

# Research Update: Incentives and Relapse Prevention

## Pregnancy Challenge Group

**1<sup>st</sup> November 2019**

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# Overview

Aim of reducing smoking at time of delivery to 6% or less by 2022

NHS Long term plan: By 2023/24, all people admitted to hospital who smoke will be offered NHS-funded tobacco treatment services. The model will also be adapted for expectant mothers, and their partners, with a new smoke-free pregnancy pathway including focused sessions and treatments.

*Support for smoking cessation is key, but to target the groups who are most likely to continue to smoke...*

**‘Going beyond NICE guidance’**

1. Incentives
2. Alternative harm reduction approaches
3. Focus on relapse prevention
4. Focus on Vulnerable populations

# Latest evidence on Incentives for smoking cessation

Caitlin Notley, Sarah Gentry, Jonathan  
Livingstone-Banks, Linda Bauld, Rafael  
Perera, Jamie Hartmann-Boyce

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Cochrane Database of Systematic Reviews

## Incentives for smoking cessation

Cochrane Systematic Review - Intervention | Version published: 17 July 2019 [see what's new](#)

<https://doi.org/10.1002/14651858.CD004307.pub6>

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# Background: incentives in pregnancy

- Incentive based programmes have been used to encourage positive health behaviour change, but are controversial:
- Public acceptability?
- Commissioning?
- Time limited effectiveness?
- Pregnant women who smoke are a high risk priority group (*incentives more acceptable?*)
- Possible mechanisms of action (theory of behaviour change):
- Operant conditioning
- Delay discounting



# Background – the last Cochrane review

- Cahill et al, 2015
- Incentives found to be effective for smoking cessation in mixed populations, and in trials recruiting pregnant women
- The odds ratio (OR) for quitting with incentives at longest follow-up (six months or more) compared with controls was 1.42 (95% confidence interval (CI) 1.19 to 1.69; 17 trials, [20 comparisons], 7715 participants)
- Only three studies demonstrated significantly higher quit rates for the incentives group than for the control group at or beyond the six-month assessment:
- “Incentives appear to boost cessation rates while they are in place”



# Objectives

To determine the long-term effect of incentives and contingency management programmes for smoking cessation.

1. Do incentives reduce the prevalence of smoking at longest follow-up?
2. What is the optimal amount and type of incentives that might be offered to impact on cessation outcomes?
3. What are the cost implications of incentives, to employers and to the community?
4. How great is the risk of disbenefits arising from the use of incentives, e.g. false claims, ineligible applicants?

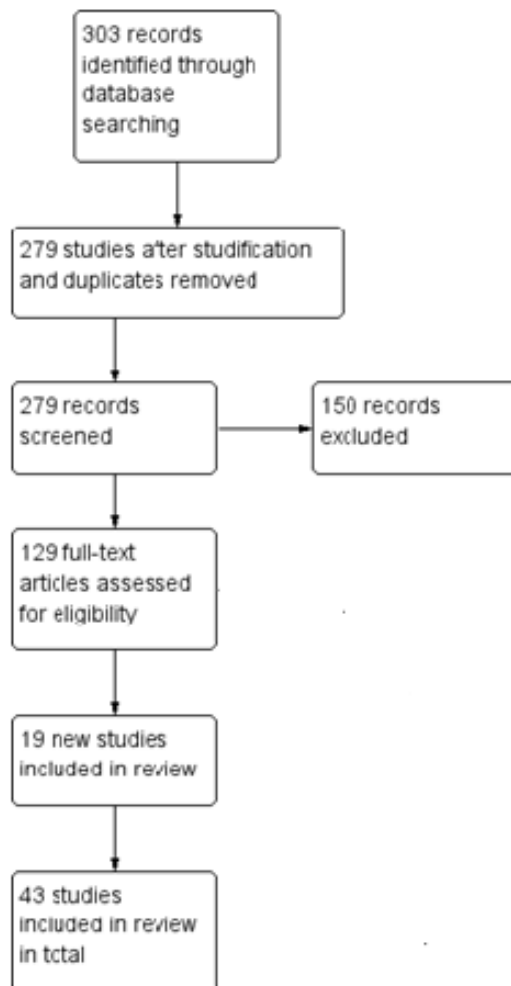


# Selection criteria

- Studies: RCTs or cluster RCTs
- Participants: Adult smokers
- Interventions: Incentive schemes to reward participants for validated cessation and abstinence
- Controls: Usual care or other smoking cessation interventions
- Outcomes: Long term smoking cessation (6 months or more), self reported or biochemically validated
- Pregnancy outcomes: long term smoking cessation to at least the end of pregnancy and at longest follow up postpartum



# PRISMA flow diagram





# Results – summary of studies included

- 33 mixed-population studies (>21,600 participants). 16 of these studies were new in this review update.
- 10 studies involving pregnant women (n=2571 participants. 1 new study for this review update).
- Studies were set in varying locations, including community settings, clinics or health centres, workplaces, and outpatient drug clinics.
- Twenty-four of the trials were run in the USA, two in Thailand and one in the Phillipines. The rest were European.



# Main results – incentives used

- Most used cash incentives (n=16) or voucher incentives (n=7) (e.g. shopping vouchers, grocery vouchers)
- 2 used self-deposits
- Others used some combination of the above, or the above combined with competition entry.



# Main results - effectiveness

Pooled relative risk (RR) for quitting with incentives at longest follow-up (six months or more) compared with controls was 1.49 (95% CI 1.28 to 1.73; 31 RCTs, adjusted N = 20,097;  $I^2 = 33\%$ ).

Substance misuse subgroup - Results suggested a favourable benefit of incentives for smoking cessation at longest follow-up (no significant subgroup difference ( $P = 0.38$ ;  $I^2 = 0\%$ ; RR in substance abuse subgroup 1.24, 95% CI 0.81 to 1.89; 8 studies; N = 1055;  $I^2 = 0\%$ ; Analysis 1.2.1).

Taken together, nine trials in pregnant smokers (eight conducted in the USA and one in the UK) delivered an RR at longest follow-up (up to 24 weeks post-partum) of 2.38, 95% CI 1.54 to 3.69; 9 RCTs; N = 2273;  $I^2 = 41\%$ ) in favour of incentives.

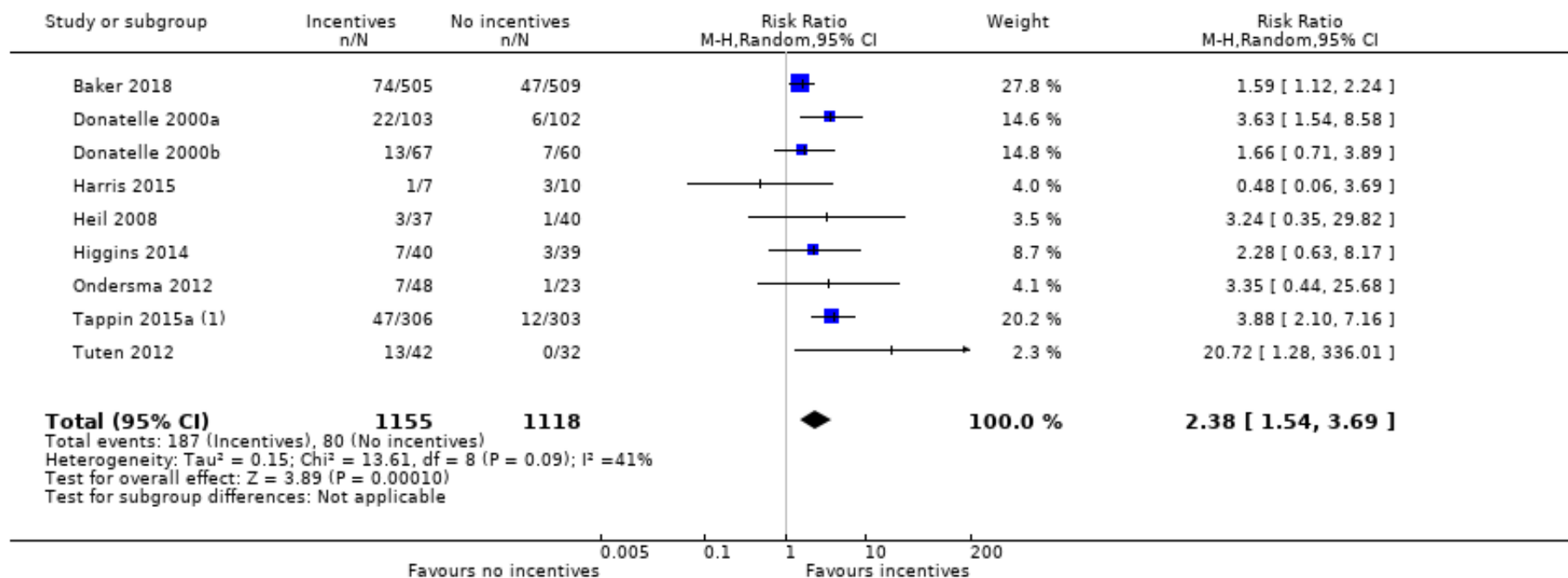




## Analysis 2.1

[Open in figure viewer](#) | [Download as PowerPoint](#)

Review: Incentives for smoking cessation  
Comparison: 2 Incentives in pregnant women  
Outcome: 1 Smoking cessation at longest follow-up



(1) 12 months post-TQD

Comparison 2 Incentives in pregnant women, Outcome 1 Smoking cessation at longest follow-up.



## Results – pregnancy

Unable to ascertain whether the size of the rewards made a difference to outcomes, due to a paucity of relevant data.

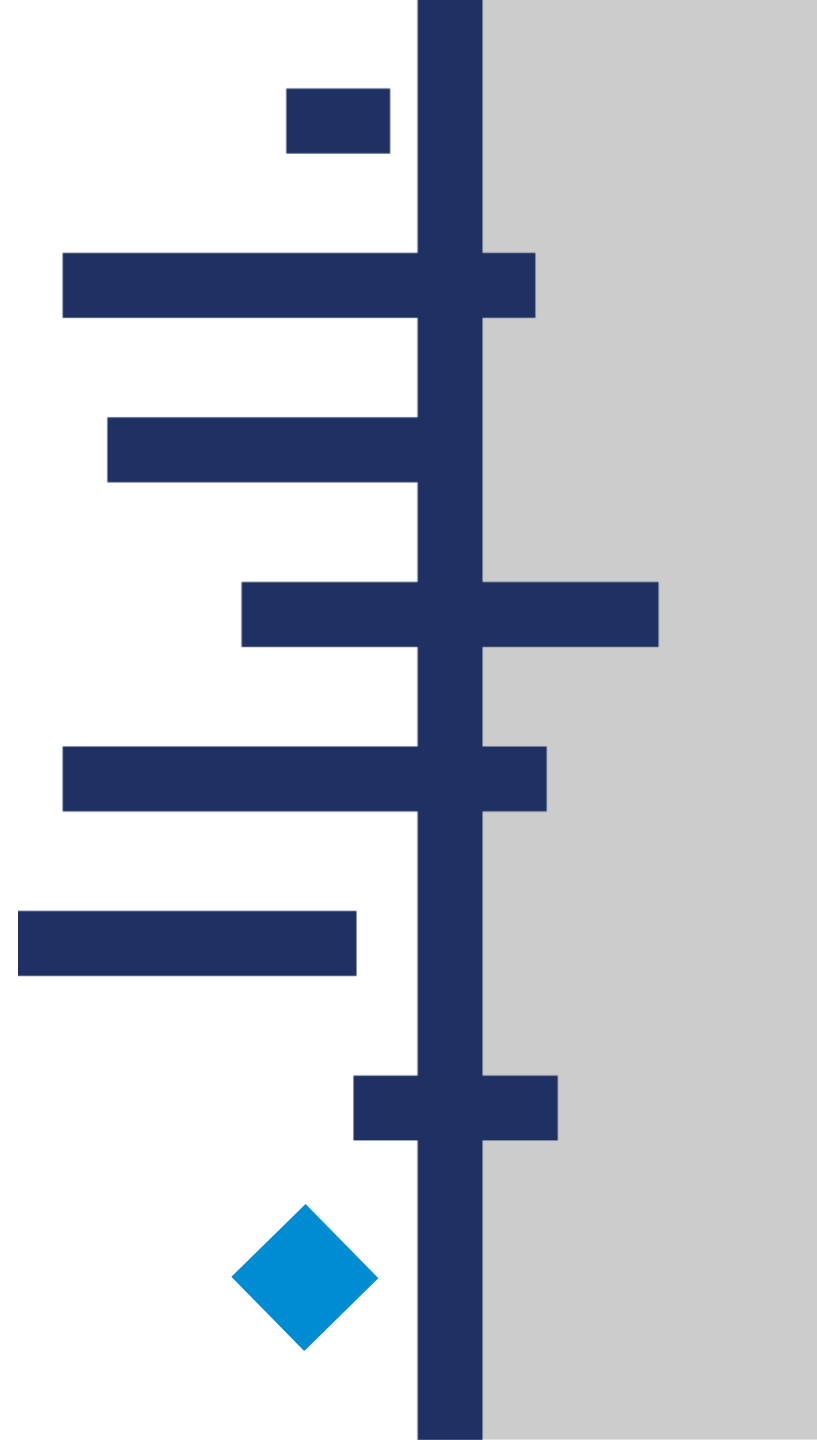
Three trials addressed the question of whether contingent rewards were more effective than non-contingent fixed payments (Heil 2008; Higgins 2014; Tuten 2012). All three trials favoured conditional over non-conditional payments, with a RR of 3.33, 95% CI 0.97 to 11.38; 3 RCTs; N = 225; I<sup>2</sup> = 18%; Analysis 2.3.

No reported harms or disbenefits. Tappin (2015) reported some limited evidence of ‘gaming’



# Incentive amount

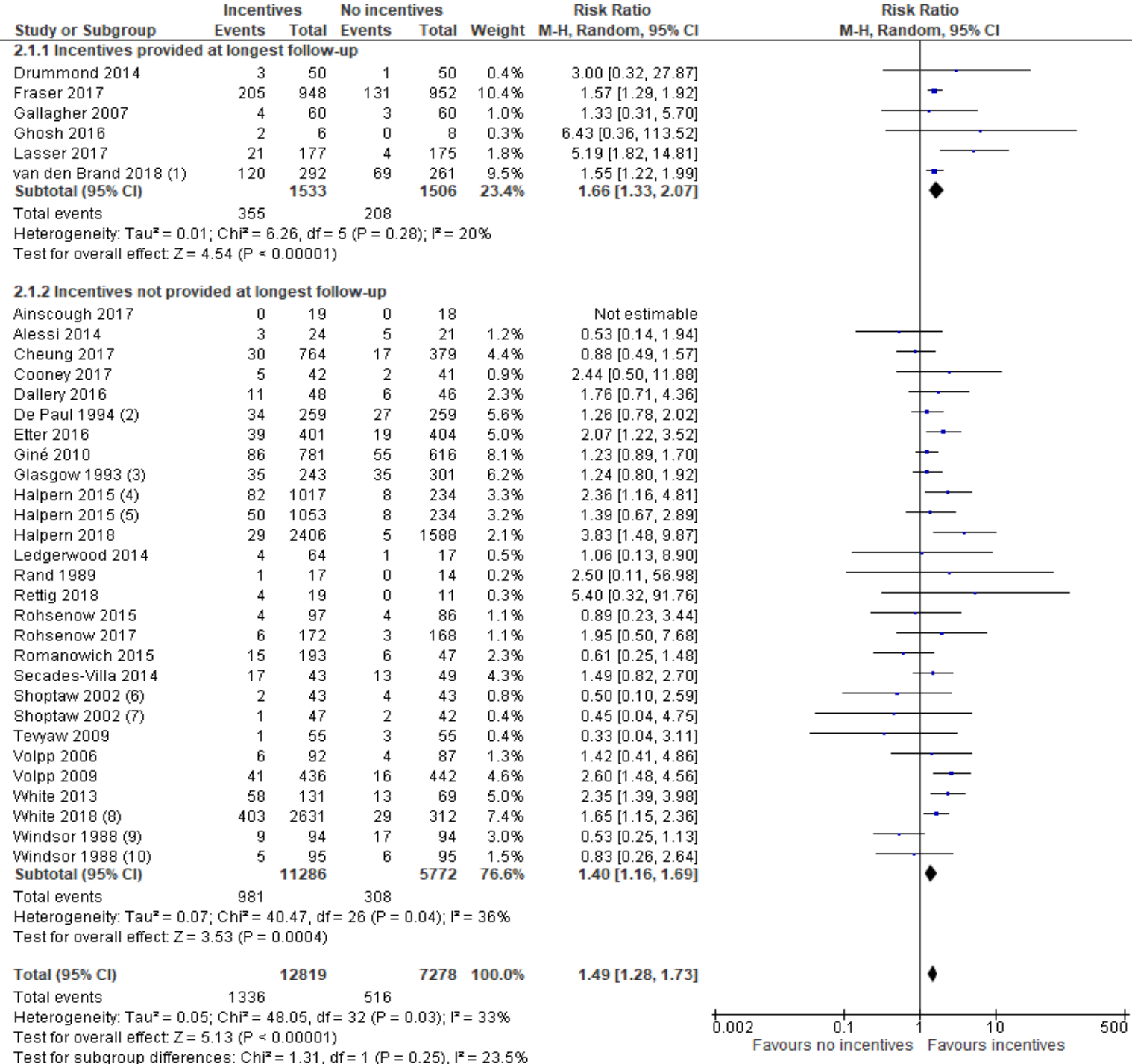
- Although not always clearly reported, the total financial amount of incentives varied considerably between trials, from zero (self-deposits), to a range of between \$45 USD and \$1185.
- There was no clear direction of effect between trials offering low or high total amounts of incentives, nor those encouraging redeemable self deposits.



# Duration of incentives

We conducted a sensitivity analysis to explore the effect of incentives offered continuously, up until the long term follow up point, compared with studies where longest follow-up was beyond the end of the incentive period.







# Conclusions

1. high-certainty evidence that incentives improve smoking cessation rates at longest follow-up in mixed-population studies
2. With moderate-certainty evidence, the nine trials in 2273 pregnant women contributing to the meta-analyses confirmed the efficacy of incentives at longest follow-up, at or around the end of pregnancy
3. Findings from our meta-analysis in mixed populations suggest that incentives continue to have a significant impact on sustained smoking cessation, even after they have finished.
4. Positive benefit of incentives for substance misusing populations



# Implications for practice

Barriers to implementing incentives in routine care or as part of mainstream services?

Public opinion regarding incentives is often negative (incentives seen as 'rewarding' behaviour change for a 'habit' that is perceived as self-inflicted)

Those who relapse to smoking and do not receive a financial incentive may conceivably disengage from subsequent cessation attempts.

Possibility of gaming needs careful monitoring (although limited evidence of this)

Incentives offer an important route to smoking cessation that is effective and may add value to a comprehensive public health approach to reducing smoking prevalence, alongside other forms of cessation support.



# Preventing Return to Smoking Postpartum: PReS Study

– DEVELOPMENT OF AN EVIDENCE BASED COMPLEX INTERVENTION  
FOR MAINTAINING POSITIVE BEHAVIOUR CHANGE

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# PReS Study: Background

- Approximately 26% of UK women report smoking in the 12 months before pregnancy (Infant feeding survey, Health & Social Care Information Centre, 2012)
- More women quit during pregnancy than at any other time. 45% are able to “spontaneously quit” (Lumley, 2009)
- The majority of women who quit smoking in pregnancy return to smoking within six months of the birth of the baby

Physiological  
changes

Motivation,  
intention to  
quit only for  
pregnancy

not  
breastfeeding

Stress,  
depression  
or anxiety

Negative social  
influences

Mistaken  
beliefs

Identify as a  
smoker and as  
a mother

Partner/  
household  
smoking

Low  
confidence to  
remain  
abstinent

**ADDICTION**

**SSA** SOCIETY FOR THE  
STUDY OF  
ADDICTION

Review

**Postpartum smoking relapse—a thematic synthesis of  
qualitative studies**

Caitlin Notley ✉, Annie Blyth, Jean Craig, Alice Edwards, Richard Holland

First published: 10 September 2015 | <https://doi.org/10.1111/add.13062> | Cited by: 16



Volume 110, Issue 11  
November 2015  
Pages 1712-1723

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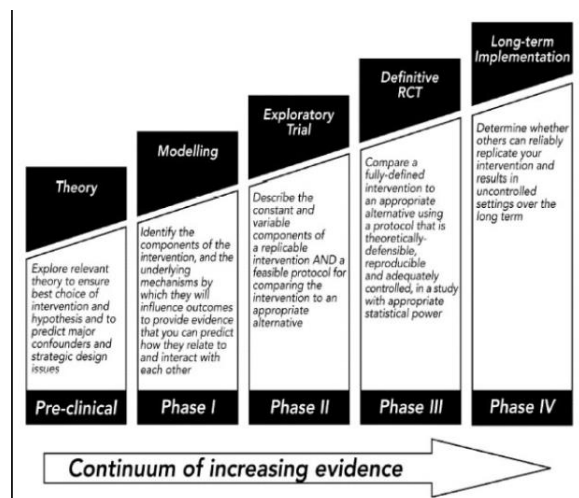
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# PReS Study: Aims & Methods



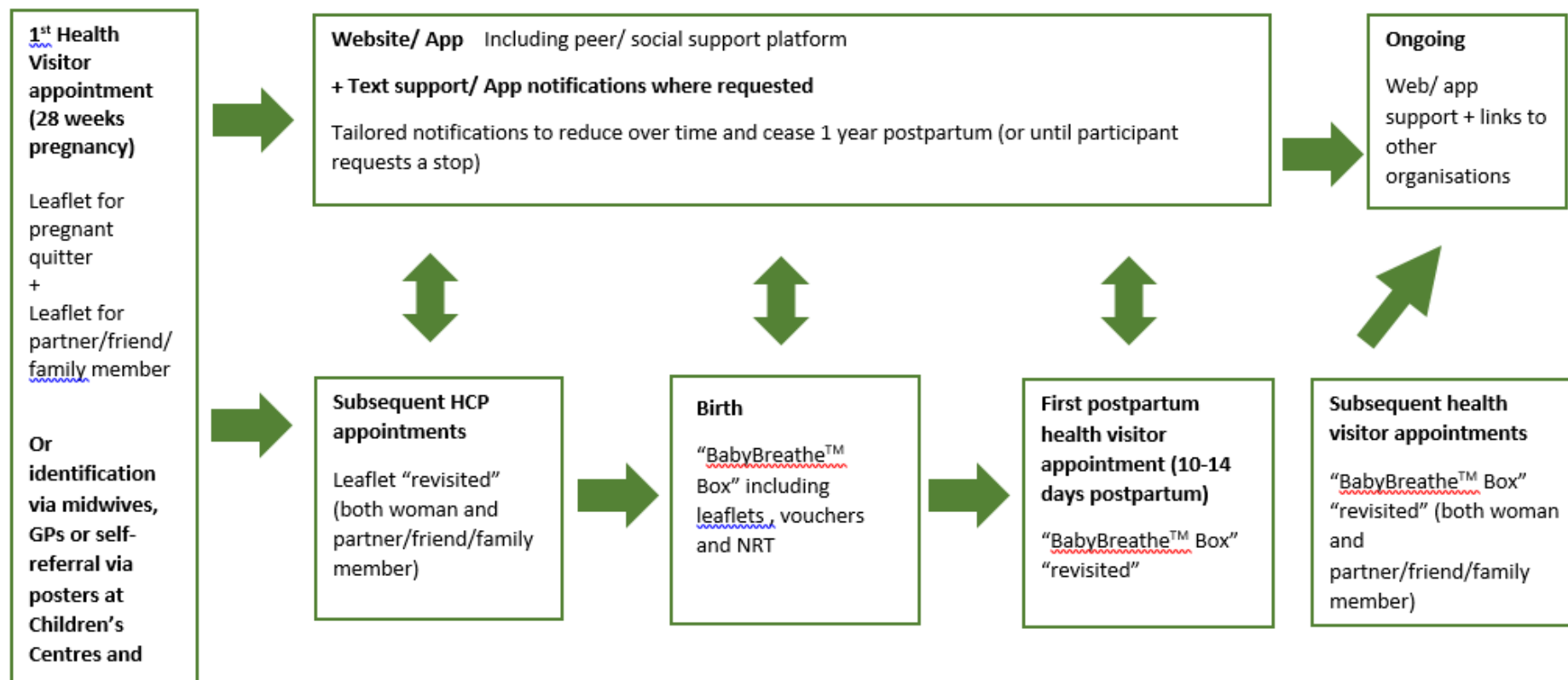
- Map literature to identify determinants and specify promising behavioural change techniques
- Refine a prototype intervention through focus groups and interviews with women, partners and health professionals
- Model the prototype intervention with postpartum ex-smokers
- Define an intervention suitable for testing in a phase II randomised feasibility trial



Following MRC framework for the development of complex interventions

# New Intervention pathway

Defined intervention pathway for BabyBreathe™ trial



# BabyBreathe trial

Overall outcome is an intervention suitable for testing in a randomised controlled trial

- Complex intervention
- Working with existing care pathways
- Going 'beyond' NHS cessation support:
- HCPs support
- Self help via a website & app
- Digital support via text messages/app notification
- Physical 'gifts' (incentives)
- NRT or e cigarette support to cope with cravings
- Support continues for 12 months postpartum

Large scale RCT planned recruiting from the Norfolk, London, Scotland and Newcastle

Approximately 800 women randomised to receive BabyBreathe package of support or usual care

Long term smoking abstinence (relapse prevention) measured at 12 months postpartum



# Focus on vulnerable populations – The NESCi Study



Norfolk and Norwich University Hospitals **NHS**  
NHS Foundation Trust



University Hospitals of Leicester **NHS**  
NHS Trust  
*Caring at its best*



1. Little dedicated smoking cessation or relapse prevention support for parents of UK NICU babies.
2. In PPI work: of 32 parents approached during a 4-month period, approximately a third were smokers and a third were ex-smokers.
3. All parents, without exception, said that they would be amenable to receiving smoking cessation or relapse prevention support, and would especially welcome advice on maintaining a smoke-free home
4. NICE guidance recommends smoking cessation referral and support for all people, including patients, carers and visitors, in secondary care settings, and postpartum (PH48 & PH26 (5))
5. Our team are developing an evidence based intervention (Grant ref: NIHR RfPB PB-PG-0817-20032)



FUNDED BY

**NIHR** | National Institute  
for Health Research



**To reach ambitious government targets for smoking in pregnancy there may be a need to 'go beyond' NICE guidance and the recommendations of the NHS long term plan**

**Incentives are effective for long term smoking cessation and may be more acceptable for targeting pregnant smokers**

**Pregnant smokers least likely to quit and most likely to relapse may benefit most from alternative approaches**

**Relapse to smoking postpartum remains a problem and there is a lack of support**

**The 'BabyBreathe' package of support may be beneficial but needs definitive testing**

**Tailored interventions are needed for specifically vulnerable populations, such as families who have a baby admitted to NICU**

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