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Introduction

We are a group of researchers from the School of Public Health at Imperial College London and the Erasmus MC – Sophia’s Children’s Hospital in the Netherlands. We have conducted a lot of research on the association of smoking and of tobacco control policies with pre- and perinatal outcomes, including pre-term birth. We have published multiple manuscripts in peer-reviewed journals and we have authored a policy brief for the World Health Organization on this issue.

Tobacco control to prevent preterm birth and its consequences

We welcome the Government’s much-needed ambition to reduce the preterm livebirth rate to 6% by 2025. In this response to the inquiry we wish to highlight the stark inequalities in preterm birth that exist in the UK, the contribution of tobacco smoke exposure to preterm birth and the associated inequalities, and the substantial potential for tobacco control policies to address these issues.

In 2021, 7.6% of all livebirths in England and Wales were preterm.¹ Socioeconomic status (SES) is a key determinant of preterm birth, the risk being approximately 50% higher in women from the lowest versus the highest SES quintile.² Tobacco smoke exposure is a well-recognised risk factor for preterm delivery, particularly among women from low-SES backgrounds.³ Currently in England, around 8% of women are known to be smokers at the time of delivery, with rates exceeding 18% in some regions.⁴ Like preterm birth, tobacco use has a strong SES gradient, with much higher prevalence among women living in vulnerable circumstances.⁵ These women also more commonly have household members who smoke, exposing them to the hazards associated with second-hand tobacco smoke exposure.

Meta-analysis has shown that smoking during pregnancy is associated with a 27% increased risk of preterm birth.⁶ Risks among women exposed to second-hand smoke are slightly lower but still clearly increased.⁷ More recent evidence from the UK using objective markers of tobacco smoke exposure estimated that preterm birth risk may in fact be up to 2.5 times higher than among non-exposed women.⁸ In the UK, up to 48% of the socioeconomic inequalities in preterm birth can be explained by higher smoking rates among low-SES women.⁹ In addition to increasing preterm birth risk per se, antenatal tobacco smoke exposure is also linked to poorer developmental and health outcomes among those born preterm.^{3,10} Altogether, available evidence indicates that protecting pregnant women from exposure to tobacco smoke has considerable potential to reduce preterm birth rates, improve long-term outcome following preterm birth, and reduce associated inequalities.

Smoking cessation is obviously crucial to reduce these risks. Clear guidance from NICE is available to optimally support pregnant women in quitting.¹¹ Here, we additionally wish to highlight the benefits of population-level approaches to reduce smoking prevalence and second-hand smoke exposure. Implementation of comprehensive smoke-free legislation in the late 2000s, for example, reduced preterm birth rates by 4-9% in England and by 11% in Scotland.^{12,13} This is in line with findings from many other countries,¹⁴ which in addition indicates that smoke-free policies can help reduce inequalities in preterm birth.¹⁵ Several studies further showed that the reduction in preterm births is more pronounced when smoke-free policies are more comprehensive (i.e. when they cover more places).^{16,17} Extending smoke-free policies to areas not currently covered has potential to further contribute to reducing preterm birth rates and associated inequalities.

Multiple studies have also linked higher tobacco taxes or cigarette prices to decreases in infant mortality,¹⁸⁻²¹ likely at least in part mediated via a reduction in preterm deliveries. Other tobacco control policies such as

mass media campaigns (which may be specifically directed to women in reproductive age) and health warnings may carry similar benefits via their impact on lowering smoking rates.²² In the UK, young women have the highest rates of smoking during pregnancy and they are also a high-risk group for preterm delivery.²³ As such, existing progressive plans for increasing the legal age for purchasing tobacco is likely to carry particular benefits for reducing preterm birth rates among young women.

The UK has consistently been at the forefront of tobacco control in recent times.²⁴ Continuing this leadership position is essential to protect current and future generations from tobacco-related harms, including (inequalities in) preterm delivery and its devastating long-term consequences.²⁵

References

1. Office for National Statistics. Birth characteristics in England and Wales: 2021. 2023. <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthcharacteristicsinenglandandwales/2021>
2. Jardine J, Walker K, Gurol-Urganci I, et al. Adverse pregnancy outcomes attributable to socioeconomic and ethnic inequalities in England: a national cohort study. *Lancet* 2021; **398**(10314): 1905-12.
3. Wagijo MA, Sheikh A, Duijts L, Been JV. Reducing tobacco smoking and smoke exposure to prevent preterm birth and its complications. *Paediatr Respir Rev* 2017; **22**: 3-10.
4. NHS England. Statistics on Women's Smoking Status at Time of Delivery: Data tables. 2024. <https://digital.nhs.uk/data-and-information/publications/statistical/statistics-on-women-s-smoking-status-at-time-of-delivery-england/statistics-on-womens-smoking-status-at-time-of-delivery-england-quarter-2-2023-24/data-tables>.

5. Smoking in Pregnancy Challenge Group. Getting back on track. Delivering a smokefree start for every child, 2021.
6. Shah NR, Bracken MB. A systematic review and meta-analysis of prospective studies on the association between maternal cigarette smoking and preterm delivery. *Am J Obstet Gynecol* 2000; **182**(2): 465-72.
7. Cui H, Gong TT, Liu CX, Wu QJ. Associations between passive maternal smoking during pregnancy and preterm birth: evidence from a meta-analysis of observational studies. *PLoS One* 2016; **11**(1): e0147848.
8. Selvaratnam RJ, Sovio U, Cook E, Gaccioli F, Charnock-Jones DS, Smith GCS. Objective measures of smoking and caffeine intake and the risk of adverse pregnancy outcomes. *Int J Epidemiol* 2023; **52**(6): 1756-65.
9. McHale P, Schlüter DK, Turner M, et al. How are socioeconomic inequalities in preterm birth explained by maternal smoking and maternal body mass index: A mediation analysis. *Paediatr Perinat Epidemiol* 2024; **38**(2): 142-51.
10. Mahabee-Gittens EM, Harun N, Glover M, Folger AT, Parikh NA, Cincinnati Infant Neurodevelopment Early Prediction Study I. Prenatal tobacco smoke exposure and risk for cognitive delays in infants born very premature. *Sci Rep* 2024; **14**(1): 1397.
11. National Institute for Health and Care Excellence. Recommendations on treating tobacco dependence in pregnant women. 2021. <https://www.nice.org.uk/guidance/ng209/chapter/recommendations-on-treating-tobacco-dependence-in-pregnant-women>.
12. Mackay DF, Nelson SM, Haw SJ, Pell JP. Impact of Scotland's smoke-free legislation on pregnancy complications: retrospective cohort study. *PLoS Med* 2012; **9**(3): e1001175.

13. Bakolis I, Kelly R, Fecht D, et al. Protective Effects of smoke-free legislation on birth outcomes in England: A regression discontinuity design. *Epidemiology* 2016; **27**(6): 810-8.
14. Faber T, Kumar A, Mackenbach JP, et al. Effect of tobacco control policies on perinatal and child health: a systematic review and meta-analysis. *Lancet Public Health* 2017; **2**(9): e420-e37.
15. Ji X, Cox S, Grosse SD, et al. Association of smoke-free laws with preterm or low birth weight deliveries—A multistate analysis. *Health Serv Res* 2021; **56**(1): 61-72.
16. Ana MV-C, Christian S, Dragana R, et al. Benefits of smoking bans on preterm and early-term births: a natural experimental design in Switzerland. *Tobacco Control* 2016; **25**(e2): e135-e41.
17. Ashford KB, Blair LM, McCubbin AK, Wiggins AT, Rayens MK, Hahn EJ. Municipal smoke-free laws and preterm birth. *Am J Obstet Gynecol* 2022; **227**(5): 767.e1-.e10.
18. Sen A, Pierard E. Estimating the effects of cigarette taxes on birth outcomes. *Can Public Policy* 2011; **37**(2): 257-76.
19. Patrick SW, Warner KE, Pordes E, Davis MM. Cigarette Tax Increase and Infant Mortality. *Pediatrics* 2016; **137**(1).
20. Filippidis FT, Lavery AA, Hone T, Been JV, Millett C. Association of cigarette price differentials with infant mortality in 23 European Union countries. *JAMA Pediatr* 2017; **171**(11): 1100-6.
21. Radó MK, Lavery AA, Hone T, et al. Cigarette taxation and neonatal and infant mortality: A longitudinal analysis of 159 countries. *PLOS Glob Public Health* 2022; **2**(3): e0000042.
22. Mallma P, Carcamo C, Kaufman JS. The impact of anti-tobacco legislation on birth weight in Peru. *Glob Health Res Policy* 2020; **5**: 5.

23. Aughey H, Jardine J, Knight H, et al. Iatrogenic and spontaneous preterm birth in England: A population-based cohort study. *Bjog* 2023; **130**(1): 33-41.
24. Joossens L, Olefir L, Feliu A, Fernandez E. The Tobacco Control Scale 2021 in Europe, 2022.
25. World Health Organization. Tobacco control to improve child health and development: thematic brief, 2021.

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