# Evaluating the impact of an incentive scheme to encourage pregnant people to set quit-smoking date


## Abstract

**Purpose**: This study demonstrates the evaluation of an incentive scheme to encourage pregnant people to set a quit-smoking date.

**Design/methodology/approach**: The paper outlines a collaborative approach, working with pregnant people, clinicians, tobacco dependency treatment practitioners and academics to gain insights into their perspectives and experiences. Quantitative and qualitative data were analysed.

**Findings**: The incentive scheme and appropriate support from clinicians have been shown to encourage pregnant people to set a quit date. The tobacco dependency treatment practitioners helped remove barriers, such as the perception of the stigmatisation of smoking when pregnant. The practitioners also helped pregnant people make informed decisions to support successful behaviour change. The impact of the scheme resulted in improved infant health indicators. The scheme's evaluation also supported establishing stakeholder knowledge exchange and learning processes.

**Research limitations/implications**: This is a single-site study amongst a relatively small group designed to achieve a specific evaluation objective. Caution in generalising to wider settings should be exercised.

**Practical implications**: This study highlights the efficacy of an incentive scheme, complemented with support from clinicians and the significance of knowledge exchange and collaboration between stakeholders in healthcare with significance in similar settings.

**Originality/value**: The paper details the incentive scheme input, activities, output, outcomes, and impact involving a wider range of stakeholders, including the emotional consequences for participants, clinicians and academics.

**Keywords**: Smoking Cessation, Pregnant People, Knowledge Exchange, Impact Evaluation, Outcome Evaluation, Stakeholders, Incentive Scheme

**Paper type:** Research paper

## Introduction

This paper outlines and evaluates how an incentive scheme to encourage pregnant people to set a quit date was developed and implemented by Sherwood Forest Hospitals NHS Foundation Trust (the Trust). To describe and evaluate the incentive scheme, we employed Rundle-Thiele's (2022) interpretation of the pathway to impact process to structure and inform the paper to simplify the presentation (See Figure I).

## Smoking: the national picture

Smoking tobacco continues to be one of England's biggest causes of health, social and economic inequalities, affecting smokers and those around them. Tobacco use in England has followed a downward trend since 1974, with 12.7% of adults recorded smoking in 2022, and with evidence of a widening behaviour gap between the richest and poorest in the population (ONS, 2023). Smoking reduces expected lifespan and is the main causative factor of premature death by numerous cancers and other life-limiting diseases. Two out of three smokers will die due to a smoking-related illness or live with a serious disease, contributing to increased healthcare and reduced economic activity. The NHS Long Term Plan (LTP) (2019) recognised that tobacco users are addicted to nicotine and acknowledged that smoking is not a lifestyle choice. Evidence-based tobacco dependence treatment effectively improves the health and well-being of ex-smokers, their families, and society. The LTP forms the NHS's contribution

to the government's ambition for a 'smoke-free' generation by making smoking obsolete in England by 2030 (Department of Health, 2017), highlighting four areas for improved treatment programmes: acute in-patients, mental health, NHS staff and, relevant to this paper, maternity.

Smoking is the leading modifiable risk factor for poor pregnancy outcomes, including miscarriage, stillbirth, and preterm birth, a leading cause of death, disability, and disease among new-borns and low birth weight. Smoking triples the risk of sudden infant death and may result in life-long risk factors for children born to people who smoke during pregnancy (Gutvirtz *et al*., 2019), is a cause of child morbidity (Ino, 2010) and disproportionately affects those who are more socio-economically deprived (Madureir *et al*., 2020). In 2022-23, 8.2% of pregnant people at the point of giving birth in England smoked tobacco (NHS Digital, 2023). Supporting those who are pregnant and smoking to overcome their tobacco dependence will not only improve their and their family's health but also reduce health inequalities and demand for NHS services by reducing the number of people presenting to the NHS with smoking-related conditions.

Overall, the NHS is investing in reducing tobacco dependence for all in-patients, pregnant people, and those in long-term mental health and learning disability services. This investment is designed to support the delivery of the UK Government's Tobacco Control Plan and the ambition to go smoke-free in England by 2030 to give citizens a healthy start to life, reduce the incidence of major illnesses and help people age well.

**The approach by the Trust**

As part of this approach to reduce the impact on health and socio-economic inequalities, the Trust was identified as an early implementer site (EIS) in early 2021 to test the nationally recommended maternity model of an in-house opt-out service that is now to be rolled out across the NHS and adopted an incentive scheme to support this. An opt-out referral service is where

everyone identified as a smoker should be referred to the relevant Trust's tobacco dependency support service. An opt-in referral service refers to the position where a referral is only made if requested or consented to by the pregnant person and if they have been asked a question such as *"Would you like to be referred to a tobacco dependency support service?"*

The smoking at the time of delivery (SATOD) rate, a key metric in reducing tobacco dependency, at the Trust in 2020-21 was 18.03%, amongst the highest incidence in England, according to Trust reports. Although high SATOD rates have decreased in the Trust recently, stark inequality exists between socio-economic groups. At the Trust in 2022, 519 pregnant people smoked when booking with the midwifery team; the largest proportion of pregnant people (79%) lived in socio-economic quintiles 1 and 2 (the 40% most deprived areas). A study that mapped postcode data to Acorn segment types showed that 82% of postcodes were in areas of higher economic deprivation (Allison and Hewitt, 2023).

At the Trust, pregnant people have been given the opportunity and support to overcome their tobacco dependence and quit smoking; pregnancy is when people are likely to be motivated to quit. The Trust follows the National Tobacco Dependence Treatment Service model that builds on the Saving Babies' Lives Care Bundle Version 3 (SBLCBV3). Element one of the model sets service expectations and metrics for maternity and Tobacco Dependence Treatment Services providers. By focusing on the referral and treatment elements of SBLCBV3, the objective is to increase engagement and improve maternity outcomes. Following the guidance of SBLCBV3, everyone registered with the maternity services should be assessed and have a recorded result for carbon monoxide (CO) exposure at every antenatal contact. The CO test data at booking and 36 weeks is a mandatory field reported in the national maternity dataset. The guidance also suggests that if the CO reading is ≥4ppm (parts per million) or if they have stopped smoking since conception, maternity staff should provide Very Brief Advice (VBA), an immediate 'opt-out' referral to the maternity specialist Tobacco Dependence Treatment

Service. If a higher reading is recorded and assuming smoking is confirmed, pregnant people can commit to a "quit date" and support to achieve this.

However, engagement with Tobacco Dependence Treatment Services has always been hard for pregnant people. Changing behaviour is necessary to reduce risk; therefore, standard treatment programmes do not always produce results quickly enough. Therefore, to encourage engagement to a "quit date", the Trust employed an incentive scheme.

**Input and activities**

In this section, we combine two elements of Rundle-Thiele's (2022) pathway to impact model: inputs (resources and financial support) and activities (the actions taken by various stakeholders). We have taken this approach because a significant part of the activities associated with the intervention were dedicated to securing the funding and resourcing required to implement and maintain the project. We now go on to discuss stakeholder involvement in three parts: the process of planning and gaining approval for the incentive scheme, the design and implementation of the scheme, including forming the clinical team and recruiting pregnant people to the scheme, and the design of the evaluation process including the role of the academics. The principal areas of collaboration between the clinical and academic teams occurred during part 3 of the process.

***Part 1: Planning and approving the incentive scheme – pre-implementation/pre-evaluation***

To support the Trust's position as an EIS for the in-house opt-out service, it was decided that an incentive scheme may help the Trust achieve its objective of reducing the SATOD rate by encouraging pregnant people to set a quit date. Incentive schemes improve cessation rates amongst pregnant smokers, with Chamberlain *et al*. (2014) concluding that incentive schemes deliver a return on investment of £4 for every £1 invested. It is estimated that 20-25% of babies admitted to a hospital-based neonatal unit are admitted primarily because of pregnancy-related

smoking, increasing the cost of delivering what is termed a complicated birth; the care of a low-birth-weight baby or a premature baby costs an average of up to £12,000 per child in the short term. Incentive schemes, therefore, provide significant cost-saving potential for maternity systems.

In November 2021, the National Institute for Health and Care Excellence (NICE) updated the guidance for "Tobacco: preventing uptake, promoting quitting and treating dependence," outlining the evidence for having a financial incentive scheme as part of a trust's tobacco dependence treatment pathway (NICE, 2021). NICE recommended a value of up to £400 per person for a CO-verified full pregnancy quit of tobacco use, issued in the form of reward vouchers in a staged manner. Based on the NICE recommendation and evidence from reviewing the literature, the Trust presented a business case to pilot an incentive scheme in the maternity service to the Nottingham and Nottinghamshire Local Maternity & Neonatal System (LMNS). The LMNS is a group managed by the local Integrated Care Board comprising members from Nottingham University Hospitals, Sherwood Forest Hospital, Public Health, CityCare, Primary Care, and community sector organisations. NHS LTP funding had been allocated to the LMNS to help support programmes designed to address SATOD, amongst other issues. The LMNS agreed to fund the initial piloting of the scheme in addition to the in-house tobacco dependence treatment programme already in place.

***Part 2: Developing and implementing the incentive scheme – pre-evaluation***

***Forming the Phoenix Team***

A maternity lead was appointed to manage the local implementation of the scheme, and three tobacco dependency treatment practitioners were recruited to commence their National Centre for Smoking Cessation Training (NCSCT) Standard Treatment Programme for Pregnant Women training in November 2021. The practitioners had been employed based on their

diverse prior experience; for example, one was already a fully trained NCSCT practitioner. Still, they completed the training to ensure they were up-to-date and had received the same training as other practitioners. They then completed a four-week induction programme tailored to the needs of pregnant people. The induction also included shadowing staff in the multidisciplinary maternity team to help understand how maternity services work and facilitate a two-way understanding of the new service. The NCSCT has a supplementary training package for treating people during pregnancy that can only be completed once the initial practitioner training is completed and passed.

The main premise of the EIS was to set up an in-house service rather than referral to an external agency that potentially would be a link that may/may not affect the take up of the service. This was to have a two-way benefit. Firstly, raise the profile of the new service by introducing the practitioners to the maternity unit workforce. The practitioners facilitated discussions to inform the midwives about their role, how to refer to the service, and how to introduce themselves as the face of the Phoenix Team. The justification is that if the midwives understood the new service, it would encourage them to raise the topic of tobacco. Making Every Contact Count will increase referral opportunities and make the Phoenix Team an integral part of the maternity service. Secondly, the practitioners should understand how the midwives interact with pregnant people at different points of the maternity pathway, facilitate referral opportunities and understand how their role fits alongside that of the midwives and obstetricians.

Branding techniques were used to establish the team's identity, resulting in a new name (i.e., the Phoenix Team) to reduce stigma and be more memorable for service users and Trust staff; it also lent itself to creating an easily recognisable team logo. Pregnant people feel guilt and embarrassment admitting they use tobacco (see later comments from interview participants). To lessen this feeling, the team's name was not an obvious admittance of what appointment they were attending when they needed to book with a receptionist in a public waiting area; for

them to have to ask for the tobacco treatment team seemed to reinforce their negative feelings - the name Phoenix Team softens this concern.

Team members have been issued Phoenix Team badges on their uniforms. These act as a point of identification for service users and other staff, a point of pride and identity for team members, and a way of reminding team members of the purpose of their roles. The word Phoenix and its associations symbolise a new beginning, a fresh start, a change, and rebirth, and it was considered an appropriate analogy for the objectives of the service. The service name also complemented the style of other specialist teams within the maternity service, e.g., the Lotus team for those with mental health conditions. The team was fully trained and ready to start face-to-face clinics in December 2021.

***Recruiting and working with pregnant people***

Recruiting the first cohort of pregnant people to the incentive scheme commenced in March 2022. The scheme was promoted to maternity unit staff through team meetings, newsletters, emails, etc. It was not promoted to the pregnant cohort via public means, but the community midwives promoted the scheme to those identified as smokers at their first appointment (leaflets were available). The decision not to publicly promote the scheme was due to funding limitations and the fact that the scheme was, at this point, considered a pilot scheme.

The Phoenix Team can receive referrals at any point during pregnancy, but the earlier someone stops using tobacco, the fewer the risks to the pregnancy and the baby. Forty-five pregnant people from the first cohort were informed about the scheme at their first appointment and formally recruited when a quit date was set. A Bedfont iCOquit Smokerlyzer® was issued by the Phoenix Team at the first appointment following the quit date, and further CO tests were performed at every contact across the maternity pathway. Instructions for its use were given to provide a motivational tool for single-person home use. The Phoenix Team's tobacco

dependence practitioners made contact within 24 hours of referral and offered an appointment within five working days. The team provided behavioural and pharmacological support until 6 weeks post-birth, either face-to-face or by telephone.

Financial incentives were allocated along the maternity pathway at intervals to maximise motivation and maintain salience. To balance motivation between immediate and delayed rewards, staged increasing incentives totalling £400 were offered. This amount was highly effective in a large UK-based randomly controlled trial (Tappin *et al*., 2022). Overall, 10 significant family members (for example, partner, sister, mother, etc.) were included in the incentive scheme as evidence suggests that if the pregnant person quits tobacco use with a significant person, they are more likely to achieve longer-term abstinence from tobacco harm, achieving a smoke-free home for the baby/children (Smoking in Pregnancy Challenge Group, 2021). The vouchers were issued after recognised periods of abstinence, as shown in Table I.

*** Insert Table I here ***

The "Love2Shop" vouchers were used rather than cash, and the participants signed a written agreement not to spend the vouchers on alcohol or cigarettes. The issue of vouchers did not affect the Department of Work and Pension benefit entitlement (Mann *et al*., 2017). Those recruited between 16-20 weeks of pregnancy found that the full £400 value was not released by the time of birth. Therefore, the remaining vouchers were issued if they maintained tobacco abstinence until 6 weeks post-birth. Recruitment to the scheme was continued until the funding had been fully allocated to participants.

***Part 3: Evaluating the incentive scheme – the role of the academic team***

As the incentive scheme is a pilot, it was expected to be evaluated against its objectives by employing an independent academic team. The intention of the tobacco dependence management had always been that if the pilot could effectively encourage pregnant people to

set a quit date and reduce SATOD, they would apply for further funding, supported by the performance data, to extend the programme – to support this, independent evaluation was required.

Maternity services at the Trust had previously worked with academics from (the university's name will be revealed after the peer-review process) to evaluate several programmes. These include a previous social marketing programme to encourage smoking cessation in pregnancy, an event in local schools to raise awareness of the benefits of breastfeeding, and a study to show the link between implementing CO monitoring and the rate of SATOD in the Trust. As a result of these collaborations, the Trust managers, practitioners, and academics delivered several research outputs presented at NHS practitioner conferences and Academy of Marketing conferences, in addition to non-peer-reviewed open-access academic publications. These collaborations spanned a period of ten years. Because this collaboration had already been established, it was decided by the Trust that this collaboration should be continued to evaluate the incentive scheme with academics working in collaboration with the Trust, the Pheonix Team, and the participants of the incentive scheme. For evaluating the pilot incentive scheme, additional funding of £4000 was obtained (the Trust contributed £2000, and the university matched the same amount from its internal Research Opportunity Fund).

This funding supported a research assistant who worked with Trust managers, incentive participants, and academics. Following ethics approval, the evaluation of the scheme is based on various sets of data:

1. Quantitative data based on the Trust's operations metrics.
2. Qualitative data was based on 13 semi-structured interviews with pregnant people (who successfully quit smoking) to provide insight into their lived experience of the scheme.

3. Qualitative data was also based on reflections from the Phoenix Team on their experience, offering insight into the scheme from their perspective and its effect on them.
4. The research assistant also recorded their feelings in a series of written reflections, adding further qualitative data to the project.

For full clarity, it should be noted that the academic team was not an active participant in the clinical intervention. Rather, its role was to evaluate the incentive scheme and make recommendations to clinical management. However, the relationship between the academic team and clinical management was collaborative, with frequent swapping of ideas regarding how the evaluation should proceed, how outcomes and impact could be assessed, how the results could be disseminated and how the results of the evaluation could be used to develop a business case to secure long-term funding for the scheme. The academic team and clinical management members have collaborated on this paper, several conference outputs, reports and presentations to Trust senior management and further dissemination is planned. Such engagement with knowledge-sharing processes is common and encouraged in the NHS. Although there was extensive collaboration and contact between the academic team and clinical management, the academic team did not work directly with members of the Phoenix Team. However, the evaluation findings were freely available to the Phoenix Team, particularly about the positive effect on pregnant people. Again, for clarity, it should be noted that other than ongoing changes to how the evaluation would proceed and how results would be reported, the academic team was not tasked with recommending any "in-scheme" changes, its role being to respond to the scheme as planned and implemented. However, the academic team has recommended several changes to the longer-term scheme currently being planned and for which funding is being sought. For example, one recommendation was to establish ongoing

quit-maintenance support (several of the interview participants focused on this), and this element of the scheme is being assessed as part of the ongoing business case for the funding.

**Outputs**

A range of supporting materials was developed to encourage engagement (push communication) with the incentive scheme, guiding service users and practitioners and creating wider on-demand awareness (pull communication) of the scheme. These can be categorised as follows:

***Encourage initial engagement – targeted at service users***

- Incentive Scheme information leaflet – See Figure II
- The Phoenix Team stop smoking poster – See Figure III
- Pull up banners at key locations on the hospital's premises – See Figure IV

*** Insert Figures II, III and IV here ***

***Encourage maintenance of quit behaviour***

- Client agreement form – to facilitate users' commitment to agreed quit dates
- Congratulations text on the issue of incentive vouchers
- Incentive scheme picnic celebration invitation mailed to all incentive scheme participants in July 2023

***Guidance for the Phoenix Team***

- Incentive scheme operational guidelines for the Phoenix Team

***Wider awareness creation:***

- Stoptober lived experience film: available at https://youtu.be/6JhJg1gV808
- NHS England Saving Babies Lives v3 film: NHS England Tobacco dependency programme: available at https://www.england.nhs.uk/ourwork/prevention/tobacco-dependency-programme/
- External communications via press releases and social media activities, including picnic photos and press release

## Knowledge exchange and learning process

Knowledge exchange between clinicians and the Phoenix Team, on the one hand, and the academic team, on the other, was not initially formally considered a key component of the evaluation beyond the mechanical delivery of an evaluation report. The evaluation activities by the academic team were primarily focused on gaining insight into how the pregnant people felt about the smoking cessation programme and the related incentive scheme. As a result, knowledge exchange processes beyond those specifically associated with service users' perceptions were not formally built into the project. However, this approach almost certainly overlooked the inevitability of exchanging knowledge in areas that are additional to service users' perceptions and overlooked their value. It also meant that we were not fully prepared for the forms the knowledge exchange took and the profound effect this would have on those involved. On reflection, it is evident that the wider sharing of knowledge that we became aware of contributes to the capacity of both the Trust and the academic team. In this regard, we are informed by Ward *et al*. (2009) as they consider the importance of addressing the skills of both researchers and practitioners and the need to consider knowledge transfer other than from academia to practice. We consider knowledge creation in terms of the Phoenix Team, clinicians, and academic teams.

### *The Phoenix Team*

The Phoenix Team identified four areas of the learning process: their knowledge of the harm of smoking, how little it is focused on in other services, the effect on themselves, and their effect on the scheme participants.

One team member stated they *"had little detailed knowledge of the dangers of smoking"* before undertaking their training and, crucially, witnessing its effect on the participants first-hand. This is an important learning point for practitioners. Despite the wide publicity about the

dangers of smoking, we cannot assume that the message has been received and understood even amongst well-informed and educated people. The public and clinicians will know that smoking is harmful, but both groups may not know how and why it causes poor health conditions. This suggests that we need to continue informing people about the harm caused by smoking and should assume no prior understanding. Also, there was a reflection on achieving an awareness of the wider effect of smoking, "[there are] *a lot of mental health issues…teenage pregnancy*" and gaining a better understanding of just how difficult it is to quit and the barriers associated with this, "*the want is there but not the readiness due to what else is going on*" [in their lives] and [I have] "*learned about the traumas people go through at vulnerable times."*

On the same theme, another team member assumed that *"smoking was a big part of the conversation about pregnancy* [within maternity services]," whilst another said they were *"surprised this isn't discussed more*" [by clinicians in other services]. One went on to speculate that the reason for this was that discussing smoking with pregnant smokers is "*an awkward conversation to have*," suggesting that clinicians might shy away from such conversations. Given the adverse impact of smoking, this suggests that opportunities are being missed to address the issue as a matter of common practice (although it is official policy).

The Phoenix Team also reflected on the results of the intervention themselves. The team expressed a sense of enjoyment ("*Loved it*") and the extent to which their work was important ("…*look at what might have been if we weren't there*" [pointing to data related to health impacts for those who smoked]). One felt that working with vulnerable people on a project that matters had affected their own confidence ("*my confidence has grown*" and "*it is important I work in my way*"). They also realised the extent to which their own lives were better due to not being smokers; "[I am] *aware how lucky we are…not everyone is that fortunate*". The emotional effect on themselves was also apparent: "*We've had our teary moments"* and *"... can't leave it at work"* as with previous jobs. Overall, they felt the personal effect had been worthwhile, *"It*

*is rewarding,"* and it was important to them "*to be part of something that works."* The suggestion here is that as part of their training, tobacco dependency treatment practitioners could be made more aware of the likely effects of their work on themselves. Opportunities for further support for them could be sought.

There is little doubt that the Phoenix Team was aware of the personal effect they have had on participants and reflected on how important it was to "*have a strong relationship"* and to *"build that connection"; "it's like coming to see a friend* [for the pregnant people]*."* One commented, *"a lot of ladies come to us very nervous, but they go away and say "thank you"".* Another said, *"some ladies attach to you…especially those with mental health problems".* Even after appointments have been completed, "*sometimes they like to come back, it's still positive for them,*" and "*coming back helps them maintain"* [their smoke-free behaviour]. Acknowledging their ongoing effect, one reflected on their part in helping participants ready themselves "*to start their new life*."

These reflections have several implications. Clinical managers should consider the emotional and soft skills required to be successful tobacco dependency treatment practitioners and reflect this in recruitment and training activities. Academics need to be aware that their activities involve real people with real emotions and real-life consequences rather than simply a series of data.

***Clinicians***

The Trust's funders required an evaluation of the incentive scheme; however, no guidance was given regarding how the initiative would be evaluated. Because the establishment of the Phoenix Team was viewed as a quality improvement (QI) programme, the service lead used various QI methods to track progress following their completion of a Quality, Service Improvement and Redesign (QSIR) course (NHS England and NHS Improvement, 2019).

Poor planning of the evaluation process could result in inconclusive results on which to base future decisions. Planning an evaluation of a service is not part of the usual skill set for clinicians, nor do they have the luxury of time to invest in training in this regard. One of the roles of the academic team was to provide guidance on evaluation techniques/processes and to assist clinical management in the analysis of data to help inform the Trust of future decisions regarding service provision. Working with academics enabled clinicians to better understand evaluation methods and the complexity of ensuring the process does not harm participants.

***Academic team***

Tobacco dependency treatment practitioners know there is a need to avoid judgment and to put aside what they think they know about smoking during pregnancy. Their experience is that this is sound advice for academics. Given the nature of the topic and its human effect, academics, mainly those involved in research, will likely be affected by their work even whilst endeavouring to remain objective. Conducting the interviews with pregnant people was a learning process beyond simply gathering and analysing data.

The research assistant started the interviews with feelings about smoking based on the assumption that smoking was a decision that pregnant people had made about their lifestyle. However, they become aware of the stigma felt by pregnant people and the guilt they feel about the probable health and social impact on their children, "*something that they were ashamed of and felt judged for doing...*". They came to see that although pregnant people were *"eager to break this habit and end the cycle"*, there were many physiological and societal barriers to achieving this: "*I was surprised to learn of the young age that the respondents had started smoking and that the initial habit started simply because it was something that they had grown up around, seeing their family, neighbours, and friends doing it."*

This awareness of the barriers and difficulty led to our interviewer *"feeling empathy for the pregnant people."* Further, they reflected on how they "*felt proud of the pregnant people for what they had achieved and continue to achieve as a result of stopping smoking. The Stop Smoking programme has proven to be a life-changing event for most, if not all, pregnant people. They each felt utmost pride in stopping smoking and how they managed to do their very best for the child at a critical point in their baby's development".*

Another significant learning point was the wider and more profound effect the quitting success had on other aspects of pregnant people's lives:

"*This event had proven to be a catalyst for other positive events, such as learning to drive, going to college, joining sporting clubs, and other factors signifying an increase in self-esteem."*

They went on to reflect on their admiration for the pregnant people and how humbling the experience of talking to them was:

*"I felt that each story was inspiring, and I felt privileged for these mums to open up and share such a personal experience with me."*

As researchers, we must remind ourselves that research in the sociological tradition often challenges us to remain objective. We are reminded of the need to avoid judgment and acknowledge that our perceived prior knowledge will likely be incomplete and simplistic, if not wrong. Our experience working on this project reminds us to remain open to learning, especially where the lived experiences of others are concerned.

**Outcomes and impact**

This section focuses on the outcome and impact of the incentive scheme. To achieve this, we consider outcomes and impact in three areas: the number of participants taking part in the incentive scheme, (outcome) general infant health indicators (impact), and the reflections of

the pregnant people who were part of the incentive scheme (both outcomes and impact). We then discuss the overall impact of reducing smoking in pregnancy: to improve babies' lives by reducing the rate of stillbirths and low birth weights and the general health of new-born babies.

***Numbers of participants setting quit dates***

Records of the number of pregnant people setting quit dates before establishing the incentive scheme are not reliably available. Accurate and audited data relates to the period following the implementation of the incentive. Therefore, we cannot comment on whether or not the incentive scheme made a difference to the number of quit date settings that were typical in the Trust prior to March 2022.

Figure V shows the numbers of pregnant people who set quit dates during the pilot scheme (March to July 2022), following the pause of the scheme once all funds had been spent (September 2022 to March 2023), and during the first two months of the resumption of the scheme (April to May 2023). Note that August 2022 is not included in the data because funds were fully exhausted at some point, making it an unreliable hybrid month. For full disclosure, the average weekly number for August was 2.25. It should be further noted that during the period October 2022 to February 2023, the clinical team was involved in producing a business case to extend the incentive scheme from April 2023; by October 22, it was evident that the number of people setting quit dates had significantly reduced following the end of the incentive scheme, providing the basis for the justification of the business case.

*** Insert Figure V here ***

Figure V also shows that 2.6 pregnant people per week set quit dates during the initial incentive period. Post-incentive, the number fell to 1.2 per week, which has subsequently recovered to 3.5 following the resumption of the scheme. In total, 131 people set quit dates during this period (including during August 2022, when 9 in total set a date).

Figure VI shows the quit dates as a percentage of pregnant smokers booking with the Trust. This demonstrates the same pattern as Figure V but confirms that the numbers shown in Figure V have not increased or decreased as a result of the total number of smokers changing.

*** Insert Figure VI here ***

It is clear from the available data that the incentive scheme coincided with significant increases in the number of people setting quit dates. The Phoenix Team was already in operation from December 2021, well before March 2022, when the incentive was implemented. Neither the clinical nor the evaluation team was aware of any other confounding factors during the period of the incentive scheme. Although correlation does not confirm causation, there is little doubt that there was a significant effect on the quit date set during the incentive period.

***Infant health indicators***

Although setting a quit date is the key behaviour change sought and, therefore, the primary metric, it is worth considering this impact on a range of infant health indicators (antenatal and postnatal) to address the secondary impact of the incentive scheme. We selected six key indicators following the work by Hill *et al*. (2020), who showed that these six were statistically significant when comparing non-smokers to smokers. Table II summarises these health indicators for a sample of 25 typical non-smokers, 25 people who smoked throughout pregnancy, and 17 who quit before 18 weeks of pregnancy from the incentive group. The 17 were selected for analysis because they had the same inclusion criteria as the two samples of 25 (BMI <25 and <40yrs old); six were involved in the semi-structured interviews. We selected 25 smokers and 25 non-smokers because the NHS Quality, Service Improvement and Redesign (QSIR, 2023) recommend a minimum of 25 for our analysis. The minimum was selected because the data exercise was extremely time-consuming, and the Trust had neither the funds nor the resources available to analyse the data given constrained NHS budgets. This is an

operational reality when clinicians with patient-facing responsibilities are tasked with non-clinical duties.

*** Insert Table II here ***

Table II shows that, in general, those who have set a quit date and maintained tobacco abstinence display health indicators broadly in line with those of non-smokers. Some of these indicators are physical and are likely to be the inevitable consequence of the physiological impact of smoking during pregnancy (gestation at birth, birth weight, and birth weight centile); the adverse impact of smoking on birth weight is demonstrated in the table. What is especially insightful, however, is regarding some behavioural choices made during pregnancy; those who set quit dates behave similarly to non-smokers and quite differently to smokers. Quit setters' infant feeding choices are much closer to those of non-smokers than smokers; they are over twice as likely to breastfeed as their smoking counterparts. Although not for this paper, the positive health, socio-economic, and educational effect of breastfeeding is well-established, so the breastfeeding participants will likely see their children benefit from this and realise the health benefits associated with quitting.

Altered fetal movement refers to a person's subjective self-assessment of their baby's expected movement pattern and foetal well-being. It can also indicate placental compromise from the effects of prolonged smoking during pregnancy and, therefore, a risk to the baby's viability. The data, admittedly small scale, shows that quit setters perceive their fetal movement pattern similarly to non-smokers. Our analysis can't show whether the reduced incidence of the reporting of altered fetal movement results from genuinely reduced placental compromise or is a result of people considering an overall reduction in risk due to smoking abstinence whether or not compromise is evident. Either way, this reduced perceived risk is likely to positively affect anxiety felt during pregnancy.

Regarding gestation weight, we have shown two figures. The figure in brackets results when we remove the data for a pregnant person with an extremely premature baby, which skewed the results.

***Participants' reflections***

During interviews, participants commented on the Phoenix Team's effect on them and its contribution to their attempts to set a quit date. Table III summarises the themes highlighted from the semi-structured interviews with incentive scheme participants.

*** Insert Table III here ***

The participants were in little doubt that the team members were a crucial support element and a major contributor to their quitting success. The extent to which the personal relationship was central to this success is evident. At this point, we consider an unexpected effect of the incentive scheme and the overall Phoenix Team processes. Participants tended to comment that whilst the incentive scheme was an added bonus, it was not the primary factor in encouraging them to set a quit date or maintain their non-smoking status. Instead, they focused on the personal interactions between themselves and members of the Phoenix Team. What was not fully expected was the extent of the emotional exchanges between the pregnant people and the Phoenix Team; the intensity of these exchanges was largely unexpected. That is not to say they could not have been anticipated, nor that they are not desirable. Perhaps on reflection, this should not have been surprising. This, then, is a key learning point and should be fully considered as part of early intervention planning discussions.

Overall, the interviews generated around 70,000 words of rich qualitative data. This data represents a valuable source of insight for Trust management/clinicians and academics. The academic team intends to analyse this data, but this stands outside the immediate remit of the evaluation project and the Trust's objectives. Therefore, at this stage, we do not apply more

detailed analytical rigour to this data, and this current paper exists in that context of remaining faithful to the Trust's objectives and underlines the agreed collaborative approach we have taken.

***Financial incentive or interpersonal relationships – what was the more impactful factor?***

We previously showed that incentive schemes improve cessation rates amongst pregnant smokers (Chamberlain *et al*., 2014) and deliver a return on investment of £4 for every £1 invested. The Trust's data also clearly showed that the number of pregnant people setting quit dates dropped when the initial phase of the incentive ended and grew again when the second phase was implemented. At face value, this suggests the efficacy of the incentive scheme. However, in the preceding section, we discussed how participants tended not to reflect on the scheme as an important factor in encouraging them to set quit dates. Participants outlined how the strength of their relationship with the Phoenix Team was a key determinant in their ability to set a quit date and maintain their cessation behaviour. It appears that the qualitative data contradicts the quantitative data. Also, what is not clear is the extent to which the existence of the incentive scheme operated as a "tool" for the Phoenix Team to initiate quit conversations with pregnant people, offering a "soft" way into a difficult conversation. In this regard, the incentive may have acted as both a "pull", encouraging pregnant people to sign up and a "push", encouraging Phoenix Team members to confidently approach service users. The incentive may also be a target to help pregnant people achieve milestones, breaking a lengthy period into a series of shorter durations to help maintain quit behaviour. It is also likely that the scheme complemented the Phoenix Team's ability to establish emotionally meaningful relationships with pregnant people. Whilst we cannot conclude whether the "incentive" was effective, it is clear that the "scheme" was effective, including, as it did, a monetary incentive, emotional support from the Phoenix Team and access to nicotine replacement therapies.

## Reflections on ethical considerations

Ethical considerations fall into three distinct categories: issues arising from the interventions of the Phoenix Team, issues arising from using public money to fund the incentive scheme and issues arising from the research process.

### *The Phoenix Team intervention*

It is important to note that the midwives/obstetricians tend to use the NCSCT's VBA format: they give information about harm and risk and recommend referral for treatment (NCSCT, 2023). In contrast, the Phoenix Team employs the principles of motivational interviewing (MI) with training provided by NCSCT. MI is a type of counselling that can help people with addictive behaviours, e.g., nicotine dependence. Rather than telling the person why and how they should change their behaviour, the Phoenix Team helps participants choose to change their behaviour, increasing their self-efficacy.

Medicine has a traditional tendency toward a paternalistic, instructional problem-solving approach. In healthcare, paternalism occurs when the physician or other healthcare professional makes decisions for a patient without the patient's explicit consent. The physician believes the decisions are in the patient's best interests. Maternity care has been the spearhead of service user involvement in the decision-making process, using an informed consent approach, and MI is a successful approach in this context.

MI involves four key steps: identifying the disadvantages of the status quo, recognising the advantages of change, expressing optimism about change, and expressing an intention to change. Therefore, it is a very powerful technique, especially considering the context where subjects can be considered vulnerable. This places great responsibility on the Phoenix Team when navigating an asymmetric power relationship with the subjects, making the team powerful, and in any discussion of ethics, the team's motive must be considered.

Perhaps it is useful to consider the ethics of the relationship between the Phoenix Team and the participants in terms of the Ethics of Care (EoC) theory (Pettersen, 2011). This seems especially appropriate given the specific context of the healthcare intervention. EoC is a normative ethical theory (where there is a "right" or "wrong") where care and benevolence are considered a virtue and where interpersonal relationships are central to ethical considerations. The participants stressed the importance of the relationship they built with the practitioners and the extent to which this relationship was personally important to them and was a stimulus in the behaviour change (again placing the practitioners in a position of power).

The participants also stressed the extent to which they did not feel judged by the practitioners, despite several reflecting on how they felt that society at large judged them. This suggests that the participants felt the Phoenix Team intended to "care" a key determinant of whether behaviour can be judged as ethical. Additionally, the participants reported desirable outcomes (smoking cessation), results being another determinant of whether action can be considered ethical. Given that several participants spoke about the positive effect on their self-confidence, this should be considered another positive result potentially of long-term significance, again allowing for an assessment that the result can be considered ethical.

***Public funding***

The financial pressure on the NHS has been comprehensively covered elsewhere. Therefore, it is not unreasonable to question whether limited funds should be spent on activities that are not direct clinical interventions or investments in NHS capacity or capability; for example, incentive funds could have been spent on medical equipment. There are concerns that incentives might reduce decision-making autonomy, especially amongst people from socio-economically deprived backgrounds. Additionally, incentives may restrict people's intrinsic desire to behave healthily and may encourage people to behave in an unhealthy manner to

attract the incentives. This raises ethical concerns; for example, should public money be spent to persuade some members of society to adopt the behaviours that others exhibit freely?

Similarly, monitored incentive schemes require a certain loss of privacy as aspects of the subjects' lives often need to be recorded. However, the counterargument suggests that the incentive scheme makes it easier for pregnant people to make short-term decisions that can affect their own and others' long-term interests, advocating that society benefits from reducing the financial burden on the NHS. There appears to be no specific evidence of adverse or unintended consequences of the incentives used. Given the emerging and incomplete nature of the ethical debate in this area, the clinical practitioners and the academic evaluation team believe that ethical concerns are outweighed by the benefits due to the tangible health benefits and the intangible results described by pregnant people. Although it is acknowledged that some of these benefits were not specifically known in advance, the teams relied on evidence from other incentive schemes.

***The research process***

The academic team sought and received full ethical clearance following the university's standard ethical approval process to conduct the semi-structured interviews and access Trust data. However, some recognised ethical issues are easier to address than others. For example, a range of recognised processes can address how Trust data is accessed, stored and shared. However, other acknowledged ethical issues are more nuanced. In this latter category falls the potential asymmetric relationship between the research assistant and the pregnant people, many of whom face multiple vulnerabilities. Such an issue does not lend itself quite so easily to a clear process but rather relies on the interpersonal skills of the interviewed and how this affects the relationship. The interviewer was well aware of the potential ethical concerns, having both been trained in the university's protocols and been briefed and guided by clinical management. The interviewer was required to use their skill and judgement during their engagements with

pregnant people, but it must be acknowledged that this is highly subjective. The team felt that ensuring just one interviewer was involved, and therefore could quickly develop a "feel" for the issues, helped mitigate the ethical risks encountered.

**Saving Babies' Lives: Impact**

In the preceding discussion about the scheme's effect and its evaluation on the individuals involved, often abstract and intangible, we should not lose sight of an absolute fundamental reality. An analysis of the data demonstrated a direct relationship between the SATOD rate and the number of stillbirths at the Trust across almost four years (Allison and Allison, 2019). We know that smoking is associated with poor health and is strongly linked to adverse socio-economic and education indicators, and smoking in pregnancy contributes to stillbirths. Therefore, whilst setting a quit date, with the associated reduction in SATOD, is the immediate behaviour change, its real importance is likely to be the longer-term impact on families. Essentially, the most significant impact is that the incentive scheme, designed to encourage the setting of quit dates, is likely to be literally "saving babies' lives" – we should not lose sight of this as the ultimate impact of the intervention discussed in this paper. Although not discussed in this paper, we acknowledge the likely further impact of reduced demand on NHS resources.

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