The Public Health Practice Evaluation Scheme (PHPES)
Addressing the challenges faced by 'front line' practitioners

Impact of a complex intervention to reduce smoking in pregnancy: 'babyClear ©' effectiveness evaluation

Smoking in pregnancy increases the risk of serious adverse outcomes including miscarriage, stillbirth and preterm delivery. Smoking rates among pregnant women in the North East are the highest in England, affecting around one in five pregnancies.

Our practitioner partners

The PHPES scheme enables people working in public health, who are introducing innovative initiatives aimed at improving health, to work in partnership with NIHR SPHR to conduct rigorous evaluations of their cost-effectiveness. This research was conducted through Fuse (the Centre for Translational Research in Public Health) one of eight academic centres of excellence in England making up the School for Public Health Research. They worked in partnership with:

 Fresh - the UK's first dedicated regional tobacco control programme, set up in the North East in 2005 to tackle the worst rates of smoking-related illness and death in the country.

 babyClear© - an initiative developed by improving Performance in Practice (iPiP) to implement best practice to support pregnant women who smoke to get help to quit.

Background

In 2012/13, Fresh worked with maternity and stop smoking services across the North East to implement the 'babyClear©' programme to reduce smoking in pregnancy.

babyClear© is an intervention package designed to support the implementation of National Institute for Health and Care Excellence (NICE) guidance on smoking in pregnancy, by standardising stop smoking interventions and referral pathways across the region.

This focused on training maternity staff to consistently deliver standardised brief interventions at the antenatal booking appointment and provide a clear, enhanced referral pathway from maternity services into Stop Smoking Services (SSS).

Systematic identification of smokers using carbon monoxide (CO) screening and opt-out referral to SSS were critical elements of this booking intervention.

A more intensive risk perception intervention, delivered by a small cohort of midwives at the 12-week dating scan, focused on the dangers of continued smoking during pregnancy and was targeted at those women still smoking at this stage in pregnancy. Introduction of the risk perception element was delayed in many trusts, although this is now in place across the region. Therefore, the results here describe the effectiveness of the 'core' booking intervention: identification of pregnant smokers using universal CO monitoring; opt out referral to SSS; increased follow up for smokers; and skills training to all frontline staff in maternity and SSS.

Key issues

- Smoking at time of delivery (SATOD) rates have traditionally been high in North East England.
- Smoking in pregnancy has a significant impact on women's and babies' health by increasing the risk of premature births, stillbirths, miscarriages and complications after labour due to smoking.

Key research questions

- Is the intervention effective in increasing referrals to stop smoking services and improving quit rates?
- Is the intervention cost-effective?

Method

Academics from Fuse (Centre for Translational Research in Public Health) based at Newcastle and Teesside Universities obtained routine information from trust maternity services on deliveries before and after the introduction of babyClear$^{©}$ and data from Stop Smoking Services on the number of referrals and quit attempts. This information was linked to generate a total cohort of 37,726 singleton deliveries, of whom 72 per cent were non-smokers and 28 per cent were smokers at the time of their first booking appointment.

Referral rates and quit rates were compared before and after implementation of the intervention in multi-variable statistical models. Birthweight was modelled among non-smokers, smokers throughout pregnancy and quitters. Costs of delivering the intervention over five years were estimated, and cost per delivery and per additional quit were calculated.

"Babies born to women who quit smoking during pregnancy were, on average, 6 per cent heavier than babies born to women who continued smoking – 260g heavier for a baby born at full term."

What next?

The challenge is to ensure that this approach is commissioned as part of maternity services to maintain its positive impact and to extend it nationally.

Key findings and learning for practice

- **Impact on referral rates:** Referral rates to Stop Smoking Services (SSS) increased progressively in the first three months after implementation, and were 2.5 times higher in month four, compared to the baseline period (95% CI 2.2-2.8).

- **Impact on quit rates:** Quit rates nearly doubled after introduction (aOR 1.8; CI 1.5-2.1). They were higher in pregnancies with a recorded referral to a SSS (aOR 3.2) and where there was a record of setting a quit date with a SSS (aOR 4.8).

- **Impact of smoking on birth weight:** Babies born to women who quit smoking during pregnancy were, on average, 6 per cent heavier than babies born to women who smoked throughout, equivalent to an additional 200g for a baby born at full term.

- **Costs per delivery and per additional quit:** The cost of implementing the babyClear$^{©}$ core package over five years is estimated at £30 per delivery, with over 90 per cent of those costs being attributable to the SSS. Nine pregnant smokers need to be treated to generate an additional quit at a cost of £938.

- **Impact on smoking rates:** For a Trust with 3,000 deliveries per year, it is estimated that the core package alone would deliver 96 additional quitters annually, reducing local smoking at time of delivery (SATOD) rates by around 3 per cent.

Key: CI (confidence interval); aOR (adjusted odds ratio)

Reference

Bell R et al. Evaluation of a complex healthcare intervention to increase smoking cessation in pregnant women: interrupted time series analysis with economic evaluation. Tobacco Control 2017 doi: 10.1136/tobaccocontrol-2016-053476.

SPHR Contact

Dr Ruth Bell, Clinical Senior Lecturer in Public Health
E: ruth.bell@ncl.ac.uk   T: +44 (0)191 208 8769