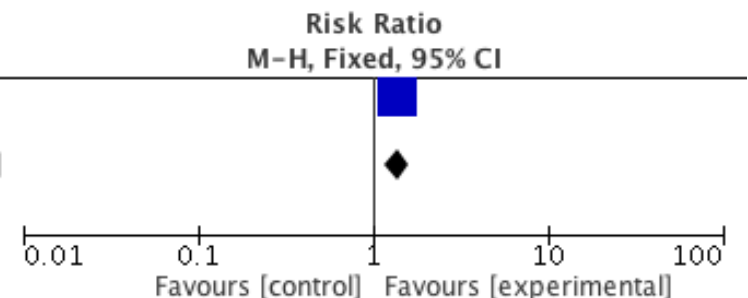
- Cessation

Study or Subgroup	Experimental		Control		Weight	Risk Ratio
	Events	Total	Events	Total		M-H, Fixed, 95% CI
Bullen 2013	21	289	17	295	100.0%	1.26 [0.68, 2.34]
Total (95% CI)		289		295	100.0%	1.26 [0.68, 2.34]
Total events	21		17			
Heterogeneity: Not applicable						
Test for overall effect: $Z = 0.73$ ($P = 0.46$)						



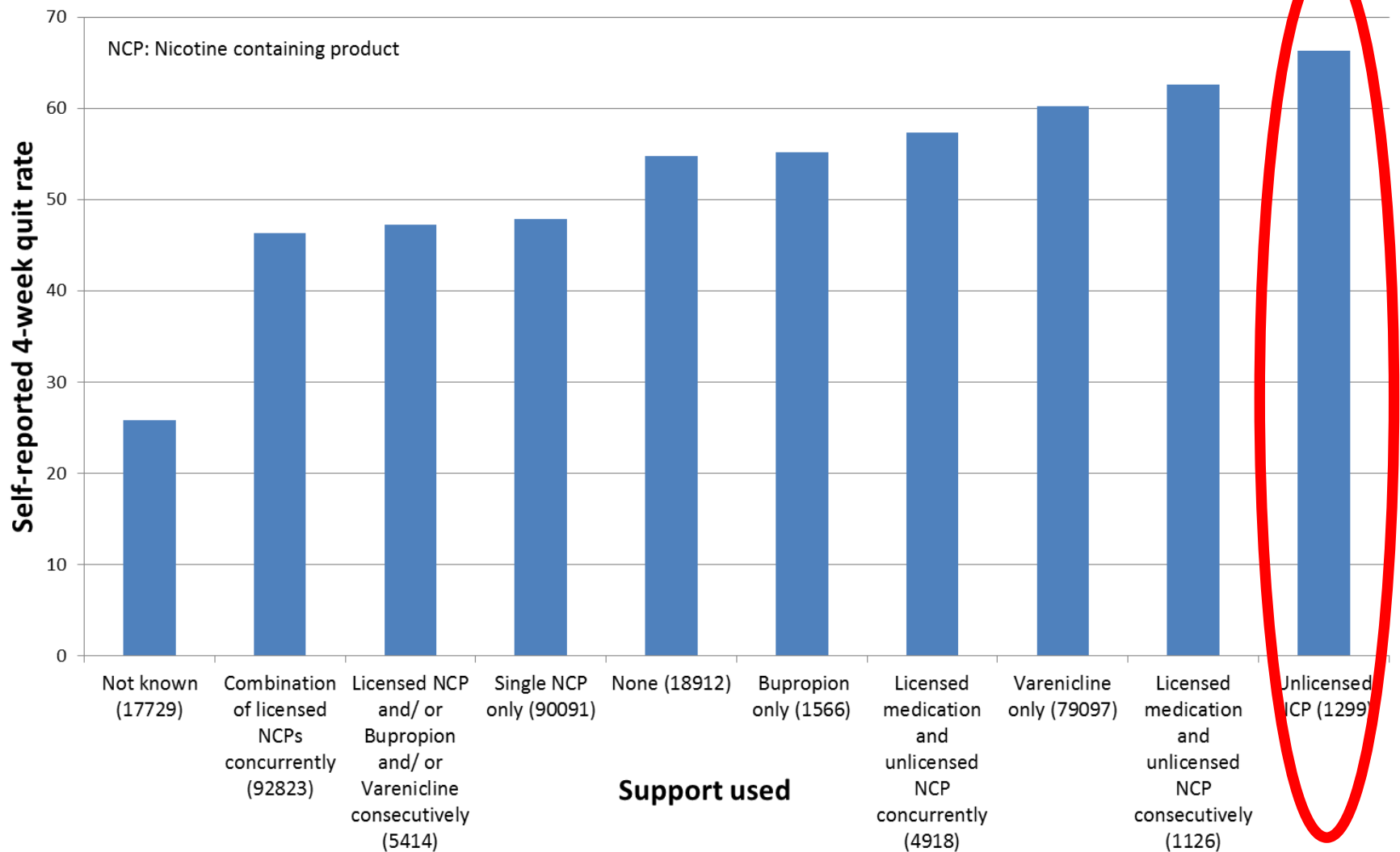
- Reduction

Study or Subgroup	Experimental		Control		Weight	Risk Ratio
	Events	Total	Events	Total		M-H, Fixed, 95% CI
Bullen 2013	186	289	138	295	100.0%	1.38 [1.19, 1.60]
Total (95% CI)		289		295	100.0%	1.38 [1.19, 1.60]
Total events	186		138			
Heterogeneity: Not applicable						
Test for overall effect: $Z = 4.20$ ($P < 0.0001$)						



Use of e-cigarettes in services

(HSCIC monitoring data, 2015)



Other recent/ongoing trials

- Adriaens et al, 2014 - 48 smokers not wanting to quit, moderately strong dependence; 3 treatment arms: 2 different **tank** models (both 18mg/ml nicotine); no e-cigarettes. **8 week supply**. **3** lab sessions
 - 8 weeks: 34% quit in the 2 treatment arms versus 0% ($p < 0.02$)
- **2 trials in UK (Hajek/McRobbie):**
 - one comparing the tank e-cigarette with standard treatment (NRT/combination NRT)
 - one adding cigalike e-cigarette to standard treatment compared with standard treatment

UK observational studies (use during quit attempts)

1. Cross-sectional study, smokers in England who used e-cigarettes to quit were more likely to quit than smokers using **no help** or **OTC NRT** (Brown et al, *Addiction*, 2014)
2. Cohort study, International Tobacco Control Policy Evaluation Study, smokers in England and US who used e-cigarettes to quit were more likely to quit than smokers using **no help** or **NRT but no more or less likely than using varenicline/bupropion** (Hitchman et al, SRNT, paper in preparation)

ITC longitudinal and US+UK data

Preliminary findings (N=462) (Hitchman, SRNT 2015)

Help at last quit attempt	N	% quit	OR	LCI	UCI	p-value
E-cigarette	46	54.35	1.00	1.00	1.00	ref
No meds/e-cigarette	227	29.96	0.14	0.05	0.37	0.0001
NRT	113	37.17	0.23	0.08	0.66	0.0062
Varenicline/bupropion	76	40.79	0.40	0.13	1.23	0.1096

Adjusting for: demographics, survey mode, quit intention, HSI, time since QA, total # of Qas, interwave interval

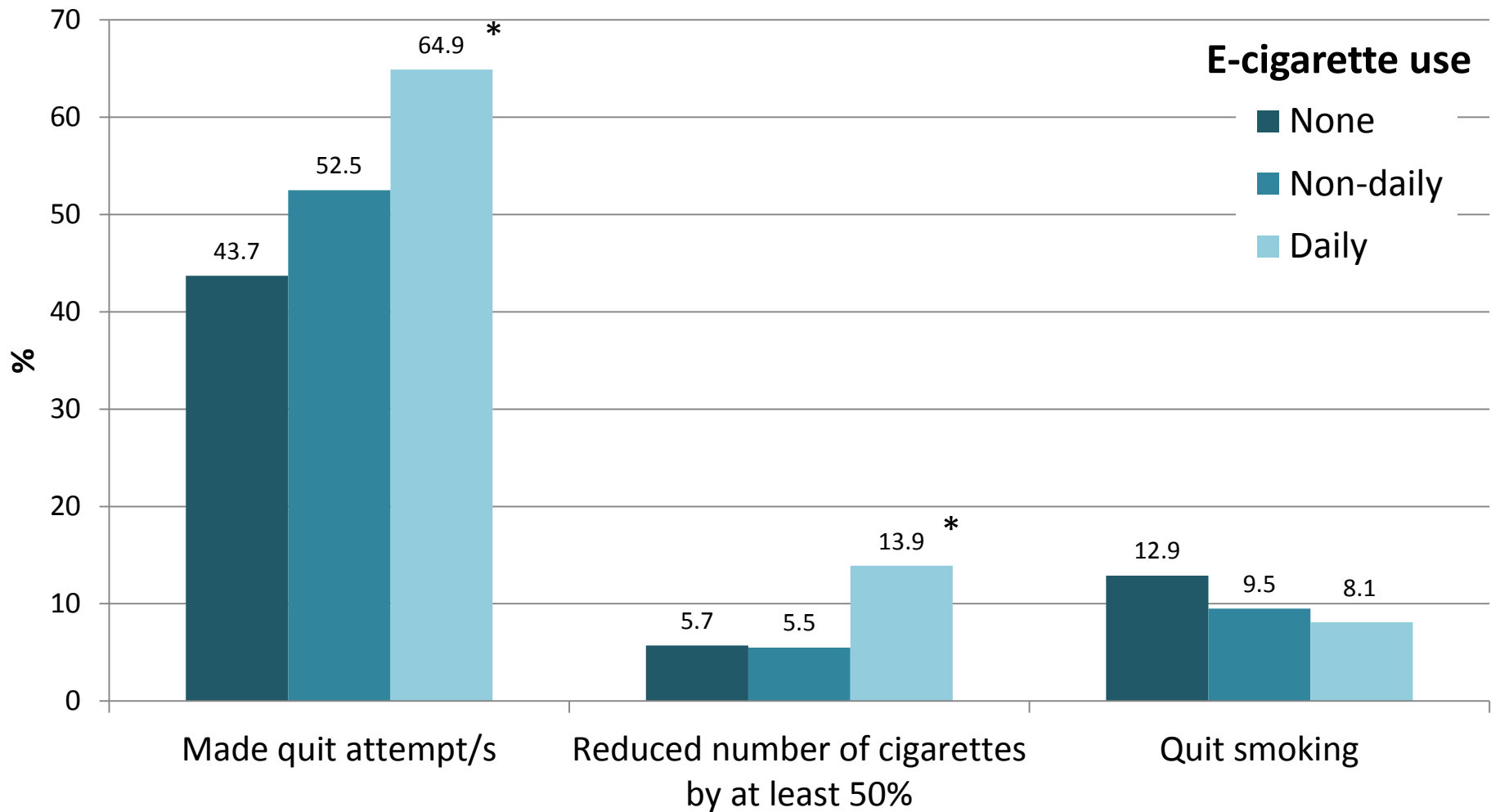
Other significant predictors of being quit: HSI, $p=0.06$ and time since last quit attempt

No significant country interaction, $p=0.86$ *unweighted frequencies and percentages

UK observational studies (e-cigarette use by smokers with a mixture of motives)

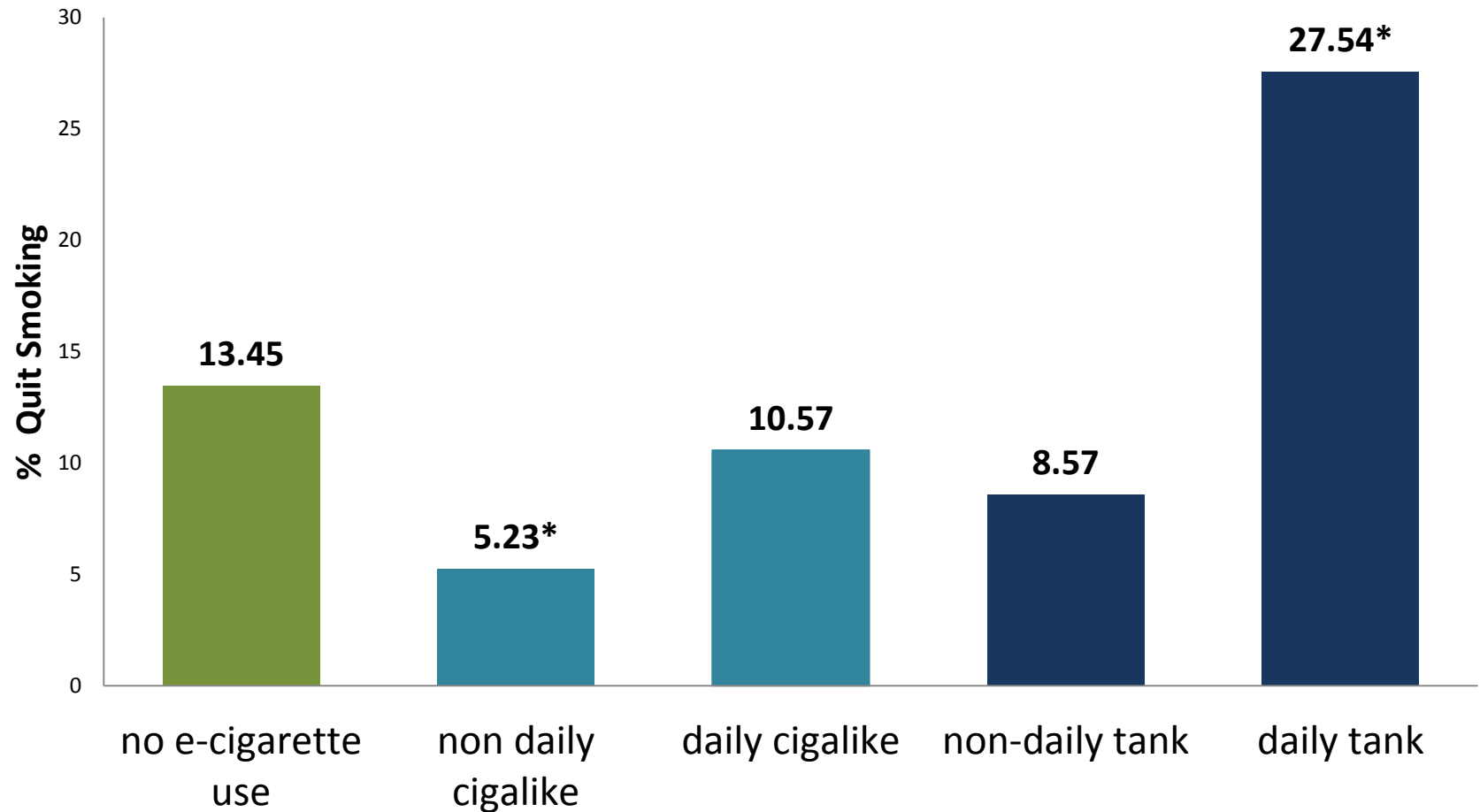
- GB internet cohort survey: wave 1 (n~5000 smokers and recent ex-smokers); wave 2 (n ~2000)

Use of ecigs among baseline *smokers* at 1 year follow-up (Brose et al, 2015)



Raw data shown.* shows significantly different from non-users after adjusting for confounding factors

Quitting in relation to type & frequency of e-cig use at follow up (Hitchman et al, 2015)



Raw data shown; * shows significantly different from non-users after adjusting for confounding factors

Conclusions from research

- **E-cigarettes are effective when used in quit attempts and also help to reduce cigarette consumption**
- E-cigarettes used alongside smoking and/or with mixture of motives leads to **increased quit attempts and reduction** but the frequency, intensity and type of e-cigarette probably makes a big difference to quit success
- More research needed: more *pragmatic trials* allowing experimentation, trials involving more behavioural support, observational studies, relapse prevention, qualitative research

Research questions/ideas

- How can presence of e-cigarettes on the market be optimised to help people to **stop smoking completely as quickly as possible**:
 - We need to understand when and why e-cigarettes work and fail to work for people
 - How do we encourage smokers who are also using e-cigarettes to stop smoking completely & quickly?
- For treatment seekers, how and what e-cigarettes should be supplied and with what support?
- More research with disadvantaged smokers and smokers with mental illness

Acknowledgements:

*Co-authors and Cochrane slides, Peter Hajek & Hayden
McRobbie*

ann.mcneill@kcl.ac.uk

Harm perceptions

(ASH YouGov surveys 2013-15)

