Cessation of Smoking Trial in the Emergency Department

COSTED

THE COSTED TRIAL
SWITCHING AWAY FROM SMOKING





Dr Ian Pope
On behalf of the COSTED team

Disclosure

- COSTED was funded by the National Institute for Health and Care Research Health Technology Assessment Programme (NIHR129438). The views expressed are those of the author and not necessarily those of the NIHR or the Department of Health and Social Care.
- I have received no funding from the tobacco or e-cigarette industry.
- I have no conflicts of interest to declare.

Plan

- Background to the Emergency Department
- COSTED trial
  - Results, pause, economic evaluation, process evaluation, implementation
- Systematic review
  - Methods, results
- Questions

Background

- ED attendance per 100,000 population per year
  - England - 28,706 (16 million attendances)
  - Australia - 32,800 (9.1 million attendances)
  - Canada - 39,000 (16.1 million attendances)
  - US - 47,300 (155 million attendances)



Background

- Groups most likely to attend
  - Lower socioeconomic groups (2:1, most vs least decile of deprivation in England)
  - Insurance status (4:1, Medicaid vs Private insurance)
  - Homelessness, substance misuse disorders, criminal justice system ↑↑↑
  - People who smoke!

Background

What people think happens in ED

Vs.

Reality





COSTED



Cessation of Smoking Trial in the Emergency Department

What was COSTED?

– Two-arm pragmatic, multi-centre, individually randomised controlled trial.



Who did we recruit?

- Inclusion
  - Adults smoking at least 1 cigarette per day attending ED
- Exclusion
  - CO <8ppm
  - dual users
  - lacking capacity



What was the intervention?

– Brief advice (15 mins)
– E-cigarette, 11 pods and advice on how to use it (15 mins)
– Referral to local stop smoking services



What was the control?

Written material about local stop-smoking services



What did we do?

People in the ED screened for smoking status

↓

Consented and randomised

↓

Intervention delivered whilst they waited

↓

1, 3, 6 and around 18 month follow-up

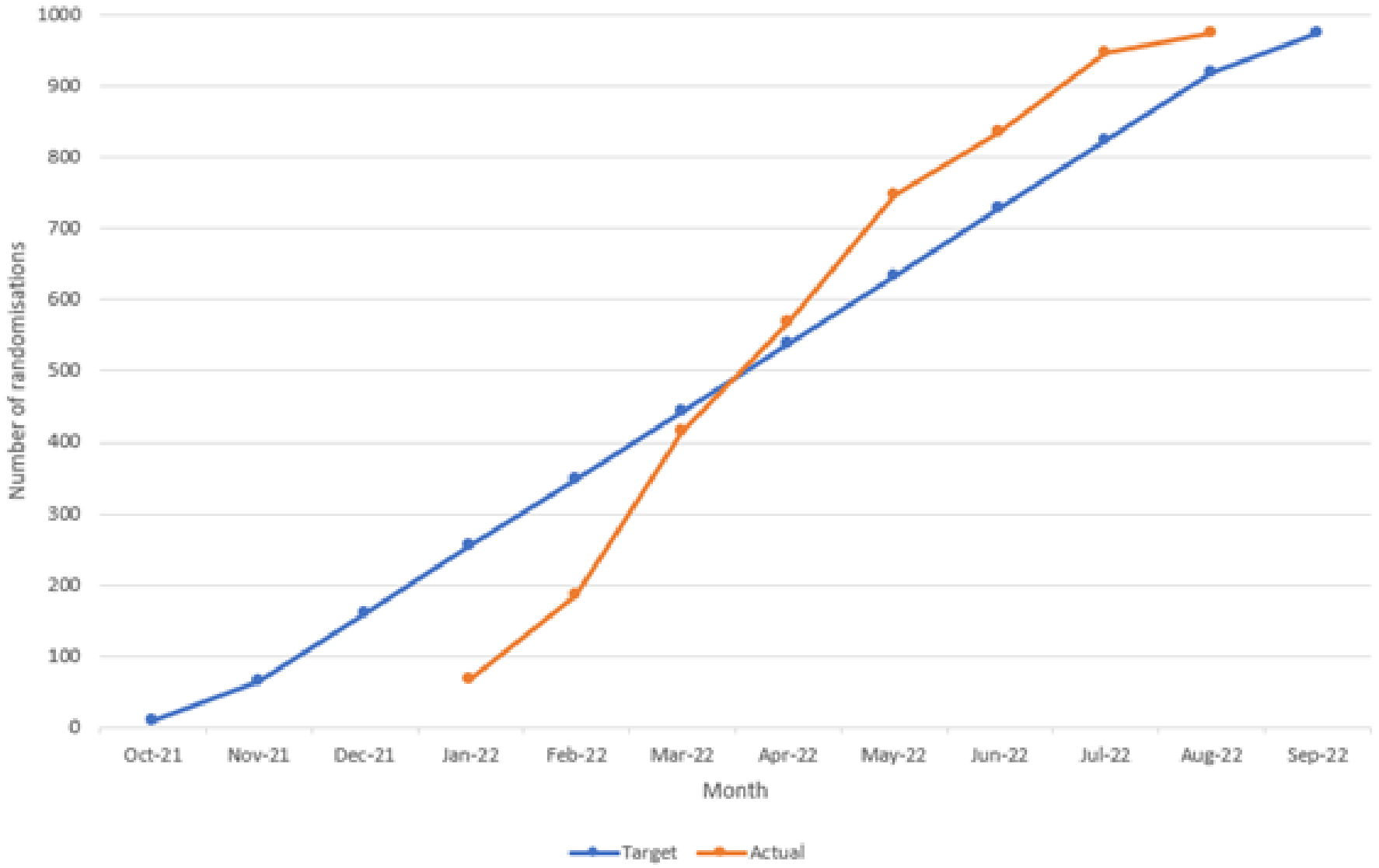
↓

If report abstinence at 6 months invited to undergo CO testing

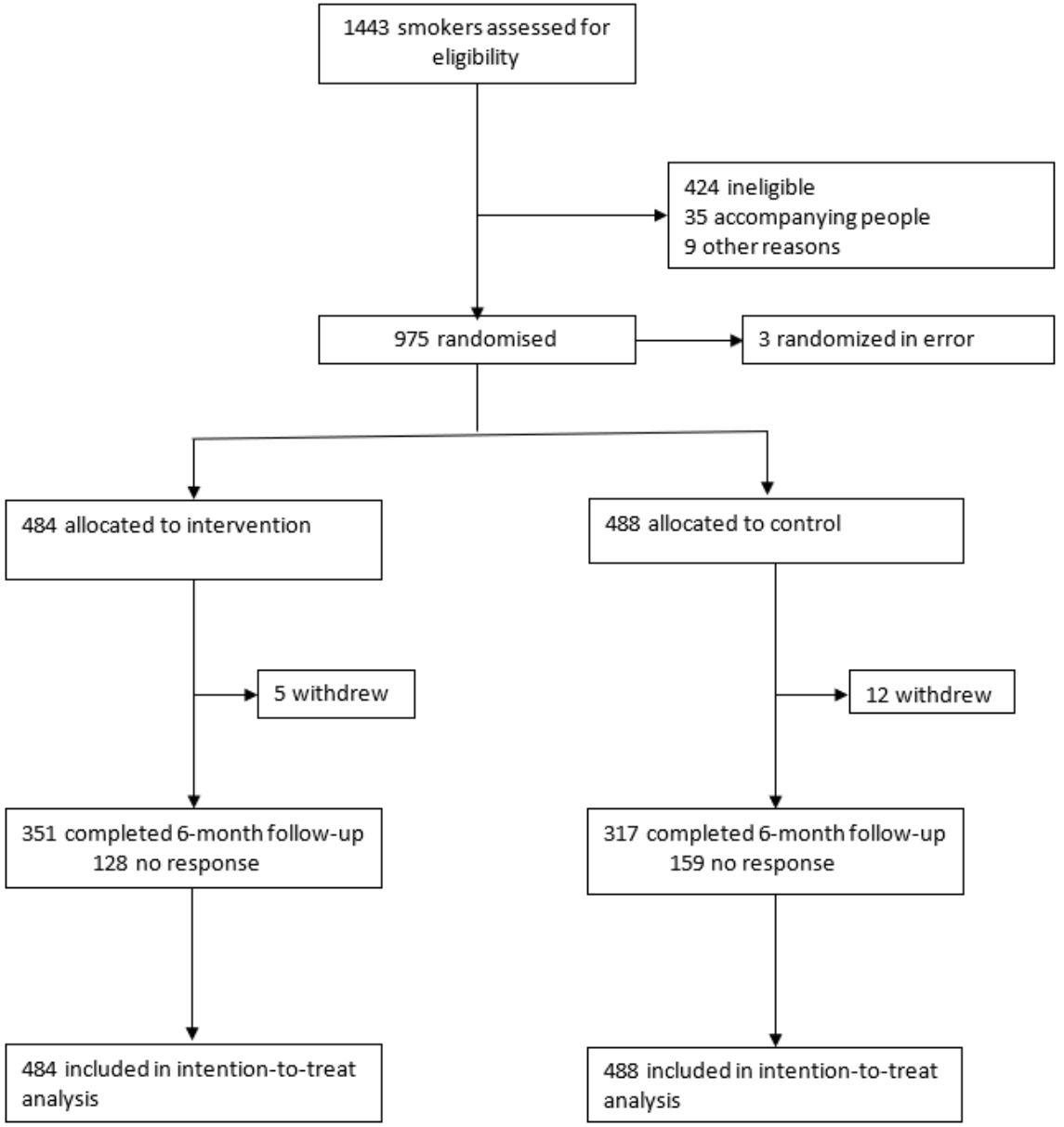


Primary outcome

Recruitment



Consort


1443 smokers assessed for eligibility
424 ineligible
35 accompanying people
9 other reasons
975 randomised
3 randomized in error
484 allocated to intervention
488 allocated to control
5 withdrew
12 withdrew
351 completed 6-month follow-up
128 no response
317 completed 6-month follow-up
159 no response
484 included in intention-to-treat analysis
488 included in intention-to-treat analysis

Baseline characteristics

Characteristic	COSTED population	England ED population	UK Smoking population
Male	62%	49%	≈54%
Mean age	40	Not available	≈42
White	72%	57%	87%
White other	13%	6%	
Black	6%	3%	2%
South Asian	7%	6%	6%
Other	3%	9%	3%
Unknown		18%	
Mean deprivation decile	4.42	4.9	4.4

Primary outcome

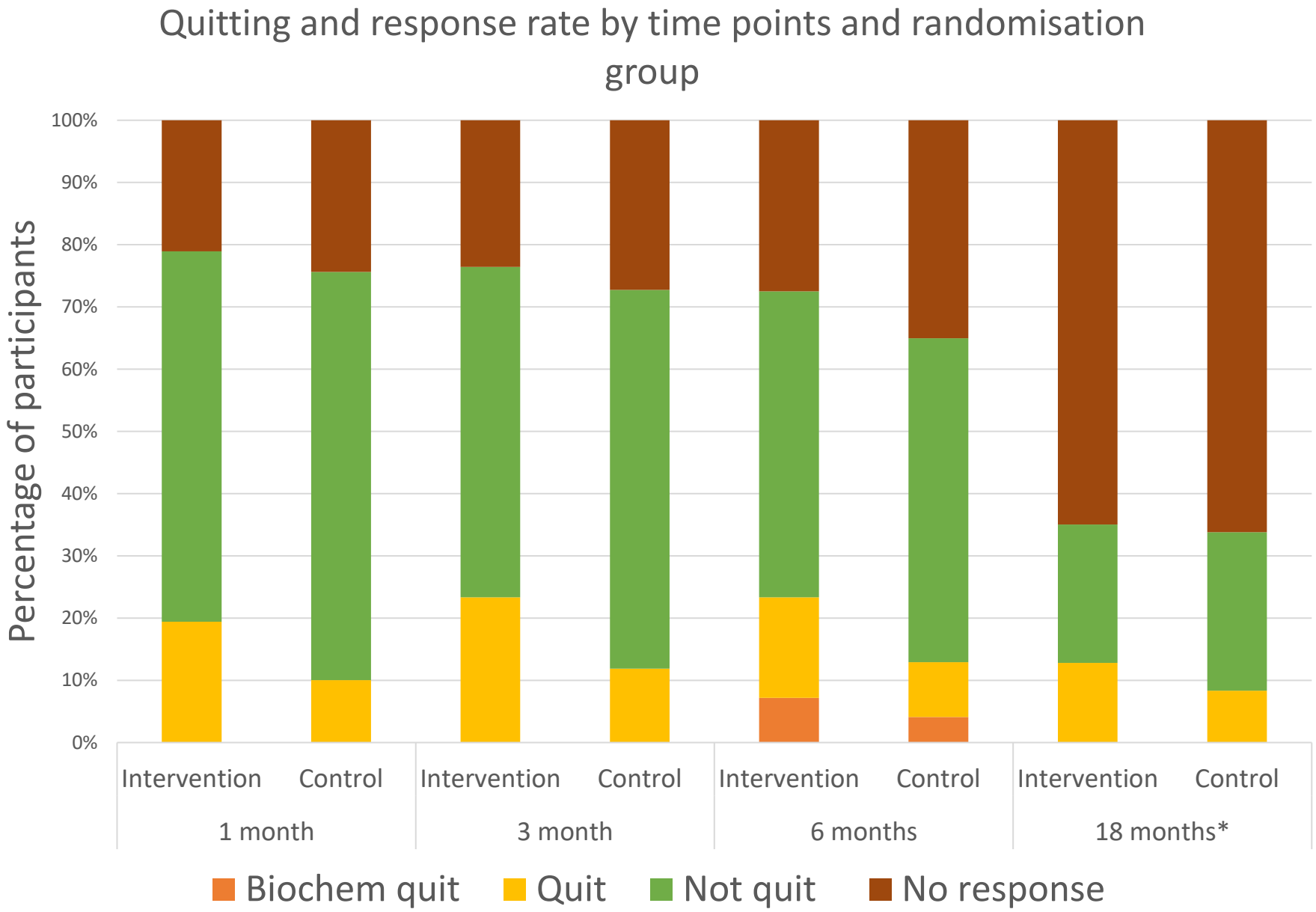
	Intervention	Control	Absolute difference (95% CI)	p-value	Relative Risk (95% CI)	p-value
Biochemically validated self-reported continuous smoking abstinence at 6 months	35/484 (7.2%)	20/488 (4.1%)	3.3% (0.3-6.3)	0.035	1.76 (1.03-3.01)	0.038

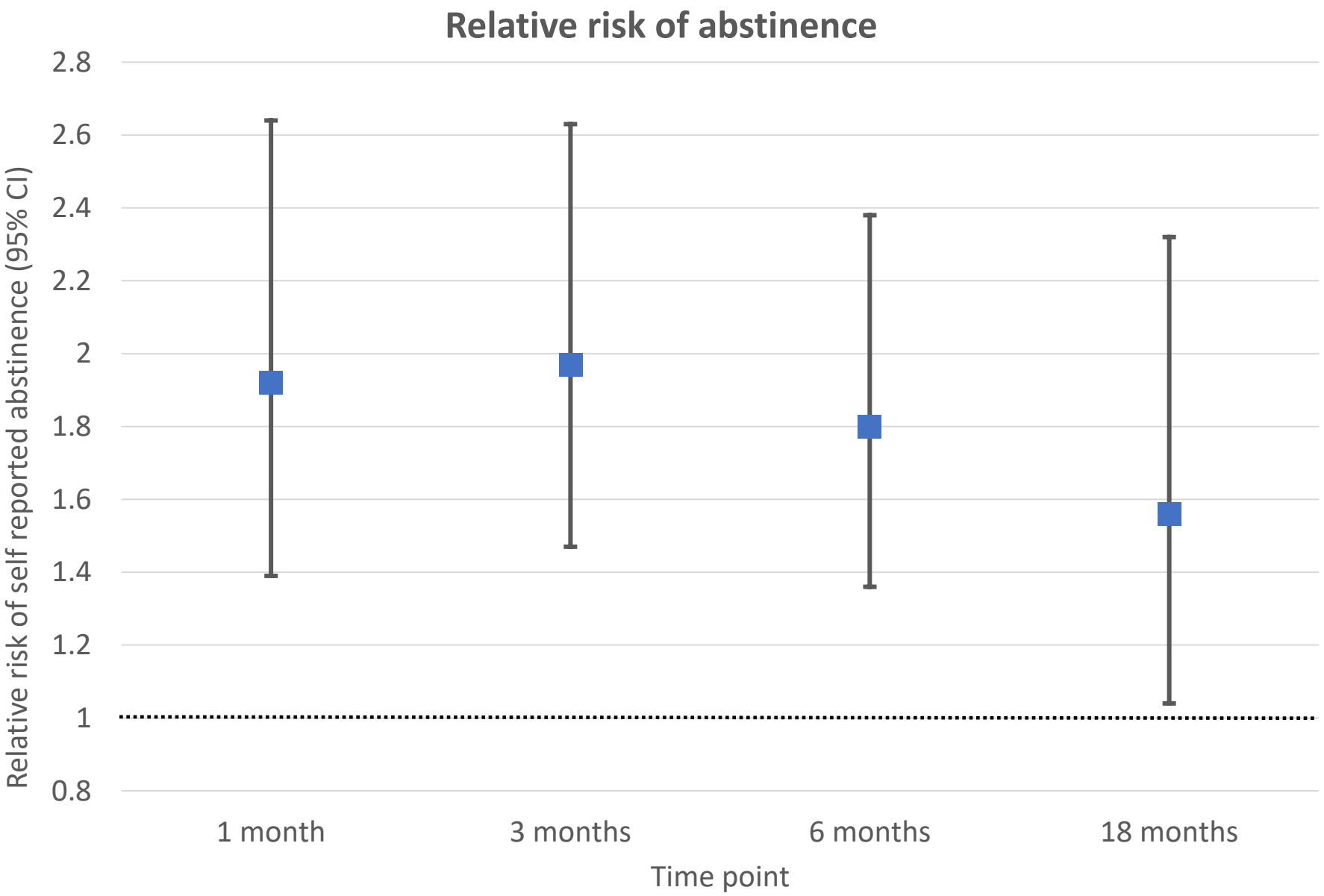
6 month self reported abstinence

	Intervention	Control	Absolute difference (95% CI)	p-value	Relative Risk (95% CI)	p-value
Self-reported point prevalence abstinence at 6 months	113 (23.3%)	63 (12.9%)	10.6 (5.86-15.41)	<0.001	1.80 (1.36,2.38)	<0.001

18 month self reported abstinence

	Intervention	Control	Absolute difference (95% CI)	p-value	Relative Risk (95% CI)	p-value
Self-reported point prevalence abstinence ≈ 18 months	53 (12.8%)	35 (8.33%)	4.6 (0.58-8.7)	0.025	1.56 (1.04,2.32)	0.031


Quitting and response rate by time points and randomisation group
Percentage of participants
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Intervention
Control
Intervention
Control
Intervention
Control
Intervention
Control
1 month
3 month
6 months
18 months*
Biochem quit
Quit
Not quit
No response


Relative risk of abstinence
Relative risk of self reported abstinence (95% CI)
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
1 month
3 months
6 months
18 months
Time point

Frequency of EC use

Frequency of e-cigarette use in past 6 months, n (%):	Intervention	Control
Not used	15%	55%
Once a month or less	12%	8%
2-4 days / month	10%	8%
2-3 days / week	16%	8%
5-6 days / week	7%	4%
Daily	40%	18%

Original research

OPEN ACCESS

Cessation of Smoking Trial in the Emergency Department (COSTED): a multicentre randomised controlled trial

Ian Pope [1], Lucy V Clark [1], Allan Clark [1], Emma Ward [1], Pippa Belderson [1], Susan Stirling,[1] Steve Parrott [2], Jinshuo Li [2], Tim Coats [3], Linda Bauld [4], Richard Holland [5], Sarah Gentry [1], Sanjay Agrawal [6], Benjamin Michael Bloom [7], Adrian A Boyle [8], Alasdair J Gray,[9] M Geraint Morris,[10] Jonathan Livingstone-Banks [11], Caitlin Notley [1]

Nicotine and Tobacco Research, 2025, **00**, 1–6
https://doi.org/10.1093/ntr/ntaf200
Advance access publication date 29 September 2025
Brief Report

SRNT OXFORD

Cessation of Smoking Trial in the Emergency Department: Long-Term Follow-up of a Randomized Controlled Trial

Ian Pope, MBBS[1], Zuzanna Halicka, BSc[2], Lucy Clark, PhD[2], Susan Stirling, MSc[2], Allan Clark, PhD[2], Caitlin Notley, PhD[3]

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NIHR | National Institute for Health and Care Research

Health Technology Assessment

Check for updates

Synopsis

Cessation of smoking in people attending UK emergency departments: the COSTED RCT with economic and process evaluation

Ian Pope,[1*] Lucy V Clark,[2] Allan Clark,[2] Emma Ward,[3] Pippa Belderson,[3] Susan Stirling,[2] Steve Parrott,[4] Jinshuo Li,[4] Timothy Coats,[5] Linda Bauld,[6] Richard Holland,[7] Sarah Gentry,[3] Sanjay Agrawal,[8] Benjamin M Bloom,[9] Adrian Boyle,[10] Alasdair Gray,[11] M Geraint Morris[12] and Caitlin Notley[3]

Pause

Nicotine and Tobacco Research, 2025, **27**, 360–363
https://doi.org/10.1093/ntr/ntae159
Advance access publication 3 July 2024
Brief Report

Engagement With Stop Smoking Services After Referral or Signposting: A Mixed-Methods Study

Ian Pope MBBS[1], Simrun Rashid MBBS[1], Hassan Iqbal MBBS[1], Pippa Belderson PhD[1], Emma Ward PhD[1], Lucy Clark PhD[2], Tom Conway BSc[1], Susan Stirling MSc[2], Allan Clark PhD[2], Sanjay Agrawal MBChB[3], Linda Bauld PhD[4], Caitlin Notley PhD[1]

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Stop smoking services engagement

Frequency of reported usage	Intervention	Control
Group session	2 (0%)	8 (2%)
One-to-one session	14 (3%)	11 (2%)
Smoking helpline	9 (2%)	9 (2%)

Data from services: 461 referrals → 43 people engaged with the services

Received: 17 April 2024 | Accepted: 24 September 2024

DOI: 10.1111/add.16698

RESEARCH REPORT

ADDICTION SSA

Cost–utility analysis of provision of e-cigarette starter kits for smoking cessation in emergency departments: An economic evaluation of a randomized controlled trial

Jinshuo Li[1] | Qi Wu[1] | Steve Parrott[1] | Ian Pope[2] | Lucy V. Clark[3] | Allan Clark[3] | Emma Ward[4] | Pippa Belderson[4] | Susan Stirling[3] | Timothy J. Coats[5] | Linda Bauld[6] | Richard Holland[7] | Sarah Gentry[4] | Sanjay Agrawal[8] | Benjamin M. Bloom[9] | Adrian Boyle[10] | Alasdair Gray[11] | M. Geraint Morris[12] | Jonathan Livingstone-Banks[13] | Caitlin Notley[4]

Economic evaluation

- Total costs= £48 ($64)/ participant
- Cost per 6 month self-reported quit= £189 ($250)
- ICER= £7,750 ($10,270) per QALY gained



Biochemical Verification of Tobacco-Use as an Inclusion Criterion in Smoking Cessation Trials-Lessons From the Cessation of Smoking Trial in the Emergency Department

Ian Pope, MBBS[1], Chandhini Suresh, MPH[2], Emma Ward, PhD[1], Pippa Belderson, PhD[1] and Caitlin Notley, PhD[1]

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Tobacco Use Insights
Volume 16: 1–3
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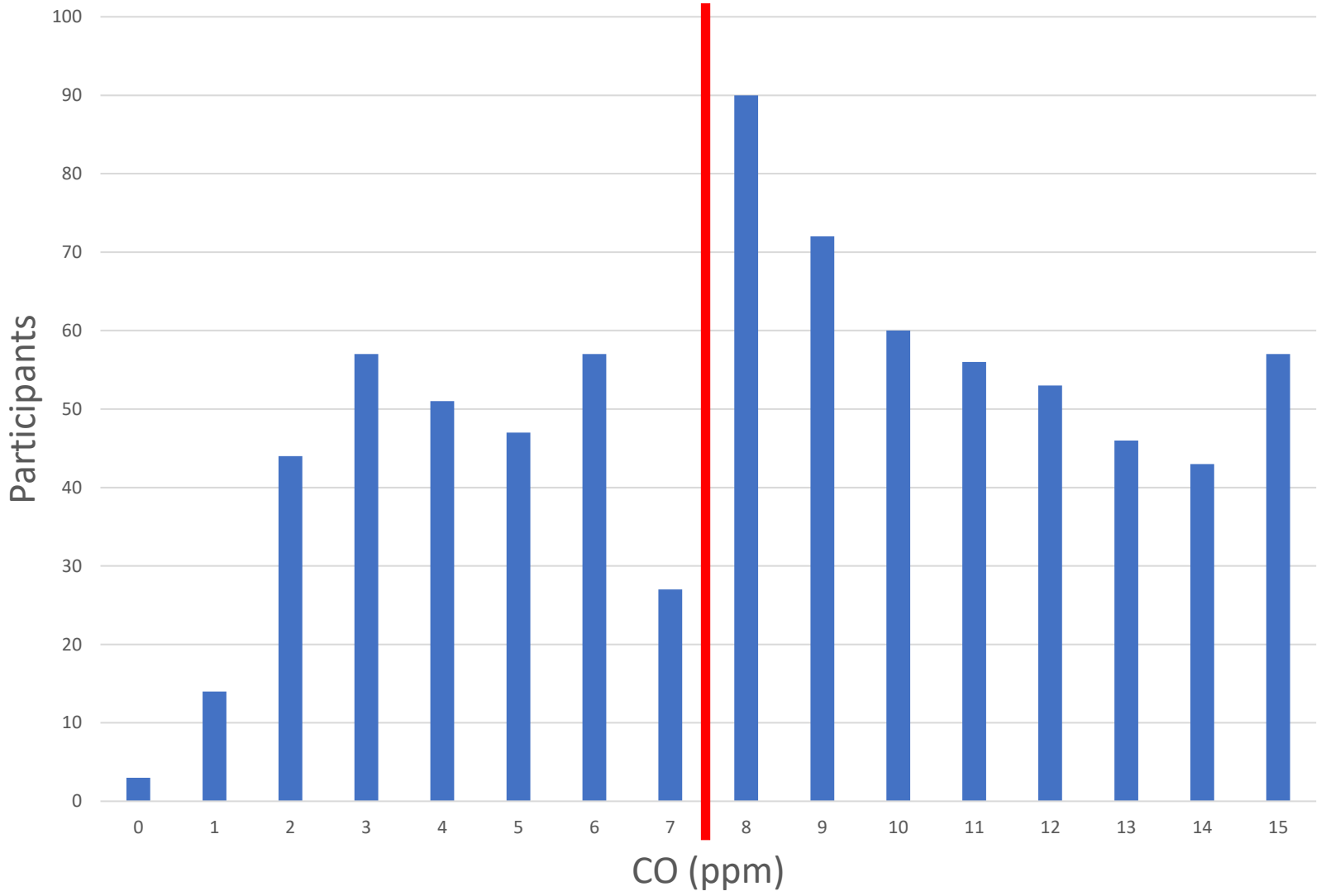
DOI: 10.1177/1179173X231193898
Sage

Carbon monoxide readings



≥16= 543

Nicotine and Tobacco Research, 2025, **27**, 909–916
https://doi.org/10.1093/ntr/ntae223
Advance access publication 7 November 2024
Original Investigation

SRNT OXFORD

The Context of the Emergency Department as a Location for a Smoking Cessation Intervention—Process Evaluation Findings From the Cessation of Smoking Trial in the Emergency Department Trial

Caitlin Notley PhD[1], Pippa Belderson PhD[1], Emma Ward PhD[1], Lucy V. Clark PhD[2], Allan Clark PhD[2], Susan Stirling MSc[2], Steve Parrott MSc[3], Jinshuo Li MPhil[3], Timothy J. Coats MD[4], Linda Bauld PhD[5], Richard Holland PhD[6], Sarah Gentry BMBS[1], Sanjay Agrawal MBChB[7], Benjamin M. Bloom PhD[8], Adrian Boyle MD[9], Alasdair Gray MD[10], M. Geraint Morris MBBS[11], Ian Pope MBBS[1,12]

COSTED

Received: 22 January 2024 | Accepted: 3 July 2024
DOI: 10.1111/add.16633

RESEARCH REPORT

ADDICTION SSA

How do people quit smoking using e-cigarettes? A mixed-methods exploration of participant smoking pathways following receiving an opportunistic e-cigarette-based smoking cessation intervention

Emma Ward | Pippa Belderson | Allan Clark | Susan Stirling | Lucy Clark | Ian Pope | Caitlin Notley

Process evaluation- mechanism of action

- ***"Right time, right place":*** teachable moment
- ***"I don't think I would have approached anybody otherwise":*** opportunistic engagement
- ***"I was unsure about using e-cigarettes":*** credible source
- ***"It was the kick start I needed":*** motivational
- ***"[the intervention] helped to distract me":*** location a positive
- ***"I felt with the study, someone came to me, not to judge me. They came saying look, there is a possible solution":*** non-judgemental



Barriers to impact

- Some participants' quit attempts faltered because of limited product availability
- Others found the vape ineffective
- Referral to local stop-smoking services was rarely taken up

Unintended consequences: snowballing

Directly because of their participation in the intervention:

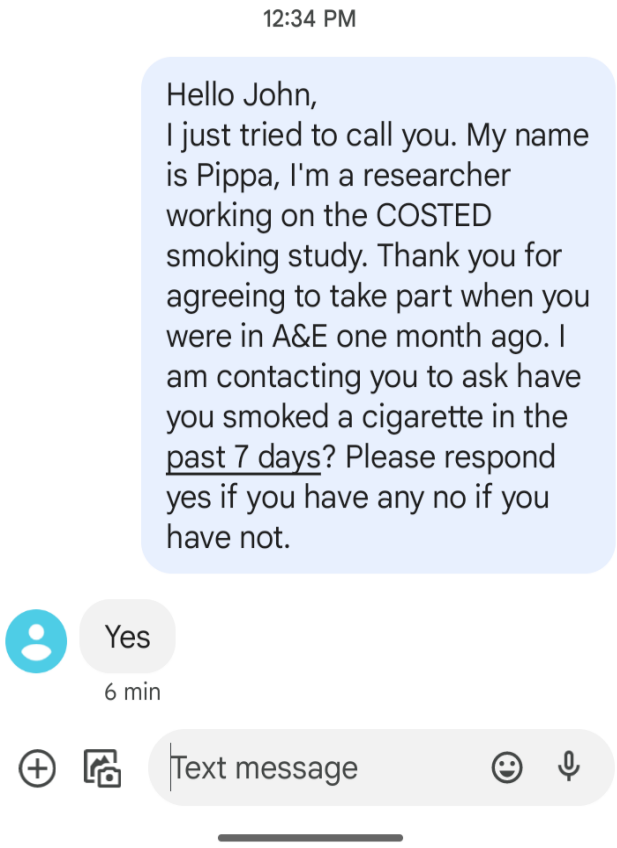
- 58 (18%) participants reported that family or friends had **started dual using**.
- 38 (12%) participants reported that family or friends had **quit smoking and switched to vaping.**



My mum ended up buying a vape because of it…and she's found it helpful [participant]

Unintended consequences: contamination

- “Having spoken to the people in A&E, it gave me the motivation to do it” [control participant]
- Follow-up texts acted = behavioural prompt



Potential impact of implementing the COSTED intervention in England

Dr Ian Pope

Aim: To estimate the impact of implementing the COSTED interventions to EDs in England (intervention details, protocol).

https://osf.io/8hbne/files/osfstorage/65a91a7ff2240f0ed532e170

Implementation model- impact in England

245,163 people who smoke



145,798 receive the intervention





22,908 extra quits

Implementation

- COSTED action group
- 17 trusts implemented
  - Vapes vs NRT vs vouchers
- Achieving 4 week quit rates ≈ 21%
- Plans for a national roll out



Thank you

Professor Caitlin Notley
Co-CI

Dr Lucy Clark
Trial Manager

Dr Emma Ward
Research Fellow

Dr Pippa Belderson
Senior Research Associate

Dr Allan Clark
Lead Statistician

Sue Stirling
Statistician

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Steve Parrott
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Jinshuo Li
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Dr Adrian Boyle
Site PI

Prof Sanjay Agrawal
Site PI

Dr Ben Bloom
Site PI

Dr Geraint Morris
Site PI

Prof Tim Coats

Prof Richard Holland

Prof Linda Bauld

Dr Sarah Gentry

All the participants

Stop smoking advisors at sites

PPI reps

FUNDED BY NIHR | National Institute for Health Research


and that's how it was left.

Systematic review

Emergency department interventions for smoking cessation: a systematic review and meta-analysis

Ian Pope [1], Sarah Gentry,[1] Jonathan Livingstone-Banks,[2] Hassan Iqbal,[1] Simrun Rashid,[1] Chistopher Corbett,[3] Caitlin Notley [1]

Systematic review

- PICO= ED based RCTs aiming to help people quit smoking
- 19 RCTs
  - 11 behavioural support alone (meta-analysis 1)
  - 6 behavioural support + NRT (meta-analysis 2)
  - 1 COSTED
  - 1 data not available

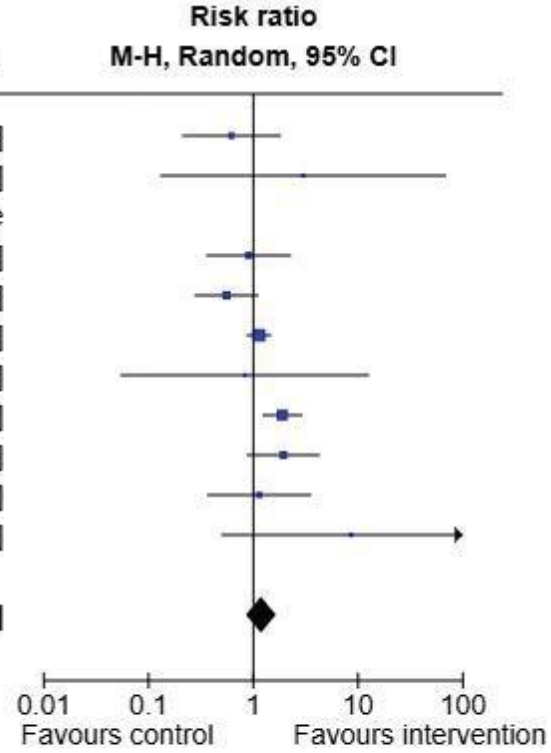
Behavioural support alone

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk ratio M-H, Random, 95% CI
Anders 2011	5	111	8	110	7.2%	0.62 [0.21 , 1.83]
Antonacci 2000	1	21	0	21	1.1%	3.00 [0.13 , 69.70]
Boudreaux 2008	0	36	0	17		Not estimable
Boudreaux 2015	8	212	9	215	9.1%	0.90 [0.35 , 2.29]
Castello 2022	12	262	18	218	13.2%	0.55 [0.27 , 1.13]
Cheung 2018	95	660	81	635	27.5%	1.13 [0.86 , 1.49]
Horn 2007	1	41	1	34	1.4%	0.83 [0.05 , 12.77]
Li 2020	55	787	29	784	21.2%	1.89 [1.22 , 2.93]
Mahabee-Gittens 2008	27	237	7	119	11.3%	1.94 [0.87 , 4.32]
Richman 2000	6	78	5	74	6.7%	1.14 [0.36 , 3.57]
Schiebel 2007	4	20	0	19	1.3%	8.57 [0.49 , 149.20]
Total (Wald[a])		**2465**		**2246**	**100.0%**	**1.18 [0.85 , 1.64]**
Total events:	214		158			

Test for overall effect: Z = 0.99 (P = 0.32)

Test for subgroup differences: Not applicable

Heterogeneity: Tau² (DL[b]) = 0.08; Chi² = 14.28, df = 9 (P = 0.11); I² = 37%



Footnotes

[a]CI calculated by Wald-type method.

[b]Tau² calculated by DerSimonian and Laird method.

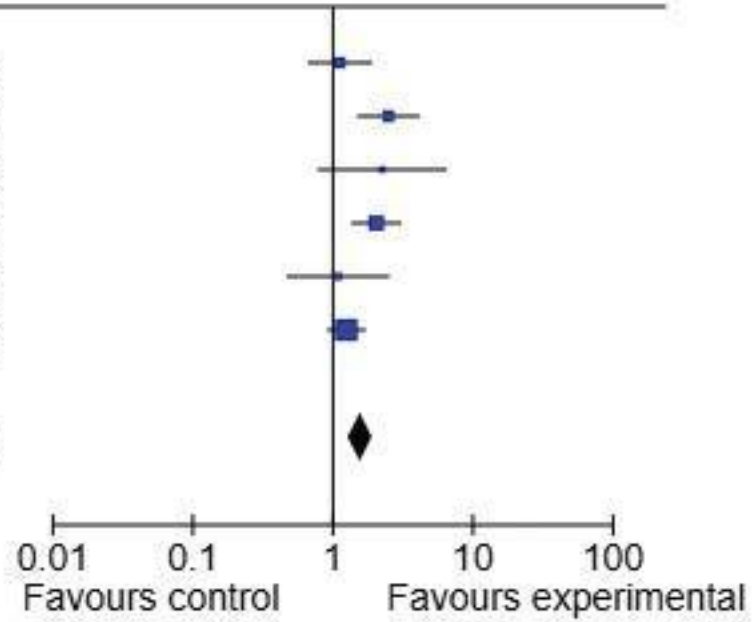
Behavioural support + NRT

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk ratio IV, Fixed, 95% CI
Bernstein 2011	25	170	22	168	14.0%	1.12 [0.66 , 1.91]
Bernstein 2015	47	388	19	390	14.9%	2.49 [1.49 , 4.16]
Bernstein 2016	9	30	4	30	3.5%	2.25 [0.78 , 6.52]
Bock 2008	59	271	29	272	23.3%	2.04 [1.35 , 3.08]
Mahabee-Gittens 2020	11	384	10	381	5.5%	1.09 [0.47 , 2.54]
Neuner 2009	73	515	60	529	38.7%	1.25 [0.91 , 1.72]
Total		**1758**		**1770**	**100.0%**	**1.55 [1.27 , 1.89]**
Total events:	224		144			

Test for overall effect: Z = 4.32 (P < 0.0001)

Test for subgroup differences: Not applicable

Heterogeneity: Chi² = 9.26, df = 5 (P = 0.10); I² = 46%



Key messages

- EDs offers an opportunity to reach underserved groups and help them to quit smoking
- Brief advice + pharmacotherapy/ vape is effective in ED settings for achieving sustained abstinence

Questions?