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| <p>Institution: St George's, University of London</p> |
| <p>Unit of Assessment: A2 Public Health, Health services and Primary Care</p> |
| <p>Title of case study: Effects of parental smoking on respiratory health among children</p> |
| <p>1. Summary of the impact (indicative maximum 100 words)</p> <p>Systematic quantitative reviews of epidemiological evidence linking parental smoking with adverse respiratory health effects in childhood were published in 1997-1999 in <i>Thorax</i>. These meta-analyses were updated as a contribution to the US Surgeon-General's report on Secondhand Smoking, published in 2006, and the UK Royal College of Physicians' report on Passive Smoking and Children, published in 2010.</p> <p>Over this period the adverse health effects of environmental tobacco smoke achieved prominence in public health policy, through campaigns for smoke-free workplaces (including pubs and restaurants) and publicity against parental smoking in the presence of children, both in cars and in the home.</p> |
| <p>2. Underpinning research (indicative maximum 500 words)</p> <p>Systematic quantitative reviews of the epidemiological evidence linking parental smoking with adverse respiratory health effects in infancy and childhood were carried out in the late 1990s under commission from the UK Department of Health, and published as a series of 9 peer-reviewed papers in <i>Thorax</i> during 1997-1999 (see references [1-3] for examples).</p> <p>At this time, Cook was senior lecturer in epidemiology, later promoted to professor. Anderson and Strachan were professors of epidemiology throughout. All three have been in continuous employment at St George's since 1993.</p> <p>Although there had been a number of previous narrative reviews, our papers were the first attempt at a quantitative meta-analysis of this rapidly expanding evidence base. For this work, Cook and Strachan were jointly awarded the 1999 European Respiratory Society / Astra Zeneca Prize for Paediatric Respiratory Research in Europe.</p> <p>The findings were summarised in a final review of the <i>Thorax</i> series [4]. This described a consistent pattern for respiratory illnesses and symptoms and middle ear disease with odds ratios of between 1.2 and 1.6 for either parent smoking, the risks usually being higher in pre-school than in school aged children. For sudden infant death syndrome the odds ratio for maternal smoking was higher at about 2.0. The results appeared robust to adjustment for a range of potential confounding variables. Significant adverse effects from paternal smoking even in countries where few mothers smoked suggested a causal role for postnatal exposure to environmental tobacco smoke, independent of any prenatal effects of maternal smoking in pregnancy.</p> <p>These meta-analyses were updated as a contribution to the US Surgeon-General's report on Secondhand Smoking, published in 2006 [5], and updated again in 2010 [6], as preparation for the UK Royal College of Physicians' report on Passive Smoking and Children. The latest review [6], focussing on respiratory illness in infancy, included 60 studies: twice as many as had been considered in the original 1997 review of these outcomes [1]. Despite this expanded evidence base, the conclusions of the original reviews were sustained.</p> <p>The original review series concluded [4] that <i>"substantial benefits to children would arise if parents stopped smoking after birth, even if the mother smoked during pregnancy. Policies need to be developed which reduce smoking amongst parents and protect infants and young children from exposure to environmental tobacco smoke."</i></p> <p>This was endorsed 12 years later [6]: <i>"Passive smoking in the family home is a major influence on</i></p> |

Impact case study (REF3b)

the risk of lower respiratory illness in infants, and ... is particularly strong in relation to post-natal maternal smoking. Strategies to prevent passive smoke exposure in young children are an urgent public and child health priority."

Over the intervening period, the adverse health effects of environmental tobacco smoke achieved prominence in public health policy, through the successful campaigns for smoke-free workplaces (including pubs and restaurants) in many countries. Currently, the evidence that we assembled in relation to risks to young children is being used to argue the case against parental smoking in the presence of children, both in cars and in the home.

3. References to the research (indicative maximum of six references)

[1] Strachan DP, Cook DG. Parental smoking and lower respiratory illness in infancy and early childhood. *Thorax* 1997;52:905-914. PMID: 9404380 DOI - 10.1136/thx.52.10.905.

[2] Anderson HR, Cook DG. Passive smoking and sudden infant death syndrome: review of the epidemiological evidence. *Thorax* 1997;52:1003-9. PMID: 9487351 No DOI available.

[3] Cook DG, Strachan DP. Parental smoking and prevalence of respiratory symptoms and asthma in school age children. *Thorax* 1997;52:1081-1094. PMID: 951690 No DOI available

[4] Cook DG, Strachan DP. Summary of effects of parental smoking on the respiratory health of children and implications for research. *Thorax* 1999;54:357-366. PMID: 10092699 No DOI available.

[5] U.S. Department of Health and Human Services. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2006. ISBN 0-16-076152-2. (Chapter 6: pages 261-420. Cook DG, Strachan DP, Weiss ST, DeMeo D. Respiratory Effects in Children from Exposure to Secondhand Smoke. <http://www.surgeongeneral.gov/library/secondhandsmoke/report/chapter6.pdf>)

[6] Jones LL, Hashim A, McKeever T, Cook DG, Britton J, Leonardi-Bee J. Parental and household smoking and the increased risk of bronchitis, bronchiolitis and other lower respiratory infections in infancy: systematic review and meta-analysis. *Respir Res*.2011;12:5. PMID: 21219618 DOI 10.1186/1465-9921-12-5.

4. Details of the impact (indicative maximum 750 words)

The evidence we published in 1997-1999 was reported to the UK Department of Health's Standing Committee on Tobacco and Health (SCOTH) and contributed, with similar evidence from studies of adults, to the growing prominence of environmental tobacco smoke (or secondhand smoke) in health policy during the past decade. The *Thorax* reviews were cited (on screen) as the principal source of evidence underlying the UK Department of Health's "smoking babies" TV advertisement campaign in 2003 (evaluated in reference [A]). Before this campaign, 48% of adults spontaneously mentioned second-hand smoke as an environmental risk to children's health and this increased to 54% after the advertisements were broadcast.

The US Surgeon-General's 2006 report [B] and particularly our chapter within it (chapter 6, reference 5 above) has been influential in development of public campaigns to reduce exposure of children to parental smoking, particularly in the United States. The US Environmental Protection Agency's initiative on smoke-free homes and cars [C] refers specifically to the Surgeon-General's report as evidence of adverse health effects [D] and has prepared a multilingual brochure, available in hardcopy and online [E], explaining the effects of secondhand smoke on the health of young families.

Since 2008, legislation to ban smoking in private vehicles when children are passengers has been introduced in several states of the USA: Arkansas, California, Hawaii, Louisiana, Maine, Maryland, Utah and most recently (June 2013) in Oregon. Similar bans exist in Australia, Bahrain, Canada, Cyprus, Mauritius, South Africa, and United Arab Emirates. Legislation is under consideration in Finland, Ireland, Israel, the Netherlands and Taiwan [F].

The UK has been slower to develop similar initiatives, but the Action on Smoking and Health (ASH) policy briefing in 2009 [G] built upon our 1997-1999 publications. Following the publication of the Royal College of Physicians (RCP) Report in 2010 [H] (which was based in part on our updated review of health effects in younger children [reference 6 above]), a revised ASH briefing paper cited both the Surgeon-General's and Royal College of Physicians' reports as evidence on parental smoking and ill-health among children [I], and a January 2012 ASH factsheet on smoking in cars refers to both the SCOTH and RCP reports as evidence of risks to children [J]. At the time of writing (July 2013), political pressure is building within the UK, particularly in Scotland [K], for legislation to outlaw smoking in cars when children are present.

Online NHS guidance [L] specifically refers to the adverse effects of parental smoking on the health of young children and advises: *"One of the best things you can do to protect other people and children is to keep your home and car smoke-free by smoking outside, as smoke can linger for up to two-and-a-half-hours."*

Thus, our work has had demonstrable impact on the direction of public policy and publicity campaigns, both in the UK and overseas. We also note, with amusement, that in 2012 a new Canadian version of Clement C Moore's classic poem *Twas the Night Before Christmas* was published with two lines (referring to Santa Claus's pipe) removed in an attempt to limit children's exposure to images of smoking [M]. This must be a rare example of epidemiological research having a cultural impact on the fictional literature, but we hesitate to suggest that there will be any resulting health benefits, except, perhaps, north of the Arctic Circle..!

5. Sources to corroborate the impact (indicative maximum of 10 references)

[A] DH evaluation of "Smoking Kids" TV campaigns 2003-2005:
http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/@freofinf/@clainf/documents/digitalasset/dh_073864.pdf [downloaded October 2011]

[B] U.S. Department of Health and Human Services. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2006. ISBN 0-16-076152-2.
<http://www.surgeongeneral.gov/library/secondhandsmoke/report/>

[C] <http://www.epa.gov/smokefree/> [accessed and screen-dumped to PDF October 2011]

[D] <http://www.epa.gov/smokefree/healtheffects.html> [screen-dumped to PDF October 2011]

[E] U.S. Environmental Protection Agency. *Secondhand Tobacco Smoke and the Health of Your Family*. EPA 402/F/09/004. U.S.E.P.A, September 2009.
http://www.epa.gov/smokefree/pdfs/trifold_brochure.pdf [downloaded October 2011]

[F] http://en.wikipedia.org/wiki/Smoking_bans_in_private_vehicles [accessed 12 July 2013].

[G] UK campaigns for smoke-free cars and homes: ASH briefing, August 2009
www.smokefreenorthwest.org/pdf/Smoking_in_Cars.pdf [downloaded October 2011]

[H] Royal College of Physicians. Passive smoking and children: A report of the Tobacco Advisory Group of the Royal College of Physicians. London: RCP, 2010. 200 pages. ISBN: 9781860163753.

[I] ASH research report. *Secondhand smoke: the impact on children, June 2011*.
www.ash.org.uk/files/documents/ASH_596.pdf [downloaded October 2011]

[J] ASH factsheet. *Smoking in cars, January 2012*. www.ash.org.uk/files/documents/ASH_714.pdf
[downloaded 12 July 2013]

[K] BBC News 28 May 2013. *MSP wants ban on smoking in cars carrying children*.
<http://www.bbc.co.uk/news/uk-scotland-scotland-politics-22684036> [accessed and screen-dumped to PDF 12 July 2013]

[L] NHS Smokefree website (tab for non-smokers and children), 2011
<http://smokefree.nhs.uk/why-quit/non-smokers-and-children/> [screen-dumped October 2011]

[M] The Guardian, 24 October 2012. *Santa's pipe put out in new edition of children's classic*.
<http://www.guardian.co.uk/books/2012/oct/24/santa-pipe-new-night-before-christmas> [accessed and screen-dumped October 2012 – still available online 12 July 2013]