



ASH Scotland

Child exposure to second-hand smoke in the home

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Key points:

- many children in Scotland are exposed to second-hand smoke (SHS) in the home
- SHS exposure is associated with a range of adverse health outcomes
- there is no evidence that banning smoking in public places in Scotland has resulted in increased exposure in the home due to a displacement effect
- evidence on effective interventions for reducing exposure in the home is mixed, with no clear evidence of efficacy for any one approach
- smoke-free home interventions are currently being developed within the UK.

The level of second-hand smoke exposure in the home

The introduction of smoke-free legislation for Scotland's public places in 2006 served as an important milestone in reducing the adverse impact tobacco has on health. Research conducted since the introduction of this legislation has emphasised the positive effects of the law, but also highlighted the fact that work must continue to reduce exposure to tobacco smoke, particularly for vulnerable groups (such as children) in areas not covered within the legislation, and particularly in the home¹.

During the passage of Scotland's smoke-free legislation concern was expressed that making public places smoke-free would push smoking inside the home and put children's health at risk. This has been shown not to be the case². Despite this, the home remains the environment where second-hand smoke (SHS) exposure is likely to be highest, particularly for children.

In Scotland in 2007, 40% of primary school children reported living with a parent who smokes, 27.4% reported they were exposed to second-hand smoke in their own home, 9.5% reported exposure at someone else's home and a further 6.5% reported exposure in a car. 19% of children were exposed to SHS at levels dangerous to arterial health³.

Infants inhale double the quantity of household dust compared to adults, and so inhale more dust containing SHS particulates (perhaps 40 more times more per body weight than adults)⁴. Infants also have greater hand/object/mouth contact, and so absorb proportionately more SHS through ingestion, as well as through inhalation⁵.

Exposure to SHS is particularly an issue for children in disadvantaged areas where smoking rates are higher than average and quit rates lower. A recent study confirms that marked social inequalities in SHS exposure exist among 11 year old children from different socioeconomic groups in Scotland⁶.

Second-hand smoke exposure and the effects on child health

Children and infants face the highest level of SHS exposure in the home as they are often unable to remove themselves from smoky environments. With their smaller airways, faster rates of breathing and immature immune systems children and infants are also most vulnerable to any adverse health effects⁷.

Exposure to SHS in childhood is associated a range of illnesses including middle ear disease, lower respiratory tract infection, wheeze, asthma and it also appears to increase the risk of bacterial meningitis.⁸ SHS exposure has also been shown to be a cause of Sudden Infant Death Syndrome (SIDS)^{9 10}.

The Royal College of Physicians estimates that, in children in the United Kingdom, SHS exposure causes around 40 sudden infant deaths, over 20,000 cases of lower respiratory tract infection, 120,000 cases of middle ear diseases, at least 22,000 new cases of wheeze and asthma, and 200 cases of bacterial meningitis each year. These cases of disease annually generate over 300,000 GP consultations and around 9,500 hospital admissions in the UK¹¹.

Research suggests that children who are exposed to SHS are at a higher risk of developing lung cancer as adults. Children exposed to SHS on a daily basis, and for many hours, face over three times the risk of lung cancer than those who grow up in smoke-free environments¹².

The effect of smoke-free legislation on SHS exposure in the home

Opponents of smoke-free legislation often argue that an immediate consequence of introducing smoke-free public places is increased smoking in the home. This argument is used to attempt to justify a voluntary approach to reducing exposure to second-hand smoke¹³.

However there is no published, peer-reviewed evidence to demonstrate that smoke-free workplaces and enclosed public places increase the exposure of children to SHS at home^{14 15}. Research conducted in Scotland¹⁶, England¹⁷, Wales¹⁸ and Ireland¹⁹ found no indications that smoking in the home increased after the legislation.

Similarly a Cochrane review found no change in either the prevalence or duration of self-reported exposure to SHS in the home as a result of legislative smoking bans²⁰. Research also demonstrates that where smoke-free workplaces and enclosed public places are the norm, parents are more likely to try and prevent smoking in the home^{21 22}.

One year after the implementation of Scotland's smoke-free legislation the proportion of children reporting a complete ban on smoking in their home, as opposed to a partial or no ban, increased independent of parental smoking status from 47% to 52%. However, children who reported living with smokers were less likely to have stringent restrictions on smoking in the home compared with children who lived with non-smoking parents. Among the smoker households the extent of restrictions varied according to the number and gender of parents who smoked. For example those living in households where only the father smoked were more likely to live in a house

with a complete smoking ban compared to children living with two parents who smoke or only a mother who smokes²³.

In California, the proportion of children and adolescents living in smoke-free homes increased from 38% in 1992, to 82.2% in 1999, one year after all enclosed public places and workplaces became smoke-free state-wide. Importantly, in homes where all adults smoked, smoke-free homes increased from 8% to 53% over the same period. In homes where at least one adult smoked the proportion of smoke-free homes increased from 33% to 67%²⁴.

Interventions for reducing children's SHS exposure in the home

Evidence on the effectiveness of interventions to reduce second-hand smoke exposure in the home is mixed. A 2008 Cochrane review aimed to determine the effectiveness of interventions to reduce children's exposure to SHS. However, the review was unable to determine that one intervention reduced parental smoking and child exposure more effectively than others, although four studies were identified that reported intensive counselling in clinical settings was effective²⁵.

Research published in 2009 suggests that the addition of smoking cessation services to SHS exposure interventions that include counselling, may offer motivation for parents to quit smoking and contribute to longer-term abstinence than stand alone SHS exposure interventions²⁶.

In a report on passive smoking and children, the Royal College of Physicians highlight the importance of promoting smoke-free homes through mass media campaigns and behavioural interventions. They also suggest that new and innovative approaches such as the use of nicotine replacement therapy to support temporary abstinence in the home should be explored further²⁷.

A media campaign on second-hand smoke exposure in the home was launched in 1992 in the state of Victoria, Australia. The campaign urged parents not to expose their children to smoke and encouraged parents to smoke outside and ban smoking in their homes. Evaluation of the campaign indicated a strong positive impact among non-smokers but less effect among smokers. In households where at least one smoker lived and children were present, smoking restrictions on visitors to the home rose from 29% in 1992 to 53% in 1997. In houses where all adults smoked and children were present, these restrictions rose from 12% to 32% over the same time period²⁸.

Smoke-free home interventions are currently being developed within the UK but to date have not been fully evaluated²⁹.

Current research and policy recommendations

A conference hosted by NHS Health Scotland in March 2008 identified a range of challenges and solutions for local agencies supporting families to protect children from second-hand smoke. A report of the event was produced with a range of recommendations based on the presentation and discussion that took place during the day³⁰.

ASH Scotland received significant funding from the Big Lottery Fund research grants programme to manage a three year research project which began in February 2010. REFRESH (Reducing families' exposure to second-hand smoke in the home) will deliver a portfolio of research to develop tools for community health workers to help them reduce children's exposure to second-hand smoke, particularly in disadvantaged communities. The project will involve three linked phases: desk-top research that includes mapping existing smoke-free home interventions in Scotland and England, a review of the literature on SHS and children's exposure and a baseline and follow-up survey of practitioners working with families and children; qualitative research to understand the issues faced by parents, practitioners and policy makers; and field work to develop, pilot, and evaluate a new intervention in the home³¹. REFRESH will report the findings from this research project in 2013.

In England in February 2010, under the previous government, the Department of Health published a new tobacco control strategy for England. One of the aspirations included in the strategy was to increase to two thirds the proportion of homes where parents smoke but that are entirely smoke-free indoors by 2020³². It is yet to be seen whether this goal will be taken forward by the current government at Westminster. In Scotland there are currently no national or local targets for reducing SHS exposure in the home.

Resources

Passive smoking and children

Royal College of Physicians, 2010, (full text free to download as a pdf)
<http://bookshop.rcplondon.ac.uk/details.aspx?e=305>
[accessed 28 February 2011]

REFRESH (Reducing families' exposure to second-hand smoke in the home)

<http://www.ashscotland.org.uk/projects/refresh>
[accessed 28 February 2011]

Latest research on second-hand smoke (updated weekly)

<http://www.ashscotland.org.uk/information/tobacco-related-research/research-2011/second-hand-and-third-hand-smoke>
[accessed 28 February 2011]

¹ Akhtar, P., et al. Changes in child exposure to environmental tobacco smoke (CHETS) study after implementation of smoke-free legislation in Scotland: national cross sectional survey. *British Medical Journal* 335(7619): pp.545-5549, 2007.

² Ibid

³ Ibid

⁴ Thomson, G., et al. Smoky homes: a review of the exposure and effects of secondhand smoke in New Zealand homes. *New Zealand Medical Journal* [online] 118(1213): U1404, 2005. Available from: www.nzma.org.nz/journal/118-1213/1404/ [accessed 8 February 2011]

⁵ Matt, G., et al. Households contaminated by environmental tobacco smoke: sources of infant exposures. *Tobacco Control* 13(1): pp.29-37, 2004.

⁶ Akhtar, P., et al. Socioeconomic differences in second-hand smoke exposure among children in Scotland after introduction of the smoke-free legislation. *Journal of Epidemiology and Community*

Health 64(4): pp341-346, 2010. Available from: <http://jech.bmj.com/content/64/4/341> [accessed 8 February 2011]

⁷ Bearer, C.F. Environmental health hazards: How children are different from adults. *The Future of Children* 5(2):11-26, 1995. Available from: www.princeton.edu/futureofchildren/publications/journals/article/index.xml?journalid=59&articleid=360 [accessed 14 February 2011]

⁸ Royal College of Physicians. *Passive smoking and children. A report by the Tobacco Advisory Group*. London: Royal College of Physicians, 2010.

⁹ Ibid.

¹⁰ Scientific Committee on Tobacco and Health (SCOTH). *Secondhand smoke: review of the evidence since 1998. Update of evidence on health effects of secondhand smoke*. [online]. London: Department of Health, 2004. Available from:

www.advisorybodies.doh.gov.uk/scoth/PDFS/scothnov2004.pdf [accessed 14 February 2011]

¹¹ Royal College of Physicians. *Passive smoking and children. A report by the Tobacco Advisory Group*. London: Royal College of Physicians, 2010.

¹² Vineis, P. et al. Second-hand smoke and risk of respiratory cancer and chronic obstructive pulmonary disease in former smokers and never smokers in the EPIC prospective study. *British Medical Journal* [online] 330(7486): p277, 2005. Available from:

<http://bmj.bmjournals.com/cgi/content/abstract/330/7486/277> [accessed 15 February 2011]

¹³ ASH Scotland. *The unwelcome guest: how Scotland invited the tobacco industry to smoke outside*. [online] Edinburgh: ASH Scotland, 2005. Available from:

www.ashscotland.org.uk/ash/files/The%20Unwelcome%20Guest.pdf [accessed 15 February 2011]

¹⁴ Callinan, J.E., et al. Legislative smoking bans for reducing secondhand smoke exposure, smoking prevalence and tobacco consumption. *The Cochrane Database of Systematic Reviews* [online] 4: CD005992, 2010. Available from:

<http://onlinelibrary.wiley.com/o/cochrane/clsysrev/articles/CD005992/frame.html> [accessed 15 February 2011]

¹⁵ Royal College of Physicians. *Passive smoking and children. A report by the Tobacco Advisory Group*. London: Royal College of Physicians, 2010.

¹⁶ Akhtar, P., et al. Changes in child exposure to environmental tobacco smoke (CHETS) study after implementation of smoke-free legislation in Scotland: national cross sectional survey. *British Medical Journal* 335(7619): pp.545-5549, 2007.

¹⁷ Jarvis M, et al. Smoke-free homes in England: prevalence, trends and validation by cotinine in children. *Tobacco Control* [online] 18(6): 491-5, 2009. Available from:

<http://tobaccocontrol.bmj.com/content/early/2009/09/10/10/tc.2009.031328> [accessed 15 February 2011]

¹⁸ Holliday, J.C. Moore, G.F. and Moore, L.A. Changes in child exposure to secondhand smoke after implementation of smoke-free legislation in Wales: a repeated cross-sectional study. *BMC Public Health* [online] 9: 43, 2009. Available from:

www.ncbi.nlm.nih.gov/pmc/articles/PMC2789068/?tool=pubmed [accessed 15 February 2011]

¹⁹ Zabir, Z. et al. Active smoking and second-hand smoke exposure at home among Irish children, 1995-2007. *Archives of Disease and Childhood*. [online] 95[1]: 42-5, 2009. Available from:

<http://adc.bmj.com/content/early/2009/10/19/adc.2008.155218.abstract> [accessed 15 February 2011]

²⁰ Callinan, J.E., et al. Legislative smoking bans for reducing secondhand smoke exposure, smoking prevalence and tobacco consumption. *The Cochrane Database of Systematic Reviews* [online] 4: CD005992, 2010. Available from:

<http://onlinelibrary.wiley.com/o/cochrane/clsysrev/articles/CD005992/frame.html> [accessed 15 February 2011]

²¹ Borland, R. et al. Trends in environmental tobacco smoke restrictions in the home in Victoria, Australia. *Tobacco Control* 8(3): 266-271, 1999.

²² Soliman, S. et al. Decrease in prevalence on environmental tobacco smoke exposure in the home during the 1990s in families with children. *American Journal of Public Health* 94(2): pp.314-20, 2004.

²³ Akhtar, P., et al. Smoking restrictions in the home and secondhand smoke exposure among primary schoolchildren before and after introduction of the Scottish smoke-free legislation. *Tobacco Control* 18(5): pp.409-15, 2009.

²⁴ Gilpin, E.A. et al. Clean indoor air: advances in California, 1990-1999. *American Journal of Public Health* 92(5): pp.785-91, 2002.

²⁵ Priest, N. et al. Family and carer smoking control programmes for reducing children's exposure to environmental tobacco smoke. *The Cochrane Database of Systematic Reviews*. [online] 4: CD001746,

2008. Available from: <http://onlinelibrary.wiley.com/o/cochrane/clsysrev/articles/CD001746/frame.html> [accessed 16 February 2011]

²⁶ Hovell, M.F., et al. Counselling to reduce children's secondhand smoke exposure and help parents quit smoking: a control trial. *Nicotine & Tobacco Research* 11(12): pp.1383-1393, 2009.

²⁷ Royal College of Physicians. *Passive smoking and children. A report by the Tobacco Advisory Group*. London: Royal College of Physicians, 2010

²⁸ Borland, R., et al. Trends in environmental tobacco smoke restrictions in the home in Victoria, Australia. *Tobacco Control* 8(3): pp.266-271, 1999.

²⁹ Royal College of Physicians. *Passive smoking and children. A report by the Tobacco Advisory Group*. London: Royal College of Physicians, 2010.

³⁰ NHS Health Scotland. The Scottish Government. *Smoking in the home: Report of the national seminar held in Glasgow 24 April 2008*. NHS Health Scotland. 2008.

³¹ ASH Scotland. *REFRESH (Reducing families exposure to second-hand smoke in the home)*. Edinburgh: ASH Scotland. 2011. Available from: www.ashscotland.org.uk/projects/refresh [accessed 18 February 2011]

³² Department of Health, *A Smokefree Future; A Comprehensive Tobacco Control Strategy for England*. 2010. Available from: http://www.dh.gov.uk/prod_consum_dh/groups/dh.digitalassets/@dh/@en/@ps/documents/digitalasset/dh_111789.pdf [accessed 18 February 2011]

ASH Scotland, 8 Frederick Street, Edinburgh, EH2 2HB

0131 225 4725

E-mail: enquiries@ashscotland.org.uk Website: www.ashscotland.org.uk

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