Financial Incentives to help women stop smoking during pregnancy: a new trial

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on behalf of the CPIT Research Team

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Outline

• Background & Literature
• Examples from UK practice
• Methods
• Results
• Limitations
• Conclusions
Background

• Making healthy lifestyles an ‘easier’ option for people is a key theme in recent policy documents in a number of countries

• Many of the most effective policy levers (taxation, advertising bans, smokefree legislation) prohibit particular behaviours or make them more difficult

• Relatively few policy levers reward behaviour change
Financial Incentives

- Provide a tool to ‘frame’ the environment to guide people to make better choices
- Offer a payment (in cash or in kind) as a reward for behaviour change
- Have been used in a number of other areas of public health.
- Smoking cessation is one area where there is a relatively rapidly growing evidence-base for incentives
Earlier studies: Incentives for medication compliance

• Example of ‘simple’ behaviour change

Systematic review (Giuffrida and Torgerson, 1997):
• 11 trials (all U.S)
• Incentives varied from $5 cash to gifts worth $1,000
• 10 of 11 trials found a positive effect
• Range of interventions i.e. dental care, immunisation, screening.
Earlier studies:
Incentives for weight loss

- Example of ‘complex’ behaviour change.

Systematic review and meta-analysis (Paul-Ebhohinhen and Avenell, 2007):
- 9 studies (8 U.S. 1 Canada)
- Incentives varied from 0.2% to 10.2% of disposable income (some deposit contracts) all as adjuvant to treatment
- Small incentives made no difference to weight loss at 12 months
- Larger incentives made some (but very small) change to weight loss at 12 months
Incentives for smoking cessation

• Cochrane review of competitions and incentives for smoking cessation (Cahill and Perera, 2011 – currently being updated)

• 19 trials included

• No significant effect beyond 6 months except in one study (Volpp et al, 2009)
Cochrane review conclusions

• Incentives and competitions do not generally appear to enhance long-term cessation rates. Early success tended to dissipate when the rewards were no longer offered, and the normal relapse pattern re-established itself.

• The only trial to achieve sustained success rates beyond the reward schedule concentrated its resources into substantial cash payments for abstinence rather than into running its own smoking cessation programme. Such an approach is feasible only where independently-funded smoking cessation programmes are already established.

• Rewarding participation in contests and cessation programmes may have potential to deliver higher absolute numbers of quitters.
Why only short term effects?

• Offering incentives may be an attractive means to increase the uptake of an intervention
• Once accessed, people may engage with the intervention in the short term
• In the longer term, however, they may have developed arguments for not complying, which may add to the likelihood that they will relapse before the incentive ends.
• Might incentives appeal to less motivated clients?
More promising?

The only trial with non pregnant smokers to find longer term impact was conducted in the U.S.A in a workplace (Volpp et al, 2009). This trial provided incentives:

- After completing a smoking cessation treatment course: $100
- Following cotinine validated cessation within 6 months of study enrollment: $250
- Following cotinine validated cessation 6 months after that: $400
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<th>End Point</th>
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<td>Smoking cessation at 3 or 6 mo</td>
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<td>Self-reported</td>
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<td>Smoking cessation at 3 or 6 mo with continued abstinence through 9 or 12 mo</td>
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<td>Continued abstinence at 15 or 18 mo among participants who quit at 3 or 6 mo and remained abstinent through 9 or 12 mo</td>
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* Smoking cessation was confirmed by means of a negative result on a cotinine test.
With pregnant smokers

- Cochrane review (Lumley et al, 2009, then updated 2014)
- Examined the effectiveness of smoking cessation interventions in pregnancy
- Incentives paid to pregnant women to promote smoking cessation were found to be significantly more effective than other intervention strategies [RR 0.76, 95% CI 0.71 to 0.81]
With pregnant smokers

• However, only 4 trials* of incentives were included in the 2009 Cochrane review
• All were conducted in the USA
• Sample across the 4 trials was 1,285 women
• More recent meta-analysis of 3 of these trials** found incentives to be effective, giving an odds ratio for smoking in later pregnancy of 0.73 [95% CI 0.66 to 0.82].

** Bauld and Coleman, 2009
Why is smoking cessation in pregnancy so important (UK figures)?

- > 20% of pregnant women smoke in Scotland - < 1 in 20 quit

- Prevent 5000 miscarriages, 180 stillbirths, 110 infant deaths each year in UK as well as pre-term birth & low birth weight

- Lifelong benefits include reduced incidence asthma/adult CVD

- Children of smokers more likely to become smokers themselves

- Extra NHS pregnancy cost for smoker (£100-£700) & extra first year NHS cost for infant (£150 - £300)
Examples from practice: NHS Tayside

- Andrew Radley and colleagues developed GIUFB in Dundee in 2007 and then expanded the scheme to cover other parts of Tayside.
- In its first year in Dundee, 55 women registered – a significant increase compared to the number of pregnant women who had accessed smoking cessation services the year before.
- A qualitative study was conducted (Eadie and Macaskill, 2009) but no formal outcome evaluation.
- NHS Tayside estimated the cost per quitter at around £1,700.
Financial Benefits

Poverty line is 60% median income £145/wk (in 2008)

Lone parent, 2 children, on Income support = £182/wk

Add GIUFB £12.50/wk
Cigarette money £38.50/wk

£51.00/wk

Source: Radley, 2008
Is it right to pay people to be healthy?

Offering people financial incentives to adopt healthy behaviour is a controversial area of public policy.

People understandably question why some people should be paid for doing something that many others do for nothing.

Surely, the fact it benefits them personally in terms of their health - or their baby in the case of the latest idea put forward to offer mothers £200 of shopping vouchers to encourage breastfeeding - should be enough of an incentive.

NHS Tayside cash to quit smoking scheme 'success'

Only one in five pregnant women paid by NHS Tayside to stop smoking is able to quit for more than three months after their baby is born, figures have shown.

But health officials said the number was higher than any other smoking cessation scheme in Scotland.
Pregnant women bribed £400 to give up smoking

By Dean Herbert

PREGNANT women are being offered £400 to give up smoking under a controversial new taxpayer-funded scheme.

Hundreds have received vouchers as a reward for renouncing cigarettes under the new cash-to-quit scheme.

Piloted by NHS Greater Glasgow and Clyde, the £750,000 scheme saw 600 women paid the incentives. Now, the team behind the project has applied for more funding to test it in Lanarkshire and wants the Scottish Government to roll the programme out nationwide.

on urine, saliva and blood. At the end of the trial, more than a fifth had managed to stop smoking.

Professor Linda Bauld of Stirling University, who headed the pilot scheme, said: “Policy makers and the NHS may worry about the costs of the intervention but in the long run it would make massive healthcare savings if we can get women to stop smoking in their pregnancies. Even if you paid the woman double, it would be cost effective.”

A Scottish Government spokesman said: “Action to reduce the harm caused by smoking continues to be a priority.

Hundreds of women given taxpayer rewards by health bosses... for NOT harming their babies

PREGNANT SMOKERS GET £400

NHS ‘BRIBE’ TO QUIT
Cessation in Pregnancy Incentives Trial

- Phase II trial developed following a feasibility study funded by the Glasgow Centre for Population Health (GCPH)
- Began in 2011 funded by the Chief Scientists Office, NHS Greater Glasgow and Clyde and GCPH
- Aimed to begin to answer a question on incentives in the 2010 NICE (UK health guidance organisation) guidance on smoking cessation in pregnancy
Within a UK context, are incentives an acceptable, effective and cost-effective way to help women who smoke to quit the habit when they are pregnant or after they have recently given birth? Compared with current services, do they attract more women who smoke, do they lead to more of them completing the stop-smoking programme and do more of them quit for good? What level and type of incentive works best and are there any unintended consequences?
Greater Glasgow & Clyde Health Board Area

Greater Glasgow & Clyde

City of Glasgow
• All women offered CO monitoring at maternity booking
• Women with CO > 4ppm automatically referred to SPS
• Advisers contact - ask about smoking & cessation and make appointment - women can opt out at this point
• Continued phone / text support until 4-weeks post quit
• Routine follow-up monitoring at 12 and 52wks post quit
• Free prescription of NRT for pregnant smokers
All women in Greater Glasgow & Clyde HB area who smoked offered enrolment over 15 months

612 pregnant smokers enrolled

Screening

306 normal care

Usual NHS support

306 incentives

Up to £400 contingent on setting quit date & abstinence @ 4, 12 & 34-38 weeks PLUS normal NHS support

Allocation

Intervention & control

Primary O/C
Cessation in late pregnancy
(saliva cotinine validated)
All women in Greater Glasgow & Clyde HB area who smoked offered enrolment over 15 months

612 pregnant smokers enrolled

306 normal care
Usual NHS support

9% quitters

Up to £400 contingent on setting quit date & abstinence @ 4, 12 & 34-38 weeks PLUS normal NHS support

23% quitters

Intervention & control

Primary O/C
Cessation in late pregnancy (saliva cotinine validated)

Economic Evaluation

Qualitative Study

Usual NHS support

Screening

Allocation

Trial Design

Phase II Individually randomised controlled trial
• Cost effectiveness of financial incentives plus usual care vs usual care

• Incremental cost-effectiveness ratio (ICER)

\[
\text{ICER} = \frac{\text{Cost}_A - \text{Cost}_B}{\text{Effect}_A - \text{Effect}_B} \leq £20,000 \text{ per QALY}
\]

• Within-trial analysis: Incremental cost per quitter

• Lifetime analysis: Incremental cost per QALY

• Sensitivity analyses to assess impact of changes & help increase confidence in model
Main Trial Results

• **14%** absolute reduction in quit rates late pregnancy (**9% vs 23%**)

• Number Needed to Treat= **7**

• RR smoking at end of pregnancy **0.85** [95% CI 0.79-0.91, p<0.0001]

• Improved postnatal cessation at 6 months after birth (**4% vs 15%**)

• **No difference** in birthweight, stillbirth, miscarriage, or premature births
Qualitative & Health Economic Results

• Qualitative analysis
  - incentives generally acceptable to women & HCPs
  - home based monitoring visits acceptable
  - Type, amount & staging of payments positively received

• Health economic analysis
  - within-trial incremental cost £1127 per additional quitter
  - lifetime incremental cost £482 per QALY gained
  - uncertainty around sustained quit rates post-natally & results sensitive to this
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<td><strong>Total</strong></td>
<td><strong>£51,363</strong></td>
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</table>
Limitations

• **Phase II** exploratory trial

• **One** geographic centre

• **One model** of SSS for pregnant women

• **Uncertainty** about post-natal relapse rates
  
  - based on self-report only - important for longer term health economic evaluation (cost per QALY gained)

  - when use self-reported postnatal estimates at 3 months financial incentives are cost saving and improve QALYs!
Conclusions

- Financial incentives **may double** rates of abstinence from smoking at the end of pregnancy when added to existing cessation services.

- Financial Incentives are **likely to be highly cost-effective** & well below the NICE threshold of £20,000/QALY.

- **Uncertainty** remains regarding post-natal relapse.

- **Larger trial now required** to demonstrate if this can work in other areas of the UK.
Acknowledgements

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Research Team members included:
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