

Use of Nicotine in Pregnancy

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smoking in pregnancy
challenge group ●



SPECTRUM
Shaping Public hEalth poliCies
To Reduce ineqUalities and harM



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UK**



Outline

- Nicotine and tobacco harm reduction
- Nicotine Replacement Therapy in pregnancy
- Cochrane review
- SNAP Trial
- Evidence from non randomised studies
- E-cigarettes in pregnancy
- Ongoing research

Some basics: where does nicotine come from?

- Nicotine is a naturally occurring substance present in several types of plants in the nightshade family. This includes potatoes, aubergine, tomatoes and red peppers
- It also includes the tobacco plant (*Nicotiana tabacum*)
- Nicotine can be produced synthetically, but this is expensive and not commercially viable
- Nicotine in cigarettes, other tobacco products (including oral tobacco) and Nicotine Replacement Therapy comes from the tobacco leaf
- It is both a sedative and a stimulant and affects the heart rate, breathing activity and blood pressure. It may improve memory and concentration
- Nicotine can be addictive but it depends on the mode of delivery

Guidance on Nicotine

- The UK has formal guidance on tobacco harm reduction and this guidance has, as its basis, evidence reviews on nicotine primarily in the form of Nicotine Replacement Therapy
- The reviews conducted for the guidance did not cover pregnancy, but make it clear that there are no circumstances under which it is safer to smoke than to use NRT
- The guidance endorses the use of NRT for: temporary abstinence, cutting down, smoking cessation and long term use (relapse prevention)

Home > NICE Guidance > Lifestyle and wellbeing > Smoking and tobacco

Smoking: harm reduction

Public health guideline [PH45] Published date: June 2013 Last updated: July 2013 [Uptake of this guidance](#)

Guidance

Tools and resources

Evidence

History

Overview

Introduction: scope and purpose of this guidance

1 Recommendations

2 Public health need and

Guidance

 NICE interactive flowchart - Smoking: tobacco harm-reduction approaches

 Quality standard - Smoking: harm reduction

Nicotine Replacement Therapy in Pregnancy

- Licensing changed in 2005 to allow prescriptions for pregnant women and other priority groups (i.e. patients with CVD, children over the age of 12)
- Widely prescribed including to women accessing stop smoking services across the UK
- Endorsed in 2010 NICE guidance, although health professionals to use clinical judgement and discuss risks and benefits with women
- No evidence of effectiveness for smoking cessation in pregnancy (see later in the presentation)
 - increased metabolism a likely explanation, along with limited adherence

Pregnant smokers are worried about nicotine

- Qualitative studies with pregnant smokers illustrate real concerns about nicotine separate from smoking
- These relate to safety, addictiveness, and whether using NRT increases the risk of relapse to smoking
- UK studies also suggest that advice and support from health professionals regarding nicotine + NRT is inconsistent
- *I can remember the conversation we had about it and [the smoking cessation advisor] was letting me know where I can put [the patches] and what not, but to myself I just thought no, that's just a bit too – you know you sit there thinking about it. I don't know, it's weird, I just think it's too close to the baby to be having all that nicotine going in*
- *My main concern was obviously 'smoking passes on horrible chemicals to the child, does this [NRT] still do that'*

Cochrane Review: NRT in pregnancy

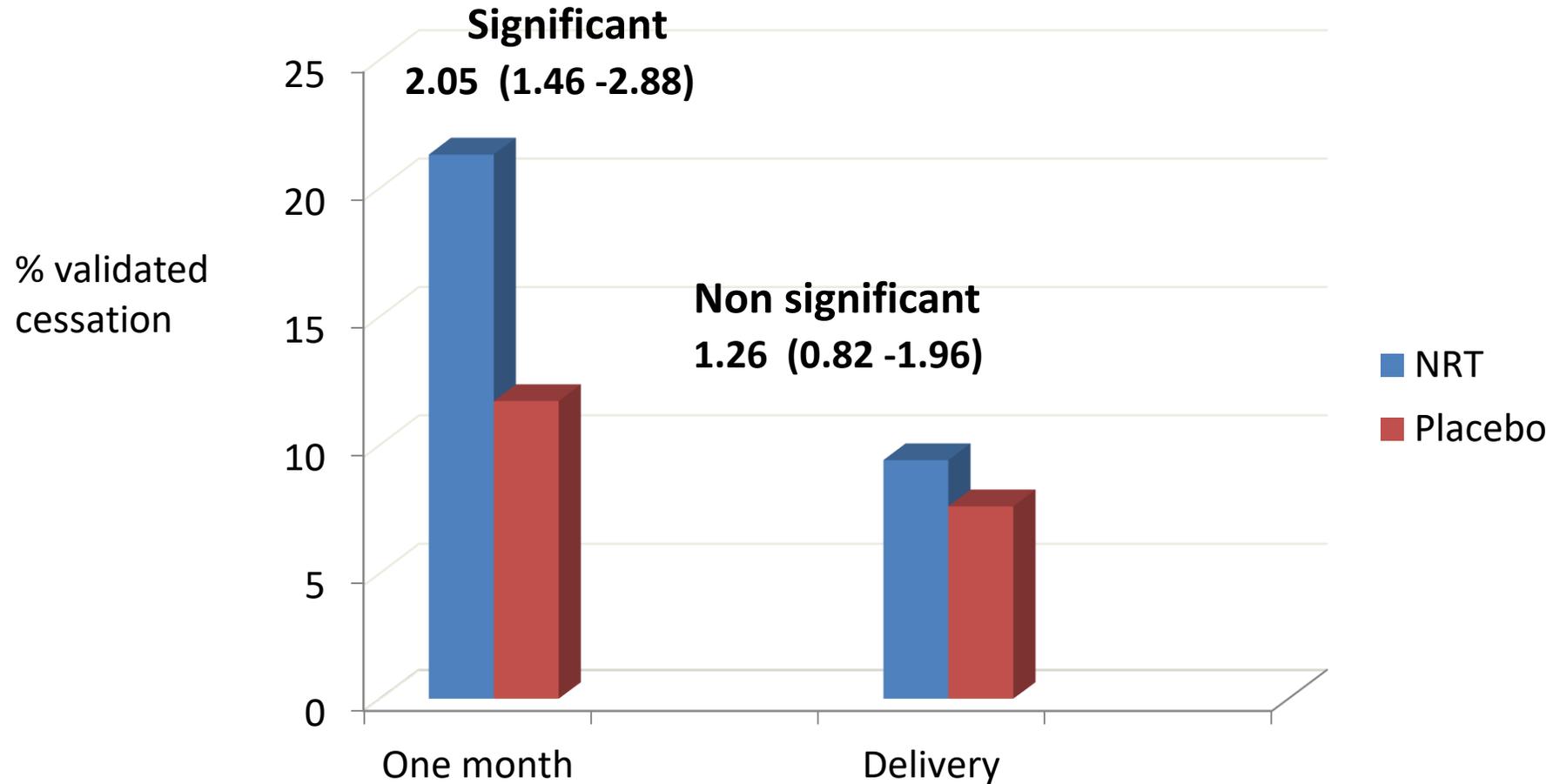
- Most recent review of RCTs examined the efficacy and safety of smoking cessation pharmacotherapies in pregnancy.
- 9 trials of NRT and one of bupropion identified up to July 2015
- Overall finding: There were no differences between NRT and control groups in rates of miscarriage, stillbirth, premature birth, birthweight, low birthweight, admissions to neonatal intensive care, caesarean section, congenital abnormalities or neonatal death.
- Non-serious side effects observed with NRT included headache, nausea and local reactions (e.g. skin irritation from patches or foul taste from gum), but these data could not be pooled.

SNAP Trial



Led by Prof Tim Coleman, University of Nottingham. 15mg/16hr patch used.
Mean gestational age at recruitment 16 wks

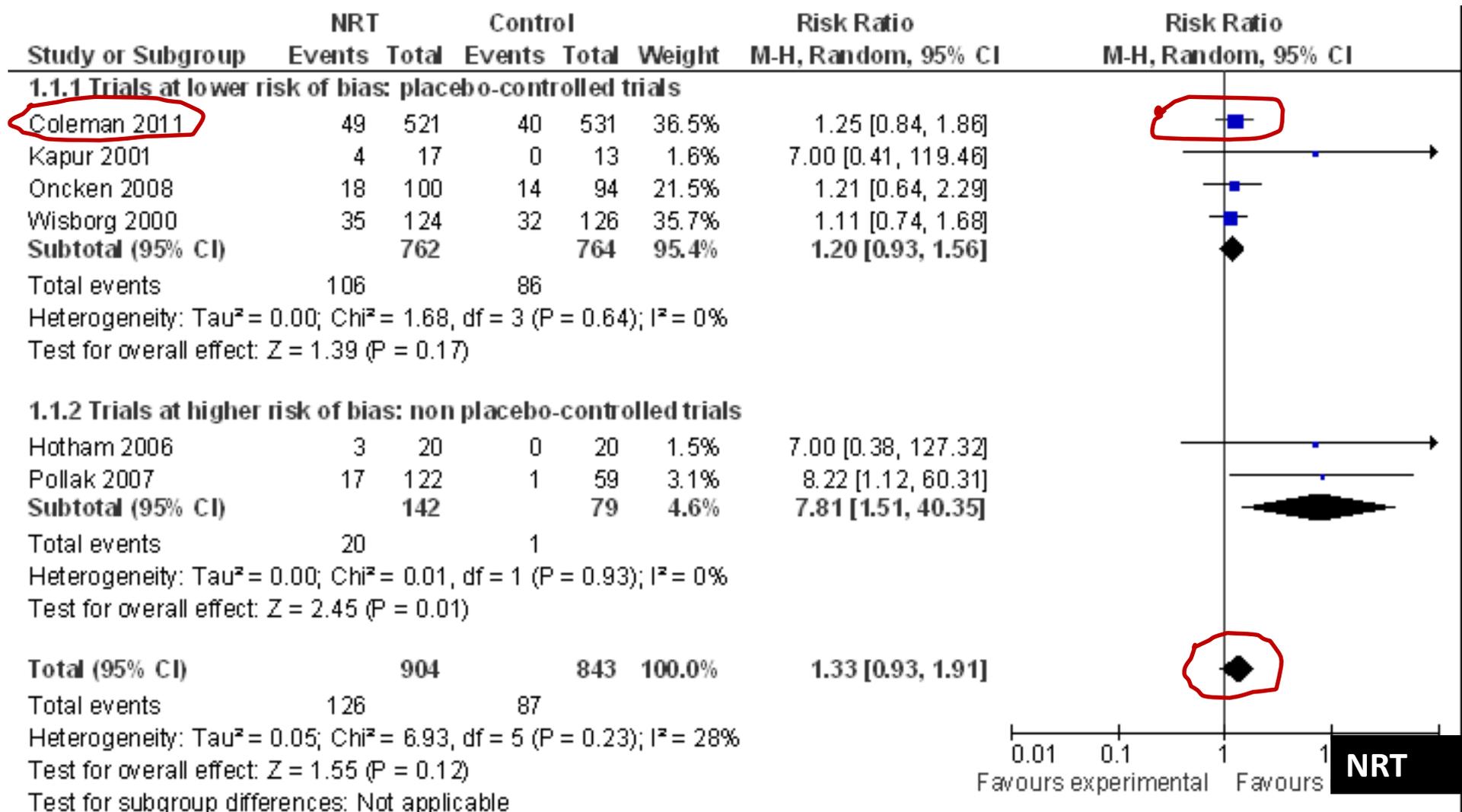
SNAP Findings



Source: Coleman, T., Cooper, S., Thornton, J. G., Grainge, M. J., Watts, K., Britton, J., & Lewis, S. (2012).

A randomized trial of nicotine-replacement therapy patches in pregnancy. *New England Journal of Medicine*, 366(9), 808-818.

Effectiveness of single product NRT for smoking cessation in Pregnancy



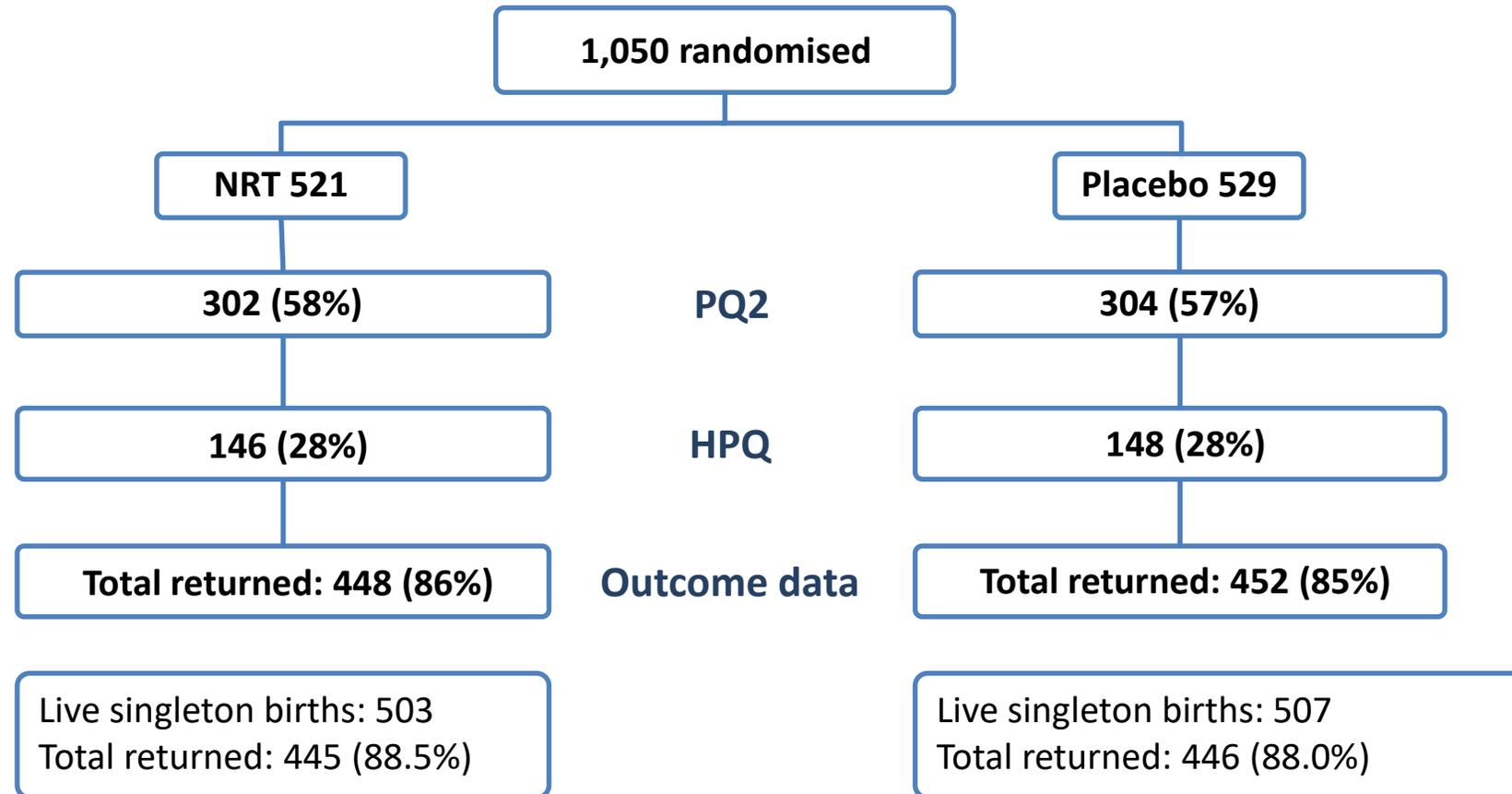
SNAP Follow up objectives

To compare at 2 years after delivery, the impact of NRT & placebo on:

- 1. Infant survival without impairment: no disability or problems with development**
 - ASQ-3: screening instrument, high sensitivity & specificity. 5 domains: communication, fine and gross motor, problem solving, personal-social. All needed to be normal.
- 2. Infant respiratory symptoms**
- 3. Maternal prolonged smoking abstinence**



Responses to parental and health professional questionnaires at 2 years



Infant outcomes at 2 years

Multiple imputation ITT analysis [singleton live births n=1010]	Outcomes allocated from PQ2 or HPQ		OR (95% CI)
	NRT	Placebo	
Survival with no impairment (primary outcome)	323/445 (73%)	290/443 (65%)	1.40 (1.05-1.86) (p=0.023)
Respiratory problems	132/444 (30%)	111/444 (25%)	1.30 (0.96-1.77)

Similar findings for complete case analyses (i.e. just those with returned questionnaires), including those adjusted for clustering by twin births, and in PQ2 only analyses

SNAP Follow up: implications

- 1st trial of smoking cessation intervention in pregnancy to assess infant outcomes at 2 years
- First time a smoking cessation intervention seen to have beneficial effect on pregnant smokers' children
- Better developmental outcomes of infants in the NRT group due to reduced smoking?

Evidence on Safety from non-RCT studies

- In addition to the Cochrane review and the SNAP trial there is some evidence on safety from non-randomised controlled trials
- These studies look at key pregnancy and birth outcomes including:
 - Preterm birth
 - Birth weight
 - Small for gestational age
 - Still birth
 - Congenital abnormalities
 - & other outcomes

Evidence on Safety from non-RCT studies

- Findings from non-RCT studies are consistent with those from the Cochrane review and provide additional detail. They primarily examine women who smoke or use NRT (or both) in pregnancy
- Overall, for the outcomes mentioned in the last slide, there is a lower rate of negative pregnancy-related health outcomes when NRT is used in pregnancy compared to smoking.
- In addition, NRT used by smokers is not associated with poor outcomes but smoking alone is, suggesting NRT may have a protective effect
- One outcome that may be worse in NRT users (with or without smoking) is infant colic. But an improvement in other pregnancy outcomes when NRT is used as an alternative to smoking probably outweigh any risk of colic.

Ongoing research: N-Ready Programme

- NIHR HTA funded programme led by Professor Tim Coleman at the University of Nottingham
- Contains a series of work streams including several systematic reviews, one is on the safety of NRT in pregnancy
- Future trial of higher dose (combination therapy) NRT planned
- Should provide valuable new evidence on the effectiveness of NRT in pregnancy and inform future updated NICE guidelines

E-cigarettes in pregnancy

- Still limited research. Systematic review recently completed for next PHE E-cigarette report – 27 studies identified, nothing on safety
- UK studies – national survey and qualitative research
- Large UK trial underway, due to report end of next year
- Challenge Group resources (see next slot in programme) recently updated and remain current and relevant
- Pregnant women who smoke and who choose to vape should be supported to do so if the alternative is continued smoking or relapse to smoking

National Survey

Aims

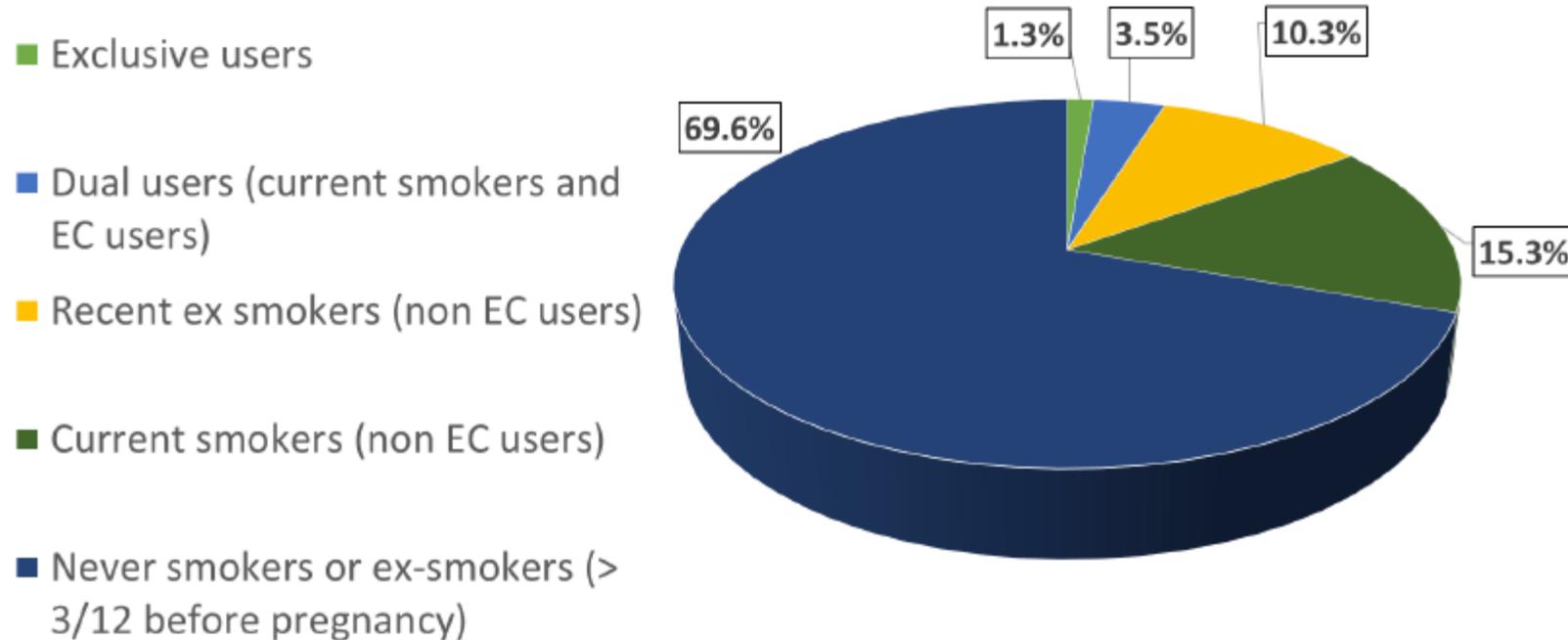
- To estimate prevalence of EC use during pregnancy in the UK
- Compare characteristics of women who use and do not use EC in pregnancy, and dual users vs exclusive vapers
- Examine pregnant women's attitudes towards Ecs

Methods

- 8-24 weeks gestation recruited from antenatal clinics in 17 UK hospitals
- Short screening survey
- Current smokers, recent ex-smokers and current vapers completed longer survey
- Final sample n=867

Prevalence of e-cigarette use

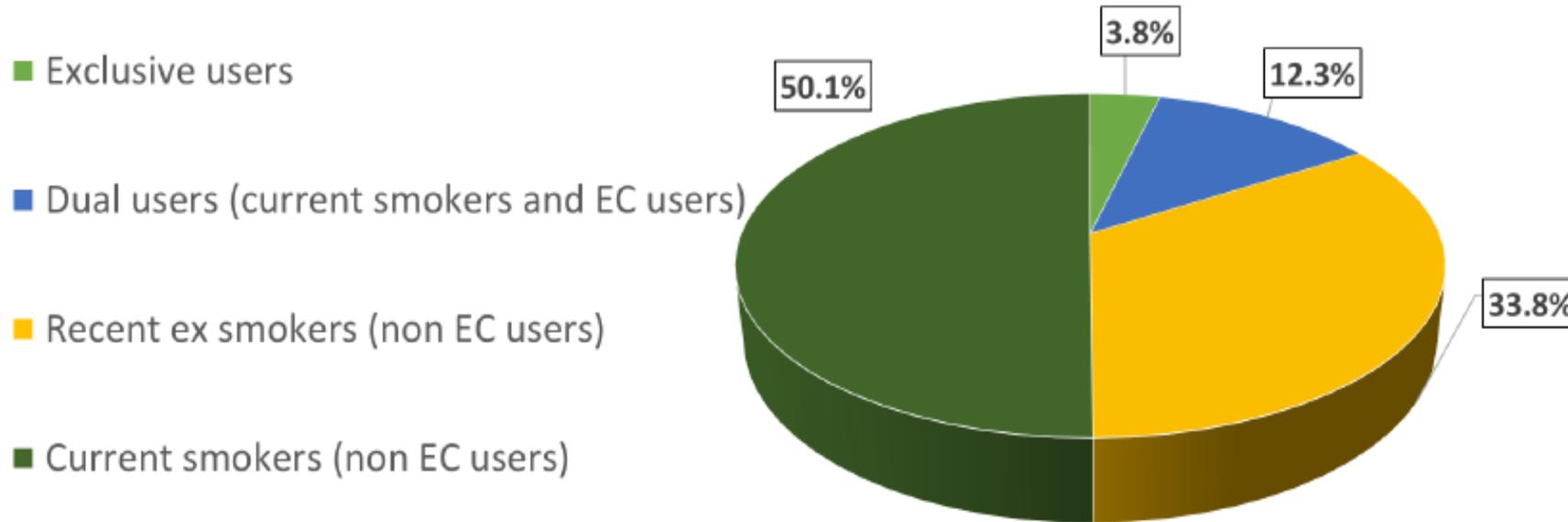
Vaping and smoking prevalence among all pregnant women who completed the initial 'screening' questions



Overall vaping rates varied by area. Lowest in London (2.5%) and the South (2.6%), Highest in the Midlands (7.1%), North (5.3%) and Scotland (6.2%)

Prevalence of e-cigarette use

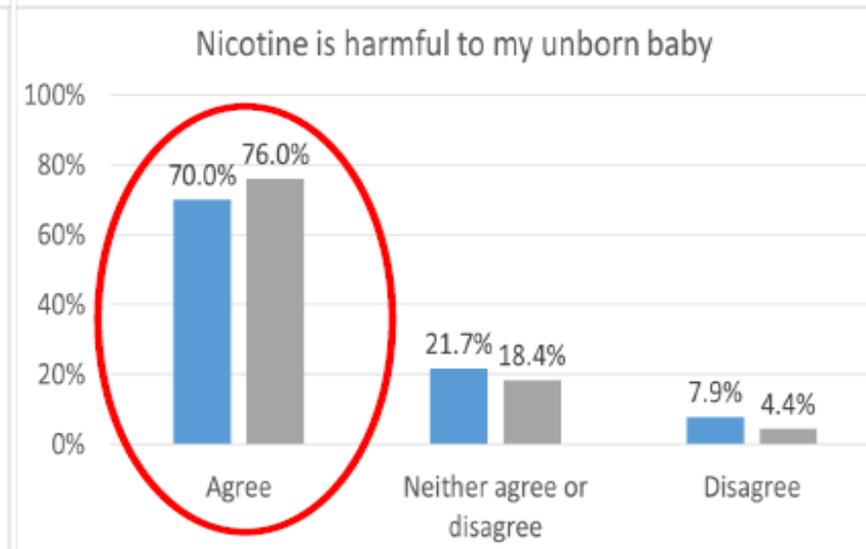
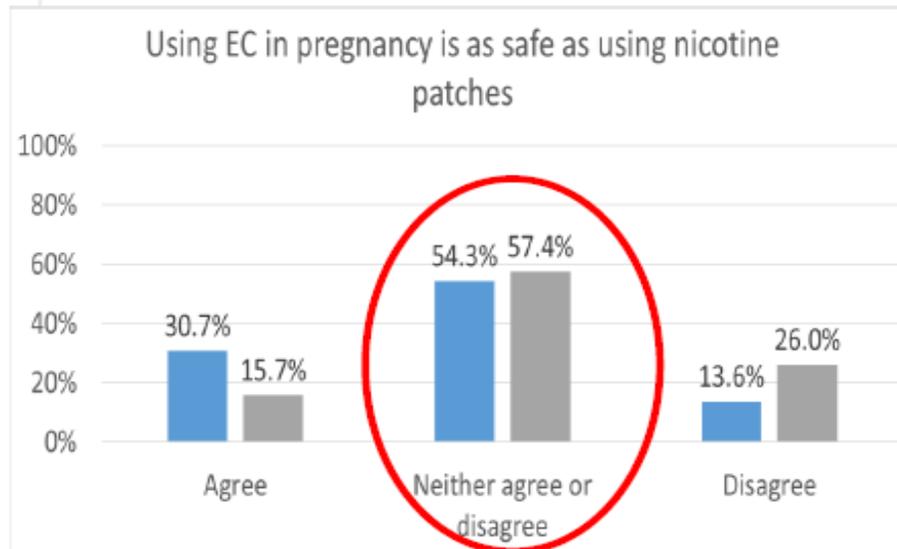
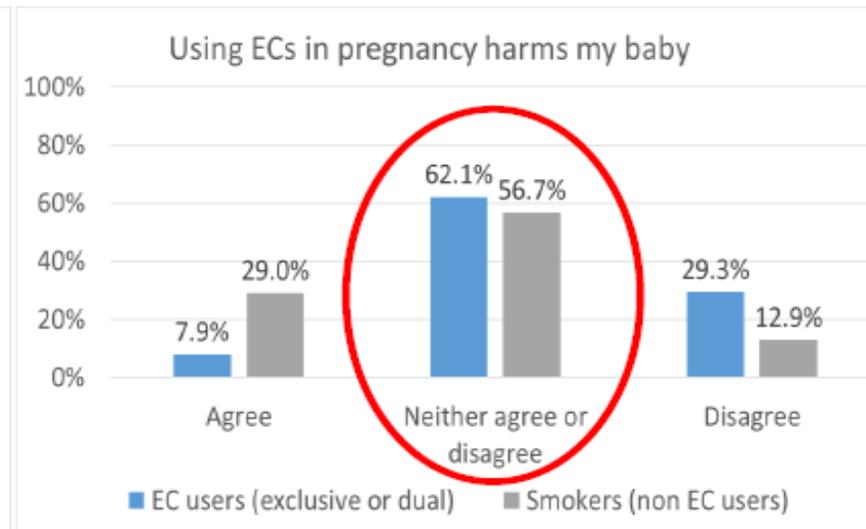
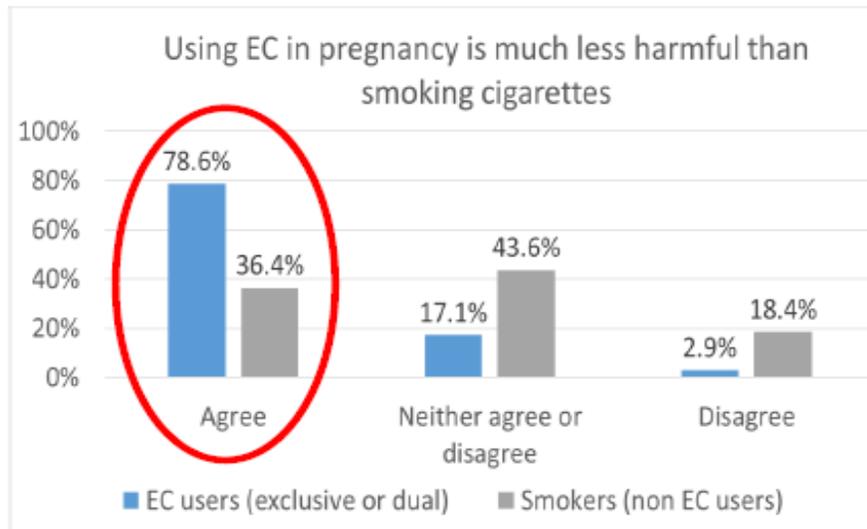
Vaping and smoking prevalence among pregnant women who completed the full survey



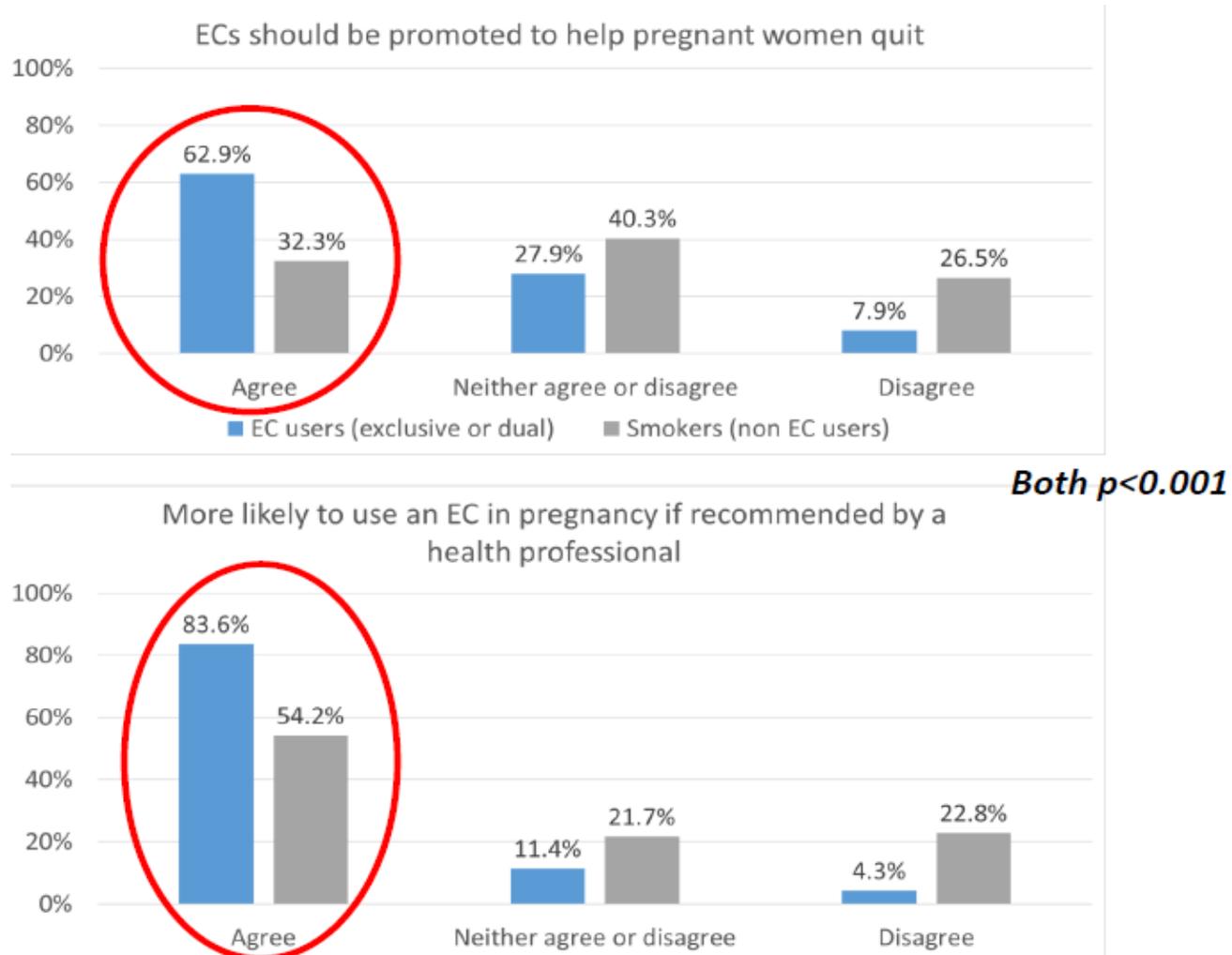
Comparisons of exclusive and dual users:

Exclusive vapers were older, more educated, had a planned pregnancy & were less likely to have smoked in previous pregnancies than dual users

Views on safety: EC users and smokers



Attitudes of EC users and smokers



- Most important reason for use among all users (exclusive and dual) were to help quit smoking and to a lesser extent to cut down
- Most important reasons for NOT using an EC among smokers – bad stories in the press or on social media, followed by not enough research

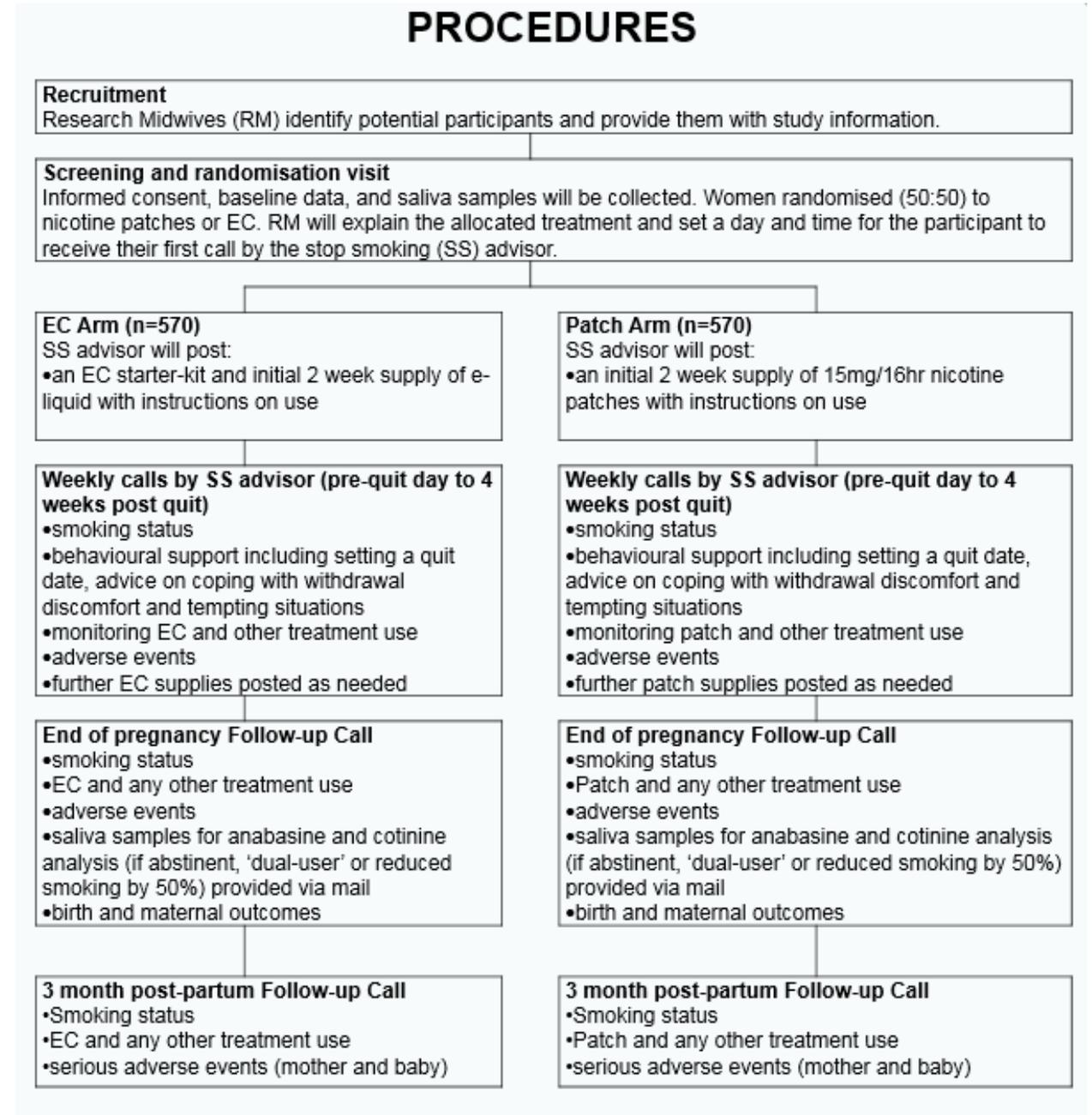
Trial of e-cigarette use in pregnancy ongoing in Scotland and England

Led by Professor Peter Hajek at Queen Mary University of London

Funded by NIHR HTA

Known as the 'PREP' trial

Recruitment now complete, study has gone very well so far and recruited ahead of schedule



Summary

- Nicotine is the addictive substance in cigarettes but is not responsible for the health harms of smoking
- NRT is widely prescribed for smoking cessation in pregnancy in the UK
- A high quality UK trial adds to international evidence suggesting single product NRT isn't effective for cessation but does not result in harm to infants
- Non randomised studies also suggest that using NRT in pregnancy is far safer than smoking
- E-cigarettes are used by relatively few pregnant women (ex smokers and dual users) in the UK, but health professionals need to be aware of use and engage with women regarding these products
- Ongoing research on e-cigarettes and further research on NRT is underway, but for now the priority remains to support women to stop smoking in pregnancy, including by continuing to use nicotine in less harmful forms than in cigarettes.

Thank You

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